COVID-19 in the California Workers' Compensation System

A Study of COVID-19 Claims and Presumptions Under Senate Bill 1159

DENISE D. QUIGLEY, MICHAEL DWORSKY, NABEEL QURESHI, SHANNON PRIER, COURTNEY A. GIDENGIL

Prepared for the California Commission on Health and Safety and Workers' Compensation

For more information on this publication, visit **www.rand.org/t/RRA1430-1**.

Published by the RAND Corporation, Santa Monica, Calif.

About This Report

This report describes work undertaken by the RAND Corporation for the California Commission on Health and Safety and Workers' Compensation (CHSWC) in the Department of Industrial Relations (DIR). The goal of this study is threefold: (1) evaluate the overall impacts of claims for coronavirus disease 2019 (COVID-19) on California's workers' compensation system; (2) evaluate the overall impacts of COVID-19 claims on California's workers' compensation indemnity benefits, medical benefits, and death benefits, including differences in the effects across differing occupational groups; and (3) assess the overall and cost impacts of the frontline worker and outbreak presumptions created by Senate Bill (SB) 1159 on California's workers' compensation system. This mixed-methods evaluation has two main tasks. First, describe the volume and outcomes of COVID-19 claims and estimate the associated costs. Second, document the views and experiences of key stakeholders. The main stakeholder groups were the following:

- Workers who contracted COVID-19 and inquired about or used the workers' compensation system for COVID-19 claims and medical care provision
- Public health officials
- Claims administrators and employers from frontline and known-outbreak industries across Northern and Southern California.

In addition, to hear an even broader policy and community perspective, we convened a technical advisory group (TAG) twice during the study to inform study priorities and assess community reaction to our findings. This research builds directly on several past RAND studies for DIR and CHSWC, including several recent studies on workers' compensation issues. Although this study focused on California, our findings may be of interest to state policymakers throughout the country who are considering adoption of or modifications to laws establishing similar presumptions for frontline workers or for workers in outbreaks.

Justice Policy Program

RAND Social and Economic Well-Being is a division of the RAND Corporation that seeks to actively improve the health and social and economic well-being of populations and communities throughout the world. This research was conducted in the Justice Policy Program within RAND Social and Economic Well-Being. The program focuses on such topics as access to justice, policing, corrections, drug policy, and court system reform, as well as other policy concerns pertaining to public safety and criminal and civil justice. For more information, email justicepolicy@rand.org.

Acknowledgments

We thank the following people and entities for their contributions to this study: expert participants in our technical advisory group (TAG); interview participants for their willingness to share their experiences and insights; RAND staff, including Cheryl Montemayor for programming and data management, Chris Whaley and Jon Cantor for expertise in identifying confirmed COVID-19 cases in the data, Grace Gahlon for reviewing literature and abstracting articles, Rosa-Elena Garcia for translation of the injured-worker interviews and recruiting documents and for conducting injured-worker interviews in Spanish, and Lynn Polite for administrative assistance. We also thank Frank W. Neuhauser, Senior Research Associate/Professor at the Institute for the Study of Societal Issues, University of California Berkeley; and Sandra Berry, sociologist and survey methodologist at RAND, for their outstanding efforts as quality-assurance reviewers. We also wish to thank Roald Euller and John Daly in the RAND information and technology division's computing environment. We also thank DIR leadership and staff for providing the opportunity and financial support needed to carry out this study—particularly Katie Hagen, Eduardo Enz, Irina Nemirovsky, Dr. Raymond Meister, George Parisotto, Nurgul Toktogonova, Meitong Jin, Genet Daba, Alissa Huang, and other programming staff that may have contributed to data extraction for this study.

Summary

The novel coronavirus SARS-CoV-2, which causes the coronavirus disease 2019 (COVID-19), has led to the most severe global pandemic in more than 100 years. COVID-19 is deadly for some and can often lead to serious illness or long-term symptoms in nonfatal cases of infection. From March 2020 through early February 2022, there were more than 8 million cases of COVID-19 infection in California, and more than 80,000 Californians were killed by COVID-19 (COVID19.CA.GOV, 2021a). In recognition of the deadly workplace risks that millions of workers suddenly found themselves facing as the pandemic started, California policymakers moved quickly to facilitate access to workers' compensation (WC) benefits for health care workers and other frontline workers who had to continue working outside the home, and who were thus most exposed to the coronavirus.

This was done by establishing legal *presumptions* that COVID-19 is work-related under specific circumstances. In the absence of a presumption for COVID-19, it would typically be difficult for workers with COVID-19 to demonstrate that their cases were work-related (defined as "arising out of and in the course of the employment") (Kingston, 1919; Cal. Lab. Code 3600, 2011) under the standard of evidence typically used in the WC system. A presumption effectively shifts the burden of proof from workers (who would typically have to prove that their injuries or illnesses are work-related for their claims to be accepted as compensable) to employers (who must show that injuries or illnesses are *not* work-related to deny claims). A temporary presumption for COVID-19 covering specified workers was established by executive order on May 6, 2020 (Newsom, 2020c). Senate Bill (SB) 1159, 2020, which was signed into law on September 17, codified this temporary presumption and introduced distinct presumptions for two groups of workers who fell ill with COVID-19 on July 6, 2020, or later:

- Labor Code section 3212.87 covers specified health care workers and workers in specified health care facilities, active firefighters, and peace officers primarily engaged in active law enforcement. We refer to this presumption as the *frontline* presumption. (Cal. Lab. Code 3212.87, 2020).
- Labor Code section 3212.88 covers workers not covered by the frontline presumption who tested positive for COVID-19 while working outside the home during an *outbreak period* at their jobsites. We refer to this presumption as the *outbreak presumption* (Cal. Lab. Code 3212.88, 2020).

These presumptions, which remain in effect until January 1, 2023, apply to workers meeting these criteria who test positive for COVID-19 using a polymerase chain reaction (PCR) test. Presumptions have been used for decades in California WC to facilitate access to benefits for public safety workers with specific types of injury or occupational disease when it is difficult for workers to prove causation in their individual cases. Yet, SB 1159 was distinguished from

previously adopted presumptions by its coverage of health care workers and others outside the public sector, as well as the use of COVID-19 outbreaks as a trigger for coverage under the presumption.

Overview of the RAND Study

To better inform debate over California's approach to handling COVID-19 in the WC system, the Commission on Health and Safety and Workers' Compensation (CHSWC) asked the RAND Corporation to conduct a study on the *Impacts of COVID-19 and Senate Bill 1159 Presumptions of Compensability on the California Workers' Compensation System*. The goal was to investigate the overall impacts that COVID-19 claims have had on the WC system and the payment of WC benefits. The RAND team was also instructed specifically to consider the impacts of COVID-19 claims and SB 1159 on different occupational groups and to analyze the effects of the different presumptions established by SB 1159.

To do this, RAND researchers conducted a mixed-methods study analyzing claims outcomes, overall and by industry and occupation, from the Workers' Compensation Information System (WCIS) between January 2020 and June 2021. We complemented these quantitative analyses with a literature review to identify the broad array of COVID-19 issues relevant to workers in the pandemic and any related best practices of employers, as well as a series of 32 semistructured key informant interviews with workers, employers, claims administrators, and public health officials. The purpose of the key informant interviews was to obtain insight into a range of experiences and perspectives on how the WC system implemented SB 1159 presumptions, how it influenced WC processes, and how it impacted claims and benefits for workers. The qualitative interview participants were chosen to reflect the geographic diversity of California and a balance of frontline worker and outbreak industries. Finally, we convened a technical advisory group (TAG) to inform study priorities and assess community reaction to our findings.

We caution that this evaluation was not designed to provide a global assessment of whether the presumptions established by SB 1159 were the optimal (or, on net, a beneficial) policy response. At the time of writing, the pandemic has lasted just under two years, and many of the long-term impacts of COVID-19 (on workers and on the WC system) are not yet observable in the available data. Instead, we use the quantitative analysis to establish several basic facts about California's experience to date with COVID-19 WC claims, and we use the qualitative analysis to identify how COVID-19 claims have affected stakeholders and to highlight lessons and considerations for policymakers that emerge from California's experience in the pandemic. These findings may help to inform policy deliberations and suggest some important unanswered questions that might be examined in the future as the pandemic continues and more data become available.

Major Findings

This section summarizes answers to the 17 specific research questions (RQs) that RAND framed to address the goals identified by the legislature. These questions are listed in Table 1.1 in Chapter 1. Summaries at the end of each chapter discuss other relevant findings. Limitations of this report are addressed throughout and must be considered in interpreting its findings. Chapter 9 recaps the problem, discusses the findings in terms their policy implications, and raises areas where future research is needed.

Overall, our study uncovered several challenges with the functioning of the WC system during the pandemic. For employers, these challenges primarily related to handling a large, fluctuating volume of claims within shortened claim administration time frames for making an initial claim decision. For workers, confusion around filing a COVID-19 claim presented challenges, including questions about what occupations were covered and qualified for WC under the presumption and whether a positive COVID-19 test was needed. In the face of these challenges, we consider how the specific aspects of the presumptions identified by SB 1159 affected workers and employers within the WC system.

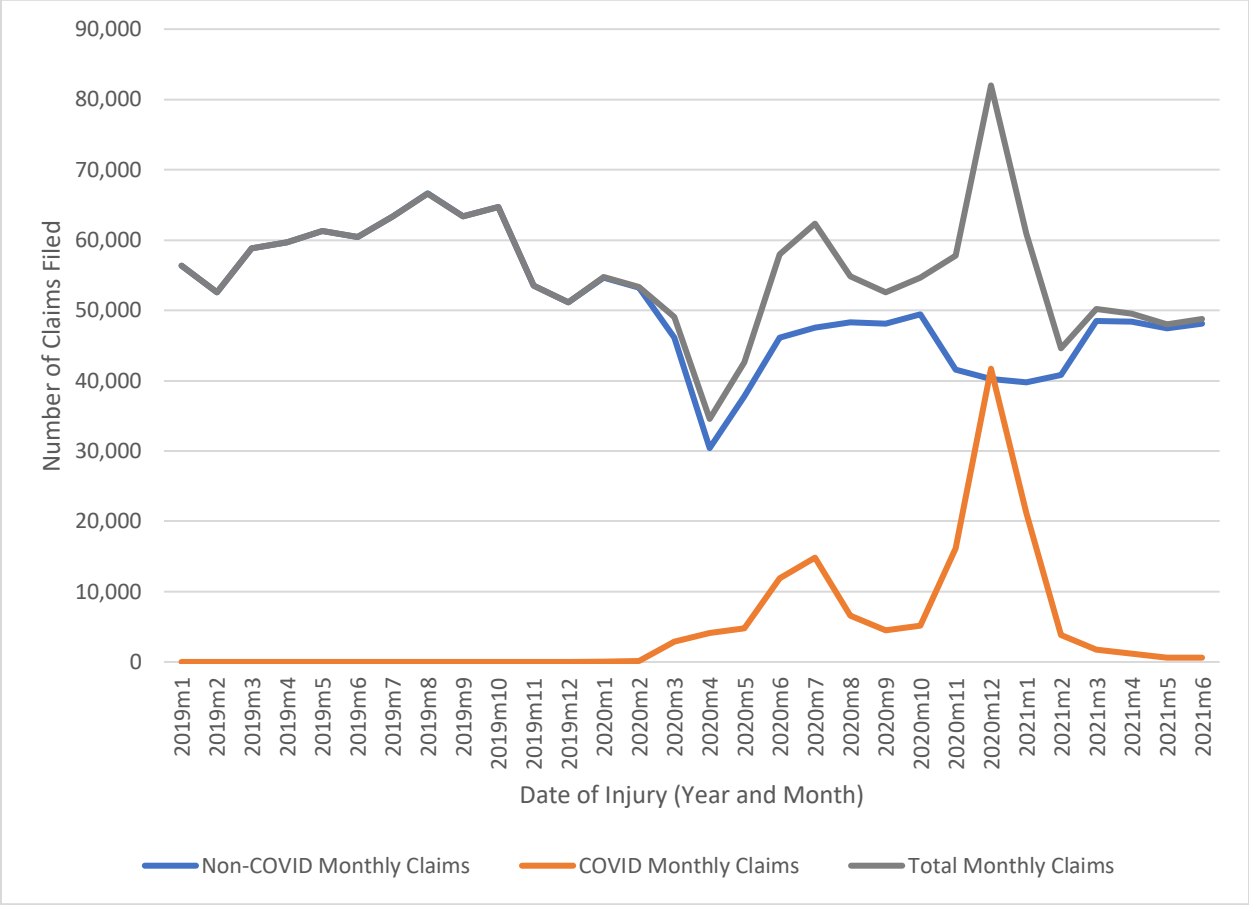
COVID-19 Claims and Outcome Decisions

To understand the impact of COVID-19 claims on the system, we need to start with an understanding of the overall volume of COVID-19 claims to date, their outcomes, and any differences across industries and workers. More detail on claim volumes and outcomes (overall and by presumption) can be found in Chapter 3. Differences across industries and occupations are described in Chapter 4.

RQ1: What is the volume of COVID-19 claims?

Over 18 months, from the start of 2020 to the end of June 2021, 142,033 claims were reported to WCIS as COVID-19 infection claims. This is about 15 percent of all claims filed in the WC system over this period. Because claim volumes by month have generally followed surges in statewide COVID-19 case volumes, the COVID-19 case volume has varied greatly over time: COVID-19 accounted for more than 20 percent of claims in June and July of 2020 and peaked at 55 percent of claims in December 2020. Workers filed a total of 82,000 claims for December 2020 injury dates. In comparison, in the decade before the pandemic (2010 to 2019), there had never been more than 68,000 claims filed in a single month.

Figure S.1. COVID-19 and Non–COVID-19 Claim Volumes, by Month of Injury



NOTES: Estimates in table reflect unweighted counts and proportions of claims reported to WCIS with First Report of Injury (FROI), nonmissing date of injury, and valid codes for cause of injury and nature of injury. Thirteen COVID claims with 2019 injury dates were excluded. See Chapter 2 and Chapter 3 for details.

In addition, during the first wave of the pandemic, the volume of non–COVID-19 claims dropped sharply following the statewide stay-at-home order, so total claim volumes dropped early in the pandemic and were 25 percent lower than the volume typical before the pandemic during the temporary presumption period. Total claim volumes in most months since July 2020 have remained below prepandemic levels.

RQ2: How does COVID-19 claim volume vary across the different presumptions created by SB 1159?

Between January 2020 and June 2021, **we estimate that 42 percent of COVID-19 claims (60,000 claims) were filed by workers in occupations likely to be covered by the frontline worker presumption**. The 42 percent of claims filed under the frontline worker presumption break down across occupational groups as follows: 32 percent of statewide COVID-19 claims were by health care workers covered by the frontline presumption, 6 percent of statewide

COVID-19 claims were filed by peace officers covered by the frontline presumption, and 4 percent of statewide COVID-19 claims were filed by firefighters covered by the frontline presumption. The remaining 58 percent of statewide COVID-19 claims (82,000 claims) were filed by workers who may potentially have been covered by the outbreak presumption, although we do not know how many of these claims were filed by workers employed at a jobsite during an outbreak period. Furthermore, the drops in non–COVID-19 claim volumes associated with stay-at-home orders and job losses during the recession are far less pronounced among frontline workers than among workers in other occupations.

RQ4: How does COVID-19 claim volume vary across occupation and industry?

The 42 percent of claims filed under the frontline worker presumption break down across occupational groups as follows: 32 percent of statewide COVID-19 claims were by health care workers covered by the frontline presumption, 6 percent of statewide COVID-19 claims were filed by peace officers covered by the frontline presumption, and 4 percent of statewide COVID-19 claims were filed by firefighters covered by the frontline presumption.

Comparing claim volumes with the number of workers in each occupation provides new insights into which workers were more or less likely to file WC claims for COVID-19 while accounting for differences in the number of workers in different occupations. We discuss the methods used to generate these insights in Chapter 4. An important caveat is that employment figures used to generate these rates reflect employment as of May 2020, so changes in hours and employment during the pandemic are not captured in the rates reported here.

The highest rate of claims per 10,000 workers was in state and local government (269 claims per 10,000 workers). This rate was more than twice the rate in health care and social assistance (130 claims per 10,000 workers). Among large industries (i.e., those with half a million workers or more in May 2020) where workers are not covered by the frontline presumption, transportation and warehousing had the highest rate of COVID-19 claims (107 claims per 10,000 workers), followed by retail (80 per 10,000 workers) and manufacturing (63 per 10,000 workers).

Industries with very low rates of COVID-19 claims were a mix of white-collar industries with low overall claim rates, such as information, and service industries that were subject to widespread closures (and, in some cases, job losses), such as educational services and arts, entertainment, and recreation. We note that this analysis does not include data on job losses during the pandemic, hours worked, or the prevalence of work-from-home arrangements, and that all these factors are likely to drive differences across major industries—especially service industries—in the rate of COVID-19 claims per 10,000 workers.

Among workers in state and local government, protective service occupations (including firefighters, peace officers, and correctional officers) claims per 10,000 workers were among the highest observed for any occupation at 722 COVID-19 claims per 10,000 workers. For peace officers (including both supervisors and lower-rank officers), the rate of COVID claims was 683

per 10,000 peace officers. For firefighters (including both supervisors and lower-rank officers), the rate of COVID-19 claims was 785 per 10,000 firefighters.

Turning to health care facilities and industries that were covered by the frontline presumption, hospitals had 202 COVID-19 claims per 10,000 workers, a rate substantially lower than that observed in protective service occupations but also more than double most rates observed in private industry. The COVID-19 claim rate at skilled nursing facilities (SNFs) was much higher: 394 COVID-19 claims per 10,000 workers. In both types of facility, COVID-19 claim rates were higher for health care support occupations than for health care practitioners and technical occupations. Claim rates in the home health care services industry were similar to those in hospitals.

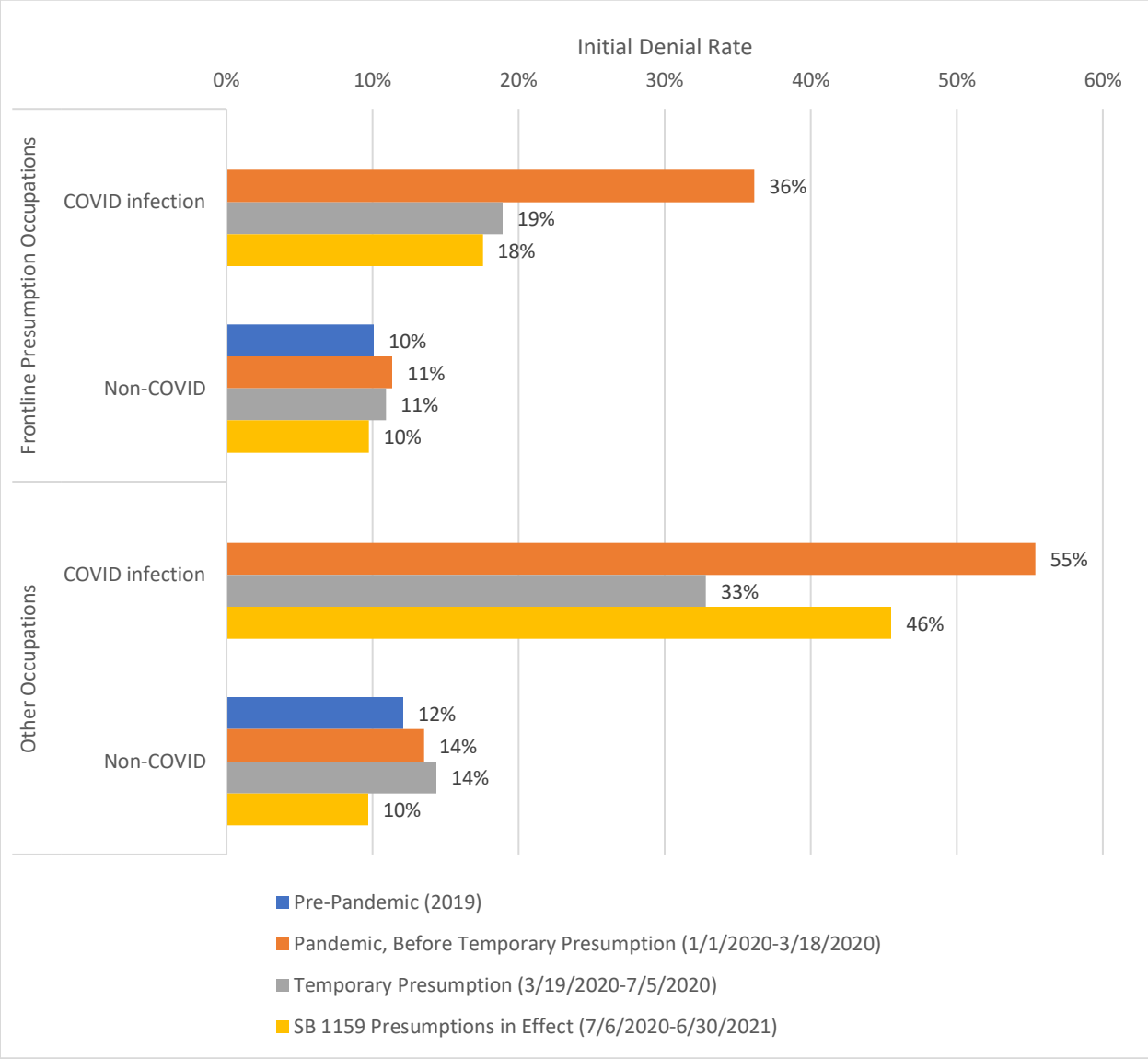
In other occupations (potentially covered by the outbreak presumption), we found that the food manufacturing industry had a COVID-19 claim rate (134 COVID-19 claims per 10,000 workers) about double the rate in all manufacturing industries (63 per 10,000 workers). This is consistent with reports and other estimates of high COVID-19 case volumes at some food processing establishments. We note, however, that food production industries were identified as an Essential Critical Infrastructure sector and were generally exempt from statewide and other stay-at-home orders, which may also have contributed to higher exposure and claims rates relative to May 2020 employment levels. Another industry with high claim rates was the transportation and warehousing sector. The couriers and messengers industry accounted for most claims in the sector as a whole and had a high rate of COVID-19 claims (509 per 10,000 workers). In the manufacturing sector as a whole (North American Industry Classification System [NAICS] 31-33) and in transportation and warehousing, transportation and material moving occupations had very high COVID-19 claim rates, while high COVID-19 claim rates in food manufacturing were driven by production operations, especially packaging/filling machine operators.

While the COVID-19 claim rate in the retail sector as a whole was also high, at 80 COVID-19 claims per 10,000 workers, the COVID-19 claim rate in food and beverage stores was about half the rate observed in the retail sector as a whole. Retail industries with high COVID-19 claim rates included building material and supplies dealers, automobile dealers, and health and personal care stores, which had 382, 181, and 142 COVID-19 claims per 10,000 workers, respectively.

RQ3: How often are COVID-19 claims denied in part or in full?

COVID-19 claims were denied much more often than non–COVID-19 claims, as indicated by Figure S.2. Depending on the period, denial rates on COVID-19 claims across all occupations have ranged from 44 percent for claims filed before any presumptions were in effect to 26 percent during the temporary presumption and 34 percent after the outbreak and frontline presumptions took effect. Denial rates on non–COVID-19 claims filed at these times were 13 percent, 14 percent, and 10 percent, respectively.

Figure S.2. Initial Denial Rates, by Presumption and Period



NOTES: *Initial Claim Denial Rate* = proportion of claims with a full denial reported on the FROI, indicating denial before payment of any benefits. Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. See Chapter 2 and Appendix B for details and definition of *Frontline Presumption Occupations*.

Figure S.2 also shows much lower denial rates for workers covered by the frontline presumption than for workers in other occupations who were potentially covered by the outbreak presumption.

It also shows that COVID-19 claim denial rates fell sharply after the temporary presumption was adopted. Finally, we note that denial rates in other occupations were higher (46-percent denial rate versus 33-percent denial rate) after July 6, 2020, when these workers moved from the

relatively lenient temporary presumption to the outbreak presumption. In contrast, denial rates in frontline occupations overall, for which the presumption remained very broad, were essentially unchanged after the SB 1159 presumption took effect.

While these estimates characterize the percentage of COVID-19 claims filed that were initially denied, caution needs to be exercised in interpreting these estimates for reasons having to do with gaps in the data that we discuss in full in Chapter 3.

RQ5: How do denial patterns vary across occupation and industry or across the different presumptions created by SB 1159?

Denial rates varied widely across workers covered by different presumptions and, within groups of workers covered by the same presumption, across industries and occupations. COVID-19 and non–COVID-19 claim denial rates in state and local government as a whole were the same (15 percent of claims initially denied). Denial rates in protective service occupations were slightly lower for COVID-19 (13 percent) than for non–COVID-19 (15 percent) claims filed while the frontline worker presumption was in effect, although initial denial rates on COVID-19 claims filed by firefighters were somewhat higher than on non–COVID-19 claims filed by firefighters.

Denial rates were slightly higher for workers in health care facilities likely to be covered by the frontline worker presumption (15 percent of COVID-19 claims were initially denied in hospitals, 25 percent in skilled nursing facilities, and 24 percent in home health care services). These rates are higher than those observed in most law enforcement occupations in the public sector but comparable with the 19-percent rate observed among firefighters.

Denial rates in other industries potentially covered by the outbreak presumption were much higher, ranging from 33 percent in the agriculture sector to 78 percent in the transportation and warehousing sector.

COVID-19 Claims and Other COVID-19 Polices About Income Loss and Medical Care

Stakeholder interviews provided insight into WC claim filing behavior for COVID-19, sources of paid time off, medical care, and the influence of non–WC policies. Stakeholders also provided perspectives on the importance of WC during the COVID-19 pandemic. More detail on these issues can be found in Chapter 5.

RQ6: What factors affect worker decisions to file COVID-19 claims?

Employees, employers, and claims administrators pointed to several factors that affected whether a worker filed a COVID-19 claim. The main factor influencing whether a worker filed a claim was having access to federal and state COVID-19 paid leave. Workers then decided to file a WC claim when their need for time off exceeded the time available from these other federal and state paid leave programs. Also, several important and unique COVID-19–related actions by private health insurers and the Health Resources and Services Administration (HRSA) affected

workers across the United States and in California. Early in the pandemic, the majority (88 percent) of workers covered by fully insured private health insurers were not required to pay co-pays and deductibles related to COVID-19 care in addition to having their out-of-pocket costs waived if they were hospitalized with COVID-19; however, this phased out in summer of 2021 (McDermott and Cox, 2020; Ortaliza et al., 2021). Also, uninsured workers were covered by a federal program that paid health care providers for their care through HRSA (Health Resources and Services Administration, 2021). Both actions changed medical care cost decisions about COVID-19 for anyone with the disease, including workers who contracted COVID-19 through exposure at work. Within this context, employees filed WC claims to cover medical costs, primarily for medical bills or medical care that included hospitalization or prolonged symptoms after recovery. Claims were also filed when there was a fatality from a work-related claim that started with medical care for COVID-19 and ended in death.

The following were major factors influencing COVID-19 claim filing:

- as noted, an employee's need for more than 80 hours of paid leave (SB 1159 required an employee to exhaust other COVID-19 paid leave before taking time off through WC)
- employee knowledge of the requirements to file a COVID-19 claim or exposure at work
- employee knowledge of exposure at work
- a positive COVID-19 test
- general lack of employee fear of job or income loss or fear of retaliation
- employee hesitancy about engaging in the WC system
- employee needs were not necessarily for medical care (access to medical care was not dependent on WC) but to pay for nonminor, high-cost medical care through WC benefits, especially given that most workers' co-pays, deductibles, and out-of-pocket costs with a hospitalization were waived if a worker was fully insured or covered by HRSA if a worker was uninsured.
- employee confusion surrounding when to file a COVID-19 claim
- a culture within public safety and health care occupations of filing a claim to have the exposure on record.

RQ7: How have other paid leave policies (e.g., state and federal leave) affected worker decisions to file COVID-19 claims?

We heard consistently, across stakeholder types and employer types, that the **federal and state policies on paid leave for COVID-19 allowed employers to provide paid time off to their employees and to reduce employee dependence on their own accrued sick time and leave**. We heard from both claims administrators and employers about workers' access to non–WC paid leave for COVID-19. Most employers we interviewed noted that this federal and state time off helped employees quarantine after a potential exposure or positive test and, with some employers, employees were able to use this paid leave to care for family members exposed, sick, or in quarantine for COVID-19. **Thus, absent these federal and state leave innovations, the impact on WC probably would have been much greater and access problems for workers needing disability compensation much more complicated.**

RQ8: What are the issues for employers regarding providing paid sick leave for essential workers or workers in a defined outbreak incident?

Employers most often noted that implementing the federal and state leave policies in general was easy and was managed largely by payroll, but some employers noted significant changes to their policies and practices to implement these leave policies, including coordination between payroll and employee health or the WC system. Employers incurred the costs of updating their human resources systems, hiring more staff for compliance, coordinating between departments, and implementing new policies.

RQ9: How does WC coverage affect workers' access to medical care for COVID-19? Or affect workers' out-of-pocket costs for COVID-19 care?

We heard that workers were able to access medical care for COVID-19 without using WC, suggesting that WC medical care benefits for COVID-19 were not critical to helping most workers receive needed care. Analysis of claims data confirmed that 80 percent of claims for COVID-19 had no medical care billed to WC. The high prevalence of claims with no medical care is very unusual within the WC system but is likely to reflect interactions with pandemic response policies adopted by private health insurers and HRSA (see details above under RQ6 and below under RQ11). **WC, however, was used to cover medical care for COVID-19 when the medical care needs were nonminor (that is, were high-cost, required hospitalization, or involved prolonged symptoms).** Employees used WC to cover outpatient care including medications, therapies, and doctor visits. WC was also used to cover hospitalizations. **Employers and claims administrators said that they had COVID-19 claims primarily for nonminor medical care with a small percentage of claims that were high-cost because they included hospitalizations that were lengthy and costly; they also indicated that some claims required further care after hospitalization or follow-up care for an underlying condition that COVID-19 exacerbated.** COVID-19 claims discussed in interviews included care for situations in which COVID-19 led to pneumonia or cardiac issues or exacerbated underlying conditions.

RQ10: Do workers have access to other sources of medical care coverage or disability compensation?

Employers and claims administrators stated that workers did not need WC to access medical care for COVID-19-related issues, because group health insurance covered workers at any health care facility. **In most cases, workers with group health insurance had their COVID-19 care covered, given that federal rules required that treatment for COVID-19 be covered by all insurers.** Also, several important and unique COVID-19–related actions by private health insurers and HRSA affected workers across the United States and in California (see the answer to RQ6). In short, most workers covered by fully insured private health insurers were not required to pay co-pays and deductibles related to COVID-19 care in addition to having their

out-of-pocket costs waived if they were hospitalized with COVID-19. Uninsured workers also were covered by a federal program that paid health care providers for their care through HRSA.

Workers often used group health insurance and employee-sponsored insurance for COVID-19 medical care coverage, unless the medical care was nonminor or included hospitalization (i.e., high-cost medical care).

In terms of other sources of disability compensation, some employers noted that employees opted to use short-term temporary disability (not WC) for time off for COVID-19–related issues. These individuals were entitled to only a fraction of their regular pay but, according to the employers, chose short-term disability to avoid the bureaucracy of filing a WC claim.

RQ11: How important are WC indemnity, medical, and death benefits to workers?

According to employers, claims administrators, and employees, workers filed COVID-19 claims for two main reasons (delineated above under RQ6): (1) for time off to quarantine that was over and above the 80 hours of state and federal paid sick leave and/or (2) coverage of primarily nonminor medical care costs, with a small percentage of claims that were high-cost.

Of the WC benefits available (indemnity, disability, medical care, death benefits), **medical care coverage for COVID-19 through WC was reported to be the most important WC benefit for workers**. Within the context of fully insured private health insurers not requiring co-pays and deductibles related to COVID-19 care or for workers to pay their out-of-pocket costs if they were hospitalized with COVID-19 (which phased out in summer of 2021)—and this same coverage for uninsured through the HRSA federal program—workers, employers, and claims administrators reported that WC medical benefits played an important role in shielding workers from the financial risk associated with medical care for high-cost cases of COVID-19. Workers reported using WC for an array of medical care needs, from medication to therapies to hospitalizations of various lengths, and for care for lingering symptoms of COVID-19.

Nearly all essential workers had access to federal time off from the Families First Coronavirus Response Act (FFCRCA, Pub. L. 116-127, 2020) or through Coronavirus Aid, Relief, and Economic Security (CARES) Act (Pub. L. 116-136, 2020) funding, as well as California paid leave time. Few employers, claims administrators, or workers mentioned WC being important in obtaining paid leave time off, indicating that WC indemnity benefits were not very important to workers who experienced only a short period of work disability that could be covered by pandemic-specific sick leave.

Health and Safety Impacts of SB 1159

Questions were raised about whether SB 1159 would encourage the health and safety of workers. We summarize the perspectives that we heard in Chapter 6.

RQ12: Does WC coverage for COVID-19 claims encourage workers' health and safety?

We heard mixed perspectives from public health officials about how WC during the COVID-19 pandemic affected worker safety. On one hand, **public health officials noted that the SB 1159 presumptions and the outbreak tracking requirements drew employers'** attention to outbreaks and spurred employers to address potential issues associated with infection risk. One mechanism for an employer to rebut a worker's claim was to show evidence of workplace interventions put in place by employers to reduce possible COVID-19 exposure; this was described as an implied defense against a COVID-19 claim. SB 1159 indicated in the Labor Code for the outbreak presumption that one avenue to rebut was to show "evidence of measures in place to reduce potential transmission of COVID-19 in the employee's place of employment and evidence of an employee's nonoccupational risks of COVID-19 infection" (Cal. Lab. Code 3212.88, 2020c, subsection 2; see Table 2.1).

Despite this, some public health officials indicated that WC was to help workers postexposure or postcontraction of COVID-19, indicating that WC was helpful only after a workplace injury occurred (in this case, a workplace exposure and contraction of COVID-19) and therefore did not impact prevention or safety directly. Furthermore, public health officials did agree that the SB 1159 presumptions for COVID-19 did align with epidemiological knowledge about the spread of COVID-19, particularly because the presumptions identified those at greatest risk for contracting COVID-19 as frontline workers and those exposed within an outbreak at the workplace. In other words, **the frontline and outbreak presumptions, as written, did cover workers at the highest risk for being exposed to and contracting COVID-19**, and using the 14-day window to calculate an outbreak was in line with knowledge about transmission and exposure. However, this support of the SB 1159 presumptions by public health knowledge was not as clear for the specific outbreak definition thresholds and the different workplace definitions and scenarios across industries and workplace composition.

RQ13: How have other state policies (e.g., AB 685 and the Cal/OSHA ETS) affected employers?

Employers and claims administrators reported administrative burden associated with implementing data collection and reporting requirements for Assembly Bill 685 (AB 685, 2020) and the California Division of Occupational Health and Safety (Cal/OSHA) emergency temporary standard (ETS; California Code of Regulations, 2020). While some employers had existing tracking systems that could be used for reporting, others had to create new systems and coordinate between departments to get the necessary information. Public health officials reported limited gains against reducing the spread of COVID-19 with these reporting requirements. There was confusion about some of the rules regarding reporting, and employers were concerned about preserving employee privacy when notifying employees of potential exposures.

COVID-19 Claims Administration

To address the numerical increase and fluctuating nature of COVID-19 claims (as they are filed in response to the surges of COVID-19 exposure), claims administrators reassigned staff, hired more staff, and changed processes to handle reviewing and investigating the COVID-19 claims under the law's shortened timelines. Details on these issues regarding COVID-19 claims administration and burden are found in Chapter 7.

RQ14: Are COVID-19 claims processed in line with the timelines mandated in SB 1159?

SB 1159 specified shorter timelines for decisions on COVID-19 claims. Instead of the typical 90 days for a claims administrator to investigate and decide upon a claim (i.e., accept or deny), the claim timeline for frontline workers' claims was shortened to 30 days, and the timeline for claims related to an outbreak was shortened to 45 days.

COVID-19 claims were denied much faster than non–COVID-19 claims, with speedier processing in frontline industries than nonfrontline industries. More comprehensive data would be needed to test for timeline compliance across claims, but it appears that SB 1159 had an impact on claim processing timelines. Also, during interviews, claims administrators commonly discussed the increased administrative burden of COVID-19 claims processing stemming from the reduced investigation periods, from 90 days on a typical WC claim to 30 or 45 days for the COVID-19 presumptions. This burden was related to not only a shorter time to investigate and decide about a claim but also the need to change processes and workflows to accommodate gathering the type of evidence needed for a COVID-19 claim (such as a positive test, an employee interview, or other workplace information).

Employers and insurers had concerns about the shortened claims investigation period and whether those shortened timelines truly benefited injured workers. **We also heard from employers and claims administrators that even though getting claim decisions faster was beneficial for workers and was done with good intent, the shortened timelines put pressure on claims administrators**. With the presumption in place, these claims administrators reported that they accepted more COVID-19 claims, given that disproving the presumption was difficult. In addition, we heard that employers were simultaneously dealing with many staffing issues and work disruptions. Employers and insurers found it difficult to process and investigate claims fast enough to meet the shortened timelines, partly because of the need to document whether someone was exposed at work.

RQ15: Have the presumptions and reporting requirements created by SB 1159 led to administrative burdens on claims administrators? On employers?

Both claims administrators and employers highlighted issues with implementing the outbreak presumption that were specifically related to the definition of *outbreaks*. In particular, employers noted the challenges in identifying a workplace for tracking and fitting the definition of an outbreak into the industry context (e.g., what is the workplace for a home health worker?). Most

claims administrators and employers discussed the lack of clarity of the definition of an outbreak, especially early in the pandemic, and the difficulty in setting up systems for tracking and reporting outbreaks. **The chief complaint discussed by employers was assigning workers to a single site for tracking purposes, encompassing the rolling count of both the number of employees with COVID-19 and the number of employees at the workplace for each worksite over a 14-day window.**

While claims administrators and employers focused on implementation difficulties, public health officials said that they believed that the SB 1159 presumptions for COVID-19 did align with epidemiological knowledge about the spread of COVID-19, and that the frontline worker and outbreak presumptions, as written, did cover workers at the highest risk for being exposed to and contracting COVID-19.

Cost Impacts of SB 1159's Presumptions for COVID-19

We investigated costs associated with COVID-19 claims filed under the different presumptions created by SB 1159. It was not clear a priori whether we should expect COVID-19 claims to cost more or less than other claims in the WC system. It is also likely that patterns observed in the early data currently available may change in the future. That said, evidence on whether COVID-19 claims appear to be very different from other claims may be helpful for understanding impacts on payers and the system as a whole, in addition to the other outcomes examined in this study. More information and explanation surrounding these costs estimates are found in Chapter 8.

RQ16: What costs are associated with indemnity, medical, and death benefits for COVID-19 claims?

We examined data on benefits paid to date, adjusting for differences in claim filing dates and claim maturity between COVID-19 and non–COVID-19 claims. At the time of writing, temporary disability benefits accounted for nearly all paid indemnity benefits. **Including claims that were denied, COVID-19 claims had lower paid indemnity benefits than non–COVID-19 claims filed between July 2020 and June 2021. Paid and settled indemnity benefits for workers covered by the frontline presumption averaged $1,477 for COVID-19 claims versus $1,632 for non–COVID-19 claims. Paid and settled indemnity benefits for workers in other occupations averaged $595 for COVID-19 claims versus $1,385 for non–COVID-19 claims.** Our qualitative findings that much of the paid time off was not paid through WC support these quantitative findings.

In terms of medical costs associated with WC COVID-19 claims, on average, WC medical care costs were also low because most COVID-19 claims had no medical care billed to WC. Including claims with no paid medical bills, the average COVID-19 claim filed between July 2020 and June 2021 had $653 of paid medical benefits, compared with $1,964 for non–COVID-19 claims filed at the same time. This was also supported by our qualitative findings that

medical care for COVID-19 was being covered by employer-sponsored insurance and group health unless the medical care included hospitalizations (i.e., there were high medical care costs).

Also, we analyzed spending on those COVID-19 claims with medical bills submitted to WC and found that **COVID-19 claims had a similar or slightly higher medical cost than non–COVID-19 claims, a pattern that was driven by a substantially higher rate of inpatient hospitalization on COVID-19 claims than on non–COVID-19 claims**. This is in line with the qualitative findings that claims were filed when there were hospitalizations and high-cost medical care bills. It remains uncertain whether costs that were not billed to WC will have to be reimbursed by WC payers at some point in the future.

Policy Implications and Discussion

SB 1159 brought several changes to WC policy for COVID-19 claims, most notably by establishing the frontline and outbreak presumptions, shortening the investigation timelines for claims to be initially denied or accepted, and modifying when temporary disability benefits would be paid by eliminating the three-day waiting period while also requiring workers to exhaust pandemic-specific sick leave before receiving temporary disability benefits. As noted above, we were unable, within the time frame and scope of this study, to provide comprehensive policy recommendations about whether these policies were the optimal response to the COVID-19 pandemic or whether they were, on net, an improvement on the prepandemic status quo. Even so, we can highlight some lessons learned that can inform evaluation of these policy changes before moving on to highlight some limitations of those lessons and noting additional questions that should be addressed to guide future policymaking. The points summarized here are discussed more fully in Chapter 9.

Implications for the frontline and outbreak presumptions

We reached several findings about the presumptions created by SB 1159 that may be viewed as supporting the approach taken by California. If the goal of the SB 1159 presumptions was to encourage WC claiming and facilitate access to benefits for workers at high risk of COVID-19, the policy appears to have served that goal. Our discussions with public health officials suggested that the groups of workers targeted by these presumptions—health care and public safety workers, as well as other workers who tested positive during an outbreak period at their jobsites—were likely at higher risk of workplace exposure to the coronavirus. This would suggest that the presumptions helped workers obtain benefits for work-related illness from the WC system, promoting broad coverage of workers and health conditions. Yet we also heard that WC claiming and the SB 1159 presumptions did relatively little to reduce coronavirus transmission or mitigate the pandemic, since pandemic-specific sick leave and other forms of paid leave were viewed as being more important for encouraging safety and discouraging workplace coronavirus transmission.

When judged against other typical goals of WC policy (see Chapter 9), findings are also mixed on whether the SB 1159 presumptions were beneficial on net. Qualitative evidence pointed toward challenges that employers and claims administrators had in implementing the outbreak tracking required to apply the outbreak presumption, while the extremely high volumes of COVID-19 claims filed during California's case surges required claims administrators to process far more claims than are typically filed at once. Whether these pressures had a meaningful impact on system expenses or the efficiency of the WC benefit delivery system is unclear from the quantitative data that were available for this study. We also cannot say how many more claims were filed because the SB 1159 presumptions were in place or because specific groups of workers were covered by the frontline presumption rather than the outbreak presumption. That is, it is plausible that the December 2020 surge of COVID-19 would have led to a spike in WC claim volumes with or without the presumptions in place.

Other stated goals of WC policy include provision of medical care and protection against income loss. Our qualitative findings suggested that, in most cases, other aspects of the federal and state response to the pandemic did more to promote these objectives than WC benefits did. These perspectives raise a very important limitation of our study, however, which is that California's experience with COVID-19 claims occurred in the context of a massive expansion (by state and federal policymakers) of access to medical care and paid leave for COVID-19. A future pandemic (or a later phase of the COVID-19 pandemic) in which these other policy responses were not present might leave workers far more financially vulnerable, in which case WC could have a larger role to play for a wide range of workers.

Furthermore, WC is designed to protect workers against medical spending and income risks that far exceed the protection likely to be provided through other aspects of the federal and state response to COVID-19. For workers with serious COVID-19 or the surviving dependents of workers with fatal COVID-19, the lifetime medical care, permanent disability, and death benefits provided through WC may provide highly valued insurance against risks that are not covered by other elements of the federal and state policy response to the pandemic. While we found that permanent disability and death benefits have been paid on few COVID-19 claims so far, this is likely to reflect the fact that the bulk of COVID-19 claims are very recent. And while these benefits are likely to be very important to the workers and survivors who suffer the most severe losses, the perspectives we heard on the importance of benefits inherently reflect the specific experiences of our interviewees and may omit different perspectives that could not be gathered within the scope of this study.

Implications for Shortened Claim Investigation Periods

SB 1159 reduced investigation periods from 90 days on a typical WC claim to 30 or 45 days for claims covered by the COVID-19 presumptions, depending on which presumption was applicable. Our findings suggest that SB 1159 had an impact on shortening claim processing timelines. Examining the time from claim filing to date when denial is reported to WCIS,

COVID-19 claims were denied much faster than non–COVID-19 claims, with faster processing in frontline industries than nonfrontline industries.

However, we did not hear that shortened timelines and quicker initial claims decisions meaningfully assisted workers in any specific manner, suggesting that these changes did not do much to promote the typical objectives of a WC system. As discussed above in the context of WC benefits in general, we heard that workers were able to obtain paid leave through other sources and access medical care regardless of whether a WC claim was filed or, if filed, accepted. Meanwhile, we heard from claims administrators that the shortened timelines were challenging to administer, and some alleged that the shorter investigation period led to more reversals in claim outcomes and possibly more denials; we could not examine these questions in the scope of our quantitative analyses or estimate the impacts of these reported administrative burdens on expenses.

We also heard that federal and state policies providing paid leave were viewed as more important for encouraging safety and protecting against income loss than WC benefits. Similarly, given that medical care for COVID-19 was generally accessible to all people with COVID-19 (whether it was contracted at work or not), it is not surprising that we heard that WC was not important for enabling workers to access treatment. We also note that our qualitative evidence on these questions does not provide a comprehensive or statistically representative picture of workers' experiences with COVID-19 and WC during the pandemic.

Implications for Changes to Temporary Disability Benefits

Our qualitative findings indicated that the provision of SB 1159 providing that pandemic-specific sick leave be exhausted before temporary benefit payments began influenced workers' claim-filing behavior, with some workers filing claims only when their sick leave had been exhausted. Employers we spoke with also indicated that it was not burdensome to coordinate WC benefits with pandemic-specific sick leave. Viewed narrowly, these findings would suggest that some potential WC claims for mild disease or involving shorter spells of disability were not filed because workers were able to access other compensation that may have replaced a greater share of their income. If so, this provision may have benefited delivery system efficiency without adversely impacting workers.

Remaining Unknowns and Research Priorities

We cannot overemphasize that COVID-19 is a unique situation in regard to both the nature of the pandemic and the extraordinary state and federal response. Specific recommendations and conclusions from this study should not be applied to other contexts that confront the WC system. Furthermore, the relevance of our findings to other stages of the COVID-19 pandemic or to future pandemics will depend on the broader state and federal policy context.

Given that so much remains unknown about the unequal risk of exposure to COVID-19 that occurred at workplaces across California, we highlight here a number of research needs that

emerged in the course of this study. We provide more detail on approaches to answering these remaining questions in Chapter 9:

- How did the COVID-19 exposure rates (and subsequent filing of COVID-19 claims and claim outcomes) vary across California and by industry and occupation?
- What did workers who contracted COVID-19 do to maintain their income, stay safe, and seek medical care when needed? These questions should be analyzed across California and by industry and occupation.
- What claim processing practices related to SB 1159 did claims administrators employ during COVID-19? Analysis across California and by different types of insurers would inform policymaking by showing how claims administrators handled large fluctuations in volumes of claims, shortened timelines, and expanded use of employee interviews (including gaining information about workers' personal nonwork behaviors). Also, learning about the common barriers and facilitators in implementing COVID-19 claims processing systems would be beneficial.
- How efficiently did the WC system handle the large, fluctuating stream of COVID-19 claims? This analysis would ideally include estimations of long-term medical costs, temporary and permanent disability costs, and litigation costs related to both SB 1159 presumptions.
- How did COVID-19 claims outcomes (i.e., accepted, denied, reversals, conditional denials, and litigation and settled outcomes) change over the course of a given claim? How did COVID-19 claims outcomes and processes vary during the different surges of COVID-19 over time? This could include discussions with workers after their COVID-19 claims are settled, asking workers about their COVID-19 claim experiences from beginning to end.

Contents

Figures and Tables

Figures

Tables

1. Introduction

The novel coronavirus SARS-CoV-2 (which causes the disease known as coronavirus disease 2019 or COVID-19) has led to the most severe global pandemic in more than 100 years. The virus is highly contagious, spreading easily through respiratory droplets and aerosol transmission. COVID-19 is deadly for some and can often lead to serious illness or long-term symptoms even in nonfatal cases of infection. From March 2020 through early February 2022, there were more than 8 million cases of COVID-19 infection in California, and more than 80,000 Californians have been killed by COVID-19 (COVID19.CA.GOV, 2021a).

Although safe and effective vaccines have been available since December 2020 and given to 25 million people in the state of California so far, uptake has still been lower than needed to achieve herd immunity (COVID19.CA.GOV, 2021b). In the meantime, the virus continues to evolve, with new variants, such as the Delta variant, already having caused a spike in cases and the Omicron variant poised to cause an even larger spike. COVID-19 vaccines appear to still largely prevent severe outcomes, such as hospitalization and death (Tartof et al., 2021), but emerging evidence points to waning effectiveness, particularly against symptomatic infection (Cohn et al., 2021; Goldberg et al., 2021). The availability of a third dose of mRNA vaccines for adults will help to prevent severe outcomes in these populations (Mbaeyi et al., 2021). The authorization in November 2021 of COVID-19 vaccines for school-aged children (Woodworth et al., 2021) means that almost the entire population of the United States is eligible to be vaccinated, except for those under five years of age. New and promising treatments to prevent severe illness from COVID-19 are emerging, including oral regimens of pills that can be taken at the first sign of infection (Merck, 2021; Pfizer, 2021), in addition to the already established use of monoclonal antibodies (National Institutes of Health, 2021).

The development of vaccines and early treatments for COVID-19 are promising for a more stable postpandemic future. However, in the spring of 2020, no such resources were available. The transmission of the virus was still not well understood, with considerable disagreement about how significant a role airborne transmission was playing. Given the lack of personal protective equipment (PPE) and no other significant protective measures, stay-at-home orders and other broad public health measures were put in place to avoid overwhelming hospitals and to save lives. Yet even as some workers were able to minimize their exposure by working from home, health care workers, first responders, and workers across most sectors of the economy had to risk infection and death by continuing to work outside the home. In recognition of the deadly workplace risks that millions of workers suddenly found themselves facing as the pandemic started, California policymakers moved quickly to facilitate access to workers' compensation (WC) benefits for health care workers and other frontline workers who had to continue working outside the home and who were thus most exposed to the coronavirus. A temporary presumption

for COVID-19 covering all frontline workers was established by executive order on May 6, 2020 (Newsom, 2020c). A presumption, in legal terms, is a legal inference that must be made in light of certain facts. In lay terms, a presumption is a rule that allows a court to assume a fact is true unless there is evidence to prove otherwise. Presumptions are used to relieve a party from having to prove the truth of the fact being presumed. Senate Bill 1159 (SB 1159, 2020), which was signed into law on September 17, codified this temporary presumption and created two new presumptions for workers who fell ill on July 6, 2020, or later.

Even though presumptions have been used for decades in California WC, the presumptions established in response to the pandemic represent a striking departure from the way that presumptions have been used in the past. Critics of SB 1159 have understandably raised concerns about fairness to employers, complexity and administrative burden, and impacts on system costs. And even if the costs and overall system impacts of SB 1159 could be predicted in isolation, interactions with a rapidly evolving policy environment and the unpredictable course of the pandemic itself made the bill's impacts exceedingly difficult to foresee at the time of its enactment. The legislature has accordingly mandated that the Commission on Health and Safety and Workers' Compensation (CHSWC) conduct a study of SB 1159's impacts on the WC system.

To address issues related to these policy decisions and the WC system, the CHSWC asked the RAND Corporation to conduct a study on the *Impacts of COVID-19 and SB 1159 Presumptions of Compensability on the California Workers' Compensation System*. The goals of the study were the following:

- Evaluate the overall impacts of COVID-19 claims on California's WC system
- Evaluate the overall impacts of COVID-19 claims on California's WC indemnity benefits, medical benefits, and death benefits, including differences in the impacts across differing occupational groups
- Assess the overall and cost impacts of the specific presumptions created by SB 1159 on California's WC system.

To achieve these study goals, we conducted a mixed-methods study, combining a number of quantitative and qualitative research tasks. We used claims data from the Workers' Compensation Information System (WCIS) to describe the volume of COVID-19 claims and the outcomes associated with these claims in terms of denial rates, receipt of different types of benefits, and costs of benefits paid to date. As requested by CHSWC, these analyses emphasize differences in COVID-19 claims and their outcomes among workers likely to be covered by different presumptions and among workers in different occupations. The qualitative tasks started with a literature review to identify the broad array of COVID-19 issues relevant to workers in the pandemic and any related best practices of employers. The main qualitative task included a series of 32 semistructured, in-depth interviews to assess WC processes and impacts on stakeholders, including interviews with relevant key informants: workers with COVID-19 who did and did not file WC claims; public health officials; specific stakeholders across industries covered by SB

1159 presumptions, including claims adjustors and risk managers (hereafter referred to as claims administrators); and employers of health care, public safety, and other frontline employees or those who experienced a COVID-19 outbreak. The samples were chosen to reflect the geographic diversity of California and a balance of frontline worker and outbreak industries. Finally, we convened a technical advisory group (TAG) to inform study priorities and assess community reaction to our findings.

Before describing the study approach and evaluation framework, we unpack some of the terminology used to define the aims of the study.

The *overall impacts* of COVID-19 claims and SB 1159 on the WC system include a broad range of impacts on workers, employers, and other WC system participants (such as occupational health providers and claims administrators), as well as on the operational performance and efficiency of the system as a whole. For workers, *overall impacts* might include access to income replacement and medical care benefits in a timely manner, as well as any consequences of SB 1159 for health and safety. For employers, *overall impacts* might include changes in their WC costs (i.e., premiums and deductibles for fully insured employers and benefit costs for self-insured employers), administrative burden associated with case reporting requirements, impacts on staff availability or business operations, or the value of protection from tort liability under the exclusive remedy rule (Cal. Lab. Code 3600, 2012). Furthermore, *overall impacts* encompass impacts of WC policy on the total costs incurred by employers and workers in coping with the pandemic, including changes in these stakeholders' exposure to financial risk or medical costs.

In addition to impacts on workers and employers, *overall impacts* on the system also include impacts of claims for insurers, third-party administrators (TPAs), and self-administered (SA) employers (claims administrators). These include administrative burden or implementation challenges associated with tracking outbreaks, as well as the expedited timelines for claims administrators to approve or deny COVID-19 claims (i.e., 30- and 45-day timelines for initial acceptance of the claim to conduct investigation of the claim, rather than the standard 90-day timeline).

The *cost impacts* of COVID-19 claims and SB 1159 refer more narrowly to the costs of paid and settled benefits associated with COVID-19 claims—both on a per claim basis and in aggregate. The research objectives also highlight the potentially different impacts of the separate presumptions created by Labor Code Section 3212.87 and Section 3212.88 (Cal. Lab. Code 3212.87, 2020; Cal. Lab. Code 3212.88, 2020), as well as the potential for differences in claim volumes, costs, and severity across different occupational groups. As discussed above, *cost impacts* may also be moderated by policies outside the WC system, including worker notification policies, availability of sick leave from other sources, testing requirements, and California Division of Occupational Safety and Health (Cal/OSHA) standards and enforcement actions.

We caution that it was not possible to definitively answer every possible research question about COVID-19 in the California WC system within the timeline of this study. In particular, it is too early to observe many important dimensions of impacts on the system, such as the ultimate

costs of COVID-19 claims or how permanent impairments resulting from COVID-19 will be rated and compensated under the state's Permanent Disability Rating Schedule. For many of the research questions (RQs) that could not be addressed quantitatively, we were able to gather qualitative data on stakeholder perspectives. Limitations of this report are addressed throughout and must be considered in interpreting our findings. That said, our analysis of California's experience to date with COVID-19 in WC can at least begin to address the questions posed by CHSWC and help to surface issues that will need to be revisited as COVID-19 claims mature and more evidence on the long-term effects of the pandemic emerges.

Evaluation Framework

The WC system represents a compromise between two main stakeholders who frequently have competing interests—employers and workers—as well as numerous other parties involved in the system's administration. With the diversity of differing interests and viewpoints, there is no standard, universally accepted framework for evaluating WC policy. However, the 1972 report of the National Commission on State Workmen's Compensation Laws articulated a set of five broad objectives for WC that remain widely accepted today by many system observers (National Commission, 1972):

- Broad coverage of workers and work-related injuries and diseases
  - Protection should be extended to as many workers as feasible, and all work-related injuries and diseases should be covered.
- Substantial protection against interruption of income
  - A high proportion of a disabled worker's lost earnings should be replaced by workmen's compensation benefits.
- Provision of sufficient medical care and rehabilitation services
  - The injured worker's physical condition and earning capacity should be promptly restored.
- Encouragement of safety
  - Economic incentives in the program should reduce the number of work-related injuries and diseases (National Commission, 1972).

The achievement of these four objectives is dependent on a fifth objective:

- An effective system for delivery of the benefits and services (National Commission, 1972).

To tie together our findings on the many disparate dimensions of *impact* that we address in this study, we use the National Commission's five system objectives as a framework for organizing our research findings. While we cannot provide any global up-or-down assessment of whether COVID-19 "should" or "should not" be covered by WC, we can provide some insight

into the extent to which COVID-19—and the presumptions for COVID-19 created under SB 1159—promote or hinder each of the five system objectives articulated in the National Commission report. In each chapter of this report, we briefly highlight linkages between each of the questions addressed and the system objectives from the National Commission framework. For each of these objectives, we then characterize, in the Conclusion (Chapter 9), the ways in which the approach taken in California to handling COVID-19 claims promotes—or fails to promote—each system objective. This evaluation framework may help policymakers and stakeholders in comprehending the many complex impacts—some for good and some for ill—that COVID-19 claims and the SB 1159 presumptions have had on the WC system to date.

Research Questions

We chose to organize our research report around the five objectives of a WC system, answering our 17 RQs throughout the discussion in this report.

We begin with chapters that describe COVID-19 claims and outcomes (Chapter 3) and differences across industries and workers (Chapter 4). These are followed by a discussion of COVID-19 claims and other COVID-19 policies related to income loss and medical care (Chapter 5), addressing two objectives of the WC system: protection against income loss and the provision of adequate medical care. Next, we discuss the health and safety impacts of SB 1159 (Chapter 6), addressing the WC objective of encouraging safety. We then review and examine the WC administration of COVID-19 claims (Chapter 7) and the costs of COVID-19 claims (Chapter 8), addressing the fifth overarching objective of an effective system for delivery of WC benefits and services. Table 1.1 provides an overview of these chapters, including which specific RQs are addressed and notating whether the RQ is answered by qualitative or quantitative methods.

Table 1.1. Chapter Topics Linked to Research Questions, Including Whether Question Is Answered by Qualitative or Quantitative Methods

Research Question		Qualitative	Quantitative
Chapter 3: COVID-19 Claims and Outcome Decisions			
RQ1	What is the volume of COVID-19 claims?		X
RQ2	How does COVID-19 claim volume vary across the different presumptions created by SB 1159?		X
RQ3	How often are COVID-19 claims denied in part or in full?		X
Chapter 4: Differences in COVID-19 Claim Outcomes Across Industries and Workers			
RQ4	How does COVID-19 claim volume vary across occupation and industry?		X
RQ5	How do denial patterns vary across occupation and industry or across the different presumptions created by SB 1159?		X
Chapter 5: COVID-19 Claims and Other COVID-19 Policies re: Income Loss and Medical Care			
RQ6	What factors affect worker decisions to file COVID-19 claims?	X	
RQ7	How have other paid leave policies (e.g., state and federal paid leave) affected worker decisions to file COVID-19 claims?	X	
RQ8	What are the issues for employers regarding providing paid sick leave for frontline workers or workers in a defined outbreak incident?	X	
RQ9	How does WC coverage affect workers' access to medical care for COVID-19 or affect workers' out-of-pocket costs for COVID-19 care?	X	
RQ10	Do workers have access to other sources of medical care coverage or disability compensation?	X	
RQ11	How important are WC indemnity, medical, and death benefits to workers?	X	
Chapter 6: Health and Safety Impacts of SB 1159			
RQ12	Does WC coverage for COVID-19 claims encourage workers' health and safety?	X	
RQ13	How have other state policies (e.g., AB 685 and the Cal/OSHA ETS) affected employers?	X	
Chapter 7: Administration of COVID-19 Claims			
RQ14	Are COVID-19 claims processed in line with the timelines mandated in SB 1159?	X	X
RQ15	Have the presumptions and reporting requirements created by SB 1159 led to administrative burdens on claims administrators? On employers?	X	
Chapter 8: Costs of COVID-19 Claims			
RQ16	What costs are associated with indemnity, medical, and death benefits for COVID-19 claims?		X
RQ17	What costs are associated with the different presumptions in SB 1159?		X

NOTES: AB = Assembly Bill (AB 685, 2020); ETS = emergency temporary standard (California Code of Regulations, 2020).

Organization of This Report

Chapter 2 presents background information and policy evidence from California regarding COVID-19 and the California WC system. Chapter 2 describes the legislative history and background of SB 1159 and its implementation timeline. We also describe the RAND team's overall study design and mixed-methods approach, lay out our evaluation framework and RQs, and provide an overview of the qualitative data collection and quantitative data sources.

Chapter 3 lists baseline facts about the volume, composition, and outcomes of COVID-19 claims from March 2020 to April 2021. Chapter 3 presents an overview of the COVID-19 claim volumes, severity of those claims, and outcomes in terms of denials and benefit receipt. We examine the overall volume of COVID-19 claims (**RQ1**), including volume of claims by the presumptions covered by SB 1159 (**RQ2**), and then we review claim volumes over time, including overall denial rates (**RQ3**), benefit receipt, and the proportion of claims that involved the death of the worker.

Chapter 4 describes which groups of workers have been more versus less likely to file claims for COVID-19 since the SB 1159 presumptions took effect in July 2020. We describe claim volumes, denial rates, and receipt of temporary disability (TD) and medical benefits across industries and occupations (**RQ4, RQ5**). To provide context for statistics on claim volumes, we use data on employment by occupation and industry to report the number of claims filed per 10,000 workers employed at the beginning of the pandemic. This analysis also records comparable statistics for non–COVID-19 claims filed during the same time period.

Chapter 5 describes what we learned from our stakeholder interviews about claim filing and its interaction with other state and federal COVID-19 policies that aimed to also protect workers against interruption of income and assist in the receipt of COVID-19 medical care. We discuss claim filing and the factors affecting workers' decisions to file COVID-19 WC claims (**RQ6**), including the influence of other state and federal policies (**RQ7**). We also include a discussion of any issues employers had providing paid sick leave in coordination with WC (**RQ8**). We also provide insight into workers' experiences gaining access to medical care for COVID-19, their use of WC for medical coverage (**RQ9),** and workers' other sources of medical care payment and coverage and disability compensation (**RQ10**). Lastly, we provide stakeholder perspectives on how important WC indemnity, medical, and death benefits are to workers and whether they have other sources of indemnity or medical care for COVID-19 (**RQ11**).

Chapter 6 summarizes the health and safety impacts of SB 1159. We provide perspectives offered by stakeholders on whether WC coverage of COVID-19 ensured the safety and health of workers (**RQ12**). We also provide input on how employers were affected by other state polices on COVID-19 in the workplace, including AB 685, the Cal/OSHA ETS (California Code of Regulations, 2020), and SB 1159 reporting (**RQ13**).

Chapter 7 describes the experiences of claims administrators and employers in their administration of COVID-19 claims and reviews the efficiency of the delivery of WC benefits in terms of how the system handled COVID-19 claims. First, we review the volume of COVID-19 claims in relation to non–COVID-19 claims and discuss claims administrators' experiences with delays, denials, and claim acceptance and the type of documentation needed and requested. We also describe claims administrators' perspectives on the 30- and 45-day mandated SB 1159 timelines (**RQ14**), the definition of an *outbreak*, and the specific presumption and reporting requirements created by SB 1159 (**RQ15**).

Chapter 8 presents the costs of benefits paid to date on COVID-19 claims. We examine the average costs of paid benefits associated with indemnity and medical benefits for COVID-19 claims (**RQ16**), both overall and for the specific SB 1159 presumptions (**RQ17**).

In Chapter 9, we conclude by recapping the problem and discussing the results laid out in the preceding chapters through the lens of the National Commission's stated objectives for WC systems. We also suggest areas where future research is needed.

2. Background and Overview of the Study

This chapter provides background information and policy evidence regarding COVID-19 and the California WC system. We describe the legislative history and background of SB 1159 and its implementation timeline. We also describe the RAND team's overall study design and mixed-methods approach, laying out the evaluation framework and RQs and providing an overview of the qualitative data collection and quantitative data sources.

Policy Background

California's WC system requires employers to provide medical care and disability (or indemnity) benefits to workers who experience workplace injuries and illnesses. In the case of fatal injuries or illnesses, death benefits must also be paid. Indemnity benefits include benefits for TD, permanent disability (PD), and death. TD benefits are set at two-thirds the amount of preinjury wages, subject to a maximum and minimum benefit; total TD benefits are paid while the worker is completely unable to work for up to a maximum duration of 104 weeks, and this category accounts for the vast majority of paid TD benefits.

Some public safety workers, including firefighters, police officers, and sheriff's deputies, are also eligible for up to a year of salary continuation in the event of a work-related injury or illness. This benefit is referred to as 4850 pay, after the authorizing labor code section (Cal. Lab. Code 4850, 2014). The 4850 pay, like TD benefits, is triggered by a work-related injury but replaces 100 percent of the worker's preinjury salary rather than two-thirds. If a worker receives 4850 pay for a year but is still unable to work at the end of that period, he or she may then begin receiving TD benefits. Although 4850 pay is a salary continuation policy that is formally separate from the WC system, it is an important source of income support for public safety workers and is thus analyzed together with TD benefits in the present study.[1]

PD benefits are assigned according to a PD rating—a number between 0 and 100 percent—assigned by an evaluating physician or medical examiner. The PD rating process involves adjustments for various factors, including for disability attributable to preexisting health conditions or other nonoccupational causes (known as apportionment). A disability rating greater than 0 percent entitles the worker to receive PD benefits for some number of weeks specified by

[1] 4850 pay provided to workers with WC benefits must be reported to the administrative database we use to analyze the system in this report. Among the claims that we classify as receiving TD benefits, 77 percent of peace officer claims and 68 percent of firefighter claims have paid 4850 benefits. We are unable to investigate the completeness of the data on 4850 benefits in the scope of this study, but the quality of WC data submitted by public-sector employers could be a worthwhile topic for future study.

the labor code. As with TD benefits, the weekly benefit rate is calculated as two-thirds the amount of preinjury wages (with a minimum floor and maximum cap).

Employers are obligated to pay WC benefits if the worker's injury or illness is determined to be work-related. Determining whether a worker's health condition is *work-related*, or "arising out of and in the course of the employment" (Kingston, 1919; Cal. Lab. Code 3600, 2011), is thus the central question that must be answered to determine if a WC claim should be accepted and paid or denied without payment of benefits.

When the claims administrator does not accept a claim, the burden of proof is generally on the injured worker (or an attorney representing the worker) to show that work was a contributing cause to the worker's injury. Most WC claims are filed after workers experience a specific injury (such as a slip or fall, overexertion, or a motor vehicle crash). In such cases, it is often relatively straightforward to determine whether the injury occurred on the job.

Establishing causation is much more challenging when it comes to occupational disease, because many diseases can result from exposures or risk factors that the worker may encounter both on and off the job. Except for diseases like black lung or mesothelioma (a type of cancer caused by inhaling asbestos fibers), which are driven primarily by risk factors that are rare outside of workplace exposures, it may be difficult, if not impossible, to show that workplace exposures, rather than nonoccupational exposures, were a contributing cause to disease in any individual worker's case.

In the case of infectious disease, WC generally does not cover "ordinary diseases of life" (Leigh and Robbins, 2004; U.S. Chamber of Commerce, 2002) (e.g., common cold or flu) that are prevalent in the broader community—as is clearly the case with COVID-19. Prior to 2020, infectious disease claims were rare in California's WC system, accounting for less than 0.5 percent of claims reported to the WCIS (California Department of Industrial Relations, 2020).[2]

Without the executive and legislative actions that were taken in California, it is likely that most workers filing WC claims for COVID-19 would have faced serious challenges in demonstrating that their infections were work-related. In the early months of the pandemic, when case counts were relatively low in California and stay-at-home orders were at their most stringent, some health care workers and others with exceptionally high levels of COVID-19 exposure in the workplace might have met the contributing cause standard. However, this possibility likely diminished as stay-at-home orders were relaxed and COVID-19 became more widespread in the community. Essential workers outside of highly exposed health care facilities would likely have faced major barriers in demonstrating that their COVID-19 cases were attributable to workplace exposure, rather than community spread. Data on claim incidence rates

[2] Authors' calculations from 2019 First Report of Injury (FROI) data. Infectious diseases defined here as FROI with *nature of injury* including Acquired Immune Deficiency Syndrome (AIDS), contagious diseases, other pneumoconiosis, and hepatitis C. As of April 20, 2020, there were 2,663 claims filed across these four *nature of injury* categories for 2019 injury dates, or 0.4 percent of all claims filed.

in states without COVID-19 presumptions are consistent with this analysis (Bernacki et al., 2021).

California policymakers, recognizing these challenges, moved quickly to shift the burden of proof for COVID-19 and facilitate essential workers' access to WC benefits. They did so by establishing legal presumptions that COVID-19 is work-related in workers who continue to work outside the home. When a presumption applies to a worker's case, the burden of proof is on the employer, rather than the worker. To deny a claim, the employer must introduce evidence rebutting the presumption and showing that the worker's health condition is attributable to nonoccupational events or exposures. In practice, employers can also challenge presumption claims by arguing that the worker is not eligible for the presumption because the worker's job duties or health conditions do not meet the definitions in the labor code.

Presumptions have been used for decades in California and other jurisdictions to make WC benefits available to workers with occupational disease when it may be difficult or impossible for workers to present individualized evidence about the causation of their health conditions. California was the first state in the country to establish a legal presumption that cancer in firefighters was work-related and compensable under WC. By the start of 2020, California Labor Code sections 3212 through 3213.2 had established presumptions for at least 11 distinct health conditions in specific groups of public safety workers.

Executive Order N-62-20

A rebuttable presumption for COVID-19 covering all essential workers was established on a temporary basis by Governor Gavin Newsom's Executive Order (EO) N-62-20, which he signed on May 6, 2020. This presumption applied to all employees working outside the home who had a COVID-19 diagnosis confirmed with either a positive polymerase chain reaction (PCR) test or a serology (antigen) test. The presumption was applied retroactively to employees whose last date of exposure (the injury date in occupational disease cases) was March 19 or later, and the EO provided for the presumption to remain in effect for two months.

This EO contained two other notable departures from the status quo. First, the order required that workers exhaust COVID-specific sick leave mandated by federal or state governments prior to receiving TD or other state-mandated disability benefits (such as California Labor Code Section 4850 time for public safety workers).[3] Second, the law established an expedited timeline for claims administrators to reject or approve claims. Claims administrators typically have 90 days to investigate and make an initial determination on a claim before the claim is automatically accepted. Under EO N-62-20, this timeline was shortened to 30 days.

[3] California Labor Code Section 4850 outlines the paid time off state workers are entitled to if they experience an injury in the workplace. This is in addition to their already accrued time off (Cal. Lab. Code 4850, 2014).

Senate Bill 1159

By the time the governor's EO expired on July 5, 2020, California was experiencing a surge in COVID-19 that was setting records for new daily cases, and several bills to address WC coverage of COVID-19 were being debated in the legislature. These bills varied in terms of the scope of workers to be covered, the strength of the proposed presumption, and whether other safety and health responses to the pandemic were also included in the legislation.

Debate was contentious, and employer groups voiced particularly strong opposition to the establishment of a presumption covering private-sector workers outside the health care industry (Senate Rules Committee, 2020). Concerns were, understandably, raised about the potential unfairness of breaking with precedent and making the WC system responsible for an ordinary disease of life. In addition, early estimates of the costs of covering COVID-19 through a *conclusive* presumption were staggeringly large, with the potential to more than double the yearly cost of the WC system under worst-case scenarios (WCIRB Actuarial and Research Teams, 2020).[4] Cost estimates published in June for the governor's presumption were far more modest (ranging from $0.6 billion to $2.0 billion), both because the governor's order was temporary (so the projected costs were not annualized) and because the presumption was disputable.

On the other side of the debate, the legislative record and popular discourse reflect several arguments in favor of covering COVID-19 through WC. It was widely recognized that essential workers were facing substantial risks so that society could continue to function—risks that were not present just a few months earlier. This was most obviously true of health care workers. While comprehensive U.S. data on the number of health care workers lost to COVID-19 are not yet available, one recent analysis reports that 2,900 health care workers died of COVID-19 in 2020 (Jewett, Lewis, and Bailey, 2020). By way of comparison, the number of fatal occupational injuries experienced by health care workers nationwide in 2019 was below 100 (U.S. Bureau of Labor Statistics [BLS], 2020a). Preliminary reports suggest that essential workers outside the health care industry had also been hit hard by the coronavirus. The United Food and Commercial Workers Union (UFCW), for instance, reported over 100 grocery worker deaths just among its union members as of September (UFCW, 2020); the number of fatal occupational injuries experienced by grocery store employees nationwide in 2019 was 40. Although it is unknowable how many of these workers were infected outside of employment, it seems indisputable that the pandemic made work outside the home vastly more dangerous than it had been a year previously, including in many occupations that typically have minimal fatality risk.

[4] In April, the WCIRB analyzed the cost of a conclusive presumption (which would have been much stronger than the rebuttable presumptions actually adopted in California) and reached a central cost estimate of $11.2 billion, or nearly two-thirds the statewide cost of insured losses and loss adjustment expenses (LAE) that was projected for 2020 prior to the pandemic. This estimate was produced under enormous uncertainty, and costs ranged across different scenarios from $2.2 billion to $33.6 billion.

Racial and ethnic disparities in the impact of the pandemic also aligned closely with disparities in the ability to work from home, especially among adults with chronic conditions that make them more vulnerable to COVID-19 (Selden and Berdahl, 2020).

In part to address employer concerns about costs and fairness, SB 1159 was modified in the assembly to introduce distinct presumptions for two different categories of workers. SB 1159 thus added *three* presumptions to the labor code.

The *temporary* presumption created by N-62-20 was codified without major changes by new Labor Code Section 3212.86, 2020. For date of injury after July 5, 2020, new Labor Code Section 3212.87, 2020, and Section 3212.88, 2020, created two distinct presumptions. These presumptions were made retroactive to July 6, 2020, and will remain in effect until December 31, 2022. Table 2.1 compares selected provisions of these presumptions. We discuss the major differences below, following the language of SB 1159 in referring to these presumptions as the *frontline worker* presumption (Cal. Lab. Code 3212.87, 2020) and the *outbreak* presumption (Cal. Lab. Code 3212.88, 2020).

The frontline worker presumption applies to health care workers (including health care workers providing direct patient care, custodial employees of health care facilities in contact with COVID-19 patients, registered nurses (RNs); emergency medical technicians (EMTs), home health agency workers, in-home support services providers, and other employees of health facilities) and several specific groups of public safety workers (including active firefighters and peace officers engaged in active law enforcement). The conditions for the frontline worker presumption broadly resemble the temporary presumption, but a few key differences should be noted:

- The types of testing allowed are more limited: The frontline worker presumption requires that COVID-19 be confirmed with a PCR test, whereas the temporary presumption also allows confirmation through an antigen test.
- The frontline worker presumption also explicitly specifies that the presumption covers posttermination claims if the worker tests positive within 14 days of their last day at the workplace, whereas there was no specific provision for posttermination claims in the temporary presumption.
- Finally, the frontline worker presumption clarifies that the presumption can be rebutted for employees of health care facilities who do not provide patient care and are not custodians (e.g., hospital administrators) if the employer can show that the worker had no contact with COVID-positive patients. Labor Code Section 3212.87, 2020, like the temporary presumption, offers no other guidance on how to challenge application of the presumption.

Table 2.1. Selected Provisions of COVID-19 Presumptions Under SB 1159

	Temporary Presumption (§3212.86)	Frontline Worker Presumption (§3212.87)	Outbreak Presumption (§3212.88)	Other Occupational Illness (§3202.5 and §3600)
Dates of injury covered	3/19/2020–7/5/2020	7/6/2020 or after	7/6/2020 or after	Any
Employees covered	Any working outside the home	Certain health care workers; active firefighters; peace officers engaged in active law enforcement	Employees at employer with 5+ employees who are working at the place of employment, excluding the worker's residence	Any
Diagnostic requirement	Test positive (PCR or serology) within 14 days of exposure, or diagnosed within 14 days of exposure and confirmed with positive test within 30 days of diagnosis	Test positive (PCR test only) within 14 days of exposure	Test positive (PCR test only) during outbreak period within 14 days of exposure	Diagnosed, and worker knows or should have known that illness is work-related
Date of injury definition	Last day worked at jobsite	Last day worked at jobsite prior to positive test	Last day worked at jobsite prior to positive test	Date when employee first suffered disability and knew, or should have known, that disability was caused by work, or date of last exposure
TD waiting period waived?	Yes	Yes	Yes	No
Offset by other paid leave?	COVID-specific paid sick leave exhausted before TD or 4850 time begins	COVID-specific paid sick leave exhausted before TD or 4850 time begins	COVID-specific paid sick leave exhausted before TD or 4850 time begins	Not specified
New employer reporting requirements?	None	None	Must report certain de-identified information to claims administrator within 3 days when any employee tests positive	None

	Temporary Presumption (§3212.86)	Frontline Worker Presumption (§3212.87)	Outbreak Presumption (§3212.88)	Other Occupational Illness (§3202.5 and §3600)
Outbreak requirement?	None	None	**Up to 100 employees:** 4+ employees test positive within 14 calendar days **More than 100 employees:** 4% of employees at jobsite test positive within 14 days **Any size:** jobsite is shut down by CDPH, local DPH, Cal/OSHA, or school superintendent due to COVID-19 risk	None
Burden of proof on . . .	Employer to rebut presumption	Employer to rebut presumption	Employer to rebut presumption	Employee to demonstrate employment is contributing cause to illness
How to rebut presumption?	Not specified	For other health care facility workers, if employer can show there was no contact with any COVID-positive patients; otherwise not specified in Labor Code	Includes "evidence of measures in place to reduce potential transmission of COVID-19 in the employee's place of employment and evidence of an employee's nonoccupational risks of COVID-19 infection" (Cal. Lab. Code 3212.88, 2020)	Not applicable
Timeline for claims administrator to accept or deny claim	30 days after claim is filed, unless new evidence is discovered after 30 days	30 days after claim is filed, unless new evidence is discovered after 30 days	45 days after claim is filed, unless new evidence is discovered after 45 days	90 days after claim is filed, unless new evidence is discovered after 90 days
Death benefits paid to DIR if no dependents found?	No	No	No	Yes

NOTES: CDPH = California Department of Public Health; DIR = (California) Department of Industrial Relations; DPH = department of public health.

The outbreak presumption is a unique use of a presumption in WC. The outbreak presumption, which applies to all workers not named in Labor Code Section 3212.87, 2020, is sharply distinguished by the inclusion of a provision that limits the applicability of the presumption to workers who test positive during an *outbreak period* at their employer. Labor Code Section 3212.88, 2020, defines an outbreak period based on the volume of positive tests over a rolling 14-day window.

Claims administrators are responsible for monitoring the occurrence of positive test results at a workplace, which is made possible by new requirements for employers to notify their insurers

or claims administrators when they learn that one or more employees has tested positive. Using these data, the claims administrator tracks whether an employer is in an outbreak period, which is triggered if a sufficiently large number of workers tests positive within a 14-day period. For larger employers with 100 or more workers, an outbreak is triggered when 4 percent or more of workers at a jobsite test positive within 14 days. For small and medium-size employers with five to 100 workers, an outbreak is triggered when four or more workers test positive within 14 days. (Labor Code Section 3212.88 does not define an outbreak for very small businesses with four or fewer employees, suggesting that workers at these businesses are never covered by the outbreak presumption.) While the mechanics are somewhat complex, the central idea is that the outbreak presumption takes effect only when there are multiple cases within a short period of time at a single jobsite, as we might expect if transmission of the virus were occurring at work.

The outbreak presumption is also distinguished from the frontline worker presumption by two more important features. First, while both Labor Code Section 3212.87, 2020, and Labor Code Section 3212.88, 2020, establish rebuttable presumptions, Labor Code Section 3212.88, 2020, provides much more specific guidance about how an employer can rebut the presumption. This might be achieved by introducing "evidence of measures in place to reduce potential transmission of COVID-19 in the employee's place of employment," or "evidence of an employee's nonoccupational risks of COVID-19 infection" (Cal. Lab. Code 3212.88, 2020). Second, the outbreak presumption has a different timeline for claims administrators to reject a claim (45 days after the claim is filed) from that of the frontline worker presumption (30 days after the claim is filed). Both these timelines are drastically accelerated compared with the 90-day timeline that applies throughout the rest of the WC system.

Even though presumptions have a long history in California WC, the presumptions established in response to the pandemic represent a clear departure from the way that presumptions have been used in the past. Eligibility for the prepandemic presumptions has been narrowly limited to active firefighters, peace officers, and certain other public safety workers, such as lifeguards, who are assumed to face elevated risks from their employment. And while several infectious diseases (tuberculosis, pneumonia, Lyme disease, Methicillin-resistant staphylococcus aureus, and blood-borne infections) were covered by presumptions prior to the pandemic, most of these diseases are not highly prevalent in California in the age groups characteristic of the public safety workforce. The COVID-19 presumptions, in contrast, cover large segments of the private-sector workforce in addition to public safety workers, and they provide coverage for a disease that is extremely widespread.

Policy Interactions and Other Factors Shaping Impacts on the Workers' Compensation System

The WC system does not exist in a vacuum, and our evaluation of SB 1159 needs to account for several factors that have changed over time and that may also drive outcomes observed within the WC system. These factors include other state policies intended to promote workplace

safety during the pandemic; a changing landscape of other health care and income replacement benefits; and, of course, the trajectory of the pandemic itself.

It is also important to note several other policies focused on COVID-19 prevention in the workplace, since successful interventions to reduce workplace transmission should reduce the potential volume of COVID-19 claims. In addition to its typical enforcement activities, Cal/OSHA has taken several major steps to address the pandemic. On May 14, 2020, Cal/OSHA issued temporary guidance intended to clarify how existing health and safety measures apply to the virus. Two policies were highlighted. First, California's Aerosol Transmissible Diseases (ATD) standard (first adopted in 2009) should already have required measures to prevent the spread of such airborne viruses as SARS-CoV-2 at a wide range of health care facilities, as well as some other establishments, such as correctional facilities and homeless shelters. Second, Cal/OSHA issued guidance instructing employers to evaluate the hazard of SARS-CoV-2 infection in their workplaces and, if there was a workplace hazard, to implement infection control measures and add these measures to their required Injury and Illness Prevention Plans (State of California Department of Industrial Relations, 2020). It is unclear whether this guidance from Cal/OSHA had substantial impacts on employer behavior or safety. By late August, however, Cal/OSHA inspectors had begun to issue citations to employers for COVID-19 safety violations; just over 100 citations had been issued statewide as of December 2020. Recently published research suggests that such enforcement activity, along with public announcements of citations, is likely to deter future violations by both cited employers and other employers nearby (Johnson, 2020).

On November 30, 2020, Cal/OSHA issued an ETS for COVID-19 prevention covering workplaces outside of employees' homes that were not already covered by the ATD standard. Several elements of the COVID-19 ETS posed major implications for COVID-19 WC claim volumes, particularly new requirements that all employees in an exposed workplace during an outbreak period must be tested immediately. The ETS defined an outbreak as three or more COVID-19 cases at a workplace within 14 days, meaning that any outbreak as defined in SB 1159 also met the definition of an outbreak in the ETS. By mandating immediate testing of all employees during an outbreak, the ETS promised to increase detection of COVID-19 in essential workers during periods when they would be covered by the outbreak presumption, which might increase COVID-19 claim volumes. The ETS has numerous other provisions, including many aimed at controlling SARS-CoV-2 coronavirus transmission in workplaces and other settings that were previously unlikely to be subject to infection control (such as employer-provided housing and transportation, which have been associated with large outbreaks among agricultural workers). Adoption of a standard substantially strengthened Cal/OSHA's ability to punish employers with inadequate safety measures, which ultimately should help reduce cases. Our study cannot evaluate the impact of these Cal/OSHA actions. Even so, communication to employers and safety enforcement have been an important part of the state's response to the pandemic and should be acknowledged as another factor that may affect the volume of COVID-

19 claims. Finally, since SB 1159 specifies that evidence of safety measures might be used to rebut the outbreak presumption, changes in employer practices resulting from Cal/OSHA regulations and enforcement could, in theory, have an impact on claim disposition.

We also highlight another law focused on COVID-19 safety in the workplace. AB 685, 2020, requires an employer to notify employees within one day whenever the employer learns that an employee who was on the jobsite was infected or potentially exposed to the virus. AB 685 also requires employers to notify potentially exposed workers and (if applicable) their unions of their eligibility for WC, sick leave, and any other relevant leave benefits. (Similar notification requirements were imposed in the Cal/OSHA ETS.) This notice must also inform employees about their protection under antiretaliation and antidiscrimination laws, including new protections added by AB 685 specifically for workers who inform their employer of COVID-19 test results or instructions to quarantine. Other provisions of AB 685 strengthen Cal/OSHA's enforcement powers for COVID-19 safety violations. These provisions of AB 685 seem likely to sharply increase awareness of WC coverage for COVID-19, which may increase the probability that workers will file claims if they test positive. The AB 685 notification requirements took effect on January 1, 2021.

In evaluating the overall impact of SB 1159 on the WC system, it is also important to consider interactions between WC benefits and other public and private benefits that can help workers afford medical care or replace lost wages. These interactions are shaped by two provisions of SB 1159. In addition to establishing presumptions, SB 1159 provides that TD benefits paid for COVID-19 claims will differ from TD benefits paid for other claims on two important dimensions, potentially expanding benefits for some workers while reducing benefits for others.

First, TD benefits for COVID-19 claims begin on the first day of temporary disability, rather than after the three-day waiting period that applies for nearly all other injuries and illnesses. Benefits for the three-day waiting period are paid retroactively on the 15th day of the TD period, but benefits and indemnity costs for claims with less than two weeks (14 days) of TD are higher under this provision than they would be in the absence of SB 1159. Second, SB 1159 explicitly provides that workers must use any pandemic-specific sick leave available to them before receiving TD benefits or related forms of disability compensation (such as benefits due to public safety workers under Labor Code Section 4850).

These new forms of sick leave have been mandated or provided as part of the state and federal responses to the pandemic. The federal Families First Coronavirus Response Act (FFCRA, Pub. L. 116-27, 2020) provides certain workers with up to two weeks of paid sick leave. This leave is available to workers who are instructed to quarantine by a health care provider or government order or who are experiencing COVID-19 symptoms and seeking diagnosis. Further details of the FFCRA pandemic sick leave and other forms of sick leave and disability insurance are presented in Table 2.2.

The FFCRA exempted many private-sector employers and groups of workers from its mandate to provide pandemic sick leave. Large businesses (above 500 employees) were exempt, and small businesses (with 50 or fewer employees) could receive exemptions. Health care workers and first responders were also excluded from the FFCRA mandate that employers offer pandemic sick leave. On April 16, 2020, Governor Newsom mandated that large employers provide supplemental paid sick leave (SPSL) benefits modeled on those mandated by the FFCRA to "food sector workers" in agriculture, food processing, groceries, restaurants, and similar industries by signing EO N-51-20 (Newsom, 2020b). This mandate was later codified as Labor Code Section 248.1, 2020, by AB 1867, 2020, which was signed into law on September 9, 2020. AB 1867 expanded the mandate for large employers to provide SPSL to all workers and mandated SPSL for health care workers and first responders excluded from the FFCRA regardless of employer size.

These pandemic-specific sick leave benefits are potentially important for the evaluation of SB 1159 because payment of TD benefits under SB 1159 does not begin until these pandemic-specific sick leave benefits have been exhausted. If employers provide these benefits as mandated, the offset may reduce or even eliminate TD payments in mild or asymptomatic cases of COVID. However, workers' eligibility for pandemic-specific sick leave is triggered by different events (worker advised to quarantine or subject to a quarantine/isolation order) than the SB 1159 presumptions (worker receives a positive PCR test), and it is likely that many workers will exhaust pandemic sick leave before they are able to return to work—especially if they have more severe cases. The extent of employer compliance with the sick leave mandates is also unclear, and so the impact of the SB 1159 offset provision on the WC system must be examined empirically.

State Disability Insurance (SDI) is administered by the Employment Development Department (EDD) and provides temporary disability benefits for workers who are unable to work due to disability incurred outside their employment. (EDD, undated). This includes most private-sector employees who are unable to work because they believe they are infected with coronavirus or are required to quarantine due to coronavirus exposure (EDD, 2022). We also note that, although SDI covers most workers, some state employees are covered by an alternative system known as Nonindustrial Disability Insurance.[5]

SDI benefits can cover 60 to 70 percent of wages, calculated from the worker's income earned five to 18 months before the date of the claim, and can be paid for up to 52 weeks (EDD, 2020a).[6] Prior to the COVID-19 pandemic, SDI claims had a mandatory one-week unpaid waiting period from the claim start date. On March 12, 2020, the Governor signed EO N-25-20

[5] Among state employees covered by the frontline worker presumption, registered nurses and those who provide medical and social services are covered; other employees, including firefighters, public safety employees, and physicians, are covered by Nonindustrial Disability Insurance (EDD, 2021).

[6] Workers must also earn $300 during the base period of their claim to be eligible for SDI benefits.

(Newsom, 2020a), which waived the waiting period for COVID-related SDI claims (Office of Governor Gavin Newsom, 2020). The one-week waiting period for COVID-19 claims was reinstated for claims starting on or after October 1, 2021, with EO N-08-21 (Office of Governor Gavin Newsom, 2021).

Employees can file a WC claim and an SDI claim at the same time but are unable to receive both benefits at the same time. SDI may cover the employee if their workers' compensation claim is rejected or pending or if the WC benefit is less than the SDI benefit (EDD, 2020b). SDI will pay the benefits until the WC claim is resolved, after which EDD may seek to recover the benefits from the WC payer through a lien (EDD, 2020b).[7]

[7] We note that the establishment of a legal presumption that COVID-19 is work-related may have implications for EDD's ability to recover SDI payments from WC payers. We are not aware of how this is playing out to date, but it may be an issue for policymakers to monitor going forward.

Table 2.2. Alternative Sources of Sick Leave and Disability Compensation for Workers with COVID-19

Indemnity Benefits	Effective Dates	Benefits Provided	Workers Covered	Who Pays?	Leave Offsets WC in COVID Claims?
FFCRA paid sick leave	April 1, 2020, to December 31, 2020	100% wage replacement, capped at $511/day, up to 2 weeks	Private-sector employees at businesses with 50 to 500 workers; public-sector workers; health care workers and first responders excluded	Employer, with private-sector employers to be reimbursed by federal tax credit	Y
SPSL for food sector employees	April 16, 2020, to December 31, 2020	100% wage replacement up to 2 weeks; shorter duration for part-time workers	Food sector workers at businesses with 500 or more employees nationwide	Employer	Y
SPSL	September 19, 2020, to December 31, 2020	100% wage replacement up to 2 weeks; shorter duration for part-time workers	Private-sector businesses with 500 or more employees nationwide; all health care workers and first responders excluded from FFCRA, regardless of employer size	Employer	Y
Ordinary (nonpandemic) paid sick leave	Any	100% wage replacement, with 3 to 6 days of leave mandated for most workers statewide	All employees; higher amounts mandated in some counties/cities	Employer	N
SDI	Any	60% to 70% of wages, tax-exempt; one-week waiting period waived during statewide COVID-19 emergency under EO N-25-20	All employees	EDD (employee payroll taxes)	N

Table 2.3. Alternative Sources of Medical Care for Workers with COVID-19

Medical Care	Effective Dates	Benefits Provided	Workers Covered	Who Pays?
Group (employer-sponsored or union) health insurance	Any	Medical care with potentially high patient cost-sharing	60% of nonelderly adult Californians	Employer/union (self-funded plans) or health insurer (fully insured plans)
Non-group private health insurance	Any	Medical care with potentially high patient cost-sharing	11% of nonelderly adult Californians	Health insurer
Medi-Cal or other public health insurance	Any	Medical care with limited or no patient cost-sharing	20% of nonelderly adult Californians	State and federal government
Uninsured or self-pay	N.A.	None—workers pay out-of-pocket	11% of nonelderly adult Californians	Workers/families, health care providers
Medicare	Any	Medical care with potentially high patient cost-sharing	~100% of Californians over age 65	Federal government

SOURCE: 2019 American Community Survey Tables HIC-5 ACS and HIC-6 ACS in U.S. Census Bureau, 2021a. Estimates reflect health insurance coverage in 2019; sources of coverage are not mutually exclusive. N.A. = not available.

In assessing the overall and cost impacts of SB 1159, it is also important to consider how workers might pay for medical care for COVID-19 if they are unable to obtain care through WC and what implications this might have for employer costs. Table 2.3 summarizes the prevalence of major sources of health insurance for Californian adults and identifies which parties pay for medical care under each coverage source. In 2019, most nonelderly adults in California (60 percent) were covered by employment-based health insurance—either an employer-sponsored plan or a union plan. Employer survey data from 2020 indicate that a slight majority (55 percent) of workers with employer coverage in the West census region were covered by a self-funded plan. For these workers, the employer pays directly for the cost of care billed to insurance, just as the employer would under a self-funded WC arrangement. For workers covered by commercial insurance (as in fully insured employer-sponsored insurance or with nongroup coverage), the health insurer (not the employer) bears the risk of high medical spending. And in many private insurance arrangements, patients may face substantial cost-sharing, in contrast to WC (which has no patient cost-sharing by law). Medi-Cal, which covers many lower-income workers in California, is funded by the state and federal governments, with very limited patient cost-sharing. Finally, Medicare provides near-universal, federally funded coverage to adults aged 65 and over, but with some degree of patient cost-sharing.

COVID-19 inpatient hospitalizations have been expensive. Analysis of a large convenience sample of commercially insured hospitalizations for COVID-19 between March and September 2020 found that the average price paid by commercial insurers (including employer-sponsored

health insurance [ESI] plans) for an inpatient stay for COVID-19 was $42,200 (Chua, Conti, and Becker, 2021). Depending on the insurance coverage of the patient, this cost might be borne by employers or health insurers, while patients with public insurance would have potentially lower costs paid by the state or federal government. COVID-19 hospitalization is also likely to result in high out-of-pocket costs for those with private (employer-sponsored or nongroup) insurance, some Medicare beneficiaries, and the uninsured. The cost impact of moving COVID-19 care into the WC system—for employers and for patients—thus depends crucially on whether workers are insured and whether (if they have employer-sponsored insurance) their employer's plan is self-funded or fully insured.

Finally, for workers covered by self-funded employer-sponsored insurance, differences in provider payments between private health insurance and WC could have a major impact on overall employer costs associated with COVID-19 health care. For care provided through WC, California's Official Medical Fee Schedule (OMFS) generally caps payments for inpatient care at 120 percent of the amount that would be paid by Medicare. Private insurance, in contrast, paid hospitals in California an average of 209 percent of the Medicare payment rate as of 2015–2016 (Kronick and Neyaz, 2019); more recent estimates using 2018 data suggest that ESI paid hospitals at 251 percent of the Medicare payment rate for inpatient care (Whaley et al., 2020).

The combined effect of the OMFS and the large gap in prices between private and public hospital payments might suggest that employers with self-funded health insurance—a group that includes many public agencies and the vast majority of very large employers—might substantially reduce the cost of providing medical care for COVID-19 when workers' care is financed through WC rather than group health. Such notional cost offsets would vary by employer size, region, and industry. In general, WC payers have somewhat fewer tools available than health insurers do to control utilization, a factor that may lead to higher utilization rates in WC that partially offset cost savings due to the fee schedule.

In reality, however, evidence has emerged that an unusually large proportion of WC claims for COVID-19 do not involve medical bills. The National Council on Compensation Insurance (NCCI) reports that, of commercially insured claims classified as having either medical or indemnity benefits (i.e., either paid or projected by claims administrators), a plurality have only indemnity benefits. This is a pattern that likely reflects two very different phenomena. First, mild cases of COVID-19 may not require any medical treatment after the initial diagnosis. Second, patients may have medical care billed to ESI or other non-WC health care payers even if they have an open WC claim or subsequently file a claim. In this case, the patient may be receiving care for COVID, but the bills are not going to WC.

Overview of Study

This evaluation study is intended to present available evidence on the volume and types of claims and claims outcomes, overall and by key occupations and industries; describe the views

and experiences of key stakeholders who used the WC system for COVID-19, such as workers, employers, and claims administrators; and then summarize the implications of this evidence on the workers' compensation system. We also raise the challenges and issues that this evidence has for policy regarding the presumptions established in SB 1159.

Approach and Study Design

To accomplish this effort, we employed a mixed-methods approach, using quantitative and qualitative methods to evaluate the impacts of COVID-19 claims and the SB 1159 presumptions on the WC system. We delineated specific research questions within the framework laid out in the 1972 National Commission report that specified the five main objectives of a WC system. See Chapter 1 for details on the framework, the five WC system objectives, and the study's RQs.

The qualitative efforts involved (1) conducting a literature search of the available evidence on workers' experiences with COVID-19 and related employer practices, (2) convening a TAG to inform study priorities and assess stakeholders' community reactions and feedback to our findings, and (3) conducting a targeted set of interviews with key stakeholders: workers who did or did not file a COVID-19 claim, claims administrators, employers, and public health officials. Interviews were conducted from July 15 through September 30, 2021.

The quantitative efforts involved analysis of workers' compensation claims data from the WCIS with injury dates from January 2019 to June 30, 2021.

Next, we describe the research approaches and tasks in more detail, starting with the qualitative research followed by the quantitative research.

Qualitative Research

Limited evidence existed about WC claim filing behavior of employees and how the SB 1159 presumptions in California supported injured workers with COVID-19 claims and/or affected claims administrators and employers. We designed a qualitative approach that, first, reviews what is known in the literature on worker and employer experiences surrounding COVID-19 and WC and, second, describes a variety of views and experiences of key stakeholders about COVID-19 claim filing decisions and the WC system delivery processes for such claims across a range of relevant stakeholders and industries.

The aim of the qualitative tasks was to gather evidence and experiences of those who have used and interacted with the WC system for COVID-19 claims across essential, frontline worker and outbreak employers in California. By doing so, we gained context and insight from workers, employers and stakeholders in the WC system for the quantitative assessment of the volume of claims, claims outcomes, and differences across industry and presumptions. The main qualitative task was to conduct a set of in-depth semistructured key informant interviews with four relevant types of stakeholders: (1) workers who had COVID-19 and did or did not submit a WC claim, (2) claims administrators for employers covered by SB 1159 presumptions, (3) employers covered by SB 1159 presumptions, and (4) public health officials dealing with COVID-19 cases and

exposure. We used the literature review to include a wide range of relevant topics in the interviews for workers and employers dealing with COVID-19 and the WC system and for the same purpose for our TAG and study team. We convened a TAG and held a meeting at the beginning of the project to discuss our research design and research questions, and at the end of the project to discuss our qualitative and quantitative findings and gain the stakeholder community's reaction and input.

Literature Review

We reviewed English-language peer-reviewed literature examining workers' experiences surrounding COVID-19 and the California WC system from March 2020 through September 2021. This included news reports and findings from literature reviews, given that much of the information in this area was likely not to have yet been published in peer-reviewed literature. Although this was not a formal systematic literature review, given that we did not rate the quality of the studies, for literature retrieval and review we adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009). We identified and reviewed 44 articles: 19 about workers' experiences and 25 about employer practices. Details and findings are described elsewhere (Quigley et al., 2022).

In brief, we found that none of the peer-reviewed or gray literature worker studies that analyzed data were about WC claims or benefits, about job loss or retaliation, or about medical care. Instead, they were primarily about leave or paid leave (n = 6 studies, n = 2 news reports) and the workplace related to health or safety (n = 5 studies, n = 3 news reports), as well as some specifically on PPE (n = 5 studies) or COVID-19 testing or screening (n = 4 studies). There was one study on hazard pay (n = 1 study), two on lack of health insurance (n = 2 studies), and one study and one news report on lost work time and return to work (n = 1 study, n = 1 news report). Furthermore, the employer-focused studies that analyzed data (three were peer-reviewed articles, and one was a gray literature study) were on workplace health and safety, hospitalizations and medical care, and staffing, along with a study on the development and field test of a return-to-work symptom screening tool implemented with California-based health care workers. The goal of the tool was to inform return-to-work guidance in real time. In addition, we found two peer-reviewed literature reviews that were about return to work, including COVID-19 testing or screening and/or health insurance, and one literature review focused on managing population health as employees return to work during the COVID-19 pandemic.

To understand what was raised in the news reports during the time of the study, we found that the included news reports indicated that, when possible, employers were opting to keep employees at home to prevent the spread of COVID-19 by promoting telework (Alix, 2020; Day, 2020) or providing additional paid leave (Boyle, 2020; Luna, 2020). In industries in which there was a shortage of employees already and no telework option, such as meatpacking and warehouse work, employers reported struggling with worker absenteeism and strikes (Almeida and Hirtzer, 2020; Buckley, Van Voorhis, and Rubin, 2020). Service industries with the greatest interaction with coworkers or customers were the hardest-hit employers, accounting for the

majority of WC claims and medical care costs (Simpson, 2021). Gray literature study reports projected that the pandemic would increase the costs to the WC system by as much as $81.5 billion (Chordas, 2020; Sams, 2020) and could jeopardize the WC system in California with what industry leaders called an *overly broad presumption* (Darragh, 2020; Hanna, 2020; Moynihan, 2020). In Virginia, news reports indicated that workers were struggling to get WC claims accepted and were facing large medical bills and loss of work resulting from their symptoms (Bailey and Jewett, 2020), whereas other types of workers reported being afraid of retaliation from their employers for disclosing the COVID-19 spread within their companies (Eidelson, 2020).

The main purpose of the literature review was to provide a standardized up-to-date set of information to our TAG and to identify any topics that we might want to add to the interview protocols. None of the articles in the review pointed to such new topics. Appendix A provides a more detailed summary of the literature review and its relevant findings.

Interviews

The main qualitative task included a series of 32 semistructured in-depth key informant interviews to assess WC processes and impacts on stakeholders, including interviews with workers with COVID-19 who did and did not file a WC claim; public health officials; and specific stakeholders across industries covered by the SB 1159 presumptions, including claims adjustors and risk managers (hereafter referred to as *claims administrators*); employers of health care, public safety, and other frontline employees; and employers who experienced a COVID-19 outbreak.

The interviews involved several tasks. First, we drafted recruiting scripts, developed information fact sheets to use during recruitment, and developed the interview protocols and submitted them for Human Subjects Protection Committee approvals with RAND's Institutional Review Board. Next, we established our nonworker stakeholder samples and employed a targeted recruitment strategy, using quota-based, purposive sampling techniques, to engage interview respondents. The samples were chosen to reflect the geographic diversity of California and a balance of frontline worker and outbreak industries.

Sampling and Recruitment

We developed four sampling pools: one each for claims administrators, employers, public health officials, and injured workers with a possible COVID-19 claim. Each of these sampling pools was developed separately. Recruitment was simultaneous across the samples. We sent initial invitations, including the information sheet, via email, followed up by phone, and attempted to contact respondents five times.

For *claims administrators*, we enlisted assistance from our TAG members to provide us with names of claims administrators across urban and nonurban areas of Northern and Southern California, as well as names of statewide and regional TPA or commercial insurers. We aimed to

recruit eight claims administrators incorporating a balance of at least one commercial insurer, one TPA insurer, two public safety employers, two health care system employers, and two counties balanced across California. From our total sampling pool of 20 names of claims administrators, eight completed the interview. Two were ineligible (not in charge of claims administration), one directly refused (i.e., hard refusal), two did not respond to outreach attempts or participated in a scheduled interview, and seven were never contacted.

For *employers*, we aimed to have 12 interviews that were split across (a) health care and (b) employers of public safety and other frontline high-risk workers. For health care employers, we aimed for two hospitals, two nursing homes, and two home health organizations with diversity across urban and rural and Northern and Southern California locations. For public safety and other high-risk frontline worker employers, we aimed for one public safety employer (we had other public safety employers also represented by claims administrators) and one employer each from industries known to have high risks of outbreaks from COVID: manufacturing, grocery, agriculture, meatpacking, warehousing, and construction. For all employer types, we reviewed publicly available data on CDPH-reported COVID-19 cases and Cal/OSHA violations within the specific industries. We also contacted employer associations for these employer and industry types identified through online searches or through TAG member referral. For health care employers, we assembled a total sampling pool of 43 employers, and five completed the interview. Nine were ineligible, 13 directly refused (too busy), ten did not respond to outreach attempts or participate in a scheduled interview, and six were never contacted. For employers of public safety and other frontline high-risk workers, we assembled a total sampling pool of 28 employers, of which six completed the interview. Two were ineligible (moved their business out of California at the very start of the COVID-19 pandemic), seven directly refused (six too busy, one advised by legal not to participate), ten did not respond to outreach attempts or participated in a scheduled interview, and three were never contacted.

For *public health officials*, we identified several statewide public health officials from the CDPH website. We reviewed CDPH data on the hardest-hit counties across California, including the top four counties in rural Northern California, urban Northern California, rural Southern California, and urban Southern California. We aimed to recruit four public health officials in total, including a balance of one statewide and three regional public health officials representing counties across California. From our total sampling pool of 16 public health officials (statewide and county-level), four completed the interview. No one was ineligible or directly refused, seven did not respond to outreach attempts or participate in a scheduled interview, and five were never contacted.

For *injured workers*, we had a three-pronged recruitment strategy. First, we enlisted assistance from our applicant attorney TAG members to provide us with names of clients with COVID-19 cases across urban and nonurban areas of Northern and Southern California. Second, we enlisted assistance from industry-specific TAG members and academic professors in relevant industry-specific content areas (occupational health, health and safety) to provide us with names

of worker research organizations, unions, and worker advocacy organizations that we would contact for direct referrals and assistance in marketing our study among their workers; this yielded the names of 27 people and organizations, including six union organizations. Third, we asked employers we interviewed whether they would post or distribute the study information sheet to their employees. We asked these individuals to assist us in recruiting injured workers. We gave them a drafted script and information sheet (in English and Spanish). We instructed them to contact employees using the script we provided (either individually or via mass distribution), which introduced the study to the employee, gained their interest, and got permission to connect them with the RAND study team. When an employee expressed interest, these individuals either obtained their contact information and passed it on to the RAND qualitative team or supplied the employees with a RAND 800-number, which employees could call to find out more about the study and, if interested, move forward to schedule an interview. We provided an 800-number in the English information that was answered by an English speaker (the principal investigator of the qualitative tasks) and a different 800-number in the Spanish information that was answered by a bilingual Spanish speaker on the RAND team. From the 12 injured workers for whom we were given names or who called the RAND team directly, nine completed the interview. No one was ineligible or directly refused, three did not respond to outreach attempts to participate in a scheduled interview, and we had no one who was never contacted.

Overall, we identified a total of 119 stakeholders and attempted to screen and contact 85 (with 13 ineligible and 21 never contacted). We completed 32 interviews (32/85): four public health officials, eight claims administrators, 11 employers, and nine workers (six with COVID-19 claims and three who did not file a claim). We had 21 direct refusals (all employers), mainly because the potential respondents reported being too busy to participate (overwhelmed with vaccine mandates in nursing homes, height of agricultural growing season, understaffed due to COVID), though one declined on advice from legal counsel. For the completed injured-worker interviews, we provided a $20 gift card to Walmart as a thank-you.

The 32 completed interviews covered the types of stakeholders we aimed to include, by type and location (see Table 2.4):

- **eight claims administrators:** one statewide commercial insurer, two statewide TPAs (one for public safety employers, one for health care employers), two urban public safety employers (one hybrid TPA/SA in Southern California, one TPA in Northern California), one large statewide health care employer with a TPA, and two urban counties (one Southern California with a hybrid TPA/SA, one Northern California with a TPA). Note that these claims administrators also represent employer types.
- **five health care employers:** two urban hospitals (one Northern California, one Southern California), two urban home health care agencies (two Southern California), and one urban skilled nursing facility with rehabilitation (one Southern California).
- **six employers of public safety and other frontline high-risk workers:** one public safety (one urban Southern California), one manufacturing and distribution (nonurban

Northern California), one grocery (one statewide), one agriculture (one statewide), and two construction (two urban Southern California).

- **four public health officials:** one statewide CDPH public health official, one urban Northern California public health official, one urban Southern California public health official, and one nonurban Southern California public health official.
- **nine injured workers:** six who filed a COVID-19 claim (five in English and one in Spanish; three in Northern California and three in Southern California) and three injured workers who did not file a claim (three in English; two in Northern California, and one in Southern California).

Table 2.4. Completed Interviews, by Stakeholder Type and Location

Respondent Type	Total Interviews (N = 32)	Statewide	Northern California	Southern California
Public health officials	4	1	1	2
Claims administrators	8*	4	2	2
Employers:				
Public safety worker employers	1 (*4)	NA	0 (*2)	1 (*2)
Health care employers	5 (*1)	0 (*1)	1	4
Other high-risk worker employers	5 (*3)	2 (*3)	1	2
Workers:				
Who filed a COVID-19 claim	6	NA	3	3
Who did not file a COVID-19 claim	3	NA	2	1
Total unique interviews	32	7	10	15

NOTES: NA = not applicable.
* Five of the eight claims administrators represent public safety and health care employers (n = 4 are public safety, n = 1 is a health care employer), while the remaining three claims administrators represent other high-risk employers.

Interviewing

Five standardized interview protocols were developed, one each for claims administrators, employers, public health officials, injured workers with a COVID-19 claim, and injured workers who decided not to file a COVID-19 claim. The interview content was similar across the nonworker interview protocols and consisted of a set of core questions in addition to a set of tailored questions specific to each stakeholder group. The worker interview protocols focused primarily on their claim filing decisions, COVID-19 experience, and, in the case of those who had filed a claim, we asked also about their claim experience. Table 2.5 presents the interview topics explored by stakeholder and how they address the study's RQs.

Table 2.5. Interview Topics, by Stakeholder

Interview Topic	Research Question(s)	Stakeholder Type			
		Claims Administrators	Employers	Public Health Officials	Injured Workers
Volume and types of claims	RQ1	X	X		
Why claims were filed	RQ6	X			X
WC claim timelines and administrative burden	RQ14, RQ15	X	X		
Reasons claims were denied	RQ3, RQ5	X	X		X-for those who filed a claim
Impact of claim volume on timelines and administration	RQ14	X			
Type and range of medical care covered by WC	RQ9	X			X-for those who filed a claim
Type and range of nonmedical WC benefits (disability, death, and posttermination claims)	RQ1	X			
Messaging on presumptions	RQ6, RQ7	X	X		
Outbreak definitions, presumption, and tracking	RQ15	X	X	X	
Impact of reporting policies (i.e., ETS, AB 685)	RQ13	X	X	X	
Return to work	RQ15	X	X		X
Impact of WC on COVID-19 testing, quarantine, medical care, and vaccination	RQ10	X	X	X	X-for those who filed a claim
Impact of WC on workforce readiness and safety	RQ10	X	X	X	
Impact of WC on public health and COVID-19 transmission	RQ12			X	
Access to and impact of paid sick leave	RQ8	X	X	X	X
Experiences with COVID-19, time off, and medical care	RQ7 RQ8, RQ9				X
Experiences pursuing a WC claim for COVID-19	RQ6				X-for those who filed a claim
Claim outcomes	RQ1, RQ3, RQ5				X
Worker knowledge of presumptions	RQ6				X

All interviews except two were conducted by phone by the qualitative lead/co-principal investigator, and the majority also included a notetaker, who is an assistant researcher on the team; one interview was conducted by this same assistant researcher, and another interview was conducted in Spanish by a bilingual team member. We conducted an informed-consent process with each participant before starting the interview, including consent for recording; all interviews

were audio-recorded. All interviews were transcribed verbatim and field notes documented, after which the interviewer reviewed and finalized the interview transcripts. Interviews lasted 50 to 60 minutes and were completed over a 12-week period from July 15 through September 30, 2021.

Our completed-interview participants, overall, are well balanced, except across a few notable dimensions: We interviewed more urban employers and injured workers than nonurban; twice as many TPAs than self-insured or hybrid employers; only white and Hispanic injured workers; twice as many female than male workers; and all six injured workers who filed a COVID-19 claim also had an applicant attorney. Table 2.6 presents characteristics of the nine workers and 19 employers interviewed. We collapsed the eight claims administrators and 11 employers to enable the reader to see the full range of employers included in the interviews.

In sum, for claims administrators, we included claims administrators for commercial insurers, for TPAs, and for employers of county public safety and health care workers. For employers, we included employers of essential, frontline workers, including health care (hospital, nursing home, home health), public safety (fire, police, sheriffs) and other workers in industries with high risk of COVID-19 outbreaks (manufacturing, grocery, agriculture, construction). For public health officials, we included statewide and regional (Northern California, Southern California) public health officials. For workers, we included public safety employees (sworn peace officers, nonsworn essential staff, correctional officers), health care workers (nurses, hospital and home health workers), and manufacturing (line workers and managers). In addition, three of the interviewed injured workers did not file a COVID-19 claim, and six did file a COVID-19 claim; the six who filed a claim for COVID-19 also all had an applicant attorney. Of the six who filed a COVID-19 claim (five in English and one in Spanish), we interviewed one hospital nurse, one corrections officer, one police officer, one nonsworn peace officer, one manufacturing line manager, and one worker–machine operator. Of the three injured workers who did not file a claim (three interviewed in English), we interviewed one hospital nurse, one home health nurse, and one home health aide.

Table 2.6. Characteristics of Workers and Employers Interviewed

	Injured Workers (*N* = 9)	Employers (*N* = 19) (including employers of 8 claims administrators)
Region		
Northern California	5	4
Southern California	4	9
Statewide	NA	6
Location		
Urban	7	12
Nonurban	2	1
Statewide	NA	6
Industry		
Public safety	3	1
Health care–home health	2	2
Health care–hospital	2	2
Health care–nursing home	2	1
Manufacturing/distribution	2	1
Grocery	0	1
Agriculture	0	1
Construction	0	2
Type of claims administration		
TPA	—	11
Self-insured	—	5
Hybrid (TPA and self-insured)	—	3
Outbreak at work	5	NA
Filed a COVID-19 WC claim	6	NA
Full-time at time of exposure	9	NA
Gender		
Male	3	NA
Female	6	NA
Race/ethnicity		
White	4	NA
Hispanic	5	NA
Required to work outside home	9	NA
Needed time off	9	NA
Needed medical care	9	NA
Had medical bill for COVID-19	8	NA

Analysis and Coding

Transcripts were reviewed, aligned with the protocol questions, and finalized. We entered transcripts into Dedoose (Dedoose v. 8.2.32, 2019), a web application for analyzing qualitative data.

We conducted both inductive and deductive content analysis to develop a coding scheme for performing a qualitative description of the themes discussed by the WC stakeholders. We used directed (deductive) content analysis, looking for a priori constructs related to the specific RQs and interview questions. We also used inductive content coding and analysis, in which latent categories or themes emerge from the data, which is appropriate when little is known about the phenomenon of interest (Cavanagh, 1997; Downe-Wamboldt, 1992).

With this combined approach, we established a coding scheme to yield a qualitative description of the themes discussed by the five stakeholder groups and to answer the posed RQs. We first developed codes based on the items in the interview protocols and on key research questions (Bernard and Ryan, 2010), with many codes common across stakeholder groups and protocols (by design). Then we further developed the code structure using systematic, inductive procedures to generate insights from responses (Bradley, Curry, and Devers, 2007; Thomas, 2003). Two qualitative team members, led by Denise Quigley, independently test-coded the same two transcripts for all major themes in the codebook for each stakeholder group. The two coders conducted such coding to identify topics, coding transcripts independently and refining the codebook (Bernard and Ryan, 2010). After this initial coding exercise, we compared the differences between the two coders' application of codes to the same interview text and obtained the following pooled kappa coefficients: 0.83, indicating "very good" coder agreement, for public health official interviews; 0.88, indicating "very good" coder agreement, for employer interviews; 0.81, indicating "very good" coder agreement, for claims administrator interviews; and 0.84, indicating "very good" coder agreement, for injured worker interviews. Discrepancies were resolved by the coders reaching consensus through discussion, which also resulted in additions or modifications to several codes, as expected. We used discussion at regular team meetings to involve the larger team and reach consensus on topics, identify discrepancies, refine concepts, make codebook changes, define codes, and dialogue about concepts and themes.

Team members worked together in identifying themes and subthemes and in reviewing the sets of interviews by type of respondent and location to understand any differences or similarities. This thematic analysis yielded summaries of the main themes involved in qualitative findings for each of the relevant RQs and by relevant stakeholder group. These thematic and comparative analyses highlight the differences and similarities found by different stakeholders and location in California.

Technical Advisory Group

During initial planning of the project, we concurrently assembled a TAG. Key stakeholder groups for the TAG were identified to make sure a comprehensive set of perspectives was present to advise the project team on study approach, analyses, and results. Individuals recruited for the TAG were meant to balance key stakeholder perspectives. The TAG comprised worker

organizations (agricultural labor, occupational health and safety, peace officers, health care workers union, hospital worker association, nursing home workers; n = 6), employer organizations (counties, cities, public safety, risk management; n = 4), claims professionals, including insurers and TPAs (n = 3), a WC applicants attorney (n = 1), and defense attorney (n = 1), an epidemiologist (n = 1), and California public health officials (n = 3).

We convened the first expert TAG meeting (virtually) at the beginning of the project (July 1, 2021) to discuss our research design, research questions, and overall approach. It was held before interviews started to allow for input and feedback on the overall design and approach. The meeting was structured with an agenda and included presentations and time for questions and discussion. For the initial TAG meeting, the RAND team laid out the research objectives, the specific research questions, the known and unknown factors, the analysis strategies, the issues, the challenges, the study approach, and the policy framing to gain important context from stakeholders. The TAG provided input and feedback and validated information on the processing and filing of COVID-19 claims, uncovered a few inconsistencies and areas of confusion in SB 1159, identified the strengths and weaknesses of the current WC process specific to COVID-19 claims, provided insight into issues with processing COVID-19 claims, and gave input into the quantitative and qualitative approaches.

Using our findings from the background research, interviews, and analysis of secondary data sources, we convened (virtually) our second TAG meeting (October 26, 2021) to review the qualitative and quantitative research findings, discuss current trends and implications of the study's findings on SB 1159, and provide feedback on the findings prior to finalizing the report.

The TAG input and feedback at both meetings was documented by a notetaker and used to aid in understanding the issues across the quantitative and qualitative team members. Based on our first TAG meeting, we incorporated a specific set of screener questions (to gain similar information and background in regard to making a decision about filing a WC claim for COVID-19) and confirmation to include Spanish interviews and provide workers a thank-you gift card. The discussion of findings from the second TAG meeting confirmed the credibility of our qualitative and quantitative findings and provided key information on framing the denial rate discussion and the discussion of claim filing behavior, claims without medical bills, and claims with high medical costs.

Limitations of the Qualitative Approach

Our approach to the qualitative analysis had several limitations. While we believe the qualitative results provide significant value for the study findings, we completed a small total number of interviews (n = 32) and completed interviews with only a few employers and only a few workers for each of the included industries, providing us with views and experiences from a wide range of industries (employers and workers) rather than an in-depth look into any one industry. We did conduct a broad outreach across many employer and employee associations; however, many potential respondents reported being overwhelmed with COVID-19 and unable to participate in the study. Our recruitment was in summer 2021, posing challenges for

recruitment across several industries. We were recruiting health care employers and workers during a time when their executive, management, and infection prevention staff were overwhelmed with the summer 2021 COVID-19 surge and the first waves of vaccination mandates for health care workers. Also, with our recruitment happening in summertime, we were recruiting agriculture employers and workers during the peak of the harvesting season. These challenges most likely biased our sample toward those willing and those able to dedicate their time; as a result, we may have spoken to those employers with fewer COVID-19 cases and/or claims; those employers with TPAs; or larger companies that would have broader bandwidth to carry the load of COVID-19 exposures, outbreaks, and claims across more staff. We were able, however, to interview claims administrators and employers of high-risk frontline employees, such as those in public safety, across several large urban counties in Northern and Southern California and in health care across several settings (hospital, home health, nursing home). In terms of our injured-worker interviews, our recruiting efforts were most successful through applicants' attorneys, yielding six injured workers with filed claims who had engaged an applicant attorney. Our other recruiting efforts, via employers, claims administrators, union representatives, and employee associations, yielded three additional injured-worker interviews. Overall, we completed nine total injured-worker interviews across public safety, health care, and manufacturing workers; six of these workers had filed a WC claim, and three had not. We were also not able to gain interviews with grocery, agricultural, or construction workers. Despite these limitations, the aim of the qualitative component of the study was to systematically gather the views and experiences of a set of relevant stakeholders with experience using the WC system for COVID-19–related claims to understand a complex, newly emerging situation and context.

The qualitative interviews in our study purposively allowed a relevant set of stakeholders affected by SB 1159 to share information in their own words about their views and experiences of COVID-19, SB 1159, and WC. In contrast to quantitative studies that prioritize representativeness and generalizability, qualitative methods draw upon small samples to understand complex phenomena, prioritizing the collection of rich descriptive data as a critical first step in addressing and understanding a problem or policy issue. Our qualitative interview findings accomplished this aim.

Quantitative Research

We used data on First Reports of Injury (FROI), Subsequent Reports of Injury (SROI), and medical bill payment data from the WCIS to study COVID-19 claims in California. Division of Workers' Compensation (DWC) programmers extracted selected variables for the RAND team in late August 2021. This section briefly describes our approach to constructing an analytic data set from the WCIS data with one observation per claim. Parts of this section draw heavily on descriptions of the methods in Quigley et al., 2021, which applied similar methods to an earlier extract from the WCIS.

The FROI is a report submitted by a claims administrator to the WCIS indicating that a new WC claim has been filed. It includes detailed information about the injured worker, the employer, and the injury. FROI information that was particularly relevant for this study included key dates in the claim history (including the date of injury, the date of report to the employer, and the date of report to the claims administrator), worker demographics (i.e., age and sex), geography (e.g., worker's ZIP code of residence), occupation (a free-text occupation description field), job and employer characteristics (i.e., weekly wages and industry), and information about the type of injury (i.e., nature, cause, and body part of injury) as classified at the time the claim was initially filed.

If claims are denied in full before any payment of benefits, this denial is also reported on the FROI. We focused on denials reported on the FROI, which we termed *initial denials*, as our measure of claim denials in this report. We could also observe denials after indemnity benefits had been paid, because these must be reported on an SROI. However, a sizable majority of full denials was reported on FROI. Looking at data on all (non–COVID-19) claims with 2017 injury dates, 84 percent of all claims with a full denial reported by the time our data were extracted (in August 2021) had a full denial reported on the FROI. For claims filed during our pandemic study period (January 2020 to June 2021), initial denials accounted for 88 percent of all denials on non–COVID-19 claims and 97 percent of all denials on COVID-19 claims, reflecting the fact that it was still fairly early to observe final outcomes on many COVID-19 claims.

The SROI database contains any subsequent reports of events filed in the processing of the claim, including the payment or settlement of each type of WC benefit, the start and end dates of payments, and the cumulative amount paid to date. The SROI also reflects termination of benefit payments, claim closure, and full or partial claim denials occurring both after the initial investigation phase and after benefits have been paid. The SROI provided our main measure of workers' receipt of indemnity benefits and settlements and of employers' costs associated with these benefits.[8]

Finally, we used claims from the medical bill payment files of the WCIS to measure medical spending and to identify claims that had bills for inpatient hospitalization or intensive care unit (ICU) care. We measured medical spending by summing paid amounts on final medical bills (after de-duplication, exclusion of certain adjustments, and other data-cleaning procedures) over specified windows of time relative to the first service date. We measured spending on all paid medical bills with service dates through July 2021.

Definitions of Key Variables in WCIS

COVID-19 claims were identified as those with *nature of injury* code 83 (COVID-19) and *cause of injury* code 83 (pandemic) on the FROI. Paid amounts on claims through the time of

[8] Amounts paid or settled for benefits were winsorized (i.e., top-coded) at the 99.5 percentile of payments observed for workers receiving each benefit type to limit the influence of outliers.

data extraction (late August 2021) were calculated from SROI data. Initial denials were identified from the FROI.

We focused on a window of three months after the first service date to identify inpatient hospitalizations and ICU care. Bills for inpatient care were identified as those with *billing format* code A and *facility* code 11, a definition that was developed in consultation with DWC programming staff. Bills for ICU care were identified as bills with *revenue* codes 201, 202, 203, 204, 207, 208, 209, 210, 211, 212, 213, or 219.

To determine which claims were potentially covered by the frontline worker presumption, we had to use information about both the worker's industry and their occupation. Industry codes are reported on the FROI, mostly as North American Industry Classification System (NAICS) codes, but in some cases as Standard Industrial Classification (SIC) codes. We crosswalked SIC codes to 2017 NAICS codes.

WC claims do not contain structured occupation codes; however, we were able to use the National Institute for Occupational Safety and Health (NIOSH) Industry and Occupation Computerized Coding System (NIOCCS) to assign occupation codes based on industry codes and on the free-text occupation description field in the WCIS. The NIOCCS algorithm assigned 2010 Standard Occupational Classification (2010 SOC) codes.

Table 2.7 lists the occupation and industry codes that we used to define each group of frontline workers. In some cases, we also drew on WC class codes to supplement industry codes. We assigned claims to the Worker Group listed in the table if they met both the occupation and industry criteria listed in the table. Workers not assigned to any frontline group were treated as potentially covered by the outbreak presumption.

Table 2.7. Definitions of Groups of Workers Covered by Frontline Presumption

Presumption (Labor Code section)	Worker Group	Occupations Included (SOC codes)	Industry (NAICS) or Class Codes
Frontline (3212.87(a)7)	Direct patient care or custodial workers in contact with COVID-19 patients at a health facility	• Healthcare Practitioners and Technical Occupations (29-) • Healthcare Support Occupations (31-) • Building and Grounds Cleaning and Maintenance Occupations (37-)	• General Medical and Surgical Hospitals (62211) • Psychiatric and Substance Abuse Hospitals (62221) • Specialty (except Psychiatric and Substance Abuse) Hospitals (62231) • Nursing Care Facilities (Skilled Nursing Facilities) (62311) • Residential Intellectual and Developmental Disability Facilities (62321)
Frontline (3212.87(a)8)	Authorized RNs and EMTs	• Registered Nurses (29-1140) • Emergency Medical Technicians and Paramedics (29-2040)	• Any Industry
Frontline (3212.87(a)9)	Direct patient care at home health agency	• Healthcare Practitioners and Technical Occupations (29-) • Healthcare Support Occupations (31-)	• Home Health Care Services (NAICS 6216) • Home Care Services (Class 8827) • Home Infusion Therapists (Class 8852)
Frontline (3212.87(a)10)	Other employees of health facilities	• Any Occupation	• Industries Used to Define Facilities for 3212.87(a)7 • Hospitals—all employees (Class 9043) • Residential Care Facilities for the Elderly (Class 9070) • Residential Care Facilities for the Developmentally Disabled—Incl. Supervisors and Receptionists (Class 9085) • Convalescent Nursing Facilities—Incl. Supervisors and Receptionists • (Class 8829)

Presumption (Labor Code section)	Worker Group	Occupations Included (SOC codes)	Industry (NAICS) or Class Codes
Frontline (3212.87(a)11)	In-home supportive services	• Any Occupation	• Services for the Elderly and Persons with Disabilities (NAICS 62412) • Home Care Services—All Employees (Class 8827)
Frontline (3212.87(a)7-11)	Health care workers	• All groups defined above	• All groups defined above
Frontline (3212.87(a)5)	Peace officers primarily engaged in active law enforcement activities[a]	• Police Officers (33-3050) • Detectives and Criminal Investigators (33-3020) • First-Line Supervisors of Police and Detectives (33-1012)	• Any Industry
Frontline (3212.87(a)1-4)	Active firefighters[b]	• Firefighters (33-2011) • First-Line Supervisors of Fire Fighting and Prevention Workers (33-1021)	• Any Industry • Firefighting Operations—not volunteers (7706)
Frontline (3212.87)	All frontline	• All the Above	• All the Above
Outbreak (3212.88)	Other occupations	• All Workers Not Classified Above	• All Workers Not Classified Above

[a] Peace officers also include injured workers with class code 7720, 9410, or missing who had an occupation description identifying them as deputies or police officers, excluding those with text indicating nonactive law enforcement occupations. See Appendix B for details.

[b] Firefighters also include injured workers with class code 7706 (any occupation or industry) and injured workers with class code 9410 or missing who had an occupation description identifying them as active firefighters. See Appendix B for details.

Table 2.8. Sample Sizes Available in 2019–2021 WCIS

Restriction on Sample	(0) All Claims with Date of Injury	(1) Date of Injury, Nature of Injury, Cause of Injury Reported	(2) +Compete Records on Other Variables	(3) +Reliable Claims Administrators	(4) +Occupation Code Available	(5) +Medical Bills Reported
Period						
Prepandemic (2019)	713,472	712,097	546,282	470,225	282,158	215,029
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	141,750	141,423	109,948	94,044	56,748	43,534
Temporary presumption (3/19/2020–7/5/2020)	160,136	159,707	122,757	103,125	65,143	44,904
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	657,927	657,360	503,933	420,297	262,589	165,801
Total	1,673,285	1,670,596	1,282,920	1,087,691	666,638	469,268

NOTES: Other Variables = Nonmissing values of gender, self-insured status, and pre-injury weekly wage; age at injury is 16 to 81; industry code is valid NAICS or SIC code; postal code of employee residence or jobsite is reported and is from a location in California. Occupation Code Available = top result from NIOCCS was an occupation code with confidence above 50 percent, and entropy of top 20 NIOCCS matches was less than 0.6. Reliable claims administrators = those reporting paid indemnity benefits on at least 10 percent of claims prior to the pandemic (2016–2019).

Missing Data and Weighting

WCIS data, like other multipayer administrative data, vary in quality across payers and over time, leading to challenging missing-data problems. We addressed these challenges using an approach developed and extensively applied in past RAND studies. We defined a set of increasingly stringent requirements for data quality to identify a subsample of claims that had usable data on all variables required for our analysis (an approach to missing data known as *casewise deletion*).

We restricted our analysis sample to claims that had complete data on key variables and were submitted by claims administrators (insurers, TPAs, or SA employers) who demonstrated reliable reporting of SROI data. This second restriction (at the claims administrator level) was needed because many claims administrators appear never to report SROI data, even when they might submit tens or hundreds of thousands of claims to the WCIS. In general, around 30 percent of compensation claims receive indemnity benefits, so it is not plausible that a claims administrator with thousands of claims would not have any indemnity injuries. These restrictions are particularly important in the present study, because data quality has been a challenge for

several government employers, including those at the local-government level who employ most public safety workers in California.

We considered claims to have a usable SOC code assigned if the probability of the top match assigned by NIOCCS was greater than 50 percent and the entropy was below 0.6.[9]

To produce estimates that are representative of all WC claims filed in the state, we derived weights to ensure that the weighted distribution of observable characteristics of claims with complete records matched the (target) joint distribution of several claims characteristics observed on the FROI: injury year, type of claims administrator (fully insured, TPA, or SA), region of California, gender, age, and pre-injury weekly wage. This population corresponds to column (2) of Table 2.8. Weights were defined using the following steps:

1. Group the data in each sample (i.e., in each column of Table 2.8) into cells defined by a combination of the variables in the target distribution, e.g., self-insured claims with 2019 injury dates from the Bay Area filed by men aged 46–60 in the lowest quartile of pre-injury weekly wage.
2. Count the number of claims in the cell in the target distribution (claims in column [2] of Table 2.8).
3. Count the number of claims in the cell in the more restricted sample (e.g., claims in column [4] of Table 2.8).
4. Define the weight for claims in that cell as the ratio of the sample in step 2 to the sample in step 3—e.g., if a cell has 3,000 claims with complete data in column (2) but only 2,000 of those claims are from reliable claims administrators and have a usable occupation code assigned, the weight assigned to claims in that cell for analyses using the sample in column (4) would be 1.5.

We constructed similar weights for claims in column (5) to produce a sample of claims with one or more medical bills reported that has similar characteristics to the sample in column (2). Table B.1 in Appendix B reports, for each sample, the number of observations available and the distribution of case characteristics before and after weighting. For all samples, the weights serve to make the distribution of claim characteristics much closer to that observed in the sample with complete records on weighting characteristics.

Under the assumption that the missingness of data (due to incomplete records, unreliable claims administrators, or missing medical bills) is uncorrelated with any of the variables of interest in our analysis, calculations using these weights will be valid estimates for the entire WC system (i.e., for all workers who file a FROI containing complete data on the target variables). This assumption is debatable, but it is inherently untestable, and we lack support for other specific assumptions that would be needed to develop alternative estimates. Missing data and the assumptions needed to address missing data are unavoidable limitations of research using the WCIS or other administrative data.

[9] The entropy of a discrete probability distribution P(k) over K events, defined as the sum over all possible outcomes k = 1. . . K of (-P(k)ln(P(k)), can be used as an informal measure of the goodness of fit of probabilistic predictions from an algorithm. Higher values indicate worse fit.

For estimates of the total number of COVID-19 claims (i.e., Tables 3.1, 3.2, and 3.3) we used the sample indicated in column (1) of Table 2.8. Counts of COVID-19 and non–COVID-19 claims by presumption section and by frontline worker group (health care, firefighter, peace officer) are derived by estimating proportions of claims by COVID-19 status and occupation using the sample in column (4) and multiplying these proportions by the total number of COVID-19 and non–COVID-19 claims appearing in column (1).[10]

For estimates of claim outcomes involving information from the SROI (i.e., denial rates, rates of benefit receipt, or average costs), we limited attention to the sample corresponding to column (4) of Table 2.8. In Chapter 8, where we analyze medical spending and utilization, we use the sample in column (4) when we report statistics ("including claims with no medical bills"), and we use the sample in column (5) when we report statistics ("excluding claims with no medical bills").

In Chapter 4, where we report on the volume of COVID-19 and non–COVID-19 claims by industry and detailed occupation, we report unweighted counts of all claims with industry and occupation codes so that all observable claims in each category are counted. As a sensitivity analysis, we also examined unweighted counts of all claims in column (1) with occupation and industry codes reported (but including claims with missing data on other key variables required in column (2) and found that the proportion of COVID-19 claims by month was within 1 percentage point of the weighted estimates at all times.

Reweighting to Adjust for Claim Maturity

Many of the key outcomes of this study emerged gradually over time and therefore are subject to right-censoring. This can make comparison between groups of claims with very different distributions of injury dates misleading. This is a concern for receipt of different types of benefits, durations to key milestones (such as the time when a claim is denied or the end of temporary disability), and the cost of paid benefits.

As we show in Chapter 3, the injury date distribution during the pandemic looks very different for COVID claims and non-COVID claims, introducing the potential for right-censoring. To provide a valid comparison between COVID and non-COVID claims that is unaffected by right-censoring, we used a reweighting method known as *entropy balancing* to derive weights for the non-COVID claims that yield a distribution of injury dates and occupational groups identical to that observed for COVID claims (Hainmueller, 2012). In Chapters 3, 7, and 8, where we report outcomes potentially affected by right-censoring, we use these entropy-balancing weights to calculate *Adjusted Totals* that provide a more informative comparison between COVID and non-COVID claims. In nearly all cases, comparisons between COVID and non-COVID claims using the adjusted totals tell essentially the same story as the

[10] Nine COVID claims with a 2019 injury date were reported to the WCIS. To simplify the presentation of findings in this report, we exclude these claims from our analysis sample, effectively assuming that these claims were classified as COVID because of a data entry error by the claims administrator.

unadjusted totals (which use sampling weights to correct for casewise deletion, but which do not reweight to match the date of injury distribution). We do not discuss the adjusted totals in the text unless they differ meaningfully from the unadjusted totals.

3. COVID-19 Claims Volumes, Denial Rates, and Benefit Receipt

This chapter presents the volume, composition, and outcomes of COVID-19 claims from January 2020 to June 2021. We provide an overview of the COVID-19 claim volumes, severity of those claims, and the outcomes in terms of denials and benefit receipt. We examine the overall volume of COVID-19 claims (**RQ1**), including volume of claims by the presumptions covered by SB 1159 (**RQ2**), and then we review claim volumes over time, including overall denial rates (**RQ3**), benefit receipt, and medical severity. This information answers RQs 1 through 3:

- **RQ1:** What is the volume of COVID-19 claims?
- **RQ2:** How does COVID-19 claim volume vary across the different presumptions created by SB 1159?
- **RQ3:** How often are COVID-19 claims denied in part or in full?

Workers' Compensation COVID-19 Claims

Table 3.1 reports the number of COVID-19 and non–COVID-19 claim volumes during four periods:

- prepandemic (injury date in 2019)
- pandemic, before temporary presumption (injury date in 1/1/2020–3/18/2020)
- temporary presumption (injury date in 3/19/2020–7/5/2020)
- SB 1159 presumptions in effect (injury date in 7/6/2020–6/30/2021)

Table 3.1. COVID-19 and Non–COVID-19 Claim Volumes

	COVID-19 Infection Claims			Non–COVID-19 Claims			Total	
Period	Number of Claims	Claims per 30 Days	Percentage of Total	Number of Claims	Claims per 30 Days	Percentage of Total	Number of Claims	Claims per 30 Days
Prepandemic (2019)	0	0	0.0	712,093	58,528	100.0	712,093	58,528
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	1,105	425	0.8	140,318	53,968	99.2	141,423	54,393
Temporary presumption (3/19/2020–7/5/2020)	25,407	6,993	15.9	134,300	36,963	84.1	159,707	43,956
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	115,521	9,627	17.6	541,839	45,153	82.4	657,360	54,780
Total (1/1/2020–6/30/2021)	142,033	7,790	14.8	816,457	44,778	85.2	958,490	52,568

NOTES: Estimates in table reflect unweighted counts and proportions of claims (FROI) reported to WCIS with the nonmissing date of injury and valid codes for cause of injury and nature of injury. Thirteen COVID claims with 2019 injury dates were excluded.

Because these periods differ in length, Table 3.1 also reports the rate of claims filed per 30 days over each period.

Statewide, the number of COVID-19 claims filed per 30 days increased rapidly during the period that would be covered by the temporary presumption, increasing from 2,500 claims in March 2020 to 12,000 by July 2020. At the same time, the volume of non–COVID-19 claims dropped sharply following the statewide stay-at-home order, and so total claim volumes dropped early in the pandemic and were 25 percent lower than the volume typical before the pandemic during the temporary presumption period.

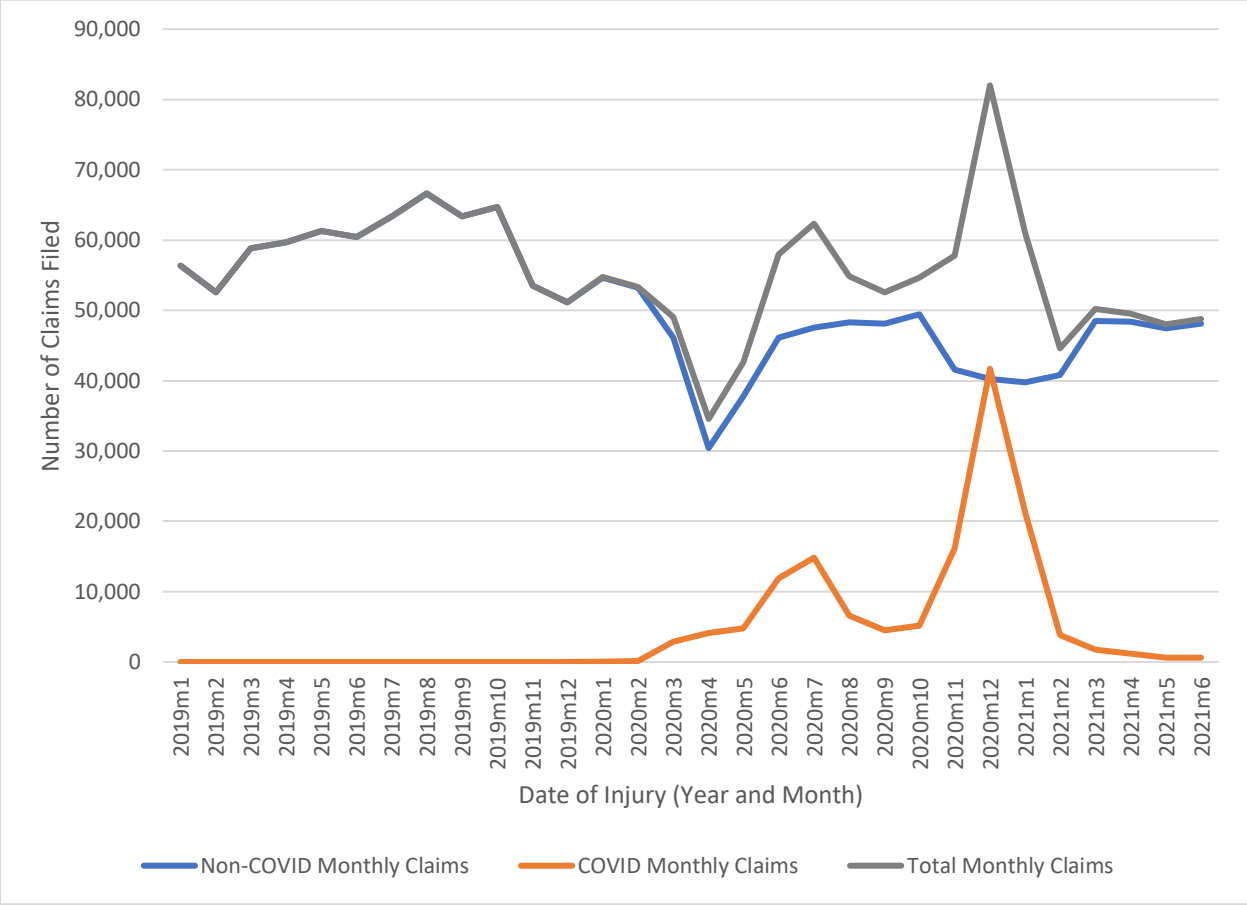
As the pandemic continued, the average volume of COVID-19 claims per month increased to an average of about 10,000 per month over the first year when the SB 1159 presumptions were in effect. Non–COVID-19 claim volumes also rebounded as the economy reopened, contributing to a rebound in total claim volumes. Monthly claim volumes in the first year after the frontline and outbreak presumptions took effect remained 6 percent lower than typical claim volumes prior to the pandemic.

The figures reported in Table 3.1 are averaged over relatively long spans of time and thus mask important patterns in the monthly volume of COVID-19 claims. Figure 3.1 presents the monthly volume of COVID-19 and non–COVID-19 claims filed from January 2019 through June 2021.

The figure also makes it clear that COVID-19 claim volumes fluctuated much more than volumes of other WC claims. COVID-19 claim volumes to date have closely tracked statewide trends in COVID-19 infections, with spikes in COVID-19 claims coinciding with case surges in late spring 2020 and, most notably, in the winter of 2020–2021. In 2019, the total number of claims filed in each month ranged between 51,000 and 67,000. In 2020, the total number of claims filed in each month ranged between 35,000 and 82,000, with the peak in December 2020 driven by the state's COVID-19 surge. While COVID-19 claims have been around 10 percent or less of total WC claims filed in most months since July 2020, COVID-19 claims actually made up a slight majority (55 percent) of all claims filed in the state in December 2020.

While total claim volumes averaged over the SB 1159 presumption period remained below prepandemic claim volumes, the presence of COVID-19 surges led to an unprecedented volume of claims being filed at once: In the decade before the pandemic (2010 to 2019), there had never been more than 68,000 claims filed in a single month (in August 2018).

Figure 3.1. COVID-19 and Non–COVID-19 Claim Volumes, by Month of Injury



NOTES: Estimates in figure reflect unweighted counts and proportions of claims (FROI) reported to WCIS with nonmissing date of injury and valid codes for cause of injury and nature of injury. Thirteen COVID claims with 2019 injury dates were excluded.

Table 3.2 shows claim volumes by presumption section and injury date. To date, 60,000 COVID-19 claims were filed by health care and public safety workers covered by the frontline presumption (42 percent of all COVID-19 claims), and 82,000 COVID-19 claims (58 percent of all COVID-19 claims) were filed by workers in other occupations who may potentially have been covered by the outbreak presumption. Earlier in the pandemic, workers who would later fall under the frontline presumption accounted for a higher proportion of COVID-19 claims—61 percent in the period before the temporary presumption took effect, and 49 percent during the temporary presumption period.

Table 3.2. COVID-19 and Non–COVID-19 Claim Volumes, by Presumption Section and Date of Injury

	Frontline Presumption Workers			Other Occupations		
Period	**COVID**	**Non-COVID**	**Total**	**COVID**	**Non-COVID**	**Total**
Prepandemic (2019)	0	110,161	110,161	0	601,932	601,932
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	677	22,844	23,490	428	117,474	117,933
Temporary presumption (3/19/2020–7/5/2020)	12,327	26,833	39,336	13,080	107,467	120,371
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	46,543	96,935	147,775	68,978	444,904	509,585
Total (1/1/2020–6/30/2021)	59,548	146,612	210,601	82,485	669,845	747,889

NOTES: Counts of claims are derived from COVID and non-COVID claim totals reported in Table 3.1, combined with estimates of the proportion of COVID claims and non-COVID claims covered by the frontline presumption. Estimates of frontline presumption coverage use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes.

Table 3.3 provides additional detail on claim volumes filed by the three major groups of workers covered by the frontline presumption—health care workers, peace officers, and firefighters. (As we discuss further in Chapter 4, we did not classify correctional officers, many of whom are peace officers under the state penal code, as peace officers in this section because it is not clear that they meet the requirement in the presumption to be "primarily engaged in active law enforcement").

Table 3.3 shows that COVID-19 claims accounted for a higher share of the total claim volume for health care workers than for peace officers and firefighters, and that health care workers account for the bulk of COVID-19 claims filed by frontline workers. As of the time of writing, health care workers have filed about 46,000 claims since the start of the pandemic, or 32 percent of all COVID-19 claims statewide. Peace officers have filed about 8,000, and firefighters have filed about 5,000, accounting for 6 percent and 4 percent of COVID-19 claims filed through June 2021.

Figure 3.2 shows COVID-19 and non–COVID-19 claim volumes by group of workers. Claim volumes for health care workers, peace officers, and firefighters are on the same scale to allow comparison across these groups, while claims for other workers are on a different scale because their numbers are much greater.

Table 3.3. COVID-19 and Non–COVID-19 Claims Filed by Frontline Presumption Workers, by Group of Frontline Worker and Date of Injury

	Health Care Workers			Peace Officers			Firefighters		
Period	**COVID**	**Non-COVID**	**Total**	**COVID**	**Non-COVID**	**Total**	**COVID**	**Non-COVID**	**Total**
Prepandemic (2019)	0	70,568	70,568	0	27,700	27,700	0	11,892	11,892
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	412	13,990	14,383	128	6,427	6,548	137	2,442	2,560
Temporary presumption (3/19/2020–7/5/2020)	10,356	15,955	26,495	1,499	7,655	9,151	473	3,223	3,689
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	35,430	61,553	100,773	6,654	24,220	31,093	4,459	11,108	15,908
Total (1/1/2020–6/30/2021)	46,198	91,497	141,651	8,281	38,302	46,792	5,069	16,772	22,157

NOTES: Counts of claims are derived from COVID and non-COVID claim totals reported in Table 3.1, combined with estimates of the proportion of COVID claims and non-COVID claims by occupation. Totals may not sum to totals in Table 3.2 due to rounding. Estimates of proportion of claims in each occupation group use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes.

Figure 3.2. Monthly COVID-19 and Non–COVID-19 Claim Volume, by Presumption Section and Group of Workers

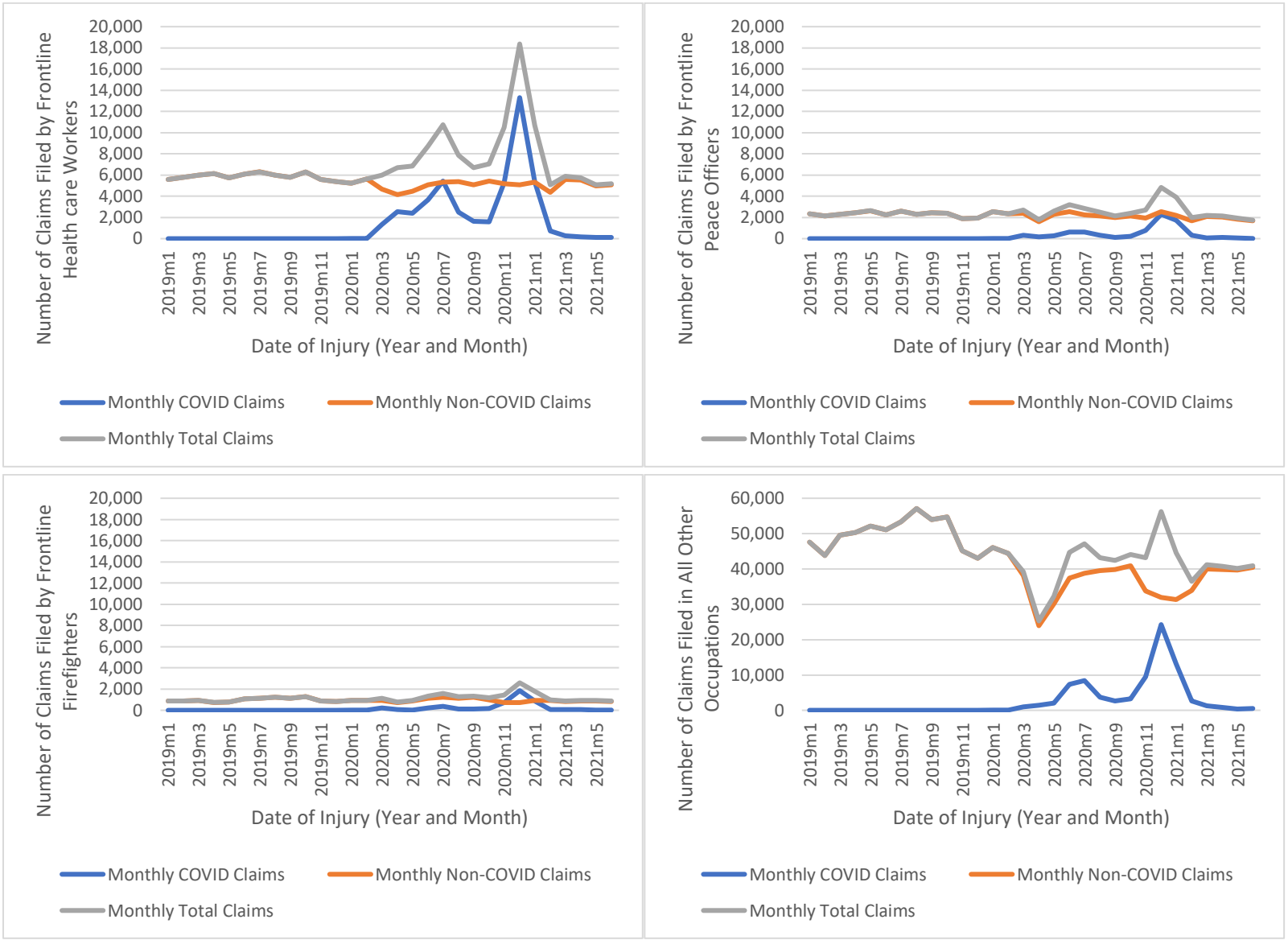


Figure 3.2 shows some differences across groups of workers in claim volume dynamics and the importance of COVID-19 claims. COVID-19 claims were a substantial majority of all claims filed by health care workers and firefighters during the winter surge and accounted for a majority of claims filed by peace officers. For workers not covered by the frontline presumption, the volume of COVID-19 claims filed always remained below the volume of non–COVID-19 claims. We note that the overall pattern of spikes in claims driven by case surges appears for all four groups of workers. Finally, the drops in non–COVID-19 claim volumes associated with stay-at-home orders and job losses during the recession were far less pronounced among frontline workers than among workers in other occupations.

Outcomes of COVID-19 Claims

In this section, we present statistics describing claim denial rates (focusing on initial claim denial rates) and the proportion of claims receiving different types of paid benefits as of the time of data extraction (August 2021). We also present estimates of the proportion of claims involving the death of the worker, counting both claims where death benefits were paid (a small fraction of death claims) and claims without paid death benefits, but where the claims administrator reported a date of death for the worker.

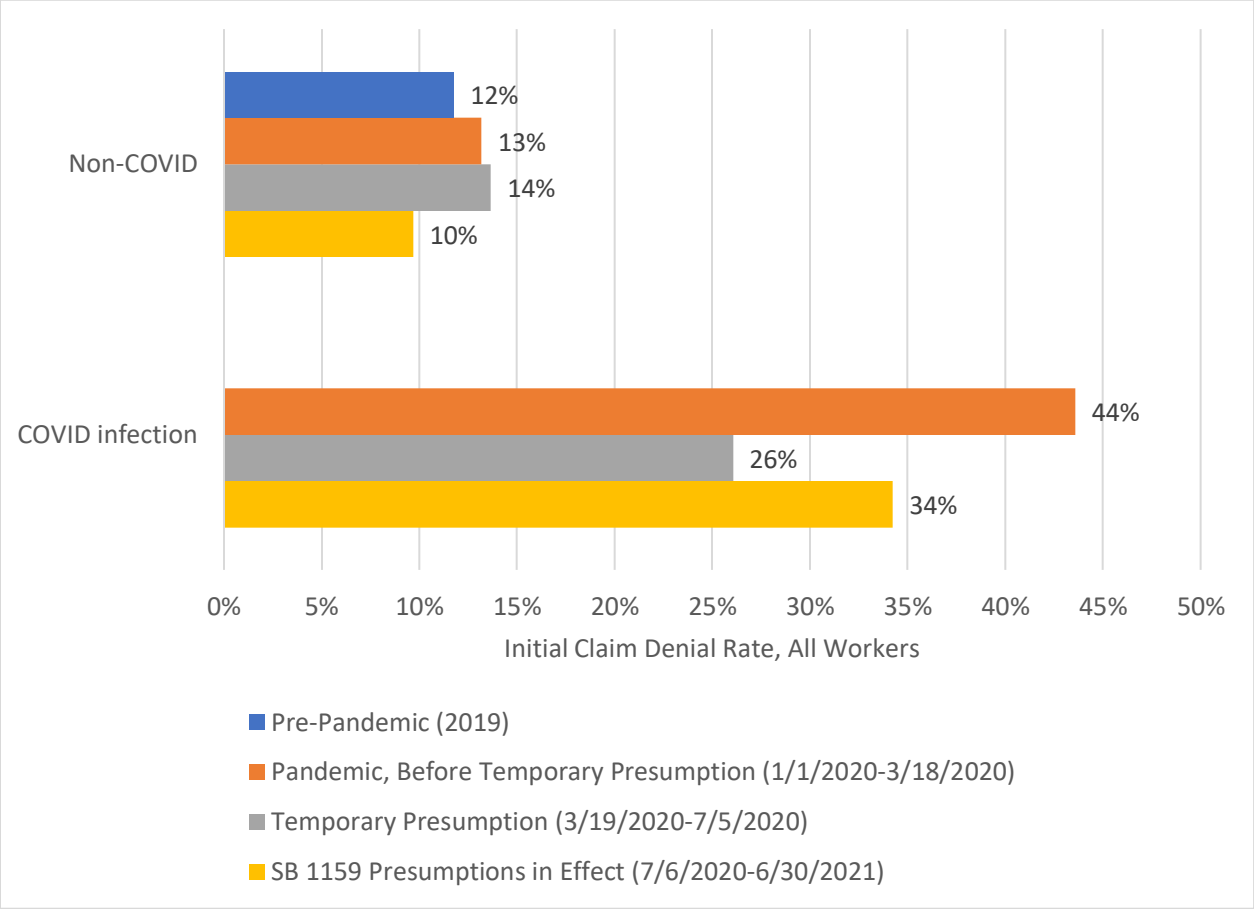
Denial Rates on COVID-19 and Non–COVID-19 Claims

Figure 3.3 reports initial denial rates for COVID-19 and non–COVID-19 claims. As discussed in Chapter 2, we use the term *initial denial* to refer to full denials reported on a FROI, indicating that the claims administrator has determined that a claim is not compensable, typically because it is not work-related. Denials are reported on a FROI if they occur prior to payment of indemnity benefits.

Claims can also be denied in full later, after some benefits have been paid, but this situation seldom appeared for claims filed since 2020. Including denials reported on an SROI, as well as those reported on a FROI, increases the claim denial rate by 1 percentage point for COVID-19 claims (on a base of 33 percent) and by 2 percentage points on non–COVID-19 claims (on a base of 13 percent).[11] We also examined data on partial denials (in which a claim is accepted as work-related, but payment of a specific benefit type is denied), but these were very infrequently reported, and we do not present results on partial denials in this report.

[11] We note that full denials reported on the SROI may occur when a worker (or an applicants' attorney) identifies a new injury or health condition that was not reported on the original claim, although they may also reflect denials of the originally reported injury or illness after benefit payment. We did not try to distinguish these situations in our analysis because denials of COVID claims on the SROI were relatively infrequent, but these different denial situations may become more important for COVID claims in the future if long COVID is reported on existing WC claims.

Figure 3.3. Initial Denial Rates on COVID-19 and Non–COVID-19 Claims, by Date of Injury



NOTES: Initial Claim Denial Rate = proportion of claims with a full denial reported on the FROI, indicating denial before payment of any benefits. Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. See Chapter 2 and Appendix B for details.

Partial denials for TD were concentrated among health care workers but accounted for less than 1 percent of claims among firefighters and peace officers; they were also rare for outbreak occupations. Payment of PD and death benefits remained too rare in COVID-19 cases to see many partial denials in data. We do not present further results on partial denials in this report.

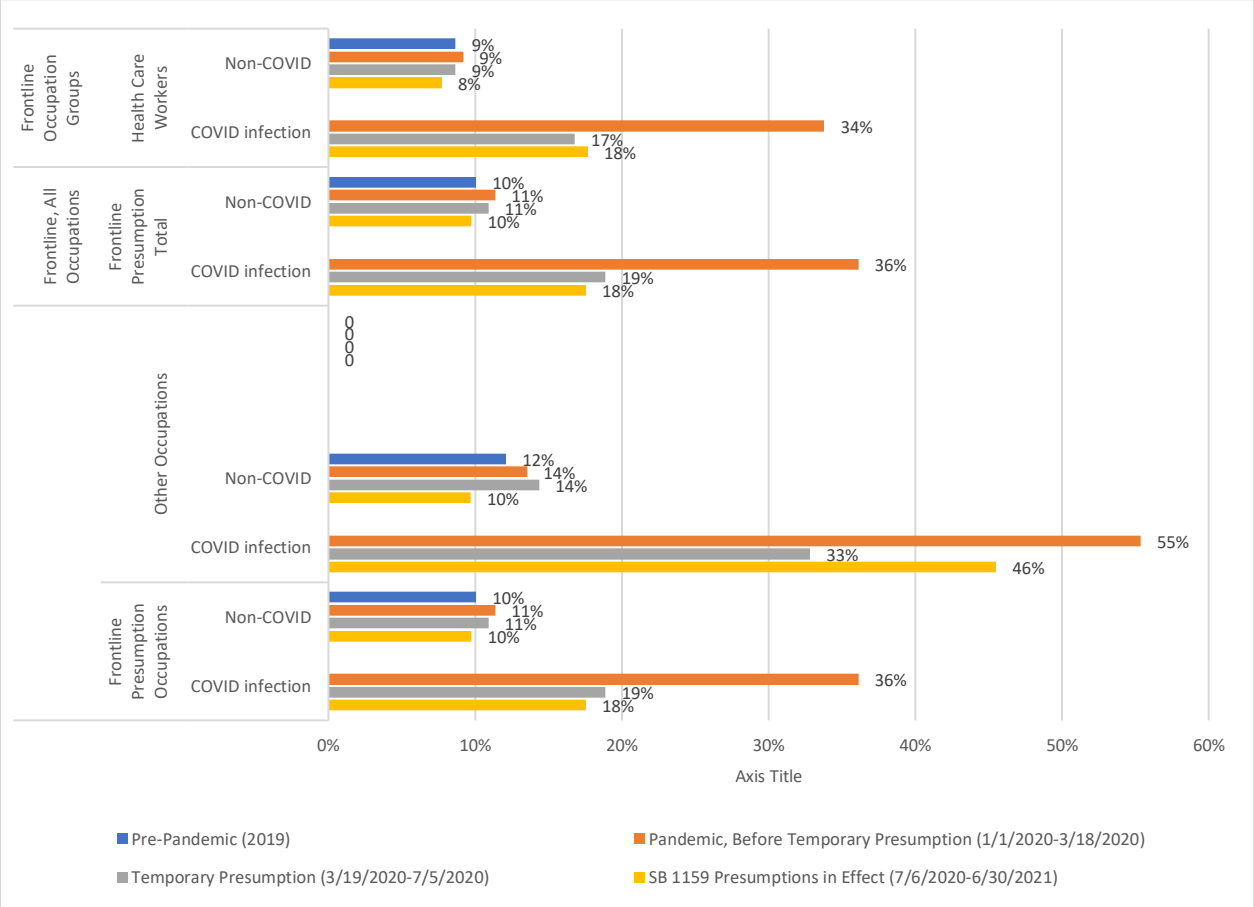
In general, COVID-19 claims were denied much more often than non–COVID-19 claims. Depending on the period, denial rates on COVID-19 claims across all occupations ranged from 44 percent, for claims filed before any presumptions were in effect, to 26 percent during the temporary presumption, to 34 percent after the outbreak and frontline presumptions took effect. Denial rates on non–COVID-19 claims filed at these times were 13 percent, 14 percent, and 10 percent, respectively.

Comparison with contagious disease claims (Workers' Compensation Insurance Organizations [WCIO] nature of injury code 73) or other occupational disease claims (WCIO

nature of injury codes 60 through 68, 70, or 71) with 2016–2019 injury dates shows that, while these occupational disease claims were denied more often than other non–COVID-19 claims (14 percent of contagious disease claims initially denied and 15 percent of other occupational disease claims initially denied), the denial rates observed for COVID-19 claims were substantially higher even after the presumptions were implemented.

While we have structured our analysis to reflect the effective dates of the presumptions, we must caution that changes in claim outcomes over time cannot be causally attributed only to changes in legal presumptions. As discussed in Chapter 2, the policy environment, economic conditions, and intensity of the pandemic were changing rapidly. This caveat is especially important when we discuss denial rates, as we explain below.

Figure 3.4. Initial Denial Rates, by Group of Workers and Time Period



NOTES: Initial Claim Denial Rate = proportion of claims with a full denial reported on the FROI, indicating denial before payment of any benefits. Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. See Chapter 2 and Appendix B for details.

Figure 3.4 shows denial rates on COVID-19 and non–COVID-19 claims for workers covered by the frontline and outbreak presumptions, including a breakout of denial rates for the three major groups of frontline presumption workers. Several facts emerge.

First, we see much higher denials for outbreak occupations than frontline occupations in all periods. Second, regarding frontline workers, the COVID-19 claim denial rates in all frontline groups fell sharply after the temporary presumption was adopted, and denial rates for peace officers dropped even further after the frontline presumption was adopted.

Third, denial rates in outbreak occupations were higher (46-percent denial rate versus 33-percent denial rate) after July 6, 2020, when these workers moved from the relatively lenient temporary presumption to the outbreak presumption. In contrast, denial rates in frontline occupations overall, for whom the presumption remained very broad, were essentially unchanged after the SB 1159 presumption took effect.

Important Considerations for Interpreting Data on COVID-19 Denial Rates

These results need to be interpreted with caution for several reasons. First, as noted above, we are not able to disentangle the effects of the changing presumptions from the many other factors that drove case volumes and denial rates. The denial rates here tell us the probability that a COVID-19 claim would be initially denied, but changes in denial rates or differences across groups of workers were very likely to be driven by differences in claim filing behavior that affected the composition of claims. When we presented these results at our second TAG meeting, we heard from multiple stakeholders that COVID-19 denial rates had been high because COVID-19 claims had frequently been filed in circumstances in which claims for more typical workplace injuries might not be filed. Qualitative evidence on COVID-19 claim filing practices is presented in Chapter 5.

We are also missing information needed to determine how many of the claims filed in each group of workers would actually be covered by the presumptions under SB 1159. The fact that denial rates estimated here for COVID-19 are non-zero or are higher than for non–COVID-19 claims does not imply that claims administrators were denying claims covered by the presumptions. This is true for several reasons.

For all workers, we lack data on the COVID-19 testing status—whether a test was performed; whether it was a PCR test, as required under the frontline and outbreak presumptions—and whether the test result was positive. A high denial rate might mean that claims covered by the presumption were being denied, but it could just as easily mean that claims were being filed that were not covered by the presumption, either because the claim was filed on a precautionary basis after a COVID-19 exposure that did not result in infection or because a positive PCR test result was not provided by the worker. As discussed in Chapter 5, this issue makes denial rates for public safety workers especially challenging to compare with rates in other occupations, insofar as these workers were likely to file claims for the purpose of documenting exposures. For workers not covered by the frontline presumption, we lack data on

whether claims were filed during an outbreak period at the worker's jobsite. Beyond saying that some unknown number of claims filed by nonfrontline workers would not be covered by the outbreak presumption, we cannot say what the claim denial rate actually was on claims covered by this presumption.

Differences in job security, unionization, working conditions, English-language ability, and immigration status also broadly affect workers' decisions to file WC claims, and our interviewees highlighted many of these factors as important in the context of COVID-19 claims (see Chapter 5). In general, we would expect WC claims filed by more economically vulnerable workers with weaker employment protections to reflect more-severe injuries, since the threat of illegal retaliation and other barriers to claim filing would deter these workers from filing less-severe claims. For the most part, unionized public safety workers have very strong employment protections compared with private-sector workers. Many patient care workers in larger health care facilities are also unionized, which should encourage workers to exercise their rights to file WC claims without fear of illegal retaliation.

With COVID, that line of argument is not relevant because case detection practices (such as regular workplace testing) and other COVID-specific factors were likely to drive claim filing, and these might vary in unexpected ways that do not align with job security or economic vulnerability across industries and occupations.

Most notably, the outbreak tracking requirements in SB 1159 were likely to lead to positive cases being reported to employers and claims administrators in many circumstances in which the worker might not have voluntarily filed a claim. Workplace testing and outbreak reporting may very well differ across industries and occupations in ways that work against the typical story sketched above about differences in job security or unionization.

While these data are not available in the WCIS, it is possible to gain insight into the circumstances associated with claim denials by drawing on analyses conducted by claims administrators and other research organizations. California Workers' Compensation Institute (CWCI) shared results from a forthcoming (at the time of writing) analysis on the reasons for COVID-19 claim denials from the fourth quarter of 2020 (October–December 2020), a period that covers the peak of the winter 2020–2021 surge. CWCI surveyed its claims administrator members about reasons for denial of COVID-19 claims. The CWCI sample comprises data from 29 claims administrators, including a mix of commercial insurers and both public- and private-sector self-insured employers.

CWCI found that a majority (58 percent) of denied COVID-19 claims were denied because the COVID-19 infection was not medically verified with a positive PCR test—either because a PCR test was not performed, or because the PCR test result was negative. An additional 32 percent of COVID-19 claim denials were attributed to either nonindustrial causation, withdrawal of the claim by the employee, or failure of the employee to cooperate with the claim investigation. Nonindustrial causation includes circumstances in which the worker had a positive PCR test, but the case was determined to result from exposure outside the workplace. We do not

know how many of these cases are from nonfrontline workers whose claims were submitted outside an outbreak period, as opposed to workers covered by a presumption, but for whom the presumption was rebutted by evidence of exposures outside work. Failure to cooperate, among other situations, includes circumstances in which the worker fails to submit requested documentation, and so might include cases in which there was a positive PCR test result, but the worker was unable or unwilling to provide it.

The remaining 10 percent of initially filed COVID-19 claims surveyed by CWCI were determined to have been filed in error, either because the worker was not an employee of the covered employer, or because a positive test that was not alleged to be work-related was reported to the claims administrator. The fact that some COVID-19 claims were opened in error when employers reported positive test results may point to challenges in implementing the outbreak tracking requirements imposed under Labor Code Section 3212.88: It is easy to imagine that positive test results may have been recorded as WC claims even when the worker did not intend to file a claim. We discuss stakeholder perspectives on outbreak tracking in Chapter 6, and we discuss administration of the outbreak tracking requirement in Chapter 7.

The CWCI data are a large convenience sample data set (including most claim denials from the fourth quarter of 2020) that has very good coverage of the fully insured sector and somewhat lower coverage of the self-insured sector, which comprises larger private-sector employers and most public-sector employers. Our estimates for the SB 1159 presumption period as a whole imply that the vast majority (about four in five) denied COVID-19 claims were filed by nonfrontline workers, about 17 percent (one in six) were filed by health care workers, and about 4 percent (about one in 25) were filed by public safety workers covered by the frontline worker presumption. The CWCI results on reasons for claim denials are thus likely to be fairly representative of outbreak industries and health care but may not represent the experience of public safety workers.

To understand denial rates among public safety workers, we can draw on (aggregated, de-identified) information provided by a Joint Powers Authority (JPA) providing coverage for public entities throughout the state. These data, which were stated by the data provider to include all COVID-19 claims filed through October 2021, included substantial numbers of claims from firefighters, peace officers (including correctional officers, as well as police and sheriff's patrol officers and other active law enforcement), public-sector health care workers, and other workers in public administration. In these data, nearly all cases with positive test results were accepted (96 percent of claims accepted conditional on positive test result), and nearly all cases with a negative test result or no test reported were denied (95 percent of claims denied conditional on negative test result), consistent with interview findings from claims administrators discussed in Chapter 7. These JPA data also show interesting differences in the distribution of COVID-19 test results across occupations among public safety workers. 50 percent of COVID-19 claims filed by peace officers had a positive COVID-19 test result, while only 30 percent of COVID-19 claims filed by firefighters had a positive COVID-19 test result. (In both groups, 5 percent or less of

COVID-19 claims had no test results reported at the time of data extraction, but the majority of those without positive test results had negative test results.) While these data are a large convenience sample that may not capture all public-sector WC claims reported to the WCIS, the difference in positive test results between firefighters and peace officers may contribute to the differences in COVID-19 claim denial rates between these groups of public safety workers (see Chapter 4)."

Indemnity and Medical Benefit Receipt on COVID-19 and Non–COVID-19 Claims

Table 3.4 shows some notable differences in the proportion of COVID-19 claims receiving TD benefits by presumption section. For workers covered by the frontline presumption, COVID-19 claims were much more likely than other claims to involve paid TD benefits. For workers in other occupations, TD receipt was more widespread in COVID-19 claims than non–COVID-19 claims during the temporary presumption period, but less likely after the outbreak presumption took effect. Many of the same caveats that applied to the denial rates apply to these estimates, including that outbreak tracking may have led to more marginal TD claims being filed in some cases.

Table 3.4. Temporary Disability Benefit Receipt for COVID-19 and Non–COVID-19 Claims, by Presumption Section

	Frontline Presumption Workers		Other Occupations		All Occupations (Total)	
Period	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Prepandemic		26.3		24.9		25.1
Pandemic, before presumptions	29.7	26.3	9.3	24.9	21.8	25.1
Temporary presumption	54.8	27.2	32.3	26.3	43.2	26.5
SB 1159 presumptions	41.2	26.8	15.0	25.2	25.6	25.5
Total (1/1/2020–6/30/2021)	43.7	26.8	17.4	25.3	28.4	25.6
Adjusted total	43.7	26.9	17.4	25.7	28.4	26.2

NOTES: Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group, reweighting non–COVID-19 claims from 2020–2021 to match COVID-19 claims. See Chapter 2 and Appendix B for details.

Table 3.5. Permanent Disability Benefit Receipt for COVID-19 and Non–COVID-19 Claims, by Presumption Section

	Frontline Presumption Workers		Other Occupations		All Occupations (Total)	
Period	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Prepandemic		4.6		5.9		5.7
Pandemic, before presumptions	0.0	2.5	0.5	3.4	0.2	3.3
Temporary presumption	0.1	1.7	0.2	2.5	0.2	2.3
SB 1159 presumptions	0.1	0.4	0.0	0.7	0.1	0.6
Total (1/1/2020–6/30/2021)	0.1	1.0	0.1	1.5	0.1	1.4
Adjusted total	0.1	0.8	0.1	0.9	0.1	0.9

NOTES: Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non-COVID-19 claims in date of injury and occupational group, reweighting non-COVID-19 claims from 2020-2021 to match COVID-19 claims. See Chapter 2 and Appendix B for details.

Table 3.5 shows rates of PD benefit receipt to date, indicating that almost no COVID-19 claims had received paid PD benefits yet. The declining rates of PD receipt among non–COVID-19 claims is driven primarily by the fact that it is too soon for most of the claims that will later receive PD to have reached maximum medical improvement. For COVID-19 claims, however, this process appears to be even slower, which is unsurprising given the medical uncertainty surrounding the long-term effects of COVID.[12]

[12] Some readers may be more familiar with estimates that report PD claims as a proportion of TD claims, or of accepted claims. We note that, throughout this analysis, the denominator for estimated rates or averages contains all claims filed, including denied claims. However, to facilitate comparison with other analyses, we can divide the rates of PD receipt in Table 3.5 by the rates of TD receipt in Table 3.4. Even after adjusting for differing rates of TD receipt (which may be viewed as a rough proxy for the proportion of claims that are ultimately accepted), the rate of PD receipt is about ten times higher on non-COVID claims (3.44 percent = adjusted average 0.9 percent of non-COVID claims with PD / adjusted average of 26.2 percent of non-COVID claims with TD) than on COVID claims (0.35 percent = 0.1 percent of COVID claims with PD / 28.4 percent of non-COVID claims with TD).

Table 3.6. Indemnity Settlement Receipt for COVID-19 and Non–COVID-19 Claims, by Presumption Section

	Frontline Presumption Workers		Other Occupations		All Occupations (Total)	
Period	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Prepandemic		2.8		4.9		4.6
Pandemic, before presumptions	1.3	1.5	3.3	3.6	2.0	3.2
Temporary presumption	0.9	1.1	0.9	2.8	0.9	2.5
SB 1159 presumptions	0.2	0.4	0.3	0.8	0.2	0.7
Total (1/1/2020–6/30/2021)	0.3	0.7	0.4	1.6	0.3	1.4
Adjusted total	0.3	0.7	0.4	1.2	0.3	1.0

NOTES: Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group, reweighting non–COVID-19 claims from 2020–2021 to match COVID-19 claims. See Chapter 2 and Appendix B for details.

Table 3.6 shows the proportion of COVID-19 and non–COVID-19 claims that have received paid indemnity settlements to date (including settlements for any type of indemnity benefit). As with PD benefits, the settlement payment results for non–COVID-19 claims tell us that it is too early to observe settlement payments on many of the claims that are likely to settle in the long run. However, we can say that COVID-19 claims appear less likely to have settled than non–COVID-19 claims.

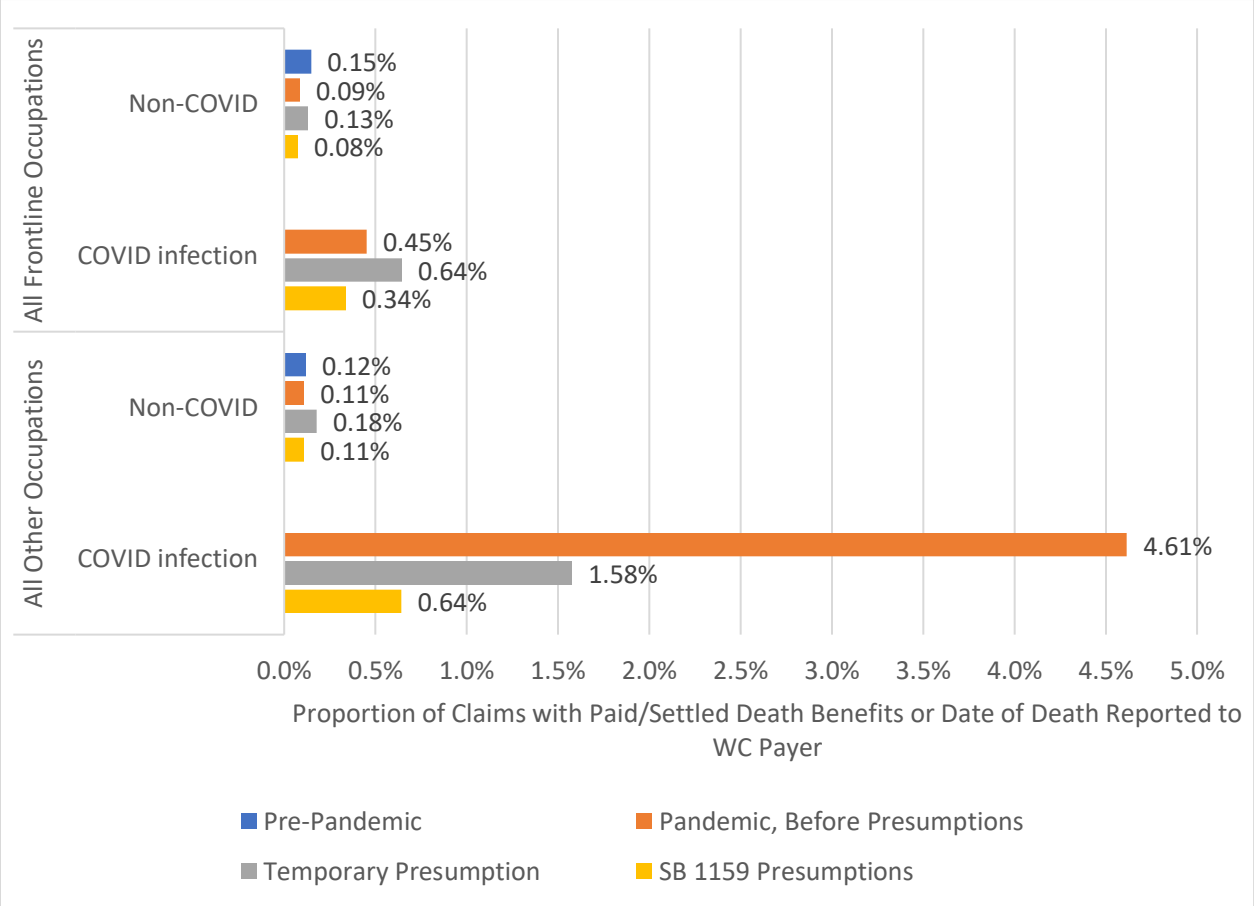
Table 3.7. COVID-19 and Non–COVID-19 Claims Without Medical Bills Submitted to Workers' Compensation

	Frontline Presumption Workers		Other Occupations		All Occupations	
Period	COVID-19 (%)	Non-COVID (%)	COVID-19 (%)	Non-COVID (%)	COVID-19 (%)	Non-COVID (%)
Prepandemic		24		25		25
Pandemic, before presumptions	66	24	64	24	65	24
Temporary presumption	68	25	75	23	71	24
SB 1159 presumptions	77	29	85	26	82	27
Total (1/1/2020–6/30/2021)	75	26	83	25	80	25
Adjusted total	75	28	83	25	80	26

NOTES: Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group, reweighting non–COVID-19 claims from 2020–2021 to match COVID-19 claims. See Chapter 2 and Appendix B for details.

Table 3.7 shows the proportion of claims without any paid medical bills for COVID-19 and non–COVID-19 claims. As noted by other analysts, a very high proportion of COVID-19 claims have no medical bills reported to WC.

Figure 3.5. Proportion of COVID-19 and Non–COVID-19 Claims Involving Death of the Worker, by Group of Workers and Time Period



NOTES: Estimates use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Death claims include those with paid or settled fatality benefits, paid funeral benefits, or a date of death reported by the claims administrator. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group, reweighting non–COVID-19 claims from 2020–2021 to match COVID-19 claims. See Chapter 2 and Appendix B for details.

Finally, Figure 3.5 reports the proportion of claims by injury date and presumption section in which the death of the worker was reported to the WCIS. As noted above, relatively few (about one in eight) of these claims have any paid or settled death or funeral benefits. The majority instead have a date of death for the worker reported to the WCIS by the claims administrator. Claims administrators are required to report the date of death when the worker's death is believed to be related to the injury or illness for which the claim is filed. We think it is unlikely

that a date of death would be reported if the worker weren't dead, but we caution that we do not know how many of these workers will ultimately receive death benefits.

The table shows that COVID-19 claims were vastly more likely to involve the death of the worker than other WC claims. The data also indicate that a lower proportion of frontline worker claims (compared with outbreak presumption claims) involved the death of the worker.

Summary

COVID-19 claims were, on average, about 15 percent of all claims filed in the WC system from January 2020 to June 2021. Total claim volumes over this period remained 10 percent lower than before the pandemic, a fact that is consistent with the recession and reduction in statewide employment that followed the start of the pandemic.

What distinguishes COVID-19 claims from other WC claims is that, because COVID-19 claim volumes move together with case volumes in the general population, there was unprecedented volatility in the volume of WC claims filed at the same time, which was driven by surges in the number of COVID-19 infections. Claims administrator perspectives on the challenges of processing a large volume of COVID-19 claims are discussed in Chapter 7.

To date, at least 60,000 COVID-19 claims have been filed by health care and public safety workers covered by the frontline presumption (42 percent of all COVID-19 claims), and 82,000 COVID-19 claims (58 percent of all COVID-19 claims) were filed by workers in other occupations who may potentially have been covered by the outbreak presumption. COVID-19 claims accounted for a higher share of the total claim volume for health care workers than for peace officers and firefighters, and health care workers accounted for the bulk of COVID-19 claims filed by frontline workers.

We found that COVID-19 claims were substantially more likely to be denied than the average non–COVID-19 claim filed at the same time, that COVID-19 claims filed by frontline workers were less likely to be denied than claims filed by other workers, and that the denial rate on claims filed by other workers increased after the temporary presumption was replaced with the outbreak presumption on July 6, 2020.

However, the evidence presented in this chapter should indicate that the composition of COVID-19 claims and the circumstances under which they are filed are likely to be very different from the typical WC claim and even from other occupational disease claims. Institutional factors that are unique to the COVID-19 pandemic—such as extremely frequent diagnostic testing for some workers, preemptive claim filing for potential COVID-19 exposures, and, as suggested by CWCI's data, claims filed in error after outbreak reporting—suggest that COVID-19 claims are a different animal from other claims in the WC system. The high proportion of COVID-19 claims without medical benefits, the very different patterns of TD receipt observed between COVID-19 and non–COVID-19 claims, and the differences in these patterns between workers covered by the different SB 1159 presumptions strongly suggest that

denial rates for non–COVID-19 claims are not a meaningful benchmark for COVID-19 denial rates. The data on denial reasons provided by outside analysts strongly suggests that many of the COVID-19 claims that were denied in both the public and private sectors may not have been covered by the SB 1159 presumptions due to lack of a positive PCR test. This paints a picture in which a sizable proportion of COVID-19 claims filed were cases in which the worker may not have actually contracted COVID, and that even with presumptions in place, these claims were denied. An implication, which we will examine more carefully in Chapter 8, is that many COVID-19 claims should have very low benefit costs, if any.

Yet COVID-19 claims were also much more likely to involve the death of the worker than other claims in the system, and by a much greater margin for the workers covered by the outbreak presumption. This fact may seem to stand in tension with the notion that COVID-19 claims were, overall, less severe, and that the filing of claims in the absence of infection or workplace exposure was driven by the outbreak presumption itself. However, it is entirely possible that COVID-19 claims were filed under a mixture of many different circumstances, and that many claims filed for mild disease or without positive tests could coexist with the presence of a smaller number of claims in cases of severe or fatal COVID. The estimates in this chapter suggest that this is the case: Compared with other WC claims, COVID-19 claims contained both more claims filed for very mild disease and more claims filed for serious or fatal disease.

Limitations

Denial rates reported in this chapter and throughout this report are calculated relative to the number of claims filed that were identified as COVID-19 infection. As we heard from members of our TAG, COVID-19 claim filing behavior was very different from claim filing behavior for more typical injuries and illnesses because claims were frequently filed in cases in which the worker may have been exposed but did not develop COVID, in which a case of COVID-19 was not confirmed by a positive test, or even in which the worker notified the employer of a positive test but did not allege that COVID-19 was work-related. While analysis of WC claim outcomes is always subject to concerns related to differences in claim-filing behavior across health conditions or different groups of workers with the same health condition, these issues are extremely pronounced for COVID-19 claims.

We also note that it is simply too soon to observe and analyze permanent disability outcomes or settlement behavior in most cases. Only about 10,000 COVID-19 claims (around 8 percent of the total) had a date of maximum medical improvement reported to the WCIS as of August 2021, and of these, only about 2,000 had any paid PD benefits. Disability rating, PD benefit costs, and long-term medical costs in COVID-19 remain a major source of uncertainty for the WC system, and these questions will have to be revisited in the future.

4. Differences in COVID-19 Claim Outcomes Across Industries and Workers

Chapter 3 characterized how COVID-19 claim volumes varied over time and across workers covered by the different presumptions established or codified by SB 1159. CHSWC and the legislature also requested that this study analyze how the "impact of COVID-19 claims on California's workers' compensation indemnity benefits, medical benefits, and death benefits" (SB 1159, 2020) varied across occupational groups. While our ability to characterize some dimensions of impact—such as ultimate employer costs—is limited, the WCIS data make it possible to describe patterns of claim filing and benefit receipt by occupation.

This chapter examines which groups of workers have been more versus less likely to file claims with presumptions in place. This examination evaluates the first objective of the WC system, which is to provide broad coverage of WC to employees and work-related injuries and diseases. The 1972 National Commission report indicated that this means "protection should be extended to as many workers as feasible and all work-related injuries and diseases should be covered" (National Commission, 1972, p. 15). To assess this, we examined claims volumes, outcomes, severity, and benefit receipt across industries and occupations (**RQ4, RQ5**). This information answers research questions 4 and 5:

- **RQ4:** How does COVID-19 claim volume vary across occupation and industry?
- **RQ5:** How do denial patterns vary across occupation and industry or across the different presumptions created by SB 1159?

Workers in similar occupations who worked in different industries may have experienced very different working conditions and COVID-19 exposures, most notably because business closures and reopenings were targeted and implemented differently by industry. Furthermore, health care workers' eligibility for the frontline COVID-19 presumption was largely based on a combination of industry and occupation. For instance, RNs engaged in direct patient care in hospitals or skilled nursing facilities were covered by the frontline worker presumption, but RNs working in physicians' offices were not. For these reasons, it is important to characterize differences in claims across industries and to compare occupations within industries, rather than simply looking at occupations on a statewide (all-industry) basis.

Also in this chapter, we report a series of descriptive tables meant to address the following questions:

1. Which industries, and which occupations within industries, had higher or lower volumes of COVID-19 claims relative to the size of the workforce?
2. How did initial claim denial rates vary by industry and occupation?

3. Did the proportion of claims that resulted in payment of temporary disability or medical benefits vary by industry or occupation?
4. Which occupations accounted for the highest volumes of COVID-19 death claims?
5. Did workers in occupations that experienced high excess mortality in the pandemic also file high volumes of death claims?

As we discuss below, substantial caution must be exercised in interpreting the occupation-specific estimates in this chapter. This is most true of claim denial rates, for reasons that we discuss at length below. Notwithstanding the many necessary caveats, our estimates of industry and occupation differences in COVID-19 claim volumes and benefit receipt in this chapter help to fill a gap in our understanding of the pandemic's impact on WC, as descriptive information about COVID-19 claims by occupation has not previously been available to policymakers, stakeholders, or researchers. In this chapter, we report estimates of claim volumes, denial rates, and receipt of temporary disability and medical benefits for selected industries and occupations.

Some basic facts about industry and occupation differences in COVID-19 claims have been established by other analysts examining data from California and other jurisdictions. Data from WCIS on the industry composition of COVID-19 claims has been regularly reported throughout the pandemic by CWCI's COVID-19 claims dashboard (CWCI, 2022). Those data show that COVID-19 claims were most likely to be filed by workers in the health care industry (NAICS 62, 30 percent of COVID-19 claims reported through November 1, 2021) and the public administration industry (NAICS 92, 19 percent of COVID-19 claims reported through November 1, 2021), which includes public safety workers. Among other industries, retail (10 percent of COVID-19 claims), manufacturing (7 percent of COVID-19 claims), transportation (7 percent of COVID-19 claims), and food services (5 percent of COVID-19 claims) also accounted for high COVID-19 claim volumes. Similar industry differences have been reported for the insured sector of the WC system by the WCIRB.

Looking outside of California, Bernacki et al., 2021, analyzed WC claims data drawn from a large claims administrator operating in 11 midwestern states and found that COVID-19 claims filed between January and August of 2020 were overwhelmingly concentrated in the health care and social assistance industry (NAICS sector 62).

Approach

To produce statistics reported in this chapter, we aggregated the WCIS claims data described in Chapter 2 by industry and occupation and then merged these aggregated data to publicly available contextual information using industry and occupation codes. Except where noted, tables in this chapter report statistics based on all claims with injury dates between July 6, 2020, and June 30, 2021, that had been reported to the WCIS by late August 2021. This period captures approximately the first year for which Labor Code sections 3212.87 and 3212.88 were in effect.

Counts of COVID-19 claims and COVID-19 claim rates reported in this chapter include all claims for which industry and occupation could be ascertained that had both a cause and nature of injury reported. These claim counts include claims that are excluded in other analyses because of missing data, or because they were reported by claims administrators who do not reliably report SROI data. We use a more expansive sample definition here than in some other parts of this report to capture the total volume of claims filed as completely as possible. Of the 142,033 COVID-19 claims with injury dates from January 2020 to June 2021 that were reported to the WCIS, 112,975 (80 percent) were reported with both a valid industry code (either a 2017 NAICS code or a 1987 SIC code) and an occupation description that was assigned with high confidence to an SOC code by the NIOCCS auto-coder algorithm.

Many tables in this chapter also report average claim outcomes by industry or occupation. These statistics are calculated using the analysis sample used in later chapters, which is restricted to claims with complete data reported by reliable claims administrators. Outcome measures reported in most tables include the following:

- percentage of claims initially denied
- percentage of claims receiving TD benefits
- percentage of claims with no medical bills submitted to WC.

Each of these statistics is reported for both COVID-19 and non–COVID-19 claims. While we do not discuss most of the estimates in these tables, we report them in the belief that this information will be of interest to policymakers, researchers, employers, and workers or their advocates who are interested in understanding the extent to which different groups of workers have used the WC system for COVID-19 and non–COVID-19 claims during the pandemic. As noted in Chapter 2, information about WC claim filing and claim outcomes by occupation is typically very scarce owing to the absence of structured occupation codes in WC claims data.

Death claims, as noted in Chapter 3, accounted for less than 1 percent of COVID-19 claims filed to date, and so the number of death claims by industry and occupation is zero for most detailed occupations and industries. Furthermore, most death claims do not yet have paid death benefits reported in the WCIS, only a date of death reported on the claim. We accordingly do not report the proportion of claims with death benefits in most of the tables in this chapter.

Contextual Data

Finally, to provide context for the claim counts in this chapter, we merged the aggregated data to two external data sets. Merging the WCIS data to both data sets required some cross-walking between different occupation and industry coding systems: Details are provided in Appendix B.

Data on employment in California at the industry and occupation level from the BLS Occupational Employment and Wage Statistics (OEWS) program, formerly known as the Occupational Employment Statistics (OES) program, was used to provide context on the

approximate number of workers employed in each occupation and each industry at the start of the pandemic. The OEWS surveys nonagricultural employers about the number of workers by occupation employed at a representative sample of establishments, allowing the BLS to report on the number of workers by occupation employed in each industry and the wage distribution by industry and occupation.

The key advantage of the OEWS data for our study is that it is the most reliable data source on occupational employment within different industries. For instance, the OEWS tells us the number of RNs employed in California hospitals (NAICS 622) versus the number of RNs employed in California skilled nursing facilities (SNFs) (NAICS 6231). The OEWS estimates used in this chapter are intended to reflect employment levels as of May 2020. (These estimates are derived using a complex methodology that incorporates data collected in six survey waves conducted over November 2017 to May 2020.) The limitations associated with using this employment measure are important and are discussed below.

We also sought external data sources on how COVID-19 had affected different groups of workers in California. While we were unable to identify data sources on COVID-19 case counts by occupation, a study by Chen et al., 2021, estimated excess mortality by occupation for nonelderly working-age Californians (aged 18–65) between March and August 2020, using occupation descriptions reported on death certificates. Excess mortality refers to the number of deaths that occur among a population over a period beyond the number that would have been predicted based on mortality trends observed in the same population before that time. In addition to providing excess mortality estimates for seven broad industrial sectors, the paper listed the 25 detailed occupations with the highest relative excess mortality during the pandemic, defined as the largest increase in mortality during the pandemic relative to the predicted level of mortality based on prepandemic mortality trends. For instance, the occupation with the highest excess mortality in California during the pandemic was *sewing machine operators*, who were 59 percent more likely to die between March and August 2020 than would have been expected without the pandemic. Chen and colleagues reported, according to their estimates and the size of the occupation, that this translated into 70 excess deaths among nonelderly sewing machine operators; they also reported that 73 recorded COVID-19 deaths among nonelderly sewing machine operators occurred in the state during the time frame of their study.

Chen et al., 2021, estimates provide us with a data-driven way to identify the occupations held by the working-age adults who were most severely affected by the COVID-19 pandemic. At the end of this chapter, we report the volume of death claims filed by workers in these occupations to characterize whether workers in high-mortality occupations were also likely to file death claims. In a separate table, we report the 20 detailed occupations with the highest number of COVID-19 death claims, which includes a mix of occupations identified by Chen and colleagues and other occupations that also had high exposure to COVID.

It is critically important to note that, although Chen and colleagues grouped individuals by occupation, their estimates captured *all* COVID-19 mortality experienced by different groups of workers and must not be interpreted as a measure of work-related COVID. As they stated: "Our findings do not conclusively demonstrate that risks are entirely workplace related. Other factors may have led to excess mortality among certain occupational sectors, including crowded housing and access to health care. Disentanglement of such factors is outside the scope of the present study" (Chen et al., 2021, p. 8). We also caution that it is unlikely, given the limitations of employment information on death certificates, that there was a reliable way for Chen et al. to limit their sample of decedents to those who were currently employed, or even recently employed. While decedents older than 65 were excluded from their study, we cannot rule out the possibility that deaths may have been concentrated among early retirees or others who were not employed, reducing the direct relevance of their estimates as a benchmark for death claim volumes.

We discuss further limitations of our analysis and considerations for interpreting the Chen et al. estimates below.

Selection of Industries and Occupations

There are hundreds of occupation codes and thousands of industry codes in the coding systems used in this chapter, so we can show estimates only for a small selection of industry-occupation combinations. We used several criteria to choose industries and occupations for inclusion in this chapter. First, we present a series of tables covering specific (three- or four-digit NAICS) industries containing workers covered by the frontline presumption, as well as other health care and social assistance industries:

- State and Local Government (Table 4.2)
- Hospitals and Skilled Nursing Facilities (Table 4.3)
- Home Health Agencies (Table 4.4)
- Assisted Living Facilities and Ambulatory Health Care (Table 4.5).

The vast majority of the California workforce is employed in industries and occupations that were covered by the outbreak presumption. Among these industries and occupations, we reviewed data on outbreaks reported to the CDPH in 2021 to identify the top 50 industries by number of outbreak cases and considered these for inclusion. We also sought to prioritize industries that accounted for a high proportion of COVID-19 claims filed by occupations with high excess mortality; e.g., we included the apparel manufacturing industry (NAICS 315) because it is a major employer of sewing machine operators. Additional specific industries (e.g., retail pharmacies) were included because of input from our TAG. The CDPH outbreak data have important limitations—reporting began only in 2021 after AB 685 took effect, and the outbreak data count cases reported among nonemployees (such as customers, elementary school students,

and assisted living residents).[13] Ultimately, we had to narrow the group of industries and occupations included to meet space constraints in this report.

Important Limitations

Data shown here must be interpreted with caution. We generally do not have an external benchmark at the industry or occupation level for the true number of work-related COVID-19 infections or the number of cases that were diagnosed.

In particular, the data presented here should not be interpreted as providing an estimate of the impact of presumption on claim filing behavior or claim denial rates: We have insufficient data to disentangle those behavioral differences from differences in infection risk and other factors. Similarly, the claim filing rates reported here cannot be interpreted directly as a measure of infections or COVID-19 infection risk. Claims might be filed in the absence of a COVID-19 infection, or when an infection was not contracted at work, as we discuss in Chapter 3, Chapter 5, and elsewhere. The one exception to this limitation is that we do have estimates of excess mortality and the number of COVID-19 deaths reported for a selected group of high-risk occupations from Chen et al., 2021. Yet these data come with the caveat that they capture both occupational and nonoccupational COVID-19 cases, and so cannot provide a benchmark for the "true" number of deaths attributable to workplace exposure.

We also caution that the *rates* reported in this chapter have important limitations and need to be interpreted carefully because of some issues with the data available on employment (i.e., the denominator of the rate) at the industry-occupation level. OEWS employment and wage estimates for May 2020 are derived from surveys conducted between November 2017 and May 2020, and BLS cautions that these estimates may not fully reflect the impacts of the COVID-19 pandemic (BLS, 2021a).

Even if the data perfectly captured employment in May 2020, the large fluctuations in employment and hours during the course of the pandemic mean that the rates per 10,000 workers reported in this chapter cannot be interpreted in the same manner as injury rates per 10,000 full-time equivalent (FTE) workers that are typically reported in other epidemiological data sources.

[13] The CDPH outbreak data available for this study report 54,749 outbreak-linked cases in workplaces reported between January 1 and September 28, 2021. Between January 1 and August 11, 2021 (the latest COVID claim injury date in our WCIS data), there were 33,024 COVID-19 claims reported to the WCIS. In industry sectors other than public administration (which contains workers covered under both the frontline and outbreak presumptions), health care and social assistance (which contains workers covered under both the frontline and outbreak presumptions), and education (which was likely to have a large number of nonemployee students counted as outbreak cases), there were 22,018 outbreak-linked cases reported to CDPH and 15,806 COVID-19 claims filed in the remaining industry sectors, which were potentially covered by the outbreak presumption. Beyond noting that the order of magnitude is similar, however, it is unclear to us that any informative conclusions can be drawn from this comparison given the differences in cases included, uncertainty about employer compliance with AB 685, differences in the CDPH and SB 1159 outbreak definitions, and variation in establishment size.

Despite these caveats, we felt that data on claim volumes by industry and occupation without contextual information about the number of workers in the state could be misleading.

We also note that substantial effort was required to crosswalk OEWS employment by occupation data to WC claims due to differences in the occupation coding systems used. Sources for crosswalks and edits made by the RAND team are discussed in Appendix B. There is also potential for errors in the WCIS industry codes that are submitted by claims administrators (based ultimately on information reported by employers) and caused by differences in industry definitions between the OEWS and the more widely used 2017 NAICS system. The major difference is that the OEWS uses a unique set of industry codes for public-sector establishments. All public-sector establishments are aggregated by level of government (local, state, or federal), except for education (NAICS sector 61) and health care (NAICS industries 621, 622, and 623) establishments operated by governments, such as county-owned hospitals. Those are excluded from state and local government employment statistics in the OEWS and reallocated to the education and health care sectors. Some of these claims may be coded as NAICS industry 92 in the WCIS.

While we explored the use of class codes to reclassify public-sector schools and health care facilities, we found that many health care and education workers have class codes 9410 or 9420 (indicating municipal employment), suggesting that we cannot rely on class codes to identify health care workers employed by governments. The education sector is not a major focus in this chapter, but health care obviously is.

If we examine COVID-19 claims from workers in health care occupations (major SOC occupations 29- and 31-), including those not identified as working in health care facilities, about 10 percent (2,000 claims unweighted) have industry codes indicating government employment but are not flagged as workers in health care facilities. Ninety-seven percent of these workers have class codes 9410 or 9420. We do not reallocate these workers to the health care industry or flag them as frontline workers, since there is no way to know whether they are working in facilities covered by the frontline presumption, in ambulatory health care, or are in administrative roles without exposure to COVID-19 patients (which should be the case if they are under WC class code 9410). However, an implication is that denominators for claim rates in health care and education may include some workers whose WC claims are counted in the public administration sector (NAICS 92).

The other major limitation of the OEWS data is that they have very incomplete coverage of the agricultural sector (NAICS sector 11). Farms in crop and animal production are covered by different statistical programs operated by the U.S. Department of Agriculture, so there are no farm employment data (for NAICS industries 111 and 112) in the OEWS. We were unable to find comparable establishment-based estimates of occupation-by-industry employment and mean wages for farmworkers. OEWS does include farm labor contractors (NAICS industry 115), but this category omits most farmworkers. We added estimates of employment in the agriculture sector reported from the EDD, but we lack occupation-level detail on the number of farmworkers

by industry. While we felt that it was important to include data on farmworkers' WC claiming because they are an occupational group that suffered high excess mortality during the COVID-19 pandemic, we are unable to report claim rates per 10,000 workers at the occupation level for agricultural occupations. Occupation-specific data on farmworker claim rates are in Table 4.11 (on occupations with high excess mortality).

COVID-19 Claim Volumes by Industry Sector

Before turning to claim volumes by industry and occupation, we report claim volumes and outcomes by industry sector (regardless of occupations). This table provides an overview of industry-level differences in claim volumes. We also note that claim volumes at the industry level include all claims with industry codes reported, including those without valid occupation codes assigned. Table 4.1 reports claim volumes, claim rates per 10,000 workers, and denial and benefit receipt rates by NAICS industry sector. Claim measures for COVID-19 and non–COVID-19 claims are reported in adjacent columns.

As reported elsewhere, the WCIS data confirm that health care and social assistance (NAICS 62) and state and local government account for the highest number of COVID-19 claims. When the number of cases is divided by the number of employees as of May 2020, we see that the highest rate of claims per 10,000 workers is in state and local government (269 claims per 10,000 workers), and that this rate was more than twice the rate in health care and social assistance (130 claims per 10,000 workers). As we discuss below, there is substantial variation in claim rates across occupations and specific industries within these sectors.

Table 4.1. COVID-19 and Non–COVID-19 Claim Volumes, by Industry Sector

Industry or Occupation Within Industry	California Employment in May 2020	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Agriculture, Forestry, Fishing and Hunting (11)	465,000	1,862	21,163	40	455	32	7	12	29	81	28
Mining, Quarrying, and Oil and Gas Extraction (21)	18,350	438	852	239	464	77	17	9	27	96	25
Utilities (22)	56,390	394	3,076	70	546	38	15	9	30	75	23
Construction (23)	866,650	3,009	30,122	35	348	46	7	12	35	87	18
Manufacturing (31–33)	1,271,830	7,946	56,465	63	444	49	10	15	24	89	23
Wholesale Trade (42)	651,200	2,454	18,221	38	280	50	8	17	32	90	19
Retail Trade (44–45)	1,518,610	12,139	76,105	80	501	61	7	10	20	94	36
Transportation and Warehousing (48–49)	722,840	7,752	42,256	107	585	72	11	13	34	94	26
Information (51)	539,660	426	6,199	8	115	47	11	17	35	90	31
Finance and Insurance (52)	535,300	3,224	13,220	60	247	41	12	24	19	95	31
Real Estate and Rental and Leasing (53)	287,140	927	8,076	32	281	59	11	13	30	87	24
Professional, Scientific, and Technical Services (54)	1,308,480	1,596	14,327	12	110	47	8	24	21	82	27
Management of Companies and Enterprises (55)	251,930	47	709	2	28	42	10	20	27	100	22
Administrative, Support, and Waste Management Services (56)	1,069,450	4,153	46,488	39	435	58	12	14	26	86	22
Educational Services (61)	1,441,840	1,739	23,254	12	161	42	10	20	23	81	26%
Health Care and Social Assistance (62)	2,495,080	32,362	63,454	130	254	18	8	47	26	78	32
Arts, Entertainment, and Recreation (71)	260,740	720	7,776	28	298	62	9	11	22	89	32

Accommodation and Food Services (72)	1,374,350	6,942	33,349	51	243	30	10	6	23	45	28
Other Services (except Public Administration) (81)	437,230	2,278	13,316	52	305	43	9	11	24	88	24
S&L Government	906,660	24,418	60,277	269	665	15	15	26	23	78	24

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. California Employment = employment in industry (all occupations) as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021. *State and Local Government* is defined as the union of OEWS industries 9992 (State Government) and 9993 (Local Government); OEWS employment in these industries excludes government-owned education and health care establishments.

Among large industries (i.e., those with half a million workers or more in May 2020) in which workers were not covered by the frontline presumption, transportation and warehousing (NAICS 48–49) had the highest rate of COVID-19 claims (107 claims per 10,000 workers), followed by retail (80 per 10,000 workers) and manufacturing (63 per 10,000 workers).[14] Industries with very low rates of COVID-19 claims were a mix of white-collar industries with low overall claim rates, such as information (NAICS 51), and service industries that were subject to widespread closures (and, in some cases job losses), such as educational services (NAICS 61) and arts, entertainment, and recreation (NAICS 71). We note that this analysis does not include data on job losses during the pandemic, hours worked, or the prevalence of work-from-home arrangements, and that all these factors were likely to drive differences across major industries—especially service industries—in the rate of COVID-19 claims per workers employed in May 2020.

Some other patterns emerge from Table 4.1. Consistent with the differences in claim denial rates reported in Chapter 3, the lowest claim denial rates are observed in state and local government (15 percent of COVID-19 claims initially denied) and health care and social assistance (18 percent of COVID-19 claims initially denied). We note that both these sectors include a mix of frontline presumption occupations and other workers who would potentially be covered by the outbreak presumption.

The rate of TD receipt is highest in health care and social assistance, with 47 percent of COVID-19 claims receiving some paid TD benefits. The rate of TD receipt in state and local government (26 percent) is also high in comparison with other industry sectors. Both sectors are also unusual in that COVID-19 claims were more likely to result in paid TD benefits than were non–COVID-19 claims.

Finally, the proportion of claims without any medical bills submitted to WC is high in most industries but is lower in health care and social assistance (78 percent of COVID-19 claims without medical bills) and in state and local government (78 percent of COVID-19 claims without medical bills) than in most other industry sectors. The one notable exception is accommodation and food services, where only 45 percent of COVID-19 claims lacked medical bills.

[14]The mining, quarrying, and oil and gas extraction industry (NAICS 21) had the highest rate of COVID-19 claims per 10,000 workers outside of state and local government. Statewide employment in this sector was only 18,000 workers, so the volume of claims is relatively low, and we do not report on patterns by occupation in this industry.

Frontline Presumption Industries and Occupations

Public Sector

Table 4.2 reports COVID-19 and non–COVID-19 claim volumes for selected occupations in state and local government.[15] COVID-19 claim volumes for workers in protective service occupations (including firefighters, peace officers, and correctional officers) were among the highest observed for any occupation in our analysis, totaling 722 COVID-19 claims per 10,000 workers employed as of May 2020. For peace officers (including both supervisors and lower-rank officers), the rate of COVID claims was 683 per 10,000 peace officers employed as of May 2020. For firefighters (including both supervisors and lower-rank officers), the rate of COVID claims was 785 per 10,000 firefighters employed as of May 2020.[16]

This is unsurprising for several reasons. First, the strong frontline worker presumption likely encouraged covered workers to file claims that might have faced a lower chance of acceptance under the outbreak presumption or in the absence of any presumption. Second, while we were not able to analyze data on hours worked within the scope of this study, it seems likely that the employment levels and work hours of firefighters, peace officers, and correctional officers were less negatively affected by the pandemic than was the case for the vast majority of workers in the economy. As a result, actual employment and hours worked relative to the number of workers employed in May 2020 was likely higher in these occupations than in other public-sector and private-sector occupations (except for workers in health care facilities). Third, there is reason to think (considering outbreak data, media accounts, and our qualitative interviews) that workers in protective service occupations faced exceptionally high COVID-19 risk due to frequent interaction with the public or with populations that were either seeking health care (in the case of firefighters) or that experienced severe COVID-19 outbreaks (in the case of correctional officers). We note, in particular, that the 4,110 COVID-19 claims identified as being filed by correctional officers represent 1,215 claims per 10,000 correctional officers employed as of May 2020—the highest rate of COVID-19 claims per 10,000 workers observed among large occupations in this study.

[15] Note that our data source for employment data, the OEWS, aggregates all state government and local government employment other than hospitals and education and does not provide breakdowns for specific government functions (such as public safety versus administration).

[16] We do not have a clear explanation for the exceptionally high rates of both COVID and non-COVID claims attributed to police and firefighting supervisors. While this is a pattern we would expect to see if lower-rank officers were incorrectly classified as supervisors, examination of the verbatim occupation descriptions in the WCIS did not suggest that such misclassification was a widespread problem. The entries in Table 4.2 for peace officers (including supervisors) and firefighters (including supervisors) would not be affected by misclassification of supervisors as lower-rank officers, and these rates are still among the highest observed in any occupation in this study.

Table 4.2. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: State and Local Government

Industry or Occupation Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID	COVID	Non-COVID
State and Local Government	906,660	24,418	60,277	269	665	15	15	26	23	78	24
Protective Service Occupations (33-0000)	175,840	12,692	26,759	722	1,522	13	15	27	27	76	23
Peace Officers (incl. Supervisors)[a]	82,240	5,609	15,058	682	1,831	15	16	20	26	74	25
Police/Sheriff's Patrol Officers (33-3050)	71,430	4,199	11,880	588	1,663	17	14	19	27	75	24
Detectives and Criminal Investigators (33-3020)	6,630	212	709	320	1,069	15	25	9	15	68	29
Supervisors of Police, Detectives (33-1012)	4,180	1,198	2,469	2,866	5,907	8	20	27	22	74	25
Firefighters (incl. Supervisors)[b]	33,930	2,664	6,118	785	1,803	19	9	26	28	75	22
Firefighters (33-2010)	31,160	1,841	4,117	591	1,321	19	8	25	28	77	21
Firefighting/Prevention Supervisors (33-1021)	2,770	823	2,001	2,971	7,224	18	12	27	29	70	23
Correctional Officers and Jailers (33-3010)	33,820	4,110	4,236	1,215	1,253	6	18	35	28	78	19
Supervisors of Correctional Officers (33-1011)	4,540	42	67	93	148	13	35	64	12	69	36
Probation Officers (21-1092)	14,090	309	536	219	380	23	21	36	15	82	30
Child, Family, and School Social Workers (21-1020)	29,780	194	680	65	228	45	15	16	21	90	35
Office Clerks (43-9061)	48,390	276	807	57	167	36	24	13	11	86	28
Business/Financial Operations (13-0000)	92,750	463	1,003	50	108	26	16	16	8	82	28
Cleaning, Maintenance Occupations (37-0000)	24,390	322	2,406	132	987	23	8	32	25	79	15

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program "hybrid" occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021. *State and Local Government* is defined as the union of OEWS industries 9992 (State Government) and 9993 (Local Government); OEWS employment in these industries excludes government-owned education and health care establishments.

[a] Peace Officers (incl. supervisors) = occupations 33-3050, 33-3020, and 33-1012.
[b] Firefighters (incl. supervisors) = occupations 33-2010 and 33-1021.

As reported in Table 4.1, COVID-19 and non–COVID-19 claim denial rates in state and local government as a whole were the same (15 percent of claims initially denied). Denial rates in protective service occupations were slightly lower for COVID-19 (13 percent) than for non–COVID-19 (15 percent) claims filed while the frontline worker presumption was in effect, although initial denial rates on COVID-19 claims filed by firefighters (19 percent of claims by firefighters, including both supervisors and lower-rank officers, initially denied) were higher than on non–COVID-19 claims filed by firefighters (9 percent).

Although it is unclear whether all correctional officers (who are peace officers) meet the "active law enforcement" criterion used in Labor Code Section 3212.87, they had the lowest COVID-19 claim denial rate reported in Table 4.2 (6 percent of claims initially denied). A low denial rate for correctional officers' COVID-19 claims is consistent with statements we heard from public-sector claims administrators that they treated correctional officers as presumptively covered even though the applicability of the frontline worker presumption was not entirely clear. As discussed earlier, we do not have data on COVID-19 test results or reasons for claim denials, but we note that a lower denial rate may also reflect the exceptional level of exposure to COVID-19 faced by correctional officers, given the large number of COVID-19 outbreaks that occurred in California's jails and prisons.

Rates of TD receipt (including 4850 pay) in public safety occupations were also fairly high compared with private industry, but lower than rates observed in health care and social assistance. Twenty-seven percent of COVID-19 claims in public safety occupations resulted in payment of TD, a rate only slightly higher than that observed among non–COVID-19 claims (27 percent with paid TD benefits).

Table 4.2 also reports COVID-19 claim volumes and outcomes for some occupations with high employment in state and local government that are not protective service occupations. (Probation officers, who are peace officers, but who may not meet the frontline presumption definition, had high COVID-19 claim rates that were nonetheless lower than rates for workers in protective service occupations.) COVID-19 claim rates for social workers, office clerks, and business and financial operations occupations were similar to those observed in private-sector industries, likely reflecting reduced exposure (because a large proportion of these workers may have worked from home or reduced field work at times during the pandemic).

Table 4.3. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Health Care Facilities

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Hospitals (622000)	553,840	11,159	22,171	202	400	15	9	57	30	68	34
Healthcare Practitioners and Technical Occupations (29-0000)	317,140	6,374	12,098	201	382	12	9	59	29	68	33
Registered Nurses (29-1141)	194,620	3,945	7,062	203	363	9	8	64	30	69	32
Licensed Practical and Licensed Vocational Nurses (29-2061)	9,390	551	546	587	582	29	6	47	28	53	23
Healthcare Support Occupations (31-0000)	62,070	2,194	3,706	354	597	20	7	57	33	65	31
Nursing Assistants (31-1131)	30,380	1,695	2,536	558	835	20	7	60	33	63	26
Maids and Housekeeping Cleaners (37-2010)	19,290	354	1,238	184	642	26	11	51	41	70	41
Nursing Care Facilities (Skilled Nursing Facilities) (623100)	135,970	5,362	6,326	394	465	25	9	28	20	95	29
Healthcare Practitioners and Technical Occupations (29-0000)	38,830	1,220	1,048	314	270	20	7	42	18	94	21
Registered Nurses (29-1141)	11,690	567	470	485	402	15	6	54	18	92	17
Licensed Practical and Licensed Vocational Nurses (29-2061)	19,970	452	301	226	151	26	7	26	16	97	24
Healthcare Support Occupations (31-0000)	56,300	2,075	3,046	369	541	23	7	25	23	95	29
Nursing Assistants (31-1131)	47,860	1,535	2,239	321	468	21	6	24	23	95	28
Home Health and Personal Care Aides (31-1120)	6,900	332	615	481	891	30	7	32	20	94	31
Maids and Housekeeping Cleaners (37-2010)	5,370	489	430	911	801	28	15	26	19	97	26

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021. DD = developmental disability. MHSA = mental health and substance abuse.

Health Care

Health Care Facilities: Hospitals and Skilled Nursing Facilities

In the hospital industry as a whole (NAICS 622), 202 COVID-19 claims were filed per 10,000 workers, a rate substantially lower than that observed in protective service occupations but more than double most rates observed in private industry. The COVID-19 claim rate at SNFs (NAICS 6231) was much higher: 394 COVID-19 claims per 10,000 workers. In both health care industries serving older adults (i.e., SNFs and home health care), COVID-19 claim rates were higher for health care support occupations (SOC major occupation 31-0000) than for health care practitioners and technical occupations (SOC major occupation 29-0000). COVID-19 case rates were generally very high within all specific occupations in these groups, but there was also substantial variation. Licensed practical and vocational nurses (SOC 29-2061) and nursing assistants (SOC 31-1131) both had COVID-19 claim rates over 500 per 10,000 workers in hospitals, while RNs (SOC 29-1141) and home health and personal care aides (SOC 31-1120) had COVID-19 claim rates of nearly 500 per 10,000 workers in SNFs.

We also examined claim rates by maids and housekeeping cleaners, a group with high employment in both types of facilities that was among the top occupations in terms of excess mortality during the pandemic. COVID-19 claim rates for maids and housekeeping cleaners in hospitals were below those for health care occupations but were exceptionally high (911 per 10,000 workers) in SNFs.

Turning to denial rates, the COVID-19 claim denial rate for hospital employees overall was 15 percent, and the COVID-19 claim denial rate for SNF employees was 25 percent. These rates are higher than observed in most law enforcement occupations in the public sector but comparable with the 19-percent rate observed among firefighters. In contrast to protective service occupations, denial rates for COVID-19 claims were generally somewhat higher than for non–COVID-19 claims in most occupations.

In light of this difference in denial rates between public safety and health care workers covered by the frontline presumptions, rates of TD receipt by hospital employees are strikingly high (57 percent), nearly double that observed among non–COVID-19 claims (30 percent). SNF employees as a group received TD at a similar rate (28 percent) to that observed for public safety occupations as a group, and at a rate that was higher than the rate of TD receipt on non–COVID-19 claims (20 percent). We suspect that higher rates of TD receipt compared with the public sector may reflect differences in the provision or generosity (in terms of days covered) of special pandemic sick leave, since large employers (which would include many if not all hospitals) were exempt from the federal pandemic sick leave mandates.

We also note that, although COVID-19 claims filed by hospital employees were more likely than non–COVID-19 claims to have no medical bills reported to WC, hospital employees had one of the lowest proportions of no-medical claims observed in our study. This finding stands in contrast to some statements made by our interview subjects (to the effect that hospital care

received by hospital employees might be billed to group health even if the case was work-related). However, we note that a "low proportion" of claims without medical bills in the context of COVID-19 still means a majority (68 percent) of claims, a situation that is starkly different from other claims in the WC system. SNF employees, in contrast, almost never submitted medical bills for COVID-19 to WC: 95 percent of COVID-19 claims from SNF employees had no medical bills reported.

Table 4.4 shows COVID-19 claim volumes and outcomes in the home health care services industry (NAICS 6216). This industry includes both home health agencies and providers of in-home long-term services and supports, both of which are covered by the frontline worker presumption. As with health care facilities, the COVID-19 claim rate (201 per 10,000 workers) in home health is substantially higher than in other private-sector industries. COVID-19 claim rates were also higher for health care support occupations (234 per 10,000 workers) than for health care practitioners and technical occupations (125 per 10,000 workers). Denial rates on COVID-19 claims were also within the range observed for workers at health care facilities.

Table 4.4. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Home Health Care

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Home Health Care Services (621600)	97,530	1,964	2,435	201	250	24	7	37	38	81	24
Healthcare Practitioners and Technical Occupations (29-0000)	33,860	424	574	125	170	22	7	45	35	77	34
Registered Nurses (29-1141)	16,140	183	317	113	196	27	10	47	30	80	36
Licensed Practical and Licensed Vocational Nurses (29-2061)	11,970	218	188	182	157	20	4	42	42	74	31
Healthcare Support Occupations (31-0000)	39,780	931	1,428	234	359	22	7	36	42	81	19
Home Health and Personal Care Aides (31-1120)	36,960	587	1,218	159	330	22	7	42	44	88	18
Nursing Assistants (31-1131)	1,820	329	192	1,808	1,055	21	4	29	34	74	19

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

Assisted Living and Ambulatory Health Care

The frontline worker presumption in SB 1159 was narrowly defined to cover only specified types of health care and congregate living facilities. The risk of COVID-19 infection, of course, was not strictly limited to the specific types of facilities and health care settings covered by Labor Code 3212.87, so it is interesting to examine patterns of COVID-19 claims in health care and congregate living settings that were likely not to be covered under the frontline worker presumption.

Table 4.5 reports COVID-19 claim volumes and outcomes in the industry (NAICS 6233) comprising assisted living facilities and continuing care retirement communities and in ambulatory health care (NAICS 621). Ambulatory health care establishments do not meet the definition of health care facilities specified in Labor Code Section 3212.87, although EMTs and paramedics employed at private-sector ambulance services should be covered by the frontline presumption by virtue of their occupation.[17] Similarly, the Health and Safety code sections cited in the definition of health care facilities in Labor Code Section 3212.87 are either hospitals, SNFs, or settings involving continuous (24-hour) nursing care. Assisted living facilities are defined to exclude establishments with on-site nursing facilities; continuing care retirement communities have on-site nursing facilities but are not "primarily engaged in providing inpatient nursing and rehabilitative services" (U.S. Census Bureau, 2021b, p. 536). We thus assume that the establishments and workers covered in Table 4.5 are not covered by the frontline worker presumption, except for EMTs and paramedics.

[17] Private-sector ambulance services are part of the Ambulatory Health Care industry and employ the majority of nonfirefighter EMTs and paramedics who are not employed by local governments or hospitals (BLS, 2021b).

Table 4.5. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Assisted Living and Ambulatory Health Care

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Continuing Care and Assisted Living Facilities for the Elderly (623300)	98,260	2,627	4,072	267	414	14	4	57	23	86	52
Healthcare Support Occupations (31-0000)	50,680	1,302	2,113	257	417	13	3	61	25	86	51
Nursing Assistants (31-1131)	6,560	419	754	639	1,149	6	2	66	29	82	67
Home Health and Personal Care Aides (31-1120)	43,080	833	1,257	193	292	25	3	51	21	92	28
Maids and Housekeeping Cleaners (37-2010)	5,040	213	348	423	691	19	6	50	19	92	45
Food Preparation and Serving Related Occupations (35-0000)	16,170	232	413	144	255	32	9	35	24	83	44
Ambulatory Health Care Services (621000)	834,080	11,020	24,019	132	288	21	6	41	22	80	28
Healthcare Practitioners and Technical Occupations (29-0000)	317,570	4,595	9,287	145	292	17	5	46	25	74	26
Registered Nurses (29-1141)	65,310	1,824	3,359	279	514	19	6	47	23	71	25
Licensed Practical and Licensed Vocational Nurses (29-2061)	27,000	488	656	181	243	20	4	43	23	79	36
Clinical Laboratory Technologists and Technicians (29-2010)	16,310	517	1,053	317	646	14	12	13	17	96	24
Emergency Medical Technicians and Paramedics (29-2040)	16,790	547	934	326	556	13	5	47	44	66	13
Healthcare Support Occupations (31-0000)	196,090	2,608	6,557	133	334	22	6	40	22	85	28
Home Health and Personal Care Aides (31-1120)	39,220	662	1,424	169	363	21	7	40	42	88	19
Medical Assistants (31-9092)	79,020	641	1,359	81	172	24	7	47	10	92	41
Maids and Housekeeping Cleaners (37-2010)	2,940	200	614	680	2,088	31	3	29	14	87	27

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any

paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

The COVID-19 claim rate at assisted living facilities and continuing care retirement communities (NAICS 6233) was 267 COVID-19 claims per 10,000 workers, which is slightly higher than that observed at hospitals or home health agencies, but lower than that observed at SNFs. Claim rates were highest for nursing assistants (639 per 10,000 workers). In Ambulatory Health Care (NAICS 621), the COVID-19 claim rate (132 per 10,000 workers) was lower than in health care facilities or home health. In contrast to the experience in SNFs and hospitals, where health care support occupations had higher COVID-19 claim rates than health care practitioners and technical occupations, the COVID-19 claim rate was slightly higher among practitioners and technical occupations in ambulatory health care. This reflects, in part, a high claim rate among EMTs and paramedics, but RNs and clinical lab technologists also had high COVID-19 claim rates (279 and 317 per 10,000 workers, respectively). Maids and housekeeping cleaners in both industries had very high claim rates, although the number of workers is modest, so these occupations accounted for a modest share of COVID-19 claims in these industries.

When we turn to claim denial rates, we see that COVID-19 claim denial rates in these industries were no higher than those observed in the frontline presumption health care industries described in Tables 4.3 and 4.4. Overall, the claim denial rate for COVID-19 claims was 14 percent at assisted living facilities and continuing care retirement communities and 21 percent in ambulatory health care services. Nursing assistants at assisted living facilities and continuing care retirement communities had an especially low initial denial rate on COVID-19 claims (6-percent initial denial rate). This is consistent with statements from some interview subjects indicating that they treated claims from assisted living facilities similar to the facilities covered under Labor Code Section 3212.87 even though they knew that these facilities were excluded from the frontline worker presumption.

Other Industries

Manufacturing

Table 4.6 reports claim volumes and outcomes for selected manufacturing industries, which were chosen mostly on the basis of CDPH-reported outbreak data and input from the TAG. (Food manufacturing industries such as slaughterhouses are presented in Table 4.7.) The table also provides occupation-level detail on the Textile Product Mills (NAICS 314) and Apparel Manufacturing (NAICS 315) industries because these are the major employers of Sewing Machine Operators (SOC 51-6031), which was the single occupation with the highest relative excess death rate during the pandemic as estimated in Chen et al., 2021.

Table 4.6. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Manufacturing

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Manufacturing (31-33)	1,271,830	7,946	56,465	63	444	49	10	15	24	89	23
Transportation and Material Moving Occupations (53-0000)	93,760	1,309	9,804	140	1,046	51	10	11	26	86	21
Production Occupations (51-0000)	530,320	3,050	24,248	58	457	45	10	19	24	86	22
Fabricated Metal Product Manufacturing (332000)	127,970	983	6,467	77	505	51	10	19	24	88	17
Plastics and Rubber Products Manufacturing (326000)	43,030	282	2,359	66	548	47	9	16	24	87	18
Computer and Electronic Product Manufacturing (334000)	281,000	609	3,854	22	137	45	9	30	19	93	23
Textile Product Mills (314000)	8,030	121	481	151	599	38	12	12	23	90	33
Production Occupations (51-0000)	4,980	57	243	115	488	30	13	9	21	89	35
Sewing Machine Operators (51-6031)	2,190	8	106	37	484	0	22	0	18	100	37
Textile, Apparel, and Furnishings Workers, All Other (51-6099)	420	18	16	429	381	40	0	6	0	88	0
Transportation and Material Moving Occupations (53-0000)	590	17	75	288	1,271	54	15	9	20	91	29
Apparel Manufacturing (315000)	27,910	92	830	33	297	82	21	9	15	79	35
Production Occupations (51-0000)	14,500	26	320	18	221	73	22	18	21	74	26
Sewing Machine Operators (51-6031)	9,290	9	155	10	167	54	23	30	11	87	27
Transportation and Material Moving Occupations (53-0000)	2,100	22	161	105	767	100	8	0	13	100	40

NOTES: Table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program "hybrid" occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any

paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

As reported in Table 2.1, the manufacturing sector (NAICS 31-33) as a whole had a COVID-19 claim rate of 63 claims per 10,000 workers—dramatically lower than all the frontline worker groups examined so far and lower than several nonfrontline industries as well. As we will see in many other private-sector, nonfrontline industries, the claim denial rate was high (49 percent), the rate of TD receipt was lower than on non–COVID-19 claims (15 percent versus 24 percent of non–COVID-19 claims), and the majority of COVID-19 claims involved no medical bills (89 percent of COVID-19 claims with no medical bills). We also note that transportation and material moving occupations had a much higher COVID-19 claim rate per 10,000 workers than did production occupations.

Looking at some specific manufacturing industries with high volumes of CDPH-reported outbreak cases in 2021 (Fabricated Metal Products, Plastics and Rubber Products, and Computer and Electronic Products), we see variation in COVID-19 claim rates per 10,000 workers, but rates are generally below 100 per 10,000 workers and thus fairly modest compared with the frontline industries.[18] Patterns of claim denial rates and TD receipt are also fairly similar across these industries: COVID-19 claim denial rates are much higher than non–COVID-19 claim denial rates, COVID-19 claim TD receipt rates are lower than non–COVID-19 claim TD receipt rates in most cases, although TD receipt for is higher for COVID-19 cases than for non–COVID-19 cases in Computer and Electronic Product Manufacturing.

Turning to Textile Mills and Apparel Manufacturing, we found much higher COVID-19 claim rates in textile mills (151 per 10,000 workers), but lower claim rates in apparel manufacturing (33 per 10,000 workers). Claim denial rates in textile manufacturing were slightly lower than the average for the manufacturing sector, while claim denial rates in apparel manufacturing are very high (82 percent of claims initially denied). In both industries, the number of claims filed by sewing machine operators was very low, which was surprising given the high excess mortality in this occupation. Claim rates are dramatically higher (though claim volumes are small due to relatively small employment of the industry) for other textile workers and for transportation and material moving occupations. As we discuss later in the chapter, however, WC claims data alone are clearly inadequate to disentangle the influence on claim or death rates of occupational COVID-19 exposures from other COVID-19 exposures that also differ among workers in different occupations, such as those related to lower socioeconomic status, living arrangements, or differences in nonother nonoccupational exposures.

[18]In the CDPH outbreak data, manufacturing industries outside of food manufacturing in the top 50 industries by number of outbreak cases include Machinery Manufacturing N.E.C. (Census Industry Code 3190), Plastics Product Manufacturing (Census Industry Code 2370), and Electronic Component Andand Product Manufacturing (Census Industry Code 3390), and Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (Census Industry Code 3380). These industries correspond to NAICS industries contained in those listed in Table 4.6.

Food Manufacturing

Table 4.7 reports claim volumes and outcomes in food manufacturing industries, including industries such as animal slaughtering and processing (NAICS 3116), in which numerous severe outbreaks and fatalities have been documented in California and other states. The food manufacturing industry (NAICS 311) was also a major employer of several occupations identified by Chen et al., 2021, as having high excess mortality during the pandemic, including butchers and other meat, poultry, and fish processing workers (SOC code 51-3020) and bakers (SOC code 51-3011). Several industries reported in Table 4.7 (beverage manufacturing, animal slaughtering and processing, fruit and vegetable preserving and specialty food manufacturing, and seafood and other miscellaneous foods not elsewhere classified) also ranked among the top 50 industries by number of outbreak cases reported to CDPH in 2021.

In the food manufacturing industry as a whole (NAICS 311), the COVID-19 claim rate (134 COVID-19 claims per 10,000 workers) was about double the rate in all manufacturing industries (63 per 10,000 workers), consistent with reports and other estimates of high COVID-19 case volumes at some food processing establishments. We caution, however, that claim rates and exposures may also have been higher in these industries because food production industries were identified as an Essential Critical Infrastructure sector and were generally exempt from statewide and other stay-at-home orders. COVID-19 claim rates were especially high in seafood processing animal slaughtering and processing (NAICS 3116) and seafood product preparation and processing (NAICS 3117), which had rates of 276 COVID-19 claims and 233 COVID-19 claims per 10,000 workers—comparable with rates observed in hospitals and other health care industries. Bakeries and tortilla manufacturing (NAICS 3118) had a COVID-19 claim rate (119 COVID-19 claims per 10,000 workers) similar to the average for all food manufacturing, while fruit and vegetable preserving and specialty food manufacturing and beverage and tobacco product manufacturing had lower claim rates (57 and 32 COVID-19 claims per 10,000 workers, respectively).

Table 4.7 also shows variation in COVID-19 claim rates across occupations. Interestingly, the high-mortality occupations identified above within the food manufacturing industry had COVID-19 claim rates that were lower than the industry-wide average. COVID-19 claim rates were higher for packaging/filling machine operators (SOC 51-9110).

Table 4.7. COVID-19 Claim Volumes and Outcomes by Industry and Occupation: Agriculture and Food Manufacturing

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Food Manufacturing (311000)	156,120	2,087	11,383	134	729	43	10	11	25	90	20
Production Occupations (51-0000)	72,960	861	5,304	118	727	39	9	9	25	90	18
Packaging/Filling Machine Operators (51-9110)	15,530	184	1,669	119	1,075	29	10	8	23	86	18
Slaughterers and Meat Packers (51-3020)	9,570	54	274	56	286	86	8	0	16	100	26
Bakers (51-3011)	7,450	65	337	87	452	42	8	10	39	80	21
Fruit/Vegetable Preserving, Spec Food Manuf. (311400)	24,410	138	1,819	57	745	30	9	20	30	92	17
Seafood Product Preparation and Packaging (311700)	1,330	31	122	233	917	0	22	100	10	100	13
Animal Slaughtering and Processing (311600)	22,460	620	1,551	276	691	43	11	4	13	94	26
Production Occupations (51-0000)	15,500	170	655	110	423	50	10	2	16	98	25
Packaging and Filling Machine Operators and Tenders (51-9110)	1,610	35	183	217	1,137	16	17	0	13	100	25
Slaughterers and Meat Packers (51-3020)	9,400	51	247	54	263	86	10	0	17	100	34
Bakeries and Tortilla Manufacturing (311800)	39,270	468	2,515	119	640	34	11	12	29	89	19
Production Occupations (51-0000)	17,170	291	1,364	170	794	28	10	10	28	86	18
Bakers (51-3011)	7,280	60	326	82	448	42	7	10	39	80	21
Beverage and Tobacco Product Manufacturing (312000)	60,070	193	2,853	32	475	31	7	23	27	90	17

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of

claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

In food manufacturing, initial COVID-19 claim denial rates averaged 43 percent, which is slightly below the denial rate observed in the manufacturing sector as a whole. We note, however, that denial rates were exceptionally high (86 percent) for butchers, slaughterers, and meatpackers in animal slaughtering and processing. TD receipt rates for COVID-19 claims (10 percent) were lower than the average in the manufacturing sector as a whole (15 percent). Lower TD receipt in food manufacturing is consistent with the provision of additional state-mandated pandemic sick leave to workers in the food supply chain, but we caution that lower claim denial rates, among other factors, could also contribute to this difference across manufacturing industries. Finally, we note that 90 percent of COVID-19 claims in food manufacturing had no medical bills reported to WC.

Transportation and Warehousing

Table 4.8 reports COVID-19 claim volumes and outcomes in transportation and warehousing (NAICS 48-49). In the sector as a whole, there were 107 COVID-19 claims per 10,000 workers. These claims were concentrated among laborers and freight, stock, and material movers, hand (SOC 53-7062),[19] who had a COVID-19 claim rate of 196 per 10,000 workers—comparable with the rate observed in the hospital industry.

Examining industries within the transportation and warehousing sector, we see that the couriers and messengers industry (NAICS 492)[20] accounted for the majority of claims in the sector as a whole and had a high rate of COVID-19 claims (509 per 10,000 workers). (We note that the industry-average rate is higher than any of the rates for occupations within the industry because it includes claims without usable occupation information.) COVID-19 claim rates in warehousing and storage (NAICS 493), truck transportation (NAICS 484), and support activities for transportation (NAICS 488) were quite low in comparison.

[19] This occupation is described as follows in the 2018 SOC manual: "Manually move freight, stock, luggage, or other materials, or perform other general labor. Includes all manual laborers not elsewhere classified. Excludes 'Construction Laborers' (47-2061) and 'Helpers, Construction Trades' (47-3011 through 47-3019). Excludes 'Material Moving Workers' (53-7011 through 53-7199) who use power equipment" (BLS, 2018).

[20] These establishments "provide intercity, local, and/or international delivery of parcels and documents (including express delivery services)" (BLS, 2020b; U.S. Census Bureau, 2021b). To the extent that pandemic-related substitution from in-person to online shopping resulted in additional hiring at these shipping and delivery businesses, claim rates in the couriers and messengers industry may be overstated relative to the actual number of FTE workers employed during the period of the study.

Table 4.8. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Transportation and Warehousing

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Transportation and Warehousing (48-49)	722,840	7,752	42,256	107	585	72	11	13	34	94	26
Transportation and Material Moving Occupations (53-0000)	472,010	4,651	23,805	99	504	80	10	7	38	94	30
Industrial Truck and Tractor Operators (53-7051)	33,300	41	357	12	107	38	7	26	22	84	22
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	113,580	2,224	8,715	196	767	88	9	4	24	98	25
Heavy and Tractor-Trailer Truck Drivers (53-3030)	145,160	1,221	10,686	84	736	79	9	6	48	98	32
Warehousing and Storage (493000)	183,320	340	11,478	19	626	46	12	33	33	86	18
Transportation and Material Moving Occupations (53-0000)	144,620	167	2,441	12	169	51	7	35	32	86	18
Truck Transportation (484000)	133,360	538	7,256	40	544	10	9	51	42	95	37
Transportation and Material Moving Occupations (53-0000)	100,720	222	6,515	22	647	24	8	20	48	92	38
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	16,500	57	964	35	584	30	6	17	44	94	24
Heavy and Tractor-Trailer Truck Drivers (53-3030)	76,150	137	5,368	18	705	23	9	21	50	92	40
Couriers and Messengers (492000)	116,140	5,909	15,512	509	1,336	89	9	3	32	99	25
Transportation and Material Moving Occupations (53-0000)	96,130	3,762	10,706	391	1,114	89	9	3	34	99	27
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	42,900	1,960	5,775	457	1,346	90	10	3	18	99	28
Light Truck Drivers (53-3030)	44,760	1,046	4,287	234	958	88	8	4	46	99	25

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion

of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

In contrast to the patterns that we saw in manufacturing and some other sectors covered by the outbreak presumption, initial COVID-19 claim denial rates in transportation and warehousing were quite high, averaging 72 percent in the sector as a whole and 89 percent in the couriers and messengers industry. Rates of TD receipt were correspondingly low, with just 3 percent of claims filed in the couriers and messengers industry receiving TD. Almost none of these claims had medical bills reported to WC, either.

We caution, again, that high claim denial rates are challenging to interpret, since we do not know in any specific industry how many claims are filed on an exposure-only basis or are mistakenly initiated after the worker reports a nonoccupational COVID-19 case. Another reason for claim denials noted in the CWCI survey data is claims being filed by nonemployees, such as independent contractors. To the extent that there is higher use of independent contractors in the couriers and messengers industry but a lack of clarity for workers and claims administrators about which workers are direct-hire employees, we might imagine that claims might be filed more often by nonemployee workers in these industries, contributing to a higher denial rate. With that caveat, the high claim rates and high claim denial rates in the couriers and messengers industry stand out from other industries.

Retail

Table 4.9 reports COVID-19 claim volumes and outcomes in the retail sector. We report estimates for detailed occupations in the food and beverage stores (NAICS 445) industry, which contains grocery stores. Other industries were included in the table because of high numbers of CDPH-reported outbreak cases or input from our TAG. The COVID-19 claim rate in the retail sector as a whole was 80 claims per 10,000 workers. Even though grocery stores were generally exempt from stay-at-home orders, the COVID-19 claim rate in food and beverage stores was about half the rate observed in the retail sector as a whole. Within the food and beverage store industry, COVID-19 claim rates were highest for butchers and meat cutters (SOC 51-3020). Claim rates in sales occupations (such as cashiers) were lower than the average in the industry, though the claim rate for supervisors was higher than the average for all workers in the industry.

Claim rates in other retail industries were much higher, including at building material and supplies dealers (382 COVID-19 claims per 10,000 workers), at automobile dealers (181 COVID-19 claims per 10,000 workers), and at health and personal care stores (142 COVID-19 claims per 10,000 workers).

Table 4.9. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Retail

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Retail Trade (44-45)	1,518,610	12,139	76,105	80	501	61	7	10	20	94	36
Food and Beverage Stores (445000)	360,310	1,379	17,869	38	496	27	9	14	31	92	19
Sales and Related Occupations (41-0000)	152,430	434	4,229	29	277	25	11	11	26	93	19
First-Line Supervisors of Retail Sales Workers (41-1011)	20,770	140	1,838	67	885	18	8	10	30	92	18
Cashiers (41-2011)	123,640	236	1,804	19	146	28	14	12	22	94	21
Butchers and Meat Cutters (51-3020)	2,540	54	835	213	3,287	24	7	16	30	80	18
Bakers (51-3011)	6,770	18	264	27	390	29	10	45	28	77	25
Transportation and Material Moving Occupations (53-0000)	96,790	402	4,397	42	454	32	12	11	37	95	20
Food Preparation and Serving Related Occupations (35-0000)	35,450	167	3,241	47	914	27	7	18	28	93	18
Automobile Dealers (441100)	116,160	2,107	4,722	181	407	43	9	23	29	93	18
Building Material and Supplies Dealers (444100)	110,830	4,234	15,167	382	1,369	76	4	0	8	99	72
Health and Personal Care Stores (446100)	105,540	1,500	4,109	142	389	6	11	53	27	68	26

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, temporary permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

In comparison with other sectors of private industry, initial COVID-19 claim denial rates in food and beverage stores were relatively low (27 percent), and COVID-19 claim denial rates in health and personal care stores were among the lowest seen in any industry (6 percent). Denial rates were substantially higher at automobile dealers and building material and supplies dealers.

Accommodations and Food Services

Table 4.10 reports COVID-19 claim rates and outcomes in the accommodations and food services sector (NAICS 71). We note that job losses and closures related to stay-at-home orders and other public health interventions were very pronounced in these industries, so the OEWS employment counts may be especially prone to overstate the size of the workforce in comparison with other industries. For the sector as a whole, the COVID-19 claim rate was 51 per 10,000 workers. Claim rates were much higher in the traveler accommodation industry (NAICS 7211) than in restaurants and other eating places (7225). In the sector as a whole, occupations with high COVID-19 claim rates included maids and housekeeping workers (112 COVID-19 claims per 10,000 workers), supervisors of housekeeping and janitorial workers (152 COVID-19 claims per 10,000 workers, and laundry and dry-cleaning workers (117 claims per 10,000 workers). Food preparation and serving workers, in contrast, had relatively low COVID-19 claim rates (36 per 10,000 workers).

Initial COVID-19 claim denial rates in the sector as a whole were low in comparison with other private industry (30-percent denial rate) but also differed dramatically across industries. The COVID-19 claim denial rate in restaurants was only 15 percent, while the COVID-19 claim denial rate in traveler accommodations was 70 percent. TD receipt on COVID-19 claims in this sector was also very low compared with other industries, averaging 6 percent of claims in the sector as a whole, 5 percent in restaurants, and 11 percent in accommodations. As noted above with food manufacturing, it is plausible that the provision of state-mandated pandemic sick leave for food workers may have contributed to low rates of TD receipt. However, many other factors could also be at work here. Finally, we note that accommodations and food services is the only sector examined in which most COVID-19 claims had medical bills reported to WC, with only 45 percent of claims lacking medical bills. This pattern is driven by claims among workers in restaurants, only 29 percent of which lack medical bills.

Table 4.10. COVID-19 Claim Volumes and Outcomes, by Industry and Occupation: Accommodations/Food Service

Industry (NAICS) or Occupation (OEWS Hybrid SOC) Within Industry	California Employment	Number of Claims		Claims per 10,000 Workers		Initial Denial Rate		TD Receipt		No Medical	
		COVID	Non-COVID	COVID	Non-COVID	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)	COVID (%)	Non-COVID (%)
Accommodation and Food Services (72)	1,374,350	6,942	33,349	51	243	30	10	6	23	45	28
Food Preparation and Serving Related Occupations (35-0000)	1,116,520	4,033	18,435	36	165	18	9	3	22	28	29
Cooks, Restaurant (35-2010)	252,750	788	5,447	31	216	15	8	2	24	25	26
Supervisors of Food Preparation and Serving Workers (35-1010)	80,720	732	2,608	91	323	15	7	3	20	30	28
Building/Grounds Cleaning and Maintenance (37-0000)	56,480	627	3,829	111	678	70	11	14	26	85	26
First-Line Supervisors of Housekeeping and Janitorial Workers (37-1010)	3,490	53	158	152	453	73	12	18	21	91	20
Maids and Housekeeping Cleaners (37-2010)	51,110	570	3,613	112	707	70	11	14	26	84	27
Production Occupations (51-0000)	9,420	141	636	150	675	56	12	18	25	79	25
Butchers and Meat Cutters (51-3020)	440	22	42	500	955	31	16	44	33	88	26
Bakers (51-3010)	4,870	16	167	33	343	56	6	26	37	50	31
Laundry and Dry-Cleaning Workers (51-6010)	2,730	32	159	117	582	54	19	5	23	74	18
Restaurants and Other Eating Places (722500)	1,098,150	4,141	18,651	38	170	15	9	5	23	29	29
Food Preparation and Serving Related Occupations (35-0000)	998,510	3,172	12,429	32	125	12	9	3	23	21	29
Building/Grounds Cleaning and Maintenance (37-0000)	3,650	16	250	44	685	73	20	19	30	100	22
Traveler Accommodation (721100)	190,520	1,725	6,175	91	324	70	11	11	24	89	28

NOTES: This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program “hybrid” occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion

of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

Death Claims and High-Mortality Occupations

Table 4.11 reports COVID-19 claim rates and the number of death claims filed by occupation for the 25 occupations identified by Chen et al., 2021, as those with the highest excess mortality during the pandemic. In contrast to the tables reported so far, claims data used in this table include all claims with injury dates from January 1, 2020, through June 30, 2021, a period of 18 months (rather than the 12-month period examined in earlier tables). The Chen et al. excess mortality estimates, meanwhile, reflect deaths occurring between March and August of 2020, a period that precedes the winter surge.

The table indicates that many of the occupations with high excess mortality did not have notably high COVID-19 claim rates in comparison with the industry and occupation groups examined in the preceding tables. There were some exceptions, however, with production workers, all other (SOC 51-9199), metal workers and plastic workers, all other (SOC 51-4199), laborers and freight, stock, and material movers, hand (53-7062), first-line supervisors of housekeeping and janitorial workers (37-1011), maids and housekeeping cleaners (37-2012), and chefs and head cooks (35-1011) having COVID-19 claim rates above 100 per 10,000 workers. Even in occupations that had a substantial number of excess deaths or COVID-19 deaths, however, the number of death claims identified by the time the data were extracted in August 2021 was fairly modest. These counts of death claims were often in the single digits and were typically between 10 and 20 percent of the number of workers who had died from COVID-19 by August 2020.

Several occupations stand out as having high volumes of death claims relative to the number of COVID-19 deaths, including butchers and other meat, poultry, and fish processing workers (51-302), who had 11 death claims to date, 20 COVID-19 deaths, and 40 excess deaths identified through August 2020; and nursing, psychiatric, and home health aides (31-101), who had 22 death claims to date, 54 COVID-19 deaths, and 121 excess deaths identified through August 2020. Looking at the other end of the spectrum, construction laborers (47-2061) had 269 COVID-19 deaths and 756 excess deaths identified through August 2020, but only three COVID-19 death claims to date; agricultural workers (45-209) had 242 COVID-19 deaths and 378 excess deaths identified through August 2020, but only 22 COVID-19 death claims to date; and maids and housekeeping cleaners (37-2012) had 73 COVID-19 deaths and 108 excess deaths identified through August 2020, but only seven COVID-19 death claims to date. Chefs and head cooks (35-1011), who had 58 COVID-19 deaths and 143 excess deaths identified through August 2020, had zero COVID-19 death claims to date. Given that the time frame over which deaths were measured ended a year before the data were collected, the total cumulative number of deaths to date in all these occupations may be substantially higher.

Table 4.11. COVID-19 Death Claims in High-Mortality Occupations

Excess Mortality Rank	Occupation Title (2010 SOC Code)	California Employment as of May 2020	Number of Claims January 2020–June 2021		Claims per 10,000 Workers January 2020–June 2021		Number of COVID-19 Death Claims January 2020–June 2021	Number of COVID-19 Deaths* (Incl. Non-Occupational) March–November 2020	Number of Excess Deaths* March–November 2020	Relative Excess Mortality* March–November 2020
			COVID	Non-COVID	COVID	Non-COVID				
1	Sewing Machine Operators (51-603)	17,190	75	866	43.6	503.8	7	73	70	1.59
2	Cooks (35-201)	287,310	1,813	15,291	63.1	532.2	17	123	316	1.57
3	Miscellaneous Agricultural Workers (45-209)	Not Available	1,552	22,352			22	242	378	1.54
4	Butchers and Other Meat, Poultry, and Fish Processing Workers (51-302)	39,020	268	2,424	68.7	621.2	11	20	40	1.52
5	Couriers and Messengers (43-5021)	9,640	179	2,712	185.7	2,813.3	3	21	59	1.52
6	Production Workers, All Other (51-9199)	24,320	1,097	11,373	451.1	4,676.4	17	61	101	1.46
7	Metal Workers and Plastic Workers, All Other (51-4199)	2,540	224	2,377	881.9	9,358.3	3	34	35	1.43
8	Taxi Drivers and Chauffeurs (53-3041)	48,930	130	1,342	26.6	274.3	3	25	46	1.42
9	Bakers (51-3011)	20,360	138	1,374	67.8	674.9	1	23	34	1.4
10	Industrial Truck and Tractor Operators (53-7051)	72,540	419	4,382	57.8	604.1	7	63	115	1.4
11	Packaging and Filling Machine Operators and Tenders (51-911)	46,460	406	3,637	87.4	782.8	4	23	31	1.39
12	Construction laborers (47-2061)	100,240	481	9,689	48	966.6	3	269	756	1.38

13	Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	378,830	5,722	52,466	151	1,384.9	45	193	450	1.37
14	Miscellaneous Assemblers and Fabricators (51-209)	105,240	524	8,892	49.8	844.9	10	40	82	1.37
15	Customer Service Representatives (43-4051)	200,900	1,702	7,575	84.7	377.1	8	47	160	1.36
16	Grounds Maintenance Workers (37-301)	114,290	319	7,689	27.9	672.8	6	112	232	1.35
17	Stock Clerks and Order Fillers (43-508)	265,810	1,030	11,449	38.7	430.7	6	30	102	1.34
18	Security Guards and Gaming Surveillance Officers (33-903)	156,540	723	6,594	46.2	421.2	12	86	204	1.34
19	First-line Supervisors of Housekeeping and Janitorial Workers (37-1011)	11,990	259	1,146	216	955.8	2	26	42	1.34
20	Maids and Housekeeping Cleaners (37-2012)	90,170	2,037	9,945	225.9	1,102.9	7	73	108	1.33
21	Nursing, Psychiatric, and Home Health Aides (31-101)	597,290	3,492	9,010	58.5	150.8	22	54	121	1.32
22	Chefs and Head Cooks (35-1011)	15,590	258	1,700	165.5	1,090.4	0	58	143	1.32
23	Driver/Sales Workers and Truck Drivers (53-303)	294,840	2,451	35,554	83.1	1,205.9	35	267	474	1.3
24	Social Workers (21-102)	84,730	674	2,356	79.5	278.1	3	20	54	1.29
25	Janitors and Building Cleaners (37-2011)	216,650	2,133	22,102	98.5	1,020.2	31	135	220	1.28

NOTES: ***** COVID deaths, Excess Deaths, and relative excess mortality from Chen et al., 2021. This table reports claim volumes and outcomes for claims with date of injury from July 6, 2020, to June 30, 2021. Rows labeled with industry report data for all workers in the industry regardless of occupation. Rows labeled with occupation report data for workers in the occupation who work in the industry listed above. Some occupation titles were shortened because of space constraints. Occupation codes reflect OEWS program "hybrid" occupations. California Employment = employment in industry (all occupations) or for specified occupation within industry as reported by BLS OEWS program. TD Receipt = proportion of claims with any paid temporary disability benefits, including temporary total disability, total permanent disability, or 4850 pay. No Medical = proportion of claims with no medical bills submitted to the WC payer as of July 2021.

Finally, Table 4.12 reports the top 20 occupations ranked by the number of COVID-19 death claims filed since the beginning of 2020. For context, the number of death claims identified in these occupations in 2019 (one year before the pandemic) are reported, and occupations identified as high mortality by Chen et al., 2021, are flagged in the last column. Several observations are in order.

First, some but not all occupations with high relative excess mortality appear in the top 20 occupations by death claims—which may simply reflect the fact that larger occupations may have a large number of COVID-19 deaths even if the increase in mortality is more limited. The occupational profile of COVID-19 mortality may also have changed since August 2020, when the data analyzed in Chen et al., 2021, were collected. Some of the occupations in Table 4.12 may have faced lower COVID-19 risk early in the pandemic because of stay-at-home orders (e.g., retail sales occupations).

Second, while some occupations in Table 4.12 faced a high risk of occupational fatality before the pandemic (such as laborers, truck drivers, farmworkers, and police and correctional officers), there were large numbers of COVID-19 death claims in some occupations with little or no occupational fatalities reported through WC in 2019. Examples include several health care occupations, home health and personal care aides, retail workers, and cooks.

We cannot overemphasize that the COVID-19 death and excess mortality counts estimated by Chen et al., 2021, include nonoccupational COVID-19 deaths, and so we cannot say what the ratio of death claims to COVID-19 deaths *should* be in any normative sense. In addition, variation in work arrangements (i.e., direct-hire versus independent contractor) and the prevalence of labor informality (i.e., underground work) across occupations would lead to variation across occupations in the proportion of workers outside the WC system (whether legally or illegally).

Notwithstanding those caveats, an important lesson from the table is that, for the most part, COVID-19 deaths among workers in high-mortality occupations were not being compensated through the WC system. In many cases, this is likely because these workers caught COVID-19 in nonoccupational settings. However, we cannot disentangle, with the data available here, how many of these workers may have caught COVID-19 at work but were unaware they might be eligible for compensation, or who were aware but decided not to file claims for other reasons. An implication is that WC is not serving as the primary source of compensation for survivors of workers who died of COVID-19 when we consider both occupational and nonoccupational COVID-19 deaths.

Table 4.12. Top 20 Occupations, by Number of COVID-19 Death Claims Reported to WCIS, January 2020 to June 2021 Injury Dates

Rank, by Number of COVID-19 Death Claims	Occupation (2010 SOC Code)	California Employment as of May 2020	Number of Death Claims for COVID-19 January 2020–June 2021	Number of Non–COVID-19 Death Claims Filed in 2019	Overlap with High-Mortality Occupation in Chen et al., 2021?
1	Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	378,830	45	47	Y
2	Nursing Assistants (31-1131)	96,630	35	4	
3	Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)	216,650	31	22	Y
4	Heavy and Tractor-Trailer Truck Drivers (53-3032)	141,970	29	61	
5	Licensed Practical and Licensed Vocational Nurses (29-2061)	69,640	23	0	
6	Correctional Officers and Jailers (33-3012)	33,820	23	17	
7	Home Health and Personal Care Aides (31-1120)	597,290	22	7	
8	Registered Nurses (29-1141)	299,540	22	4	Y
9	Production Workers, All Other (51-9199)	24,320	17	13	Y
10	Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)		14	33	Y
11	First-Line Supervisors of Retail Sales Workers (41-1011)	104,780	12	5	
12	Cooks, Restaurant (35-2014)	136,810	12	4	Y
13	Security Guards (33-9032)	155,950	12	19	Y
14	Police and Sheriff's Patrol Officers (33-3051)	72,970	11	39	
15	Bus Drivers, Transit and Intercity (53-3052)	24,840	11	3	
16	Industrial Machinery Mechanics (49-9041)	24,330	10	6	
17	First-Line Supervisors of Production and Operating Workers (51-1011)	45,970	10	2	
18	Retail Salespersons (41-2031)	330,630	10	5	Y
19	Miscellaneous Assemblers and Fabricators (51-2090)	103,980	10	0	
20	First-Line Supervisors of Police and Detectives (33-1012)	4,430	9	5	

Summary

This chapter provided a detailed description of COVID-19 claim volumes, claim rates per 10,000 workers, denial rates, TD receipt rates, and rate of claims without medical benefits by industry and occupation. Several key findings emerged.

First, health care and public safety occupations and industries had much higher rates of COVID-19 claims per 10,000 workers than did other occupations and industries in the private sector (where claims may have been covered by the outbreak presumption). While it is plausible that the frontline presumption contributed to these high COVID-19 claim volumes, comparison with similar occupations that were not covered by the frontline presumption may suggest that the high claim volumes in these industries were driven more by their extraordinarily high levels of exposure to COVID, including the fact that frontline health care and public safety workers were continually working throughout the pandemic, even at times when many private-sector businesses were shut down or had reduced interactions with the public.

Within the public sector, we note that correctional officers (who may not be covered by the frontline presumption) had a higher COVID-19 claim rate and a lower denial rate in comparison with other peace officers and firefighters. Similarly, within the health care industry, claim rates at assisted living facilities and continuing care communities (which were not covered by the frontline presumption) were higher than those observed at hospitals, although they were lower than those observed at SNFs. COVID-19 claim rates in ambulatory health care, which was clearly not covered by the frontline worker presumption, were lower than at hospitals, SNFs, and other congregate living facilities but were still much higher than those observed in most private industry, and the claim denial rate in ambulatory health care was intermediate between those observed for hospitals and SNFs.

Taken at face value, these comparisons (between correctional officers and other peace officers, and between nonfacility health care establishments, hospitals, and SNFs) might suggest that the frontline worker presumption had a limited impact on claim volumes or denial rates within these highly exposed industries. However, this interpretation would assume that claims administrators applied the frontline presumption exactly as it has been interpreted in this report, which may not be the case. From the qualitative interviews, a representative of a claims administrator who works with public-sector entities told us that their organization had treated correctional officers as if the frontline presumption applied to them. We heard in the interviews, similarly, that claims administrators treated assisted living facility claims as if they were covered by the frontline presumption (i.e., accepting claims with a positive PCR test without verifying that the claim was filed during an outbreak period), even though they were acknowledged not to have been covered by the letter of the law. We cannot pinpoint the source of the apparent leniency applied by claims administrators that we spoke to regarding these high-risk occupations and workplaces that were unlikely to be covered by the frontline worker presumption. One possibility is that the claims administrators decided strategically to avoid the potential for

litigation and negative publicity that might result from denying COVID-19 claims from workers who were obviously highly exposed. It is hard to say whether similar decisions would have been made for these frontline-adjacent industries and occupations if the frontline worker presumption did not exist.

Turning to other industries and occupations, we saw that COVID-19 claim rates outside of health care and public industry were generally much lower. We also saw, however, that denial rates, rates of TD receipt, and the proportion of claims with no medical bills varied widely. Variation in TD receipt across industries and occupations appeared broadly consistent with the provisions in SB 1159 specifying that TD benefits would begin only after pandemic-specific sick leave was exhausted. Compared with other frontline occupations in health care, rates of TD receipt were relatively low for public safety workers whose employers were subject to the pandemic-specific paid leave mandate in the FFCRA. Similarly, workers in food retail, restaurants, and food manufacturing, where large establishments would have been covered by the state's SPSL for food workers, had low rates of TD receipt compared with other outbreak industries. Of course, these comparisons are suggestive at best, as we lacked data on compliance with leave mandates and, more important, rates of TD receipt could be influenced by unmeasured differences across industries in disease severity or claim filing behavior, as discussed extensively in this chapter and Chapter 3.

Initial denial rates were very high in some industries (e.g., 82 percent in apparel manufacturing, 90 percent within couriers and messengers) and occupations within industries (e.g., 85 percent for slaughterers and meatpackers within animal slaughtering and processing), including some occupations that had high excess mortality during the pandemic. We cannot say definitively whether these high claim denial rates are artifacts of the unusual patterns of COVID-19 claim filing discussed at length in Chapter 3, whether these claims were denied because they were filed outside of an outbreak period (or, as we might imagine to be the case in the couriers and messengers industry, some proportion of claims were filed by independent contractors who were not covered by WC), or whether claims filed during an outbreak period were successfully rebutted by evidence of nonoccupational exposure. All we can say is that, for some groups of workers, the outbreak presumption did not result in ready access to WC benefits. Whether these claim denials led to hardship for these workers is not knowable with the data from this study but could be constructively investigated in future work using household survey data with data on COVID-19 infection and household finances (such as the California Health Interview Survey).

Finally, when we examined claim volumes among occupations with high excess mortality during the pandemic, we found that the number of death claims in many of these occupations was very limited relative to the number of COVID-19 deaths identified among nonelderly workers or the number of excess fatalities identified by Chen et al., 2021. The implication is that, even for some of the hardest-hit occupations, including health care occupations covered by presumptions, there will be many COVID-19 deaths that are not compensated through WC. Of course, WC is not designed to compensate deaths that are caused by nonoccupational factors

(and WC coverage is not priced to provide such compensation). Further investigation using sources beyond claims data—and, in many cases, examining future outcomes that are still being adjudicated by the system right now—will be needed to determine whether the survivors of COVID-19 victims whose cases were work-related face excessive barriers to receiving WC benefits, and what other sources of compensation will ultimately become available to families of deceased workers.

Recap of Limitations

We discussed several limitations in the data presented here earlier in the chapter to ensure that the caveats would not be missed by readers who read only part of the chapter. To recap, errors may be introduced by differences in the coding systems used by NIOCCS and the OEWS data. Furthermore, OEWS employment estimates are for a point in time (May 2020), may be affected by pandemic-related survey challenges, and do not reflect fluctuations in hours or employment that occurred over the period of the study.

Caveats with interpretation of denial rates that were discussed at length in Chapter 3 also apply here. Briefly, differences in denial rates can come from differences in the way that claims are handled given the situation surrounding the claim (e.g., outbreak reporting, exposure-only, COVID-19 infection without positive test, COVID-19 infection with positive test) and the evidence submitted but can also come from unmeasured differences in circumstances.

5. COVID-19 Claims and Other COVID-19 Policies About Income Loss and Medical Care

This chapter describes what we learned from our stakeholder interviews about claim filing and its interaction with other state and federal COVID-19 policies that were also intended to protect workers against interruption of income and assist in the receipt of COVID-19 medical care. These views and experiences are not ones that we can observe in the WCIS claims data and were obtained to better understand the experiences of workers, employers, and other relevant stakeholders interfacing with the WC system during the COVID-19 pandemic. We also reviewed these stakeholder experiences and perspectives to gain insight into how the WC system "provides substantial protection against interruption of income" (second National Commission objective) and "sufficient provision of medical care and rehabilitation services" (third National Commission objective). These WC objectives are outlined in the 1972 National Commission report (National Commission, 1972) and indicate that protection against income loss means "a high proportion of a disabled worker's lost earnings should be replaced by workmen's compensation benefits" (p. 15), whereas the "sufficient provision of medical care and rehabilitation services" means that "the injured worker's physical condition and earning capacity should be promptly restored" (p. 15). In reviewing these objectives, we discuss claim filing and the factors affecting workers' decisions to file COVID-19 WC claims (**RQ6**), including the influence of other state and federal policies (**RQ7**). We also include a discussion of issues employers had when providing paid sick leave in coordination with WC (**RQ8**). We describe what stakeholders reported about workers' experiences gaining access to medical care for COVID-19, their use of WC for medical coverage (**RQ9)**, and other sources of medical care coverage or disability compensation used by workers (**RQ10**). Lastly, we provide stakeholder perspectives on how important WC indemnity, medical, and death benefits are to workers and whether they have other sources of indemnity or medical care for COVID-19 (**RQ11**). This information addresses RQs 6 through 11:

- **RQ6:** What factors affect worker decisions to file COVID-19 claims?
- **RQ7:** How have other paid leave policies (e.g., state and federal paid leave) affected worker decisions to file COVID-19 claims?
- **RQ8:** What are the issues regarding providing paid sick leave for frontline workers or workers in a defined outbreak incident?
- **RQ9:** How does WC coverage affect workers' access to medical care for COVID-19? Or affect workers' out-of-pocket costs for COVID-19 care?
- **RQ10:** Do workers have access to other sources of medical care coverage or disability compensation?
- **RQ11:** How important are WC indemnity, medical, and death benefits to workers?

Claim Filing and Factors Affecting Workers' Decisions

We heard a common message from the employers, claims administrators, and public health officials whom we interviewed: Filing of a WC claim for COVID-19 is predicated on the employee knowing about their right to file a WC claim for COVID-19 and then exercising that right. We heard that providing this knowledge about filing a WC claim for COVID-19 according to the SB 1159 frontline worker presumption or the outbreak presumption rested primarily on the employer. We also heard that unions and other labor organizations played a role in informing employees. We describe here what we heard about employer messaging around COVID-19 claim filing and the SB 1159 presumptions, as well as employers' perspectives on workers' hesitancy to file a COVID-19 claim. In so doing, we describe the factors affecting whether an employee filed a COVID-19 claim.

Employer Messaging Around COVID-19 Claims and SB 1159 Presumptions

Employers and public health officials we spoke to emphasized the importance of employer messaging around COVID-19 claims and the SB 1159 presumptions. A public health official stated,

> To have an impact on public health, the important thing is the extent to which the employee knows they have that right to stay home and they have comfort in knowing they can access that right to stay home and not lose pay.

Most claims administrators and employers whom we interviewed indicated that, early in the pandemic, there was confusion about WC claims for COVID-19; the confusion occurred primarily from March through early June of 2020. All claims administrators and employers interviewed indicated that it was time-consuming to keep abreast of COVID-19 and the related laws. As one public safety employer said,

> We realized pretty quickly it was like drinking from a fire hose when it came to messaging about COVID-19 and COVID-19 claims. There was so much information and that was always changing.

Half of the employers we interviewed admitted that they did not provide any messaging specific to SB 1159 or to filing a claim for COVID-19. These employers indicated that they handled COVID-19 like any other injury in WC; this included providing the employee with the official DWC DWC-1 form (Department of Industrial Relations, 2021) and, in many cases, also a medical declination form, which is insurer-generated for employers to use to document the employee's refusal of treatment and protect the employer from future penalty. The DWC-1 form or Form 5021, known as the Doctor's First Report of Occupational Injury or Illness (Department of Industrial Relations, 2020), can be filed within a year of the incident or injury and applies to all injuries, including COVID-19. These employers were across several industries and in both Northern and Southern California. One manufacturing employer stated,

> For any injury, we give the DWC-1 form. We tell them they can file the WC claim. We also give the employee a medical declination form to verify treatment was offered and that they denied treatment. That was standard messaging. No different for COVID.

The other half of the employers we interviewed talked about how they partnered with unions or labor groups to assist them with messaging about COVID-19 and claims from their workers. A health care hospital employer explained,

> We had daily meetings with [REDACTED NAME OF UNION] that is our union representing [REDACTED], the biggest group of employees that we have. We had major calls with all unions to provide them the same information, since employees would sometimes go to the unions over us.

Most employers we interviewed set up frequent communication (most often weekly) with employees to ensure that employees felt comfortable coming forward about a COVID-19 exposure or a claim and that the workers would be kept safe. Several employers set up hotlines or some other mechanism for staff to call in to report that they had COVID-19, or to provide the needed information about COVID-19 and WC claims. One public safety employer reported,

> We had a weekly meeting where we had people call in with HR personnel and leave coordinators to support and answer questions. They would submit questions to the team in risk management and the benefits teams and we would answer them. . . . It has been invaluable having people on the phone to be responsive to questions. In March 2020, we also did this for self-preservation. We had hundreds of emails a day and did not know how to answer them or know what the consistent responses should be. A lot of the questions were very detailed, so it was better to have the whole group in on the conversation.

Half of the claims administrators indicated that, early on, they sent WC claim forms to every employee with a positive COVID-19 case. Several other claims administrators admitted that they were overwhelmed during the holiday surge of COVID-19 cases (i.e., November and December 2020) and that during that time messaging about COVID-19 claims was not as consistent.

We also heard from a statewide insurance carrier that handles health care clients that messaging and communication about COVID-19 and claims varied greatly according to the size of the hospital or health care system. This statewide TPA insurance carrier for health care organizations said,

> Larger hospitals have a risk department, a solid HR department, and understood the laws, whereas the smaller hospitals relied more heavily on their claims insurer to provide seminars to go over the laws, how to file and when to file COVID-19 claims.

Claims administrators for public safety employers indicated that their departments (sheriff, fire, police) were well informed and well versed in WC, so they did not need to engage in much education on the SB 1159 presumption but instead focused on providing information when there was a positive COVID-19

case at a worksite. A claims administrator for a large urban county public safety employer recalled,

> We moved from providing information when there was a positive case to embedding their messaging about COVID-19 claims into their workplace contact tracing process.

Another statewide insurance carrier claims administrator told us,

> We did a lot of work on messaging for COVID-19 claims and sending out FAQs and pamphlets and videos specifically geared toward employers and safety precautions, best practices for return to work and what to look for. Should they do symptom checking every day? What should they do to keep their workforce safe? It was sponsored by us as the carrier because we knew the more education we had, the more would trickle down to the workforce and reduce claim volume, severity, and frequency. I don't know how many other carriers took measures like that. Are you a carrier that provides a wide range of services such as prevention side and risk management mitigation, or managing claims as they come in the door?

Another claims administrator for a large city described their messaging efforts this way:

> We put out regular messages through one person, so it was reliable and easy to follow. We relied on frontline supervisors to share the information with their employees as well. We have internal specialists that are resources to their departments that helped with messaging or answering questions. As guidance changed, there were questions, and our specialists were able to respond. General messaging came centrally from the WC claims and Human Resources office.

How Employees Heard About COVID-19 Claims and SB 1159 Presumptions

Furthermore, half of the injured-worker employees whom we interviewed found out about how to file a claim from their employer, the others through family, one from an applicant attorney friend, and one from a colleague. An injured public safety worker mentioned their employer:

> My lieutenant filed a claim and he had COVID. I don't know about any nonsworn people who filed a claim. I think I am the only one. My lieutenant was the one who told me to file because it was work-related. He knew we got it at work.

An injured police officer mentioned hearing about filing from their applicant attorney:

> I filed the claim with the knee and my lawyer was doing the paperwork. I told him about having COVID. He told me the governor signed a bill to make is presumptive, so he told me about it and filed for me.

Employee Hesitancy to File a Claim

Claims administrators and employers across the industries in which we interviewed indicated that workers were not hesitant to file a COVID-19 claim, with a few exceptions. Those indicating that there was no hesitancy also mentioned that the sworn public safety workers,

health care workers, and grocery workers are well versed in filing WC claims. However, in agriculture, a statewide employer acknowledged that migrants, out of a fear of government, were hesitant to come forward with a claim. This was coupled with the fear of possibly losing pay and their job. The statewide agricultural employer stated,

> I think from just conversations that we had amongst employees and that I had from leaders in the field, particularly early on, there was some distrust of workers who are migrants; they have fear of institutions and they were not willing to come forward. That is why we had conversations to make sure they knew what was happening and knew about other COVID cases and what happened so they would feel OK with coming forward. There was some hesitation from the fear of losing pay and feeling like the government was going to be involved. We had the same issue with vaccinations. The fear could have been from losing pay and their losing job fears. I was not in their heads. Our human resources department has a group that interacts with the workers a lot. We wanted to understand what they felt and thought so we could address things.

Hesitancy was characterized by employers as existing only at the beginning of the pandemic, when filing a claim and having a COVID-19 positive case qualify as WC was still confusing. Several employees mentioned such hesitancy, mixed with confusion. A statewide insurer claims administrator recalled,

> The hesitancy of filing was at the beginning due to the confusion on if COVID was WC. Once the increase in COVID cases came, there was still confusion for employees on making a claim, but not hesitancy.

A hospital employer also mentioned that hesitancy to file a COVID-19 WC claim came from employees not wanting to engage with the WC system, rather than anything related to having COVID-19. The health care employer explained,

> The hesitancy to filing a COVID claim would be working with the WC system in general, not about COVID per se. WC process is daunting. I emphasize that I do refer people [to] file and make sure the claim is on file because there is no fault discussed or assigned here. However, there is still a stigma to get back to the WC system.

A claims administrator for public safety employers concurred:

> No one has really been hesitant to file from what I am aware of. Some people do not want to be troubled with the filing of WC. They would prefer not to file or deal with the WC system at all.

Most employers whom we spoke to, which included mostly health care employers in various settings of care but also grocery and construction, mentioned that among their employees there was not a hesitancy to file a COVID-19 WC claim because there were other avenues for employees to more efficiently access and use paid time off, for time out for quarantine due to exposure or minor sickness. In many cases mentioned, these other avenues also paid full-time pay, which is not the case when using WC for time off.

Precautionary Filing for COVID-19 Exposure

Early in the pandemic (prior to October 2020), employers and claims administrators indicated that employees filed COVID-19 claims for exposure only, out of fear of income loss and the desire to have a claim on file, i.e., a *precautionary* filing. Employers and claims administrators stated that starting in late fall 2020, before the large winter surge, the "exposure only" claims reduced dramatically in volume as dissemination of information increased about the requirements of needing a positive COVID-19 test for filing a COVID-19–related claim. A claims administrator for a large, Southern California county reported,

> A lot of the earlier COVID-19 claims from the beginning of the pandemic were from people who were quarantined and were afraid of not getting paid. They were precautionary filings. We saw a much higher denial rate then because we didn't have positive tests. People did not understand that there was paid COVID leave available and that there were other policies to cover them. As the process matured, we started to see more claims and more positive tests and then accepted claims.

Claims administrators and employers also indicated that in late fall 2020, claims were more routinely filed for being positive with COVID-19 and included a positive COVID-19 test.

A health care employer at a large hospital system recalled,

> We had two COVID claim surges. One surge was a spike in the summer of 2020 (around July) and the other actual surge was in March–April of 2021. The initial surge of COVID-19 claims was due to panic. People filed because of not knowing and fear of the unknown. People were asking for COVID leave for exposure and not testing positive. The second surge in 2021 was those employees who had the virus. We had to shut down the nonessential workers in health care and clinics and had units that were down a lot of staff.

A claims administrator for a public safety employer explained,

> It was only at the beginning that we saw a bunch of negative cases because people were filing claims from exposure and quarantine. Over the last year to 14 months, the majority of the COVID-19 claims were for the employee's own medical condition treatment as well as quarantine time off because they were positive. Our numbers later on in 2020 after the first few months were 95 percent all positive cases. As we got into the program in May and June 2020, we were only seeing positive cases being filed.

Claims administrators and employers both noted that precautionary filings were primarily filed by first responders, such as police, firefighters, sheriff and correctional officers, and some health care workers. They pointed to a combination of factors explaining why such workers would file precautionary claims, including higher exposure to COVID-19, familiarity with the WC system, and the workplace culture. A claims administrator for a Northern California public safety employer provided these same insights into claim filing behavior:

> Claims [for our public safety workers] have been made almost exclusively to get the claim in their record. They do not want money or require us to gain anything such as medical records, because the state gave the 80 hours paid time off and

> money for that, so the claim of time off needed is in the file for their records in case something happens. Police and fire like to have such claims on file.

A public safety employer also reported,

> In July 2020, the governor put in the executive order that changed the ease with which something could be work-related. It made it so that safety officers were inclined to file much more than other groups. They are entitled to 4850 benefits, so that was a push for them to file a claim. If the safety officers had to quarantine, it was worth it for them to put in a claim.

Workers' Access to Non–Workers' Compensation Leave for COVID-19

As is widely documented, outside of the WC system, several federal and state mechanisms were established in 2020 and 2021 for employers to provide paid leave to employees for COVID-19 (see Table 2.2 in Chapter 2). Access to these federal and state-mandated paid leaves reduced the impact on and need for WC. Primarily, the Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act (Pub. L. 116-136, 2020), established a $2.2 trillion economic stimulus bill passed by the 116th U.S. Congress and signed into law by President Donald Trump on March 27, 2020; this was undertaken in response to the economic fallout of the COVID-19 pandemic in the United States. Also, the FFCRA required certain employers to provide employees with paid sick leave or expanded family and medical leave for specified reasons related to COVID-19 (Pub. L. 116-127, 2020). The Department of Labor's Wage and Hour Division administered and enforced this new law's paid leave requirements. These provisions applied from the effective date through December 31, 2020. The paid sick leave and expanded family and medical leave provisions of the FFCRA applied to certain public employers and private employers with fewer than 500 employees. Furthermore, for California specifically, the COVID-19 Supplemental Paid Sick Leave established under California law was in place initially until December 31, 2020, and was recently extended under the 2021 COVID-19 Supplemental Paid Sick Leave law through September 30, 2021 (SB 95, 2021; Labor Commissioner's Office, California Office of Industrial Relations, 2021).

These federal and state mandates allowed employers to provide paid time off to their employees and to reduce employee dependence on their own accrued sick time and leave. Both the worker and employer and insurer are incentivized to use these benefits in place of WC TD. We heard from both claims administrators and employers about workers' access to non-WC paid leave for COVID-19 when we asked about workers' claim filing behavior surrounding COVID-19. They stated that the main reason that workers filed a COVID-19 claim was for time off to quarantine that was over and above the 80 hours of state and federal paid sick leave (i.e., the 80 hours of paid sick leave was exhausted). Employers explained that the other available non-WC paid leave covered most employees' need for time off. Most employers whom we interviewed noted that the federal and state time off helped employees quarantine after a potential exposure or positive test, and, with some employers, employees were able to use this paid leave to care for family members exposed, sick, or in quarantine for COVID-19.

The most common form of non-WC COVID-19 paid leave that we heard about in the interviews was the paid time off from the FFCRA, which used a refundable tax credit that matched employer contributions dollar-for-dollar for paid leave provided to employees. This included 80 hours of time off to employees to quarantine or recover from a positive COVID-19 test or diagnosis. We also heard about the California COVID-19 Supplemental Paid Sick Leave Act (SB 95, 2021), which required employers with more than 25 employees to provide up to 80 hours of supplemental paid sick leave to employees. The supplemental paid leave time covered the worker's self-care, care for a family member, and care for vaccine-related side effects.

A few employers noted that their counties and cities provided additional leave. For example, one public safety employer noted that they had access to natural disaster pay or general funds from the county that were appropriated to provide additional financial support and sick time to employers. A few employers also noted that they provided sick leave until the worker was healthy enough to work and did not limit time off if the individual had to be out for themselves once and for a family member another time, using more than the 80 hours of time allotted through federal and state programs.

In a few cases, employers noted that employees opted to use short-term temporary disability (not WC) for time off for COVID-19–related issues. These individuals, however, were entitled to only a fraction of their regular pay and, according to the employers, did this to avoid the bureaucracy of filing a WC claim. No employer or claims administrator reported knowing about receiving a posttermination COVID-19 WC claim for disability.

Among the injured workers whom we interviewed, the three who did not file a claim explained that they either did not need more than the 80 hours of time off (n = 2) or that they were not certain that they were exposed at work (n = 1).

Workers' Medical Care Coverage for COVID-19

Medical care provision for COVID-19 has had several important and unique COVID-related actions across the United States and in California. Early in the pandemic, the majority (88 percent) of workers covered by fully insured private health insurers were not required to pay co-pays and deductibles related to COVID-19 care in addition to having their out-of-pocket costs waived if they were hospitalized with COVID-19; however, this phased out in summer 2021 (McDermott and Cox, 2020; Ortaliza et al., 2021). Also, uninsured workers were covered by a federal program that paid health care providers for their care through the Health Resources and Services Administration (HRSA; HRSA, 2021); this HRSA program is a claims reimbursement program for health care providers who provided care for uninsured patients with COVID-19 as the primary diagnosis for care.

According to the nine workers who contracted COVID-19 whom we spoke to, all of them except one inquired about filing a WC claim for two reasons: First, they needed time off for missed work caused by COVID-19 symptoms and quarantine and, second, they had medical care (and medical care bills) from being treated for COVID-19. Of the nine, six filed claims for

COVID-19 and engaged an applicants' attorney. These workers' medical care needs included urgent care visits, emergency department visits, primary care visits, medications, hospitalization (ranging from one day to 80 days, with the most common length of stay among the five hospitalized injured workers being two-and-a-half weeks), supplemental oxygen, pulmonary rehabilitation, catheter lab for heart attack care, follow-up doctor appointments with cardiologists and pulmonologists, and post-acute sequelae SARS-CoV-2 infection, hereafter referred to as *long COVID-19* symptoms (fatigue, prolonged cough, trouble breathing).

Furthermore, half of these employees found out about how to file a claim from their employer, most others through family, one from an applicant attorney friend, and one from a colleague. Three of these employees did not file a claim; two did not need more than the 80 hours of time off, and the other was not certain that exposure happened at work. All nine employees were required for their jobs to work outside the home. All were frontline workers: two hospital RNs, two home health aides, one police officer, one nonsworn police officer, one correctional officer, and two frontline manufacturing workers.

According to employers and claims administrators, employees filed COVID-19 claims for coverage of medical care costs (see Table 2.3 in Chapter 2 for alternative sources of medical care for workers with COVID-19). Employers and claims administrators discussed COVID-19 claims filed and the employee's need for medical care for COVID-19 (after testing positive). Employers and claims administrators acknowledged that COVID-19 claims were primarily for nonminor medical care, with a small percentage of claims being high-cost owing to hospitalizations that were lengthy and expensive; they also indicated that some claims also included further care required after hospitalization or follow-up care for an underlying condition that COVID-19 exacerbated. A statewide TPA claims administrator for a Southern California public safety employer explained,

> We saw COVID-19 claims primarily for quarantine and then claims with medical care. . . . 90 percent of the positive COVID-19 cases had enough time through leave from their department to be off and quarantine or have a short time of being sick. Only 10 percent of claims needed additional paid time off for the employee to get well; they filed a claim. Those were due to medical complications but were paid for through WC.

Overall, we heard that COVID-19 claims included care for situations in which COVID-19 led to pneumonia or cardiac issues or exacerbated underlying conditions. Such care resulted in high medical bills and included medical care with hospitalization, respiratory therapy, pulmonologist visits (for serious cases), and prolonged symptoms after recovery. A statewide grocery employer described medical care for their COVID-19 claims:

> The WC claims are from longer hospitalizations. We only had a small number of WC claims with long hospitalizations, but it does occur. We see hospitalizations typically for two–three or four weeks at a time. For nonhospitalization WC COVID claims, medical care was typically home oxygen therapy, steroid therapy

> to decrease the swelling in lungs, and antibiotics for those that develop pneumonia.

A Southern California county public safety employer described medical care for COVID-19 claims:

> [For the COVID-19 claims], the majority of the medical that was billed was for hospitalizations. For the test and being seen by a doctor, that is a couple hundred bucks, so almost nothing, no claim pursued. The costs that result in claims are from the hospitalizations and vents.

We heard the same about medical care costs and WC claims for COVID-19 from a statewide agriculture employer:

> For the most part, the medical care was the biggest part of the claim. We had one [COVID-19 claim] here with [TYPE OF WORKER] and that was $50K, as they were hospitalized over two weeks.

A statewide TPA claims administrator for health care employers reported,

> The majority of claims for health care workers were quarantine-only claims. The health care employee goes in, gets tested, is positive, gets a diagnosis of COVID, and then gets quarantined. Then there was a small percentage of COVID claims for health care workers that included medical bills which were high-dollar hospital stays for one or two months in the hospital.

Medical care claims were primarily for nonminor medical care, and a small percentage were for high medical bills that included hospitalizations. We also heard that many claims were for long COVID-19 cases, with lingering symptoms and issues, and those that ended in a fatality (i.e., a death claim). A claims administrator for a large Northern California county recounted,

> Primarily the COVID claims were for the ten days of quarantine. Some subset of claims were long haulers and those who were hospitalized. We had only 1 death for our total of 37K employees. Another death was a COVID case that contracted it outside of work. We had low numbers of hospitalizations related to claims.

We also heard about long COVID-19 cases and claims. See the box on symptoms and long-term effects of COVID-19 (Groff et al., 2021; Michelen et al., 2021; World Health Organization [WHO], 2021). A statewide grocery employer said,

> We have had our number of long hauler COVID cases and claims. . . . As a result, we now ask in the employee interview about their claim about risk factors such as asthma, hypertension, diabetes, obesity, and also if someone is immune compromised because of a transplant. Those employees are all high risk. For long haul COVID, we see COVID result in cardiac issues and hypertension.

Several employers, particularly in public safety and health care, pointed out the possible litigation that will ensue for long COVID-19 claims. A public safety employer observed,

> By having employers cover an infectious disease with WC, we have opened the door to a long-term unintended consequence for future changes. For long haulers, we are going to see litigation start.

Long COVID-19 symptoms raised several issues in the minds of the claims administrators whom we interviewed. They discussed the uncertainty of the impact of COVID-19 on the WC system and on claims payout. One claims administrator for a large urban Southern California county reflected,

> It is premature to say what the impact will be on COVID. I would like to see how the COVID cases develop. Everyone is all over the places on the impact of COVID on comorbidities. If you get flu-like symptoms and it goes away, you likely will not get a lot of influence from WC. We have had fatalities and hospitalizations. We need to take care of the families. We need time to see how it plays out. From WCIRB, the initial cost eval[uation] was in the billion-dollar range. It was significant. Everyone in WC looks at the dark side, the cost side. We have [$]27.2 million in reserves now. That will grow.

Several claims administrators across the state raised the issue of the uncertainty of how future medical for COVID-19 claims would be determined. A claims administrator for a statewide insurer acknowledged,

> We are still trying to figure out future medical with the claims. That is a tough one to figure out. On the minor cases, those who have completely recovered, that is fine and easy. . . . For the long hauler cases, we are not sure if they have reached *maximum medical improvement*, WC MMI. It is complicated for those on a vent, and had post COVID . . . issues or had

Box 5.1. Symptoms and Long-Term Effects of COVID-19

Long-term symptoms following COVID-19 are being increasingly recognized as a significant contributor to the morbidity associated with this infection. While data on the post-acute sequelae of COVID-19—more commonly referred to as *long COVID-19 syndrome*—are still emerging, it is clear that a substantial proportion of adults is affected by persistent symptoms following the acute phase of infection. There had been no standardized definition for long COVID-19, which is currently characterized by a heterogeneous mix of symptoms, though the World Health Organization recently developed a clinical case definition of post–COVID-19 with 12 domains of symptoms (WHO, 2021). The key characteristics of a post–COVID-19 condition are that it occurs in those "with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis." (WHO, 2021, p. 11).

The number of people living with long COVID-19 is not well established. One systematic review suggests that about half of people who have had COVID-19 infection have at least one postacute symptom at six months after the initial infection (Groff et al., 2021; Michelen et al., 2021; WHO, 2021). The WHO suggests that 10 percent to 20 percent of people with COVID-19 experience symptoms for weeks to months after acute infection (WHO, 2021). Risk factors for long COVID-19 include female gender, minority race/ethnicity, increasing age, severity of initial illness, and presence of other comorbidities.

The symptoms of long COVID-19 are highly varied, and likely represent different underlying disease processes and pathogeneses. Some symptoms may result from direct underlying damage to organs from the initial acute infection, while others may represent a postinfectious ongoing inflammatory response or yet another process. Symptoms may be of new onset after the initial recovery phase following acute COVID-19 infection or may persist from the initial infection. Systematic reviews of studies of long COVID-19 (Michelen et al., 2021) note that common symptoms are neurologic (e.g., headaches, memory problems, concentration difficulties, cognitive impairment, disturbance of taste/smell), mental health–related (e.g., anxiety, depression, sleep disorders), cardiopulmonary (e.g., breathlessness, cough), and systemic (e.g., fatigue, weakness, fever, sweating, dizziness). Other reported symptoms span essentially every system of the body. Symptoms may also fluctuate or relapse over time and can result in a significantly decreased health-related quality of life (Groff et al., 2021; Michelen et al., 2021; WHO, 2021). While vaccination is thought to lower the risk of long COVID-19, its full impact is not yet known.

In summary, the available evidence points to long COVID-19 being a complex, multifactorial syndrome that is affecting a substantial number of people worldwide. Research in this area would benefit from a standardized case definition, which would also help efforts to ensure fair WC policies related to these symptoms.

> rehab post COVID. They may be at work, but they may still have symptoms. They may have pulmonary issues, cardiac issues, foggy brain, fatigue. We don't know if these are all related to COVID. We can't even get a sense for the value of permanent disability. I don't know if it is rateable. Pulmonary and cardiac issues, you can probably rate.

Finally, we discussed with employers, claims administrators, and injured workers whether they had access to other sources to pay for their COVID-19 medical care. We heard from employers and from workers who had COVID-19 through exposure at work that their COVID-19 medical care was billed through non-WC payers, such as group health. We heard from employers and some claims administrators that many injured workers exposed at work used their own group health insurance for their medical care needs. A claims administrator for a public safety employer reflected on employees' use of WC for medical care:

> WC system should have dealt with COVID. Testing was through the city. The employees have had medical access through their medical provider. We have generous benefits including health care coverage. Health insurance has covered their medical care needs, unless there was long hospitalizations, large bills or extended symptoms. There was no need for WC.

A large hospital health care employer observed,

> It is hard to say what the type and range of medical care needed for COVID claims were, as employees who contracted COVID mostly got their initial care at employee health. If they needed to be out and quarantine, they were referred to the treating physician at employee health. Sometimes the employees are admitted into the hospital, but most often they were not. Then they mostly go through their health plan for medical care at that point. We have a managed provider network for our WC claims. They might have ended up at an Occ[upational] Health clinic for treatment, like Kaiser or Sentra. But for the claims that came in, we have seen the full range of medical care from medicines to nebulizers to hospitalizations.

COVID-19 Testing Was Outside the Scope of WC

We heard that access to testing by employees was not related to WC for several reasons. Most claims administrators and employers pointed out that WC is only applicable with a work-related injury, i.e., a positive case for COVID-19 that is work-related, which is determined after testing.

Testing for COVID-19 was provided through other means, such as by health care facilities themselves or by cities or counties that had testing sites. Testing was provided free of charge for employees and was often a requirement to work, especially for public-facing or health care employees. A claims administrator from a public safety employer explained,

> For testing, the fact that we hosted our own testing sites and provided access there made that easy for employees.

Injured workers similarly noted that WC was not a part of their COVID-19 testing but rather that they were able to access COVID-19 testing through sites set up by localities, their

employers, or their group health insurance. An injured nonsworn officer in a correctional facility who filed a COVID-19 claim stated,

> I do not think [WC affected testing]. It was so widespread to get tested even if you do not have insurance.

An exception we heard about was from non–health care or public employers. Employers discussed providing COVID-19 testing as a preventive and using their WC funds for funding such measures. However, by and large, these employers also did not feel that WC affected access to testing or medical care. A statewide employer in the agriculture industry asserted,

> WC doesn't . . . affect access to testing or vaccines or medical care. One, because we do have our own insurance company that WC and I do use monies from that fund for prevention matters. We did and do pay for testing from those WC funds. It is prudent to do that because it is about protecting the workers, or it can end up being much bigger cost if workers get sick. It is preventative. Top-dollar carriers do this, and I think it is a program that we should have, so we do.

The factors that we have discussed here affect workers' decisions to file a COVID-19 WC claim and are important context for our next topic. Next, we describe the stakeholder perspectives about the importance of WC indemnity benefits (i.e., temporary disability benefits), WC medical benefits, and WC death benefits.

Perspectives on WC Indemnity Benefits and Non-WC Paid Leave

As previously discussed, workers had access to multiple forms of paid leave for COVID-19–related issues, including quarantine for a positive test or prolonged medical care in the hospital setting. These were provided by federal law, state law, and employers' policies. Within the context of these paid leave policies, we asked injured workers with COVID-19 who did and did not file a WC claim, public health officials, employers, and claims administrators about the importance of having WC coverage for paid time off for COVID-19. This addresses RQ11: How important are WC indemnity, medical, and death benefits to workers?

Importance of WC Indemnity Benefits for Paid Leave

Indemnity benefits are compensation that is paid to a WC claimant for lost time that has been brought about by a work-related injury or illness. These benefits replace wages during the time that an employee is not able to work because of that work-related injury or illness. A few employers and claims administrators mentioned WC being important for workers to access paid leave for COVID-19, primarily when suffering extended symptoms or hospitalization. As we described earlier in Chapter 5 (in the section on Workers' Access to Non–Workers' Compensation Leave for COVID-19), nearly all workers had access to at least federal time off from the FFCRA or through CARES Act funding. Many employees also had access to supplementary state time off. This resulted in workers having access to paid leave for time needed for quarantine and for exposure to COVID-19. We heard that the federal and state paid

leave was sufficient for most employees, leading to little need for the WC system to cover paid leave. Few workers needed more than the 80 hours allocated through federal and state paid leave programs, as most individuals needed just the time for quarantine for positive COVID-19 tests. We heard this consistently across the types of employers and claims administrators interviewed.

Similarly, most injured workers noted that other forms of leave and their own personal leave were enough to cover their time off. Injured workers had mixed impressions of how important WC was to get back pay for personal time taken. One injured worker did get back pay, but others reported significant hassles with the WC system, or being denied back pay for time taken off. These workers did have applicants' attorneys at the time of writing, and their claims had not been finalized, so they may ultimately get their back pay. An injured hospital nurse who filed a COVID-19 claim was doubtful about making the effort:

> I did not get sick time back yet. I am not going to ask for that back. It is too much of a hassle. I just want to feel well. My main goal is to feel well.

WC was important in a few cases, particularly when someone had exhausted all other forms of leave but still needed time off related to a COVID-19 issue. This could be for caregiving responsibilities for family members, potential reinfections, or prolonged care needed to treat COVID-19 in a hospital. A public health official from an urban Southern California area raised this concern:

> If the need for leave related to COVID was extended past the 14 days, or the 80 hours of paid leave was used for taking care of a caregiver, but the employee did not get sick, and then later that employee got sick from work, then WC coverage was critical to them. . . . Recently, we have found employees coming in sick with COVID because it is not work-related and they have no [COVID-19 or sick time remaining], so they think they need to work sick. For those situations, WC would be a perfect solution.

Moreover, this federal or state-provided paid leave sufficed in many cases for time off for the medical needs from COVID-19 if it was not severe, as we described earlier (in the section Workers' Medical Care Coverage for COVID-19).

Overall, absent these federal and state leave innovations, the impact on WC probably would have been much greater and access problems for workers needing disability much more complicated.

Issues Implementing Federal and State COVID-19 Paid Leave

Employers noted a range of experiences implementing the federal and state leave policies. While a few employers said that implementing these leave policies was easy and managed largely by payroll, others noted significant changes to policies and practices to implement these leave policies, including coordination between payroll and employee health or the WC system. Employers incurred the costs of updating their human resources systems, hiring more staff for

compliance, coordinating between departments, and implementing new policies. For example, a health care nursing home employer described increased coordination and reporting:

> We coordinated heavily with payroll to set up a CD-PSL that is the supplemental paid sick leave. We coordinated closely. They had to run that time out before TPD would pay. If we are not talking about just WC, but even reporting. We had biweekly reports that came out. I don't have a number, but we had quite a few in the organization in the acute care setting mostly, but still some in skilled nursing. We had to coordinate the paid leave.

One major issue discussed was changing policies around quarantine in response to the availability of testing. An individual might be required to take off time for exposure without access to a test and then have to quarantine again for a positive diagnosis months later. A statewide grocery employer pointed out,

> One of the biggest challenges with the paid leave for employees was the multiple episodes of incidents. We paid for testing, positive or not. I can call in March and say I had symptoms consistent with COVID. If I was not tested, they had to isolate or quarantine in CDC [Centers for Disease Control and Prevention] guidelines. I can call back in June and say I had close contact exposure and isolate then. Now I call in November and now I am positive and get quarantine pay again. That is the biggest frustration and hardest thing to tackle. We are also dealing with people who have symptoms but do not get tested, but quarantine under CDC guidelines. This is to prevent exposure at the workplace to reduce risk to others coming in.

Another issue was the retroactive nature of the state leave policy. Because this affected leave already taken, one public safety employer noted that the constant changes in rules were not visible to the employee, but the employer was responsible for putting those policies in place and updating leave already taken while dealing with other issues, such as employee safety:

> It has been like standing in quicksand for the last 18 months. It is always changing. It is the same for providing sick pay. We had to deal with retroactive leave from the state, which was really complicated. I don't know if it is complicated for the employee. It is a lot of time and effort for employers in HR, payroll, and our fiscal folks. The rules keep changing. Even the rules when the governor did the executive order had retrospective elements. It was hard to deal with this in real time and then go back and readjust things.

Employer Practices That Protected Employees Against Income Loss

Employers implemented a range of practices and protocols to protect employees and prevent a loss of income. In particular, employers prioritized keeping employees with COVID-19 symptoms or positive cases out of work with paid time off. As one grocery employer stated, "If someone was exposed at work or out of work or had symptoms, we paid employees. That way, they did not come to work sick." This paid leave was either from the employer, financed by the CARES Act, or through the federal paid leave program.

Perspectives on the Importance of WC Medical Care and Death Benefits

Employers and claims administrators discussed their thoughts on whether WC benefits were important for workers to access testing, quarantine for exposure or a positive test, and receive medical care or hospitalization. Overall, employers opined that WC benefits were not important to access testing and quarantining due to a positive COVID-19 case. Most employers noted that WC is a reactive system, meaning that benefits are paid out to those who had a work exposure or a positive COVID-19 case. Thus, testing and time out for quarantine were not captured under WC, as they were used in the process of finding out about contracting COVID-19. WC was also deemed not important in relation to accessing vaccinations. These perspectives did not vary by the employer type or their location in California. One health care hospital employer summed up in this way:

> WC had nothing to do with workers' access to testing or vaccines or medical care, really. COVID testing was done on-site here and was not related to a WC claim. If you were a health care worker, it was on-site. Otherwise, it was a drive-through test or a vaccine. No one was treating for COVID, so you went home and only went to the ER if you had trouble breathing. 90 percent of people were good with the 80 hours they received of paid leave.

When asked about the impact of WC on medical and death benefits, all claims administrators agreed that having coverage through WC benefits did not affect whether employees with COVID-19 gained access to medical care; however, WC benefits were used to pay for medical care and to claim death benefits. For medical care coverage through WC in particular, claims administrators and employers both agreed that workers did not need WC to get access to medical care for COVID-19–related afflictions, either outpatient, emergency, or inpatient care. All health care facilities, including employee health departments within employers, accepted workers' group health insurance coverage when workers presented with COVID-19; we did not hear that employees were asked whether it was work-related. Most individuals whom we heard about or talked to directly did not file a claim until after they tested positive, needed medical care, or were hospitalized, so WC coverage was not necessary to access care, as was explained clearly by this TPA for health care employers:

> In terms of medical care, the employees would get their needed medical care regardless of it being in WC or not. You will get the care regardless, whether the hospital is writing it off, charging insurance, or charging WC.

However, some employers and claims administrators did note that WC benefits were important to pay for costly care, such as hospitalizations and respiratory therapy stemming directly from COVID-19. In most cases, workers would have care covered by their group health insurer as well, since federal rules required that treatment for COVID-19 be covered by all insurers. A TPA for health care employers described the process:

> As an employee, you don't typically go to a hospital for care that you don't work at. When you walk in, even if you have a positive test and you are a worker, they

> will ask for your insurance rather than ask you for WC. And that is the scenario that is taking place a lot. The employee won't call in for their time off and get a claims number. The hospital will work with the employee. When we get the WC claim, we will call in and get a doctor contact. If the employer tells us [that the employee] has been treated, we will call the treating provider to start the investigation and get the information from their medical appointment with the doctor and the doctor's examination.

Similarly, injured workers mostly discussed the issues and barriers around using WC to access medical care, such as difficulty getting their claim accepted or using group health insurance in lieu of WC because most of their care was covered by their group health insurance. A line manager at a manufacturing company who filed a COVID-19 claim used WC and insurance to cover the injury:

> I do not think [WC] made a difference because I was able to use the group health. Even now, I am using both. The portable oxygen is from WC. I am getting care from both. The pulmonologists, inhalers are through the personal insurance. I see the WC doc once a month and the QME [qualified medical evaluator] has been the only interaction with WC.

One injured worker whose claim for COVID-19 was initially denied had significant issues with the disease, ultimately leading to a cardiac incident. The roadblocks and issues accessing care made it difficult to use the system to get care, so he opted to use his group health insurance. An injured police officer who filed a COVID-19 claim noted from a hospital,

> WC sucks because they put up roadblocks to gain the care you need. They try to save money and make you jump through hoops. They have outdated protocol. How is PT going to help you with a fractured tibia with the bone fragments? Because their hands are tied, they have to play the game. There are too many roadblocks that leads to unnecessary pain and suffering. If I waited for WC to treat me, I would have died.

A few employers and most claims administrators also discussed receiving death benefit claims, though these were the least common claim received. Employers discussed the need to do a deeper investigation into these claims to determine the cause of death (whether it was COVID-19) and whether the exposure was from work. In most cases, employers knew whether a worker was hospitalized because of prolonged time off work or an existing WC claim, as described by this grocery employer:

> We are likely interfacing with the employee ahead of time, closer to the time that they are first sick or needing medical attention. If the person was hospitalized and then died, we would already know about the sickness and the claim.

But as a TPA for health care employers explained, cause of death in the presence of COVID-19 was not a straightforward determination:

> Right now, the death claims are under investigation. If we had a death certificate that says COVID-19, we would move it to settling. But if it says that plus eight other things, it is a tough scenario to determine if COVID was the cause of death. Who gave them COVID is also important. We still have to investigate that.

Summary

Across the interviews, we heard about a few differences among the phases of the pandemic. Most claims administrators and employers said that, early on in the pandemic, there was confusion about WC claims for COVID-19, but that dissipated by the end of summer 2020. Several claims administrators admitted that they were overwhelmed during the holiday surge of COVID-19 cases (i.e., November and December 2020) and that during that time, messaging about COVID-19 claims was not as consistent. We heard from employers and claims administrators that, early in the pandemic (prior to October 2020), employees filed COVID-19 claims for exposure only, out of fear of income loss, and also out of the desire to have a claim on file, i.e., a *precautionary* filing. "Exposure only" claims reduced dramatically in volume as dissemination of information increased about the requirements of needing a positive COVID-19 test for filing a COVID-19 related claim. During the winter surge in 2020, claims administrators and employers indicated that it was time-consuming to keep abreast of COVID-19 and the related laws.

Claims administrators and employers both noted that precautionary filings were primarily filed by first responders, such as police, firefighters, sheriff and correctional officers, and some health care workers, pointing to a combination of factors, including higher exposure to COVID-19, familiarity with the WC system, and the workplace culture. Claims administrators and employers also indicated that, by late fall 2020, claims were more routinely filed for being positive with COVID-19 and included a positive COVID-19 test. Overall, we heard that the main factors related to employee claim filing for COVID-19 were employee knowledge of the requirements to file a COVID-19 claim or exposure at work, having a positive COVID-19 test, not having any fear of job loss or hesitancy to engage in the WC system, need for more than 80 hours of paid leave, and need for and payment of medical care. About half of the employers we talked to admitted that they did not provide any messaging specific to SB 1159 or specific to filing a claim for COVID-19, indicating that they handled COVID-19 like any other injury in WC. The other half of the employers described how they partnered with unions or labor groups to assist them with messaging about COVID-19 and claims from their workers. Most employers discussed how they set up frequent communication with employees to ensure that employees felt comfortable coming forward about a COVID-19 exposure or a claim and that the workers would be kept safe. Claims administrators for public safety employers indicated that their departments (sheriff, fire, police) were well informed and well versed in WC, so they did not need to engage in much education on the SB 1159 presumption.

Claims administrators and employers across the industries in which we interviewed felt that their workers were not hesitant to file a COVID-19 claim, with a few exceptions. In agriculture, we heard from employers that some employees were hesitant due to governmental fear. This was coupled with the fear of possibly losing pay and their job. The majority of employers we spoke to mentioned that employees were not hesitant to file COVID-19 WC claims because there were

other avenues that employees could access and use to gain paid time off to quarantine or for minor sicknesses.

We heard across the board from all interviews that the federal and state mechanisms established in 2020 and 2021 for employers to provide paid leave to employees for COVID-19 reduced employees' dependence on their own accrued sick time and leave. In many cases mentioned, these other avenues also paid full-time pay, which is not the case with WC for time off. *Thus, absent these federal and state leave innovations, the impact on WC probably would have been much greater and access problems for workers needing disability much more complicated.*

Medical care provision for COVID-19 also had several important and unique COVID-related actions across the United States and in California. Early in the pandemic, the majority (88 percent) of workers covered by fully insured private health insurers were not required to pay co-pays and deductibles related to COVID-19 care in addition to having their out-of-pocket costs waived if they were hospitalized with COVID-19; however, this phased out in summer 2021 (McDermott and Cox, 2020; Ortaliza et al., 2021). Also, uninsured workers were covered by a federal program that paid health care providers for their care through HRSA (HRSA, 2021). This changed medical care cost decisions about COVID-19 for anyone, including workers who contracted COVID-19 through exposure at work.

According to employers, claims administrators, and employees, employees filed COVID-19 claims for two main reasons: (1) (as mentioned above) time off to quarantine that was over and above the 80 hours of state and federal paid sick leave or/and (2) coverage of primarily nonminor medical care costs, with a small percentage of claims that were high-cost. Note that co-pays, deductibles, and out-of-pocket costs were waived with a hospitalization for those who were fully insured. COVID-19 care often resulted in high medical bills for hospitalization, respiratory therapy, pulmonologist visits (for serious cases), and prolonged symptoms after recovery. We heard that many injured workers exposed at work used their own group health insurance for their medical care needs, not having to pay co-pays, deductibles or out-of-pocket costs with a hospitalization.

Long COVID-19 symptoms raised several issues with claims administrators whom we interviewed. Several claims administrators across the state raised the issue of the uncertainty of how future medical care and costs for COVID-19 claims would be determined. In addition, several employers, particularly for public safety and for health care, pointed out the possible litigation that may ensue for long COVID-19 claims.

WC benefits were not considered important to access testing and quarantine. Most employers noted that WC is a reactive system, so benefits were paid out after an individual had a work exposure or already had a positive COVID-19 case. WC was also not important in relation to accessing vaccinations. These perspectives did not vary by the employer type or location in California. Furthermore, when asked about the impact of WC on medical and death benefits, *claims administrators and employers both agreed that workers did not need WC to get access to*

medical care for COVID-19–related issues because group health insurance covered workers at any health care facility but did need WC to pay for nonminor medical care. Some employers and claims administrators did note that WC benefits were important to pay for costly care, such as hospitalizations stemming from COVID-19, including respiratory therapy and hospital care. In most cases, workers could have their COVID-19 care covered by their group health insurer, given that federal rules required that treatment for COVID-19 be covered by all insurers.

In addition, injured workers with denied WC claims being handled by applicants' attorneys pointed out several issues and barriers around using WC to access medical care, rather than if they had used group health coverage, such as difficulty getting their claim accepted, hassles gaining access to specialty doctors through WC, and denials of medical care payment.

6. Health and Safety Impacts of SB 1159

This chapter discusses what we heard during interviews about the health and safety impacts of SB 1159, which we cannot observe in the claims data. We provide perspectives offered by stakeholders on whether WC coverage of COVID-19 played a role in ensuring the safety and health of workers (**RQ12**). We also provide input on how employers were affected by other state policies on COVID-19 in the workplace, including AB 685, Cal/OSHA ETS, and SB 1159 reporting (**RQ13**). We review these perspectives and experiences to assess the fourth objective of the WC system: the encouragement of safety, delineated in the 1972 National Commission report as the WC system having "economic incentives that should reduce the number of work-related injuries and diseases" (National Commission, 1972, p. 15). This information answers RQs 12 and 13:

- **RQ12:** Does WC coverage for COVID-19 claims encourage workers' health and safety?
- **RQ13:** How have other state policies (e.g., AB 685 and the Cal/OSHA ETS) affected employers?

Perspectives on WC Affecting COVID-19 Spread and Safety for Workers

We asked public health officials—one state public health official; two regional public health officials in a large, urban, heavily COVID-19–affected county; and one nonurban county official—about their perspectives on how the SB 1159 presumptions and WC benefits influenced workplace safety and specifically how WC affected the spread and transmission of COVID-19.

Several public health officials noted overall that the spread of COVID-19 was influenced by WC only through how well WC identified and helped limit outbreaks. They stated more specifically that the SB 1159 presumptions and the outbreak tracking requirements drew employers' attention to outbreaks and spurred employers to address potential issues associated with infection risk. A public health official for a large, urban Northern California county stated,

> I think with the SB 1159, what stood out to me was how it interplayed with if there was an outbreak, then it could be followed up on accordingly and consider [the COVID-19 outbreak] presumptive. So work comp helped with identifying outbreaks.

One aspect of the outbreak presumption was that it included language for employers on how to rebut a worker's claim. Employers could show evidence of workplace interventions that they put in place to reduce possible COVID-19 exposure; this was described as an implied defense against a COVID-19 claim (i.e., how to rebut). SB 1159 indicated this specifically in the Labor Code for the outbreak presumption. (See Table 2.1 in Chapter 2.)

In most cases, public health officials were not sure that WC had any impact specifically on worker safety outside of outbreak scenarios. We heard that, early in the pandemic, employees would continue to come into work when they had the option to stay home or when they had potential exposures or were showing symptoms. Public health officials pointed to the paid leave as the greater driver of employee safety, not WC coverage. A public health official in a large, urban Northern California county asserted,

> I kind of see WC coverage and workplace safety as separate, although they line up in certain areas. Public health does investigations through contact tracing for safety and, if needed, if the employee could not continue to work, that is if it is job-related exposure then WC offers coverage for time off if they needed it. However, often employees came into work early in the pandemic when something happened, they did not know they could stay home and be paid, and they exposed others.

A public health official in a large, urban Southern California county department of public health acknowledged,

> At the beginning, WC didn't really impact workplace safety because we had the paid leave. One of the trends we saw was that [with COVID] workplace and home no longer has a strong line separating it for employees. One of the trends is that workplace cases could have started in the home and then COVID crossed over into work, infecting people at work. Before COVID, we do not get into asking employees about what they do over the weekend or at home. In the safety world, there were two big arenas: personal medical or work-related. We differentiated the two. For COVID, those lines blurred. With COVID, employees were open and honest about exposure. There was no harm no foul with disclosing the source because they were getting the time off no matter what from the federal and state matched leave. I didn't see any enhanced safety based on the ability to file a WC claim.

The public health officials interviewed noted that the role of WC was to help people postexposure or postcontraction of COVID-19. Other than the outbreak cases, public health officials we interviewed indicated that WC did not affect workplace safety. In a few situations, public health officials noted that individuals were more likely to come forward with symptoms or positive cases because they knew WC would cover them, but since paid leave was mostly paid through federal or state programs, these individuals used that non-WC paid leave rather than getting their time paid for by WC because the non-WC paid leave was easier to receive, needed to be exhausted before WC could be used, and sufficiently covered their time-off needs, as described by this public health official:

> I do [believe WC impacted COVID-19 transmission]. Positive COVID employees would stay out of work to recover. There was federal leave that trickled down to the employer and used by the employees. But WC did help on top of that paid leave time for things like medical treatment. It helps keep the employees out of work and not interacting with staff. So, it lessened the opportunities for transmission.

One public health official also noted that there were WC carriers in the state who offered proactive services to support employee safety. They helped reduce risk to employees by helping employers implement safety protocols proactively, thereby reducing the number of claims they received.

It is in employers' interest to keep sick workers out of the workplace to reduce the spread of COVID-19 and keep other workers safe whenever a positive COVID-19 case presented itself, regardless of whether it was work-related or not. Employers pointed to the federal and state paid leave as the mechanism that kept workers home.

This was corroborated by a health care management staff member at a Northern California County health care and hospital system employer:

> The federal leave is what helped with not having COVID spread. The issues were just about how the leave was managed in terms of safety. Workers' Compensation does not have a role in the spread of COVID or in safety. [WC] would be used only after a positive case.

A claims administrator from a statewide TPA for a southern California public safety employer agreed:

> I do not think WC had anything to do with improving safety. It was the paid leave from the federal or state that was important, not the WC benefit, for safety and allowing people to quarantine.

All public health officials interviewed also noted that the federal sick leave was integral to stopping the spread of COVID, especially among workers who were at high risk of exposure but did not have access to employer-provided leave. A public health official from Southern California reported,

> The federal and state paid leave was great. That did more than anything else to help public health and slow down transmission. If you are a low wage earner or a single income household, if you get sick, you may not have paid time off. In those situations, the workers are still going to go to work, because they cannot afford to not have that income. We see this with cold and flu season. You get people exposed with the coughs and sneezes. COVID is the same.

Alignment Between WC and Public Health Knowledge

In general, public health officials expressed the belief that the specific SB 1159 presumptions for frontline workers and outbreak workers for COVID-19 were in line with epidemiological knowledge—that is, that the frontline and outbreak presumptions, as written, particularly did cover workers at the highest risk for being exposed to and contracting COVID-19 and that using the 14-day window to calculate an outbreak was in line with knowledge about transmission and exposure. In particular, they noted the characteristics of those who should be covered, such as those in proximity to others or who could not work from home, as being drivers of that assessment. Some individuals who were not at higher risk, however, did get coverage under

these presumptions, even though they were at lower risk comparatively. One Southern California public health official noted,

> Current epidemiological knowledge points to workers who have to work in close contact with others at work are at higher risk. As long as the presumptions covered people who were interacting in public spaces, I think [that] is aligned with science. I look at health care and police, fire, and the grocery and retail where you have to interact with the public, and they are all essential. So, the presumptions covered the right people. Some of the office workers like myself, we may be getting it as we are considered essential workers, but our chances are much lower to get COVID given all of the safety and health protections.

Even though these individuals still had to work in these higher-risk conditions, reasonable efforts were taken to protect them outside of WC. Especially before the vaccine was available, employers were taking precautions by limiting exposure as much as possible. But some jobs required proximity to people and so could never be totally safe, as one statewide public health official acknowledged:

> Particularly prior to vaccination, yes, workers covered by SB 1159 and its presumptions are at elevated risk for COVID-19. Those who are higher-risk are those exposed to other people who could be infected. Depending on the type of job, the proximity to people, frequency of interactions, and control measures, which were limited in the beginning.

Some public health officials did have concerns with the outbreak presumption and whether it lined up with epidemiological knowledge of COVID-19 spread. A few had concerns with the thresholds for an outbreak, while others were concerned with applying the same standard across industries even though contextual factors heavily affect the likelihood of COVID-19 spread; one public health official questioned both thresholds and context:

> I am not sure of the efficacy of the outbreak and of the percentage definitions. I am not sure how they came up with the 4 percent threshold. What does it represent? Where did it come from? It seems a little random. 4 percent of a company of 500–600 versus 4 out of 100 is [a] really different set of numbers. The odd part is that the presumption does not take into account the workplace. How far are people working apart from each other? How often is there contact among employees or employees to clientele? Are the workers all in the office, or in a shared workspace? What is the ventilation like? There are a lot of public health transmission questions you can ask that are not part of the presumption.

Public health officials had additional concerns about the outbreak presumption. They stated that there was a lack of clarity on what met the definition of an outbreak. A public health official pointed out discrepancies:

> Our world of public health was on show and on display for everyone to see in this era of COVID-19. The troubles we had digging through regulations and staying complaint was hard. They did not line up. We saw the CDC guidance and Cal/OSHA ETS standards not aligning. We had issues with communications about these differences. We needed consistent communication to sync over time.

In practice, an outbreak under one set of standards or regulations was not an outbreak under others, leading to confusion. One public health official provided an example of a small workplace with individuals contracting COVID-19 from different sources:

> If we had a group of employees with ten employees each, and five get COVID, originally, that looks like an outbreak, but those were five individual cases that contracted COVID outside the workplace. So, is that a true definition of an outbreak? For Cal/OSHA, it was three+ in a given time, but not work-related. It was finally solved [with the emergency temporary standards] that five cases contracted outside the workplace is work-related. At times, we had a lot of cases in small departments prevaccine where they were doing things together for work. But now most of us are safer at home. If an employee got it home, how safe were they really?

However, public health officials did note that any defined outbreak did show that there was need to address workplace safety more broadly, even if it did not perfectly align with epidemiological knowledge of COVID-19 spread. One statewide public health official reasoned,

> Anytime there is an outbreak, three or four or five positive cases together, it shows transmission was in the workplace. The presumption specific to the outbreak brings more attention to the fact that there is something common to these workers that needs to be addressed to protect the rest of the workers there. So the outbreak presumption does align with epidemiological knowledge about COVID transmission.

Impact of Other Policies on Safety for Workers

Assembly Bill 685

When asked about the impact of AB 685 on WC and worker safety, claims administrators reported having little visibility and oversight of the process. This was the purview of the employer, with claims administrators being a "second set of eyes" on the reporting requirements. Overall, one public health official declared the reporting requirements to be overly burdensome and not specific enough to meet the objectives of reducing COVID-19 spread.

> I thought it was an incredible burden on the employers to have the required reporting and notification to all employees. It was well intended, to make people aware that that they might be exposed, but it didn't have enough detail or have enough flexibility to be able to use judgment or critical thinking. For example, there is no need to cause a panic among 500 employees when these 50 people might be the only ones exposed. That is a lot to deal with as an employer. If you can link it to contact tracing or other mechanisms, that would have been better.

A few employers discussed already having a tracking system in place, so modifying it for compliance with AB 685 requirements was not a lot of work. One health care hospital employer explained,

> We got a system up and running, but it had kinks at first. Because of the volume it was hard in the beginning, but we wanted to get it up and going. We had

> started it ahead of time. We created an email notification and a report that goes [to] the union for the positive cases. The email was leading a written notification. There were multiple forms of notification. We also did do contact tracing in-house. Staff will be contacted in person if they were exposed.

While there were some issues, systems that were retrofitted were able to get up and running with greater ease. A public health official shared a similar process:

> Early on, we realized that we needed to take control of the reins about what to report about an infected workplace or a positive case and what to communicate to other employees. Our early communication had too much information, as it included who was positive. Early on, before the bill AB 685 was passed, we put together templates that departments would use and put out if there was a positive COVID case. If there was a positive COVID case in a particular office, then a general information was sent out to everyone on that floor. It was a general communication to the floor occupants, saying "if you were a close contact, Occ[upational] Health will reach out." We provided information on who to call and what the symptoms are. We provided guidance on hygiene and coming to work. Then when the bill AB 685 went into place, we updated it to meet the requirements, but it was mostly the same. The notification went out on the same day as the exposure.

For employers that did have to take part in reporting, there was confusion around the policy. Employees were sometimes confused by what the notifications meant for them as employees, requiring increased communication from the employer, as described by this grocery employer:

> The biggest confusion about employees is that employee gets a notice. They call in and say they have had close contact. They say I do not know if I did or when. They get confused when they see "someone in your workplace tested positive." There is a difference; it is close contact. Then you will be called and told to quarantine.

Others noted confusion about who was included in reporting and what qualified as a workplace. This was true for industries in which people are out in the field or have different roles that move between places while others stay in a small, concentrated area. A lack of clarity and the need for the employer to make decisions on what "counted" and what did not led to a large burden on the employers, as this public safety employer illustrated:

> Operationally, with what we do in the fire department for example, a fire captain might be at four different sites in a day. What is then considered their worksite? . . . A lot of law firms and consulting groups had webinars and seminars, but it was clear there was no continuity or alignment. If there was an accident on the freeway, and then the ambulance takes the person to the hospital, what is the worksite if the fire department, sheriff, and hospital staff all interacted? There was not clarity on this. It was a good intention to keep people safe, but cross-agency work is common, and the effects were not as meaningful. The reporting has been more of a burden than a solution.

One employer discussed concerns about injured-worker privacy. One agricultural employer elaborated:

> We did not want to violate privacy or confidentiality, so we held, of course, to what was required for the notification to all employees. We made sure that anyone who was uncomfortable knew they could talk to us. We also wanted to know about each case and that allowed us to let them know things would be private and confidential. But we could notify about a positive case.

Cal/OSHA Emergency Temporary Standards

Claims administrators and employers noted several issues around implementing the ETS released by Cal/OSHA. As with other policies and regulations, claims administrators and employers noted challenges with the regulation, including the heavy lift and burden to implement the policy and set up the reporting and outreach materials. In particular, administrators discussed the short timeline between the release of the regulation and when it was expected to be implemented, like this claims administrator for a Northern California County employer:

> It was difficult and confusing for people to understand when it first came out. We didn't have time to set up the changes and do the training before we were being held accountable. We are a huge organization that needs a lot of time to train. We have union issues.

Another claims administrator, for a statewide health employer, discussed issues with reporting specifically related to hospitalized patients:

> The hardest part for us is meeting the deadline for OSHA for hospitalization. When you are not in COVID, when someone is injured or ill at work, you know that since they are working when they get hurt. Everyone knows what to do for that type of case. With COVID, people went home. At some point, while they are home, they realize they need to go to the hospital. The last thing they do is tell an employee or their employer that this is work-related for the reporting; they go to get medical help. The way we found out someone was hospitalized was through a family member, a manager. The thing is the employee did not call their manager before they went into the hospital to tell them. Just because they are in the hospital doesn't mean the manager knows they are in the hospital.

A few claims administrators discussed not taking part in the ETS implementation at their worksites and instead relying on employers and occupational health to handle reporting and implementation of the policy. As with the outbreak presumption, employers noted issues with the definition of what *outbreak* was in the standards, like this grocery employer:

> The definition of an outbreak was not well defined when OSHA first published the standard. They had different FAQs for that. If you think about a retailer, I have 2,000 employees. Most employees' workplaces are different than an office setting. One of the biggest issues, the methodology did not follow epidemiological methods in terms of looking at the likelihood of exposure being tied to cases, was the issues of needing to be at the same place, same time, same shift, and no other likely exposure. But that was not defined. They did come back in the FAQs to further define it for employers. It is still somewhat confusing. We have worked through it the best we can.

Compounding the reporting burden were changes in the regulations, leading to increased confusion and burden to the employer to change internal processes to continue to comply with the ETS, as summarized by one health care hospital employer:

> There were quite a few issues with Cal/OSHA. Cal/OSHA has been a harder thing to stay on top of because the regulations keep changing and do not account for the size or type of organization.

One manufacturing employer added,

> It was difficult for legal when the emergency temporary standard was put in place for Cal/OSHA. For state agencies versus 1159, the reporting was different. We broke the rules up by department; the legal department took the temporary emergency standard, and I worked on 1159 to prevent confusion between the two.

Summary

Across the interviews, we heard mixed perspectives from public health officials about how WC during the COVID-19 pandemic affected worker safety. On one hand, **public health officials noted that the SB 1159 presumptions and the outbreak tracking requirements drew employers' attention to outbreaks and spurred employers to address potential issues associated with infection risk**.

Even though the labor code for the outbreak presumption specified that employers could rebut a worker's COVID-19 claim by showing evidence of workplace interventions that they had put in place to reduce possible COVID-19 exposure, **public health officials still indicated that WC** was primarily to help workers postexposure or postcontraction of COVID-19—and therefore did not impact prevention or **safety directly.**

Furthermore, public health officials agreed that the SB 1159 presumptions for COVID-19 did align with epidemiological knowledge about the spread of COVID-19, particularly given that the presumptions identified those at greatest risk for contracting COVID-19 as frontline workers or those exposed within an outbreak at the workplace. That is, officials agreed that **the frontline and outbreak presumptions as written did cover workers at the highest risk for being exposed to and contracting COVID-19**, and that using the 14-day window to calculate an outbreak was in line with knowledge about transmission and exposure. However, this support of the SB 1159 presumptions by public health knowledge was not as clear for the specific outbreak definition thresholds and the different workplace definitions and scenarios that existed across industries and workplace composition.

In addition, it was the state and federal paid leave policies that were what encouraged safety, allowing employees to stay home without income loss. All public health officials interviewed noted that the federal sick leave was integral to stopping the spread of COVID-19, especially among workers who were at high risk of exposure and did not have access to employer-provided leave. Employers also voiced a desire to keep sick workers out of the workplace to reduce the

spread of COVID-19 and keep other workers safe whenever a positive COVID-19 case presented itself, regardless of whether it was work-related.

Lastly, the additional reporting requirements imposed by AB 685 and the ETS were considered a significant burden to employers without some type of system already in place to track COVID-19 exposures. There was also some confusion about the rules regarding reporting, and employers were concerned about preserving employee privacy when notifying employees of potential exposures.

7. Administration of COVID-19 Claims

This chapter describes the views and experiences of claims administrators and employers on the administration of COVID-19 claims. We review the efficiency of the delivery of WC benefits in terms of how the system handled COVID-19 claims; this is the fifth objective of the WC system upon which the other four basic objectives (reviewed in the proceeding chapters) are dependent. The 1972 National Commission report indicated that, to have an effective system for delivery of the benefits and services, "the four basic objectives should be met comprehensively and efficiently" (National Commission, 1972, p. 15). To assess this, we review the volume of COVID-19 claims in relation to non–COVID-19 claims and discuss claims administrators' experiences with delays, denials, and claim acceptance and the type of documentation that was needed and requested. We also describe claims administrators' perspectives on the 30- and 45-day mandated SB 1159 timelines (**RQ14**), the definition of an *outbreak*, and the specific SB 1159 presumption and reporting requirements to address whether those presumptions and reporting requirements led to administrative burdens on claims administrators or on employers (**RQ15**). This information answers RQs 14 and 15:

- **RQ14:** Are COVID-19 claims processed in line with the timelines mandated in SB 1159?
- **RQ15:** Have the presumptions and reporting requirements created by SB 1159 led to administrative burdens on claims administrators? On employers?

COVID-19 Claim Volume and Its Impact on Claims Administration

Employers and claims administrators all noted that their COVID-19 claim volumes seemed to coincide with the surges in the spread of COVID-19 across the state of California and nationally. In particular, employers and claims administrators reported a high number of claims early in the pandemic (March and April 2020), with surges in claims at the end of the summer (August and September 2020), over the winter holidays (December 2020 and January 2021), and a final spike during the summer that was ongoing (July 2021 onwards) at the time of the interviews. Employers and claims administrators speculated that the ongoing summer surge was likely due to the relaxation in precautions, reduced mask usage, and the spread of the Delta variant.

Claims administrators discussed the impact of the pandemic and COVID-19 claims on non–COVID-19 claims. Almost all claims administrators noted that because many staff were working from home, the number of non–COVID-19 claims went down. A few claims administrators noted that employees pushed off care for other WC claims to avoid exposure at their medical care provider's office, or that the medical care that they needed was postponed or severely delayed as hospitals focused on COVID-19 care and shut down many elective surgeries and

procedures. Only one claims administrator whom we spoke to estimated that the reduction in non–COVID-19 claims offset most of the increase in COVID-19 claims; the remaining claims administrators managed larger claim loads during most of the pandemic. A claims administrator for an employer in large urban Northern California county said,

> We had a drop in other non-COVID claims. We had about a 3-percent increase in overall cases; the drop in the other non-COVID cases really helped.

Claims administrators reported a variety of issues with administering the large influx of COVID-19 claims. Most claims administrators discussed staff shifting assignments to handle the influx of COVID-19 claims in specific industries or during specific surges and hiring or need to hire temporary staff to deal with the increase in claims, like this claims administrator working for a statewide insurer that covers health care providers:

> We have a very flexible WC program. We can cover many shifts in claims. We rearranged and moved people, especially at the beginning to get staff on the COVID claims and get up to speed on the details and rules. We shifted coverage. We expanded resources in certain offices and locations because we wanted to train a group of people rather than the whole organization.

The types of claims coming in for COVID-19 were primarily indemnity claims for time off. Multiple employers and public health officials noted that the volume of claims was lower than expected due to the availability of federal and state-mandated COVID-19 sick time. As one public health official explained,

> Last year, [we had] the Emergency Paid Sick Leave that was for all federal civil service employees and the FFCRA that was mandated for all employees. It was 80 hours of leave. A lot of the cases in the city were covered in those 80 hours. I don't know how many transitioned into a WC claim when they needed more than the 80 hours leave. A lot of the folks isolated or quarantined and did not need to use a lot of their own sick leave.

For employers and claims administrators who did have COVID-19 claims, the next-most-common reason for filing the claim was for medical care, including medical attention and new therapies for patients who had COVID-19, and hospital care for more acute cases. See Chapter 5 for details on the type and range of medical care for COVID-19 claims.

Administrative Timelines and Initial Claim Outcome

When asked about the shorter COVID-19–specific timelines for processing claims, claims administrators raised multiple issues. Commonly, claims administrators discussed the increased administrative burden on claims administrators stemming from the reduced investigation periods, from 90 days on a typical WC claim to 30 or 45 days for the COVID-19 presumptions. This burden was not only related to a shorter time to investigate and make a decision about a claim, but it also encompassed the need for changed processes and workflows to accommodate the type of evidence needed for a COVID-19 claim (such as a positive test, an employee interview, workplace information) with an efficient mechanism for gathering information from injured

workers. Unlike other presumptions or changes required to the WC system, these modifications stemmed from an emergency and required rapid action and mobilization along with adaptation to new work environments, as described by a claims administrator for a statewide commercial WC insurer:

> From my experience, SB 1159 was one of the most difficult regulations to follow, since it was implemented in an emergency. Usually, we have some time to implement. We had no foundation for such tracking, and we had to . . . build a tracking system for our policyholders overnight. We are still working on it because we had to jump in so quickly.

Claims administrators talked about the difficulty of collecting all the necessary documentation for a COVID-19 claims during the investigation period of the claim, including gathering the proof of a positive COVID-19 test or existing COVID-19 infection. They pointed out that it was difficult to process and investigate claims according to the shortened timelines and be certain that they had gathered sufficient information about whether the worker was exposed at work. A few claims administrators noted that the reduced timeline led to higher use of *conditional denials*: If, after exercising due diligence, a claims administrator was unable to gather the necessary information to accept or deny a claim by the deadline (i.e., for non–COVID-19 claims, the 90th calendar day), a claims administrator might issue a *conditional denial*, which permitted the claims administrator to continue to investigate the claim for an additional 90 calendar days. This delayed the decision for a worker and allowed the insurer to gain more time for investigation or for a pending agreed medical examiner (AME) or panel QME report, as a claims administrator for a statewide health employer explained:

> Conditional denials went away a long time ago, but we had no choice but to use it with the 30-day timeline for COVID claims. If you look at it from the employee perspective, 30 days probably was right. If you think about it, the presumption works for 30 days for a normal employer. For us, though, when you have 1,000 claims come in in one month and have a staff of 57 examiners and some temps, they came in so fast, so 30 days was tough.

There were also concerns raised about the shortened claims investigation period and whether those abbreviated timelines truly benefited injured workers. While getting claim responses faster was beneficial for workers in general and was done with good intent, the shortened timelines were hard for claims administrators.

With the presumption in place, several claims administrators reported that they accepted more COVID-19 claims, given that disproving that the COVID-19 exposure was work-related was difficult. In response to the shortened timelines, these claims administrators relaxed the level of proof needed for a COVID-19 claim. If the worker was a frontline worker and the presumption was in place, the preference was to accept claims on the timeline of 30 or 45 days. As one claims administrator said about denying claims for health care workers, “You need a heck of a good reason to deny a COVID-19 claim.” Another claims administrator for a public safety employer in Northern California revealed,

> We are probably accepting more [COVID-19 claims] than we should. Some of these cases are probably not COVID contracted at work, but we are hemmed in to accepting them unless there is strong countervailing evidence. We do not have the timeline to do that. So, we accept them.

One TPA claims administrator for health care employers discussed significant challenges with health care workers in particular:

> It forced WC managers to work faster, and I am not sure that we worked better. I think that is why we were more liberal in handling some of the claims. The law forced us into that. I don't know if that is better at the end of the day. We were not able to get information that we needed in such a short window. For health care, the employees also stopped working. It was very difficult to get medical care and records from the doctor's offices. We could not get the employees the medical care they needed because they all moved to telemedicine. Office staff were at home so we could not get medical records. 30 days to get things done, investigate and gain records was insane. We had to use our gut and go with it to make a determination at 30 days.

Other claims administrators discussed their department's alternative strategy, which was to deny claims and then overturn the decision if there was any change or update showing that a worker got COVID-19 at work and could produce evidence of a work-related exposure. A claims administrator at statewide TPA for public safety employers opined,

> I do not think that the shortened timelines for COVID claims impacted decisions. Not necessarily. We had a plan set in place to review files and claims. There was a plan in place for the 30 days. Accept them if they have positive COVID test results within the period of time in the statute. If the claim does not have the positive test in the time period, we denied it and would wait for more results and information. Because it was 30 days, we would deny the claim at the 30 day and get results a week later to overturn the denial. We did not use the delay often since it only gave us two additional weeks and then the claim could get lost in the system. We also did not use . . . conditional denials.

Evidence on Timing of Claim Denials from WCIS

To provide additional evidence on the extent to which claim administrators were able to implement the shortened timelines required under SB 1159, we used the WCIS to examine the timing of initial claim denials by analyzing the interval from the date when a claim was submitted to the date when the claim was initially denied.

To measure the date when a claim was submitted, we used the minimum of the date when the claim was reported to the employer and the date when it was reported to the claim administrator. Measuring the date of a denial is less straightforward because there is not, to our knowledge, any data element in the WCIS corresponding to the date when a denial decision was made or communicated to the worker. Instead, we used information on the date when the claim denial was reported to the WCIS. For claims with an initial denial reported on an FROI, DWC programmers extracted the date when the FROI reporting the denial was first submitted to the WCIS by the claim administrator. (This date is known as the *maintenance type date*.) WCIS

regulations require that claim administrators submit at least 95 percent of FROI indicating claim denials within ten or fewer days after the date when the denial decision was made.

Further limitations should also be noted. Claims that do not involve lost work time might receive an initial denial (reported on an FROI) at the statutory deadline of 90 days, so we also note that some unknown proportion of claims with an initial denial reported more than ten days after the statutory deadline are likely to be in compliance. Given the limitations of the data, 100-percent compliance for any of these groups is likely unrealistic. Instead, a better benchmark may be the processing of non–COVID-19 claims prior to the pandemic.

Subject to those caveats, it is still possible to use the data on the timing of FROI reporting to ask how often denials of frontline workers' claims were reported to the WCIS within ten days of the relevant statutory deadline. For workers potentially covered by the outbreak presumption, the statutory deadline is unknown, but it is possible to ask whether claim processing timelines were accelerated for COVID-19 claims after the shortened timelines were adopted.

Table 7.1 displays the percentage of initial denials reported to the WCIS within ten days of the applicable statutory deadline (30 days for frontline worker COVID-19 claims and 100 days for non–COVID-19 claims) or within 55 days for COVID-19 claims potentially covered by the outbreak presumption.

Table 7.1. Reporting Timelines for Initial Claim Denials of COVID-19 and Non–COVID-19 Claims

	Total (all frontline)	Total (all frontline)	Health Care Workers	Health Care Workers	Peace Officers	Peace Officers	Fire-fighters	Fire-fighters	Other Occupations	Other Occupations
	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID
Frontline and outbreak presumptions in effect (7/6/2020–6/30/2021)										
Mean duration to initial denial	39.9	56.1	41.6	47.0	36.4	65.3	31.8	65.3	40.0	54.6
Adjusted mean duration to initial denial	39.9	56.1	41.6	50.0	36.4	66.3	31.8	70.5	40.0	57.6
Median duration to initial denial	29	59	30	27	28	78	27	79	37	44
Proportion of denials reported within 10 days of statutory timeline (%)	66.5	92.6	64.0	92.2	75.2	93.7	74.3	90.6	83.5	90.3%
Adjusted proportion of denials reported within 10 days of statutory timeline (%)	66.5	91.7	64.0	91.9	75.2	93.0	74.3	87.8	83.5	88.9%
Statutory timeline (days)	30	90	30	90	30	90	30	90	45	90
Number of observations	4,160	3,136	3,372	1,552	490	1,262	298	325	13,981	16,869
Prepandemic (1/1/2019–12/31/2019)										
Mean duration to initial denial		82.1		78.2		84.9		92.4		86.0
Median duration to initial denial		65		50		79		80		58
Proportion of denials reported within 10 days of statutory timeline (%)		84.3		83.4		85.9		84.6		83.4%
Statutory timeline (days)	N.A.	90	N.A.	90	N.A.	90	N.A.	90	N.A.	90
Number of observations		3,809		1,931		1,400		490		29,676

NOTES: N.A. = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 2 and Appendix B for details. Cost estimates in table include claims with initial denials and claims with zero paid benefits.

For claims with 2019 injury dates, the median time to an initial denial decision was 59 days for workers who would later be covered by the frontline presumption and 52 days for other workers. About five in six initial denials in both groups of workers were reported to the WCIS within 100 days, which is a timeline that is consistent with the 90-day statutory deadline.

Since the SB 1159 presumptions took effect, about 90 percent of initial denials of non–COVID-19 claims were reported within 100 days of the claim filing date. We note that some of this apparent acceleration in claim processing was due to the mechanical effect of looking at more recent injury dates. When we compare claim denial timelines, we see that, in fact, COVID-19 claims are denied dramatically faster compared with non–COVID-19 claims. The median time to reporting of initial denials for COVID-19 claims filed by frontline workers in the year after the frontline presumption took effect was 29 days, versus 59 days for non–COVID-19 claims filed by frontline workers. Sixty-seven percent of COVID-19 claim denials for frontline workers were reported to the WCIS within 40 days of the date when the claim was reported. Among frontline workers, the proportion of denials reported within this timeline was 64 percent for health care workers, 75 percent for peace officers, and 74 percent for firefighters.

The median time to an initial denial for COVID-19 claims in other occupations was 37 days. Eighty-four percent of COVID-19 claim denials for workers in other occupations were reported to the WCIS within 55 days of the date when the claim was reported.

Taken together, the results in Table 7.1 do indicate that COVID-19 claim denials were processed more quickly than non–COVID-19 claim denials during the pandemic, and that the majority of initial denials were reported in line with the shortened statutory timelines created under SB 1159. These results cannot be taken as evidence of compliance or noncompliance with the statutory timelines because of the many caveats noted above, but they do suggest that claim administrators expedited processing of COVID-19 claims—which is what we would expect to see if the shorter statutory timelines in SB 1159 had their intended effect.

Perspectives on Feasibility of Proving Job-Relatedness of a COVID-19 Claim

When assessing the job-relatedness of a COVID-19 claim, all claims administrators interviewed agreed that having a positive COVID-19 test was necessary but not sufficient to prove a claim. Data on the relationship between test results and claim denial or acceptance decisions were discussed extensively in Chapter 3. Every claims administrator and most employers noted that the positive test was necessary. Half of claims administrators also discussed the need for a doctor's note regarding whether a positive test was needed (such as when a patient already had active COVID-19 symptoms). A doctor's report of injury is typical for any WC claim (California Workers' Compensation Institute, 2021). The structured employee interview was the component necessary to claims administrators to determine whether the COVID-19 exposure was work-related. In our interviews, we heard about a range of questions used by claims administrators to determine

- essential work functions
- other potential sources of exposure
- when symptoms were first noticed
- when symptoms were reported
- what symptoms the worker was experiencing
- other COVID-19 cases at worker's place of employment or jobsite

Some claims administrators discussed processes in place to determine work-relatedness of a claim, such as this claims administrator from a statewide commercial insurer:

> We have a whole list of questions related to exposure and their activities that we use to determine this. We rule out as many other exposures of COVID as possible to see if work is the only place it could have occurred.

Employers outside of the health care context were less confident in determining the work-relatedness of a claim. Beyond obvious cases, such as an outbreak in the office, employers outside of the health care context said it was difficult to prove that the source of the exposure was work-related. Employers used employee interviews and contact tracing to try to determine whether exposure occurred at work or could have happened outside the workplace. Employers often created lists of questions to rule out as many other sources of exposure as possible, leaving workplace exposure as the most likely source. However, to assess a claim for a presumptive group such as frontline workers, it was difficult to prove that exposure was definitely not work-related. For employers of workers who were not frontline workers, such as construction workers and nonsworn peace officers, it was clear that a worker was exposed to COVID-19 at work only when there was an outbreak at a jobsite, as acknowledged by a construction employer in Southern California:

> Say there was an outbreak and several people on the construction project got COVID-19; that is clear[where they were exposed]. But other than that fact, it would be hard to prove it is work-related.

An urban Southern California public safety employer concurred:

> For the nonsworn or other types of workers without a presumption, it is impossible to prove you got COVID at work, unless there is a massive outbreak. If you have been anywhere else at all—grocery store, talking to a neighbor—you have a lot of trouble proving that it is more likely than not you got COVID from work.

Similarly, health care employers also noted the difficulty of proving whether a claim was work-related; most used contact tracing and the employee interviews to determine whether exposure happened on the job. In most cases, these interviews were meant to ascertain whether any other exposure could have occurred. A health care manager in a nursing home in Southern California admitted to uncertainty:

> I cannot tell you if the employee's COVID-19 is work-related. I cannot trace it. Unless they were on vacation for two weeks or a month and not at the facility,

> then that would be most likely from the outside. I do not know if they got if from the store or from outside.

In instances with death benefits for a COVID-19 claim, one employer noted that they needed COVID-19 to be listed as a cause of death on the death certificate to prove that COVID-19 was work-related and the cause of the employee's death to accept the final claim.

In contrast, injured workers were often confident that they got COVID-19 from the workplace. In multiple cases, injured workers reported knowing that someone else in their workplace was sick and that they had been exposed to that person, or that they were the only person sick in their family, as illustrated by these two injured manufacturing workers:

> Well I know I was exposed at work. Two others got sick that I know of, but I was the one that got the sickest. In my office I later heard others got sick as well. Various people. I don't go out and was not going out during that time so I know I got it there.

> I know they asked for names and there had to be a certain percentage of people to qualify. I had to tell them what I do, how long I had been there. They key was how many people had COVID. It had to have a certain percentage and then it was easier to prove it was an outbreak. They were fighting, saying others got it from outside. In our home, we have five people and none of them are tested positive. That was everyone else in the home. That supported my case.

Over the course of the pandemic, the working and home environment for workers has changed, particularly in regard to potential exposures to COVID-19, testing, and safer-at-home rules. Initially, COVID-19 testing was difficult to procure. Employers struggled with getting enough testing with results fast enough for their workers and knowing how best to connect their employees to necessary resources, as described by this public health official:

> If employers were more proactive, that is if employees felt sick, they should get tested, the employers could provide resources or support for how to access health care through group health. Or smaller employers that did not have group health could provide supports for how to get medical care through clinics or urgent care. In the early phases of COVID, you could not get tested at any urgent care. So in the beginning finding a test was problematic.

In addition, PPE and sanitization products were also difficult to procure. One public health official related how employers worked to keep those workers who could work from home in the home while trying to promote safety within the workplace for those who had to be on-site:

> Before telework was required, we had city telework mandates to transition out of the office and those were really important. For those on a worksite, hand sanitizer was not available for purchase early on. We were working as much as we could to get that in place to provide PPE and cleaners as best we could. We were working on this before the requirements.

One additional issue discussed by a public health official is the impact of the vaccine on workers contracting COVID-19. While it was agreed that vaccines were going to be effective to

reduce COVID-19 transmission, there was some concern that those who contracted a breakthrough case with mild symptoms might not realize they had COVID-19. The impact of those potential breakthrough cases and their effect on workplace transmission was not known, and the official identified them as troubling:

> I am concerned for transmission post vaccination. Now with vaccination, the symptoms are less and look like colds or allergies, so the employees are coming to work. In one case, someone had been vaccinated and came in to work on Thursday but tested positive on the weekend. That is a personal concern of mine. That could be a real problem. People can be a carrier and have minimal symptoms where they don't get tested and don't know they are sick. If you are just feeling a little off that day, you may still come in and expose others.

Claim Payment

No injured worker had a claim finalized and paid out as of the time of writing. In two cases, claims that were denied were still being adjudicated, and in one case, the claim was filed for back pay and still pending at the time of the interview. Another claim was awaiting a QME evaluation.

In each case, the injured worker was working with an applicants' attorney to collect medical records and other documentation, such as positive test results, to appeal denied claims.

Claims administrators discussed difficulties with understanding how many workers were using group health for their COVID-19 care. Employers expected more COVID-19 care and claims but assumed that lesser volume than expected was attributable to the use of group health insurance. This was noted earlier in a quote by a TPA for health care employers in Chapter 5.

Administration of the Frontline Worker and Outbreak Presumptions

Several claims administrators and employers discussed implementing the frontline worker presumption using a broad, general definition of a *frontline worker* rather than the specifics of the Labor Code delineated in the presumption. We discuss the definition of what is considered a *frontline worker* in Chapter 2. One health care hospital employer noted that all of their organization's claims were presumed to be for frontline workers, since their workers worked in health care:

> The WC claim was processed and time off was given, since it was presumed as essential health care workers. Because of the short timeline to make a decision on the essential worker WC claims, we accepted the WC claim and didn't have a reason to deny it, since we did not have the time to investigate more deeply. As long as the presumption is there, we moved the essential WC claims through the process on the compressed timeline.

Both claims administrators and employers highlighted issues with implementing the outbreak presumption, specifically, related to the definition of *outbreaks*, as mentioned earlier in Chapter 6. Most claims administrators and employers discussed the lack of clarity of the definition of an

outbreak, especially early in the pandemic, and the difficulty in setting up systems for tracking and reporting outbreaks. A statewide commercial insurer said,

> We did not have an outbreak definition prior to SB 1159. We had to use case law to determine that for exposure at work as an outbreak. When we got clarity on the outbreak definitions, we could apply that definition to the claims.

Tracking systems were built quickly and had to track multiple aspects of positive tests, claims, and potential exposures for workers. Outbreaks were just one of the many items that claims administrators and employers had to report, and systems had to be coordinated and aligned between many agencies internally and externally to meet all the regulations and requirements on employers. A claims administrator for public safety in an urban Southern California area told us,

> The main areas of concern for outbreak tracking was the new tracking system. We did not have that set up, so with 33 departments, with many supervisors and directors. We worked with IT to create that. It was a bumpy ride at the beginning. It was a burden that we had to overcome because we had a lot of working parts and a lot of claims coming in. We had other reporting to do to the CDC and county with its own requirements as well. It was hard to get through the notice and reporting requirements.

One issue that emerged for claims administrators who were dealing with both frontline and nonfrontline workers was balancing and managing the different presumptions, adding to administrative burden. One public safety claims administrator in an urban Southern California area who worked with both frontline workers (sworn officers) and nonfrontline workers (nonsworn police department employees) discussed how claims were handled differently by employee type:

> The sworn were clear-cut. The civilians, it was presumptive if there were other positives near them for the outbreak definition. Otherwise, it is a regular claim. For outbreaks, we had a good number of denials because there was no "outbreak" based on the definition. Through our investigation, other family members had positive cases so it made the work connection unclear.

As mentioned earlier in Chapter 6, public health officials also expressed concerns with the outbreak definition, particularly as it related to how outbreaks affected the spread of COVID-19. The chief complaint discussed by most public health officials was definition of the worksite and local context for an employee. Number of employees is an important contextual factor included in outbreak tracking, but how spread apart employees were or whether they were on the same or different floors was not considered in the definition despite those questions being crucial to determining whether the outbreak presumption would actually affect employee health. The definition of an *outbreak* does not take into account the type of employment or facility itself, or what employees do for work. A Southern California public health official explained,

> What I question is that all employers, all with the same number of employees, face the same risk without any knowledge on the workplace environment. Is it 25

> in a small space like a retail store, or are these same 25 workers in a giant warehouse? That is a whole different situation. How much ventilation is there, how much air flow is there? But the workplace safety and exposure differ largely by the workplace and working conditions.

Another issue brought up by a public health official was the disconnect between positive tests for COVID-19 and the actual number of COVID-19 patients. Because tests were not readily available for so long, and there were many people who were asymptomatic, actual cases exceeded the number of reported cases. This created further complication when defining an *outbreak*, and the official pointed out that some people could be positive for COVID-19 without anyone's knowledge:

> There are gaps in reporting for COVID at every level. There are a lot of asymptomatic people. If there are no bad symptoms, you may not get tested and that is an unreported number. The number of actual cases is likely 2.5 times greater than those who are testing positive. As far as WC or the presumption plays into this, the workers are not thinking "I should get tested to use WC." WC only covers time off work if you are not having strong symptoms.

SB 1159's Reporting Requirements and Outbreak Tracking

When asked about the outbreak tracking and reporting process, claims administrators and employers discussed multiple issues and administrative burdens associated with the process. The chief concern was the added administrative burden of tracking, including setting up a new system, establishing a process to collect and track data, and submitting reporting to multiple agencies, as described by a statewide insurer:

> The biggest challenge with outbreak and outbreak tracking was that employers only had to report claims. This is a new process. There was no mechanism in place. We were working with departments to get this set up. It was one of the pieces we would be responsible for. We worked with our team to set up the infrastructure for the outbreak tracing and tracking and reporting. It was a challenge. . . . We created a form that can be filled out because there was so much confusion about what to report. We created a calculator for our adjusters to go in and check. It is tracking cases of COVID and allowing access to check the counts. They can't just check on the status times, but it was a sliding scale. It is 14 days within a test, after or before, so it was a sliding scale.

There was a variety of systems developed for tracking purposes. Some sites had systems in place that developed over time, becoming more advanced and tailored, while others used other data sources that already existed for outbreak tracking, including systems created by TPAs.

> I think the contract tracing workflow that we had went really well. We had to develop the templates, train the HR staff, and we had it set up in April 2020 as a separate reporting mechanism. The legislation came out after that so we were already there when the law came into effect. We could use our reporting tool for the tracing. (Northern California county employer)

> We had to respond really quick. We threw together a spreadsheet if there were four or more from a location. This then developed as we had more time. We then had our software that would trigger if we had an outbreak, and we would alert the employers if that happened. (TPA for health care employers)

> We [as a TPA] implemented a statewide tracking system. Employers were able to enter their numbers into that statewide system. We are able to track and identify outbreaks based on their data, specifically by location. It is all tabulated by client. The claims offices get regular updates when a particular location hits the outbreak criteria. This has been great and helpful. (Claims administrator from a TPA for public safety employers)

The rules also required a sliding scale for the window for outbreak tracking, so systems had to be dynamic and retrospective as well. Claims administrators, like this one from a large, urban Southern California county, also had to check the system multiple times and update periodically, adding administrative burden and, in some cases, affecting accuracy:

> Measuring the outbreak is difficult. You have to take the rolling average of the cases and divide by the estimate of those on the worksite. I understand what they were trying to do, but it was difficult. I only know my employees, but there are shared facilities, and I don't know their situation. I don't think the numbers are very accurate. There is motivation for people to say things are working great. I have been doing WC a long time. Nobody does everything great. I doubt people are doing this reporting with exactitude.

For sites that had positive COVID-19 cases, employers noted that there were additional concerns with the alignment between outbreak tracking and employer context. Guidance was vague, and questions about what to count were hard to get answered. Some employers, such as home health agencies, do not have large offices or workers who are in the field together, so outbreak tracking is less of a concern, while retailers and construction have more people working at a single site. A statewide agricultural employer made these distinctions:

> Who to count in the denominators for the outbreak definition was a question, and we did not get definitive answers from our legal support. We at first looked at it as the individual entity. Then we took it to a specific field. If they moved from one field to another, then we went back to the entity. But in any event, we didn't have a situation where that got challenged. We had an employee who got sick and there would be a carpool of people who rode together. If carpooling together to and from work, that is not a workers' comp issue. If they were going from one field to another because we told them, then it would be workers' comp.

When asked whether the presumptions successfully identified individuals at a higher risk for getting COVID-19, all the public health officials agreed, with some caveats. In general, they stated that because these individuals were exposed to people who might have COVID-19 as a part of their regular duties, it was more likely that they were exposed to COVID-19 as a part of their work activities if they ultimately ended up contracting COVID-19. This public health official was representative of the consensus:

> You have the first responder/health care presumption. If you fall under it, the line of work you are in will likely bring you into contact with community spread of COVID. You cannot easily tell whether that essential, frontline worker got it from their regular work, which is high-risk for exposure, or from some other normal activity. It is far more likely that in the course of their work they were exposed. If they contracted COVID while on the job, then it is work-related.

In addition to being exposed to the public, those who were covered by the presumptions were also exposed to each other, in crews or groups, as a part of their regular activities. This included first responders, such as police officers and firefighters who work in teams of at least two, and construction workers and health care workers, who interact with other types of workers or groups regularly, as described by this public health official:

> SB 1159 covered the highest-risk people. One of the things we realized was that the essential, frontline workers who were there to maintain infrastructure, respond to emergencies, they work in crews. They are at a high risk. They have to interact with each other and the public. That included things like repairmen. From the city employee perspective, the employees that continued to provide services, such as maintaining clean drinking water, refuse collections, etc., those types of individuals are essential and should be covered.

Other Potential Future Issues with COVID-19 Claims

Claims administrators and employers discussed difficulties with having employees return to work after exposure to or quarantine for COVID-19. Most claims administrators said that they followed current CDC guidance on when it was safe for a worker to return to work, either via a negative test, 72 hours after the symptoms subsided, or 14 days after the first symptoms. These dates and timelines varied a bit by employer and region, with some taking more conservative timelines, and one claims administrator for a statewide health employer cited variation in response to guidance revisions:

> We required whatever the CDC had in place at the time. It changed at least four times that I can remember. We would ask the same questions with the employees. . . . So initially this was a negative test based on CDC guidelines. Then it was 72 hours after no symptoms, then it was 14 days after the first symptom. It changed all of the time. We had to keep messaging those changes as they came out.

Frontline-worker employers discussed similar processes for return to work, most following the guidelines set by the CDC, with most mentioning the changes in guidelines and a few, including this public safety employer, expressing confusion and added burden from the differing and changing guidance:

> There has been a change in guidance on return to work. We followed that changed guidance. From our perspective as a public entity, we were not in a position to create rules different than public guidance. We followed public health directors who worked for the county. We aligned that with Cal/OSHA. Our county would have preferred negative tests for return to work, but Cal/OSHA did

> not allow for that. Everyone is not on the same page in terms of what is required to return to work after COVID.

For health care employers in particular, there were concerns about staffing and shortages. The gradual step down in the CDC requirements was hailed as a benefit to employers to prevent shortages and increased costs by at least one home health agency:

> What was required to return to work after exposure or having COVID changed. At the beginning it was 14 days. Then it was ten days. Then it was three days with no fever. There was a step down. I had to read the directive for the time to find out what the rules were. Moving to the ten days was a good move because of the staffing shortages. I could not hire someone to cover when I was short staffed, and I could only ask caregivers to work more and work longer hours and in some cases work overtime.

Very few claims administrators or employers discussed the ability of workers to come back on modified work. Of those who offered modified work, the most common form was via teleworking. Only a few health care worker employers discussed workers coming back with modifications, most often to a seated or otherwise nonstrenuous job to accommodate fatigue or difficulty breathing. One TPA claims administrator for health care employers noted that these modifications were financially motivated, since an employer would not be paying a worker to be at home:

> We saw modifications for health care workers returning from COVID, like they would initially need a seated job or one a little isolated before they were brought back into their full-time work. In most cases, the employers were willing to accommodate and modify work because they wouldn't have to pay for people to be at home. Hospitals with a larger bankroll can pay for employees to be out longer. For hospitals without that financial backing, they had to bring people in after those 14 days in any capacity. They could because they needed workers.

Other employers of essential workers did not mention modified work. When it was discussed, it was in the context of telework as an alternative to coming into work to avoid further exposure to COVID-19, as in the case of this Northern California county employer:

> We did have some modified work available for those who needed to remain or wanted to remain more isolated. We did telecommute for those who could.

Summary

Across the interviews, we heard several factors that affected the administration of claims and reporting requirements. Employers and claims administrators discussed how increases in COVID-19 claims coincided with surges in COVID-19, including early in the pandemic, the end-of-summer surge, and over the winter holidays. Non–COVID-19 claims and medical care decreased during this time as many if not most employees worked from home and elected to avoid medical settings during the pandemic.

To address the increase in COVID-19 claims, claims administrators reassigned staff, hired more staff, and changed processes to handle the load of reviewing and investigating the COVID-19 claims. Despite the changes made by claims administrators, the compressed timelines to investigate claims were a large administrative burden, particularly in light of the need to collect evidence and documentation to assess the work-relatedness of a claim. The shortened timelines led to some claims administrators relaxing the burden of proof for claims or denying claims and then overturning the denials once documentation was available.

The most important piece of documentation discussed was the positive COVID-19 test or a medical report (i.e., doctor's note or report) of COVID-19. Claims administrators struggled to determine the work-relatedness of COVID-19 claims, using questionnaires and contact tracing to help make the determination. Injured workers interviewed were largely confident in the work-relatedness of their claims.

Over the course of the pandemic, the distinctions between work and home lives varied, leading to noteworthy changes in how claims were investigated. From the early phase of the pandemic, when PPE and tests were hard to obtain; to later in the pandemic, when PPE was easy to procure, testing was convenient, but results could still take time; to the distribution of vaccines, employers and workers adapted to ensure safety based on constraints.

Claims administrators discussed issues with the SB 1159 presumptions, including the use of blanket definitions of *frontline workers* in the health care setting, the rules surrounding what was considered an outbreak, and the different requirements of the two SB 1159 presumptions. Reporting requirements and outbreak tracking were an administrative burden, requiring the development of retrofitting for data systems. Some employers, particularly in home health and manufacturing, noted that *workplace* is hard for them to define; other industries, particularly agriculture and construction, also struggled to fit the definition of an *outbreak* to their unique contexts.

Lastly, return-to-work requirements changed over the course of the pandemic and required constant updates to internal guidelines. The loss of workers to time off for quarantine or medical care led to staff shortages, especially because most sites did not have modified work for those returning to work.

8. Costs of COVID-19 Claims

This chapter examines the costs of COVID-19 claims. We examine the costs that are associated with indemnity, medical, and death benefits for COVID-19 claims (**RQ16**) and costs of claims filed under the different SB 1159 presumptions (**RQ17**). This information is not an explicit objective of the WC system but is an important aspect of its efficiency and viability. This information answers RQs 16 and 17:

- **RQ16:** What costs are associated with indemnity, medical, and death benefits for COVID-19 claims?
- **RQ17:** What costs are associated with the different presumptions in SB 1159?

Costs of Paid Benefits on COVID-19 Claims

Unless otherwise noted, estimates of average costs reported in this chapter were calculated including both claims that were accepted and claims that were initially denied or that had not yet at the time of analysis received paid benefits. We also note that we used paid-to-date amounts, which do not reflect anticipated future benefits. Incurred benefits, which reflect insurers' estimates of the total benefit cost that will result over the lifetime of a claim (including both past and future benefits), are not reported to the WCIS and so were not available to us for this analysis.

This means that our definition of benefit costs differs from the convention used in some other settings, such as analyses by actuaries that might focus on the average incurred cost per indemnity claim or per accepted claim, so caution should be used in comparing our estimates with those reported elsewhere.

We also note that claims initially reported as denied can later result in payment of benefits. Looking back at claims with 2017 injury dates, similar proportions of claims with and without initial denials ultimately received paid or settled indemnity benefits (26 percent of claims without an initial denial and 25 percent of claims with an initial denial). For 2017 injuries, the average cost of benefits paid to date was actually slightly higher on claims with an initial denial ($5,462 of paid and settled indemnity benefits by August 2021) than on claims without an initial denial ($4,480 of paid and settled indemnity benefits by August 2021).[21] Quigley et al., 2021, which focused on claims filed by public safety workers, also found that claims initially denied often resulted in substantial paid benefits. However, we did not analyze reversals of denials or

[21] Cost statistics reported here are unlikely to be driven by outliers because they were calculated using data winsorized at the 99.5 percentile. Initially denied claims also have higher paid-to-date indemnity benefits and settlements than claims without initial denials at the 90th and the 95th percentiles of the distribution.

final claim disposition in this study because many COVID-19 and non–COVID-19 claims will likely be subject to change in the future.[22]

Paid Indemnity Benefits on COVID-19 Claims

As shown in Chapter 3, TD benefits were by far the most frequently paid form of indemnity benefits on COVID-19 claims: PD benefits, death benefits, and indemnity settlements had been paid on only a tiny fraction of COVID-19 cases submitted to date. Table 8.1 reports the amount of TD benefits paid to date by COVID-19 claim status, by presumption section, and by date of injury. COVID-19 claims during the temporary presumption period had an average of $1,900 in paid TD benefits among workers covered by the frontline presumption and an average of $850 in paid TD benefits among workers in other occupations. For both groups of workers, paid TD benefits on non–COVID-19 claims were much higher, totaling $3,000 for workers covered by the frontline presumption and $2,200 for other workers.

Claims filed after the SB 1159 presumptions took effect in July 2020 have lower paid TD across the board due in large part to the mechanical effect of looking at paid benefits on claims filed more recently (i.e., right-censoring). Comparison of COVID-19 claims with non–COVID-19 claims filed within the same period confirms, however, that the average paid TD amount on COVID-19 claims remained lower than those on non–COVID-19 claims. For workers covered by the frontline presumption, the average COVID-19 claim paid $1,348 in TD benefits, compared with an adjusted $1,538 in TD benefits for the average non–COVID-19 claim. This is the case although COVID-19 claims filed by this group of workers were 17 percentage points more likely to have paid TD benefits (40 percent of COVID-19 claims received TD versus 28 percent of non–COVID-19 claims).

[22] At the time when data were extracted, 7 percent of non–COVID-19 claims that were initially denied and 2 percent of COVID-19 claims that were initially denied had received some paid or settled indemnity benefits.

Table 8.1. Paid TD Benefits on COVID-19 and Non–COVID-19 Claims, by Presumption Section

	Frontline Presumption Workers			Other Occupations		
Period	COVID-19 Infection	Non-COVID	Total	COVID-19 Infection	Non-COVID	Total
Prepandemic (2019)		$3,619	$3,619		$2,595	$2,595
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	$1,717	$3,002	$2,968	$848	$2,208	$2,203
Temporary presumption (3/19/2020–7/5/2020)	$2,067	$2,853	$2,600	$1,014	$2,102	$1,981
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	$1,178	$1,425	$1,334	$308	$977	$871
Total (1/1/2020–6/30/2021)	$1,348	$1,944	$1,753	$410	$1,383	$1,260
Adjusted total	$1,348	$1,538	N.A.	$410	$1,212	N.A.
Unweighted *N*	26,351	90,866	117,217	36,641	512,839	549,480

NOTES: N.A, = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 2 and Appendix B for details. Cost estimates in table include claims with initial denials and claims with zero paid benefits.

For workers in other occupations, who may have been covered by the outbreak presumption, the average paid TD benefit per COVID-19 claim filed was $410, compared with an adjusted total of $1,212 for the average non–COVID-19 claim. Here, the difference in paid TD benefits between COVID-19 and non–COVID-19 claims is driven in part by the lower rate of TD receipt among COVID-19 claims filed by workers not covered by the frontline presumption after the frontline and outbreak presumptions took effect (15 percent of COVID-19 claims received TD versus 25 percent of non–COVID-19 claims).

We also examined the duration of paid TD benefits among COVID and non-COVID claims receiving TD that had a start and end date reported. Table 8.2 presents the mean and median duration by date of injury and group of workers, as well as the proportion of claims with duration above two weeks, four weeks, or six weeks. Even after adjusting for claim maturity, COVID claims have much lower TD duration on average. For frontline workers, the mean duration on COVID claims with January 2020–June 2021 injury dates was half that on non-COVID claims (25 days mean duration on COVID claims versus 53 days adjusted mean duration on non-COVID claims). For workers in other occupations, the difference was even larger, with the mean duration on COVID claims just over one-third the adjusted mean duration of non-COVID claims (22 days mean duration on COVID claims versus 62 days adjusted mean duration on non-COVID claims).

Table 8.2. Temporary Disability Duration of COVID and Non-COVID Claims with Paid TD Benefits, by Presumption Section

	Total (all frontline)	Total (all frontline)	Other Occupations	Other Occupations
	COVID Infection	Non-COVID	COVID Infection	Non-COVID
Mean TD duration				
Adjusted mean TD duration (January 2020–June 2021 injury dates)	25.3	53.3	22.1	61.9
Median TD duration				
Pre-pandemic (2019)	N.A.	28	N.A.	42
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	24	20	23	41
Temporary presumption (3/19/2020–7/5/2020)	21	27	20	43
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	13	15	13	20
Adjusted proportion (January 2020–June 2021 injury dates) of TD spells with duration above . . .				
2 weeks	48.5%	56.4%	45.4%	62.3%
4 weeks	21.1%	40.2%	16.8%	46.4%
6 weeks	11.9%	32.9%	9.0%	37.5%

NOTES: N.A. = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claim administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted quantities use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Sample in table is limited to workers with paid TD benefits for whom TD start and end dates were reported, including those with initial claim denials who later received TD.

Comparing the median duration between COVID and non-COVID claims also reveals shorter duration on COVID claims, and the lower panel of Table 8.2 indicates that COVID claims generally have shorter TD duration than non-COVID claims. We note that the means and proportions in Table 8.2 are all reweighted to adjust for claim maturity differences due to the timing of COVID and non-COVID claims.

Table 8.3. Total Paid and Settled Indemnity Benefits on COVID-19 and Non–COVID-19 Claims, by Presumption Section

	Frontline Presumption Workers			Other Occupations		
Period	COVID-19 Infection	Non-COVID	Total	COVID-19 Infection	Non-COVID	Total
Prepandemic (2019)		$4,437	$4,437		$3,680	$3,680
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	$2,608	$3,329	$3,310	$1,045	$2,808	$2,802
Temporary presumption (3/19/2020–7/5/2020)	$2,415	$3,122	$2,895	$1,683	$2,542	$2,447
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	$1,247	$1,473	$1,390	$413	$1,093	$985
Total (1/1/2020–6/30/2021)	$1,477	$2,078	$2,760	$595	$1,639	$2,475
Adjusted total	$1,477	$1,632	N.A.	$595	$1,385	N.A.
Unweighted *N*	26,351	90,866	117,217	36,641	512,839	549,480

NOTES: N.A. = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 2 and Appendix B for details. Cost estimates in table include claims with initial denials and claims with zero paid benefits.

Table 8.3 reports the total amount of paid and settled indemnity benefits to date for COVID-19 and non–COVID-19 claims. As suggested by the rates of benefit receipt reported in Chapter 3, total paid and settled indemnity benefits on COVID-19 claims are driven almost entirely by paid TD benefits.

The differences in benefit costs in Table 8.3 are driven in large part by the differences in denial rates between COVID-19 and non–COVID-19 claims. As discussed above, we think that cost differences driven by claim denial patterns are relevant for helping policymakers to understand the average cost of a COVID-19 claim filed in California. Other calculations that restrict attention to accepted claims or those with indemnity benefits are more appropriate for objectives, such as ratemaking or modeling future costs, that were not the goal of this study.

To explore the contribution of denial rates to cost differences, and because some readers may be interested in the average cost of accepted claims, we also calculated the average amount of paid indemnity benefits for COVID-19 and non–COVID-19 claims with no denials reported (either on the FROI or the SROI). We used the weights described in Chapter 2 to adjust the non–COVID-19 claims for differences in claim maturity and the mix of occupational groups, so that the distribution of injury date and occupational group (health care workers, peace officers, firefighters, and other occupations) matched that observed for COVID-19 claims.

When we limit the sample to claims that have never been denied, we find that COVID-19 claims still have lower paid indemnity benefits than non–COVID-19 claims. The average cost of paid TD benefits on COVID-19 claims without a denial was $1,188, compared with an adjusted average cost of $1,504 on non–COVID-19 claims without a denial. Because TD accounts for the

bulk of benefits paid to date on these relatively recent claims, differences in total paid indemnity benefits were similar. The average cost of all paid and settled indemnity benefits on COVID-19 claims without a denial was $1,351, compared with an adjusted average cost of $1,605 on non–COVID-19 claims without a denial. This might seem surprising in light of the fact (discussed in Chapter 3) that COVID-19 claims were more likely to receive paid TD benefits. However, a pattern of higher TD receipt and lower TD benefit payments appears consistent with the disability duration estimates shown in Table 8.2, which show that claims with a temporary disability duration beyond six weeks were far more likely on non–COVID-19 than on COVID-19 claims.

Paid Medical Benefits on COVID-19 Claims

As noted in Chapter 3, COVID-19 claims are sharply distinguished from other WC claims by the high proportion with no medical bills submitted to WC. For injury dates from July 6, 2020, through June 30, 2021, 77 percent of COVID-19 claims from frontline presumption workers and 85 percent of COVID-19 claims from other workers had no medical bills submitted to WC as of July 2021. For other WC claims submitted during this range of injury dates, the proportion without any medical bills submitted was 29 percent for frontline presumption workers and 26 percent for other workers. Settlements for future medical care have also been very rare so far in COVID-19 claims, and we do not analyze them further in this report.

Because so many claims have no medical bills submitted, the amount of medical bill payments to date on COVID-19 claims is likely to be relatively small, on average. Table 8.4 confirms that this is the case. When claims with no medical bills are included, the average paid amount for medical bills on frontline presumption workers' COVID-19 claims with injury dates from July 6, 2020, through June 30, 2021, was $617, compared with $1,624 for non–COVID-19 claims filed during the same period. For workers in other occupations, the average paid amount for medical bills on COVID-19 claims from this period was $380, compared with $1,712 for non–COVID-19 claims.

Table 8.4. Paid Medical Benefits on COVID-19 and Non–COVID-19 Claims, by Presumption Section, Including Claims with No Medical Bills Submitted to Workers' Compensation

Total Paid Medical	Frontline Presumption Workers			Other Occupations			All Occupations (total)		
Period	COVID-19 Infection ($)	Non-COVID ($)	Total ($)	COVID-19 Infection ($)	Non-COVID ($)	Total ($)	COVID-19 Infection ($)	Non-COVID ($)	Total ($)
Prepandemic (2019)		3,207	3,207		2,864	2,864		2,917	2,917
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	1,900	2,753	2,730	1,285	2,547	2,543	1,662	2,581	2,574
Temporary presumption (3/19/2020–7/5/2020)	1,276	2,732	2,264	1,781	2,687	2,586	1,536	2,696	2,507
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	617	1,624	1,254	380	1,712	1,502	476	1,696	1,446
Total (1/1/2020–6/30/2021)	752	2,011	1,607	582	2,022	1,840	653	2,020	1,789
Adjusted total	752	1,887	N.A.	582	2,019	N.A.	653	1,964	N.A.

NOTES: N.A. = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Cost estimates in table include claims with initial denials and claims with zero medical bills submitted to WC.

We also examined spending among claims with one or more medical bills submitted to WC. Table 8.5 shows the total amount paid for medical care through July 2021 by group of workers, COVID-19 claim status, and date of injury. When we restrict attention to claims with medical bills submitted to WC, COVID-19 claims (across all occupations) submitted in March 2020 or later have higher medical spending than non–COVID-19 claims. For dates of injury during the temporary presumption period, COVID-19 claims with medical bills had much higher medical spending than non–COVID-19 claims. The difference in spending between COVID-19 and non–COVID-19 claims was more muted and was only somewhat larger among frontline presumption worker claims ($2,797 average medical spending on COVID-19 claims for frontline presumption workers versus an adjusted average of $2,650 on non–COVID-19 claims) than on claims submitted by workers in other occupations ($3,513 medical spending on COVID-19 claims versus $2,643 on non–COVID-19 claims).

Table 8.5. Paid Medical Benefits on COVID-19 and Non–COVID-19 Claims, by Presumption Section, Excluding Claims with No Medical Bills Submitted to Workers' Compensation

Total Paid Medical	Frontline Presumption Workers			Other Occupations			All Occupations (Total)		
Period	COVID-19 Infection ($)	Non-COVID ($)	Total ($)	COVID-19 Infection ($)	Non-COVID ($)	Total ($)	COVID-19 Infection ($)	Non-COVID ($)	Total ($)
Prepandemic (2019)		4,043	4,043		3,676	3,676		3,733	3,733
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	4,622	3,500	3,513	3,253	3,250	3,250	4,114	3,296	3,299
Temporary presumption (3/19/2020–7/5/2020)	3,628	3,447	3,480	7,115	3,398	3,553	5,049	3,409	3,535
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	2,498	2,197	2,245	2,556	2,185	2,199	2,524	2,188	2,209
Total (1/1/2020–6/30/2021)	2,797	2,638	2,661	3,513	2,562	2,593	3,115	2,577	2,608
Adjusted total	2,797	2,650	N.A.	3,513	2,643	N.A.	3,115	2,647	N.A.

NOTES: N.A. = not applicable. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, for exclusion of claims that could not be assigned occupation codes, and for submission of medical bills to WC. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Cost estimates in table include claims with initial denials; claims with zero medical bills submitted to WC were excluded, but claims with bills submitted and zero medical benefits paid were included.

We note that these data must be interpreted with caution because we do not know whether the claims that were submitted to WC were for relatively severe or mild cases of COVID-19. Interview findings discussed in Chapter 5 suggested that WC claims were filed in at least some cases because workers had severe COVID, but other interview findings and other measures of claim severity suggest that many more low-severity claims may have been filed for various reasons. We also heard from interview subjects that, in some cases, workers with severe disease who were hospitalized might seek treatment without notifying the employer or submitting a WC claim. Put differently, it seems unlikely that workers' decisions to file COVID-19 claims were uncorrelated with the severity of their cases. Differences in the relationship between disease severity, claim filing, and care seeking in WC might also vary across occupations.

Despite these limitations, the WCIS data enabled us to compare the medical severity of COVID-19 claims with non–COVID-19 claims, which may help policymakers and stakeholders understand what drives the differences in spending reported in Table 8.4. Broadly speaking, we know a priori that spending differences should be driven by differences in the volume and mix of

services because California has a fee schedule for WC (the OMFS) that caps most payments to providers. Even so, it may be of interest to explore utilization differences between COVID-19 and non–COVID-19 claims, as well as spending differences among claims with broadly similar utilization patterns. We provide evidence on these questions by examining inpatient hospitalization and ICU use in WC.

Restricting attention to claims with one or more medical bills reported to WC, Table 8.6 reports the proportion of claims with bills for inpatient hospitalization or ICU care. COVID-19 claims with medical bills reported were about six times more likely to involve inpatient hospitalization within three months than non–COVID-19 claims reported by the same group of workers in the same period. Turning to rates of ICU care, we also see that COVID-19 claims were several times more likely to involve ICU care than non–COVID-19 claims from the same period.[23]

[23] While Table 8.6 was limited to claims with medical bills reported to WC, COVID-19 claims also involve more-intensive medical care when claims without medical bills are included (see Appendix B, Table B.2).

Table 8.6. Proportion of Workers with Inpatient Hospitalization or ICU Care Billed to Workers' Compensation Within Three Months of Earliest Service Date, Excluding Claims with No Medical Bills, by COVID-19 Status and Presumption Section

	All Frontline Occupations	All Frontline Occupations	Other Occupations	Other Occupations	All Occupations	All Occupations
	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID	COVID-19 Infection	Non-COVID
Percentage of claims with one or more inpatient hospitalizations billed to WC						
Period						
Prepandemic (2019)		0.67		0.83		0.81
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	4.22	0.54	6.21	0.79	4.95	0.75
Temporary presumption (3/19/2020–7/5/2020)	6.39	0.74	7.90	0.93	7.01	0.89
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	3.90	0.56	4.22	0.82	4.04	0.77
Total (1/1/2020–6/30/2021)	4.51	0.59	5.00	0.83	4.73	0.79
Adjusted total	4.51	0.47	5.00	0.83	4.73	0.63
Percentage of claims with one or more ICU bills billed to WC						
Period						
Prepandemic (2019)		0.07		0.11		0.10
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	1.14	0.05	0.00	0.10	0.72	0.09
Temporary presumption (3/19/2020–7/5/2020)	0.36	0.11	0.56	0.14	0.44	0.13
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	0.39	0.08	0.21	0.12	0.31	0.11
Total (1/1/2020–6/30/2021)	0.39	0.08	0.28	0.12	0.34	0.11
Adjusted total	0.39	0.06	0.28	0.12	0.34	0.09

NOTES: Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, for exclusion of claims that could not be assigned occupation codes, and for submission of medical bills to WC. Adjusted totals use weights to adjust for differences between

COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Cost estimates in table include claims with initial denials; claims with zero medical bills submitted to WC were excluded, but claims with bills submitted and zero medical benefits paid were included.

Table 8.6 suggests that the difference in spending between COVID-19 and non–COVID-19 claims with medical bills reported was driven by the frequency of hospitalization and ICU care. While the probability of ICU care conditional on hospitalization was actually slightly higher for non-COVID claims than for COVID claims,[24] COVID claims were much more likely to involve hospitalization.

This raises the question of how medical spending compares between inpatient hospitalization claims on COVID and non-COVID cases. It is also possible that COVID-19 claims involving hospitalization may have been more expensive than non–COVID-19 claims involving hospitalizations. Table 8.7 reports total medical spending stratified by whether a worker was hospitalized or not. We found that COVID-19 claims without hospitalization had much lower medical payments than non–COVID-19 claims without hospitalization. For all claims with injury dates from July 6, 2020, to June 30, 2021, the total paid amount on claims without hospitalization averaged $108 for COVID-19 claims, but $1,383 for non–COVID-19 claims. Turning to claims with inpatient hospitalizations, we found that total medical spending was broadly similar for COVID-19 and non–COVID-19 claims filed by nonfrontline workers ($58,814 per COVID-19 claim involving hospitalization versus $54,326 per non–COVID-19 claim involving hospitalization). When we adjusted for claim maturity and looked at the entire pandemic period (January 2020–June 2021), spending on COVID claims involving inpatient hospitalization ($51,780) was several thousand dollars lower than on non-COVID claims involving inpatient hospitalization ($54,621).

To sum up, even when we excluded the claims with no medical bills submitted to WC, COVID-19 claims with no hospitalization had lower medical costs than non–COVID-19 claims with no hospitalization. And, looking at COVID-19 claims from all occupations and industries, claims with a hospitalization had a slightly lower level of medical spending than non–COVID-19 claims with a hospitalization. This tells us that medical spending differences between COVID-19 and non–COVID-19 claims with care billed to WC were driven primarily by the much higher frequency of hospitalization in COVID-19 claims rather than by major differences in spending among claims with a hospitalization.

[24] Thirteen percent (= 0.06/0.47) of non-COVID frontline presumption worker hospitalizations involved ICU care, versus 9 percent (= 0.39/4.51) of COVID hospitalizations, and 13 percent (= 0.06/0.47) of non-COVID frontline presumption worker hospitalizations involved ICU care, versus 9 percent (= 0.39/4.51) of COVID hospitalizations, and 14 percent of non-COVID hospitalizations in other occupations involved ICU care, versus 7.2 percent (= 0.34/4.73) of COVID hospitalizations.

Table 8.7. Paid Medical Benefits on Claims of Workers with Inpatient Hospitalization or ICU Care Billed to Workers' Compensation Within Three Months of Earliest Service Date, Excluding Claims with No Medical Bills, by COVID-19 Status and Presumption Section

	All Frontline Occupations COVID-19 Infection ($)	All Frontline Occupations Non-COVID ($)	Other Occupations COVID-19 Infection ($)	Other Occupations Non-COVID ($)	All Occupations COVID-19 Infection ($)	All Occupations Non-COVID ($)
Claims without inpatient hospitalization						
Period						
Prepandemic (2019)		2,928		2,483		2,551
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	257	2,550	390	2,183	309	2,243
Temporary presumption (3/19/2020–7/5/2020)	346	2,414	274	2,272	309	2,300
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	160	1,438	73	1,371	108	1,383
Total (1/1/2020–6/30/2021)	195	1,798	102	1,665	141	1,689
Adjusted total	195	1,715	102	1,651	141	1,678
Claims with inpatient hospitalization						
Period						
Prepandemic (2019)		53,340		59,024		58,281
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	91,416	45,629	36,131	58,171	65,540	56,619
Temporary presumption (3/19/2020–7/5/2020)	42,764	51,410	75,318	54,925	58,814	54,326
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	47,012	45,774	48,661	52,638	47,819	51,808
Total (1/1/2020–6/30/2021)	46,206	47,191	57,570	54,022	51,780	53,126
Adjusted total	46,206	50,820	57,570	56,038	51,780	54,621

NOTES: Medical spending was winsorized at $634,862, which was the 99th percentile of total medical spending among claims with 2019 or later injury dates that had one or more inpatient hospitalizations billed to WC. Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, for exclusion of claims that could not be assigned occupation codes, and for submission of medical bills to WC. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Cost estimates in table include claims with initial denials; claims with zero medical bills submitted to WC were excluded, but claims with bills submitted and zero medical benefits paid were included.

Summary

To date, the amounts of benefits paid on COVID-19 claims have been modest for several reasons. Claim denial rates were high relative to non–COVID-19 claims, especially for workers not covered by the frontline presumption. And although rates of TD receipt among frontline workers were higher than average for non–COVID-19 claims, paid TD amounts were lower. Total indemnity benefits paid to date on COVID-19 were driven primarily by TD, as PD indemnity settlements, and paid death benefits have remained rare so far.

As a result of the high proportion of claims without medical benefits, average paid medical benefits have been very limited compared with non–COVID-19 claims. If we restrict attention to claims with paid medical benefits, a more complicated story emerges. Paid medical bills to date for claims with injury dates between July 2020 and June 2021 were slightly higher on COVID-19 claims than on non–COVID-19 claims for workers covered by the outbreak presumption and substantially higher among workers covered by the frontline presumption.

As discussed in Chapter 3 in connection with denial rates, it appears that the overall population of COVID-19 claims contains both more very low-severity and very high-severity claims—in terms of medical outcomes for the worker, if not yet in terms of costs—than the distribution of cases that is typically seen in the WC system. Even if claims without any paid medical benefits are included in the calculation, COVID-19 claims with injury dates through June 2021 were about 83 percent more likely than non–COVID-19 claims (0.99 percent of claims, versus adjusted proportion 0.54 percent of claims) to have an inpatient hospitalization billed to WC. When we restrict attention to claims with paid medical bills, COVID-19 claims were more than seven times more likely than non–COVID-19 claims to involve an inpatient hospitalization billed to WC (4.63 percent of COVID-19 claims with one or more medical bills submitted to WC versus 0.63 percent of non–COVID-19 claims), and more than three times more likely than non–COVID-19 claims to involve ICU care billed to WC (0.34 percent of COVID-19 claims with one or more medical bills submitted to WC versus 0.9 percent of non–COVID-19 claims).

Analysis of medical spending on claims with versus without inpatient hospitalization shows that COVID-19 claims without hospitalizations had lower paid medical spending (across all care settings, including prescription drugs) than did non–COVID-19 claims, while medical spending on claims involving hospitalizations was very similar between COVID-19 and non–COVID-19 claims. The difference in spending between COVID-19 and non–COVID-19 claims with paid medical bills was thus driven mostly by the higher frequency of hospitalization on COVID-19 claims.

Of course, the average cost of COVID-19 claims included the majority of claims with zero medical spending: Medical spending may have been somewhat higher on the COVID-19 claims with medical bills submitted to WC, but it is also relevant for costs that (on claims with injury

dates from July 2020 to June 2021) 75 percent of non–COVID-19 claims had medical bills submitted to WC, while only 20 percent of the COVID-19 claims did.

One of the biggest unknowns facing the system is how many workers with COVID-19 claims received (or will receive) medical care for COVID-19 that was billed to other payers. This could have implications for the ultimate costs that may be borne by WC if other payers seek to recover some portion of their hospital payments from WC. This question cannot be answered directly within the scope of this study: A linkage between individual-level WC claims data and ESI claims for the same population might provide an answer, but such a linkage was not feasible within the timeline of the present study.

Limitations

We analyzed paid amounts to date relatively soon after the date of injury on the time scale relevant to California's WC system, and certain high-cost benefit types, most notably permanent disability, had not emerged sufficiently to be measured reliably. Similarly, our analysis of medical costs to date necessarily lacks information on future medical spending, including costs initially billed to other payers that may eventually be shifted back to the WC system.

9. Conclusions, Policy Implications, and Future Research Priorities

In this analysis, we used both quantitative and qualitative research to provide the legislature with evidence on how COVID-19 claims have affected California's WC system to date. We used claims data to describe the volume and characteristics of COVID-19 claims filed between January 2020 and June 2021. This descriptive analysis included a characterization of claim outcomes (denial rates, rates of benefit receipt, and costs paid to date), with estimates reported for the system as a whole, for the different presumptions established for frontline workers and those in other industries under SB 1159, and for specific industries and occupations across the California economy. We also conducted in-depth interviews with a diverse group of stakeholders, including employers, claims administrators, public health officials, and workers who had work-related COVID-19. In these interviews, we learned about these stakeholders' perspectives on COVID-19 claim filing behavior and the influence of other policies, such as the federal and state COVID-19 paid leave, on the filing of claims for income loss due to time off work and for medical care. Employers also discussed state policies concerning COVID-19 reporting, notifications, and Cal/OSHA safety standards for COVID-19. Claims administrators and employers described the administrative burden and implementation issues related to COVID-19 claims, presumptions, and reporting requirements created by SB 1159.

In this concluding chapter, we draw on our research to identify some high-level findings that address the major questions posed by CHSWC (and, ultimately, by the legislature) when this study was commissioned. We caution that this evaluation was not designed to provide a global assessment of whether the presumptions established by SB 1159 were the optimal (or, on net, a beneficial) policy response. At the time of writing, the pandemic has been ongoing for just under two years, and many of the long-term impacts of COVID-19 (on workers and on the WC system) are not yet observable in the data available for this study.

Instead, we tie our findings (where possible) to our normative framework (discussed in Chapter 1) that takes the five system objectives identified by the 1972 National Commission report as the objectives of a WC system (National Commission, 1972). That is, we highlight ways in which our findings suggest that the approach taken in California to COVID-19 claims (either the presumptions adopted under SB 1159 or the practice of handling COVID-19 claims through WC) either promoted or failed to promote specific objectives identified in the National Commission report.

We then close this chapter with policy implications, further reflections, and discussion of some important open questions that should be examined or revisited in the near future as more time passes after the first cohorts of COVID-19 claims to be filed, and as additional claim outcomes and data sources become available.

Overall Impacts of COVID-19 Claims

Over 18 months, from the start of 2020 to the end of June 2021, 142,033 claims were reported to the WCIS as COVID-19 infection claims. (The total number reported through October 2021 was 166,642.) Over this 18-month period, 958,490 total WC claims were reported to the WCIS, so COVID-19 claims averaged 15 percent of the claim volume in the system. In most months of the pandemic, COVID-19 cases were around 10 percent or less of the total volume of WC claims. However, because claim volumes by month generally followed surges in statewide COVID-19 case volumes, the COVID-19 case volume fluctuated greatly: COVID-19 accounted for more than 20 percent of claims in June and July of 2020 and peaked at 55 percent of claims in December 2020.

While WC claim volumes always exhibit seasonality, the large fluctuations of COVID-19 claim volumes is something outside the historical experience of the WC system. Surges of COVID-19 claims around December 2020 were identified as being very administratively challenging by claims administrators and employers we spoke with. This is primarily a fact about the virus (and its exceptional contagiousness) rather than a reflection of anything specific to WC, and it is important to note that WC was hardly the only administrative system that faced challenges in keeping up with unprecedented workloads during the pandemic.

Yet, specific aspects of California's approach to COVID-19 claims were viewed by claims administrators and employers as increasing system complexity and administrative burden. These stakeholders mentioned having to exert significant effort to retool or develop information systems for outbreak tracking or reporting of employee cases to claims administrators even when claims were not filed. Claims administrators also viewed the level of detail about workers' nonwork activities and exposures that was routinely collected in COVID-19 claims to be a departure from their typical practices. And, finally, claims administrators indicated that the shortened claim investigation timelines for claims covered by the outbreak or frontline worker presumptions were very challenging to implement, especially given that SB 1159 took effect immediately (as an urgency measure) and there was no phase-in period.

Overall Impacts on Indemnity, Medical, and Death Benefits

COVID-19 claims looked very different from other claims in the WC system—even from other occupational disease claims—in terms of the frequency with which they resulted in paid indemnity, medical, or death benefits. Some of these patterns varied substantially between workers covered by the frontline presumption (certain health care and public safety workers) and those potentially covered by the outbreak presumption.

We found that COVID-19 claims were substantially more likely to be denied than the average non–COVID-19 claim filed at the same time, that COVID-19 claims filed by frontline workers were less likely to be denied than claims filed by other workers, and that the denial rate on claims filed by other workers increased after the temporary presumption was replaced with

the outbreak presumption on July 6, 2020. Data shared by other researchers and a JPA involved in claims administration for many public-sector entities suggested strongly that denied claims often lacked a positive PCR test result for the worker. These high denial rates should be kept in mind when interpreting differences in benefit receipt to date.

In terms of benefit receipt, paid PD benefits and indemnity settlements have been extremely rare so far on COVID-19 claims. While PD benefits and settlements have also been rare on non–COVID-19 claims filed at the same time, they were even less common on COVID-19 claims. Total indemnity benefits paid to date on COVID-19 were driven primarily by TD, as PD indemnity settlements, and paid death benefits have remained rare so far as a proportion of COVID-19 claims.

That said, many workers who have not yet received death benefits (likely because claims are still being adjudicated) were reported as deceased by the claims administrators, and claims involving the death of the worker were far more common among COVID-19 claims than among non–COVID-19 claims.

COVID-19 claims were also sharply distinguished from other health conditions in the WC system by the high proportion of claims with no medical bills submitted. As a result of the high proportion of claims without medical benefits, average paid medical benefits were very limited compared with non-COVID-19 claims. If we restrict attention to claims with paid medical benefits, a more complicated story emerges. Paid medical bills to date for claims with injury dates between July 2020 and June 2021 were slightly higher on COVID-19 claims than on non–COVID-19 claims for workers covered by the outbreak presumption, and substantially higher among workers covered by the frontline presumption. When we restrict attention to claims with paid medical bills and adjust for claim maturity, COVID-19 claims were 7.5 times more likely than non–COVID-19 claims to involve an inpatient hospitalization billed to WC (4.7 percent of COVID-19 claims with one or more medical bills submitted to WC versus 0.6 percent of non–COVID-19 claims) and about three times more likely than non–COVID-19 claims to involve ICU care billed to WC (0.34 percent of COVID-19 claims with one or more medical bills submitted to WC versus 0.11 percent of non–COVID-19 claims). While medical spending among hospitalization claims was comparable between COVID-19 and non–COVID-19 claims, the higher hospitalization rate in comparison with other WC claims led to higher costs when medical bills were reported to WC.

This is in line with qualitative research findings. Our stakeholder interviewees felt that workers with high medical bills were more likely to file WC claims, while those who required less-intensive medical care were likely to have their care paid by group health insurance (when available). This was within the context of the important and unique COVID-19–related actions taken by private health insurers and HRSA early in the pandemic (and phased out in summer 2021) to pay co-pays and deductibles related to COVID-19 care in addition to waiving out-of-pocket costs for hospitalization with COVID-19 for those workers who were fully insured by private health insurance and the uninsured workers who were covered by a federal program that

paid health care providers through HRSA. Both of these actions changed medical care cost decisions about COVID-19 for everyone (both insured and uninsured), including workers who contracted COVID-19 through exposure at work. Moreover, billing medical care received to group heath or ESI was automatic for a worker (i.e., done behind the scenes by medical billing offices) when health insurance information was provided at intake or admission, as compared with WC that first investigates and accepts a claim before covering and providing payment for medical care received.

Impacts on Different Occupations

We found that COVID-19 claim rates outside of health care and public industry were generally much lower. We also saw, however, that denial rates, rates of TD receipt, and the proportion of claims with no medical bills varied widely. Variation in TD receipt across industries and occupations (especially public safety and food workers versus others) appeared broadly consistent with the provisions in SB 1159 specifying that TD benefits would begin only after pandemic-specific sick leave was exhausted. Initial denial rates were very high in some industries (e.g., 82 percent in apparel manufacturing, 89 percent within couriers and messengers) and occupations within industries (e.g., 86 percent for slaughterers and meatpackers within animal slaughtering and processing), including some occupations that had high excess mortality during the pandemic.

Our qualitative research pointed to differences in claim filing culture between public safety and health care workers and those in other occupations, which may suggest that public safety and health care workers would also have been more likely to file COVID-19 claims in the absence of the presumption.

We also note that, when we examined claim volumes among occupations with high excess mortality during the pandemic, we found that the number of death claims in many of these occupations was very limited relative to the number of COVID-19 deaths identified among nonelderly workers or the number of excess fatalities identified in Chen et al., 2021. This finding suggests that the survivors of many nonelderly COVID-19 victims have not received financial compensation from the WC system, but we caution that our comparison of death claim volumes to overall COVID-19 mortality cannot be used to draw strong conclusions about claim filing behavior or access to benefits because we lack data on the proportion of COVID-19 deaths that may have been potentially compensable or covered by presumptions. Other limitations are discussed at length in Chapter 4. Rather, this analysis should highlight the need for future study that evaluates what sources of financial compensation (including, but not limited to, WC) have been made available to the surviving family members of COVID-19 decedents, and whether any specific groups of survivors face continuing hardship that might warrant future policy intervention.

Overall and Cost Impacts of the Specific Presumptions Created by SB 1159

COVID-19 claims filed by frontline workers were less likely to be denied than claims filed by other workers, and the denial rate on claims filed by other workers increased after the temporary presumption was replaced with the outbreak presumption on July 6, 2020. Health care and public safety occupations and industries also had much higher rates of COVID-19 claims per 10,000 workers than did other occupations and industries in the private sector (where claims may have been covered by the outbreak presumption). These basic patterns are consistent with the anticipated effects of the frontline worker presumption. However, comparison of COVID-19 claim volumes with those in similar occupations that were not covered by the frontline presumption (e.g., assisted living facilities) may suggest that the high claim volumes in these industries was driven more by their extraordinarily high levels of exposure to COVID-19, including the fact that frontline health care and public safety workers were continually working throughout the pandemic, even at times when many private-sector businesses were shut down or had reduced interactions with the public.

As noted above, denial rates varied widely among the occupations and industries covered by the outbreak presumption. Our qualitative findings also pointed to a lot of confusion (for claims administrators, employers, and workers) about implementation of the outbreak presumption.

Policy Implications

Our study uncovered several challenges with the functioning of the WC system. For employers, these were primarily related to the handling of a large and fluctuating volume of claims within shortened claim administration time frames for making an initial claim decision. For workers, the challenges were primarily confusion and misunderstanding around filing a COVID-19 claim, including the specifics on what occupations were covered and qualified for WC under the presumption and the need for a positive COVID-19 test.

In the face of these challenges, we consider how the specific aspects of the presumptions identified by SB 1159 affected workers and employers within the context of the WC system and how well the WC achieved its objectives.

Broad Coverage of Workers and Health Conditions

The frontline presumption appears to have contributed to **broad coverage of workers and health conditions**, specifically coverage of COVID-19 for some of the most exposed public safety and health care workers.

Among most workers who were not covered by the frontline presumption, denial rates were generally higher than those observed among health care and, especially, public safety workers. We caution that we cannot say definitively whether these high claim denial rates are artifacts of

the unusual patterns of COVID-19 claim filing discussed at length in Chapter 3, whether these claims were denied because they were filed outside of an outbreak period (or, as we might imagine to be the case in the couriers and messengers industry, some proportion of claims were filed by independent contractors who were not covered by WC), or whether claims filed during an outbreak period were successfully rebutted by evidence of nonoccupational exposure. Furthermore, for some groups of workers, the outbreak presumption did not result in ready access to WC benefits. This suggests that the outbreak presumption may not have had the effect of providing **broad coverage of workers and health conditions** to all groups of COVID-19–exposed workers outside of the frontline presumption.

Moreover, without data on exposure or risk by occupation, we cannot make a determination about whether the bill should have named the specific workers and occupations that it did.

What we do know from our analysis is that volumes for COVID-19 claims were large and fluctuating in nature over time and thus a burden for the majority of claims administrators handling COVID-19 claims. The volume of COVID-19 claims also included a large percentage of COVID-19 claims filed by workers in occupations likely to be covered by the frontline worker presumption (36 percent), with the largest percentage (29 percent) filed by health care workers and smaller percentages by peace officers (5 percent) and firefighters (3 percent). The remaining 64 percent of statewide COVID-19 claims were filed by workers who may potentially have been covered by the outbreak presumption, although we do not know how many of these claims were filed by workers employed at a jobsite during an outbreak period. Also, we found the drops in non–COVID-19 claim volumes associated with stay-at-home orders and job losses during the recession that resulted from the pandemic were far less pronounced among frontline workers than among workers in other occupations. Taken together, this evidence does suggest that despite the issues with implementing and operationalizing the definition of an *outbreak* raised within the interviews with employers and claims administrators, both the frontline and outbreak presumptions did still manage to cover a large percentage of workers across the state who claimed exposure at work in a frontline occupation or within a workplace COVID-19 outbreak. This suggests that naming specific high-risk workers was an important feature of protecting workers' income with TD benefits and death benefits, as well as covering medical care costs for both frontline workers and nonfrontline workers exposed during an outbreak at work.

The appropriateness of the frontline presumption and the outbreak presumption were also supported by the public health officials we interviewed. They specifically confirmed that the SB 1159 presumptions, one for frontline workers and one for workers experiencing a workplace outbreak of COVID-19, were in line with epidemiological knowledge. That is, the public health officials indicated that the frontline and outbreak presumptions, as stated, did cover workers at the highest risk for being exposed to and contracting COVID-19, and that using the 14-day window to calculate an outbreak was in line with knowledge about transmission and exposure. In particular, the public health officials noted that the characteristics of those who should be

covered were working close to others and inability to work from home, as these were the main drivers of assessing exposure. They acknowledged that the possibility remained open that some individuals not at higher risk might qualify for WC coverage under these presumptions, but even though that was possible, those workers were at lower risk, comparatively.

Lastly, the complex specifics of who was covered and who was not covered under the frontline presumption were most likely not followed consistently across employers and occupations, because strict adherence required a very detailed knowledge of the Labor Code and the presumptions.

Occupations covered by the frontline presumption had lower denial rates than occupations and industries potentially covered by the outbreak presumption. This cannot necessarily be attributed entirely to the frontline worker presumption, as we discussed above, but it is consistent with SB 1159 having an impact on denial rates as intended.

Encouragement of Safety

We also heard from employers, claims administrators, and public health officials that WC coverage of COVID-19 was unlikely to have had much impact on disease transmission. Pandemic-specific sick leave was viewed as more important for allowing workers to stay home while contagious. WC coverage of COVID-19 may not have done much for **encouragement of safety**.

In addition, public health officials expressed the belief that the SB 1159 presumptions for COVID-19 did align with epidemiological knowledge about the spread of COVID-19, particularly identifying those at greatest risk for coverage as essential workers. That is, they agreed that the frontline and outbreak presumptions as written did cover workers at the highest risk for being exposed to and contracting COVID-19, and that using the 14-day window to calculate an outbreak was in line with knowledge about transmission and exposure. This support of the SB 1159 presumptions by public health knowledge was not as clear for the outbreak definition thresholds and the different workplace definitions and scenarios across industries and workplace composition.

Provision of Medical Care

WC was not viewed by these stakeholders as important for providing access to testing or to medical care. WC was viewed as playing little to no role in access to or payment for COVID-19 testing, since a positive test was needed to file an accepted claim. Most employers noted that WC is a reactive system, so benefits were paid out after an individual had a work exposure or already had a positive COVID-19 case. Claims administrators and employers both agreed that workers did not need WC to get access to medical care for COVID-19–related issues, since group health insurance covered workers at any health care facility and federal rules required that treatment for COVID-19 be covered by all insurers.

Despite this, one of the main reasons that employees filed COVID-19 claims was for coverage of nonminor medical care costs, with a small percentage of claims being high-cost. Such care resulted in high medical bills for hospitalization, respiratory therapy, pulmonologist visits (for serious cases), and prolonged symptoms after recovery. WC benefits were deemed important by employers and claims administrators to pay for costly care, such as hospitalizations stemming from COVID-19, including respiratory therapy.

Also, because of broad coverage of medical care costs outside of WC, including waiving of co-pays and care for the uninsured, WC wasn't a necessary condition for obtaining health care. Yet, WC may still have been important for the provision of medical care in many workers' individual cases, and in high-cost cases, such as those involving hospitalization, WC did protect workers from potentially high cost-sharing in group health plans.

Furthermore, there is uncertainty surrounding how future medical for COVID-19 claims will be determined and how long COVID-19 symptoms are being handled in WC claims. These issues were raised by claims administrators and several employers, particularly for public safety and for health care, due to the possible litigation that will ensue for long COVID-19 claims.

Protection Against Income Loss

We lacked data on how WC payments fit into the full context of other sources of protection against income risk that workers who caught COVID-19 may have had. But the high rates of TD receipt among workers under the frontline presumption, in conjunction with the fact that TD, in many cases, should have been paid only after a worker had received other pandemic-specific sick leave, suggests that TD benefits likely went to many workers who had fairly high total disability duration (including disability covered by other leave or social insurance programs before TD benefits began). PD and death benefits, if and when these are paid out, are likely to be very important for protecting workers and their surviving dependents against income loss caused by more-severe COVID-19. So, it seems likely that COVID-19 claims promote the objective of **protection against income loss**.

California's Workers' Compensation Delivery System Efficiency

Finally, the complexity of the SB 1159 presumptions and the implementation challenges noted by stakeholders suggest that the state's approach to COVID-19 claims may not have promoted an efficient delivery system.

Shortened Initial Decision Timelines

A specific feature of a COVID-19 claim was the shortened initial decision timeline. Claims administrators made changes in processing and operations for COVID-19 claims in response to the compressed timelines that reduced investigation periods from 90 days on a typical WC claim to 30 or 45 days for the COVID-19 presumptions; this was perceived as a large administrative burden. Examining the time from claim filing to date when denial was reported to WCIS,

COVID-19 claims were denied much faster than non–COVID-19 claims, with faster processing in frontline industries than nonfrontline industries. That said, more-comprehensive data would be needed to test for compliance, but it appears that SB 1159 had an impact on shortening claim processing timelines. Also, the shortened time to decide on a COVID-19 claim required the collection of evidence and documentation from an injured worker (such as a positive test, an employee interview, workplace information) in a shorter period to assess the work-relatedness of a claim. We heard in the interviews that the most important piece of documentation was the positive COVID-19 test or a medical report (i.e., doctor's note or report) of COVID-19. Claims administrators indicated that they struggled to determine the work-relatedness of a COVID-19 claim, using questionnaires and contact tracing to help make the determination that exposure was from being at work. The shortened timelines led to some claims administrators relaxing the burden of proof for claims or denying claims and then overturning the denials once documentation was available.

We did not hear that shortened timelines and quicker initial claims decisions meaningfully assisted workers in any specific manner; we heard that workers were able to gain paid leave through other sources and gain access to medical care without needing the decision on a claim—WC was also not needed to access testing or to be in quarantine. Our findings suggest that these shortened timelines may not have benefited workers and may have caused more reversals in claim outcomes and possibly more denials and added administrative burden per claim along with the large volumes of claims. If it is true that a widespread increase in the frequency with which initial claim denial decisions were reversed resulted from the shortened timelines, this would suggest that the shortened timelines added administrative burden that does not support an efficient delivery system of WC benefits.

Given the global and national nature of the pandemic, which was unique and unprecedented compared with other WC injuries, the federal and state paid leave were a much larger contributor to encouraging safety and protecting income loss for all workers than the WC system. Additionally, given that medical care was accessible to all people with COVID-19 (whether contracted at work or not), it was difficult to determine how WC was used as a source for medical care, seemingly accessed not for minor medical care needs but for both mild disease and serious and fatal COVID-19 cases.

Concern about the impact on the WC system for COVID-19 claims has grown and not subsided, as COVID-19's variants continue to surge and frontline workers—such as health care workers, firefighters, and peace officers, as well as other workers exposed to COVID-19 from an outbreak at work—continue to have high risk of exposure at work. However, as workers have returned to work and schools have opened, claims administrators tasked with determining whether COVID-19 was contracted at the workplace continue to struggle with the burden of documentation collection and employee investigations.

Furthermore, we lack the data needed to fully evaluate insurer expenses on COVID-19 versus non–COVID-19 claims, and the impact of the SB 1159 presumptions on litigation and other

transaction costs is theoretically unclear. It seems likely that, by defining a positive PCR test as a necessary condition for the presumptions to take effect, SB 1159 set a de facto standard for compensation that is simpler than other conceivable approaches (e.g., if no specific requirement for a COVID-19 claim to be accepted had been put forward).

One way to think about the efficiency impact of a presumption is to view it as reducing litigation over cases that meet the presumption's definition while increasing the potential for litigation in a different set of cases that would have been clearly denied without the presumption—but that now might be on the margin. In the case of COVID-19, the former class of cases includes those workers who tested positive, and there is no ambiguity about their work exposure, outbreak occurrence, or other conditions needed for the presumption to take effect. The cases that are marginal and may be subject to litigation may be more limited for frontline workers, although more time would be needed to analyze litigation frequency and outcomes. Among outbreak occupations, however, there seems to be ambiguity that led to more cases being litigated. In particular, there were reported issues about the ambiguity in the definition of the *jobsite* (e.g., home health) or how to treat jobsites with multiple employers and nonemployee workers (e.g., grocery stores where workers might include store employees, security guard contractors, and various vendors and delivery workers employed by transportation firms or self-employed as independent contractors). We will have to wait to see whether there is widespread litigation about the definition of the outbreak presumption, which, as written, does not seem to allow for the type of "fissured workplace" that has become increasingly common in many industries.

Importantly, much of the inefficiency and transaction costs associated with COVID-19 claims are still to be realized in the future as cases are evaluated for permanent disability, as death claims are adjudicated, and as continuing medical care or temporary disability for long COVID-19 become more important. In short, we documented ways in which SB 1159 requirements (outbreak tracking and shortened timelines), in isolation, likely reduced **delivery system efficiency**. However, there is also the theoretical potential for SB 1159 to have been beneficial in establishing a clear criterion for a COVID-19 claim to be accepted.

Future Research Priorities

Our analysis of California's experience to date with COVID-19 in WC addressed the questions posed by examining WC claims data for claims filed for exposure to COVID-19 at work and gaining insights from workers who filed or did not file a claim for contracting COVID-19 from exposure at work, employers across several impacted industries, claims administrators for different types of insurers, and public health officials. Yet, so much remains unknown about the possibly unequal risk of exposure to COVID-19 that occurred at workplaces across California. We therefore think it is also important to highlight several research questions (with possible study approaches) that emerged during this study. Future work on these topics could

help to address some of these limitations and provide a stronger foundation for future policymaking.

Our analysis of California's experience to date with COVID-19 in WC will need to be revisited as COVID-19 claims mature and more evidence on the long-term effects of the pandemic emerge. Ideally, this will answer the RQ, *"How did the COVID-19 exposure rates (and subsequent filing of COVID-19 claims and claim outcomes) vary across California and by industry and occupation?"* Further research would be an analysis of COVID-19 exposure data and WC claims side by side, by industry and occupation. This would allow for a comparison of the percentage of workers exposed in each region and the percentage of workers exposed in a given occupation and industry, alongside the volume of COVID-19 claims across those same occupations and industries. Our understanding is that CDPH may be using WCIS data in conjunction with other data sources on workplace outbreaks to measure occupational COVID-19 exposures: Such research efforts should be prioritized both for understanding the unequal impacts of the current pandemic and for developing prevention strategies relevant to the ongoing fight against COVID-19 or possible future pandemics.

Our qualitative research indicated that many workers who contracted COVID-19 at work had health care paid elsewhere (e.g., through group health insurance) and got income support somewhere else as well (e.g., through the federal paid leave program). Further, SB 1159 was enacted to provide economic support and security for those who got COVID-19 in the workplace. This raises the question, *"Given the dramatic influence of the pandemic on the economy and work life across California, what did workers who contracted COVID-19 across California and by industry and occupation do to maintain their income, stay safe, and seek medical care (when needed)?"* This question could be addressed by a broader study based on a representative sample of COVID-infected workers that reflects the diversity of California and its industries and occupations to specifically investigate the details of what income supports and programs workers applied for and received, what type of economic loss they experienced, their decisions surrounding medical care, how they gained payment for their medical bills, and what overall cost or burden they incurred from income loss and their needed medical care for COVID-19. If such a broad study is not possible, then a smaller, focused study is needed that would review overall trends and differences in paid leave usage across occupations in California.

The emergence of long COVID-19 also raises questions about how workers experiencing long-term effects from their COVID-19 will obtain medical care, compensation for income losses due to work disability, and vocational rehabilitation, and the extent to which these needs will be met by WC or other payers. Regarding just the WC system, widespread coverage of a previously nonexistent health condition that lacks medical consensus or sound treatment guidelines will pose challenges for administering WC medical benefits and discouraging fraud and provision of low-value care. It is also unclear what costs might be associated with these benefits for WC and for other payers. There is clear potential for cost spillovers from work-related long COVID onto other private and public health insurance payers, including Medi-Cal.

Linkage of WCIS data to Medi-Cal claims or, in time, California's nascent All-Payer Claims Database (the Health Care Payments Data Program, which is scheduled to begin receiving monthly production submissions in January 2023) could be an important step toward monitoring the full range of health care needs related to COVID-19 and quantifying the extent to which workers with work-related COVID receive care from other payers.

Our study also raised several issues around the implementation of SB 1159 by claims administrators that most likely vary by claims administrator characteristics (such as TPA versus SA, size of employer, etc.). A study is needed to answer, *"What claim processing practices did claims administrators across California and by different types of insurers employ during COVID-19 related to SB 1159 (such as handling large fluctuations in volumes of claims, shortened timelines, and expanded use of employee interviews that included gaining information about workers' personal nonwork behaviors)? What were the common barriers and facilitators in implementing COVID-19 claims processing systems?"* This most likely would require a larger, more in-depth study of claims administrator practices during COVID-19 to identify and quantify the sources of costs for insurers and to gain a deeper understanding of the most common and most costly implementation challenges related to the SB 1159 presumptions (for employers, insurers, and types of claims administrator). This type of study would be most useful if it started with a larger set of in-depth interviews with claims administrators, with a sample that is balanced on the aforementioned claims administrator and employer characteristics. This would provide a broader understanding of the implementation issues experienced by claims administrators in regard to specific presumptions. The interviews could also have questions that elicit the lessons learned from claims administrators on how to handle large, fluctuating volumes of claims; shortened timelines; and expanded employee interviews that require gaining information about nonwork behaviors to provide insights into how to effectively use presumptions. This set of in-depth interviews would be designed to uncover implementation successes and challenges, as well as the costs of restructuring processes and labor management. These interviews could then be followed by a claims administrator survey across a much broader, stratified sample of industries and occupations, including those covered by the SB 1159 presumptions, to gain a broader, more representative evidence base about the issues identified in the interviews.

We found that COVID-19 claims were an administrative burden because the COVID-19 claim volumes hit in large waves. A study could investigate the question, *"How efficiently did the WC system handle the large, fluctuating stream of COVID-19 claims?"* Ideally, two years of claims data would be analyzed, given the variability of the COVID-19 claims during 2020 and 2021, and the research would produce estimations of long-term medical costs, temporary and permanent disability costs, and litigation costs related to both SB 1159 presumptions.

Additionally, as time has moved forward and the waves of the COVID-19 pandemic have continued to surge and change, it would be important to ask, *"How did COVID-19 claims outcomes (i.e., accepted, denied, reversals, conditional denials, and litigated or settled outcomes) change over the course of a given claim? And how did COVID-19 claim outcomes*

and processes vary during the different surges of COVID-19 overtime?" This would be a mixed-method study centered on a review of claims outcomes and how they changed over time, complemented by interviews with workers who filed claims during each of the unique waves of COVID-19 after their claims are settled. This study could also include a specific analysis of claims outcomes over time, especially claims reversals, use of conditional denials, and litigated or settled outcomes. The interviews would discuss the overall experience of the workers' claims processes from beginning to end. This would be of value to better understand how much reversals of claim outcomes affected claims administrators, employer costs, and workers.

Appendix A. Summary of Literature Review Results

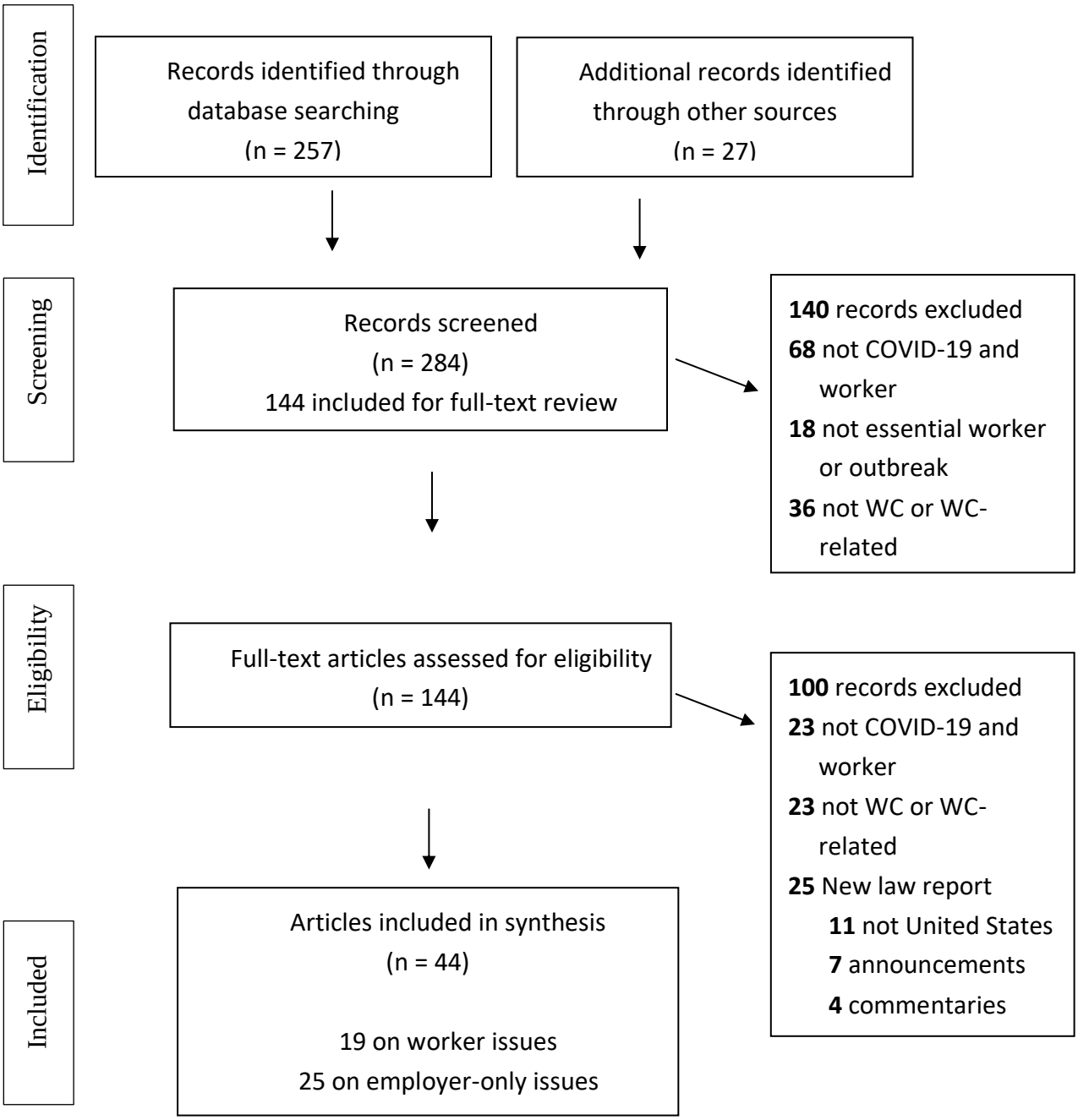
Understanding the context and experiences of workers and employers related to COVID-19 and the WC system is critically important to both the future of this legislative effort and its overall consequence on the WC system. We conducted a literature review of the available peer-reviewed and gray literature on worker experiences surrounding COVID-19 and the WC system and any related literature regarding employer best practices. We included news reports and findings from literature reviews, given that much of the information in this area is likely not to have yet been published in peer-reviewed literature. Although this was not a formal systematic literature review because we did not rate the quality of the studies, for literature retrieval and review we adhered to the PRISMA guidelines.

Search Strategy. We conducted structured search strategies via PubMed and Web of Science to identify peer-reviewed studies, limited to English-language peer-reviewed articles published from March 2020 to September 30, 2021, in the United States. We identified articles with at least (1) one COVID-19 term, (2) one worker term inclusive of essential worker industries (e.g., *agriculture*, *firefighter*/*public services*) and (3) one WC term, including *qualified medical examiner*, *applicants'*/*defense attorney*, *claims adjustor*/*administrator*, *leave*, *temporary disability*, *benefits*, *wage loss*, *retaliation*, *claims*, *denial*, *utilization review*, *medical access*, and *workers' compensation*. We conducted a separate search with the same terms in Business Source Complete. We also conducted a gray literature search in Policy File Index and advanced Google searches (i.e., Workers' Compensation Research Institute [WCRI], Society for Human Resource Management [SHRM], National Council on Compensation Insurance [NCCI], California Coalition on Workers' Compensation [CCWC] etc.). To ensure comprehensiveness, we reference-mined articles to identify additional relevant literature and asked experts about articles and reports. Details of our search and review are described elsewhere (Quigley et al., 2022).

As shown in Figure A.1, our PRISMA flow diagram, the searches identified 257 articles. Experts identified an additional 27 articles for a total of 284 articles for title and abstract screening. Articles were excluded if they did not address COVID-19 worker experiences (n = 68); were not about essential workers or outbreak workers (n = 18); were not about WC or WC-related experiences (n = 36); or were not based on work conducted within the United States (n = 13).

A total of 144 articles were identified for full review after article screening. During full text review, an additional 100 studies were excluded: not COVID-19 and worker–related (n = 23); not WC or WC-related (n = 23); information about the passing of a new law reported in an association report (n = 25); not conducted in the United States (n = 11); commentary (n = 4); an announcement (n = 7) and not an empirical study (n = 3).

Figure A.1. PRISMA Flow Diagram



Altogether, 44 articles were identified as relevant for inclusion. Of the included 44 articles, 19 examined worker experiences, and 25 were about employer experiences only. Table A.1 lists the articles on workers (n = 19) by study type and topic. It shows that none of the peer-reviewed or industry worker studies that analyzed data were about WC claims or benefits or about job loss

or retaliation or about medical care. Instead, they were primarily about leave or paid leave (n = 6 studies, n = 2 news reports) and the workplace related to health or safety (n = 5 studies, n = 3 news reports), as well as some specifically on PPE (n = 5 studies) and COVID-19 testing or screening (n = 4 studies). There was one study on hazard pay (n = 1 study), two on lack of health insurance (n = 2 studies), and one study and one news report on lost work time and return to work (n = 1 study, n = 1 news report).

Table A.2 lists the employer-focused articles (n = 25) by study type and content. It shows that four studies analyzed data (three were peer-reviewed studies and one was a gray literature study). Three of these studies were on workplace health and safety, hospitalizations and medical care, and staffing, and one was about the development and field test of a return-to-work symptom screening tool implemented with California-based health care workers. The goal of the tool was to inform return-to-work guidance in real time. In addition, there were three peer-reviewed literature reviews and 18 news reports. Two of the three peer-reviewed literature reviews were about return to work, including COVID-19 testing or screening and/or health insurance. One literature review focused on managing population health as employees return to work during the COVID-19 pandemic.

Lastly, Table A.3 for worker articles (n = 19) and Table A.4 for employer-only articles (n = 25) provide a description of the article focus, type of study, design, time frame, main topics, sample size, description of sample, and relevant results. A full discussion of the results is reported elsewhere (Quigley et al., 2022). However, in sum, none of the 44 included articles in the review pointed to new topics that needed to be added into the initial draft interview protocols.

Table A.1. Worker Studies (n=19), by Study Type and Content

Study Type	WC (n = 3)	WC Death Benefits (n = 1)	Job Loss/ Retaliation (n=2)	Lost Work Time/Return to Work (n = 2)	Leave/ Sick Leave (n = 8)	COVID-19 Screening/ Testing (n = 4)	PPE (n = 5)	Workplace Issues: Health, Safety (n = 8)	Other: Lack of Health Insurance/ Hazard Pay (n = 3)
Peer-reviewed: Studies (n = 7)				Shenoy et al., 2020	Pichler, Wen, and Ziebarth, 2020 Rogers et al., 2021	Coto et al., 2020 Niu et al., 2020 Ramos et al., 2021 Rogers et al., 2021	Coto et al., 2020 Ramos et al., 2021 Rogers et al., 2021	Coto et al., 2020 Iddins et al., 2021 Ramos et al., 2021 Rogers et al., 2021	
Literature reviews (n = 2)					Cherry and Santos Rutschman, 2020 Ghilarducci and Farmand, 2020		Cherry and Santos Rutschman, 2020		Cherry and Santos Rutschman, 2020
Gray literature studies (n = 3)					Flores, 2020 Flores and Padilla, 2020		Flores and Padilla, 2020	Flores, 2020	Flores and Padilla, 2020 Rhinehart et al., 2021
News reports (n = 7)	Sams, 2020 Sclafane, 2021 Simpson, 2021	Almeida and Hirtzer, 2020	Eidelson, 2020 Flores and Padilla, 2020	Sclafane, 2021	Almeida and Hirtzer, 2020 Perry, 2020			Almeida and Hirtzer, 2020 Eidelson, 2020 Perry, 2020	

Table A.2. Employer Studies (n = 25), by Study Type and Content

Study Type	WC (n = 7)	WC Death Benefits (n = 1)	Job Loss (n = 1)	Return to Work (n = 3)	Leave/ Sick Leave (n = 11)	COVID-19 Screening/ Testing (n = 3)	Workplace Issues: Health, Safety Including PPE (n = 6)	Hospitalizations and Medical Care (n = 2)	Other: Staffing, Health Insurance (n = 2)
Peer-reviewed: Studies (n = 3)				Lichtman et al., 2021			Pasco et al., 2020 Harrington et al., 2020 Lichtman et al., 2021	Pasco et al., 2020	Harrington et al, 2020
Literature reviews (n = 3)				Plantes et al., 2021 Fragala, Goldberg, and Goldberg, 2021		Plantes et al., 2021 Fragala, Goldberg, and Goldberg, 2021	Gravina et al., 2020 Fragala, Goldberg, and Goldberg, 2021		Fragala, Goldberg, and Goldberg, 2021
Gray literature studies (n = 1)	Everling 2021	Everling 2021						Everling, 2021	
News reports (n = 18)	Chordas, 2020 Darragh, 2020 Darragh, 2021 Hanna, 2020 Moynihan, 2020 Sams, 2020		Stout-Tabackman and Thompson, 2020		Alix, 2020 Almeida and Hirtzer, 2020 Boyle, 2020 Buckley, Van Voorhis, and Rubin, 2020 Camillo, 2020 Day, 2020 Jacobs et al., 2020 Luna, 2020 Massar and Kelly, 2020	Sundar, 2020	Massar and Kelly, 2020		

Study Type	WC (n = 7)	WC Death Benefits (n = 1)	Job Loss (n = 1)	Return to Work (n = 3)	Leave/ Sick Leave (n = 11)	COVID-19 Screening/ Testing (n = 3)	Workplace Issues: Health, Safety Including PPE (n = 6)	Hospitalizations and Medical Care (n = 2)	Other: Staffing, Health Insurance (n = 2)
					Sundar, 2020 Thorn, 2020				

Table A.3. Description of Article Focus, Type of Study, Design, Time Frame, Main Topics Included, Sample Size, Description, and Relevant Results for Worker Studies (n = 19 Studies)

Study	Article Focus	Type of Study, Design and Time Frame	Main Topic(s)	Sample Size and Description	Relevant Results from the Study[a]
			WORKER STUDIES		
Cherry and Santos Rutschman, 2020	Workers	Law review, July 2020	PPE, paid leave, hazard pay	Gig workers	Many gig jobs are considered "essential work," and the rules of state lockdowns across the country classified gig workers as "essential workers." . . . The Economic Security Act (CARES Act) granted gig workers sick leave and federal unemployment benefits. In other cases, gig workers have asked for personal protective equipment, sick days, hazard pay, and supplies of disinfectants, and some companies have met those requests. Others met those requests only in the face of protests or other collective action by gig workers. These protections, which workers in the gig economy had long been fighting for, have demonstrably improved working conditions for gig workers and brought them closer to the rights and benefits enjoyed by traditional employees. The changes will improve conditions for gig workers, whose numbers have been steadily growing. . . . Before the pandemic, meaningful changes to the status of gig economy workers were incremental and accomplished through a patchwork approach. Over the past five years, gig workers have brought legal cases around the world, seeking to obtain the same benefits and legal protections as traditional employees. The results, however, have been far from uniform. Numerous courts, such as those in Italy and France, have looked at the amount of control and surveillance that platforms have over workers and have concluded that employment protections should apply. Other courts, relying on gig workers' flexibility to set their own hours and the fact that gig workers often supply their own equipment, have instead determined that gig workers are independent contractors or, in the United Kingdom, fit into a third intermediate category. The situation in the United States has largely been one of confusion. Early cases on worker classification were largely settled out of court.
Coto et al., 2020	Workers Health care (hospital, skilled nursing, rehabilitation,	Cross-sectional Prospective survey April 2020	Work environment, access to PPE, COVID-19 testing, mental health	920 workers Mostly female, 25–34 years old, excluded EMTs	This study identified that having access to PPE helped mitigate reported levels of stress. Note that this study was conducted during the beginning of the pandemic and therefore results may be different if the survey were administered following a prolonged period of time. However, identifying how providers are feeling at the beginning of a pandemic is important as it can inform decisions regarding need for monitoring or interventions, as well as policies

	Veterans Affairs)				for healthcare providers working in different settings. This study did not include all health professionals. For example, EMTs were excluded due to their higher risk of exposure and stress. Also, although we did inquire whether respondents had access to PPE, we did not inquire if they were using the PPE and under what circumstances. Future research would benefit from gathering information on PPE use as this can be helpful for inventory planning and policy making.
Flores, 2020	Workers Rural San Joaquin Valley workers in agricultural and food processing jobs	Household survey August 2020	Sick leave, job loss, workplace health and safety practices	301 persons with phones in small rural cities in Fresno, Merced, and Tulare counties Median 39 years 68% Latin, 19% White, 4% Black, 3% Asian, 3% Native American, 5% mixed race 3.5 persons per household	Nearly half (44%) of rural San Joaquin Valley households sampled experienced income reduction since March 1, 2020. Three in ten (30%) households went without food or relied on food stamps or a food bank. Fifteen percent (15%) of renters failed to pay rent in April or May. Most respondents (59%) claimed they would be "very concerned" if they were to experience COVID-19 symptoms. Most workers (57%) claimed they had not been able to work from home—for any amount of time—since the Governor's stay-at-home order on March 19. Nearly half (46%) were unable to affirm that their workplaces had safe practices for preventing COVID-19 spread. Only 28% of workers said they qualified for ten days of paid sick leave. More than half (53%) of workers felt the government was opening businesses "too quickly" or "much too quickly."
Flores and Padilla, 2020	Worker San Joaquin Valley workers	Observational, cross-sectional prevalence study using secondary data 2014–2019	COVID-19 issues for workers, including lack of sick leave protections, lack of protective equipment, lack of health insurance	U.S. Census Bureau–Annual Social and Economic Supplement of the Current Population Survey 2014–2019	San Joaquin Valley workers lack robust sick leave protections. Many valley workers are exposed to consistent and severe housing and food insecurity. Crucial linkages in the valley's food chain lack extended paid sick leave and expose the public to the risk of COVID-19. The San Joaquin Valley stands out in its lack of sick leave protection. Among California's five most populous cities, only Fresno has workers that are not protected by local paid sick leave ordinances. Los Angeles, San Diego, San Jose, and San Francisco all offer some form of paid sick leave. In the COVID-19 era, ordinances have been passed in Los Angeles, San Francisco, and San Jose to address gaps in the FFCRA. Of the top five most populous cities in California, Fresno is alone in not requiring businesses to provide paid sick leave to employees. FFCRA does not extend paid sick leave to employees of firms with fewer than 50 employees and extended paid sick leave as two weeks (80 hours). Valley food chain workers lack protective equipment mandated by counties in other regions. Lack of health insurance among food-chain workers exposes the public to further risk. Many San Joaquin workers are in economically precarious places and lack benefits and protections that would support them through COVID-19. Lack of protections for workers and low insurance rates in the work done in this area make it susceptible to COVID-19 spread.

Ghilarducci and Farmand, 2020	Older frontline workers	Literature review, April 2020	Access to paid leave	Literature on older frontline works in high-risk job categories, including food distribution, truckers, janitors, and home and personal health care workers	Older workers [. . .] over 50 years old constitute a significant proportion of those working in crucial care and service professions but are much more susceptible than younger workers to becoming seriously ill from COVID-19. Despite this fact, 40% of older workers have no paid sick leave (compared to 38% of workers under the age of 50). This is based on 40% based on CDC data from the 2018 National Health Interview Survey (NHIS). The sample includes individuals who reported being employed (18 years and older). Access to paid sick leave rates are calculated for employed individuals who responded yes or no to the following question: "Do you have paid sick leave on your main job or business." Moreover, 50% of older workers in healthcare support occupations (which include home health aides, occupational and physical therapist assistants and others) do not have paid sick days according to authors' calculations from the CDC data. Moreover, a significant number of older people are unpaid caregivers, thus risking exposing even higher risk individuals to the virus should the worker become sick. Protecting older workers on the job and providing paid sick leave is thus critical to maintaining and improving both their own health and the public health during the coronavirus pandemic. Older workers are susceptible to severe COVID-19 due to the work they tend to do work in care and service professions. They lack sick leave and also tend to be caregivers, increasing their chance to spread COVID-19 as well. Many workers cannot afford to take time off if they become ill; moreover, they may fear losing their jobs if they do so. Consequently, they report to work, which can exacerbate their illness or spread disease to others.
Lichtman et al., 2021	Employer mitigation strategies	Tool development; April 2–17, 2020	Symptom screening tool	9,446 health care workers	The transmission of infectious diseases in hospitals can occur for many different reasons over the community, namely HCW to HCW interactions, HCW to patient interactions, and HCWs working while sick (presenteeism). Rates of presenteeism have been shown to be high among HCWs, including during previous pandemics. Symptom monitoring of HCWs is a proven method of addressing the unique challenges of hospital transmission and has been instrumental in controlling many emerging infectious diseases including H1N1, Ebola Virus, and seasonal influenza. Symptom monitoring can be classified as active or passive. Active monitoring requires a health institution to initiate contact with HCWs to monitor symptoms, usually at least once daily. Passive or self-monitoring means a HCW monitors themselves and only initiates contact with the institution to report positive symptoms. In early March 2020, the CDC published guidelines encouraging active monitoring for all HCW with medium or high-risk exposures, while allowing passive monitoring for low-risk exposures or no known exposures.

Niu et al., 2020	Workers First responders	Observational, survey linked to screening data from March 23–April 29, 2020	COVID-19 prevalence/ positivity rate and exposure patterns, return to work	3,375 first responders at a drive-through testing center for COVID-19 in Broward County, Florida, were screened for COVID-19 infection 44% male, median age 42 years (interquartile range 33–52 years)	A total of 2,902 first responders (85.9%) were asymptomatic, and 473 (14.1%) reported symptoms associated with COVID-19. Overall, 289 (8.6%) were positive, with the highest rates among the age between 25 and 49 years. Of those testing positive, 235 (81.3%) were asymptomatic. Fourteen days after their first positive test, 81 (69.8%) of the 116 asymptomatically infected FRs were negative, and 35 (30.2%) remained positive and asymptomatic. This highlights that a large number of asymptomatic FRs who were not recognized as having COVID-19 infection and therefore not isolated might have contributed to further spread. It is important to monitor their health for signs and symptoms of COVID-19 resolution to be able to discontinue isolation and be allowed to go back to work, especially in this very important time where FRs are mostly needed to help the community with COVID-19 response. The findings had limitations. The study sample was not fully representative of the national FRs in the USA, because they screened FRs from Broward County, Florida, and the distributions of age and gender may be unequal in different counties. Information bias is possible because exposure and symptom status were identified by self-report. In addition, pre-existing medical conditions in FRs were insufficient to assess association between health status and infection rates, so we did not perform a relevant analysis.
Pichler, Wen, and Ziebarth, 2020	Workers	Cross-sectional, natural experiment using COVID-19 Tracking Project data used difference-in-differences March 8–May 11, 2020	Emergency sick leave provision's influence on (i.e., reduction of) COVID-19 activity in the short run in the United States	Workers (1,945) from 30 U.S. states from the COVID-19 Tracking Project (17 treatment and 13 control states[b])	One of the bipartisan policy measures to combat the spread of COVID-19—the Families First Coronavirus Response Act, signed into law on March 18—included two weeks of emergency sick leave at full pay because of COVID-19. This study used a difference-in-differences design to test whether this emergency sick leave provision reduced COVID-19 activity in the short run in the US. Findings showed that states where employees gained access to paid sick leave because of the FFCRA had a statistically significant decrease of approximately 400 fewer confirmed new cases per state per day relative to the pre-FFCRA period and to states that had already enacted sick pay mandates before enactment of the FFCRA. Thus, granting access to paid sick leave helped flatten the curve, in line with previous research and theoretical considerations. Prior research has shown that paid sick leave coverage induces contagious employees to take sick leave, thereby reducing influenza activity during normal times. However, as of the conduct of this article, it has been unclear whether this mechanism is also effective during the COVID-19 crisis. These results pertain to a short-term perspective because the data end in May, about a month and a half after the implementation of the FFCRA. Further, in terms of the methods, although the matching models aimed to compare similar states, and the authors

					also controlled for a rich set of possible confounders, it is still possible that the approach did not capture relevant unobservables that increased the number of new COVID-19 cases in the control states. The authors were also unable to investigate the underlying mechanisms of why COVID-19 cases decreased. Channels could have included reduced coworker or customer infections because sick employees called in sick instead of working sick, as well as reduced spread of infections through children. Specifically, the effect may also have operated through enhanced paid family leave and sick children who stayed home with their parents instead of being sent to childcare when their parents gained access to paid sick leave. However, we think it is unlikely that the effect operated through paid family leave.
Ramos et al., 2021	Essential workers	Prospective survey; May 7–25, 2020	Workplace safety	585 workers in meatpacking industry	Nearly three fourths (n = 419, 72%) of workers believed that they were at “high risk” for contracting COVID-19, but only 42% had been tested at the time of the survey. When asked about barriers to testing, 45% of participants responded that they were not sick so there was no need to be tested. Participants also noted other barriers such as being unsure about the location of testing sites (9%), being unsure what to do if they tested positive (9%), and the cost of testing (8%). Most workers reported that their employer had instituted temperature screening for anyone entering the facility (88%), made everyone wear a face mask while in the facility (83%), and posted signage in multiple languages throughout the facility about COVID-19 (79%). Less than one half of participants reported physical distancing on the line (39%), slowing down the line (34%), additional paid time off (28%), or restructuring of shifts (20%).
Rhinehart et al., 2021	Worker classification Independent contractors	Gray literature report	AB 5 in California	N/A	Employers routinely misclassify workers. A 2000 study commissioned by the U.S. Department of Labor found that between 10% and 30% of audited employers misclassified some workers, and that up to 95% of workers who said they were misclassified as independent contractors were reclassified as employees following review; Employers misclassify employees as independent contractors to save on paying for employee benefits, employment taxes, and workers’ compensation and unemployment insurance premiums which, as previously noted, can add up to 30% on top of wages. A related and significant problem, but one beyond the scope of this report, is paying workers off the books in cash to avoid any record of employment whatsoever. Together, these payroll fraud practices undermine worker protections and deprive government programs of important revenue.

Rogers et al., 2021	Essential workers	Prospective survey; March–June 2020	Workplace safety	1,373 workers in meatpacking industry	Knowledge of COVID-19 mitigation strategies implemented at the facility was assessed by using an unaided recall item without a list of mitigation strategies: “In response to COVID-19, what changes did you see in your work section and at work?” (see Supplemental Digital Content Appendix 1, available at http://links.lww.com/JPHMP/A810). The 3 mitigation strategies mentioned most often were using face coverings or masks (n = 43; 67%), installation of additional handwashing stations (n = 37; 58%) and maintaining distance of 6 ft (n = 29; 45%) (Table 2). Leave policy changes were mentioned least often (n = 5; 8%). Harvesting workers mentioned barriers (e.g., plexiglass) less often than fabrication workers (prevalence ratio, 0.17; 95% confidence interval [CI], 0.04–0.67). Participants who indicated English as their preferred language mentioned mask-wearing 1.54 (95% CI, 1.04–2.29) times and additional handwashing stations 1.68 (95% CI, 1.18–2.40) times that of Spanish speakers. Although 62% of respondents (37/60 valid responses) who answered a question about leave reported that they thought it was easy to take COVID-19–related sick leave, 19 (32%) said it was difficult. Follow-up qualitative responses indicated concerns or confusion regarding taking leave, despite its availability; the short-term disability pay available to those with confirmed COVID-19 was less than their hourly work pay, resulting in lost wages; and missing work without a positive test meant no access to this short-term disability pay, resulting in complete loss of wages.
Shenoy et al., 2020	Workers Health care (hospital)	Observational Cross-sectional study using secondary data March 7, 2020, and April 22, 2020	Loss of work time due to testing, return to work criteria	8,930 employees tested at a Massachusetts General Brigham institution	8,930 employees were tested and 1,049 (11.7%) were positive for SARS-CoV-2. *Lost work time*: Of those who tested positive, 37 (3.5%) were hospitalized at an MGB institution within 7 days of their positive test. Among 590 healthcare workers (HCW) with subsequent testing, 425 (72.0%) had at least 1 negative NP swab. The mean and median number of days from first positive to first negative were 17.1 (SD, 6.7) and 17 (IQR, 9), with a minimum of 2 days and a maximum observed of 38 days. Of the 425 HCWs with positive SARS-CoV-2 test results, 263 (61.9%) had a sequential second negative NP. The mean and median number of days from first positive to second negative were 19.5 (SD, 6.1) and 19 (IQR, 8), with a minimum observed of 6 days, 25th percentile at 15 days, and a maximum observed at 37 days. The Kaplan-Meier estimate of median time to clearance was 29 days (95% CI, 28–31). We estimated that test-based clearance accounted for an additional 4,097 days of cumulative lost work time, corresponding to a mean of 7.2 additional days of work lost per employee than would have

					been accrued using the time plus symptom-based clearance method. *Return to work*: The HCWs diagnosed and treated for COVID-19 had prolonged recovery of viral RNA; the test-based strategy resulted in a median time to return-to-work of 19 days. The long duration of PCR positivity is consistent with prior studies. The time plus symptom–based criteria would have resulted in 4,097 fewer lost workdays, or an average of 7.2 fewer days of work lost per employee. The additional psychological toll of prolonged positivity on HCW well-being was not assessed; some HCWs reported stress and anxiety from isolating within their households and extended delays in returning to work. This research had several limitations. A subset of employees were still in process for RTW considerations at the end of the study period. Some employees lost to follow-up include those who elected not to be retested despite meeting criteria, including those who were working remotely during the study period. Also, during the study period, additional evidence emerged regarding lack of transmission after recovery from symptoms, which has informed a shift away from a test-based strategy in favor of a time plus symptom–based strategy for ending isolation and permitting RTW in healthcare settings. Viral load has been shown to be highest at the time of symptom onset and then to decline within a week thereafter. Transmission is rare among close contacts of COVID-19 cases when that contact occurred after day 6 of the source individual's infection, and transmission has not been reported from close contacts of patients who have tested positive after recovery from their illness. These observations were noted by the CDC in their May 3, 2020, decision memo supporting a move away from test-based strategies for discontinuation of isolation. MGB accordingly switched to time plus symptom–based RTW criteria on May 22, 2020.
WORKER NEWS REPORTS					
Almeida and Hirtzer, 2020	Workers and employers Meat plants	News report, December 2020	COVID-19–driven changes to work in meat plants	Meat plant workers in the United States and Canada	The world's top meat producer sent thousands of vulnerable U.S. workers home on paid leave. Another company facing higher absenteeism at its plants. Labor union warns extra hours taking a physical toll on workers. People are working more extra hours and Saturdays, and since the lines can't go the same speed with fewer people, what used to take about 16 hours now takes 20.
Bailey and Jewett, 2020	Workers Families of the deceased	News report, July 2020	Claims, denials, death benefits from WC in the Commonwealth of Virginia	139 workers who died of COVID-19	As the COVID-19 toll climbs, sick workers and families of the dead face another daunting burden: fighting for benefits from workers' compensation systems that, in some states, are stacked against them. . . . An early glimpse of data shows that healthcare workers and first responders, two groups hit hard by the virus, make up the

	Deceased health care workers and first responders Commonwealth of Virginia				majority of those seeking benefits. Data from the Centers for Disease Control and Prevention shows that more than 95,000 healthcare workers have been infected, a figure the agency acknowledges is an undercount. KHN and The Guardian U.S. have identified more than 700 who have died and told the story of 139 of them. For these workers' families, the stakes of the pending laws are enormous. In Virginia, attorney [NAME] is representing a nurse and a physician assistant who contracted the coronavirus while working at the same urgent care center. The physician assistant, who administered COVID-19 tests, was hospitalized with COVID-19 and pneumonia for about a week. He missed five weeks of work. When the physician assistant asked the urgent care center for paperwork to file a workers' compensation claim to cover his hospital bill, an administrator refused to hand it over, saying coronavirus treatment wouldn't be covered, [NAME] said. He was laid off days later and left with a $60,000 hospital bill. [NAME] said the law in Virginia will likely consider COVID-19 an "ordinary disease of life," akin to a cold or the flu. She said she'd have to prove by "clear and convincing evidence" that he caught the coronavirus at work. The bar is so high, she said, that she's waiting to file a claim in hopes that Virginia joins many other states passing laws that make it easier for health workers to prove their cases. [NAME], president-elect of the Virginia Trial Lawyers Association, said he took on a test case and received a quick denial of workers' compensation benefits for a COVID-19 positive physician assistant.
Eidelson, 2020	Workers and employers Food service, warehouse workers	News report, August 2020	Retaliation, safety, leave, being fired	Food service, warehouse workers	U.S. businesses have been on a silencing spree. Hundreds of U.S. employers across a wide range of industries have told workers not to share information about COVID-19 cases or even raise concerns about the virus, or have retaliated against workers for doing those things, according to workplace complaints filed with the NLRB and Occupational Safety and Health Administration (OSHA). Many thousands of OSHA complaints about coronavirus safety issues have yielded citations against just two companies—a health-care company and a nursing home—totaling about $47,000. Employees at the plant filed a fresh OSHA complaint, alleging they were in harm's way because of insufficient masks, excessive line speeds, and "elbow-to-elbow" close quarters. Later, in a sworn affidavit, another worker said he told the human resources department he'd tested positive for COVID, but HR told co-workers he hadn't. Data-sharing has been among employees' best defenses.

Iddins et al., 2021	Workers and employers Health care (medical group)	Observational study using secondary data over 9-month period	Infection, identification, surveillance	5,500+ employees at one large health care workplace	A set of benchmarks was established by integrating public health–related pandemic interventions with disaster management and leadership principles. All interventions and benchmarks were designed to support the health and safety of individuals as well as organizational decision making with continuity of operations the ultimate goal. Exemplar workplace-related SARS-CoV-2 benchmarks are described and illustrated with empirical data.
Perry, 2020	Workers and employers	News report April 2020	Work environment, sick leave		Despite management's best efforts, some employees may fall sick. Anyone who comes down with symptoms of the virus (fever, coughing, and shortness of breath) should be separated from the workplace and required to remain at home. That will protect their coworkers from infection, helping to contain the spread of the disease. Afflicted individuals should contact their healthcare provider, or the state or local health department, for advice on what to do next. "Infected individuals should not go straight to the doctor's office or to the hospital emergency room, because they are not equipped for infectious disease control," says [NAME]. "Instead, they should call ahead to determine whether symptoms are consistent with a COVID-19 infection. If they are, the individuals will be directed to the appropriate testing facility." Employees with the relevant symptoms should stay away from the workplace even if they have not been definitely diagnosed with the coronavirus. "Traditionally, in our country's culture, people come to work sick," says [NAME], vice president of Hagerty Consulting, an emergency management consulting firm based in Evanston, Ill. "But the novel coronavirus is extremely contagious, and we do not have the diagnostics to tell us who has the virus and who doesn't." A business may need to change its traditional sick leave policies in light of the coronavirus. "Sometimes a liberal sick leave policy is tough for employers," says [NAME]. "But it is much better to lose a portion of your workforce than to lose all of them." The employer must decide whether to pay people who are out sick. While no national law mandates that they do so, some states and cities have passed legislation touching on the matter. Jurisdictions with some type of sick leave laws include states such as Washington, Michigan and Vermont, plus cities such as San Francisco and New York. Even companies which are located outside of such protected areas should consider reimbursements for quarantine time. "Employers should avoid being penny wise and pound foolish," says [NAME]. "They should establish non-punitive leave policies, and that includes loosening requirements that employees provide doctors' notes to prove sickness. Bear in mind that local health workers will likely be overwhelmed with live cases and may not be able to provide such notes."

Sick leave reimbursement decisions may be based on the circumstances surrounding the event. “In some cases, an individual who is out sick for an extended period of time because of COVID-19 may be entitled to short-term disability,” says [NAME]. “An employee who was infected while on business travel to an affected country may be eligible for workers compensation.” Some states have paid family leave laws that mandate partial pay for employees who are out of work because they are caring for sick family members, says [NAME]. “Some states’ and cities’ sick time laws provide for paid sick time when an individual’s workplace—or a child’s school or day care center—is shut down due to a declared public health emergency.” On occasion it is not the employee who becomes sick, but a child, parent or a loved one. Or a child must stay home because of the closing of a school or day care center. Or an employee may express fear about using public transportation to commute to work. In all such cases employers must decide whether to grant paid sick leave.

Employers are also taking steps such as the following:

- Limiting travel. “Most of the companies I am talking to are limiting or prohibiting all future international travel,” says [NAME]. “They are also asking employees if they have traveled internationally, whether for business or pleasure, and are requiring them to stay home if they have visited countries with elevated risk. When feasible, audio and video conferencing is taking the place of in-person visits.”
- Restricting outsider visits. “Some companies are limiting third parties who can come into the offices, separate and apart from their own employees,” says [NAME]. “Visiting clients and vendors are being asked where they have traveled in the last few weeks, and whether they are exhibiting any flu-like symptoms.”
- Coordinating with vendors. The CDC website suggests businesses “talk with companies that provide contract or temporary employees about the importance of sick employees staying home and encourage them to develop non-punitive leave policies.”

Sams, 2020	Workers and employers	News report May 2020	COVID-19 presumption and WC information, lawsuits	Health care workers and first responders	NCCI recently released projections on the potential impact of the pandemic under various scenarios. In the worst case, 50% of workers are infected and 60% of their claims are deemed compensable. That would result in $81.5 billion in increased costs — or two and half times current workers' compensation loss costs — for the 38 states and District of Columbia, where NCCI tracks claims data. On the other hand, if eligibility is limited to first responders and healthcare workers and only 5% of those workers are infected, the increase in costs would be just $2 billion, assuming 60% of claims are paid. NCCI said it used a range of scenarios to illustrate the potential impact of a state enacting legislation to expand eligibility to include COVID-19-related claims. The virus has spurred legislation in several states to ensure workers receive benefits. Minnesota was among the first to amend its state law to create a presumption for healthcare workers and first responders who are sickened by the novel coronavirus. State lawmakers in California, New York, Ohio, Pennsylvania, Louisiana, Utah and Vermont have introduced similar bills to require compensation for COVID-19-stricken first responders, healthcare workers or "critical workers." Kentucky Gov. [NAME] issued an executive order creating a presumption that COVID-19 is compensable if contracted by first responders, healthcare workers and workers in several other essential enterprises, including grocery stores. The Illinois Workers' Compensation Commission created a similar presumption with an emergency rule change, but the commission repealed that rule after business groups filed suit.
Sclafane, 2021	Workers and employers	News report February 2020	Long-term effects of COVID-19 infection on the worker, return to work	Essential workers	Reporting on the results of a study of 4,000 people in the U.S., [NAME] aid that 50 percent were unable to work full time six months after they tested positive for COVID, even though only 8 percent of those people actually were hospitalized. She reported on symptoms ranging from fatigue to attention disorders to breathing difficulties based on a larger volume of research, noting that 80 percent of 50,000 patients infected with COVID-19 develop one or more long-term symptoms. "We don't know quite yet from the literature if this virus is lying dormant in the tissue for a little while and then suddenly something activates it. There's more that we don't know than what we do know," [NAME] said, expressing particular concern for healthcare workers. "These front-line workers who resiliently keep going on the front lines every day may be suffering from PTSD, I'm a little worried what will happen with these folks. It's something we have to be very mindful of in our industry and be prepared for how we will deal with it." In California: Reporting on actual COVID-19 infections and deaths in the state and actual workers comp claims, he said that injured workers between the ages 18 and 65 made up about 78 percent of

					the state's infections and about one-quarter of all the fatalities. The actual number of workers' compensation claims was a small fraction. Only about 4.7 percent of the working-age Californians who were infected had a corresponding workers' compensation claim, and roughly 5.6 percent of the fatalities among working-age Californians had an accompanying workers compensation claim, he said. [NAME] drilled down into comp claims data by industry, noting a change in the distribution of claims for the first half of 2020 claims compared to more recent claims—from October 2020 through January 2021. In the earlier time period, 39 percent of these COVID-related claims were from the health care sector compared 29 percent more recently. While the percentage of claims from first responders (public safety/government workers) stayed around 15-16 percent in both time periods, retail workers now represent 12.5 percent of infections compared to 7.9 percent in first-half 2020, and transportation workers are 8 percent of the total, double what they were earlier in the year.
Simpson, 2021	Workers and employers High-risk services	News report April 2020	Medical care for claimants	Claims data from the first and second quarters of 2020 compared with the first and second quarters of 2019; research discussed at conference	"COVID-19 claims have a concentration in high-risk services, more than 60% of all claims were happening among workers in high-risk services," [NAME] stated. Lower risk services had another 30% of COVID-19 claims. "So, service industries have majority of COVID-19 claims by the end of the second quarter 2020." "We found no change in pattern in the first treatment, and no change in the number of visits," said economist [NAME] during WCRI's recent annual conference in explaining the preliminary findings of her research. [NAME] analyzed data on COVID-19 paid claims from 27 states for the first two quarters of 2020 compared to 2019.The number of days from injury to treatment in 2020 was largely unaffected for COVID-19 and non-COVID-19 medical claims, as was the number of medical visits per claim. There was no delay for evaluation and management services, emergency room services, physical therapy, or surgery. That was true whether the claims originated in the first half of 2020 or were existing claims carried over from 2018 and 2019. In fact, there was a slight improvement in speed to surgery for 2019 claims carried into 2020. [NAME] also observed that for non-COVID-19 claims, there was almost no change in the injury composition between 2020 and 2019 second quarters. In 2019, 22% were lacerations/contusions compared to about 21% in 2020. Also, 26% were strains in 2019 while 22% were in 2020.

NOTES: N/A = not applicable.

[a] Unless otherwise indicated in brackets, the text in this column is drawn verbatim from the cited study.

[b] The COVID-19 Tracking Project, Kaiser Family Foundation, included control states, which are Arizona, California, Connecticut, the District of Columbia, Massachusetts, Maryland, Michigan, New Jersey, Nevada, Oregon, Rhode Island, Vermont, and Washington; and treated states, which are Alaska, Colorado,

Delaware, Florida, Georgia, Hawaii, Iowa, Illinois, Indiana, Kentucky, Louisiana, Minnesota, Missouri, Mississippi, Montana, New Hampshire, New Mexico, New York, Ohio, Pennsylvania, Utah, Wisconsin, and West Virginia.

Table A.4. Description of Article Focus, Type of Study, Design, Time Frame, Main Topics Included, Sample Description, and Relevant Results for Employer-Only Studies (n = 25 Studies)

Study	Article Focus	Type of Study, Design, and Time Frame	Main Topic	Sample Description	Relevant Results from the Study[a]
EMPLOYER-ONLY STUDIES					
Everling, 2021	Employer	Impact study	Impact of COVID-19 presumption on the private sector in Minnesota	Impact study	An unusual characteristic of COVID-19 claims is the high propensity for indemnity-only claims. 91% of closed claims with indemnity payments do not have medical payments. This is likely due to the CDC quarantine period and potential for mild cases to recover at home. . . . MWCIA's financial data call captured COVID-19 claim data under the large loss call with catastrophe code 12. This data shows a large proportion, 85%, of closed claims are indemnity-only. The average severity of closed claims is similar to the Indemnity Data Call at $1,452 compared to $1,301. Focusing in on average indemnity severity on closed claims, the financial data average of $1,064 is nearly the same as the Indemnity Data Call average of $1,068. This makes sense because of the claim overlap in each source.
Fragala, Goldberg, and Goldberg, 2021	Employers	Literature review	Return-to-work strategies; evidence-based perspectives of self-insured employers for managing population health during the COVID-19 pandemic	Literature on managing population health as employees return to work during the COVID-19 pandemic Guidance for self-insured employers	Employers are obliged to follow Occupational Safety and Health Administration (OSHA) standards to prevent occupational exposure to SARS-CoV-2, including personal protective equipment (PPE) standards and furnishing each worker with ''employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm.' With low virus spread and high system preparation and capacity, businesses may prepare to resume or continue operations. Daily symptom tracking (at home or in person) of employees before they enter the worksite and separation of those who exhibit signs or symptoms consistent with COVID-19 may be an important component of a workplace strategy to mitigate viral transmission. . . . Managers can support employee interactions directly by ensuring that each employee receives daily outreach during the work week, through a supervisor or buddy system, just to maintain social contact. In addition, people managers in the workplace play an important role in transparency and communication to help foster higher perceived knowledge—an important factor associated with emotional well-being during the pandemic. Positive psychology in the workplace may be fostered through both clear communications of the decisions related to the business continuity plan of the organization during the pandemic and by involving employees in the preparation of the post-pandemic business plan. Such

					practices may reduce employees' level of stress, foster positive attitudes, and reinforce team cohesion.
Gravina et al., 2020	Employer protective actions	Journal article	Protection of workers	Essential worker protection	The Centers for Disease Control recommends several strategies for decreasing the spread of illnesses in the workplace, including a) promoting proper hand hygiene, b) cleaning and sanitizing the work area, c) encouraging sick employees to stay home, d) personal protective equipment, and e) social distancing. Research suggests that instructions are often not sufficient to change work behaviors, and behavioral interventions maybe needed. Thus, the present paper reviews existing research that informs the implementation of behavioral strategies to reduce the spread of disease in the workplace, and makes recommendations for organizations to protect employees, clients, and customers.
Lichtman et al., 2021	Return to work	Journal article, April 2020	Symptom screening	9,446 health care workers	During the period from April 2nd to April 17th, 2020, 9446 HCWs had enrolled in the symptom tracking survey, with 5,035 HCWs completing the survey daily at the end of this period. 1,318 HCWs had been identified as being symptomatic with an indication for SARS-CoV-2 testing and were directed to the hotline to have this ordered. Of these, 82% reported not currently staying home from work due to illness or quarantine when first reporting symptoms. A survey-based symptom monitoring tool can be rapidly designed and implemented and incorporated with a testing strategy. Our results show the potential for quick uptake, and effectiveness in identifying and addressing presenteeism. We report our large academic institution's experience as a model to be adapted for use in this and future pandemics.
Pasco et al., 2020	Employer protective actions	Journal article	Protection of workers	Construction	Allowing unrestricted construction work was associated with an increase of COVID-19 hospitalization rates through mid-August 2020 from 0.38 per 1000 residents to 1.5 per 1000 residents and from 0.22 per 1000 construction workers to 9.3 per 1000 construction workers. This increased risk was estimated to be offset by safety measures (such as thorough cleaning of equipment between uses, wearing of protective equipment, limits on the number of workers at a worksite, and increased health surveillance) that were associated with a 50% decrease in transmission. The observed relative risk of hospitalization among construction workers compared with other occupational categories among adults aged 18 to 64 years was 4.9 (95% CI, 3.8–6.2).
Plantes et al., 2021	Employers	Literature review, published February 2021	Testing, surveillance, workplace transmission	Essential workers	The workplace is an important source of potential transmission and, as such, can play a crucial role in containing the spread of an infectious disease outbreak. Most (75%) US workers are employed in occupations that cannot be done at home. The continuing need for health care, manufacturing, retail, and food services puts approximately 108.4 million workers at increased risk for adverse health outcomes related to working during a pandemic. Most exposed workers are employed in health care sectors; other occupational sectors with high proportions of exposed

					workers include protective services, office and administrative support occupations, education, community and social services, construction, meat and poultry packing, and maintenance. The degree of exposure also varies among occupations. For example, approximately 10% (14.4 M) of US workers face exposure to infection at least once per week, and approximately 18.4% (26.7 M) face such exposure at least once per month. Exposure is generally defined by close contact (i.e., within 6 feet for a total of 15 minutes or more) with a person with COVID-19 and is more likely in the aforementioned occupations. Although SARS-CoV-2 has different transmission characteristics than influenza (e.g., higher transmissibility, longer incubation period, asymptomatic transmission, prolonged viral shedding), data from studies of influenza can shed light on the potential role of the workplace in SARS-CoV-2 transmission. Evaluations of influenza epidemics have demonstrated the substantial contribution of the workplace to transmission. As many as 20%–25% of weekly contacts are made in the workplace, and modeling studies suggest that 9%–33% of influenza transmission occurs in the workplace. A modeling study also suggested that most (72%) of the workplace transmission that occurs during an influenza epidemic results from exposure to employees who go to work sick (presenteeism). During the ongoing COVID-19 pandemic, increases in absenteeism have been reported among occupational groups less able to avoid exposure to SARS-CoV-2. The concern about exposure to SARS-CoV-2 in the workplace points to the need for accurate, real-time assessment of transmission risk along with measures to mitigate the risk. Risk assessment tactics include surveillance in the workplace as well as in regions that employees commute from.
EMPLOYER-ONLY NEWS REPORTS					
Alix, 2020	Employer benefits for workers	News article, March 2020	Paid leave for workers	Bank employers and employees	“Keeping employees and customers as safe as possible is every bank’s top priority, which is why banks are embracing telework and social distancing, providing paid sick leave, expanding safe banking services through drive-up windows, and personalized ‘golden hours’ appointments for at-risk seniors,” [NAME], the senior vice president, risk and cybersecurity policy at the American Bankers Association said in an email. “These efforts are just one way America’s banks are trying to stop the spread of COVID-19, while still supporting the economy.”
Almeida and Hirtzer, 2020	Employer benefits for workers	News article, December 2020	Paid leave for workers	Meat industry	The meat industry is trying to avoid the type of disruptions that shut plants and left supermarket shelves empty after thousands of workers across North America caught the virus earlier this year. JBS has sent more than 5,000 of its most vulnerable employees home on paid leave. The American unit of Sao Paulo–based JBS has hired 6,000 workers in the U.S. in the past four months, but that hasn’t been enough to compensate for those who have left the company or are on paid leave, Nogueira said.

					It's common for meat companies to have high absenteeism, but levels have increased in the pandemic.
Boyle, 2020	Employer benefits for workers	News article, March 2020	Paid leave for workers	Retail	Target Corp. is boosting hourly wages, expanding its paid-leave policy and delivering bonuses to thousands of store employees, the latest move by a major retailer to reward rank-and-file staff for coping with the coronavirus. The cheap-chic retailer said it's raising hourly pay by $2 until at least May 2 and offering paid sick leave of up to 30 days for staffers who are 65 or older, pregnant or have underlying medical conditions. It's also doling out bonuses ranging from $250 to $1,500 for 20,000 hourly workers who oversee store departments like beauty or food and beverage. The company said it will hire more people as needed.
Buckley, Van Voorhis, and Rubin, 2020	Employer benefits for workers	Industry magazine	Paid leave, WC information, COVID-19 preventive measures	Human resources	But employee "telework" is a pay complication under the new federal COVID-19 coverage laws that will need to be resolved case by case, says [NAME], managing principal at Albuquerque-based law firm Jackson Lewis. He also sees potential issues from remote work in workers' compensation claims. There also could be conflict with union collective bargaining agreements, attorneys say. Such pacts "do not exempt employers from complying with the FFCRA," says [NAME], national chair of the labor and employment practice at [NAME] in Atlanta. She says the law allows employers covered by union agreements to satisfy their obligations with added contributions to their multiemployer fund, plan or program in lieu of the new paid leave. [NAME] says recent guidance was issued by the National Labor Relations Board. Early on, many human resources concerns centered around new federal sick leave and family leave provisions, as employers feared a possible wave of workers needing time off because of COVID-19. The Families First Coronavirus Response Act, which took effect on April 1, offers payroll tax credits to businesses with fewer than 500 employees if they provide a worker paid leave for an individual or family member's virus care. With firms clamoring for added federal guidance, an ongoing list of U.S. Labor Dept. updates and answers was approaching triple digits. Under FFCRA, workers for eligible employers can receive up to 80 hours of paid sick leave at a rate equal to 100% of the employee's pay—capped at $511 per day for a total of 10 workdays. Up to 10 weeks of qualifying leave can be counted toward the child-care leave credit at a cap of $200 per day. . . . Disclosure of an employee's COVID-19 illness has created another HR issue, balancing broad workplace protection with employee privacy. Jarrett acknowledges that employers could face claims under the Americans With Disabilities Act and similar laws by revealing identities of virus-infected workers and also could be sued for failing to take reasonable steps to prevent COVID-19 spread. "At the end of the day, employers will find themselves being the proverbial birdie in the badminton game, trying to do the right thing to keep

					employees and customers safe while not crossing the legal line by being too aggressive," he says.
Camillo, 2020	Employer benefits for workers	News article, March 2020	Paid leave for workers	Warehouse	Close to 100 Amazon.com Inc. warehouse workers in Staten Island, New York, are planning a walk-out on Monday morning as they demand that the facility be closed for cleaning and employees receive paid time off while it's shut down, CNBC reported.
Chordas, 2020	Employer Presumption	Industry magazine	COVID-19 presumption and WC information	Insurers	In April, the National Council on Compensation Insurance published a white paper that estimated COVID's impact on the workers' compensation system under various hypothetical scenarios. The paper showed that the potential impact of COVID-19 could climb as high as $81.5 billion. That amount, according to NCCI, would translate to an additional 254% of workers' compensation payouts due to the virus. The Workers' Compensation Insurance Rating Bureau of California also has provided its take on projected costs based on a July study of front-line worker claims in the state. The bureau also has provided its take on projected costs, concluding in April that the annual cost of COVID-19 claims by California's essential critical infrastructure employees under a conclusive presumption could range from $2.2 billion to $33.6 billion, "with an approximate midrange estimate of $11.2 billion, which is equal to 61% of the annual estimated cost of the total workers' compensation system prior to the impact of the pandemic," according to an issue brief by the American Academy of Actuaries. In California, rebuttable evidence can include workers' recent personal travel logs, employees failing to comply with state social distancing mandates and employment records indicating an employee was working from home during the incubation period, [NAME], chief sales officer at Marsh & McLennan Agency West, said. In California, more than 11,090 health care workers in nursing homes and long-term care facilities as of mid-July tested positive and 102 died as a result of COVID, according to data from the state health department.
Darragh, 2020	Employer Presumption	Industry magazine	COVID-19 presumption and WC information	Insurers	The American Property Casualty Insurance Association commended the efforts of front-line workers during the pandemic, but their efforts should not require insurers to pick up costs for which they are not responsible, said [NAME], president and chief executive officer. "Gov. Newsom's executive order on workers' compensation is overly broad and could force employers in the public and private sector to cover COVID-19 cases not contracted in the workplace," he said. "APCIA believes this overly broad executive order jeopardizes the stability of the workers' compensation system. Maintaining proof of a causal connection that a covered injury or disease was contracted in the workplace is essential for a stable no-fault workers' compensation system for employers and employees alike." Sampson added it is important to remember that under current law, workers who contract COVID-19 in the course of their employment are already able to file claims and receive benefits.

Darragh, 2021	Employer Presumption	Industry magazine	COVID-19 presumption and WC information	Insurers	As of Sept. 27, 2020, the Texas division said, insurance carriers reported more than 25,000 COVID-19 workers' comp claims and 100 fatalities. According to the report, the professionals most heavily hit were first responders and corrections workers. Insurers accepted 48% of claims filed by those with positive tests for COVID-19, it said. This past September, California Governor Gavin Newsom signed a bill creating two presumptions: one specific to frontline workers such as peace officers, firefighters, health care providers and home care workers, and a general presumption for employees who contract COVID-19 in the midst of a workplace outbreak. As in other states, California saw cases peak in July with 14,658 first reports of COVID-19 injury, according to the state Division of Workers Compensation. They fell to 3,503 in October, giving the state a running total of 53,072 claims and 15,919 denials through mid-November, it said. While a number of states expanded presumption rules to cover first responders and frontline health care providers, some "adopted more expansive categories of workers entitled to compensability presumptions related to COVID-19 exposures," Employers Holdings President and CEO [NAME] said in an earnings call. "These changes will have a negative impact on ultimate losses for the workers' compensation industry, although we continue to believe our exposure to additional losses from enacted changes are likely to be less impactful given the classes of business we write," said [NAME].
Day, 2020	Employer benefits for workers	News article, April 2020	Paid leave for workers	Warehouse	Amazon.com Inc. will offer sick leave to hourly workers quarantined or diagnosed with the disease caused by the coronavirus, in an effort to extend protections to the e-commerce company's hundreds of thousands of logistics workers. . . . Employees diagnosed with Covid-19 or placed into isolation will be eligible for as much as two weeks of pay, [NAME], Amazon's human resources chief, said in a blog post on Wednesday. Much of Amazon's corporate staff—at the company's headquarters in Seattle, as well as in hubs like the San Francisco Bay Area, and New York City—has been given the option to work from home to limit the spread of the disease. Such benefits weren't available for the hourly workers who staff Amazon's warehouses, or the independent contractors who deliver packages.
Hanna, 2020	Employer Presumption	News article, April 2020	Inclusion of workers in COVID-19 presumption	Essential workers	New rules introduced last week—which allow essential personnel including grocery clerks and nurses to collect worker's compensation without having to show they contracted the illness on the job—overstep the state's authority and will impose significant costs on employers, the trade groups said in a lawsuit.
Harrington et al., 2020	Employer	Journal article	Nurse staffing in nursing homes	Essential workers	Nursing homes with total RN staffing levels under the recommended minimum standard (0.75 hours per resident day) had a two times greater probability of having COVID-19 resident infections. Nursing homes with lower Medicare five-star ratings on total nurse and RN staffing levels (adjusted for acuity), higher total health deficiencies, and more beds had a

					higher probability of having COVID-19 residents. Nursing homes with low RN and total staffing levels appear to leave residents vulnerable to COVID-19 infections. Establishing minimum staffing standards at the federal and state levels could prevent this in the future.
Jacobs et al., 2020	Employer benefits to workers	News article, March 2020	Paid leave	Federal guidance	President [NAME] is expected to take a series of executive actions to deliver economic relief from the coronavirus outbreak, including paid sick leave for hourly workers and extending tax-filing deadlines for small businesses, according to two people familiar with the matter.
Luna, 2020	Employer benefits to workers	News article, March 2021	Paid leave	Restaurants	Restaurant companies have been rapidly rolling out new paid sick leave policies in an effort to slow the spread of the coronavirus and ensure the safety of millions of workers and consumers. Darden Restaurants Inc., McDonald's Corp. and Starbucks Corp. are among the major restaurant companies that have expanded sick leave coverage as the coronavirus pandemic brought heightened scrutiny to restaurant worker benefits.
Massar and Kelly, 2020	Employer benefits to workers	News article, April 2020	Paid leave	Health care workers	We've been working around the clock to provide PPE [personal protective equipment] and other safety measures and including protective panels at our pharmacies and front store checkouts. We are offering to help employees with dependent-care needs, while providing sick leave to part-time employees for the duration of the pandemic. We have a number of things to provide some peace of mind. For example, we're providing cash bonuses to our pharmacists, other health-care professionals who are on the front lines—including our store associates and managers—and other individuals.
Moynihan, 2020	Employer Presumption	News article, March 2020	COVID-19 presumption and WC information	Insurer	However, by Wednesday evening the California governor's web site had not immediately specified exactly what personnel are included under the heading of "frontline healthcare workers," which some experts maintain is part of the problem with presumption executive orders. Those definitions vary from state to state. "Typically, it would apply to workers who are patient-facing," Mark Walls, Vice President of Communications & Strategic Analysis at specialty insurance and reinsurance provider Safety National, told Reactions last week. "Other states' definitions are not as clear." . . . . [NAME] added that in some states, many people who are not working or even exposed to patients are being covered under such orders. "Most of those 'presume' laws are very vague, and that's the problem," he said. "It basically takes away your ability to investigate a claim properly." [NAME], President and CEO of the American Property Casualty Insurance Association (APCIA), released a statement Wednesday night criticizing California's workers' comp presumption executive order as "overly broad" and could force employers in the public and private sector to cover COVID-19 cases not contracted in the workplace.

Sams, 2020	Employer Legal implications	News report	Coverage, benefits	Essential workers	Fisher Phillips, a national law firm that specializes in employment law, said whether COVID-19 is compensable under workers' comp depends on the specific facts. The worker must show that the illness or disease arose out of or was caused by conditions peculiar to the work and that he or she had a greater risk of contracting the disease and in a different manner than the general public, the firm said. However, NCCI said at least 10 states have issued mandates for coverage of coronavirus by health insurers. The directives vary but include coverage for testing and visits to emergency rooms or urgent care facilities without deductibles or copays, NCCI said. "These measures, if expanded to more states, could have the impact of limiting claim activity in the WC market in those cases where only testing or quarantine are necessary," NCCI said.
Stout-Tabackman and Thompson, 2020	Employer Commonwealth of Virginia	News report	Paid leave	Hourly workers	Many employers will consider mandatory use of paid leave and furloughs, temporary shutdowns, or reduced hours plans as alternatives to layoffs. However, employers must take care not to jeopardize the status of employees who are exempt from the minimum wage and overtime requirements of the Fair Labor Standards Act (FLSA), by inadvertently violating the salary basis requirement of the exemption. Furloughing or reducing the hours of non-exempt workers is typically straightforward. Absent a contract or collective bargaining agreement providing otherwise, hourly workers need be paid only for actual hours worked. To meet the "salary basis" test under the FLSA and many state laws, an exempt employee must receive, for each pay period, a "predetermined amount" constituting all or part of the employee's compensation. This amount is not subject to reduction because of variations in the quality or quantity of work performed. With few exceptions, an exempt employee must receive their full salary (no less than $684 a week under the FLSA and in Virginia) for any week in which the employee performs any work, regardless of the number of days or hours worked in that week. Salary deductions cannot be made for a full- or partial-day's absence due to lack of work as "occasioned by the employer or by the operating requirements of the business." Under the FLSA and Virginia law, employers may make mandatory deductions from an exempt employee's accrued PTO for a full- or partial-day's absence during a shutdown, furlough, or reduced hours plan, without affecting FLSA-exempt status, as long as the employee receives their full salary. Employers should review their PTO policies, paying particular attention to whether they have reserved discretion to require or prohibit the use of leave based on business needs.
Sundar, 2020	Employer	News report March 2020	Sick leave	Retail workers	Testing for COVID-19 has been a fraught issue in recent weeks, amid questions about the actual availability of test kits to diagnose patients, and the capacity to process tests as the illness spreads. Testing has moved slowly in the U.S., as initially only the Centers for Disease Control and Prevention was able to conduct the tests, at a time when the agency and the U.S. Food and Drug Administration hadn't yet permitted other hospital labs to conduct the testing. Since then, public officials have highlighted the

				quandary of increasing demand for COVID-19 testing, saying it could overwhelm health-care providers. Member Mark Levine, who chairs the council's committee on health, urged restraint on seeking testing, saying health-care providers have to prioritize more serious cases. "If every person who feels ill or thinks they were exposed to someone with COVID-19 tries to get a test, it will push the health-care system to the breaking point," he wrote in a Twitter thread Thursday. Globally, there are at least 137,445 confirmed COVID-19 cases, and more than 5,000 deaths, though the actual number of unconfirmed COVID-19 cases remains an unknown, making it difficult to assess the actual fatality rate. The retailers' emergency policies announced this week do provide options for workers to stay home if they suspect they are ill. Walmart, for instance, has said that it will waive its attendance policy until April and allow workers to use their existing paid time off to miss work if they feel unwell. Target similarly said it waived its absenteeism policy, and that it would offer its current benefits including paid family leave and backup day care for eligible team members and virtual medical visits. But those measures don't go far enough to address the unprecedented climate of uncertainty for retail workers, who, if they are unable to be tested for COVID-19, may end up opting to go to work rather than miss out on a needed paycheck, employment experts said.
Thorn, 2020	Employer	News report April 2020	Sick leave	Any workers subject to quarantine or isolation due to COVID-19, as well as patients experiencing symptoms and awaiting diagnosis, must be paid their regular pay up to $511 per day, up to a total of $5,110, according to the law. Additionally, workers who aren't sick themselves but are caring for others in quarantine, or for a child with symptoms similar to those of COVID-19, are eligible to two-thirds pay up to $200 a day and $2,000 total. Full-time employees get a total of 80 hours of paid sick leave, and part-time workers get the average number of hours they work in a two-week period. The law specifies that employees don't need to find a replacement for their shifts, nor do they need to accrue paid sick time or undergo a waiting period before they are eligible for pay in either of these situations, nor can they be required to take other paid leave they have accrued. That's not the case for an additional employee benefit enacted by the law, which gives paid leave to those who must take care of children because school or daycare is closed or because their childcare provider is unavailable due to a public health emergency. After 10 days of unpaid leave, or using paid leave if they're eligible, employers must pay employees who have worked for them for at least 30 days at least two-thirds of their pay, up to $200 per day or $10,000 total, for up to 12 weeks. However, private businesses with fewer than 50 employees may be exempted from paying that last benefit if doing so "would jeopardize the viability of the business as a going concern," according to the wording of the legislation. Companies with more than 500 employees are exempted from the requirements.

[a] Unless otherwise indicated in brackets, the text in this column is drawn verbatim from the cited study.

Appendix B. Additional Information and Supplementary Results on Quantitative Analyses

Sources for Industry and Occupation Crosswalks

As discussed in Chapters 2, 3, and 4, we had to crosswalk different industry and occupation coding systems to produce the estimates reported in Chapter 4 and to identify high-mortality occupations.

WCIS to OEWS Crosswalking

We used May 2020 OEWS estimates to measure employment at the industry and occupation level for calculating rates in Chapter 4. The OEWS in 2019 and 2020 used a unique occupation coding structure that BLS describes as a "hybrid" of 2010 and 2018 SOC codes. A crosswalk from 2010 SOC codes (which are assigned by NIOCCS) and the OEWS codes is available from the BLS website (BLS, 2020b).

OEWS publishes estimates at the major and detailed occupation levels, but not at intermediate levels of occupational detail. For example, there are estimates for SOC 29 (Healthcare Practitioners and Technical Occupations) and 29-1141 (Registered Nurses), but not for 29-1000 (Health Diagnosing and Treating Practitioners). In many cases, we had to aggregate the OEWS data on detailed occupations to a higher level of occupational detail because the crosswalked OEWS code resulted in a more aggregated occupation. We did so by summing employment. Claims outcomes such as denial rates, TD receipt rates, and proportion with no medical bills were aggregated according to the unweighted number of WC claims in the industry and occupation cells being aggregated.

Using Class Codes and Verbatim Occupation Descriptions to Identify Active Law Enforcement and Active Firefighters with Other Occupation Codes

In response to questions from one of our reviewers about the reliability of our occupation-level rate estimates, we inspected the verbatim occupation descriptions on COVID claims for the 20 occupations identified as having the highest COVID claim rates. The occupation descriptions for these occupations generally appeared consistent with the assigned occupation codes. However, we noticed that approximately 200 claims from workers who appear to be firefighters (fire engineers) had been classified by NIOCCS as Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (SOC code 17-2111). This led us to develop a manual edit based on class codes and the occupation description to override the NIOCCS occupation code and classify these workers as firefighters.

Stata 17 code for this edit is as follows (`frtline_grp1` is the name for a binary variable that identifies active firefighters):

```
      replace frtline_grp1 = 1 if real_occ==1 & (class_code=="7706" |
(inlist(class_code,"9410","") & regexm(occupation_desc,"FIRE") &
regexm(occupation_desc,"(ENGINE|PARAMED|CAPTA|FIGHTE|EQUIP)")))
// updated 12/6/2021 to add FF class code + municipal/missing class codes if
occupation description looks like firefighting job title: adds 236 COVID
claims for firefighters
```

This edit reassigned workers with valid occupation codes assigned by NIOCCS who were not otherwise identified as firefighters if the claim had class code 7706 (Firefighting Operations–not volunteers), or if all three of the following criteria were met:

1. The class code was 9410 (Municipal, State or Other Public Agency Employees–not engaged in manual labor, or direct supervision of construction or erection work) or missing (public-sector claims, which are overwhelmingly self-insured, often have no class code reported).
2. The occupation description included the text "FIRE" (all occupation descriptions are uppercase).
3. The occupation description also included text consistent with the job titles "engineer," "paramedic," "captain," "fighter," or "equipment operator."

This edit identified an additional 236 firefighter COVID claims, a 6-percent increase in the volume of firefighter COVID claims initially identified using NIOCCS-assigned occupation codes alone.

We also found that some sheriff's deputies who work in county jails were classified as correctional officers. We believe these workers may be covered by the frontline worker presumption due to their inclusion as deputy sheriffs under Penal Code section 830.1(a), although we note that a separate penal code section covering deputy sheriffs with exclusively custodial/detention facility assignments (830.1(c)) is not named in Labor Code Section 3212.87. We accordingly applied the following edit to flag these workers for inclusion under the frontline presumption, using the following Stata code:

```
      replace frtline_grp2 = 1 if real_occ==1 & frtline_grp1==0 &
inlist(class_code,"7720","9410","") &
regexm(occupation_desc,"(DEPUT|POLICE|SHERIF)") &
~regexm(occupation_desc,"(RECOR|NURS|CORONE|DISPATCH|COMM|MECH|ATTORN|MAIL|SP
EC|DEFEN)")                                  // updated 12/6/2021 to add
PO/municipal/missing class code, excluding non-active police/sheriff
occupations: adds 782 COVID claims
```

Edits to Occupation Codes

Other than the public safety occupations listed above, we generally did not edit the NIOCCS output. We did make one exception, however: NIOCCS classified an implausibly large number

of workers in the Couriers and Messengers (43-5021) occupation, which includes only office couriers (e.g., Bicycle Messenger, Laboratory Courier, Office Runner) and which contains only about 10,000 workers statewide. We inspected the verbatim occupation descriptions and found that most of these workers looked more like Light Truck Drivers (53-3033) (e.g., Grocery Light Truck Driver, Parcel Truck Driver), the occupation that should include home delivery drivers; this occupation contains around 100,000 workers statewide. Workers assigned to Couriers and Messengers who had ("PACKAGE", "DELIVER", or "DRIVE") in the verbatim occupation description and did not have ("COURIE" or "MESSENG") were recoded as Light Truck Drivers.

Supplementary Tables on Weighting

Appendix Table C.1 shows the distribution of sample characteristics for claims in the WCIS as we applied the sample criteria described in Chapter 2. The table compares unweighted and weighted distributions of characteristics. These results may be of interest to technically inclined readers.

Table C.1. Sample Construction and Comparison of Weighted and Unweighted Case Characteristics

	Unweighted Count of Records	Unweighted Count of Records	Unweighted Average or Proportion	Unweighted Average or Proportion	Weighted Average or Proportion	Unweighted Average or Proportion	Weighted Average or Proportion	Unweighted Average or Proportion	Weighted Average or Proportion
Sample restrictions applied									
Injury year reported	X	X	X	X	X	X	X	X	X
Complete records on weighting targets		X	X	X	X	X	X	X	X
Reliable claim administrator and complete records on other variables				X	X	X	X	X	X
Occupation code available						X	X	X	X
Medical bills reported								X	X
Demographics									
Percentage female	43.5	44.1	44.1	43.0	44.1	43.7	44.1	43.3	44.1
Percentage male	56.5	55.9	55.9	57.0	55.9	56.3	55.9	56.7	55.9
PERCENTAGE GENDER MISSING (derived variable)	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average age	40.9	41.1	41.1	40.9	41.1	41.1	41.1	41.4	41.1
PERCENTAGE AGE MISSING OR AGE NOT 16 TO 80 (derived variable)	0.0	0	0	0	0.00%	0.00%	0	0.00%	0
Weekly wage	$781	$784	$784	$755	$785	$778	$789	$816	$791
WEEKLY WAGE MISSING (percentage of cases)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage self-insured	67.1	35.7	35.7	27.6	35.5	29.5	35.3	26.1	34.8
Percentage not self-insured	32.8	64.3	64.3	72.4	64.5	70.5	64.7	73.9	65.2
UNKNOWN/INVALID self-insured flag	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Region									
Los Angeles County	972,907	749,155	25.4%	25.2%	25.4%	24.5%	25.5%	24.2%	25.6%
Orange County	273,599	212,585	7.2%	7.0%	7.2%	6.9%	7.1%	6.8%	7.1%
San Diego County	295,444	232,368	7.9%	7.7%	7.9%	7.5%	7.9%	7.6%	7.9%
Rest of Inland Empire (Riverside + San Bernardino + Imperial)	518,611	411,820	14.0%	13.6%	14.0%	13.7%	14.0%	13.9%	14.0%
Eastern Sierra + North State/Shasta + North Sacramento Valley	171,951	130,519	4.4%	4.5%	4.4%	4.6%	4.4%	4.6%	4.3%
Bay Area	675,469	529,630	18.0%	18.2%	18.0%	18.2%	18.1%	18.5%	18.1%
Central Valley	464,499	355,515	12.1%	12.3%	12.1%	12.8%	12.1%	12.9%	12.1%
Sacramento Valley	169,497	135,175	4.6%	4.8%	4.6%	4.8%	4.6%	4.8%	4.5%
Central Coast	255,199	193,276	6.6%	6.8%	6.5%	7.1%	6.5%	6.9%	6.5%

UNKNOWN/INVALID/OUT OF STATE REGION	6,446	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Number of cases by year									
2016	667,476	521,273	17.7%	18.4%	17.7%	18.0%	17.7%	17.9%	17.7%
2017	700,880	552,455	18.7%	19.6%	18.7%	19.1%	18.8%	19.1%	18.7%
2018	709,576	555,206	18.8%	18.9%	18.9%	18.8%	18.9%	20.0%	18.9%
2019	713,472	546,282	18.5%	18.1%	18.5%	18.2%	18.5%	19.6%	18.6%
2020	657,588	506,568	17.2%	16.4%	17.2%	17.2%	17.2%	16.3%	17.2%
2021	354,630	268,259	9.1%	8.6%	9.1%	8.8%	9.0%	7.2%	8.9%
Year missing or not in 2016–2021	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Occupation group (defined on presumption tab)									
Public safety	133,405	120,372	4.1%	3.4%	4.3%	5.67	6.1%	5.64%	6.0%
Health care	243,668	198,117	6.7%	6.3%	7.3%	10.45	10.8%	10.05%	10.7%
Other occupations	1,716,929	1,427,926	48.4%	50.2%	48.9%	83.87	83.1%	84.31%	83.3%
UNKNOWN/INVALID OCCUPATION CODE + INDUSTRY	1,709,620	1,203,628	40.8%	40.1%	39.6%	0.00%	0.0%	0.00%	0.0%
Industry sector									
Agriculture (11)	135,730	103,067	3.5%	3.8%	3.5%	497.0%	3.5%	4.8%	3.4%
Mining, etc. (21)	4,596	3,959	0.1%	0.1%	0.1%	11.0%	11.0%	0.1%	9.0%
Utilities (22)	11,711	10,698	0.4%	0.4%	0.4%	26.0%	32.0%	0.3%	30.0%
Construction (23)	170,821	142,004	4.8%	5.4%	4.8%	635.0%	4.8%	7.0%	4.9%
Manufacturing (31–33)	348,305	277,397	9.4%	10.2%	9.4%	922.0%	9.4%	10.0%	9.4%
Wholesale (42)	128,169	101,962	3.5%	3.8%	3.5%	3.3%	3.5%	3.5%	3.4%
Retail (44–45)	449,666	383,482	13.0%	13.1%	13.1%	13.1%	13.1%	11.2%	13.2%
Transportation and Warehousing (48–49)	211,159	178,920	6.1%	6.2%	6.1%	6.8%	6.1%	6.6%	6.1%
Information (51)	54,502	46,841	1.6%	1.7%	1.6%	1.0%	1.5%	1.0%	1.5%
Finance, Insurance, Real Estate (52, 53)	133,386	106,147	3.6%	3.9%	3.6%	3.0%	3.6%	2.7%	3.4%
Professional and Management Services (54–55)	95,500	73,660	2.5%	2.8%	2.5%	2.4%	2.5%	2.5%	2.5%
Administrative and Support Services (56)	288,870	225,585	7.7%	8.5%	7.7%	8.3%	7.7%	8.8%	7.8%
Education (61)	250,136	214,451	7.3%	6.7%	7.3%	6.7%	7.3%	6.5%	7.4%
Health Care and Social Assistance (62)	426,372	353,419	12.0%	10.8%	12.0%	12.2%	12.1%	11.9%	12.2%
Arts, Entertainment, Recreation (71)	73,899	63,134	2.1%	2.0%	2.1%	1.5%	2.0%	1.4%	1.9%
Accommodation and Food Service (72)	231,127	189,141	6.4%	7.0%	6.3%	6.8%	6.3%	7.1%	6.4%
Other Service (81)	107,672	85,321	2.9%	3.2%	2.9%	2.7%	2.9%	2.7%	2.9%
Public Administration (92)	428,685	390,855	13.3%	10.4%	13.3%	11.3%	13.3%	11.8%	13.3%
UNKNOWN/INVALID NAICS	253,316	0	0%	0%	0%	0%	0%	0%	0%
Sample sizes and weights									
N (unweighted)	3,803,622	2,950,043	2,950,043	2,594,509	2,594,509	1,553,791	1,553,791	1,097,495	1,097,495

N (weighted)	N.A.	N.A.	N.A.	N.A.	2,939,007	N.A.	2,923,349	N.A.	2,895,512
Percentage of previous column retained (UNWEIGHTED)	N.A.								
Cumulative percentage retained	N.A.								
Mean weight	N.A.	N.A.	N.A.	1.13	N.A.	1.88	N.A.	2.64	N.A.
Standard deviation of weight	N.A.	N.A.	N.A.	0.64	N.A.	1.08	N.A.	1.99	N.A.
Max weight	N.A.	N.A.	N.A.	283	N.A.	275	N.A.	275	N.A.

NOTE: N.A. = not applicable.

Table C.2 shows the impact of the weights used to produce "adjusted" statistics in tables throughout the report. As discussed in Chapter 2, the weights were derived to reweight the non-COVID claims to match the joint distribution of date of injury and occupation group observed among COVID claims. This provides an adjustment both for claim maturity differences and for differences in occupation mix between COVID and non-COVID claims.

Table C.2. Distribution of Injury Date and Occupation Group for COVID and Non-COVID Claims, Before and After Applying Weights for Adjusted Means

	COVID (%)	Non-COVID (%)	Non-COVID, Adjusted (%)
Month of Injury			
2020m1	0.1	7.0	0.1
2020m2	0.1	6.7	0.1
2020m3	1.7	5.8	1.7
2020m4	2.7	3.8	2.7
2020m5	3.1	4.7	3.1
2020m6	7.5	5.6	7.5
2020m7	9.5	5.8	9.5
2020m8	4.7	5.9	4.7
2020m9	3.0	5.9	3.0
2020m10	3.6	5.9	3.6
2020m11	11.2	5.0	11.2
2020m12	30.3	4.9	30.3
2021m1	16.6	4.9	16.6
2021m2	2.9	5.0	2.9
2021m3	1.5	5.9	1.5
2021m4	0.8	5.8	0.8
2021m5	0.5	5.7	0.5
2021m6	0.4	5.7	0.4
Occupation Group			
Peace Officers	5.8	4.7	5.8
Firefighters	3.6	2.1	3.6
Health Care	32.3	11.2	32.3
Other occupations	58.3	82.1	58.3

NOTES: COVID and non-COVID claim distribution was estimated using sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. "Non-COVID, adjusted" distribution was estimated using entropy balancing weights described in Chapter 2.

Supplementary Results for Chapter 8

Table B.2 shows the proportion of COVID-19 and non–COVID-19 claims with inpatient hospitalization billed to WC when claims with no medical bills submitted to WC are included in the calculation. This table provides a sensitivity analysis for Table 8.6.

Table C.3. Proportion of Workers with an Inpatient Hospitalization Billed to Workers' Compensation Within Three Months of Earliest Service Date, Including Claims with No Medical Bills, by COVID-19 Status and Presumption Section

	All Frontline Occupations	All Frontline Occupations	Other Occupations	Other Occupations	All Occupations	All Occupations
	COVID-19 Infection (%)	Non-COVID (%)	COVID-19 Infection (%)	Non-COVID (%)	COVID-19 Infection (%)	Non-COVID (%)
Period						
Prepandemic (2019)		0.55		0.67		0.66
Pandemic, before temporary presumption (1/1/2020–3/18/2020)	1.80	0.47	2.50	0.65	2.07	0.62
Temporary presumption (3/19/2020–7/5/2020)	2.19	0.65	2.01	0.79	2.10	0.76
SB 1159 presumptions in effect (7/6/2020–6/30/2021)	0.98	0.42	0.63	0.66	0.77	0.62
Total (1/1/2020–6/30/2021)	1.21	0.47	0.83	0.68	0.99	0.64
Adjusted total	1.21	0.35	0.83	0.68	0.99	0.54

NOTES: Estimates in the table use sampling weights to correct for casewise deletion of incomplete records, for exclusion of data from unreliable claims administrators, and for exclusion of claims that could not be assigned occupation codes. Adjusted totals use weights to adjust for differences between COVID-19 and non–COVID-19 claims in date of injury and occupational group. See Chapter 3 and Appendix B for details. Estimates in table include claims with initial denials; claims with zero medical bills submitted to WC were excluded, but claims with bills submitted and zero medical benefits paid were included.

Abbreviations

AB	Assembly Bill
AME	agreed medical examiner
ATD	Aerosol Transmissible Diseases
BLS	U.S. Bureau of Labor Statistics
Cal/OSHA	California Division of Occupational Safety and Health
CDC	Centers for Disease Control and Prevention
CDPH	California Department of Public Health
CHSWC	Commission on Health and Safety and Workers' Compensation
COVID-19	disease caused by novel coronavirus SARS-CoV-2
CWCI	California Workers' Compensation Institute
DIR	(California) Department of Industrial Relations
DWC	Division of Workers' Compensation
EDD	Employment Development Department
EMT	emergency medical technician
EO	executive order
ESI	employer-sponsored health insurance
ETS	emergency temporary standard
FFCRA	Families First Coronavirus Response Act
FROI	First Report of Injury
FTE	full-time equivalent
HRSA	Health Resources and Services Administration
ICU	intensive care unit
JPA	Joint Powers Authority
LAE	loss adjustment expenses
NAICS	North American Industry Classification System
NCCI	National Council on Compensation Insurance
NIOCCS	NIOSH Industry and Occupation Computerized Coding System
NIOSH	National Institute for Occupational Safety and Health
OES	Occupational Employment Statistics
OEWS	Occupational Employment and Wage Statistics
OMFS	Official Medical Fee Schedule
OSHA	Occupational Safety and Health Administration
PCR	polymerase chain reaction
PD	permanent disability
PPE	personal protective equipment
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses

QME	qualified medical evaluator
RN	registered nurse
RQ	research question
SA	self-administered
SB	Senate Bill
SDI	State Disability Insurance
SIC	Standard Industrial Classification
SNF	skilled nursing facility
SOC	Standard Occupational Classification
SPSL	supplemental paid sick leave
SROI	Subsequent Reports of Injury
TAG	technical advisory group
TD	temporary disability
TPA	third-party administrator
UFCW	United Food and Commercial Workers Union
WC	workers' compensation
WCIO	Workers Compensation Insurance Organizations
WCIS	Workers' Compensation Information System

References

Alix, L., "Banks Supplement Benefits to Help Employees Affected by Coronavirus," *American Banker*, March 20, 2020.

Almeida, I., and M. Hirtzer, "Pandemic Is Starting to Hit North American Meat Plants Again," Bloomberg News, 2020.

Assembly Bill 1867, Small Employer Family Leave Mediation: Handwashing: Supplemental Paid Sick Leave, September 9, 2020.

Assembly Bill 685, COVID-19: Imminent Hazard to Employees: Exposure: Notification: Serious Violations, September 17, 2020. As of November 15, 2021: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB685

Bailey, M., and C. Jewett, "Families of Health Workers Killed by COVID Fight for Denied Workers' Comp Benefits," July 13, 2020. As of June 17, 2021: https://khn.org/news/adding-to-covid-stress-families-of-health-workers-fight-for-denied-workers-comp-benefits/

Bernacki, E. J., D. L. Hunt, L. Yuspeh, R. A. Lavin, N. Kalia, N. Leung, N. F. Tsourmas, L. Williams, and X. Tao, "What Industrial Categories Are Workers at Excess Risk of Filing a Covid-19 Workers' Compensation Claim? A Study Conducted in 11 Midwestern U.S. States," *Journal of Occupational and Environmental Medicine*, Vol. 63, No. 5, May 2021, pp. 374–380. As of January 10, 2022: https://journals.lww.com/joem/Fulltext/2021/05000/What_Industrial_Categories_Are_Workers_at_Excess.4.aspx

Bernard, H. R., and G. W. Ryan, "Code Books and Coding," Chapter Four in *Analyzing Qualitative Data: Systematic Approaches*, Thousand Oaks, Calif.: Sage Publications, 2010, pp. 75–105.

BLS—*See* U.S. Bureau of Labor Statistics.

Boyle, M., "Target Boosts Wages and Delivers Bonuses to Rank-and-File," Bloomberg News, 2020.

Bradley, E. H., L. A. Curry, and K. J. Devers, "Qualitative Data Analysis for Health Services Research: Developing Taxonomy, Themes, and Theory," *Health Services Research*, Vol. 42, No. 4, August 2007, pp. 1758–1772. As of June 30, 2021: http://www.ncbi.nlm.nih.gov/pubmed/17286625

Buckley, B., S. Van Voorhis, and D. K. Rubin, "Managing Human Assets Gets Harder in the COVID-19 Era," *Engineering News-Record*, April 29, 2020. As of September 2, 2021: https://www.enr.com/articles/49285-managing-human-assets-gets-harder-in-covid-19-era

California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders, Section 3205, as amended December 1, 2020.

California Department of Industrial Relations, Division of Workers' Compensation, "Workers' Compensation Information System (WCIS): Workers' Compensation Claims by Injury Type," webpage, 2020. As of January 10, 2021: https://www.dir.ca.gov/dwc/wcis/WCIS_tables/Tables1-3/WCIS_Reports-Table1-3.html

California Labor Code, Section 248.1, Paid Sick Days, September 9, 2020.

California Labor Code, Section 3600, Conditions of compensation liability, January 1, 2012.

California Labor Code, Section 4850, City police and firemen, sheriffs, and others, January 1, 2014. As of January 12, 2022: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=LAB&sectionNum=4850

California Labor Code, Section 3212.86, Employees with COVID-19–related illness, September 17, 2020.

California Labor Code, Section 3212.87, Compensation first responders for COVID-19-related injuries, September 17, 2020.

California Labor Code, Section 3212.88, Employees who test positive during an outbreak at place of employment, September 17, 2020.

California Workers' Compensation Institute, "Physicians," webpage, 2021. As of November 9, 2021: https://www.cwci.org/Physicians.html

California Workers' Compensation Institute, "COVID-19 & Non-COVID Interactive App," online tool, 2022. As of February 14, 2022: https://www.cwci.org/CV19claims.html

Camillo, G., "Amazon Workers Plan Strike at Staten Island Warehouse, CNBC Says," 2020.

Cavanagh, S., "Content Analysis: Concepts, Methods and Applications," *Nurse Researcher*, Vol. 4, No. 3, May 1, 1997, pp. 5–16. As of June 25, 2021: https://www.ncbi.nlm.nih.gov/pubmed/27285770

Chen, Y. H., M. Glymour, A. Riley, J. Balmes, K. Duchowny, R. Harrison, E. Matthay, and K. Bibbins-Domingo, "Excess Mortality Associated with the COVID-19 Pandemic Among Californians 18–65 Years of Age, by Occupational Sector and Occupation: March Through November 2020," *PloS One*, Vol. 16, No. 6, June 4, 2021, p. e0252454. As of January 10, 2022:
https://www.ncbi.nlm.nih.gov/pubmed/34086762

Cherry, M. A., and A. Santos Rutschman, "Gig Workers As Essential Workers: How to Correct the Gig Economy Beyond the COVID-19 Pandemic," *ABA Journal of Labor and Employment Law*, Vol. 35, No. 1, 2020, pp. 11–16.

Chordas, L., "On the Front Line," *Best's Review*, 2020.

Chua, K. P., R. M. Conti, and N. V. Becker, "Assessment of Out-of-Pocket Spending for COVID-19 Hospitalizations in the US in 2020," *JAMA Network Open*, Vol. 4, No. 10, October 1, 2021, p. e2129894. As of January 10, 2022:
https://www.ncbi.nlm.nih.gov/pubmed/34661662

Cohn, B. A., P. M. Cirillo, C. C. Murphy, N. Y. Krigbaum, and A. W. Wallace, "SARS-CoV-2 Vaccine Protection and Deaths Among US Veterans During 2021," *Science*, November 4, 2021, p. eabm0620. As of January 10, 2022:
https://www.ncbi.nlm.nih.gov/pubmed/34735261

Coto, J., A. Restrepo, I. Cejas, and S. Prentiss, "The Impact of COVID-19 on Allied Health Professions," *PloS One*, Vol. 15, No. 10, October 30, 2020, p. e0241328. As of January 10, 2022:
https://www.ncbi.nlm.nih.gov/pubmed/33125385

COVID19.CA.GOV, "Tracking COVID-19 in California," webpage, 2021a. As of September 2, 2021:
https://covid19.ca.gov/state-dashboard/

COVID19.CA.GOV, "Vaccination Data," webpage, 2021b. As of November 15, 2021:
https://covid19.ca.gov/vaccination-progress-data/

Darragh, T., "California Workers' Comp Order Opposed by Insurers," *Best's Review*, 2020.

Darragh, T., "The Great Unknowns: Workers' Comp Insurers Face Many Uncertainties Around COVID-Related Claims," *Best's Review*, 2021.

Day, M., "Amazon to Offer Sick Pay to Ill and Quarantined Hourly Workers," Bloomberg News, 2020.

Dedoose version 8.2.32, SocioCultural Research Consultants, LLC, 2019.

Department of Industrial Relations, State of California, "Doctor's First Report of Occupational Injury or Illness," online form, 2020. As of December 6, 2021: http://www.dir.ca.gov/dwc/forms/5021.pdf

Department of Industrial Relations, State of California, "Workers' Compensation Claim Form (DWC 1) & Notice of Potential Eligibility," online form, 2021. As of December 6, 2021: https://www.dir.ca.gov/dwc/DWCForm1.pdf

Downe-Wamboldt, B., "Content Analysis: Method, Applications, and Issues," *Health Care for Women International*, Vol. 13, No. 3, July–September 1992, pp. 313–321. As of June 21, 2021: https://www.ncbi.nlm.nih.gov/pubmed/1399871

EDD—*See* Employment Development Department, State of California.

Eidelson, J., "Covid Gag Rules at U.S. Companies Are Putting Everyone at Risk," *Bloomberg BusinessWeek*, August 27, 2020. As of September 2, 2021: https://www.bloomberg.com/news/features/2020-08-27/covid-pandemic-u-s-businesses-issue-gag-rules-to-stop-workers-from-talking

Employment Development Department, State of California, "State Disability Insurance Program," fact sheet, undated.

Employment Development Department, State of California, "About Disability Insurance," webpage, December 8, 2020a. As of January 13, 2022: https://edd.ca.gov/Disability/About_DI.htm

Employment Development Department, State of California, "Workers' Compensation and Disability Benefits," webpage, December 16, 2020b. As of January 13, 2022: https://edd.ca.gov/Disability/Employer_Workers_Compensation.htm

Employment Development Department, State of California, "About the State Disability Insurance Program," webpage, January 19, 2021. As of January 13, 2022: https://edd.ca.gov/Disability/About_the_State_Disability_Insurance_(SDI)_Program.htm

Employment Development Department, State of California, "COVID-19 FAQs: Disability and Paid Family Leave Benefits," webpage, 2022. As of January 13, 2022: https://edd.ca.gov/about_edd/coronavirus-2019/faqs/disability-paid-family-leave.htm

Everling, A., *COVID-19 and Privately-Insured Workers' Compensation in Minnesota*, Minneapolis, Minn.: Minnesota Workers' Compensation Insurers Association, 2021.

Flores, E., "The Impact of the COVID-19 Pandemic on Rural San Joaquin Valley Households and Workers," research brief, Community and Labor Center, University of California Merced, December 2020. As of September 2, 2021: https://clc.ucmerced.edu/sites/clc.ucmerced.edu/files/page/documents/harvesting_safety_study.pdf

Flores, E., and A. Padilla, "Gaps in Federal Bill Leaves Valley at Risk," policy brief, Civic Capacity Research Initiative, University of California Merced, April 2020. As of September 2, 2021: https://clc.ucmerced.edu/sites/clc.ucmerced.edu/files/page/documents/ccri_policy_brief-_gaps_in_federal_bill_leaves_valley_at_risk.pdf

Fragala, M. S., Z. N. Goldberg, and S. E. Goldberg, "Return to Work: Managing Employee Population Health During the COVID-19 Pandemic," *Population Health Management*, Vol. 24, No. S1, February 2021, pp. S3–S15. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33347795

Ghilarducci, T., and A. Farmand, "Older Workers on the COVID-19-Frontlines Without Paid Sick Leave," *Journal of Aging and Social Policy*, Vol. 32, No. 4–5, July–October, 2020, pp. 471–476. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/32436446

Goldberg, Y., M. Mandel, Y. M. Bar-On, O. Bodenheimer, L. Freedman, E. J. Haas, R. Milo, S. Alroy-Preis, N. Ash, and A. Huppert, "Waning Immunity After the BNT162b2 Vaccine in Israel," *New England Journal of Medicine*, October 27, 2021. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34706170

Gravina, N., J. A. Nastasi, A. A. Sleiman, N. Matey, and D. E. Simmons, "Behavioral Strategies for Reducing Disease Transmission in the Workplace," *Journal of Applied Behavior Analysis*, Vol. 53, No. 4, September 2020, pp. 1935–1954. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33063854

Groff, D., A. Sun, A. E. Ssentongo, D. M. Ba, N. Parsons, G. R. Poudel, A. Lekoubou, J. S. Oh, J. E. Erickson, P. Ssentongo, and V. M. Chinchilli, "Short-Term and Long-Term Rates of Postacute Sequelae of SARS-CoV-2 Infection: A Systematic Review," *JAMA Network Open*, Vol. 4, No. 10, 2021, p. e2128568. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34643720

Hainmueller, J., "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies," *Political Analysis*, Vol. 20, No. 1, 2012, pp. 25–46.

Hanna, J., "Firms Sue to Block Illinois Virus Benefits for Essential Workers," Bloomberg News, 2020.

Harrington, C., L. Ross, S. Chapman, E. Halifax, B. Spurlock, and D. Bakerjian, "Nurse Staffing and Coronavirus Infections in California Nursing Homes," *Policy, Politics and Nursing Practice*, Vol. 21, No. 3, August 2020, pp. 174–186. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/32635838

Health Resources and Services Administration, "COVID-19 Claims Reimbursement to Health Care Providers and Facilities for Testing, Treatment, and Vaccine Administration for the Uninsured," webpage, 2021. As of December 16, 2021: https://www.hrsa.gov/CovidUninsuredClaim

HRSA—*See* Health Resources and Services Administration.

Iddins, B. O., M. H. Waugh, B. Buck, T. Cato, D. E. Graham, K. Attia, D. Jones, A. Partin, R. Shourbaji, and C. Wesh, "Benchmarking SARS CoV-2 Infection in the Workplace to Support Continuity of Operations," *Journal of Occupational and Environmental Medicine*, Vol. 63, No. 7, July 1, 2021, pp. 548–556. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33741830

Jacobs, J., M. Saleha, N. Wadhams, and R. Beene, "Trump Likely to Reveal Sick Leave, Tax Extension Plan for Virus," *Bloomberg | Quint*, March 11, 2020. As of September 3, 2021: https://www.bloombergquint.com/markets/trump-likely-to-reveal-sick-leave-tax-extension-plan-for-virus

Jewett, C., R. Lewis, and M. Bailey, "More Than 2,900 Health Care Workers Died This Year—and the Government Barely Kept Track," San Francisco, Calif.: Kaiser Family Foundation, December 23, 2020. As of January 10, 2022: https://khn.org/news/article/more-than-2900-health-care-workers-died-this-year-and-the-government-barely-kept-track/

Johnson, M. S., "Regulation by Shaming: Deterrence Effects of Publicizing Violations of Workplace Safety and Health Laws," *American Economic Review*, Vol. 110, No. 6, 2020, pp. 1866–1904.

Kingston, G. A., "Arising out of and in Course of Employment," *Virginia Law Register*, Vol. 4, No. 11, 1919, pp. 804–820.

Kronick, R., and S. H. Neyaz, *Private Insurance Payments to California Hospitals Average More Than Double Medicare Payments*, Washington, D.C.: West Health Policy Center, 2019.

Labor Commissioner's Office, California Department of Industrial Relations, "2021 COVID-19 Supplemental Paid Sick Leave FAQs," webpage, 2021. As of November 9, 2021: https://www.dir.ca.gov/dlse/COVID19Resources/FAQ-for-SPSL-2021.html

Leigh, J. P., and J. A. Robbins, "Occupational Disease and Workers' Compensation: Coverage, Costs, and Consequences," *Milbank Quarterly*, Vol. 82, No. 4, 2004, pp. 689–721. As of February 14, 2022: https://www.ncbi.nlm.nih.gov/pubmed/15595947

Liberati, A., D. G. Altman, J. Tetzlaff, C. Mulrow, P. C. Gotzsche, J. P. Ioannidis, M. Clarke, P. J. Devereaux, J. Kleijnen, and D. Moher, "The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration," *PLoS Medicine*, Vol. 6, No. 7, July 21, 2009, p. e1000100. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/19621070

Lichtman, A., E. Greenblatt, J. Malenfant, and A. Kuo, "Universal Symptom Monitoring to Address Presenteeism in Healthcare Workers," *American Journal of Infection Control*, Vol. 49, No. 8, August 2021, pp. 1021–1023. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34294381

Luna, N., "Paid Sick Leave Policies Under New Scrutiny," *Nation's Restaurant News*, Vol. 54, No. 4, March 2020, p. 16. As of January 10, 2022: https://www.proquest.com/trade-journals/paid-sick-leave-policies-under-new-scrutiny/docview/2395483472/se-2?accountid=25333

Massar, C., and J. Kelly, "CVS Head Says Supplies Adequate, Protecting Workers Is Priority," Bloomberg News, 2020.

Mbaeyi, S., S. E. Oliver, J. P. Collins, M. Godfrey, N. D. Goswami, S. C. Hadler, J. Jones, H. Moline, D. Moulia, S. Reddy, K. Schmit, M. Wallace, M. Chamberland, D. Campos-Outcalt, R. L. Morgan, B. P. Bell, O. Brooks, C. Kotton, H. K. Talbot, G. Lee, M. F. Daley, and K. Dooling, "The Advisory Committee on Immunization Practices' Interim Recommendations for Additional Primary and Booster Doses of COVID-19 Vaccines—United States, 2021," *MMWR: Morbidity and Mortality Weekly Report*, Vol. 70, No. 44, November 5, 2021, pp. 1545–1552. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34735422

McDermott, D., and C. Cox, "Cost-Sharing Waivers and Premium Relief by Private Plans in Response to COVID-19," *Health System Tracker*, August 20, 2020. As of December 16, 2021: https://www.healthsystemtracker.org/brief/cost-sharing-waivers-and-premium-relief-by-private-plans-in-response-to-covid-19/

Merck, "Merck and Ridgeback's Investigational Oral Antiviral Molnupiravir Reduced the Risk of Hospitalization or Death by Approximately 50 Percent Compared to Placebo for Patients with Mild or Moderate COVID-19 in Positive Interim Analysis of Phase 3 Study," press release, October 1, 2021. As of November 15, 2021: https://www.merck.com/news/merck-and-ridgebacks-investigational-oral-antiviral-molnupiravir-reduced-the-risk-of-hospitalization-or-death-by-approximately-50-percent-compared-to-placebo-for-patients-with-mild-or-moderat/

Michelen, M., L. Manoharan, N. Elkheir, V. Cheng, A. Dagens, C. Hastie, M. O'Hara, J. Suett, D. Dahmash, P. Bugaeva, I. Rigby, D. Munblit, E. Harriss, A. Burls, C. Foote, J. Scott, G. Carson, P. Olliaro, L. Sigfrid, and C. Stavropoulou, "Characterising Long COVID: A Living Systematic Review," *BMJ Global Health*, Vol. 6, No. 9, September 2021. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34580069

Moynihan, S., "California Joins List of States Beset by WC Presumption Executive Orders," *Reactions*, March 2020.

National Commission—*See* National Commission on State Workmen's Compensation Laws.

National Commission on State Workmen's Compensation Laws, *The Report of the National Commission on State Workmen's Compensation Laws*, Washington, D.C., 1972.

National Institutes of Health, "Anti-SARS-CoV-2 Monoclonal Antibodies," webpage, 2021. As of November 15, 2021: https://www.covid19treatmentguidelines.nih.gov/therapies/anti-sars-cov-2-antibody-products/anti-sars-cov-2-monoclonal-antibodies/

Newsom, Gavin, Executive Order N-25-20, Sacramento, Calif.: Executive Deparment, Stae of California, March 12, 2020a.

Newsom, Gavin, Executive Order N-51-20, Sacramento, Calif.:Executive Department, State of California, April 16, 2020b.

Newsom, Gavin, Executive Order N-62-20, Sacramento, Calif.: Executive Department, State of California, May 6, 2020c. As of January 10, 2022: https://www.gov.ca.gov/wp-content/uploads/2020/05/5.6.20-EO-N-62-20.pdf

Niu, J., J. A. Rodriguez, C. Sareli, J. Goldman, M. Puga, and P. A. Eckardt, "COVID-19 Infection Among First Responders in Broward County, Florida, March–April 2020," *Journal of Public Health (Oxford)*, December 24, 2020. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33367792

Office of Governor Gavin Newsom, "Governor Newsom Issues New Executive Order Further Enhancing State and Local Government's Ability to Respond to COVID-19 Pandemic," press release, March 12, 2020. As of January 13, 2022: https://www.gov.ca.gov/2020/03/12/governor-newsom-issues-new-executive-order-further-enhancing-state-and-local-governments-ability-to-respond-to-covid-19-pandemic/

Office of Governor Gavin Newsom, "As California Fully Reopens, Governor Newsom Announces Plans to Lift Pandemic Executive Orders," press release, June 11, 2021.As of January 13, 2022: https://www.gov.ca.gov/2021/06/11/as-california-fully-reopens-governor-newsom-announces-plans-to-lift-pandemic-executive-orders/

Ortaliza, J., M. Rae, K. Amin, M. McGough, and C. Cox, "Most Private Insurers Are No Longer Waiving Cost-Sharing for COVID-19 Treatment," *Health System Tracker*, August 19, 2021. As of December 16, 2021: https://www.healthsystemtracker.org/brief/most-private-insurers-are-no-longer-waiving-cost-sharing-for-covid-19-treatment/

Pasco, R. F., S. J. Fox, S. C. Johnston, M. Pignone, and L. A. Meyers, "Estimated Association of Construction Work with Risks of COVID-19 Infection and Hospitalization in Texas," *JAMA Network Open*, Vol. 3, No. 10, October 1, 2020, p. e2026373. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33119111

Perry, P. M., "Managing Through Crisis: Surviving COVID-19," *Metal Center News*, April 1, 2020. As of September 2, 2021: https://www.metalcenternews.com/editorial/current-issue/managing-through-crisis--surviving-covid-19/43922

Pfizer, "Pfizer's Novel COVID-19 Oral Antiviral Treatment Candidate Reduced Risk of Hospitalization or Death by 89% in Interim Analysis of Phase 2/3 EPIC-HR Study," press release, 2021. As of November 15, 2021: https://www.pfizer.com/news/press-release/press-release-detail/pfizers-novel-covid-19-oral-antiviral-treatment-candidate

Pichler, S., K. Wen, and N. R. Ziebarth, "COVID-19 Emergency Sick Leave Has Helped Flatten the Curve in the United States," *Health Affairs*, Vol. 39, No. 12, December 2020, pp. 2197–2204. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33058691

Plantes, P. J., M. S. Fragala, C. Clarke, Z. N. Goldberg, J. Radcliff, and S. E. Goldberg, "Model for Mitigation of Workplace Transmission of COVID-19 Through Population-Based Testing and Surveillance," *Population Health Management*, Vol. 24, No. S1, February 2021, pp. S16–S25. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/33493409

Public Law 116-127, Families First Coronavirus Response Act, March 18, 2020. https://www.congress.gov/116/plaws/publ127/PLAW-116publ127.pdf

Public Law 116-136, Coronavirus Aid, Relief, and Economic Security Act, March 27, 2020.

Quigley, D. D., M. Dworsky, N. Qureshi, J. S. Ashwood, K. O'Hollaren, and L. S. Meredith, *Posttraumatic Stress in California's Workers' Compensation System: A Study of Mental Health Presumptions for Firefighters and Peace Officers Under Senate Bill 542*, Santa Monica, Calif.: RAND Corporation, RR-A1391-1, 2021. As of January 10, 2022: https://www.rand.org/pubs/research_reports/RRA1391-1.html

Quigley, D. D., N. Qureshi, G. Gahlon, and C. Gidengil, "Worker and Employer Experience with COVID-19 and the California Workers' Compensation System: A Review of the Literature," *American Journal of Industrial* Medicine," Vol. 65, No. 3, 2022, pp. 203–213.

Ramos, A. K., A. Lowe, J. J. Herstein, N. Trinidad, M. Carvajal-Suarez, S. Quintero, D. Molina, S. Schwedhelm, and J. J. Lowe, "A Rapid-Response Survey of Essential Workers in Midwestern Meatpacking Plants: Perspectives on COVID-19 Response in the Workplace," *Journal of Environmental Health*, Vol. 84.1, July 2021, pp. 16–25. As of January 10, 2022: https://www.neha.org/node/62034

Rhinehart, L., C. McNicholas, M. Poydock, and I. Mangundayao, *Misclassification, the ABC Test, and Employee Status: The California Experience and Its Relevance to Current Policy Debates*, Washington, D.C.: Economic Policy Institute, 2021.

Rogers, T. M., S. J. Robinson, L. E. Reynolds, C. N. Ladva, M. Burgos-Garay, A. Whiteman, H. Budge, N. Soto, M. Thompson, E. Hunt, T. Barson, and A. T. Boyd, "Multifaceted Public Health Response to a COVID-19 Outbreak Among Meat-Processing Workers, Utah, March–June 2020," *Journal of Public Health Management and Practice*, June 1, 2021. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34081669

Sams, J., "What to Expect in Workers' Compensation Costs from COVID-19: NCCI," *Insurance Journal*, Vol. 98, No. 10, 2020, p. 11.

SB—*See* Senate Bill.

Sclafane, S., "Workers' Compensation and COVID: More Data on Evolving Claims," *Claims Journal*, March 9, 2021. As of June 17, 2021: https://www.claimsjournal.com/news/national/2021/03/09/302453.htm

Selden, T. M., and T. A. Berdahl, "COVID-19 and Racial/Ethnic Disparities in Health Risk, Employment, and Household Composition," *Health Affairs*, Vol. 39, No. 9, September 2020, pp. 1624–1632. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/32663045

Senate Bill 1159, Workers' Compensation: COVID-19: Critical Workers, September 17, 2020.

Senate Bill 95, Employment: COVID-19: Supplemental Paid Sick Leave, March 19, 2021.

Senate Rules Committee, *SB-1159 Workers' Compensation: COVID-19: Critical Workers: Floor Analysis*, California Office of Senate Floor Analyses, 2020. As of January 10, 2022: https://leginfo.legislature.ca.gov/faces/billAnalysisClient.xhtml?bill_id=201920200SB1159#

Shenoy, E. S., L. R. West, D. C. Hooper, R. R. Sheehan, D. Hashimoto, E. R. Boukus, M. N. Aurora, D. S. McEvoy, and M. Klompas, "Healthcare Worker Infection with SARS-Cov-2 and Test-Based Return to Work," *Infection Control and Hospital Epidemiology*, Vol. 41, No. 12, December 2020, pp. 1464–1466. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/32843110

Simpson, A. G., "No Delays Found in Medical Care for Workers' Compensation Claimants During COVID," *Insurance Journal*, Vol. 99, No. 9, April 26, 2021, pp. 23–24. As of November 10, 2021: https://www.insurancejournal.com/news/national/2021/04/26/608807.htm

State of California Department of Industrial Relations, "Cal/OSHA Interim General Guidelines on Protecting Workers from COVID-19," webpage, May 14, 2020. As of January 11, 2021: https://www.dir.ca.gov/dosh/coronavirus/general-industry.html

Stout-Tabackman, L. A., and L. T. Thompson, *New Virginia Executive Order, Federal Leave Law Responding to COVID-19 Raises New Issues for Employers*, Washington, D.C.: JacksonLewis, March 25, 2020.

Sundar, S., "Fashion and Retail Groups Want Tariffs Dropped amid Pandemic," *WWD*, March 13, 2020. As of September 2, 2021: https://wwd.com/business-news/government-trade/tariffs-retail-coronavirus-1203539198/

Tartof, S. Y., J. M. Slezak, H. Fischer, V. Hong, B. K. Ackerson, O. N. Ranasinghe, T. B. Frankland, O. A. Ogun, J. M. Zamparo, S. Gray, S. R. Valluri, K. Pan, F. J. Angulo, L. Jodar, and J. M. McLaughlin, "Effectiveness of mRNA BNT162b2 COVID-19 Vaccine up to 6 Months in a Large Integrated Health System in the USA: A Retrospective Cohort Study," *The Lancet*, Vol. 398, No. 10309, October 16, 2021, pp. 1407–1416. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34619098

Thomas, D., "A General Inductive Approach for Qualitative Data Analysis," *American Journal of Evaluation*, Vol. 27, No. 2, 2003.

Thorn, B. B., "What the 'Families First' Act Means for Businesses," *Nation's Restaurant News*, Vol. 54, No. 5, 2020.

UFCW—*See* United Food and Commercial Workers.

United Food and Commercial Workers, "National Press Conference on COVID-19 Surge Highlights Growing Threat to Grocery Workers on Frontlines of the Pandemic This Thanksgiving," press release, November 23, 2020.

U.S. Bureau of Labor Statistics, "Injuries, Illnesses and Fatalities: TABLE A-5. Fatal Occupational Injuries by Occupation and Event or Exposure, All United States, 2019," webpage, 2020a. As of January 10, 2022: https://www.bls.gov/iif/oshwc/cfoi/cftb0332.htm

U.S. Bureau of Labor Statistics, "Occupational Employment and Wage Statistics: Implementing the 2018 SOC in the OES Program—May 2019 and May 2020 Hybrid Occupations," webpage, March 31, 2020b. As of February 1, 2022: https://www.bls.gov/oes/soc_2018.htm

U. S. Bureau of Labor Statistics, "Effects of COVID-19 Pandemic on Occupational Employment and Wage Statistics," webpage, March 31, 2021a. As of December 9, 2021: https://www.bls.gov/covid19/effects-of-covid-19-pandemic-on-occupational-employment-and-wage-statistics.htm

U.S. Bureau of Labor Statistics, "Occupational Employment and Wages, May 2020: 29-2040 Emergency Medical Technicians and Paramedics," webpage, March 31, 2021b. As of November 13, 2021: https://www.bls.gov/oes/current/oes292040.htm#ind

U.S. Census Bureau, "Health Insurance Historical Tables—HHI Series," webpage, October 8 2021a. As of January 14, 2022: https://www.census.gov/data/tables/time-series/demo/health-insurance/historical-series/hic.html

U.S. Census Bureau, "2017 North American Industry Classification System (NAICS) Manual," webpage, updated December 16, 2021b. As of February 6, 2022: https://www.census.gov/library/publications/2017/econ/2017-naics-manual.html

U.S. Chamber of Commerce, *Analysis of Workers' Compensation Laws*, Washington, D.C.: Statistics and Research Center, 2002.

WCIRB Actuarial and Research Teams, "Cost Evaluation of Potential Conclusive COVID-19 Presumption in California Workers' Compensation," research brief, April 2020. As of January 10, 2022: https://www.wcirb.com/sites/default/files/documents/wcirb_april_2020_cost_evaluation_of_conclusive_covid-19_presumption.pdf

Whaley, C. M., B. Briscombe, R. Kerber, B. O'Neill, and A. Kofner, *Nationwide Evaluation of Health Care Prices Paid by Private Health Plans: Findings from Round 3 of an Employer-Led Transparency Initiative*, Santa Monica, Calif.: RAND Corporation, RR-4394-RWJ, 2020. As of January 10, 2022: https://www.rand.org/pubs/research_reports/RR4394.html

Woodworth, K. R., D. Moulia, J. P. Collins, S. C. Hadler, J. M. Jones, S. C. Reddy, M. Chamberland, D. Campos-Outcalt, R. L. Morgan, O. Brooks, H. K. Talbot, G. M. Lee, B. P. Bell, M. F. Daley, S. Mbaeyi, K. Dooling, and S. E. Oliver, "The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-Biontech COVID-19 Vaccine in Children Aged 5–11 Years—United States, November 2021," *MMWR: Morbidity and Mortality Weekly Report*, Vol. 70, No. 45, November 12, 2021, pp. 1579–1583. As of January 10, 2022: https://www.ncbi.nlm.nih.gov/pubmed/34758012

World Health Organization, *A Clinical Case Definition of Post COVID-19 Condition by a Delphi Consensus, 6 October 2021*, Geneva, Switzerland, October 6, 2021. As of November 15, 2021: https://www.who.int/publications/i/item/WHO-2019-nCoV-Post_COVID-19_condition-Clinical_case_definition-2021.1