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Access to Medical Care in California Workers' Compensation

Recent Trends in Patient Access and Provider
Participation

PR-A4760-3

August 2026

Prepared for California Department of Industrial Relations

RAND Health

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About This Project Report

This study is part of a multi-year project being carried out to meet the requirements of California Labor Code section 5307.2 to examine several dimensions of access to medical care for injured workers in the workers' compensation system.¹ This first annual report examines several key questions in support of the overall long-term study, including calculating measures of provider supply and demand, access to medical care and payments made by specialty, the impacts of COVID-19 on medical access, the adoption of and access implications of telehealth, and stakeholder views on system frictions.

The study may be of interest to policymakers, workers' compensation regulators, workers' compensation administrators, health care professionals, employee advocacy organizations, and the public.

RAND Health

This work was conducted in the Health Services and Outcomes Program of RAND Health, a division of RAND that strengthens health care systems and the societal conditions that support health. For more information, visit www.rand.org/health or email Health@rand.org.

Funding

This study was sponsored by the California Department of Industrial Relations through Agreement Number S25DWC003.

Acknowledgments

We thank the staff at the California Department of Industrial Relations for sharing data to support our analyses and the thoughtful feedback they provided on a draft of this report. We especially thank Alissa Huang and Amanda Ades, the Project Managers for this study. We thank Sara Heins and an external reviewer for quality assurance review that substantially improved the report. We also greatly appreciate input from our colleagues Aaron Kofner for assistance with GIS distance calculation, Leah Yegneswaran for administrative assistance, and Eric Salehi for communications assistance.

¹ California Labor Code section 5307.2 “requires the Administrative Director of the DIR Division of Workers’ Compensation (DWC) to contract with an independent consulting firm to perform an annual study of access to medical treatment for injured workers. The study shall analyze whether there is adequate access to quality health care and products, including prescription drugs and pharmacy services, and make recommendations to ensure continued access.”

Summary

The California’s workers’ compensation system makes employers responsible for providing all necessary medical care to workers who are injured on the job. To know whether employers are meeting this obligation, it is important to know that workers are able to access necessary care in a timely manner. California Labor Code section 5307.2 accordingly requires the Administrative Director of the Department of Industrial Relations (DIR) Division of Workers’ Compensation (DWC) to contract for an independent study measuring workers’ access to care. This study is the first of four annual reports that RAND will produce describing access to workers’ compensation medical care for injured workers in California and exploring factors affecting their access to care.

Key Measures and Data Sources

Access within California’s workers’ compensation system can be examined across several interrelated domains that integrate system capacity, patient experience, and the regulatory processes to capture the full picture of whether injured workers can obtain timely, high-quality care. We reviewed several previous studies and reports on access to healthcare in the workers compensation system to identify the most frequently used measures and their limitations. Based on our findings and the availability of data, we focus this report on two domains of access:

- *Patient-Level Access Measures* that capture the timeliness of care and the distance traveled to receive care
- *Provider Supply Measures* reflecting the availability and distribution of providers that participate in workers’ compensation by specialty and geography

For the 2026 report we primarily used the Workers’ Compensation Information System (WCIS) Medical Bill Payment data (which we refer to as medical billing data) and First Report of Injury (FROI) records obtained under a data use agreement with the California Department of Industrial Relations (DIR). Medical bills submitted to payers by providers are reported to WCIS by workers’ compensation payers, each carrying information about the injured worker, the rendering and billing provider, diagnosis and procedure codes, the charges billed to the payer, and the payments made. The period examined in this report covers medical care provided in 2017–2024.

Patient-Level Access Measures

We measure timeliness by calculating the number of days from the date the claim was reported to the employer to the first visit of a given type. Timeliness is analyzed for evaluation and management (E&M) and physical medicine (PM), two widely used visit types that are relevant to initial access. To ensure a meaningful comparison of timeliness between older and

more recent injuries, we limited our analysis of timeliness measures in this chapter to cases where care was received within the first year after the injury was reported. To further reduce the influence of outliers, we report both the median and mean durations to the first visit. Our principal measure of distance traveled is based on the driving distance in miles to the provider location for each patient's first visit within a type of care (e.g., the first physical medicine visit).

Unless otherwise noted, results on patient-level access measures reflect timeliness and distance among initially accepted claims for specific injuries. This means that the findings discussed in this summary do not include claims for cumulative trauma, occupational disease, mental health, or multiple physical injuries, which often result from complex exposure histories and may be recognized as work-related long after onset, making it more difficult to interpret the duration from claim reporting to receipt of workers' compensation medical care. Similarly, we focus on timeliness and distance traveled among initially accepted claims because the time from the start of the claim to the first receipt of medical care in the workers' compensation system may be affected by claim denials or investigations. These exclusions make it easier to interpret the timeliness of care as a reflection of the workers' compensation medical delivery system, as opposed to litigation and other processes in the broader workers' compensation system. In the 2024 injury year, specific injury claims that were initially accepted constituted 80.9% of all claims. Timeliness of non-specific injuries and denied claims is reported in the appendix.

Our timeliness and distance measures have been used in previous studies of access to care in workers' compensation, including past studies focused on California. These simple claims-based measures offer the ability to describe trends and geographic differences in access across the entire system and are relatively straightforward to describe and interpret. Some limitations should be noted, however. An ideal measure of timeliness would compare patients with identical clinical characteristics and account for potential differences in the need for care. For physical medicine in particular, changes in case mix or referral decisions of the primary treating physician could lead to variation in timeliness that does not reflect the patient's ability to access care. Similarly, a higher distance traveled between a patient's residence and a physician's office or other provider location might reflect factors other than insufficient access to care, such as perceived provider quality or other variation in patient preferences.

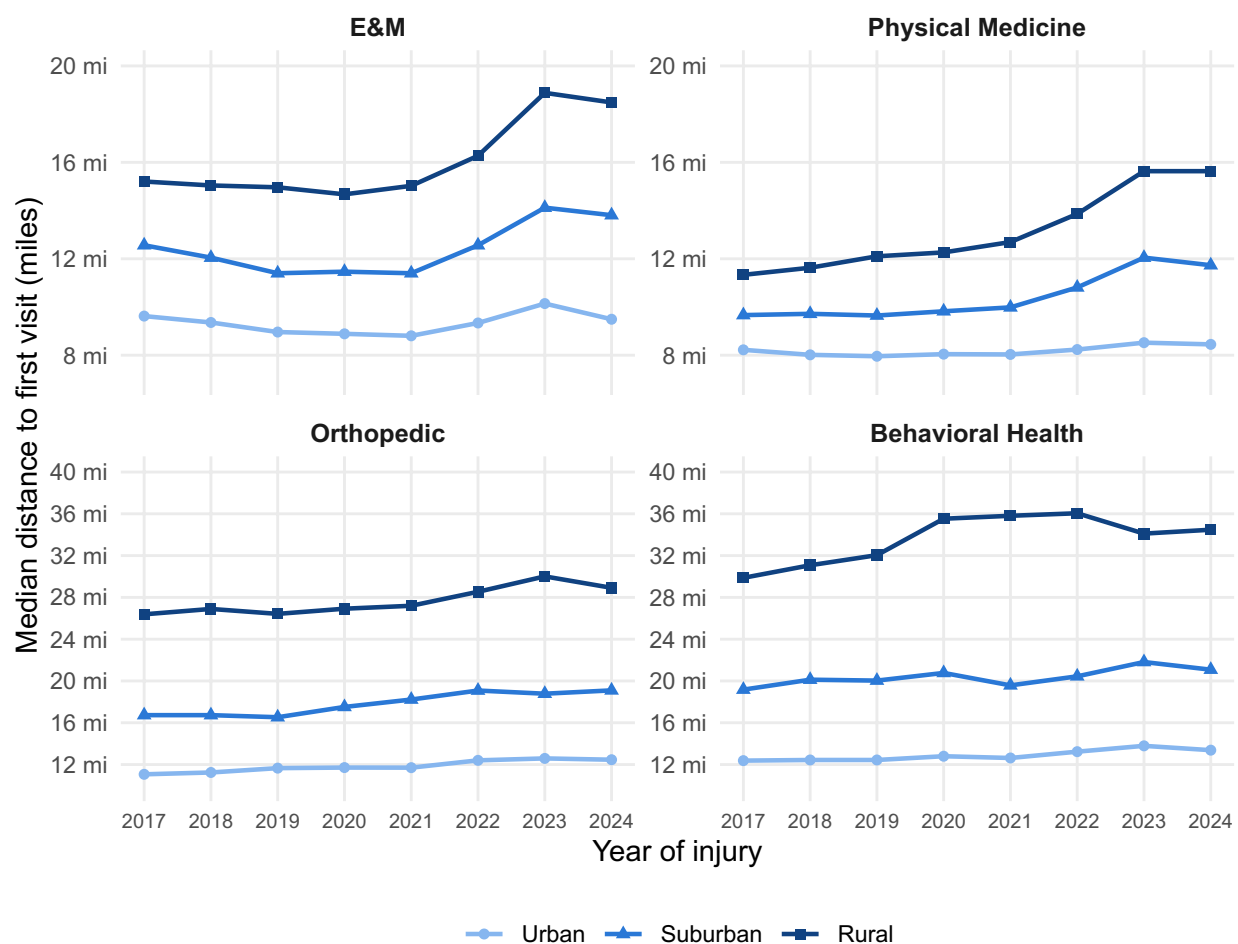
Duration to First Visit and Distance Traveled Were Stable for the Typical Injured Worker

At the statewide level, access to care for the typical (median) worker has largely been stable over the last few years. The median time to the first E&M visit has remained at 1 day after the report of injury since 2019, and the median time to the first physical medicine visit for those using physical medicine care was slightly lower (16 days) in 2024 than in 2022-2023 (17 days). Median distance traveled has increased slightly in recent years across three of four visit types examined, but by very modest amounts. Taken together, these figures do not point toward worsening access for the typical injured worker with an accepted specific injury claim.

Distance Traveled to Care Is Increasing in Rural and Suburban Areas

Stability in access to care at the statewide median coexisted with widening differences in distance traveled to receive in-person care between workers in urban, suburban, and rural areas, however. Figure S.1 shows the median distance traveled for each type of care by the population density of the injured worker's residential ZIP code, reporting statewide medians for urban (population density over 3,000 persons per square mile), suburban (population density 1,000 to 3,000 persons per square mile), and rural (population density below 1,000 per square mile) areas.

Figure S.1. Median Miles Traveled to the First Visit by Population Density and Year of Injury



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

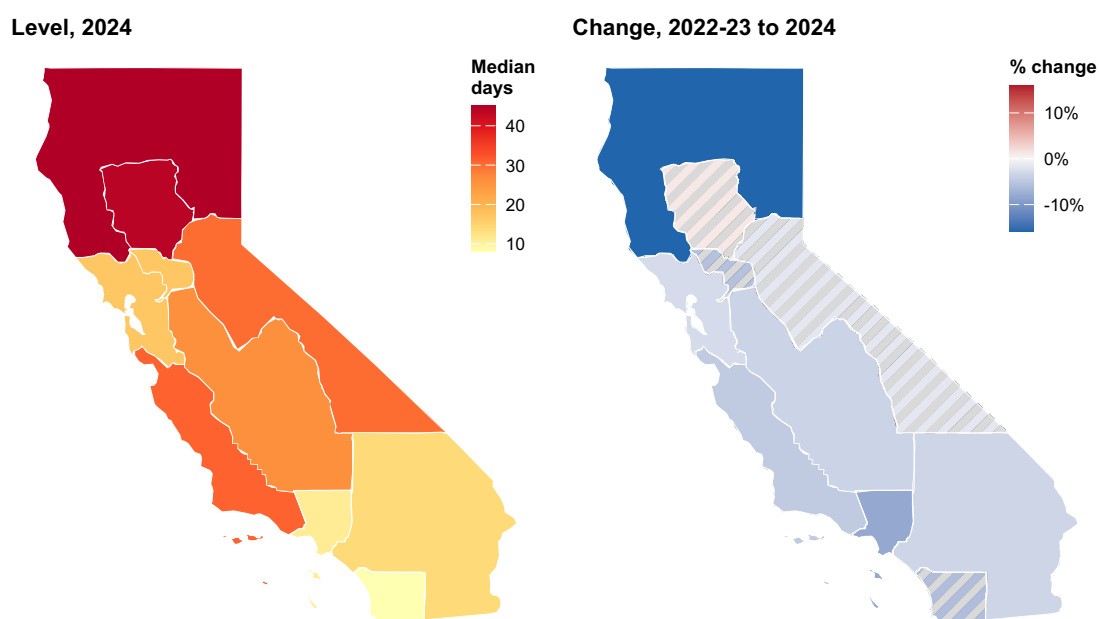
NOTES: Distance is the driving distance along the road network between the population-weighted ZIP code centroid of the worker's residence and that of the provider's location, for the first in-person visit of each type. Figure includes accepted specific injury claims. Density categories are based on the worker's residence ZIP code: urban = 3,000 or more persons per square mile; suburban = 1,000 to under 3,000; rural = under 1,000. Number of observations for 2024, by visit type: E&M = 353,995; Physical Medicine = 179,342; Orthopedic = 51,439; Behavioral Health = 9,722.

As expected, driving distances are higher in less densely populated areas, but the figure also shows that driving distances for E&M and physical medicine visits increased for workers in suburban areas and, especially, for workers in rural areas since 2022. Distance traveled for rural workers using behavioral health care also increased steadily from 2017 and were higher during the pandemic before declining slightly from 2022-2023, while increases in distance to orthopedic care were more modest. Consistent with this pattern, examination of trends in the mean distance traveled suggests that patients with above-median driving distances have traveled further in recent years for all four types of care examined. Sharp increases in driving distances for injured workers living in rural and suburban areas coexisted with relatively stable driving distances for injured workers living in urban areas.

Regional Differences in Timeliness of Care

We also found regional differences in timeliness of care. The median time to the first E&M visit in the most rural regions (North Sacramento Valley, Eastern Sierra/Foothills, and, especially, North State-Shasta) were above the statewide median of 1 day. Median times to the first physical medicine visit, which have more dispersion, were also far above the statewide median of 16 days in the Central Valley (26 days) and the Central Coast (31 days) (Figure S.2).

Figure S.2. Median Days from Injury Report to the First Physical Medicine Visit by DWC Region: 2024 Level and Change from 2022-23 to 2024



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no physical medicine visits within 365 days are excluded.) Geography is the DWC region of the injured worker's residence. The left panel shows the 2024 level; the right panel shows the percent change from the 2022-2023 average to 2024. Diagonal bands indicate a change that was not statistically significant at the 5 percent level. Significance of the change from the 2022-23 average to 2024: Wilcoxon rank-sum test. Number of observations in 2024 = 180,302 injury claims with a physical medicine visit within 365 days of employer reporting date.

As suggested by the differences by ZIP code population density, distance traveled varied widely between more urban and more rural regions of the state. The right panel of Figure S.2 does show, however, that the median time to the first physical medicine visit decreased between 2022-23 and 2024 or was stable across all regions in the state.

Taken together, these findings indicate that while access to care for the median injured worker has remained stable, access may be more difficult for a minority of cases, particularly in suburban and rural areas. The recent increases in distance traveled may suggest increasing access challenges, but these changes have not become widespread enough to affect timeliness of care for the typical worker.

Key Findings on Provider Supply in Workers' Compensation

We use the rendering provider National Provider Identifier (NPI) on medical bills to identify individual health care providers (such as physicians, chiropractors, or physical therapists) who serve workers' compensation patients. We link external data from the National Plan and Provider Enumeration System (NPPES) that records whether an NPI is individual (e.g., physician, chiropractor) or non-individual (e.g., hospital, pharmacy). Our analyses of provider participation exclude NPIs that are identified as organizational in the NPPES. We further excluded NPIs from our analysis if their most common taxonomy code in the WCIS corresponded to a non-individual provider type.

Our primary measure of provider participation counts a provider as participating if they were the rendering provider on at least one workers' compensation bill line in a service year. We also examined definitions that require more sustained involvement with workers' compensation in terms of the provider's total paid amount in a year (at least \$10,000) or the number of unique workers' compensation patients the provider treated in a year (at least 10 patients). Bill lines for medical-legal services were excluded, so providers who served only as Qualified Medical Examiners or otherwise provided medical-legal services without also providing medical care would not be counted as participating.

For analysis of regional differences in provider supply, we assigned a single primary practice location based on the facility ZIP code most commonly reported on a provider's bills in each service year. Additional location information from the billing ZIP code and external sources (like the CMS NPPES and PPEF files) was used in cases where there was no facility ZIP code located in California.

Total Provider Participation Has Remained Flat, But Participation Is Shifting from Physicians to Advance Practice Providers

Access to care for injured workers depends on the participation of a sufficient number of health care providers in the workers' compensation system. In 2024, there were just under 75,000 individual providers who provided any care to injured workers through the workers' compensation system. Although the total number of providers in the system has been flat in recent years, the mix of providers with any participation in the system has been shifting away from physicians and chiropractors and toward advance practice providers such as nurse practitioners and physician assistants. Among physicians, recent declines in the number of participating providers are widespread across specialties, including primary care (-5.1% change from 2022-23 to 2024), surgery (-3.3% for orthopedic surgery and -2.8% for other surgery), anesthesiology (-3.5%), physical medicine and rehabilitation (-4.0%), and neurology (-6.1%).

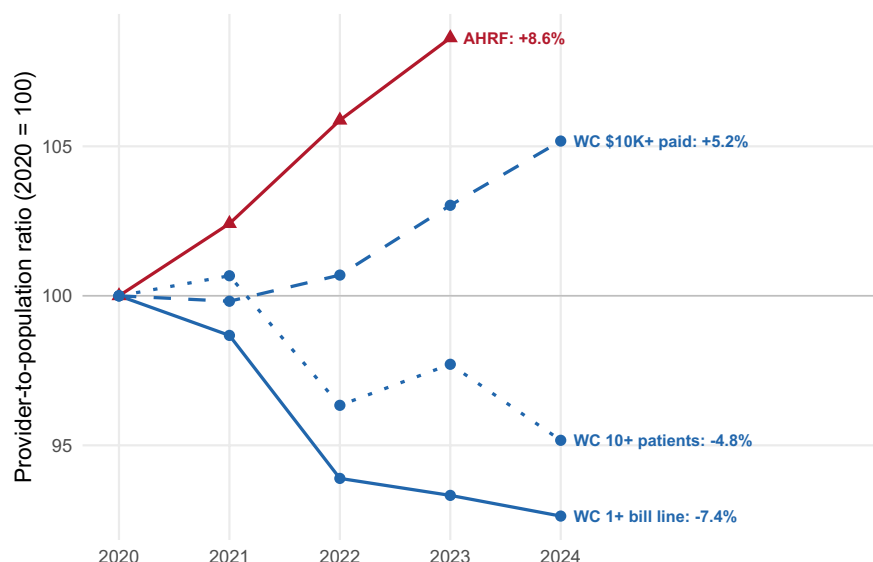
The above statistics reflect the lowest possible threshold for counting participation in the workers' compensation system, and other definitions are considered in the report. The number of providers who treat 10 or more workers' compensation patients in a year increased slightly (+0.9%) between 2022-23 and 2024, for example.

Workers' Compensation Provider Participation Has Not Kept Up with the General Health Care System for Most Types of Providers

To provide more context for counts of participating providers, we compared workers' compensation provider supply to the supply of providers in the general health care system in California, adjusting both for the relevant population (total population for the general health care system, and the number of workers' compensation patients in a year for workers' compensation providers).

Figure S.3 shows the results of this comparison for the supply of physicians in California. Under each definition of workers' compensation participation that we considered, the supply of physicians with an active license relative to the population grew faster in the general health care system (8.6% increase in physicians per 10,000 population from 2020 to 2023) than in workers' compensation (7.4% decrease in providers with 1+ bill line per 10,000 patients from 2020 to 2024). In Chapter 4, we provide similar comparisons for chiropractors, nurse practitioners, physician assistants, and selected physician specialties.

Figure S.3. Physician Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide physicians per 10,000 California population (general health care system, from the 2024 Area Health Resources File). "WC 1+ bill line" = workers' compensation physicians per 10,000 WC patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = WC rate per 10,000 WC patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = WC rate per 10,000 WC patients counting only providers treating ≥ 10 WC patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of WC physicians in 2020 was 43,789.

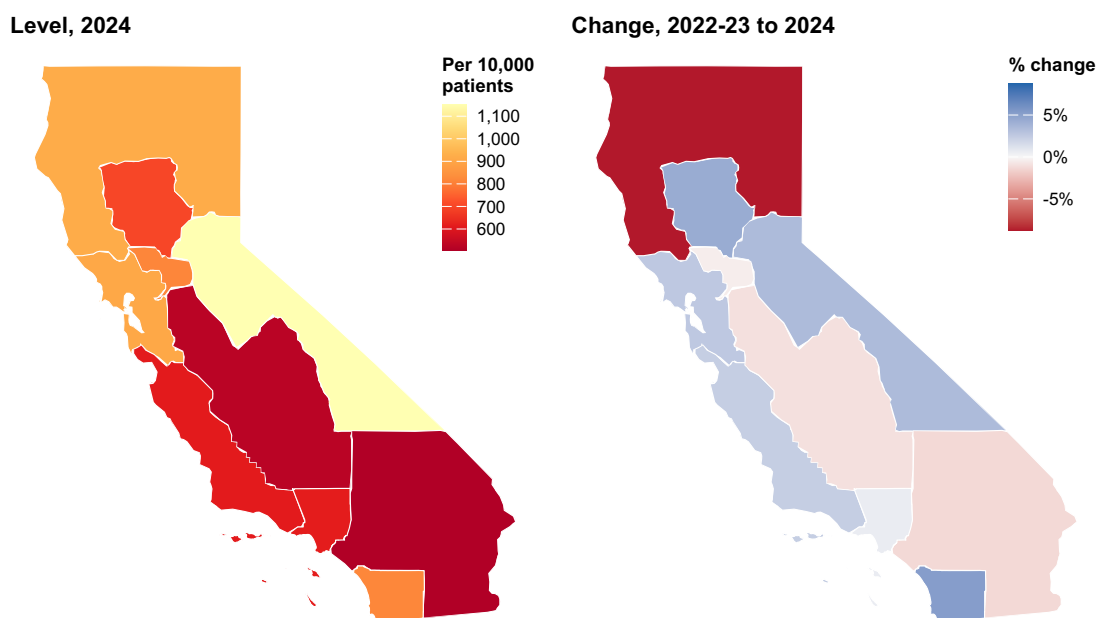
Overall, the total number of providers participating in California workers' compensation remained essentially stable between 2022-23 and 2024, declining by 0.3 percent (from 74,747 in 2022 and 74,871 in 2023 to 74,599 in 2024). However, this stability masked meaningful shifts in the composition of the provider workforce. The most notable trend was a shift from physicians (-1.5% change), chiropractors (-2.1% change), physical therapists (-1.0% change) and psychologists (-4.6% change) toward nurse practitioners (+11.2% change) and physician assistants (+4.5% change), as well as acupuncturists (+9.2% change). These statistics reflect the number of unique individual providers who provided any care in the workers' compensation system, and trends in the supply of providers with more sustained workers' compensation involvement (i.e. treating 10 or more workers' compensation patients or receiving \$10,000 or more in workers' compensation payments) are more positive. In Chapter 4, we also examine trends in caseloads (patients per provider) and the share of care in different specialties provided through Medical Provider Networks (MPNs) or under preferred provider organization (PPO) agreements.

Provider Supply Varies Widely by Region

Regional differences in access to care and in the supply of providers are a longstanding concern. To allow comparisons across regions with widely differing populations, we report on the number of providers per 10,000 patients in 2024, where each region's patient count is the number of injured workers with 1+ medical bill in 2024 with a residential ZIP code in the region. Figure S.4 shows how this provider-to-patient ratio varies across the state.

In general, the number of providers relative to patients is lowest in the Central Valley (526 providers per 10,000 patients) and the Inland Empire (507 providers per 10,000 patients) and is highest in the Bay Area (907 providers per 10,000 patients) and San Diego (817 providers per 10,000 patients). The provider-to patient ratio is also high in two predominantly rural regions (North-State Shasta and Eastern Sierra-Foothills) but these regions have small patient populations that may make the ratio of providers per 10,000 patients volatile.

**Figure S.4. Providers per 10,000 Workers' Compensation Patients, by DWC Region:
2024 Level and Change from 2022-23 to 2024**



SOURCE: 2022-2024 WCIS.

Figure S.5 (next page) describes provider-to-patient ratios by type of provider. Among large regions, the Bay Area had the largest number of physicians per workers' compensation patients (580 per 10,000 patients) and the Inland Empire had the lowest ratio at 267.9 physicians per

10,000 workers' compensation patients. Eastern Sierra/Foothills consistently has among the highest ratios across all provider types, though San Diego also has a relatively large ratio of physical therapists and the North State-Shasta region has relatively high rates of nurse practitioners, physician assistants and chiropractors.

Among large regions, the Central Valley and Inland Empire are consistently at the lower end of these ratios across all provider types.

Figure S.5. 2024 Providers per 10,000 Workers' Compensation Patients, by Region and Type of Provider



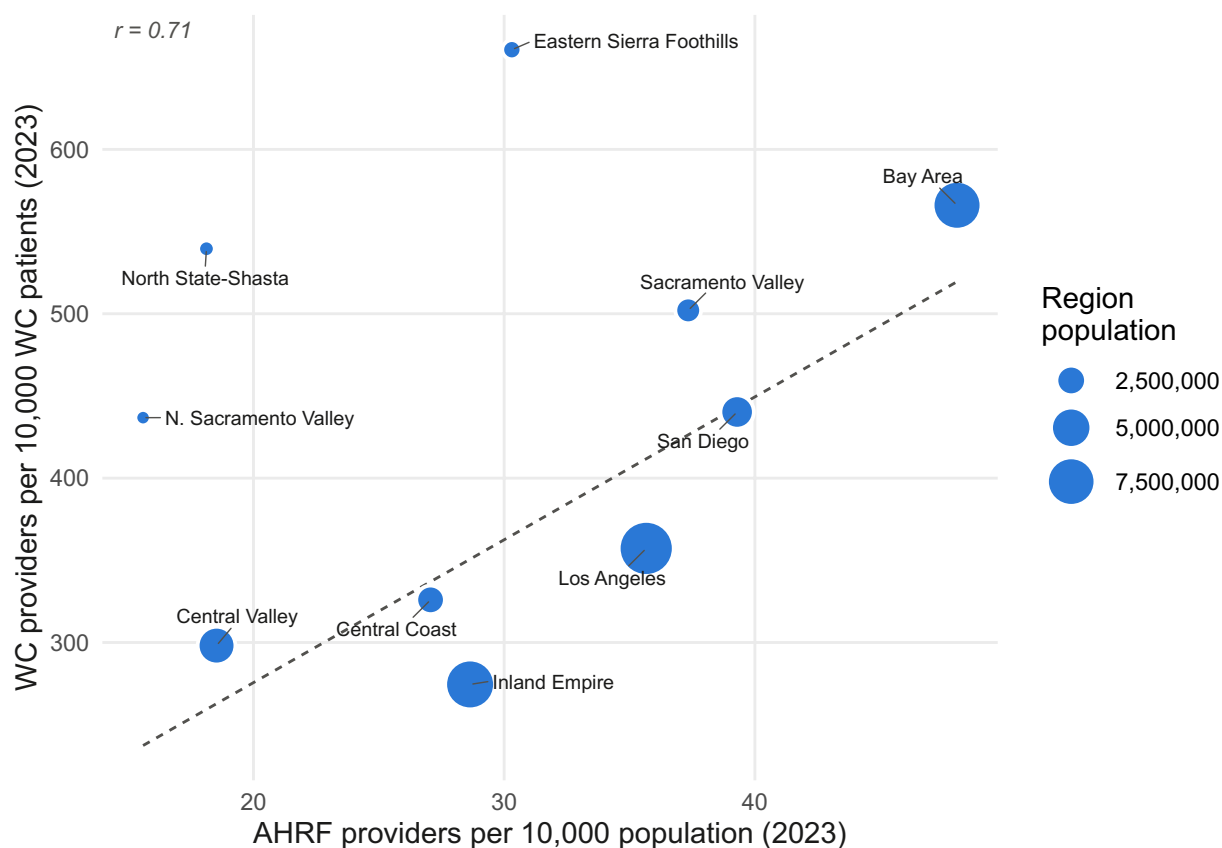
SOURCE: RAND analysis of 2024 WCIS medical billing data.

NOTES: Cells show 2024 ratio of individual workers' compensation providers per 10,000 workers' compensation patients. A provider counts toward a year if they had at least one paid bill line in that year; individual NPIs only. Cells with 10 or fewer providers are overlaid with light diagonal bands. Cell color is normalized within each provider type, so colors are not comparable across columns.

Low Provider Supply in Workers' Compensation Is Associated with Limited Supply in the General Health Care System Across Regions

Issues with provider supply are not unique to the workers' compensation system, and it may be helpful for workers' compensation policymakers to know where regional variation in the supply of workers' compensation providers is driven by more general provider shortages, and where issues with provider supply in workers' compensation are more acute than in the general health care system. We compare the rate of workers' compensation providers per 10,000 patients to the rate of general health care providers per 10,000 population for 2023 (the latest year with comparable regional data). A population-weighted linear regression (shown as a dashed line) summarizes the relationship across regions between provider supply in workers' compensation and the general health care system. Figure S.6 shows this relationship for physicians.

Figure S.6. Comparison of Workers' Compensation Physicians per 10,000 Patients to Physicians per 10,000 Population in General Health Care System in 2023, by Region



SOURCE: 2023 WCIS and AHRF.

NOTES: Figure plots ratio of workers' compensation-participating physicians per 10,000 patients against ratio of licensed physicians per 10,000 residents in the general health care system. Points are weighted by regional population, the dashed line is a weighted least squared line of best fit, and r is the population-weighted correlation coefficient.

Figure S.6 makes it clear that much of the regional variation in workers' compensation provider supply is closely related to differences in the supply of providers in the general health care system: areas with more health care providers in general have more participating providers in workers' compensation. The population-weighted correlation coefficient (r) of 0.71 implies that 50% of regional differences in physicians per 10,000 workers' compensation patients is predicted by the rate of physicians per 10,000 population in the general health care system.

Southern California Regions Have Provider Supply Issues Not Predicted by Provider Supply in the General Health Care System

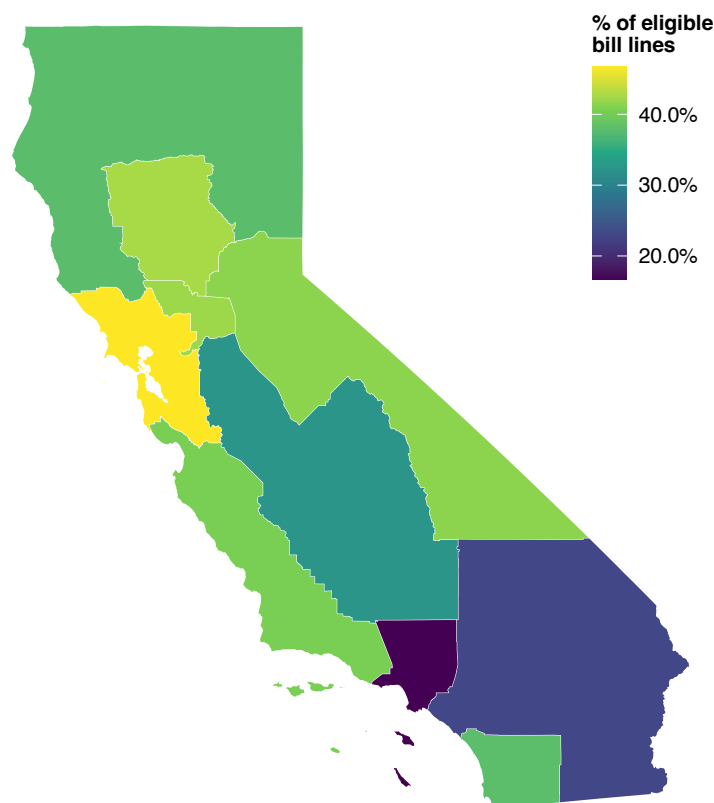
Figure S.6 comparing a region's provider-to-patient ratio to the predicted level (indicated by the dashed line of best fit) offers a novel perspective on where low provider supply in workers' compensation reflects issues with the general health care system (the Central Valley), and where provider supply in workers' compensation is unexpectedly low compared to the general health care system (the Inland Empire and Los Angeles). From the perspective of an injured worker, the fact that low physician participation in workers' compensation is predicted by the general health care system does not lessen the potential access challenges. (If anything, provider shortage in the general health care system might suggest that workers in the Central Valley would also face challenges obtaining care outside workers' compensation.) From the perspective of a policymaker considering region-by-region interventions, however, this information might be quite useful. Knowing that workers' compensation participation is lower than predicted in the Inland Empire but higher than predicted in the Central Valley might suggest that policies focused narrowly on increasing workers' compensation participation have more scope to attract new providers in the former region than in the latter; conversely, policies intended to improve workers' compensation participation in the Central Valley might be more effective if coordinated with broader regional or state efforts to increase the overall supply of health care providers.

In Chapter 5, we present similar analyses for other provider types (chiropractors, nurse practitioners, physician assistants) and for selected physician specialties. These results generally confirm that provider supply in workers' compensation and provider supply in the general health care system are closely related. Yet they also highlight lower-than-expected workers' compensation provider supply in the Inland Empire and Los Angeles across a number of provider types and specialties.

Telehealth Adoption in Behavioral Health May Be Improving Access to Care in the Central Valley and Central Coast

Telehealth has potential to alleviate provider shortages in some markets and for some provider specialties. We examined telehealth use since 2020 and its association with patient-level access measures. Use of telehealth is highest in behavioral health, where there has been a recent increase in the share of care delivered by telehealth. In the Central Coast and Central Valley, two areas with low supply of psychologists and high distance traveled, telehealth adoption has been higher (Figure S.7).

Figure S.7. Telehealth as a Percentage of Telehealth-Eligible Bill Lines in Behavioral Health, by DWC Region, 2024



SOURCE: 2024 WCIS.

NOTES: Cell values are the percentage of telehealth-eligible behavioral health bill lines that were delivered as telehealth in 2024, by DWC region (denominator = telehealth-eligible bill lines in the region). Lighter (yellow) shades indicate higher telehealth adoption; darker (purple) shades indicate lower adoption.

In Chapter 7, we examine telehealth utilization and its association with access to care, focusing on behavioral health (which had by far the highest levels of telehealth adoption among the visit types examined). A rough calculation of the distance traveled to receive behavioral

health with and without at-home telehealth visits suggests that the average distance traveled when telehealth visits are counted as having zero driving distance was meaningfully lower in the Central Valley and Central Coast, a function both of high driving distances to in-person behavioral health care and high telehealth adoption in those regions. However, telehealth cannot fully substitute for in-person care in many specialties that are important in workers' compensation (such as physical medicine and surgical specialties), and adoption of telehealth even among telehealth-eligible bill lines in orthopedic care has been declining since 2020.

Implications and Future Priorities

This study is the first of four annual reports on access to care in California workers' compensation, and the empirical analyses reported here are meant to establish an updated baseline for regular tracking of access measures in the coming years. The descriptive findings shown here also raise some questions that may help frame more targeted analyses that are planned for future years of this study.

How Far Can Provider Supply Decline Before Widespread Access Problems Emerge?

Patients' access to care is shaped by the supply of participating providers relative to the level of demand. We would expect inadequate or worsening provider supply to lead to access problems such as longer delays in accessing care and higher distance traveled to care.

With this framework in mind, this study's findings on statewide trends in patient-level access and provider-level supply pose somewhat of a puzzle. We found flat or slightly declining participation for individual providers overall in workers' compensation, which included declines in participation among key provider types (physicians, chiropractors, and psychologists) and physician specialties (primary care, orthopedic surgeons, and other surgeons) with substantial workers' compensation participation. Yet with the exception of some recent increases in distance traveled by patients (especially in rural and suburban areas), patient-level measures of access have largely been stable over the study period, suggesting that there have not been substantial changes at the statewide level in the prevalence of access problems for the categories of care examined in this report.

One possible explanation is that increasing participation by nurse practitioners and physician assistants may have helped to offset declining physician participation, especially when it comes to enabling timely access to initial E&M or physical medicine visits. (While nurse practitioners and physician assistants generally do not provide physical medicine, more timely E&M visits may facilitate physical medicine access by reducing delays related to referrals or other frictions.) Increased nurse practitioner and physician assistant participation in workers' compensation has been identified as a nationwide trend, and while receipt of early care from these advance practice professionals as opposed to physicians was not found to be associated with differences in access at the individual level (Savych and Fomenko, 2025), it is plausible that their increased

participation at the system-wide level has helped keep patient-level access measures stable at a time when participation of other provider types has been declining.

However, advance practice professionals may be limited in their ability to provide some types of care, most notably physical therapy and orthopedic surgery, that are important in workers' compensation and that generally must be obtained from types of providers that have had declining workers' compensation participation in recent years. The critical question for the workers' compensation system and policymakers is whether and when declining workers' compensation provider participation will actually result in widespread and measurable access problems for injured workers. This study will continue to track these measures in the coming years.

Does California's Approach to Care Delivery Promote or Hinder Access to Care, and How Can It Be Improved?

System participants and observers, including injured workers and their representatives, have voiced concern about access to care and barriers to provider participation for some time. Features of California's approach to care delivery in workers' compensation, including the requirement that payers adopt a utilization review plan and the use of Medical Provider Networks to direct patients' choice of providers, have been criticized for adding friction and complexity to the system in ways that discourage provider participation, if not directly limiting patients' access to needed care (Jones and Swedlow, 2022). These topics will be examined more closely in future reports using additional data sources to supplement the WCIS.

What Explains Lower-Than-Predicted Provider Participation in Southern California?

It is useful to place workers' compensation provider participation and access trends in context with the general health care system beyond workers' compensation. Our analysis of regional variation in provider supply highlighted Los Angeles County and, especially, the Inland Empire region (the counties of Imperial, Orange, Riverside, and San Bernardino) as areas where the supply of participating providers in workers' compensation is low relative to workers' compensation supply in most other regions and is also below the level that would be expected given the supply of providers in the general health care system. This annual report was not scoped to include a close examination of what regional factors result in lower-than-expected provider participation in these areas, but we plan to revisit this question as new data sources are incorporated into the study in future years.

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1. Introduction

The California's workers' compensation system makes employers responsible for providing all necessary medical care to workers who are injured on the job. To know whether employers are meeting this obligation, it is important to know that workers are able to access necessary care in a timely manner. California Labor Code section 5307.2 accordingly requires the Administrative Director of the Department of Industrial Relations (DIR) Division of Workers' Compensation (DWC) to contract for an independent study measuring workers' access to care. This study is the first of four annual reports that RAND will produce describing access to workers' compensation medical care for injured workers in California and exploring factors affecting their access to care.

In this report, we use administrative medical billing data maintained by DWC to describe a set of key indicators of access to care in workers' compensation. Focusing on data covering 2022-2024, we report on recent trends in a core set of measures that reflect several key dimensions of access to care. In particular, we focus on health care services and access to individual health care providers, with an emphasis on variation in access measures (and in the direction of change) across regions, across types of medical care, and across different groups of providers. Future annual reports in this project in 2027, 2028, and 2029 will provide regular updates to these core measures, providing timely updates on the baseline established in this report.

The present report also examines how access to care changed during the COVID-19 pandemic and examines whether the expanded use of telehealth in California workers' compensation since 2020 has been associated with changes in access to care. Future reports produced as part of this study will look more closely at specific structural features of California's approach to workers' compensation medical care delivery and examine how these features may promote or hinder access to care. Topics to be examined in future reports include utilization review (UR), the Independent Medical Review (IMR) and Independent Bill Review (IBR) processes, and Medical Provider Networks (MPNs). These topics were deferred to future reports in agreement with DIR because they require additional data collection that was not feasible on the timeline for this first report. At the end of the project, RAND will produce a final report that synthesizes lessons learned and makes policy recommendations to improve access to care.

Approach to Measuring Access to Care in This Report

Access to care is a central dimension of health care quality, especially within the workers' compensation system, where timely, appropriate treatment directly affects recovery and return-to-work outcomes. Individuals with greater access to high-quality medical systems are more

likely to receive comprehensive care and experience better health results. The Institute of Medicine defines access as the timely use of personal health services to achieve the best possible health outcome (Institute of Medicine Committee on Monitoring Access to Personal Health Care, 1993). Measuring access solely through outcomes can be misleading, however, since those outcomes depend on numerous other factors—such as health behaviors, treatment adherence, and system-level constraints.

Access within California’s workers’ compensation system can be examined across several interrelated domains that integrate system capacity, patient experience, and the regulatory processes to capture the full picture of whether injured workers can obtain timely, high-quality care. We reviewed several previous studies and reports on access to healthcare in the workers compensation system to identify the most frequently used measures and their limitations (Jones and Swedlow, 2022; Kapinos and Montemayor, 2019; Kominski et al., 2006; Miller, 2015; Miller et al., 2013; Miller et al., 2014; Wickizer et al., 2009; Cossyleon, 2024).

Based on our findings and the availability of data, we focus this report on the following domains:

- **Patient-Level Access Measures**
 - **Timeliness measures** assess how quickly workers receive care after the injury is reported to the employer. We limit our analysis of timeliness to evaluation and management (E&M) and physical medicine (PM) services (comprising physical therapy, chiropractic, and acupuncture services), since these services are widely needed early in the course of a workers’ compensation claim.
 - **Distance to care measures** quantify the distance that patients have to travel to receive care. We focus primarily on the driving distance in miles between patient and provider locations. In addition to E&M and physical medicine, we analyze distance to care for selected types of specialty care that are less widely used.
- **Provider Supply Measures**
 - **Provider participation measures** characterize the availability and distribution of providers by specialty and geography. We focus primarily on the number of providers that participate in workers’ compensation.

In addition, we aim to answer two focused objectives to understand how trends have changed since the COVID-19 pandemic, and the extent to which changes in telehealth encounters have changed following policy changes from the public health emergency that allowed telehealth and the formal changes to the medical fee schedule in January 2022. Other domains of access (network adequacy and administrative burden) will be examined in future reports using data that better captures these measures. In sharp contrast to other health care settings, where patient financial burden is often a major barrier to access, we do not consider the cost of care to be a direct measure of patient access in workers’ compensation since there is no patient cost-sharing for covered care. Provider payments (which are a key dimension of the cost of care), their relationship with network structure and preferred provider organization (PPO) agreements, and their impact on provider participation will be examined in greater depth in these future reports.

Examining access to care through these multidimensional lenses provides a more complete understanding of how regulatory, structural, and operational factors jointly shape the quality and efficiency of care available to injured workers in California.

The Organization of This Report

Chapter 2 describes the primary data sources and measures we used to develop our assessment. Chapter 3 outlines recent trends in the timeliness of care and the distance that injured workers travel to receive care. Chapter 4 discusses statewide trends in provider participation in workers' compensation and provider payment. Chapter 5 delineates regional differences in provider participation. Chapter 6 describes changes in access measures and provider participation associated with the COVID-19 pandemic. Chapter 7 examines whether telehealth adoption has been associated with changes in access to care. Chapter 7 presents some conclusions from these analyses. Appendix A provides additional details about our methodology, and Appendix B reports additional results supporting the findings presented in the body of the report.

2. Data and Methods

This chapter describes the data and measures used to analyze access to care in this report. As described in Chapter 1, this report focuses on two types of measures:

- Patient-level measures of access: the timeliness of the first visit for common types of care, and the distance traveled to receive care. We refer to these measures as *patient-level* because they treat the injured worker as the unit of observation.
- Measures of provider supply: the number of providers who treat workers' compensation patients. These measures treat the health care provider as the unit of observation. To provide context for observed patterns of provider supply, we report comparable data on trends in provider supply in the general health care system. We also report statistics on provider caseload and the prevalence of care provided through Medical Provider Networks (MPN) or under preferred provider organization (PPO) agreements that may be associated with discounted payment rates.

Here we outline the workers' compensation claims data used in this study, the public-use contextual data used to classify and locate providers, the construction of each family of measures, and our approach to constructing the analytic files used in this study. Additional detail on data sources and processing methods is provided in Appendix A.

Data sources

Workers' Compensation Information System (WCIS)

For the 2026 report we primarily used the WCIS Medical Bill Payment data (which we refer to as medical billing data) and First Report of Injury (FROI) records obtained under a data use agreement with the California Department of Industrial Relations (DIR). Medical bills submitted to payers by providers are reported to WCIS by workers' compensation payers, each carrying information about the injured worker, the rendering and billing provider, diagnosis and procedure codes, the charges billed to the payer, and the payments made. The period examined in this report covers medical care provided in 2017–2024. This period begins after major improvements to the data submission format that were adopted in April 2016 and ends in 2024 to allow sufficient follow-up time after injury (for patient-level measures) and sufficient claims runout (for provider supply measures).

To process the claims data and make them suitable for analysis, we merged the bill files, line-level files (professional, dental, institutional, and prescription), line-payment files, adjustment files, and files containing diagnosis and procedure codes. We de-duplicated bills and took

additional steps to reconcile payment amounts between bill lines and bill headers. Technical details of this process are described in Appendix A.

From the processed bills we built two types of analytic files: a patient-level file with the Jurisdiction Claim Number (JCN) as the unit of observation, and a provider-level file with the NPI as the unit of observation. This JCN-level file was used to construct measures of distance traveled and timeliness of care, which we refer to as “patient-level” outcome measures. The NPI-level file aggregates bill lines to one row per rendering provider (NPI) per service year and underlies the provider participation and discount measures calculated.

Visit Types

In our analysis of distance traveled (Chapter 3), we classify measures by the type of visit. These categories are defined at the bill-line level from the procedure code and, for some types, the rendering provider’s specialty. We focus on four visit types:

- Evaluation and management (E&M) is built from the type-of-service crosswalk used in prior WCIS studies, supplemented by CMS Restructured Berenson-Eggers Type of Service codes (RBCS) and restricted to non-facility settings—excluding inpatient-hospital and emergency-department places of service—so it reflects office-based care (Centers for Medicare & Medicaid Services, 2025).
- Physical medicine combines that crosswalk with active physical therapy codes, passive modality codes, and chiropractic and acupuncture code sets derived from RBCS.
- Orthopedic care is defined to include either a procedure for which the rendering provider was an orthopedic surgeon, or that is classified under the RBCS system as a major musculoskeletal procedure. (The RBCS identifies major procedures as those with a high resource intensity occur in an inpatient setting at least 15% of the time; examples are given in Appendix Table A.11).
- Behavioral health is defined as care provided by a psychologist or a psychiatrist, or that is classified under the RBCS system as behavioral health. Appendix Table A.11 provides a more detailed listing of these code sets.

Bill lines for medical-legal services (e.g., Qualified Medical Examiner reports) and workers’ compensation-specific procedure codes (e.g., the Primary Treating Physician’s Permanent & Stationary Report) are excluded from all analyses. As a result, providers whose participation in the system is limited to medical-legal services are not counted.

Telehealth

We first classified services as telehealth-eligible based on whether the procedure code appeared on the CMS telehealth-approved list for that service year. Because that list is year-specific, the eligible share is effectively zero before 2020. We then classified services as being delivered through telehealth only if they were eligible *and* the bill had a place-of-service code, modifier, or revenue code indicating delivery through telehealth (see Appendix Table A.12). An

eligible service with no telehealth delivery indicator is treated as in-person, as is a telehealth delivery indicator with no associated telehealth eligible service. These distinctions let us express telehealth adoption as a share of the eligible caseload in our analysis of telehealth (Chapter 6). We also use these indicators for telehealth to exclude telehealth visits from our primary measure of distance traveled, as we discuss below.

External Data

For each bill we used the rendering provider's National Provider Identifier (NPI) to merge two external files.

- The National Plan and Provider Enumeration System (NPPES) is the CMS system through which all providers obtain an NPI. We used the June 2026 public file, which supplies practice-location and business-mailing addresses and taxonomy codes indicating provider type and specialization. Because the NPPES download is a point-in-time snapshot overwritten with each refresh, it reflects only the most current self-reported address, not a provider's location in a prior period.
- The CMS Public Provider Enrollment File (PPEF) provides annual information on providers actively approved to bill Medicare sourced from the Provider Enrollment, Chain, and Ownership System. We used the provider's PPEF ZIP code to supply a location where the WCIS facility ZIP was missing; because a provider can be associated with multiple ZIPs in a year, we resolved each to a single geography by taking the most commonly occurring county for that provider and year. PPEF excludes providers who have opted out of Medicare and thus does not cover every WCIS provider.

Data on Provider Supply in General Health Care System

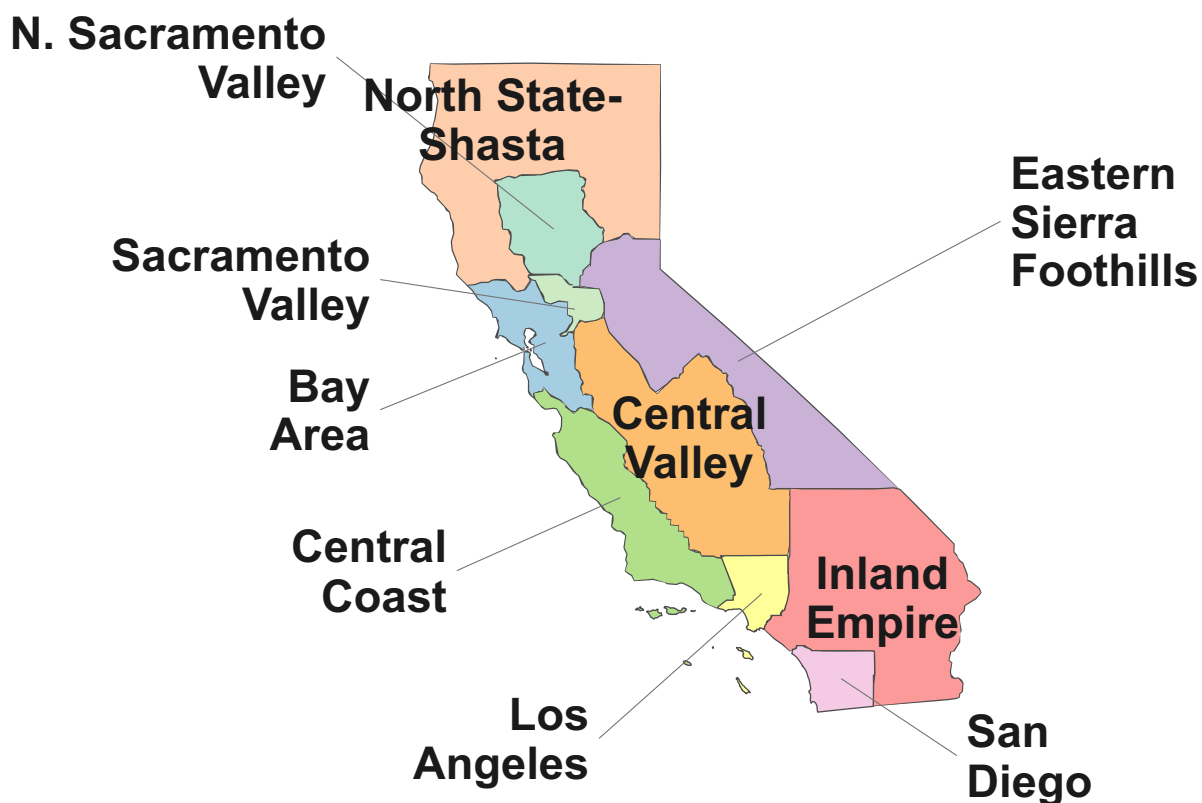
The Area Health Resources File (AHRF), published annually by the Health Resources and Services Administration [HRSA], provides county-level counts of providers by specialty drawn from the American Medical Association master files and the CMS NPI file. Detailed provider types are reported annually from 2020 onward (and only every five years before 2020). Counts distinguish physicians (MD and DO), nurse practitioners, and physician assistants, with specialty detail; some types (e.g., active physicians, surgeons, internal medicine, nurse practitioners) are available at the county level, while others (e.g., chiropractors and physician assistants) are available only statewide. The count of primary care providers from AHRF excludes residents and physicians who do not work in patient care (e.g., administration or research). Other counts of physicians reported in the study include all physicians with an active license. We use the AHRF to derive provider counts and provider-to-population ratios at the statewide and county level as a frame of reference for the workers' compensation supply measures derived from the WCIS.

Geographic Data

Using the medical bills with provider geocodes, we assigned a county to each ZIP using the U.S. Department of Housing and Urban Development (HUD) United States Postal Service ZIP Code to County Crosswalk. Because ZIP codes are postal delivery routes rather than geographic areas, many span county boundaries; for these we assigned the ZIP to the county containing the highest share of its residential addresses. We supplemented the crosswalk with special-purpose California ZIPs (single-building, PO-box, or large-volume-customer ZIPs with no housing units) that HUD omits by using a Census Bureau crosswalk from mailing ZIP to ZIP Code Tabulation Area to map all ZIP codes appearing in the WCIS to the HUD ZIP to County crosswalk.

We report patient-level and provider participation measures for ten DWC administrative regions. Figure 2.1 shows these regions. Appendix Table A.9 lists the counties included in each region and provides statistics on the number of injured workers in each.

Figure 2.1. DWC Regions Used in Report



We also classified ZIP codes as urban, suburban, or rural according to population density, combining ZIP code tabulation area (ZCTA) data from the 2020 census with land area in square miles for ZIP code tabulation areas from the Census Gazetteer files (U.S. Census Bureau, n.d.).

We followed Jones and Swedlow (2022) in defining urban (population density over 3,000 persons per square mile), suburban (population density 1,000 to 3,000 persons per square mile), and rural (population density below 1,000 per square mile) ZIP codes.

Patient-Level Access Measures: Timeliness and Distance

Patient-level access measures are built at the level of the injured worker and analyzed based on the date of injury. For each worker and visit type, the analytic file records the *first* post-injury visit of that type, the date of that visit, the distance and travel time from the worker's residence to the provider, and the timeliness of that visit. Geography for these measures is based on the worker's residence using the ZIP code reported on the FROI. If a ZIP code is not available on the FROI, we use the most commonly reported employee ZIP from an individual's medical bills.

Timeliness of Care

We measure timeliness by calculating the number of days from the date the claim was reported to the employer to the first visit of a given type. Timeliness is analyzed for E&M and physical medicine, the widely used visit types that are relevant to initial access.

In some cases, the first visit preceded the date when the claim was reported to the employer, but took place after the injury date; in those cases, we set the duration to zero. In a small number of cases where the first visit predates the injury, we code the timeliness measure as missing. To limit the influence of extreme values and of right-censoring, we exclude cases that did not have an E&M visit or a physical medicine visit care within 365 days. That is, our main timeliness measures report the duration to the first visit only for those who used E&M or physical medicine.

Distance to Care

Distance and travel time are used as measures of geographic access to care. We used ArcGIS to calculate the driving distance and travel time (by driving) between the centroid of the worker's residence ZIP and the centroid of the provider's location ZIP. Distance and travel time were calculated for every possible pair of ZIP codes within California and from ZIP codes in California to those in neighboring states. These distances were then merged onto bill lines based on the patient and provider ZIP codes. Distance was coded as missing for bills with patients living outside California or providers outside California, Oregon, Nevada, and Arizona.

Our principal measure of distance traveled is based on the driving distance in miles to the provider location for each patient's first visit within a category of visits (e.g., the first physical medicine visit). Provider location was assigned following a hierarchy: the facility ZIP code from the bill, the provider's PPEF ZIP code, the NPEPS practice location ZIP, the NPPES practice location zip code, the NPPES business mailing address ZIP code, and the billing provider ZIP code. We report distance and travel time for the first in-person visit (excluding telehealth);

missing if every visit of that type was remote). Additional details on assignment of provider ZIP codes and distance calculation are given in Appendix A.

Analytic Approach

Our main analysis of timeliness is focused primarily on describing changes in measures over time and differences across regions within the state. A challenge in comparing timeliness of care across injury dates is that, for more recent injuries, there is less follow-up time available to observe care, making the observation window mechanically shorter. A small number of outlier cases, where the first visit occurs long after the injury was reported, can skew statistics like the average duration to treatment and result in biased comparisons of timeliness. We therefore limited our analysis of timeliness measures in this chapter to cases where care was received within the first year after the injury was reported. In 2017, the earliest year we analyze, very few cases received a first E&M visit more than one year after the date of employer report: 1.7% for E&M, and 3.7% for physical medicine.

To further reduce the influence of outliers, we report both the median and mean durations to the first visit. These two statistics offer complementary insights. The median represents the experience of a typical injured worker, as half of injured workers have the same duration or higher, and half have the same duration or lower. The mean is more sensitive to outliers and, for durations and similarly right-skewed variables, is therefore not a good representation of the typical worker's experience. However, when viewed alongside the median, the mean can provide useful context by reflecting shifts anywhere in the distribution.

Provider Participation Measures

We use the rendering provider National Provider Identifier (NPI) on medical bills to identify individual health care providers who serve workers' compensation patients. After aggregating bills to one record per NPI per service year, we used the NPPES and PPEF data to supplement information on provider type and location in the WCIS. The NPPES records whether an NPI is individual (e.g., physician, chiropractor) or organizational (e.g., hospital, pharmacy). Our analyses of provider participation exclude NPIs that are identified as organizational in the NPPES. We further excluded NPIs from our analysis if their most common taxonomy code in the WCIS corresponded to a non-individual provider type.

Our primary measure of provider participation counts a provider as participating if they were the rendering provider on at least one workers' compensation bill line in a service year. As noted above, bill lines for medical-legal services were excluded, so providers who served only as Qualified Medical Examiners or otherwise provided medical-legal services without also providing medical care would not be counted as participating.

We also examined definitions that require more sustained involvement with workers' compensation in terms of the provider's total paid amount in a year (at least \$10,000) or the

number of unique workers' compensation patients the provider treated in a year (at least 10 patients). Lower thresholds for payment (\$5,000) and patient count (5 unique patients) were also examined as sensitivity analyses.

To make counts comparable across regions with different populations and workers' compensation case volumes, we calculated rates of workers' compensation providers per 10,000 unique workers' compensation patients in the region. We compare these provider-per-population rates to rates of providers per 10,000 population in the general health care system derived from the AHRF. Providers are classified into physician-specialty groupings based on the highest-volume taxonomy code on their bills, mapped to categories using the National Uniform Claim Committee [NUCC] taxonomy hierarchy.

Practice Locations

For analysis of regional differences in provider supply, we assigned a single primary practice location based on the facility ZIP codes reported on a provider's bills in each service year. We extract the five-digit ZIP code from each reported facility ZIP and assign the provider to the most common five-digit ZIP code (i.e., the ZIP code with the highest count of bill lines for that provider) located in California. In some cases, the facility ZIP code is missing on a provider's bill lines; more commonly, the ZIP code is located outside California. In these cases, we attempt to assign the provider ZIP code from other sources. In order, these are the PPEF practice location (randomly selected if there is more than one PPEF practice location for the NPI), then the NPPES practice-location ZIP code, then the NPPES business-mailing ZIP code, and finally the most-common WCIS billing ZIP code. At each step of this hierarchy, we continue to the next step if the ZIP code is located outside California. Providers whose practice location is still out-of-state or who lack any usable practice location appear only in the statewide total, but are excluded from regional counts.

Network Agreement Measures

We use provider agreement codes reported at the bill level to provide some basic descriptive statistics on how often care provided by different provider types and specialties is identified as being provided through an MPN or covered by a PPO agreement, and whether the proportion of care provided under either arrangement is changing over time. Data submitters are instructed to use the provider agreement code to indicate if the provider belongs to an MPN that is available to the worker, and whether the care is subject to a PPO agreement (which may result in payments being discounted below the rates in the Official Medical Fee Schedule [OMFS]). We also explored bill adjustment reason codes 131 (claim-specific negotiated discount) and P25 (adjusted per the network) as a way to identify provider discounts, but we found that these were too rarely used to be informative.

In this report, we combine the codes that are intended to indicate MPN participation and PPO agreement status into a single "MPN/PPO" category. In practice, MPN and PPO participation are

not mutually exclusive, and more investigation of the data is needed before we can provide a rigorous breakdown of which bills covered by an MPN are also subject to a PPO agreement. We plan to revisit this distinction in a future report when we focus on MPNs as a special topic.

Statistical Inference

When we report changes over time in patient-level measures, we use statistical tests to evaluate whether changes in the averages observed in a given year are distinguishable from randomness. To summarize the direction of change in recent years, we compare the average outcome for 2024 injuries to the average for 2022 and 2023 injuries pooled together. For wait times, we use a two-sample t-test with unequal variances to evaluate the statistical significance of changes in the mean, and we use a Wilcoxon rank-sum test to evaluate the statistical significance of changes in the median. (We note that the rank-sum test is a test for whether the entire distribution of outcomes has shifted, so it is possible for this test to indicate a significant change even when the median does not change.) For our estimates of the probability that timeliness exceeds a threshold (which is a binary outcome), we use a chi-squared test. We use a 5% significance level to determine statistical significance. In figures that illustrate changes over time, statistically insignificant changes are indicated by diagonal shading.

Differences across geographic areas are not tested for statistical significance. Counts of participating providers and other provider-level statistics are also not evaluated for statistical significance, since the data shown here directly measure the count of unique providers in the WCIS without sampling error.

3. Recent Trends in Injured Workers' Access to Care: Timeliness and Distance Traveled

In this chapter, we focus on two key patient-level measures of injured workers' access to care: the timeliness of the first visit, and the distance workers travel to receive care. Unless otherwise noted, results in this chapter reflect timeliness and distance among initially accepted claims for specific injuries. In the 2024 injury year, specific injury claims that were initially accepted constituted 80.9% of all claims (Appendix Table B.15).

This means that the main results shown in this chapter do not include claims for cumulative trauma, occupational disease, mental health, or multiple physical injuries. We refer to these four broad categories together as *non-specific* injuries: together, they made up 13.1% of 2024 injury year claims. These cases often result from complex exposure histories and may be recognized as work-related long after onset, making it more difficult to interpret the duration from claim reporting to receipt of workers' compensation medical care.

Similarly, we focus on timeliness and distance traveled among initially accepted claims because the time from the start of the claim to the first receipt of medical care in the workers' compensation system may be affected by claim denials or investigations. Although the Labor Code requires employers to provide up to \$10,000 of medical care for an injured worker during the initial investigation of a claim, some care received during an investigation or after a claim denial may not be billed to workers' compensation in practice. Excluding cases with an initial denial makes it easier to interpret our evidence on timeliness of care as a reflection of the workers' compensation medical delivery system, as opposed to a reflection of litigation and other friction in the broader workers' compensation system. In 2024, 5.7% of all injuries were specific injuries that were initially denied (accounting for 6.7% of all specific injury claims filed), and 5.6% of all injuries were non-specific injuries that were initially denied (accounting for 42.7% of all non-specific injury claims filed)(California Labor Code §5402(c)).

We describe timeliness and distance measures for non-specific injuries and denied claims in the Appendix, but we caution that claims data (like the WCIS data used in this study) do not clearly distinguish between delays in treatment related to disputes over compensability and delays resulting from issues in the medical delivery system. In contrast, accepted claims for specific injuries provide a clearer view of whether the workers' compensation medical delivery system is working to provide workers with access to care, and is thus more likely to provide evidence that will be useful for policymakers considering the medical delivery system.

Timeliness of Care

As described in Chapter 2, we calculated the duration from the date when each injury was reported to the service date of the first evaluation and management (E&M) visit and the first physical medicine visit. We excluded E&M visits provided in an inpatient or emergency room setting. These definitions follow previous studies of the timeliness of care in California workers' compensation (Jones and Swedlow, 2022; Kapinos and Montemayor, 2019). Telehealth services are included in timeliness measures, but are excluded from the distance traveled measures reported later in this chapter.

Table 3.1. Mean and Median Days from Injury Report to First E&M Visit, by Year of Injury

Year Of Injury	Mean Days	Median Days
2017	9.7	0
2018	7.8	0
2019	10.2	1
2020	8.9	1
2021	8.8	1
2022	8.9	1
2023	8.2	1
2024	8.8	1

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no E&M visits within 365 days are excluded.) Number of observations in 2024 = 359,551 injury claims with an E&M visit within 365 days of employer reporting date.

Table 3.1 reports the mean and median days from the claim to the first E&M visit outside of an inpatient or emergency room setting. In 2024, the median duration was 1 day, meaning that half of workers had a first E&M visit either on the day of the employer report or the day after. The average duration was 8.8 days to the first E&M visit, reflecting the right-skewed nature of duration distributions. However, like the median, the mean duration remained largely stable from 2020 to 2024. While the 2024 mean of 8.8 days was 2.3% higher than the 2022-2023 average, it is very similar to the means reported between 2020-2022. In total, 90% of workers with accepted specific injury claims for 2024 injury dates had one or more E&M visit within a year of the employer reporting date (Appendix Table B.1).

The sharp increase in the mean duration in 2019 may reflect access issues during the early stages of the COVID pandemic. We examine this issue in depth in Chapter 6.

Table 3.2: Mean and Median Days from Injury Report to First Physical Medicine Visit, by Year of Injury

Year of Injury	Mean days	Median days
2017	37.4	18
2018	33.8	16
2019	37.0	17
2020	33.8	15
2021	33.9	15
2022	35.2	17
2023	34.9	17
2024	35.3	16

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no physical medicine visits within 365 days are excluded.) Significance of the change from the 2022-23 average to 2024: two-sample t-test with unequal variances for the mean, Wilcoxon rank-sum test for the median. Number of observations in 2024 = 180,302 injury claims with a physical medicine visit within 365 days of employer reporting date.

Table 3.2 reports the mean and median duration to the first physical medicine visit, defined as receipt of physical therapy, chiropractic manipulation, or acupuncture. Physical medicine is not needed in all workers' compensation cases, and acupuncture is not recommended by the Medical Treatment Utilization Schedule (MTUS) during the acute phase for some common injuries, but physical therapy and other forms of physical medicine are widely used and important for recovery and return to work: 45% of workers with accepted specific injury claims for 2024 injury dates had one or more physical medicine visit within a year of the employer reporting date (Appendix Table B.2).

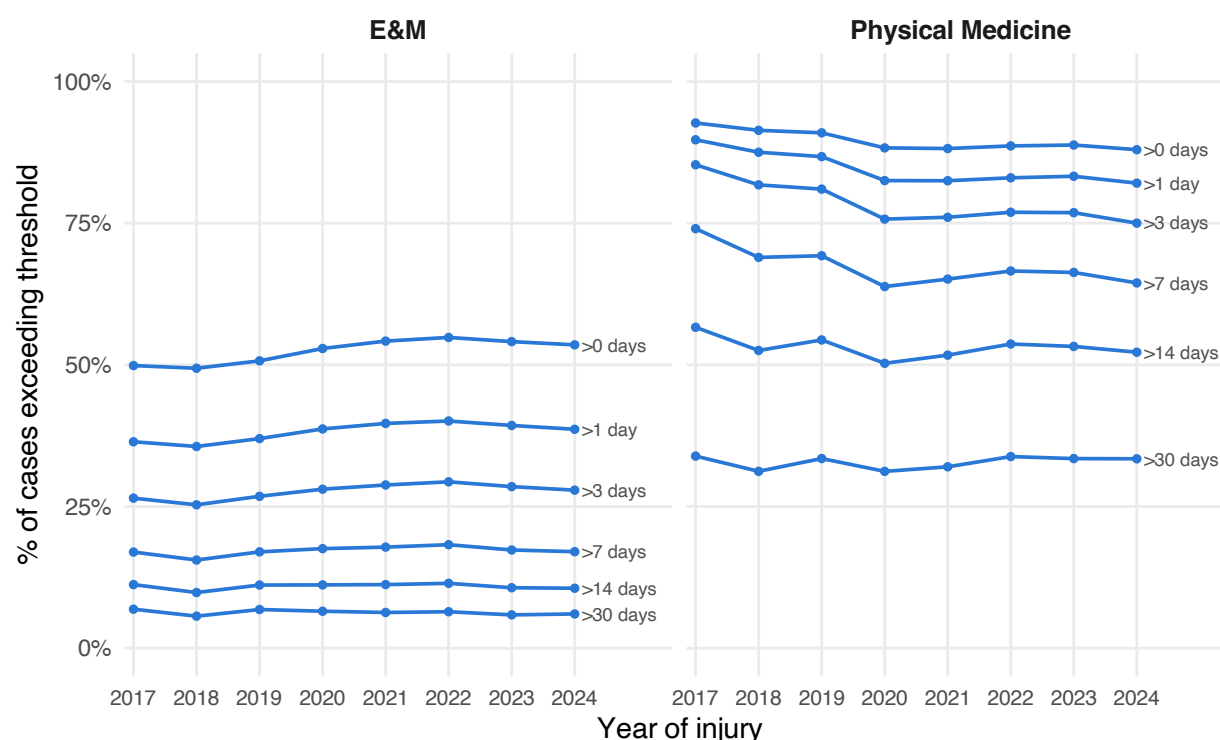
In 2024, the median duration between the injury date and the first physical medicine visit was 16 days. This was slightly lower than the median of 17 days in 2022 and 2023. The mean duration of 35.3 days to first physical medicine visit was slightly higher in 2024 than in 2022 (35.2 days) and 2023 (34.9 days). Taken together, the trends in the median and mean suggest that timeliness may have improved slightly for the typical worker, while the duration to receiving physical medicine for workers with the longest wait times increased slightly. We caution, however, that while these changes are statistically significant, they are very modest in size, and timeliness in 2024 for both E&M and physical medicine are within the range observed in earlier years.

Probability of Exceeding Durations to First E&M or Physical Medicine Visit

The trends in the mean and median durations reported above provide an overview of how timeliness is evolving for injured workers as a whole. To better understand changes in wait times or workers with shorter versus longer durations to the first visit, we calculated and plotted the proportion of workers whose time to first visit exceeded various thresholds (ranging from 0 to 30

days) over time. The results are shown in Figure 3.1; the underlying estimates are reported in Appendix Tables B.7 and B.8. Each line in the figure shows the percentage of workers whose wait time was greater than the threshold labeled at the right of the line. An upward movement in the line means that more workers waited longer than the indicated threshold (i.e., timeliness got worse), while a downward movement means fewer workers waited longer than the indicated threshold (i.e., timeliness got better).

Figure 3.1: Percent of Cases with Time to the First E&M or Physical Medicine Visit Beyond Selected Day Thresholds, by Year of Injury



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no qualifying visits within 365 days are excluded.) Each line is one day threshold, labeled at the right edge. Number of observations in 2024 = 359,551 injury claims with an E&M visit and 180,302 with a physical medicine visit within 365 days of employer reporting date.

The left panel of Figure 3.1 shows that nearly half (46%) of workers injured in 2024 had a first E&M visit on the injury date (as reported by the employer), three in five (61%) had a first E&M visit within one day, and over 7 in 10 (72%) had a first E&M visit within three days. The share of workers exceeding these thresholds increased after 2018, but have declined slightly between 2022-2023 and 2024. The share of injured workers exceeding higher thresholds (7 days, 14 days, or 30 days) also decreased slightly between 2022-23 and 2024. Although these improvements in timeliness between 2022-23 and 2024 were all statistically significant

(Appendix Table B.7), the changes are modestly sized and, the figure is generally consistent with the picture of stability in timeliness of E&M visits indicated by the means and medians reported in Table 3.1.

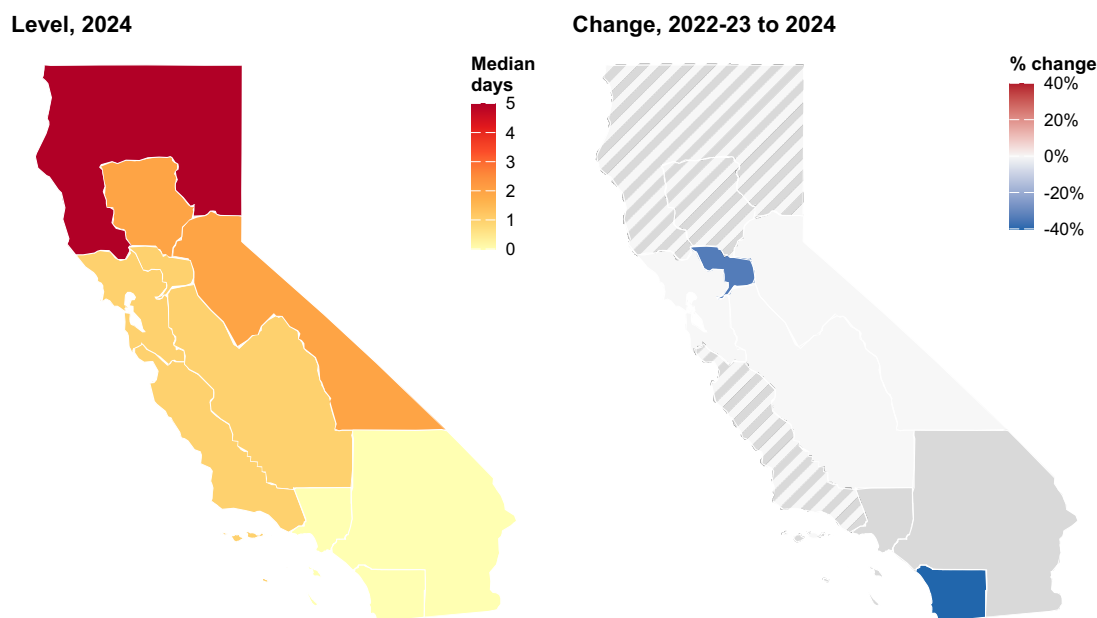
The right panel of Figure 3.1 shows, similarly, that the shares of workers with durations above each threshold between 0 and 14 days to the first physical medicine visit increased after 2020, peaked in 2022 and saw statistically significant but small declines between 2022-2023 and 2024 (Appendix Table B.8). The share of workers with a duration above 30 days also increased between 2018 and 2022, but has remained flat since 2022, with no significant change ($p = 0.11$). These results suggest that the slight increase in the mean time to physical medicine between 2022-2023 and 2024 was driven by increases among the one in three workers with a duration beyond 30 days to the first physical medicine visit.

Regional Variation in Timeliness of E&M and Physical Medicine

We also examined how timeliness varied across regions in 2024, reporting on changes between the 2022-2023 average and 2024. Figure 3.2 shows the median time to the first E&M visit by DWC region. The median time to the first visit was lowest in three southern California regions (Los Angeles, the Inland Empire, and San Diego) that had a median of zero in 2024. The median duration was 1 day in the Bay Area, Sacramento Valley, Central Valley, and Central Coast regions, 2 days in the Eastern Sierra Foothills and North Sacramento Valley regions, and 5 days in North State-Shasta. Between 2022-23 and 2024, the Sacramento Valley and San Diego regions had statistically significant reductions in the median.

Regional patterns in the mean duration to first E&M visit for 2024 injuries were similar to the median: areas with higher median durations also had higher mean durations (Appendix Table B.10). However, some regions with stable medians between 2022-23 and 2024 saw statistically significant increases in the mean duration. These regions included the Central Coast (5% increase, $p < 0.05$), Central Valley (8% increase, $p < 0.01$), Inland Empire (5.1% increase, $p < 0.01$), San Diego (5.6% increase, $p < 0.05$), and the North Sacramento Valley (24% increase, $p < 0.01$).

**Figure 3.2. Median days from Injury Report to the First E&M Visit by DWC Region:
2024 Level and Change from 2022-23 to 2024**

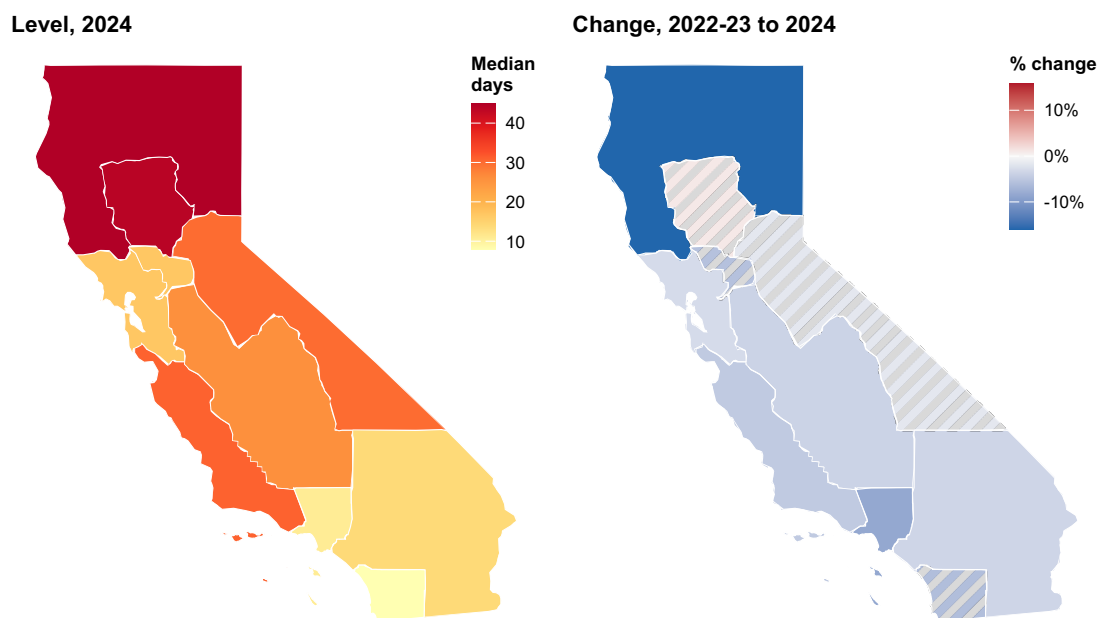


SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no E&M visits within 365 days are excluded.) Claims assigned to DWC regions based on the injured worker's residence. The left panel shows the 2024 level; the right panel shows the percent change from the 2022-2023 average to 2024. Areas overlaid with light diagonal bands had a change that was not statistically significant at the 5 percent level. Significance of the change in the median from 2022-23 to 2024 evaluated using a Wilcoxon rank-sum test. The percent change is undefined for the Inland Empire and Los Angeles (median zero in every year, shown in solid gray).

Figure 3.3 shows the median days to the first physical medicine visit by region. As with E&M, the time to the first physical medicine visit in 2024 was lower in San Diego (8 days), Los Angeles (11 days) and the Inland Empire (14 days) than in other regions. The median time was close to the statewide median of 16 days in both the Bay Area and Sacramento Valley (both 17 days), was higher in the Central Valley (26 days), Central Coast (31 days), and Eastern Sierra/Foothills (30 days), and was highest in the North Sacramento Valley (44 days) and North State-Shasta (45 days). However, median durations to the first physical medicine visit fell between 2022-23 and 2024 across all regions in which a statistically significant difference was observed. Regional differences in the mean days to the first physical medicine visit were very similar to those shown in Figure 3.2 (Appendix Table B.12)

Figure 3.3. Median Days from Injury Report to the First Physical Medicine Visit by DWC Region: 2024 Level and Change from 2022-23 to 2024



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Analysis population limited to accepted specific injury claims. Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. (Cases with no physical medicine visits within 365 days are excluded.) Geography is the DWC region of the injured worker's residence. The left panel shows the 2024 level; the right panel shows the percent change from the 2022-2023 average to 2024. Areas overlaid with light diagonal bands had a change that was not statistically significant at the 5 percent level. "California Statewide" and "Out of California" are excluded from the maps. Significance of the change from the 2022-23 average to 2024: Wilcoxon rank-sum test. A median has no standard error, so no confidence interval is reported. Unlike the E&M median, the physical medicine median varies widely across regions (8 to 45 days in 2024) and its percent change is defined everywhere. Number of observations in 2024 = 180,302 injury claims with a physical medicine visit within 365 days of employer reporting date.

Comparison to Prior Studies

Two recent studies on access to care in California's worker's compensation system conducted by RAND and CWCI assessed the timeliness of workers' first visit in the workers' compensation system, however they studied different types of visits and considered different time periods. The 2019 RAND study found that for an initial E&M visit with any provider, the average wait was 16.4 days, but the median wait time was 2 days (Kapinos and Montemayor, 2019). For only first E&M visits with a primary care provider (defined there to include primary care physicians and chiropractors) in any non-ED setting, the median wait time was 6 days (Kapinos and Montemayor, 2019). The RAND study relied on data for 2016 (Kapinos and Montemayor, 2019) and did not restrict the sample to accepted specific injury claims.

The 2022 CWCI report separately assessed the time to the initial visit for three types of care (E&M, physical medicine, and for a group of five widely used surgical services) across the 2010-2020 injury years (Jones and Swedlow, 2022). CWCI found that the median wait time for both E&M and first medical was same-day treatment, but that there was a longer median wait time for physical medicine (range of 15-20 days across the study period) (Jones and Swedlow, 2022). The CWCI study noted a slight increase in physical medicine wait times after legislative changes to the workers' compensation system were implemented, including the Independent Medical Review and Request for Authorization processes, but the study did not proposal a causal relationship between the policy changes and the increased wait times (Jones and Swedlow, 2022).

Distance Traveled to Care

Distance traveled is another key measure of access to care. In contrast to timeliness, comparisons of distance traveled over time are not affected by bias from right-censoring, so we include the first visit of each type of care regardless of how long after the injury the care was received. Distance measures reported in this chapter exclude visits that were billed as telehealth. To the extent that telehealth care is accurately billed, distance estimates reported here should reflect travel distances to in-person care. As above, figures shown in this chapter are limited to accepted specific injury claims unless otherwise noted.

Table 3.3. Median and Mean Miles Traveled to the First Visit, California Statewide, by Year of Injury and Visit Type

Year of injury	E&M median	E&M mean	Physical Medicine median	Physical Medicine mean	Orthopedic median	Orthopedic mean	Behavioral Health median	Behavioral Health mean
2017	10.8	32.0	8.8	29.9	13.8	28.5	15.6	30.5
2018	10.6	29.5	8.7	28.3	14.1	28.5	15.7	31.5
2019	10.2	25.7	8.7	29.4	14.5	28.5	15.8	32.7
2020	10.2	23.1	8.9	30.0	15.0	28.9	16.9	38.1
2021	10.2	24.7	8.9	31.6	15.0	31.4	16.5	42.4
2022	10.8	32.4	9.3	36.2	15.6	34.5	16.8	46.2
2023	12.1	44.1	9.9	43.9	16.1	36.7	17.7	49.3
2024	11.4	41.3	9.8	46.0	15.9	36.3	17.4	46.5

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Distance is the driving distance along the road network between the population-weighted ZIP code centroid of the worker's residence and that of the provider's location, for the first in-person visit of each type. Table includes accepted specific injury claims. Number of observations for 2024, by visit type: E&M = 353,995; Physical Medicine = 179,342; Orthopedic = 51,439; Behavioral Health = 9,722.

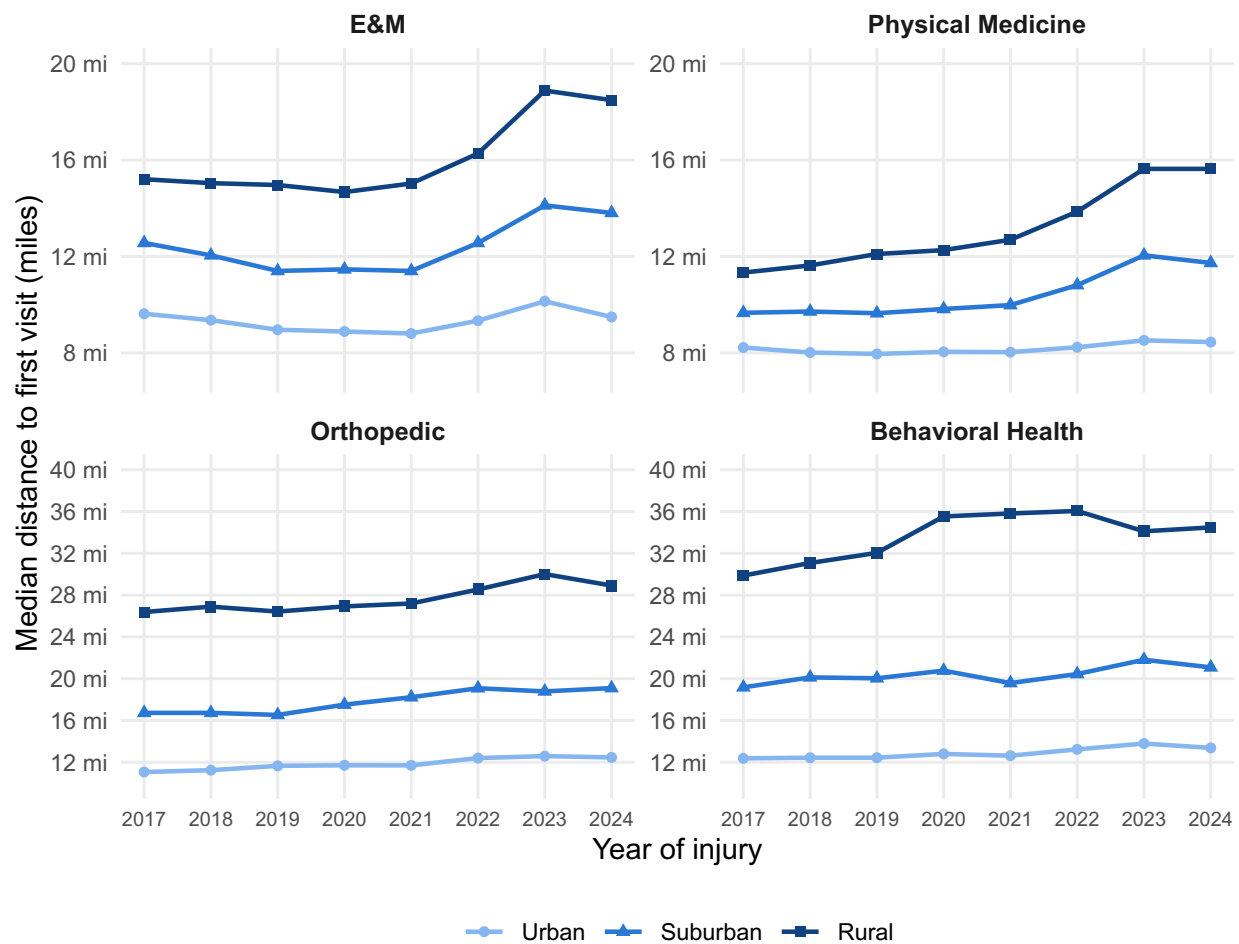
Table 3.3 reports the median and mean distance traveled to the first in-person visit for four types of care: E&M, physical medicine, orthopedic, and behavioral health. For physical medicine and behavioral health care, the median distance to the first visit increased slightly from 2022-23

to 2024. Distance traveled for orthopedic care was not statistically significantly different in 2024 from the 2022-23 average ($p = 0.87$). Mean distance traveled increased more substantially for all types of care. The divergence between mean and median distance traveled in recent years points toward increases among a minority of cases with high travel distances while changes for the typical injured worker were muted.

Travel distance varies with population density, and trends in distance traveled could be different across areas with differing population density. Following Jones and Swedlow (2022), we classified ZIP codes as urban (population density over 3,000 persons per square mile), suburban (population density 1,000 to 3,000 persons per square mile), or rural (population density below 1,000 per square mile) and plotted the median distance traveled by year for each population density grouping.

Results in Figure 3.4 below confirm that driving distances are higher in less densely populated areas. However, the figure also shows some differences in recent trends across types of care and density levels. Driving distances for E&M and physical medicine increased for workers in suburban areas and, especially, for workers in rural areas. Distance traveled for rural workers using behavioral health care also increased steadily from 2017 and were higher during the pandemic before declining slightly from 2022-2023, while increases in distance to orthopedic care were more modest.

Figure 3.4. Median Miles Traveled to the First Visit by Population Density of the Worker's Residence ZIP Code and Year of Injury, Four Visit Types



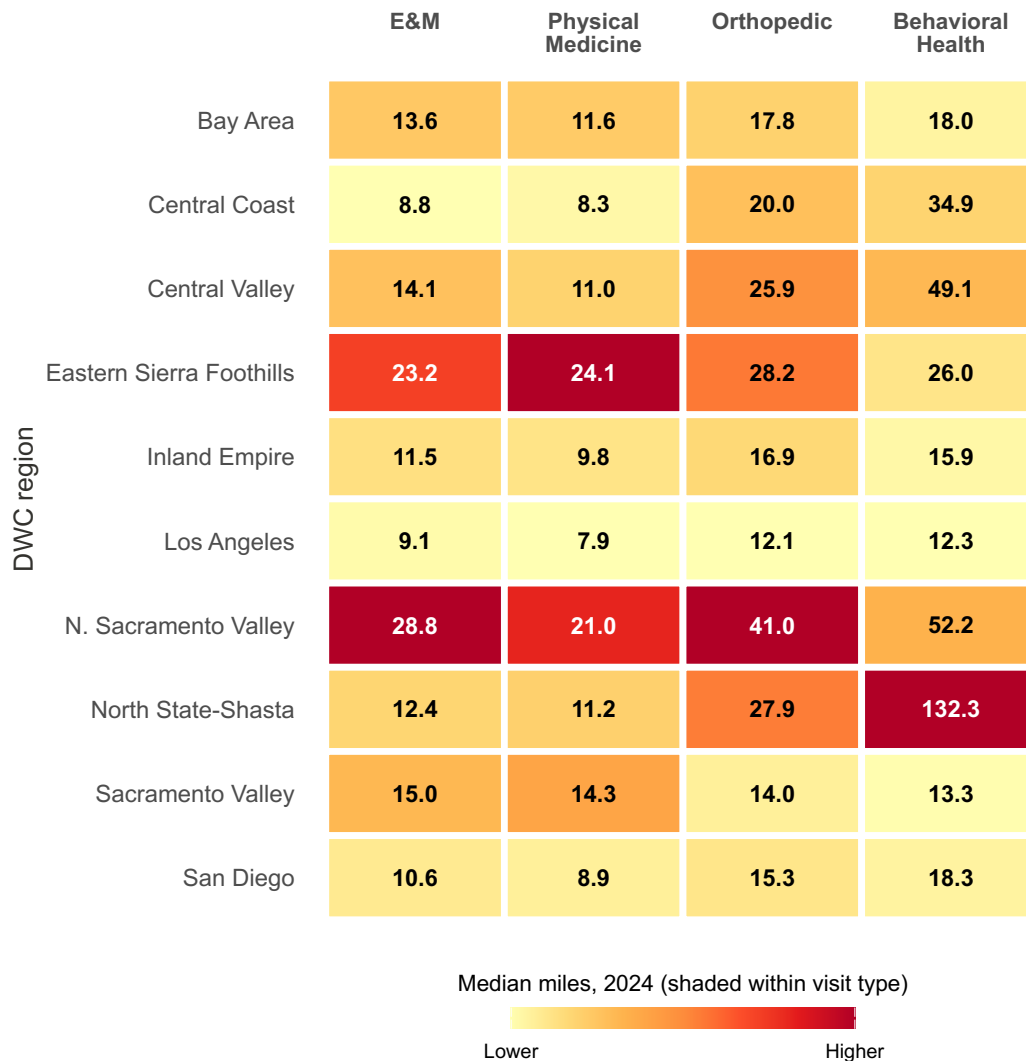
SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Distance is the driving distance along the road network between the population-weighted ZIP code centroid of the worker's residence and that of the provider's location, for the first in-person visit of each type. Table includes accepted specific injury claims. Density categories are based on the worker's residence ZIP code: urban = 3,000 or more persons per square mile; suburban = 1,000 to under 3,000; rural = under 1,000. Number of observations for 2024, by visit type: E&M = 353,995; Physical Medicine = 179,342; Orthopedic = 51,439; Behavioral Health = 9,722.

Regional Variation in Distance Traveled

We also found substantial regional differences in the distance traveled to care (Figure 3.5).

Figure 3.5. Median Miles Traveled to the First Visit by DWC Region and Visit Type, 2024



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

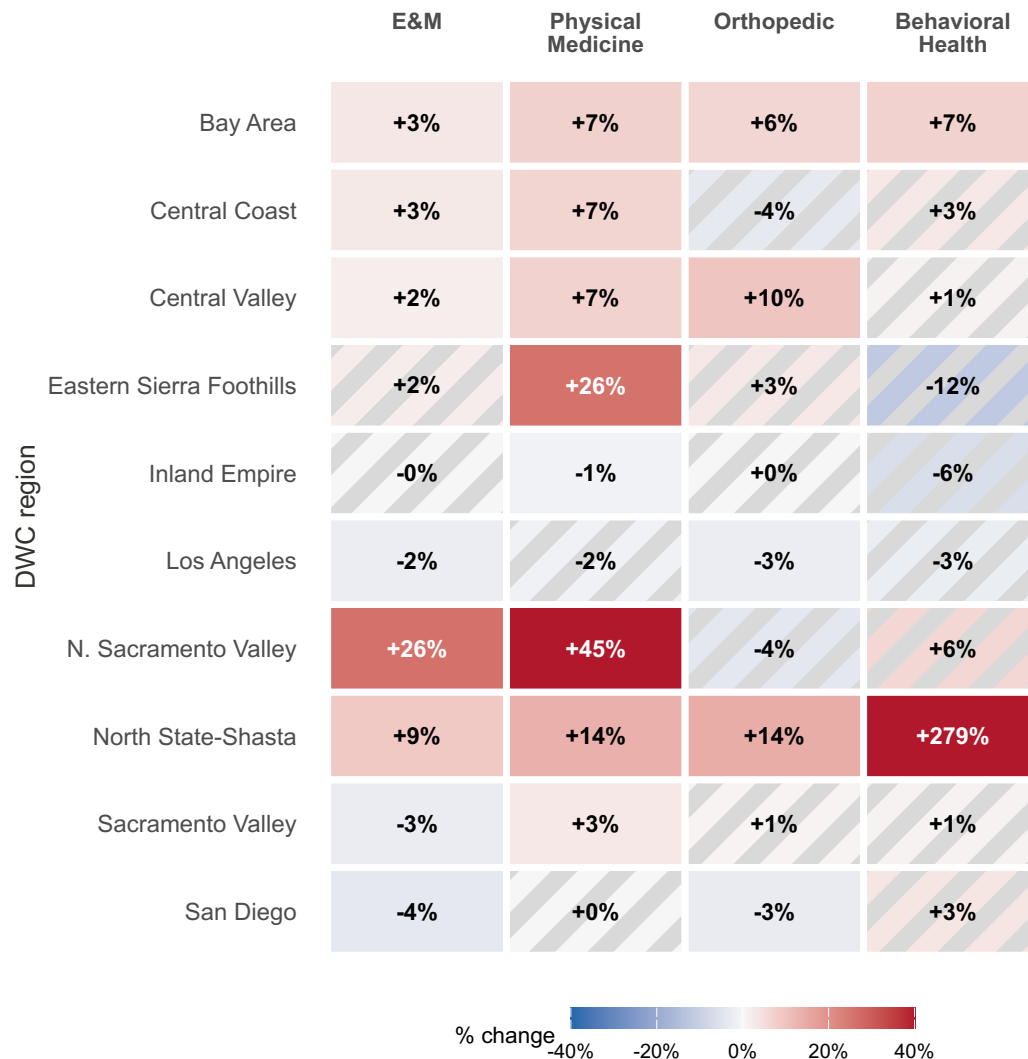
NOTES: Distance is the driving distance along the road network between the population-weighted ZIP code centroid of the worker's residence and that of the provider's location, for the first in-person visit of each type. Table includes accepted specific injury claims. Shading is normalized within each visit type (column). Number of observations in 2024, by visit type: E&M 353,995; Physical Medicine 179,342; Orthopedic 51,439; Behavioral Health 9,722.

Median driving distances for orthopedic and behavioral health are highest for workers in the North Sacramento Valley, North State-Shasta, Eastern Sierra/Foothills, Central Valley, and Central Coast regions. The North Sacramento Valley, and the Eastern Sierra/Foothills also have high distances to E&M and physical medicine, as do North State-Shasta, the Central Valley, and the Sacramento Valley.

Figure 3.6 shows changes between 2022-23 and 2024 in the median distance traveled. Distance traveled for behavioral health increased in the Bay Area, Central Coast, and Central Valley, and distance traveled to Physical Medicine increased in 7 of 10 regions. Increases across

multiple visit types in the North Sacramento Valley and North State-Shasta are large and statistically significant, but we caution that these are based on relatively small samples.

Figure 3.6. Change in Median Miles Traveled to the First Visit by DWC Region and Visit Type, 2022-23 Average to 2024



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Distance is the driving distance along the road network between the population-weighted ZIP code centroid of the worker's residence and that of the provider's location, for the first in-person visit of each type. Table includes accepted specific injury claims. Shading is normalized within each visit type (column). Red indicates that median distance increased; blue indicates it decreased. Areas overlaid with light diagonal bands had a change that was not statistically significant at the 5 percent level based on a Wilcoxon rank-sum test. Number of observations in 2024, by visit type: E&M 427,584; Physical Medicine 214,718; Orthopedic 64,183; Behavioral Health 22,522.

Comparison to Prior Studies

The 2022 CWCI study examined trends in the distance workers traveled for initial treatment for the 2010-2020 plan years. CWCI analyzed the average distance traveled on a statewide level and based on whether the worker lived in an urban, suburban, or rural area. The distance traveled was generally consistent for all workers across the study period. On average, workers overall traveled between 5.3 and 5.7 miles to access care during the study period. However, rural workers traveled greater distances than their urban and suburban counterparts. Rural workers traveled, on average, between 11-13.1 miles for care over the study period. Urban workers traveled, on average, between 4.0 and 4.4 miles for care over the study period. Suburban workers traveled, on average, between 5.6 and 6.4 miles to access care over the study period. The CWCI report suggested that improving the geographic distribution of providers could improve medical access in the workers' compensation system. We note that the CWCI study used more granular address information (exact addresses) for injured workers and providers than we do in this study, whereas we assign injured workers and providers to the population-weighted ZIP code centroid containing their address. The 2019 RAND study did not measure the distance traveled by workers to receive treatment.

Limitations

One potential concern with our analysis of trends in timeliness is that we excluded cases in which the duration to the first E&M or physical medicine visit was over one year. These cases might indicate worrisome access issues, but they likely reflect unusual circumstances that would call for them to be analyzed separately. Fortunately, relatively few cases involve a first E&M or physical medicine visit more than one year after the injury. As noted above, in 2017, 1.7% of workers with an accepted specific injury claim had their first E&M visit more than a year after the injury, and 3.7% of workers with an accepted specific injury claim had their first physical medicine visit more than a year after the injury. Excluding these cases avoids right-censoring bias that these cases would introduce into our analysis of trends.

More generally, the duration from the date of injury report to the first visit in workers' compensation can reflect factors other than the effectiveness of the medical delivery system. This especially limited our ability to evaluate the timeliness and availability of providers for specialty care where the time frame when patients begin to seek care is not observable in claims data. This limitation motivated our focus on accepted specific injury claims, where it is reasonable to assume that nearly all new injury claims should result in contact with a provider.

However, as we discuss in Chapter 2, nearly 1 in 5 workers' compensation claims was either for a non-specific injury or was initially denied. Appendix Tables B.13 and B.14 report the mean and durations to the first E&M and physical medicine visit for these categories of claims in 2022-24. These figures confirm that claim denials are associated with substantial delay in the first E&M and first physical medicine visit, and that even for accepted non-specific injury

claims, the duration to the first E&M and first physical medicine visit is higher than for accepted specific injury claims. For example, the median duration to the first E&M visit in 2024 was 5 days for denied specific claims, 2 days for accepted non-specific claims, and 29 days for denied non-specific claims, compared to 1 day for accepted specific injury claims. The median time to the first E&M visit increased between 2022-23 and 2024 for both specific and non-specific injury claims that were denied, but the mean time to the first E&M visit was not statistically significantly different in 2024 for either group of claims, and the increase in the median days to the first E&M visit for specific injury claims that were denied was also not statistically significant ($p = 0.09$). The time to the first physical medicine visit, meanwhile, was stable or declining between 2022-23 and 2024 for each group of claims.

Research on access to care among these more complex or contested cases may be of interest to policymakers, especially since the share of injury claims that are for cumulative trauma and other conditions that we classified as non-specific injuries has increased steadily in recent years. Ultimately, however, data from outside the workers' compensation system (such as worker surveys or linked patient records or claims from group health) are needed to assess whether these workers are going without needed care or obtaining it from other sources while claims are delayed or denied. The readily available statistics on the duration from claim filing to receipt of workers' compensation care are difficult if not impossible to interpret directly as measures of whether there are problems with the medical delivery system as opposed to claims handling, adjudication, and other aspects of the workers' compensation system.

There are two key limitations to our distance measures. First, there is potential for inaccuracy in the patient and provider ZIP codes used to calculate distance. Worker ZIP codes should be accurate in the WCIS since they are important for claim administration, but changes in address after the claim is filed would not be reflected in our main measure. This source of error should be limited because we focus on the first visit after the injury for distance calculations (typically weeks after the ZIP code of residence is reported). We also acknowledge that our use of the ZIP code rather than the exact address to calculate distance is a limitation with the implication is that our estimates of distance are not directly comparable to the estimates reported in Jones and Swedlow (2022) or other studies that use the exact address. However, because our approach to measurement is consistent within this study, trends in our distance measures are likely to reflect changes that might be measured using more detailed distance data.

The more significant source of error is that in many cases the provider address where the service was rendered is uncertain. We believe the facility ZIP code should be accurate, but this was available in only around 77% of cases. We used external data sources (PPEF and NPPES) to assign practice locations when the facility ZIP code was missing, but these sources are also subject to uncertainty: relatively few providers matched to usable address information in the PPEF, while NPPES practice locations are well-populated but are infrequently updated. Relatively few providers had in-state locations taken from these outside sources, however, so the impact of these potential errors on distance results should be limited. In Appendix B, we provide

statistics on distance traveled using alternative measures, including calculations limited to the subset of claims with a facility ZIP code, and calculations that used the NPPES practice address for all claims. There are some differences from our main analysis in the statistical significance of changes from 2022-23 to 2024 for behavioral health and physical medicine, but recent trends and regional patterns generally do not differ meaningfully from those shown in this chapter.

Our other concern is that failure of providers to use the required telehealth codes could lead us to misclassify telehealth visits as in-person visits, which may substantially inflate estimated travel distances. In the appendix, we repeat the analysis of distance in this chapter using a version of the distance measure that is winsorized (or topcoded) at 150 miles to reduce the influence of outliers. Statewide trends in the mean distance traveled remain very similar, showing increases relative to pre-pandemic levels across all four visit types. (Median estimates are not affected by winsorization above the median, so we do not report them.) The data available to us do not provide a way to independently determine how accurate telehealth coding is. However, as we discuss in Chapter 7, the visits we count in our physical medicine measures overwhelmingly involve in-person evaluation or are almost never billed as telehealth since most of the procedures included involve in-person manipulation or other therapies. The distance trends for physical medicine care suggest that recent increases in distance traveled are not just an artifact of misreported telehealth encounters.

Chapter Summary

This chapter examines two core measures of access to care for California's injured workers: how quickly workers receive initial medical attention following a workplace injury, and how far they must travel to receive care. The findings suggest that, at the statewide level, access to care for the typical (median) worker has largely been stable over the last few years. The median time to the first E&M visit has remained at 1 day after the report of injury since 2019, and the median time to the first physical medicine visit for those using physical medicine care was slightly lower (16 days) in 2024 than in 2022-2023. Median distance traveled has increased slightly in recent years across three of four visit types examined, but by very modest amounts. Taken together, these figures do not point toward worsening access for the typical injured worker with an accepted specific injury claim.

However, examination of the mean distance traveled suggests that patients with above-median driving distances have traveled further in recent years for all four types of care examined. Substantial increases in driving distances for injured workers living in rural and suburban areas coexisted with relatively stable driving distances for injured workers living in urban areas.

We also found regional differences in timeliness of care. The median time to the first E&M visit in the most rural regions (North Sacramento Valley, Eastern Sierra/Foothills, and, especially, North State-Shasta) were above the statewide median of 1 day. Median times to the

first physical medicine visit, which have more dispersion, were also far above the statewide median of 16 days in the Central Valley (26 days) and the Central Coast (31 days).

Taken together, these findings indicate that while access to care for the median injured worker has remained stable, access problems exist in some regions, and driving distance appears to be increasing for some injured workers, especially in rural and suburban areas. In the next chapter, we look at trends in provider participation and the geographic distribution of providers across the state, which may indicate if areas with high and increasing travel distances also show indications of lower provider supply.

4. Provider Participation in California Workers' Compensation

Access to care for injured workers depends on the participation of a sufficient number of health care providers in the workers' compensation system. In this chapter, we report on recent trends in the number of providers that rendered care to injured workers. Statistics on provider participation in the general health care system are included to provide context for trends observed in workers' compensation. We also report on the proportion of care provided through MPNs or covered by PPO agreements, as identified in the medical billing data.

As described in Chapter 2, we calculated the number of providers by counting the number of unique individual NPIs appearing as a rendering provider on one or more bill line in each service year. In contrast to Chapter 3, where we analyzed patient-level access measures grouped by the injured worker's year of injury, here we focus on health care providers that provided care in the workers' compensation system regardless of when the patients they treated were injured. Statewide statistics include patients and providers located outside of California. (About 1% of workers with 2017-2024 injury dates have a residential ZIP code outside California.) Providers located outside of California are included in system-wide totals in this chapter, but are excluded from the regional estimates that we present in Chapter 5. As discussed in Chapter 2, we do not evaluate statistical significance for changes in counts of providers, since the data available directly measure the entire provider population.

Overall Provider Participation in California Workers' Compensation

Table 1 shows the total number of individual providers who provided any care to workers' compensation patients in each year from 2022 to 2024. We focus here on the three latest years of our data in order to characterize current provider participation and abstract from potential disruptions to the health system and workers' compensation associated with the early stages of the COVID pandemic. Data on earlier years is presented later in this chapter.

The first row of Table 1 ("With 1+ Bill Line in Year") shows trends in our broadest definition of provider participation, which counts any provider that was the rendering provider on at least 1 bill line for a workers' compensation patient in a service year. In 2024, there were just under 75,000 individual providers who provided care to injured workers. The table shows that this total number of providers was essentially flat between 2022 and 2024.

There are other possible ways to define participation in the workers' compensation system. Table 1 shows provider counts using four alternative definitions based on the number of unique workers' compensation patients treated and the total paid amount in the year. The number of providers who treated at least 5 or at least 10 workers' compensation patients per year grew slightly (0.8% or 0.9%, compared to -0.3% for our main definition). If we define participation based on receipt of at least \$5,000 or \$10,000 in paid amounts, we find more substantial growth

(4.4% or 5.2%). While some growth in providers above these payment thresholds is a mechanical result of updates to the fee schedule, Table 1 also suggests growth among providers who were more engaged in the care of injured workers, while the number of providers treating any injured workers was essentially unchanged. Differences in participation trends between this broad definition and the narrower definitions may be informative about the extent of engagement with the workers' compensation among the providers entering and exiting workers' compensation participation, and we discuss some of these differences (along with statistics on average provider caseloads) later in the chapter. Unless otherwise noted, however, statistics on provider participation in this report are based on the broadest definition (1+ workers' compensation bill line).

Table 4.1. Count of Unique Rendering Providers in California Workers' Compensation in 2022-2024, by Participation Threshold

Participation Threshold	2022	2023	2024	% change 2022-2023 avg to 2024
With 1+ WC Bill Line in Year	74,747	74,871	74,599	-0.3%
With 5+ WC Patients per Year	28,000	28,304	28,376	0.8%
With 10+ WC Patients per Year	20,026	20,411	20,394	0.9%
With \$5,000+ Paid	20,562	21,322	21,855	4.4%
With \$10,000+ Paid	15,189	15,769	16,283	5.2%

SOURCE: 2022-2024 WCIS

NOTES: Table counts number of unique individual NPIs participating in workers' compensation under five alternative definitions of participation. "WC" = workers' compensation

Composition of Providers in California Workers' Compensation

We classified providers into categories based the type of provider (e.g. physician, NP, etc.) and among physicians, their specialty (e.g. primary care, orthopedic surgery, etc.). These categories were assigned according to the provider taxonomy codes most commonly reported with their NPI in the WCIS (see Appendix A for details). For providers missing taxonomy codes in the WCIS, the primary taxonomy code in the NPPES was assigned.

We caution that the mix of providers at a point in time does not, in itself, constitute evidence of low participation or provider shortages: data on the mix of patients and the specific needs of the workers' compensation patient population must be taken into account to draw conclusions about whether the supply of providers is adequate. Changes over time in participation within a provider type or physician specialty are more interpretable, since the size and composition of the workers' compensation patient population is largely stable from year to year (see Appendix Tables A.4-A.8).

Provider Type

Table 2 reports counts of providers participating in workers' compensation by select major categories of providers: physicians, chiropractors, acupuncturists, psychologists, physical

therapists, nurse practitioners, and physician assistants. Physicians comprise 58% of the individual providers who participated in 2024. Physical therapists (12% of individual providers), physician assistants, (7%), and nurse practitioners (4%) also accounted for large numbers of individual providers. Chiropractors (3%), acupuncturists (2%), and psychologists (1%), who can also serve as the primary treating physician in some cases, were less common. Appendix A describes the distribution of four other provider types and four physician specialties with over 500 participating providers in the system in 2024.

The stable number of total providers in the system reported in Table 4.1 masked changes in the mix of provider. Participation declined among physicians (-1.5%), chiropractors (-2.1%), psychologists (-4.6%), and physical therapists (-1%) declined from 2022-23 to 2024. As participation by these providers declined, participation increased rapidly for acupuncturists (+9.2%), nurse practitioners (+11.2%), and physician assistants (+4.5%).

Table 4.2. Count of Unique Rendering Providers Participating in California Workers' Compensation, by Type of Provider

Provider type	Unique individual providers 2022	Unique individual providers 2023	Unique individual providers 2024	% change 2022-2023 avg to 2024
Physicians	43,885	43,530	43,038	-1.5%
Chiropractors	2,419	2,400	2,359	-2.1%
Acupuncturists	1,334	1,364	1,473	9.2%
Psychologists	871	813	803	-4.6%
Physical Therapists	9,289	9,314	9,213	-1.0%
Nurse Practitioners	2,775	3,011	3,216	11.2%
Physician Assistants	4,668	4,794	4,945	4.5%

SOURCE: 2022-2024 WCIS

NOTES: Table counts number of unique individual NPIs appearing as a rendering provider on one or more workers' compensation bill in a given service year. See Appendix Table A.10 for definitions.

Table 4.3 provides a more detailed breakdown of physician participation by specialty between 2022 and 2024. Specialties reported were chosen with input from DIR and on the basis of the number of participating physicians in 2024. Counts for other physician specialties with more than 500 participating physicians in 2024 are provided be found in Appendix A.

In 2024, 9,567 primary care physicians treated workers' compensation patients, accounting for just over one in five (22%) physicians who participated in workers' compensation. Other large groupings of physicians included emergency medicine (10% of physicians in 2024), anesthesiology (11%), orthopedic surgery (8%), and other surgical specialties (9%). Physical Medicine and Rehabilitation (PM and R) and Preventive Medicine physicians were 3% and 2% of participating physicians in 2022; neurology (2%) and psychiatry (1%) were the specialties with the smallest number of participating physicians among those reported here.

Table 4.3. Count of Unique Physicians Participating in California Workers' Compensation, by Physician Specialty

Provider type	Unique individual providers 2022	Unique individual providers 2023	Unique individual providers 2024	% change 2022-2023 avg to 2024
Primary Care	10,420	9,751	9,567	-5.1%
Emergency Medicine	4,096	4,334	4,354	3.3%
Anesthesiology	4,868	4,758	4,643	-3.5%
Orthopedic Surgery	3,504	3,412	3,345	-3.3%
Other Surgery	4,201	3,988	3,981	-2.8%
PM and R	1,172	1,252	1,163	-4.0%
Preventive Medicine	995	1,043	1,030	1.1%
Neurology	827	836	781	-6.1%
Psychiatry	444	411	439	2.7%

SOURCE: 2022-2024 WCIS

NOTES: Table counts number of unique individual NPIs for physicians appearing as a rendering provider on one or more workers' compensation bill in a given service year for selected groupings of physician specialties. Other Surgery includes all surgical specialties participating in workers' compensation other than orthopedics. PM and R = Physical Medicine and Rehabilitation. See Appendix Table A.10 for definitions.

The trends shown in Table 4.3 indicate that the recent decline (between 2022-23 and 2024) in overall physician participation shown in Table 4.2 was observed across a range of specialties, including primary care (-5.1% change from 2022-23 to 2024), surgery (-3.3% for orthopedic surgery and -2.8% for other surgery), anesthesiology (-3.5%), PM and R (-4.0%), and neurology (-6.1%). The number of participating physicians increased in emergency medicine (+3.3%), preventive medicine (+1.1%), and psychiatry (2.7%), although we note that the increase in psychiatry relative to the 2022-2023 average leaves the number of participating psychiatrists essentially unchanged from 2022.

Taken together, the statistics shown above indicate a shift away from physicians, chiropractors, and psychologists toward acupuncturists and advance practice providers, as well as declines in physician participation among both primary care physicians and some key specialties including surgeons. The definition of participation used in Tables 4.2 and 4.3 (1+ workers' compensation bill line in a service year) is the most inclusive of those we consider, and it is possible that some providers who meet this definition treat workers' compensation patients only incidentally or otherwise do not provide a substantial amount of care to workers' compensation patients.

Comparison to the General Health Care System

Having described the current mix of workers' compensation providers and recent changes in participation, we provide additional context below by comparing participation trends for selected provider types to trends in the general health care system. We report on how the ratio of the supply of providers to the volume of workers' compensation patients has changed from 2020 to 2024 using three of definitions of provider participation: 1) our broadest definition (1+ workers' compensation bill line in a service year), 2) a definition based on patient volume (10+ workers'

compensation patients in a service year), and 3) a definition based on payments (\$10,000 or more in payments on the provider's workers' compensation bill lines in a service year). As noted above, the volume-based and payment-based measures can be interpreted as reflecting care provided by those with greater engagement with the workers' compensation system. In some cases, all three measures move together, but in other cases we see divergence across the measures.

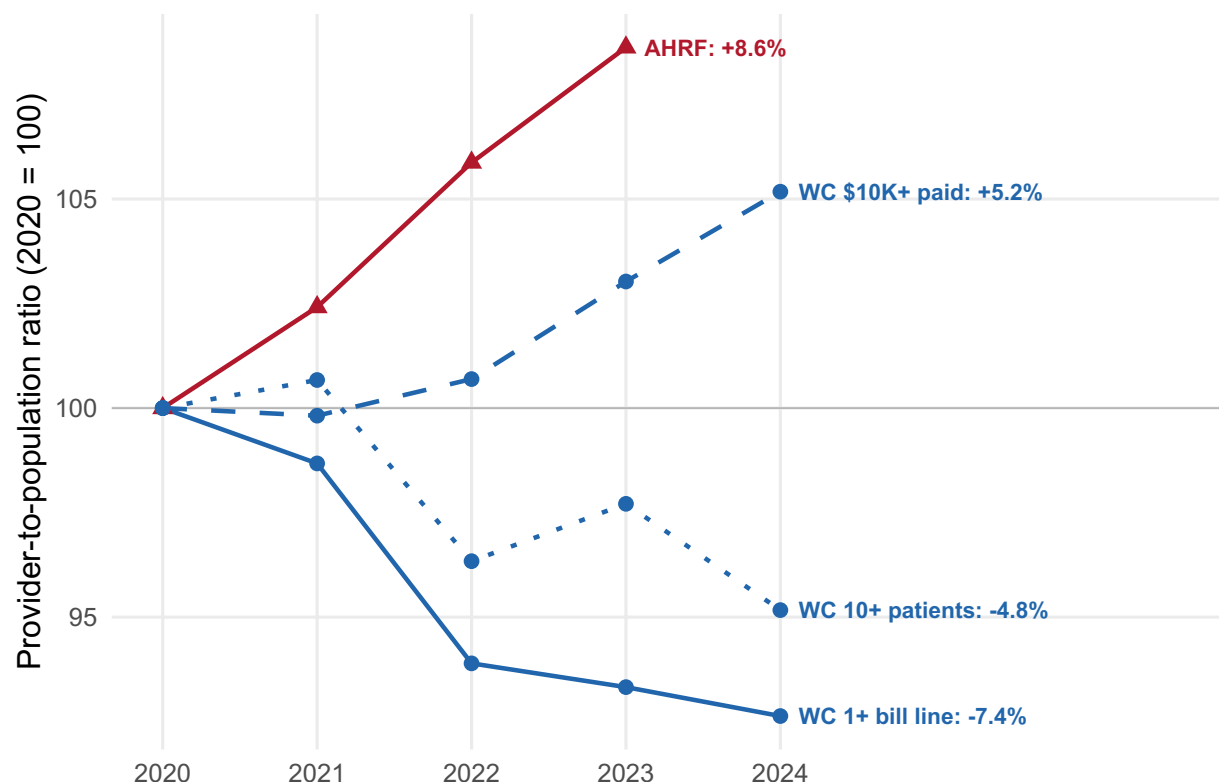
To compare trends in these measures, we calculated rates of WC-participating providers per 10,000 workers' compensation patients across the three samples. Statewide, the number of unique workers' compensation patients with at least 1 bill appearing in the WCIS increased from about 875,000 in 2020 (when, as we discuss in Chapter 5, care-seeking patterns were disrupted by the COVID pandemic) to about 930,000 in each year from 2022-2024. In addition to adjusting changes in workers' compensation patient volume over time, we relied on rates of participating providers per 10,000 patients to compare provider supply across regions.

In addition to examining different definitions of workers' compensation participation, we compared workers' compensation provider supply to the supply of providers in the general health care system in California. As discussed in Chapter 2, we used data from the AHRF to obtain counts of different types of licensed providers and counts of physicians by primary specialty. We used population estimates from the California Department of Finance (which are derived from Census population estimates) to represent AHRF provider supply as rates per 10,000 individuals in the general population (State of California Department of Finance, 2026).

AHRF data on provider participation were not available beyond 2023, and were reported only at 5-year intervals prior to 2020, so we report on changes between 2020 and 2023. As discussed in Chapter 2, AHRF data on physicians and physician specialties count the number of providers with an active license in non-federal employment. The count of primary care providers from AHRF excludes residents and physicians who do not work in patient care (e.g., administration or research), but the total count of physicians and counts for other specialties include all physicians with an active license. AHRF data on nurses and physician assistants are obtained from CMS. Some provider types of interest (such as physical therapists and psychologists) are not reported in AHRF, limiting the set of provider types for which we can provide a comparison to the general health care system. For those exhibits and for regional comparisons, we divided the number of providers by a measure of the relevant population: Workers' compensation patients for workers' compensation providers, and the total population for providers in the general health care system.

Provider Participation by Type of Provider

Figure 4.1. Physician Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



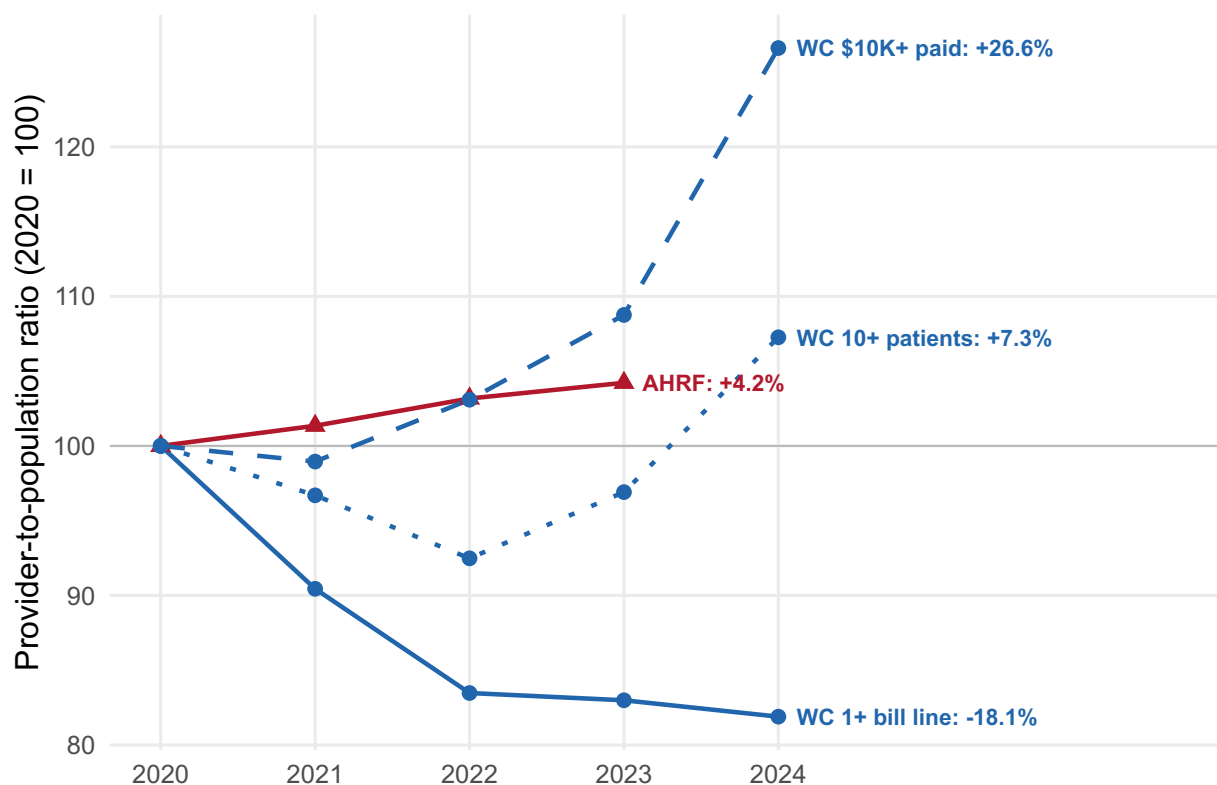
SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide physicians per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation physicians per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation physicians in 2020 was 43,789.

Figure 4.1 shows that the statewide supply of physicians participating in workers' compensation has not kept up with the growth in the number of providers in the general health care system in California since 2020. However, the size of the gap is sensitive to how we define the sample, and varies whether we count providers with any participation or only those meeting higher thresholds based on volume or payments. Using the payment-based measure of participation, we found little change in the supply of physicians between 2020-2022, but growth roughly trending similarly to the statewide number of licensed physicians.

Figure 4.2 (next page) shows that the trend in the number of chiropractors providing care to workers' compensation patients varies, depending on which measure of participation we used. Using the most inclusive measure that defines participation based on any with any medical bills, we found a relative decline in the per-patient volume of chiropractors, with the 2024 ratio at about 82% of the 2020 level. However, among providers meeting the volume or payment-based measures of participation, we found a relative increase of between 7.3% and 26.6% (depending on the measure) as of 2024.

Figure 4.2. Chiropractor Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020

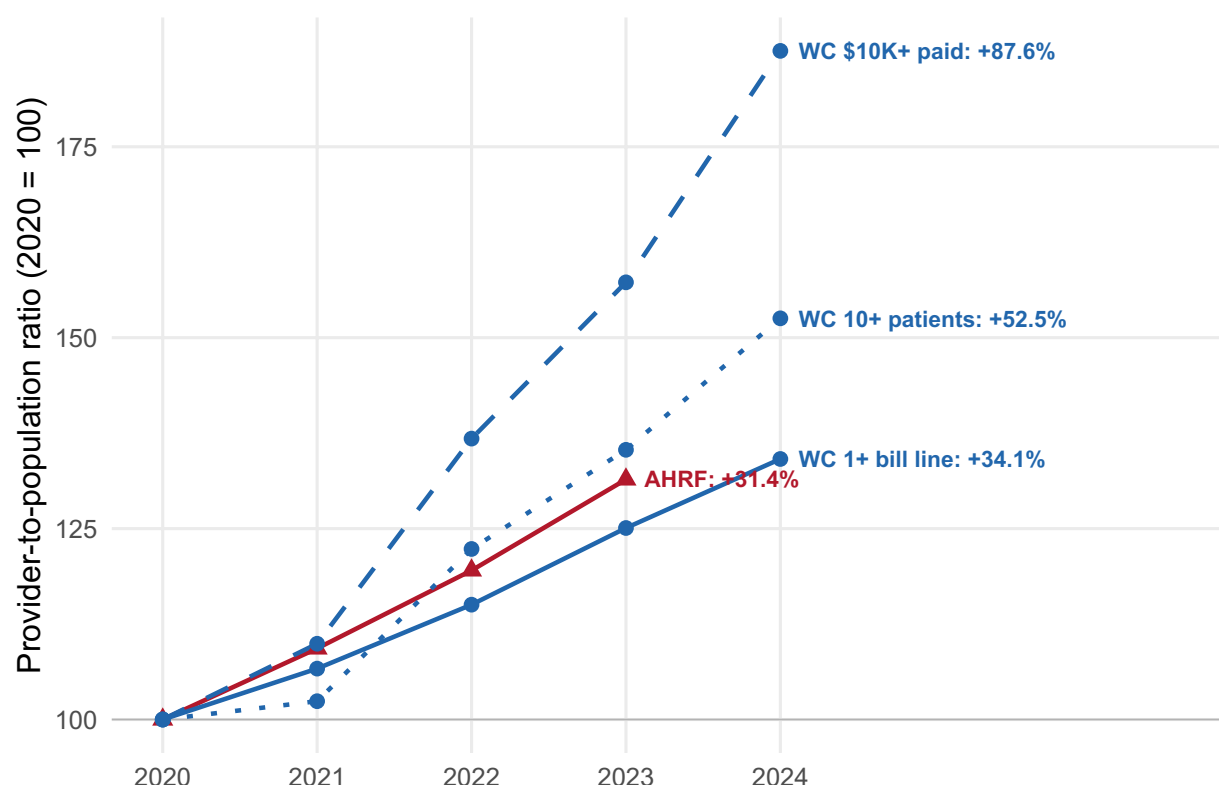


SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide chiropractors per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation chiropractors per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation chiropractors in 2020 was 2,715.

Regardless of how we defined participation of nurse practitioners, their per-patient ratios increased significantly after 2020 (Figure 4.3). The number of nurse practitioners providing any care increased at a rate that was similar to the overall increase in the ratio of nurse practitioners per patients in the state of California. However, among the providers meeting the volume- or payment-based participation criteria, we found much larger increases in the ratio: 52.5 to 87.6%, as compared to a 34.1% increase among all workers' compensation providers.

Figure 4.3. Nurse Practitioner Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020

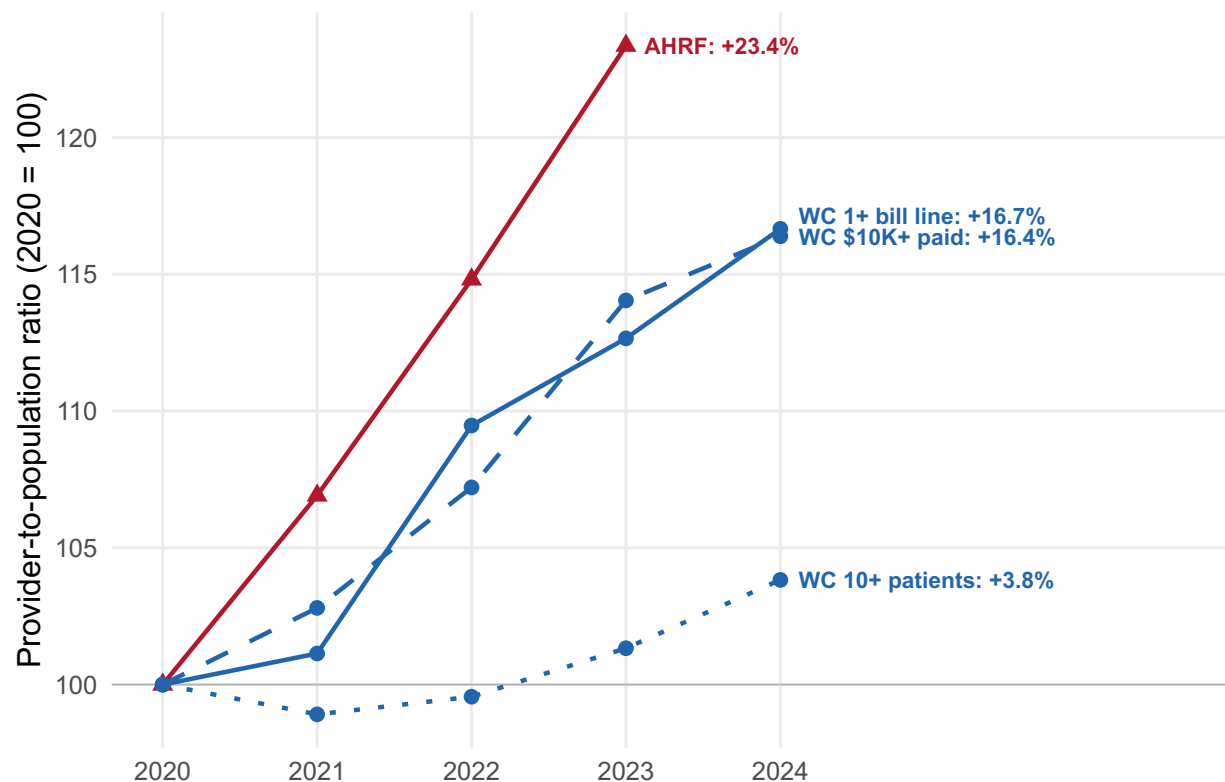


SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide nurse practitioners per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation nurse practitioners per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation nurse practitioners in 2020 was 2,260.

Among physician assistants, there were again consistent patterns of increasing participation, but the magnitude of the growth was much smaller, and considerably lower than in the broader California health care market (Figure 4.4). For example, 2020 to 2023, the ratio of physician assistants to patients increased by 23.4% according to AHRF data, whereas the increase in the per-patient ratio among the most active workers' compensation providers was only about 16.5%.

Figure 4.4: Physician Assistant Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



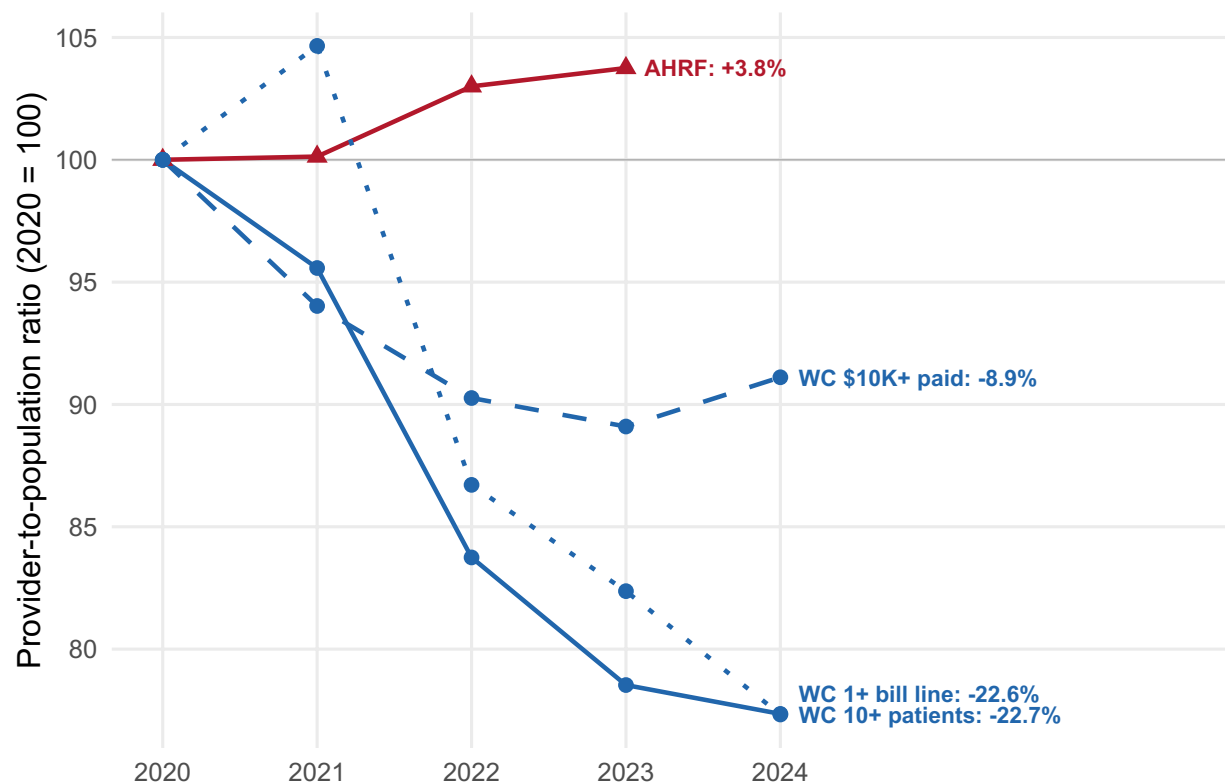
SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide physician assistants per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation physician assistants per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation physician assistants in 2020 was 3,995.

Physician Participation by Specialty

In the following figures, we show parallel results broken out for selected physician specialties. Figure 4.5 shows that primary care physicians providing care to workers' compensation patients declined between 8.9% and 22.7% from 2020 to 2024. In the general health care system, AHRF data show that the number of primary care providers per 10,000 population increased by 3.8% between 2020 and 2023.

Figure 4.5. Primary Care Physician Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



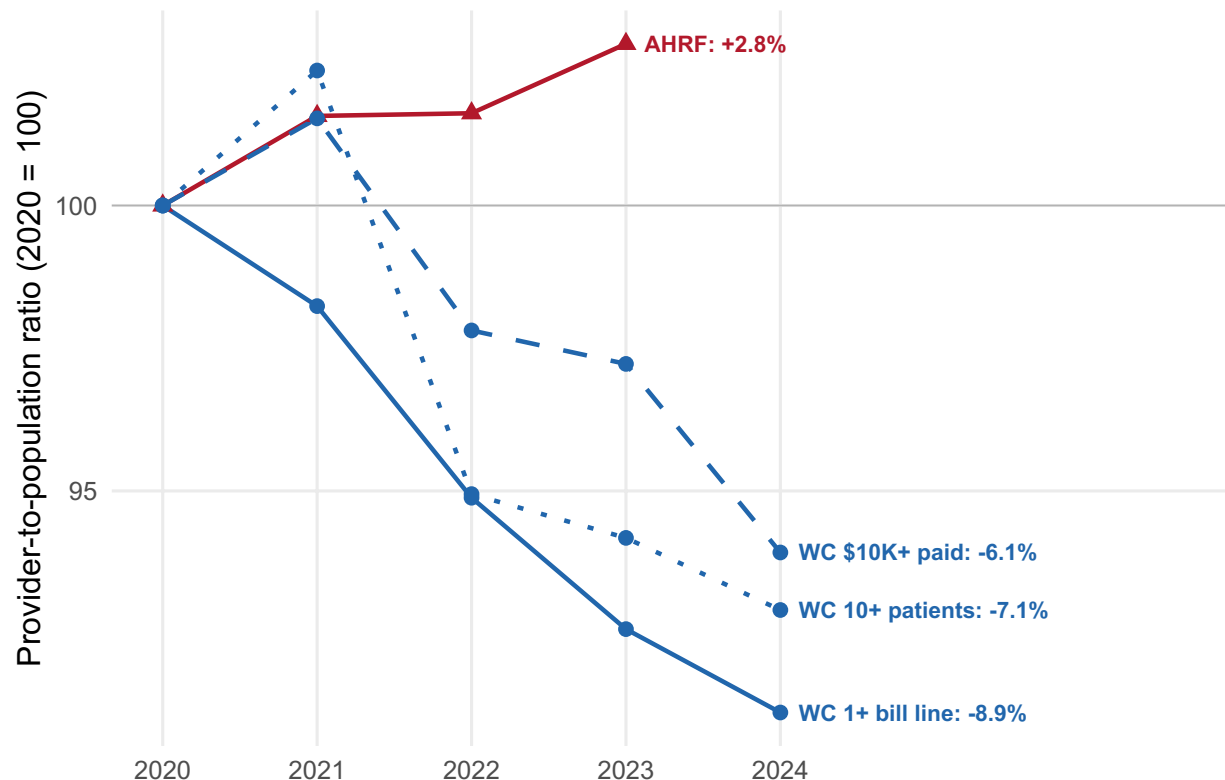
SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide primary care physicians per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation primary care physicians per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation primary care physicians in 2020 was 11,657.

Figures 4.6 and 4.7 show participation trends for orthopedic surgeons and other surgeons. For both groups of surgeons, the difference between the broader health care market supply and those providing care to workers' compensation patients is similar to the trend for overall physicians. Between 2020 and 2023, surgeons per 10,000 population increased slightly in the general health

care system (2.8% for orthopedic surgeons and 3.6% for other surgeons). Meanwhile, in workers' compensation, the number of both orthopedic and other surgeons per 10,000 patients declined, with the largest decline observed for our most inclusive definition (1+ bill line). Declines were less dramatic for the number of surgeons treating 10+ workers' compensation patients, but all measures show participation in workers' compensation declining relative to the general health care system.

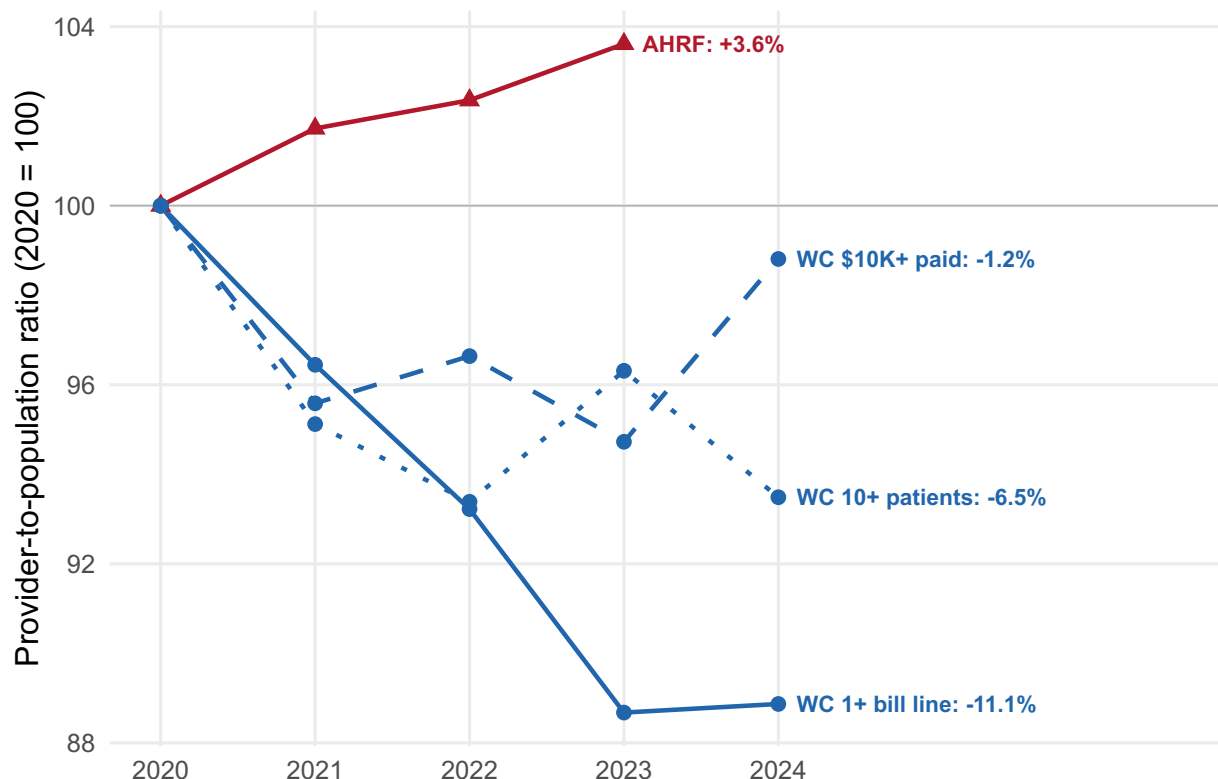
Figure 4.6. Orthopedic Surgeon Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide orthopedic surgeons per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation orthopedic surgeons per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation orthopedic surgeons in 2020 was 3,460.

Figure 4.7. Other Surgeon Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020

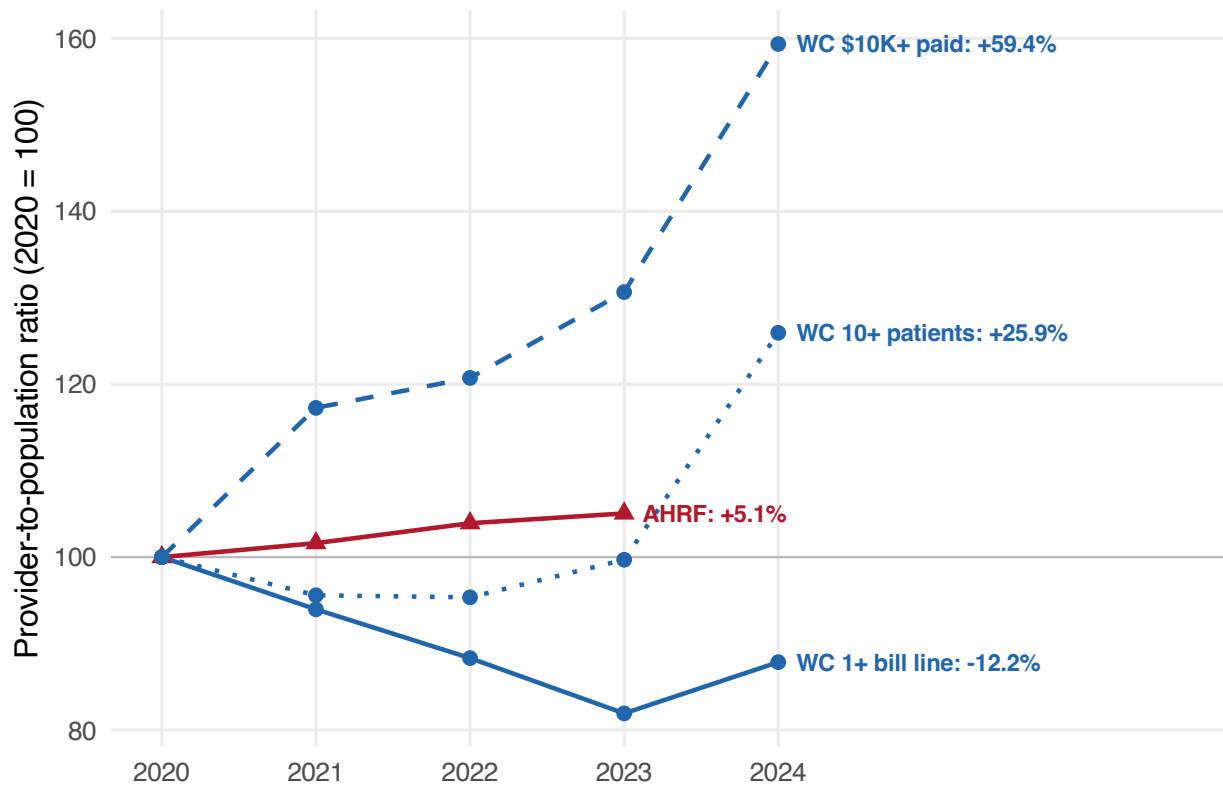


SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide orthopedic surgeons per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation orthopedic surgeons per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation other surgeons in 2020 was 4,222.

In Figure 4.8, the patterns among psychiatrists suggest greater growth in the ratio of those providing care to workers' compensation patients relative to the broader healthcare market trends. The overall increase from the AHRF data suggest a 5.1% increase in the ratio of psychiatrists to patients, whereas we found a 26% to 59% increase among workers' compensation providers who meet the volume- or payment-based thresholds. However, we found a decline in the ratio of workers' compensation providers with any number of medical bills. This suggests that there are fewer psychiatrists seeing workers' compensation providers on the extensive margin, but increases on the intensive margin. In other words, among those providers regularly engaging with the workers' compensation system, we observed increases in their participation.

Figure 4.8. Psychiatrist Participation in Workers' Compensation (WC) Compared to Provider Supply in General Health Care System (AHRF), Percentage Change Since 2020



SOURCE: 2020-2024 WCIS and AHRF.

NOTES: "AHRF" = statewide psychiatrists per 10,000 California population (general health care system, from the Area Health Resources File). "WC 1+ bill line" = workers' compensation psychiatrists per 10,000 workers' compensation patients (any provider with ≥ 1 paid bill line). "WC \$10K+ paid" = workers' compensation rate per 10,000 workers' compensation patients counting only providers paid $\geq \$10,000$. "WC 10+ patients" = workers' compensation rate per 10,000 workers' compensation patients counting only providers treating ≥ 10 workers' compensation patients. Each series is indexed to its own 2020 value (2020 = 100). AHRF data extend through 2023 (latest available). The statewide number of workers' compensation psychiatrists in 2020 was 471.

Comparison to Prior Studies

The 2019 RAND study reviewed and described the specialties of providers in California's workers' compensation system. Of the 76,950 providers participating in the workers' compensation system in 2016, the most frequently reported specialties were internal medicine, physical therapist, physician assistant/nurse practitioner, emergency medicine, and family medicine/general practice (Kapinos and Montemayor, 2019). (Internal medicine, family medicine, and general practice are all included in our primary care physician category here).

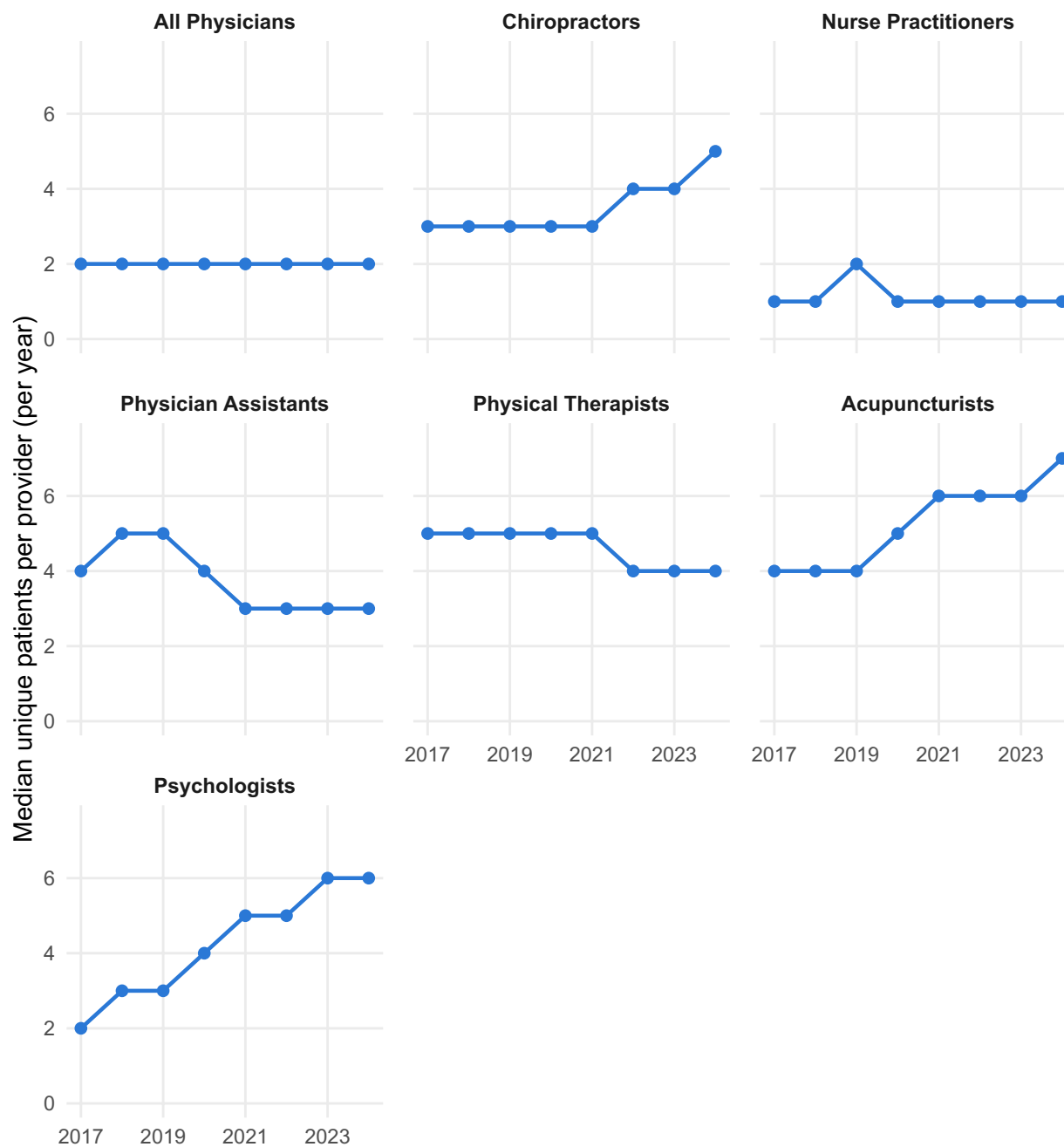
The 2022 CWCI study did not report a description of the overall provider landscape in the workers' compensation system, but did include qualitative findings conducted directly with participating providers, which included discussions of administrative delays and reporting requirements (Jones and Swedlow, 2022).

Typical Caseload by Provider Type

As noted above, trends in the number of providers with any medical bills were not always consistent with the trends in the number of providers who meet volume- or payment-based criteria (i.e., 10+ workers' compensation patients or total annual workers' compensation payments of \$10,000). For physicians as a whole, and for several key specialties (including chiropractors, orthopedic surgeons, other surgeons, and psychiatrists), workers' compensation participation among providers with more sustained involvement with workers' compensation increased more than our main measure of participation.

Because not all workers' compensation patients use each type of care in a service year, the figures reported above on provider supply per 10,000 patients do not tell us about the volume of workers' compensation patients treated by each provider within a type or specialty. Provider caseload (which we define as the number of unique patients treated in a service year) can tell us about a provider's level of engagement with workers' compensation, and very high caseloads might be associated with reduced availability of participating providers to take on new patients. However, without data on these providers' caseload outside of workers' compensation, we cannot infer from these trends whether participating providers are at capacity.

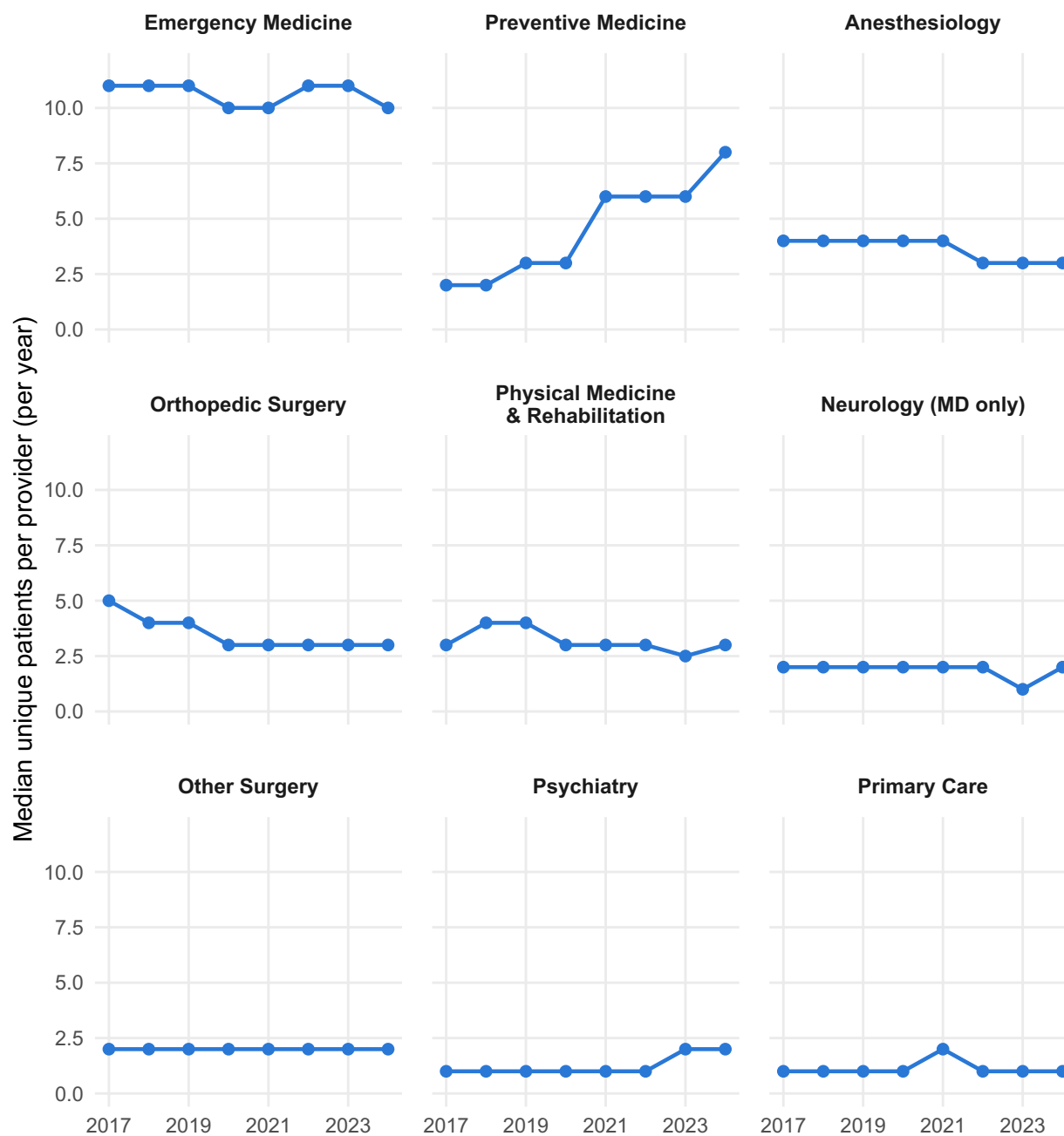
Figure 4.9. Unique Patients per Provider, by Provider Type and Service Year, 2017-2024



SOURCE: 2017-2024 WCIS.

In Figure 4.9 we present trends since 2017 in the median number of unique workers' compensation patients per provider in each services year. There was little change among physicians, and a decline in the median caseload for physician assistants, while the median caseload has grown for chiropractors, acupuncturists, and psychologists.

Figure 4.10. Unique Patients per Provider, by Physician Specialty and Service Year, 2017-2024



SOURCE: 2017-2024 WCIS.

Although we noted little change in the median caseload for physicians as a whole, we found some differences by specialty, as shown in Figure 4.10 (following page). The median workers' compensation caseload was low and stable for most specialties examined, with the exception of preventive medicine.

In the Appendix, we report on mean caseloads by provider type and specialty. These means are dramatically higher, reflecting some providers with extremely high caseloads. We note that, for neurologists and psychiatrists, we found significant increases in the average number of unique patients per provider: a 41.7% increase for neurologists and a 16.7% increase for psychiatrists. These trends are consistent with the earlier finding of a decline in the ratio of neurologists and psychiatrists providing any care per workers' compensation patients. The mean caseload declined for anesthesiologists (-6.0%), emergency medicine physicians (-16.0%), and primary care physicians (-4.4%).

Prevalence of MPN/Provider Agreement Care

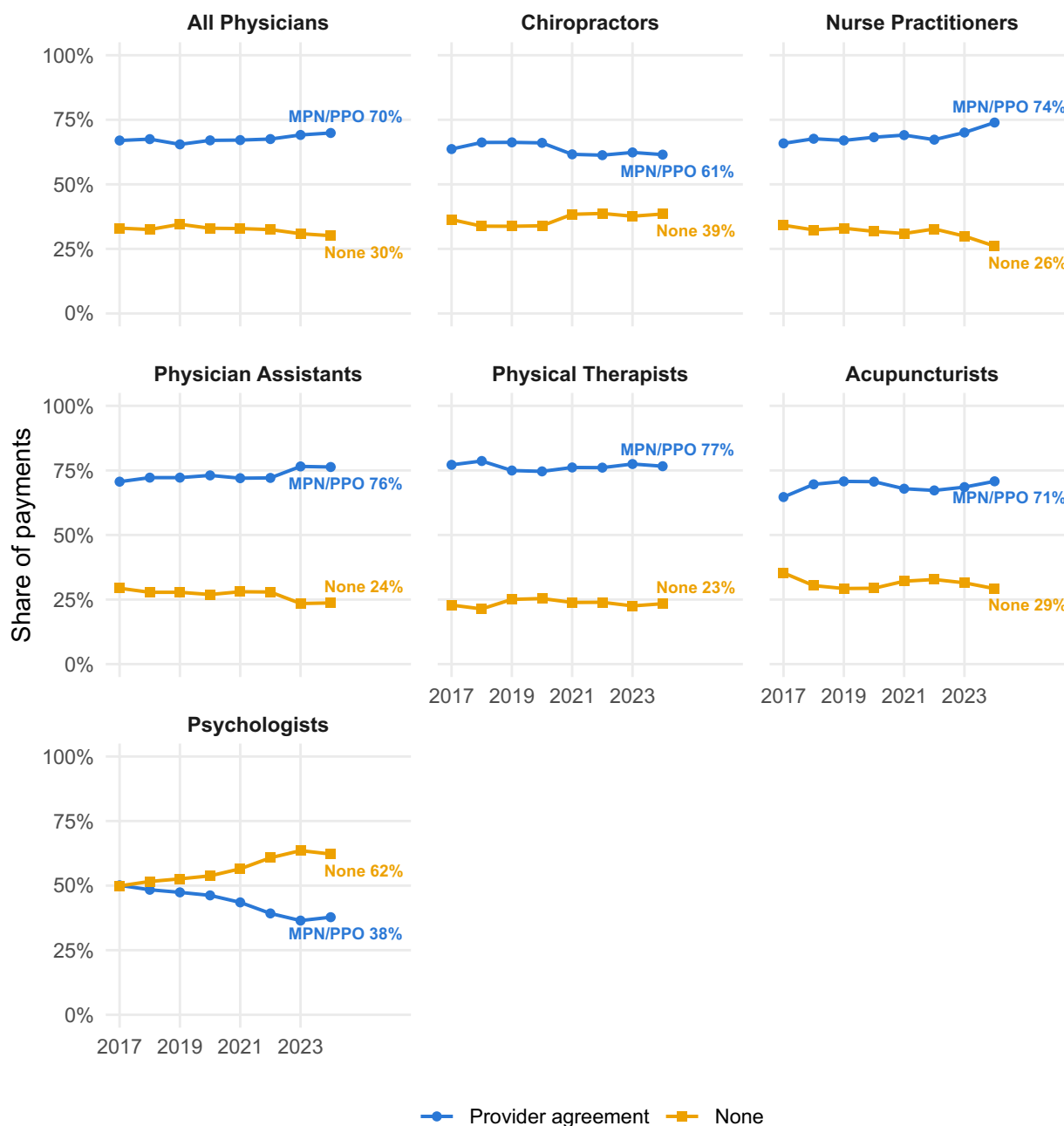
Medical Provider Networks (MPNs) can be used by employers or insurers to direct patients to a selected group of providers. MPNs are required to meet certain access standards in order to be binding, including minimum provider-to-patient ratios and maximum travel time and distance requirements (Department of Industrial Relations, undated-a)(California Labor Code §4600)(California Labor Code §4616). Not all employers maintain MPNs, but when they do use them, injured employees typically must select a provider from the MPN, and referrals are made within the MPN system with the goal of controlling costs and ensuring timely access to appropriate care. Providers in an MPN may or may not be subject to a Preferred Provider Organization (PPO) arrangement with the workers' compensation payer. The question of how MPNs and PPOs interact and how these arrangements affect provider supply and access to care is complex and contentious. We will examine these issues in depth in a future report under this project.

In the present report, we seek just to establish a basic description of how prevalent care provided either through an MPN or under a PPO contract is for different types of providers, and whether the proportion of care subject to these arrangements has changed during the study period. For each workers' compensation bill, we use provider agreement codes reported by the payer to assess whether the care was provided by a provider participating in an MPN, a similar contracted network agreement, or neither (no agreement). The analysis below is at the provider level: for each individual provider, we compute the payment-weighted share of their bill lines that falls into each agreement category in a given year.

In 2024, 69 percent of workers' compensation payments associated with individual providers were identified in the WCIS as being covered by a MPN or PPO agreement, while 31 percent went to providers with no network agreement. The payment-weighted proportion of care provided under a MPN or PPO arrangement has ranged between 66% and 69% in each year from 2017 to 2024. The proportion of all care rendered by individual providers that is covered by agreements has increased slightly in recent years, from 67% in 2022 to 69% (Appendix Table B.29), but in general the proportion of care provided through these agreements has remained within a narrow range over the eight-year study period.

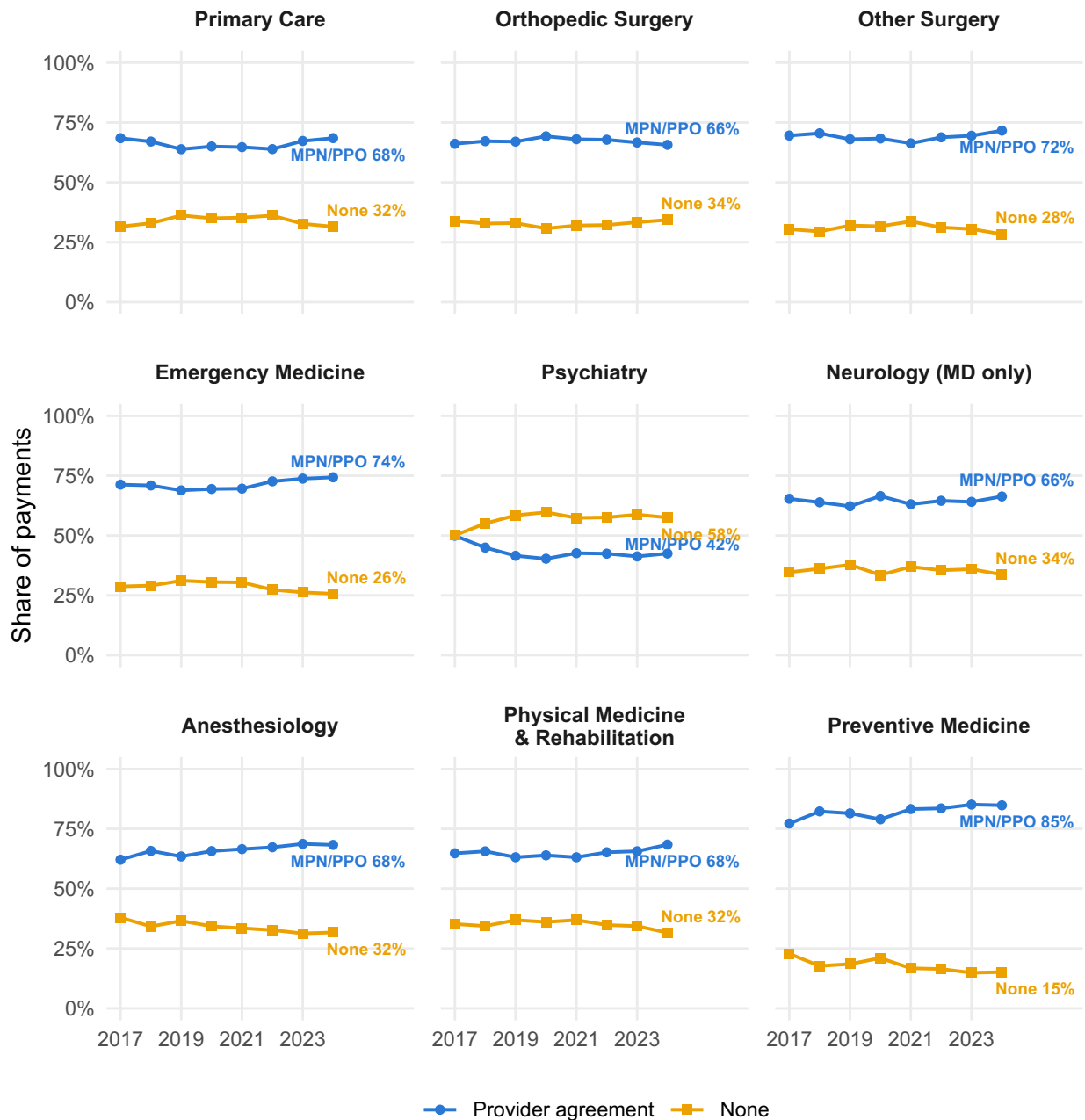
Figure 4.11 shows that MPN and PPO coverage varied considerably across provider types, however. Physical therapists had the highest MPN participation rate of any provider type, with 77 percent of their workers' compensation payments in 2024 linked to MPN or PPO agreements.

Figure 4.11. Share of Payments Covered by MPN or PPO by Provider Type and Year, 2017-2024



SOURCE: RAND analysis of 2017-2024 California WCIS medical billing data.
 NOTES: Payment-weighted share of paid amounts. "Provider agreement" combines medical provider network (MPN), PPO, and HMO/managed-care agreements; "None" is care delivered under no network agreement.

Figure 4.12: Share of Payments Covered by MPN or PPO by Physician Specialty and Year, 2017-2024



SOURCE: RAND analysis of 2017-2024 California WCIS medical billing data.

NOTES: Payment-weighted share of paid amounts. "Provider agreement" combines medical provider network (MPN), PPO, and HMO/managed-care agreements; "None" is care delivered under no network agreement.

Physician assistants (76%) and nurse practitioners (74%) also had relatively high rates of MPN or PPO coverage. Physicians (70%) and acupuncturists were close to the statewide average, while chiropractors had lower coverage (61%). Psychologists, in, contrast, provided a

majority of care outside of MPNs and PPOs, with only 38% covered by MPN or PPO arrangements. Psychologists have also seen the largest change in the proportion of care covered by MPN and PPO arrangements during the study period, with coverage declining from 50% in 2017 to 38% in 2024.

Figure 4.12 reports MPN and PPO coverage rates by physician specialty. In 2024, five of nine specialties examined had between 66% and 68% of care provided under MPNs or PPOs. Coverage was higher for Other Surgery (72%), Emergency Medicine (74%), and Preventive Medicine (85%). Psychiatry, in contrast, had the lowest share of care provided through MPNs or PPOs (42%), reflecting a decline from about 50% in 2017. Coverage rates for other specialties have been largely stable over the study period.

Chapter Summary

Overall, the total number of providers participating in California workers' compensation remained essentially stable between 2022-23 and 2024, declining by 0.3 percent (from 74,747 to 74,599). However, this stability masked meaningful shifts in the composition of the provider workforce. The most notable trend was a shift from physicians (-1.5% change), chiropractors (-2.1% change), physical therapists (-1.0% change) and psychologists (-4.6% change) toward nurse practitioners (+11.2% change) and physician assistants (+4.5% change), as well as acupuncturists (+9.2% change). These statistics reflect the number of unique individual providers who provided any care in the workers' compensation system, and trends in the supply of providers with more sustained workers' compensation involvement (i.e. treating 10 or more workers' compensation patients or receiving \$10,000 or more in workers' compensation payments) are more positive.

Comparing workers' compensation provider supply to trends in the general health care system reveals that the supply of WC-participating providers has not kept pace with the broader provider workforce in California, however. The supply of licensed physicians per 10,000 California residents increased by 8.6 percent from 2020 to 2023, while workers' compensation physician participation per 10,000 workers' compensation declined or grew more slowly (depending on the measure chosen). This divergence is especially pronounced for primary care physicians and surgeons (both orthopedic and other surgeons). In contrast, we saw growth in participation of emergency medicine physicians.

The analysis in this report does not pinpoint the factors that are driving these declines in provider participation; more in-depth investigation of specific topics (such as MPNs and the UR process) is planned for subsequent years of this study. As a first step toward such analysis, we reported on the share of workers' compensation payments covered by MPNs or PPO agreements, as reported on medical bills. In general, we found that the proportion of care covered by MPNs, PPOs, or both has increased slightly in the last few years but was generally stable between 2017 and 2024, ranging between 66% and 69% (weighted by paid amounts) of care associated with

individual providers. Coverage of psychologists and psychiatrists under MPNs and PPOs was persistently lower than the other provider types examined here. This pattern may reflect the limited integration of mental health providers into managed care networks and warrants further attention.

Some observers of the workers' compensation system have highlighted issues with MPNs and negotiated provider discounts under PPO agreements as barriers to provider participation. We caution that the descriptive statistics provided here do not support inferences about whether participation in MPNs or PPO arrangements is a facilitator of or a barrier to provider supply and access to care, or whether there is potential for improvements to California's statutory and regulatory approach to MPNs and PPO agreements. Work planned for future years of this study is expected to look more directly at these questions by examining the structure of the MPN networks, the extent of provider discounting under PPO agreements, and other issues that could not be addressed within the scope of this first annual report.

Potential Implications for Access to Care

With the possible exception of some recent increases in distance traveled by patients, the patient-level measures examined in chapter 3 have largely been stable over the study period, suggesting that there have not been substantial changes at the statewide level in the prevalence of access problems for the categories of care examined in this report. This chapter's findings on declining provider participation and shifts away from key provider types (physicians, chiropractors, and psychologists) and physician specialties (primary care, orthopedic surgeons, and other surgeons) with substantial workers' compensation participation paint a more nuanced picture, however. Increases in participation among nurse practitioners and physician assistants mirror trends in the general health care system, and increased nurse practitioner and physician assistant participation in workers' compensation has been identified as a nationwide trend (Savych and Fomenko, 2025). It is plausible that these advance practice providers have helped to offset declining physician participation, especially when it comes to enabling timely access to initial E&M visits.

However, advance practice professionals may be limited in their ability to provide some types of care, most notably physical therapy and surgery, that are widespread in workers' compensation and that generally must be obtained from types of providers that have had declining workers' compensation participation in recent years. The critical question for the workers' compensation system and policymakers is whether and when declining workers' compensation provider participation will actually result in widespread access problems for injured workers. In the next chapter, we begin to approach this question by examining how provider supply varies across regions within California, and whether regional variation in provider supply is associated with regional differences in patient-level access measures.

5. Regional Differences in Provider Participation

California is large and geographically diverse, and so regional differences in access to care and in the supply of providers are a longstanding concern. In this section, we show how the distribution of providers varies across ten regions defined by DWC. We also present the direction and magnitude of recent changes in the number of participating providers. To account for differences in population across regions, we focus on the number of providers per 10,000 workers' compensation patients in each region. As described in Chapter 2, providers are assigned to regions based on the most common facility ZIP code appearing on their bill lines in each service year. Practice locations from the billing ZIP, NPPES, or PPEF are used for providers with no facility ZIP code in a given service year (see Appendix A for details). Results shown in this section use our most inclusive definition of workers' compensation participation: providers who appeared as the rendering provider on one or more bill lines over the course of a year.

Total Providers per 10,000 Workers' Compensation Patients by Region

In Table 5.1, we show trends in total counts of unique providers by DWC region. The number of participating providers declined in North State-Shasta (-6.7%), the N. Sacramento Valley (-2.0%), the Inland Empire (-1.1%), the Central Coast (-0.4%), the Bay Area (-0.4%), and the Central Valley (-0.4%). Provider participation grew in San Diego (4.5%), Los Angeles (1.2%), the Eastern Sierra Foothills (0.7%), and the Sacramento Valley (0.1%).

Table 5.1. Count of Unique Rendering Providers, by DWC region

Primary practice DWC region	2022	2023	2024	% change 2022- 2023 avg to 2024
California Statewide	74,747	74,871	74,599	-0.3%
Bay Area	12,964	12,995	12,933	-0.4%
Central Coast	3,793	3,750	3,755	-0.4%
Central Valley	6,408	6,335	6,349	-0.4%
Eastern Sierra Foothills	1,860	1,753	1,820	0.7%
Inland Empire	10,264	10,096	10,070	-1.1%
Los Angeles	14,690	14,807	14,919	1.2%
N. Sacramento Valley	736	758	732	-2.0%
North State-Shasta	1,337	1,239	1,202	-6.7%
Out of California	14,518	14,759	14,304	-2.3%
Sacramento Valley	3,070	3,153	3,115	0.1%
San Diego	5,107	5,226	5,399	4.5%

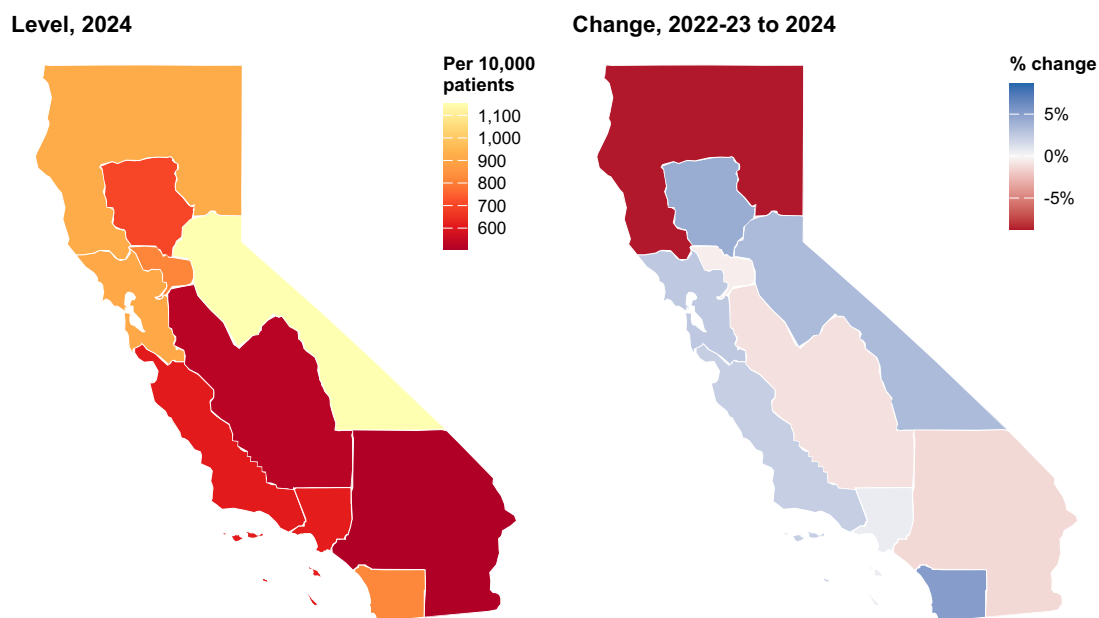
SOURCE: 2022-2024 WCIS

NOTES: Table counts number of unique individual NPIs appearing as a rendering provider on one or more workers' compensation bill in a given service year. Statewide total includes providers located outside California; regional rows exclude them.

The relatively high share of providers with locations outside California points to a limitation (noted in Chapter 2) of the provider location information available for this study: Facility ZIP code on the workers' compensation bill may not be accurately reported by some providers or claims administrators and may reflect a business location rather than a practice location (or, in some cases, the mailing address of a clearinghouse or other billing intermediary). Our approach to assigning provider location uses an out-of-state location only if no in-state location associated with an NPI is found in the facility ZIP, PPEF, NPPES, or billing ZIP. While this is an important data limitation affecting the counts of providers by region reported here, the impact on our estimates of recent trends in provider distribution may be limited given that the number of out-of-state providers has been fairly stable since 2022. We omit out-of-state providers from subsequent statistics reported in this chapter unless otherwise noted.

To allow comparisons across regions with widely differing populations, we report on the number of providers per 10,000 patients in 2024, where each region's patient count is the number of injured workers with 1+ medical bill in 2024 with a residential ZIP code in the region. (In contrast to the patient-level access measures reported in Chapter 3, patient counts in this chapter include all patients who received care in a service year regardless of their injury dates.) Figure 5.1 reports on the regional distribution of all individual providers that provided care in California workers' compensation in 2024 relative to the number of patients in each region. Dark red shades indicate fewer providers relative to the workers' compensation patient volume, while light yellow shades indicate more providers.

Figure 5.1. Providers per 10,000 Workers' Compensation Patients, by DWC Region: 2024 Level and Change from 2022-23 to 2024



SOURCE: 2022-2024 WCIS.

In general, the number of providers relative to patients is lowest in the Central Valley (526 providers per 10,000 patients) and the Inland Empire (507 providers per 10,000 patients), and is highest in the Bay Area (907 providers per 10,000 patients) and San Diego (817 providers per 10,000 patients). The provider-to patient ratio is also high in two predominantly rural regions—North-State Shasta (919 providers per 10,000 patients) and Eastern Sierra-Foothills (1,153 providers per 10,000 patients)—but these regions have small patient populations (13,076 and 15,788, respectively, in 2024) that may make the ratio of providers per 10,000 patients volatile. The figure on the right summarizes regional trends in participating providers by showing the change in providers per 10,000 patients between 2022-23 and 2024. Blue colors indicate increases in provider participation, and red indicates decreases in provider participation, with darker shades indicating larger changes. The largest reduction in provider participation was in North State-Shasta, but we also note that there were declines in provider participation in the Central Valley and Inland Empire, which have the lowest provider participation relative to the patient population.

Regional Differences in Participation by Provider Type

In Figure 5.2, we show the 2024 provider to patient ratios by provider type and DWC region. Each provider type (row) is normalized so that the darkest color represents the highest per-patient ratio and the lightest shade represents the lowest per-patient ratio. Provider-to-patient ratios based on fewer than 10 providers are indicated by gray diagonal hatching. In general, as noted above, patient volumes are low in the Eastern Sierra/Foothills, North State-Shasta, and North Sacramento Valley regions, which may result in very large provider-to-patient ratios.

Among large regions, the Bay Area had the largest number of physicians per workers' compensation patients (580 per 10,000 patients) and the Inland Empire had the lowest ratio at 267.9 physicians per 10,000 workers' compensation patients. There are also some interesting regional patterns of non-physician provider supply. San Diego has a relatively large supply of physical therapists and acupuncturists, while Los Angeles has lower supply of both physicians and advance practice professionals. Among large regions, the Central Valley and Inland Empire have lower provider supply across most provider types.

Figure 5.2. 2024 Providers per 10,000 Workers' Compensation Patients, by Region and Type of Provider



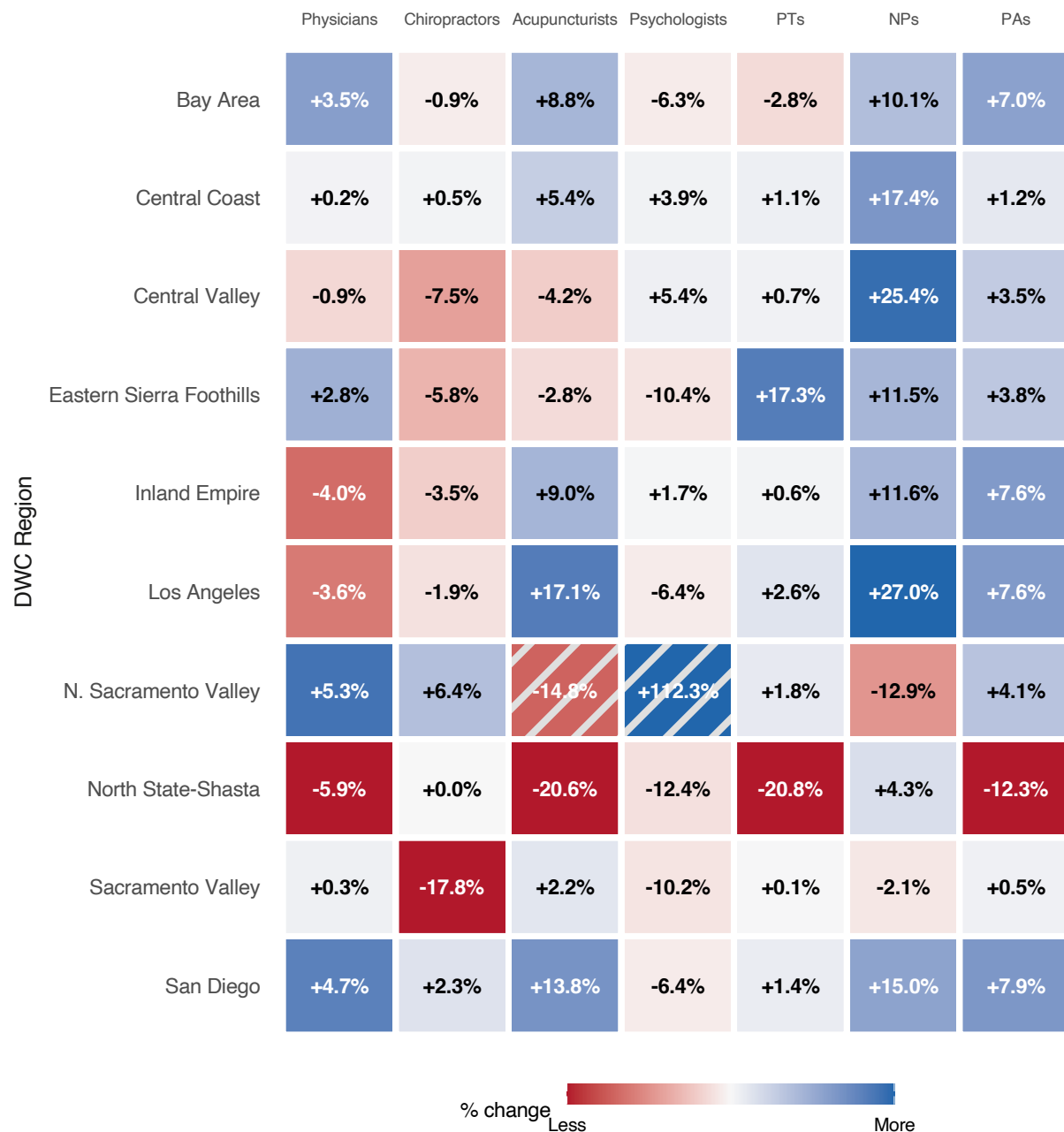
SOURCE: RAND analysis of 2024 WCIS medical billing data.

NOTES: Cells show 2024 ratio of individual workers' compensation providers per 10,000 workers' compensation patients. A provider counts toward a year if they had at least one paid bill line in that year; individual NPIs only. Cells with 10 or fewer providers are overlaid with light diagonal bands. Cell color is normalized within each provider type, so colors are not comparable across columns. "PT" = physical therapist. "NP" = nurse practitioner. "PA" = physician assistant.

In Figure 5.3, we show how provider-to-patient ratios have changed in recent years (from the 2022-23 to 2024). Growth in physicians was fastest in the North Sacramento Valley and San

Diego, with 5.3 and 4.7% increases, respectively. North State-Shasta had the largest decline in the physician ratio at -5.9%, although we caution again that estimates for North Sacramento Valley and North State-Shasta may be volatile due to the small patient populations in those areas.

Figure 5.3. Percentage Change in Providers per 10,000 Workers' Compensation Patients from 2022-23 to 2024, by Region and Type of Provider



SOURCE: RAND analysis of 2022-2024 WCIS medical billing data.

NOTES: Cells show percentage change from 2022-23 average to 2024 in the ratio of individual workers' compensation providers per 10,000 workers' compensation patients. A provider counts toward a year if they had at

least one paid bill line in that year; individual NPIs only. Cells with 10 or fewer providers are overlaid with light diagonal bands. Cell color is normalized within each provider type, so colors are not comparable across columns. "PT" = physical therapist. "NP" = nurse practitioner. "PA" = physician assistant.

Although we noted a significant increase in nurse practitioners and physician assistants overall in Chapter 4, there were some regions with little change or decline. Notably, there was a 2.1% and 12.9% decline in nurse practitioner per-patient ratios in Sacramento Valley and N. Sacramento Valley, respectively. There was a 12.3% decline in the physician assistant per-patient ratio in North State-Shasta. The ratios of chiropractors to patients were generally lower than the ratios of PTs to patients, but both groups experienced variable changes over time.

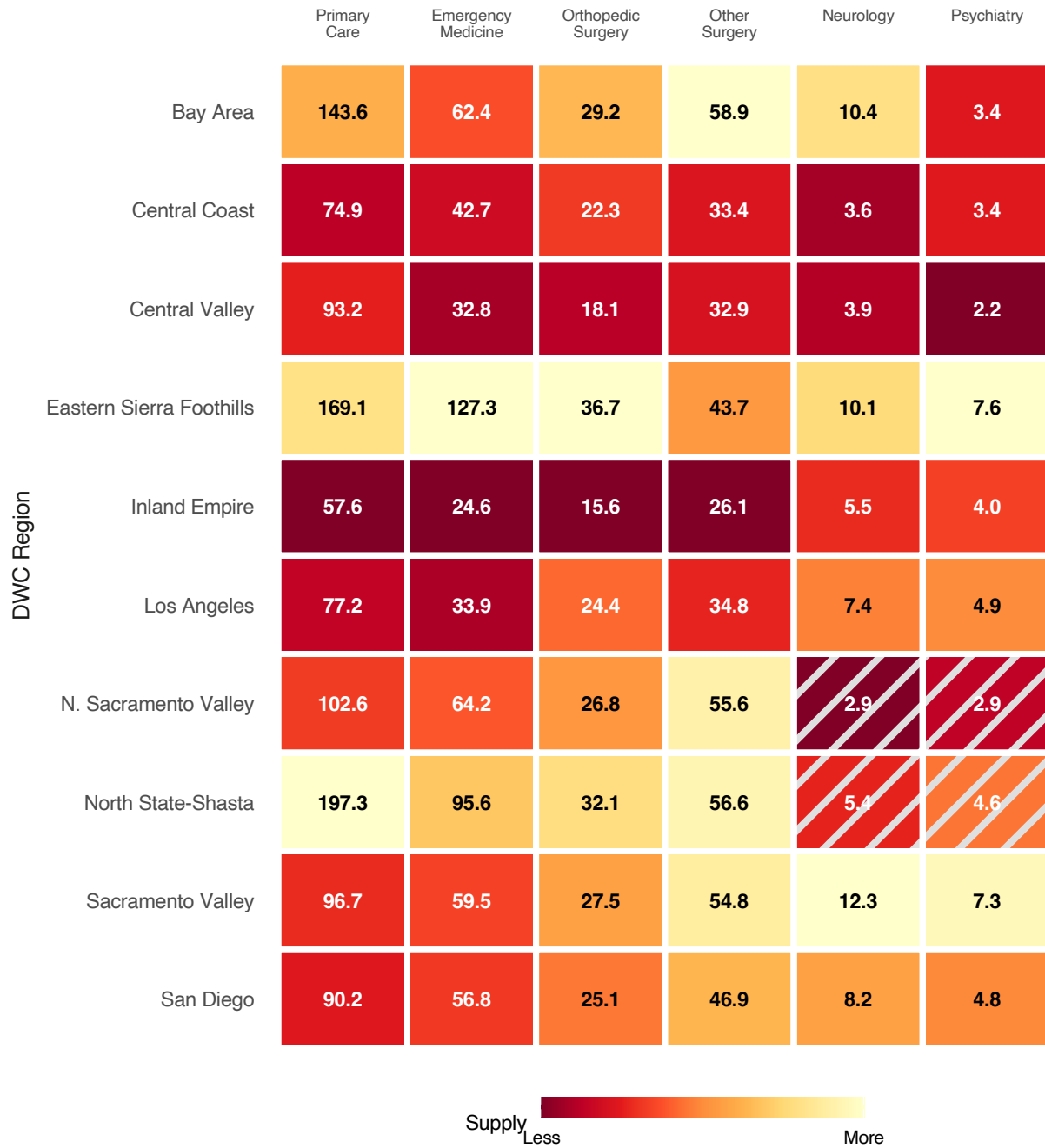
Regional Differences in Participation by Physician Specialty

In Figure 5.4 (next page), we show variation in physician-to-patient ratios by specialty and across the DWC regions. Results for anesthesiology, PM and R, and preventive medicine are omitted due to space constraints.

Among large regions, the Inland Empire had the lowest ratio of primary care physicians to injured workers, (58 per 10,000 workers' compensation patients) while the Bay Area had the highest ratio (144 per 10,000 patients). Neurology and psychiatry had among lowest rates and the smallest differences across regions. For example, the Central Valley had lowest ratio for psychiatrists (2.2 per 10,000 patients), compared to 7.3 in the Sacramento Valley.

In Figure 5.5, we show percentage changes in provider-to-patient ratios across the DWC regions by provider specialty. There was significant heterogeneity in changes both across regions and by specialty. Orthopedic surgery and primary care showed predominantly negative trends across most regions: orthopedic surgery declined in 8 of 10 regions, and primary care fell in 6 of 10 regions. The latter figure includes notable drops in Los Angeles (-13%) and Inland Empire (-12%). Emergency medicine was the most consistently positive specialty, with gains in most regions and the largest increases in Bay Area (+13%) and Sacramento Valley (+11%).

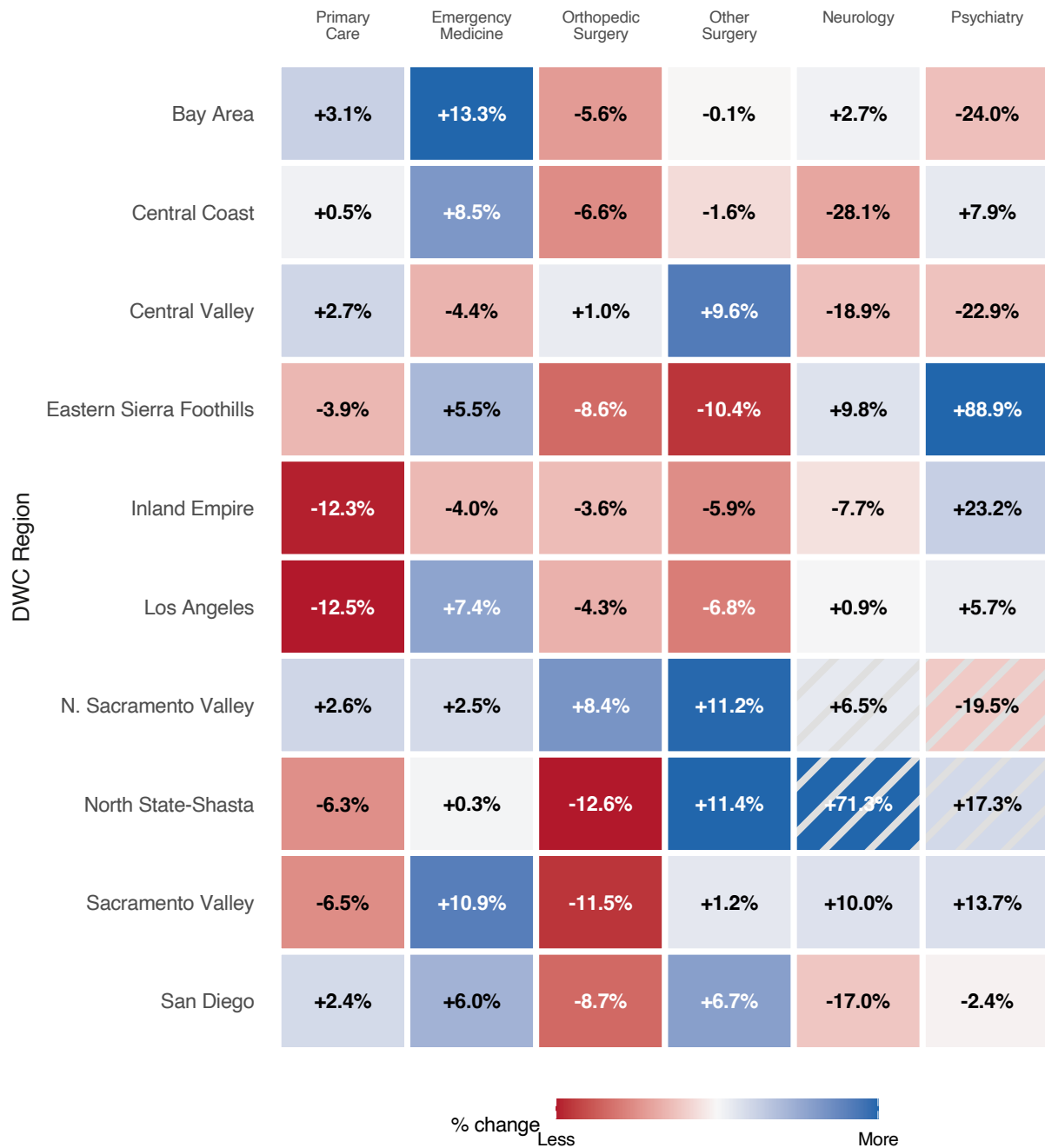
Figure 5.4. 2024 Providers per 10,000 Workers' Compensation Patients, by Region and Selected Physician Specialty



SOURCE: RAND analysis of 2024 WCIS medical billing data.

NOTES: Cells show 2024 ratio of individual workers' compensation providers per 10,000 workers' compensation patients. A provider counts toward a year if they had at least one paid bill line in that year; individual NPIs only. Cells with 10 or fewer providers are overlaid with light diagonal bands. Cell color is normalized within each provider type, so colors are not comparable across columns.

Figure 5.5. Percentage Change in Providers per 10,000 Workers' Compensation Patients from 2022-23 to 2024, by Region and Selected Physician Specialty



SOURCE: RAND analysis of 2022-2024 WCIS medical billing data.

NOTES: Cells show percentage change from 2022-23 average to 2024 in the ratio of individual workers' compensation providers per 10,000 workers' compensation patients. A provider counts toward a year if they had at least one paid bill line in that year; individual NPIs only. Cells with 10 or fewer providers are overlaid with light diagonal bands. Cell color is normalized within each provider type, so colors are not comparable across columns.

The largest percentage changes occurred in neurology and psychiatry ratios, which is consistent with the fact that there are fewer of these physicians. (Percentage changes can appear

larger when baseline numbers are low.) For example, there was a near 90% increase in the ratio of psychiatrists to workers' compensation patients in the Eastern Sierra Foothills, but the rate in 2024 was only 7.6 per 10,000. Most regions showed both growth and decline that varied across specialties, except in the Inland Empire, which experienced declines across all specialties except psychiatry.

Regional Provider Participation in Comparison to the General Health Care System

Provider shortages are not unique to the workers' compensation system, and it may be helpful for workers' compensation policymakers to know whether regional variation in the supply of workers' compensation providers is driven by more general provider shortages, and where issues with participation in workers' compensation are more acute than in the general health care system.

Using the AHRF data that was presented in Chapter 4, we plotted the rate of workers' compensation providers per 10,000 patients against the rate of general health care providers per 10,000 population in the AHRF for 2023 (the last year with both workers' compensation and AHRF data). A population-weighted linear regression, indicated by the dashed line, was used to summarize the relationship between workers' compensation and AHRF. Comparison of a region's point to the regression line can offer insight into whether a region's supply of WC-participating providers is higher or lower than would be expected based purely on the region's provider supply in the general health care system. The correlation coefficient (r) between the two provider supply measures, which describes the strength of the relationship between the measures, is reported in the figure: a coefficient of 1 means that all variation in one measure is explained by the other (and vice versa), while a coefficient of zero means there is no linear association between the two measures.

Figure 5.6. Comparison of Workers' Compensation Providers per 10,000 Patients to General Health Care Providers per 10,000 Population in 2023, by Type of Provider and Region



SOURCE: 2023 WCIS and AHRF.

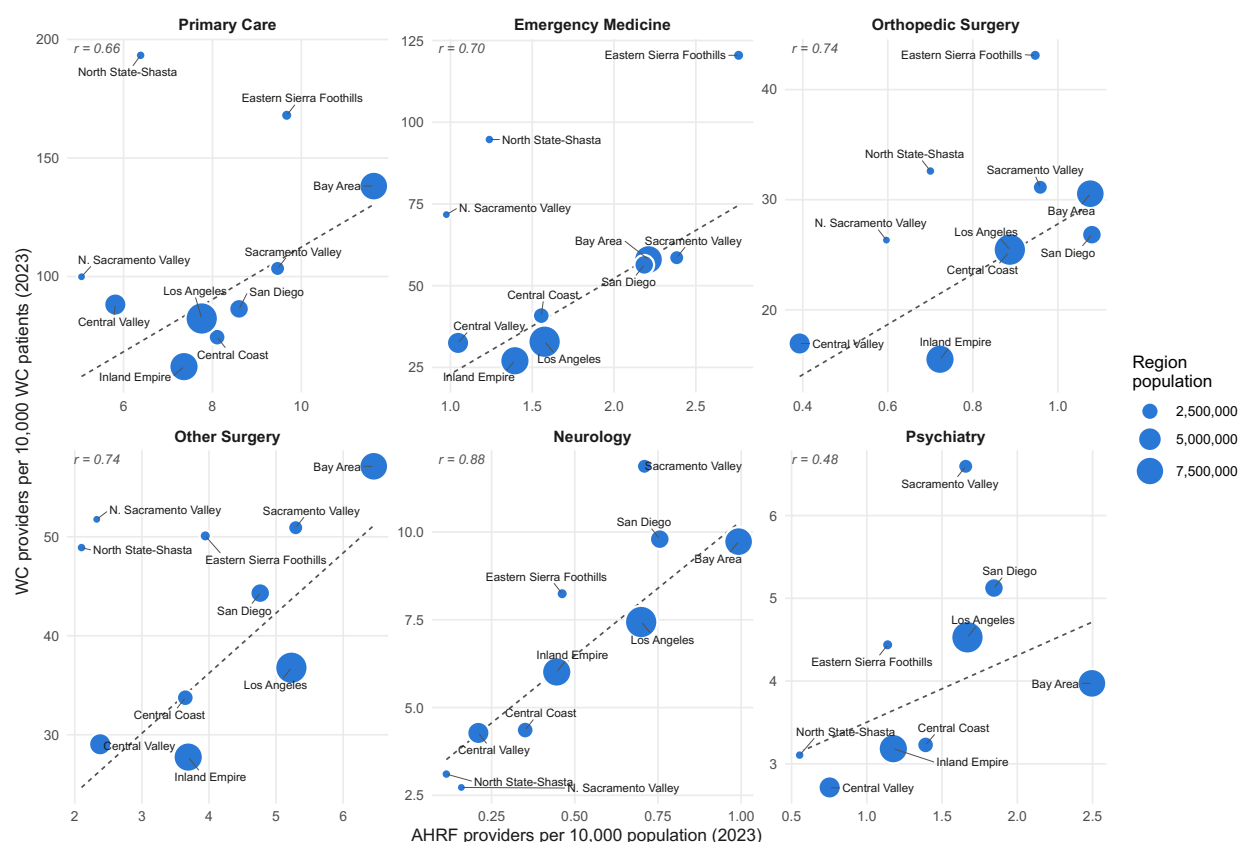
NOTES: Figures plot ratio of workers' compensation providers per 10,000 patients against ratio of licensed providers per 10,000 residents in the general health care system. Points are weighted by regional population, the dashed line is a weighted least squared line of best fit, and r is the population-weighted correlation coefficient. Counts of Physical Therapists and Psychologists are not available in AHRF. Aspect ratios are fixed across provider types to facilitate comparison of the slope of the regression lines.

Figure 5.6 shows that there is a positive relationship across regions between workers' compensation provider supply and provider supply in the general health care system for each type of providers examined (physicians, chiropractors, nurse practitioners, and physician assistants): areas with more health care providers in general have more participating providers in workers' compensation. However, the relationship is much tighter for physicians ($r = 0.71$) and chiropractors ($r = 0.80$) than for nurse practitioners ($r = 0.26$) or physician assistants ($r = 0.27$).

Some notable findings emerge for these four types of providers. First, the very low workers' compensation provider participation in the Central Valley is in line what one would predict, based on the supply of health care providers in the general health care system. In Los Angeles

and the Inland Empire, in contrast, provider participation is lower than predicted for each of the provider types in the figure, most conspicuously for physicians. Chiropractor participation in San Diego is also lower than predicted. The figure suggests that low provider participation in these areas should not be attributed only to shortages in the general health care system.

Figure 5.7. Comparison of Workers' Compensation Providers per 10,000 Patients to General Health Care Providers per 10,000 Population in 2023, by Type of Provider and Region



SOURCE: 2023 WCIS and AHRF.

NOTES: Figures plot ratio of workers' compensation providers per 10,000 patients against ratio of licensed providers per 10,000 residents in the general health care system. Points are weighted by regional population, the dashed line is a weighted least squared line of best fit, and r is the population-weighted correlation coefficient. Aspect ratios are fixed across provider types to facilitate comparison of the slope of the regression lines.

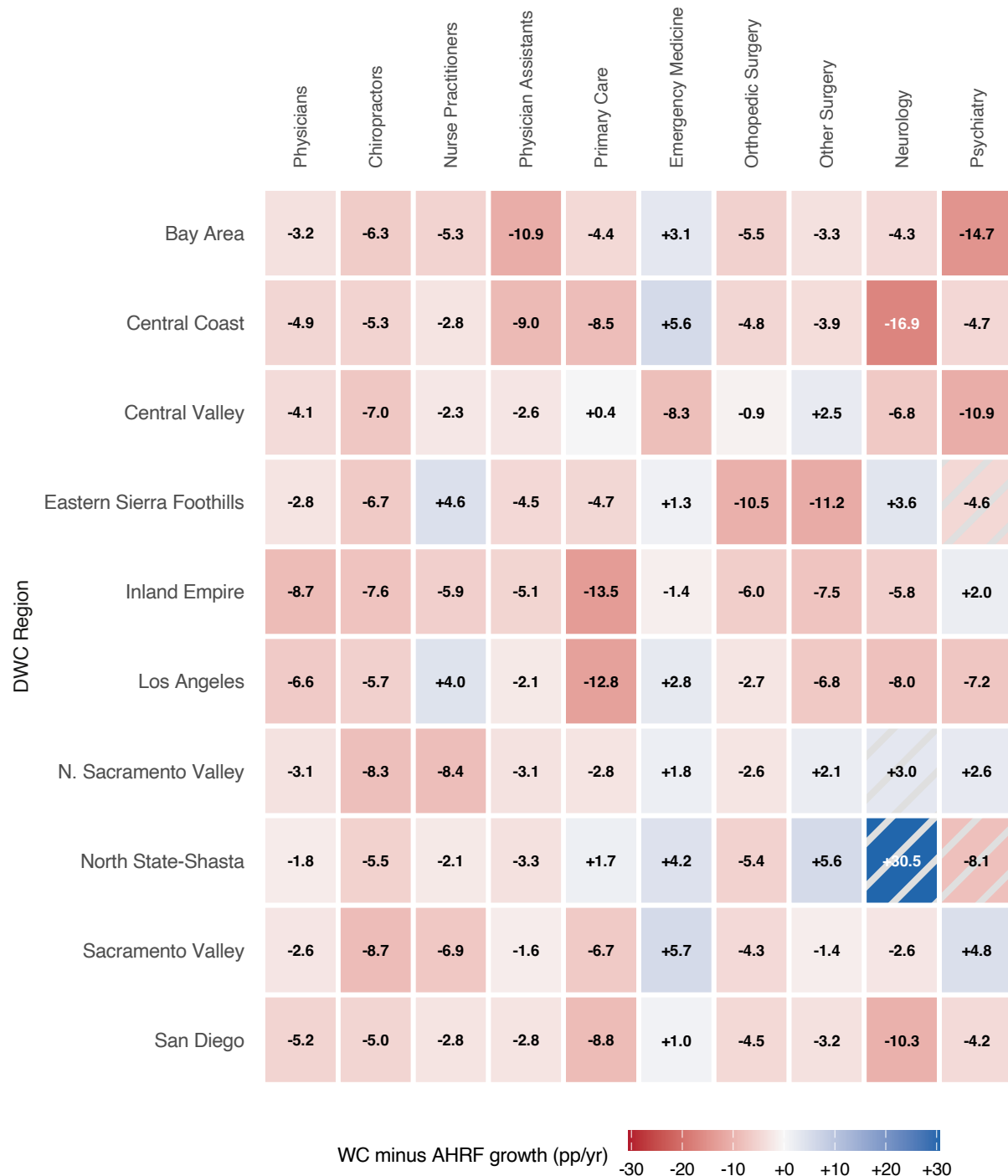
Figure 5.7 drills down further into physician specialties. Here, the relationship between providers in the general health care system and workers' compensation participation is tighter for most specialties, with moderately strong correlation coefficients for primary care, orthopedic surgery, emergency medicine, neurology, and anesthesiology. Psychiatry has a more moderate correlation of $r = 0.48$. For primary care, orthopedic surgery and other surgery, the Inland Empire stands out for having lower-than-predicted provider participation.

Figure 5.8 uses a heat map similar to those shown above to compare workers' compensation provider participation changes (measured between 2020 and 2024) to changes in the supply of providers in the general health care system (measured between 2020 and 2023). We calculated an annualized growth rate to allow comparison across different time frames. The figure is shaded according to the percentage-point difference in annualized growth rates between workers' compensation and the general health care system. Blue indicates faster provider growth in workers' compensation, and red indicates faster provider growth in general health care.

As an illustrative example, we can take the cell for physicians in the Inland Empire. The rate of WC-participating physicians in the Inland Empire declined from 329 per 10,000 patients in 2020 to 274 per 10,000 patients in 2024, or an 18.6% decrease. This cumulative change over four years implies a compound annual growth rate of -5%: $0.95^4 - 1 \approx -19.4\%$. Meanwhile, the rate of physicians per 10,000 population in the general health care system in the Inland Empire increased by 25.7 to 28.6 between 2020 and 2023; an 11.5% increase over three years implies a 3.7% compound annual growth rate. Comparing these annualized growth rates tells us that physician supply in the Inland Empire grew at an annualized rate that was 8.7 percentage points below the rate in the general health care system for that region.

The figure confirms that the patterns shown in Chapter 4—slower growth of workers' compensation compared to general health care—are widespread across the regions of California. Several less populated regions (the North Sacramento Valley and Eastern Sierra/Foothills) showed faster growth across several provider types, but other regions of the state showed slower growth across nearly all categories except emergency medicine.

Figure 5.8. Difference in Annualized Growth Rate Since 2020 Between Workers' Compensation Providers per 10,000 Patients and General Health Care Providers per 10,000 Population, by Type of Provider and Region



SOURCE: 2020-2024 WCIS and AHRF.

NOTES: Cells show difference (in percentage points) between compound annual growth rate (annualized growth rate) of workers' compensation providers per 10,000 patients and general health care providers per 10,000

population since 2020. Workers' compensation annualized growth rate calculated over 2020-2024. General health care system growth rate calculated over 2020-2023. Cells with 10 or fewer providers are overlaid with light diagonal bands.

Chapter Summary

In this chapter, we examined how provider participation in workers' compensation varies across the state's ten Division of Workers' Compensation (DWC) regions. Across many measures, provider supply relative to the patient population is lowest in the Central Valley and Inland Empire, which have the lowest provider-to-patient ratios and experienced declines over the study period across many provider types.

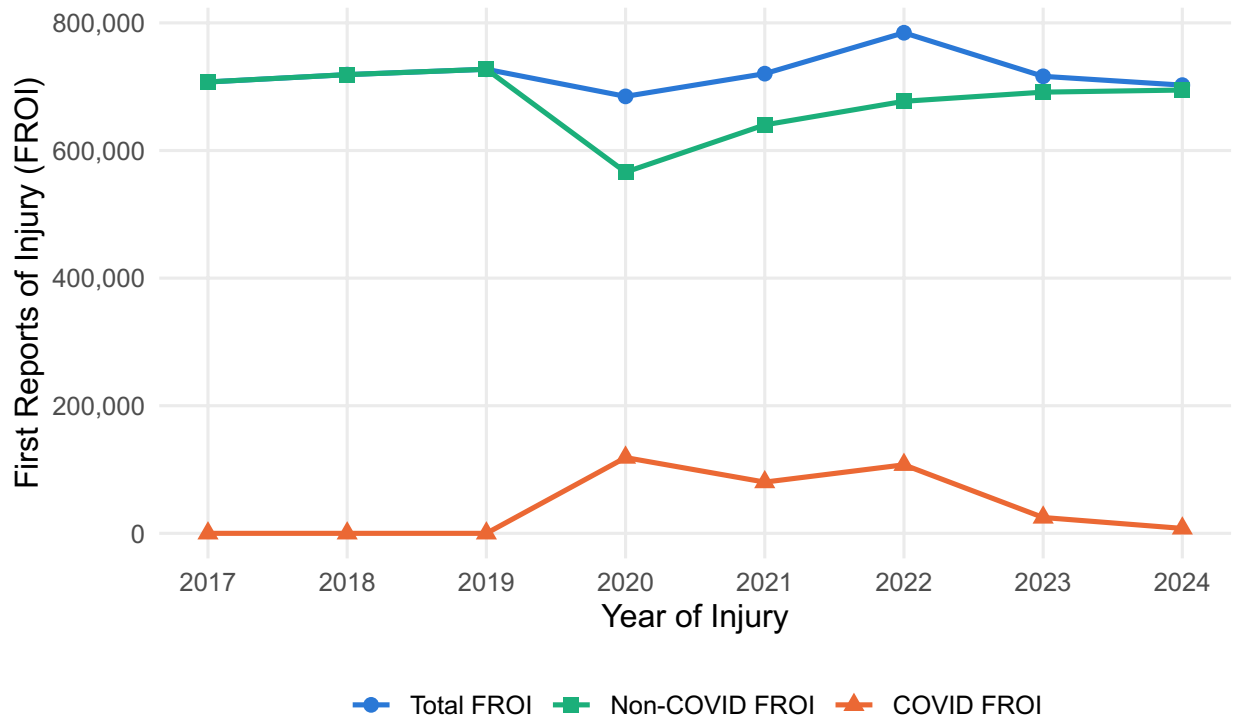
Issues with provider supply are not unique to the workers' compensation system, and it may be helpful for workers' compensation policymakers to know whether regional variation in the supply of workers' compensation providers is driven by more general provider shortages, and where issues with participation in workers' compensation are more acute than in the general health care system. This analysis makes it clear that much of the regional variation in workers' compensation provider supply is closely related to differences in the supply of providers in the general health care system: areas with more health care providers in general have more participating providers in workers' compensation. For workers' compensation policymakers, however, the most informative findings from this analysis may be which regions that deviate substantially from the predicted level of workers' compensation provider supply: Knowing that physician supply in workers' compensation is lower than predicted in the Inland Empire but higher than predicted in the Central Valley might suggest that policies focused narrowly on increasing workers' compensation participation have more scope to attract new providers in the former region than in the latter. Conversely, policies intended to improve workers' compensation participation in the Central Valley might be more effective if coordinated with broader regional or state efforts to increase the overall supply of health care providers.

6. Special Topic: Changes in Access to Care During the COVID-19 Pandemic

This chapter describes trends in access through the COVID-19 pandemic. We compared access (as measured by timeliness of care and distance traveled) across three periods: 2017-2019, 2020-2022, and 2023-2024. For convenience, we label these periods pre-pandemic, pandemic, and post-pandemic (noting that COVID remained prevalent after 2022). California implemented a temporary presumption for COVID-19 for specific workers via Executive Order N-62-20 (Executive Order N-62-20, 2020). The presumption was then added to the Labor Code in September 2020 by SB 1159, which described separate presumptions for workers who contracted COVID-19 on July 6, 2020, or after that date (SB 1159, 2020).

COVID-19 sharply changed the composition of new workers' compensation claims in California between 2020 and 2022. Job losses and changes in work activities reduced the volume of non-COVID claims, while the rapid spread of COVID and the adoption of presumptions for COVID-19 covering a wide range of workers led to high volumes of COVID-19 claims between 2020 and 2022. California's presumptions expired on January 1, 2024, and COVID claims have declined as a share of new injuries.

Figure 6.1. Total New Injury Claims (FROI) and COVID FROI

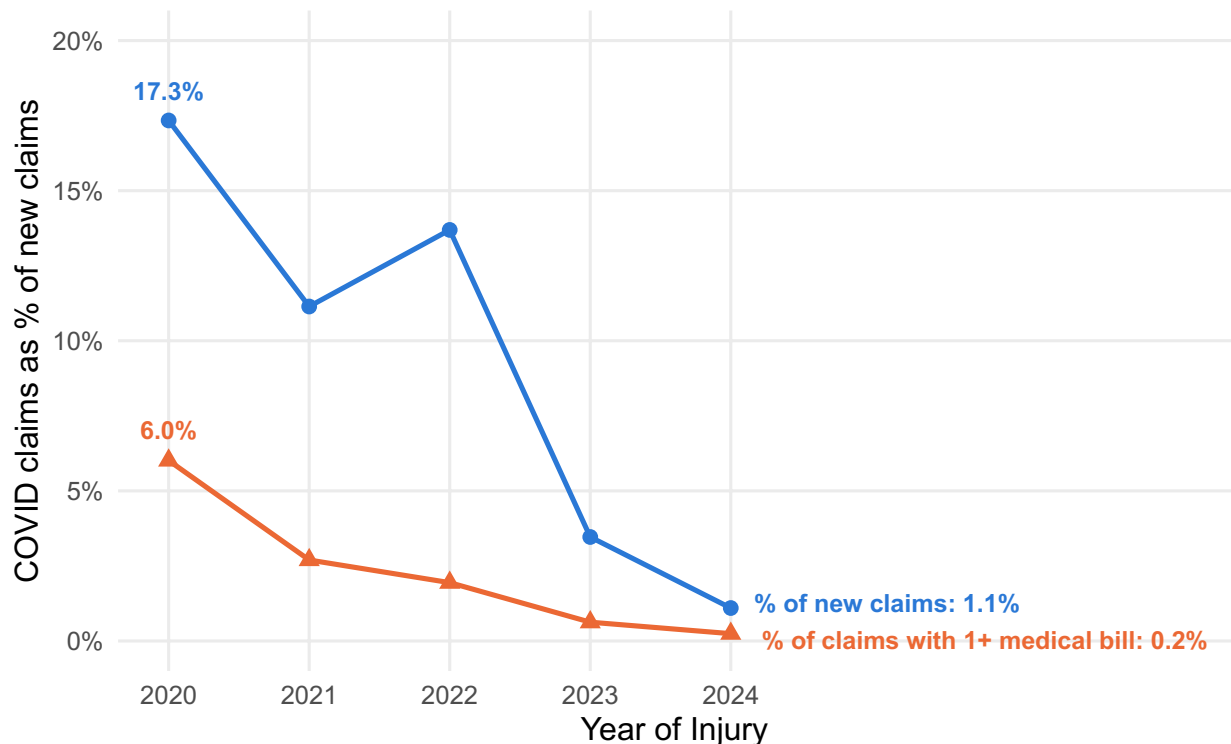


SOURCE: 2017-2024 WCIS.

In this chapter, we restrict attention to access to care among workers with non-COVID claims. Figure 6.1 shows the volume of claims by injury year from 2017 to 2024, stratified by COVID claim status. In 2020, the total claim volume declined slightly. Although COVID-19 claims constituted a large share of all new injuries during the pandemic, many of these claims were *indemnity-only* claims, with no medical treatment provided. Figure 6.2 reports the share of COVID claims out of all new injuries alongside the share of COVID claims that received workers' compensation medical care as a share of all new injuries that received workers' compensation medical care. In 2020, COVID claims were 17% of all new injury claims, but only 6% of all claims with 1+ medical bill. COVID claims declined sharply after 2022. In 2024, the first full year after the COVID presumptions expired, COVID claims were only 1% of total claims and 0.25% of claims that received workers' compensation medical care.

Our analysis of COVID's impact on access to care therefore focuses on changes in access among *non-COVID* workers' compensation claims. We first describe how the timeliness and distance measures examined in Chapter 3 changed for non-COVID claims from the 2017-2019 pre-pandemic period through the 2020-2022 pandemic period and through the 2023-2024 period, which we refer to as the post-pandemic period.

Figure 6.2. COVID as Share of All Claims (FROI) and Claims with Medical Care (1+ bill line), 2020-2024



SOURCE: 2017-2024 WCIS.

COVID's impacts on care for non-COVID patients may have operated through several channels. Most of these channels would lead us to expect reduced access during the pandemic. Facility closures and other precautions may have made it harder to get an appointment. Changes in the supply of health care workers during the pandemic would also be expected to undermine access to care for injured workers. Health care worker absences or exit from patient care jobs, whether due to COVID infection, to worsening working conditions (including increased workplace violence and exposure to psychological trauma), or to other non-COVID health and safety hazards, would also be expected to worsen both timeliness and geographic access to care.

A countervailing factor is that the lower volume of non-COVID injury claims in 2020-2022 might have been expected to reduce the number of new patients seeking care in the workers' compensation system. In the absence of changes in provider supply, participating providers might have been better able to take new patients.

COVID also led to increases in payers' willingness to reimburse telehealth visits. California followed CMS in adopting expanded coverage of telehealth services in 2020, a change which could have increased access to care for services that could be done over telehealth. We examine telehealth in greater depth in Chapter 7; for now we note that the expansion of telehealth might also facilitate timely care. (The distance measures used in this chapter exclude telehealth visits,

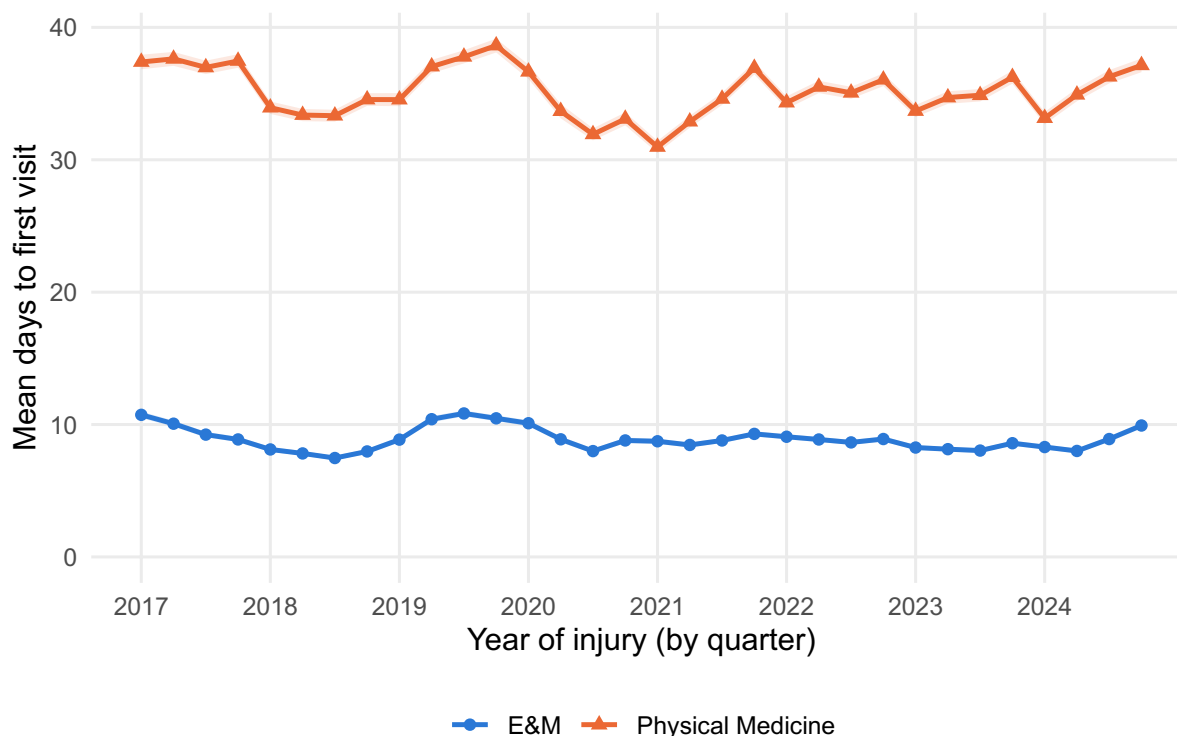
but telehealth might change the average distance traveled if patients located further away from providers were able to substitute telehealth visits for in-person care. We examine this question more closely in Chapter 7 as well.)

Changes in Timeliness and Distance Traveled During the Pandemic

Timeliness of Care

Figure 6.3 plots the average time to the first E&M (blue) and the first physical medicine visit (orange) by the calendar quarter of injury. The time to the first visit increases slightly for workers injured just before the pandemic (in 2019) for both E&M and physical medicine visits, a pattern that might be explained by delays in receipt of care for workers who sought care in the early period of the pandemic. However, any disruptions appear to have been short-lived, since the average time to first visit declines for workers injured after the start of the pandemic, and the average number of days until the first physical medicine visit actually fell by 2.4% from the pre-pandemic period (39.4 days) to the pandemic period (38.5 days, $p < 0.01$). The median time to first visit was stable for both E&M (1 day at the median in all periods) and physical medicine (the median fell from 18 days in the pre-pandemic period to 17 days in the pandemic period).

Figure 6.3. Timeliness of E&M and Physical Medicine by Date of Injury (visits within 1 year), 2017-2024



SOURCE: 2017-2024 WCIS.

Distance Traveled

Table 6.1 reports the average distance traveled by type of visit across the pre-pandemic, pandemic, and post-pandemic time periods. In contrast to the timeliness measures shown above, telehealth visits are excluded from the distance measure.

Table 6.1. Distance to First In-Person Visit, by Time Period

Visit type	Pre-Pandemic (2017-2019)	Pandemic (2020-2022)	Post-Pandemic (2023-2024)	% change, pre to pandemic	% change, pandemic to post
E&M	10.3	10.3	11.1	-0.6%	8.2%
Physical Medicine	8.6	8.9	9.4	3.0%	6.0%
Orthopedic	14.0	15.0	15.6	6.9%	4.2%
Behavioral Health	15.5	16.4	17.1	5.8%	4.1%

SOURCE: 2017-2024 WCIS.

NOTES: All differences between time periods (columns) within a type of care (rows) are statistically significant at the 1% level, with the exception of the post-pandemic vs. pandemic difference for chiropractic. p-values are two-sided tests for equality of means between each pair of periods. Table covers non-COVID claims only; distance is to the first in-person visit (telehealth visits excluded).

The median distance traveled to the first in-person visit increased during the pandemic for both orthopedic care (6.9% increase) and behavioral health (5.8% increase), but also for physical medicine (3.0% increase). For both of those visit types the distance increased further in the post-pandemic period. By contrast, with E&M the average distance traveled was essentially unchanged between the pre-pandemic and pandemic periods (0.6% decrease), but it increased between the pandemic period and the post-pandemic period (8.2% increase).

Chapter Summary

The time to first visits for E&M increased noticeably around the time the pandemic began, when health care facility closures and other disruptions were most notable. There was also a more modest increase in the time to first visits for physical medicine. However, this change in timeliness appeared to be temporary, with the times to first visits of both types declining for workers injured after the start of the pandemic.

The analysis in this chapter compares timeliness and distance traveled between workers injured during the pre-pandemic, pandemic, and post-pandemic periods. The volume of non-COVID claims fell sharply in the early phases of the pandemic, and we cannot rule out the possibility that compositional differences in the types of injuries reported during the pandemic contributed to the changes in claim timeliness observed around the start of 2020. However, the fact that increases in the time to first E&M and physical medicine visit were observed among

workers injured before the pandemic suggests that there were real changes in access to care beyond those purely due to compositional factors.

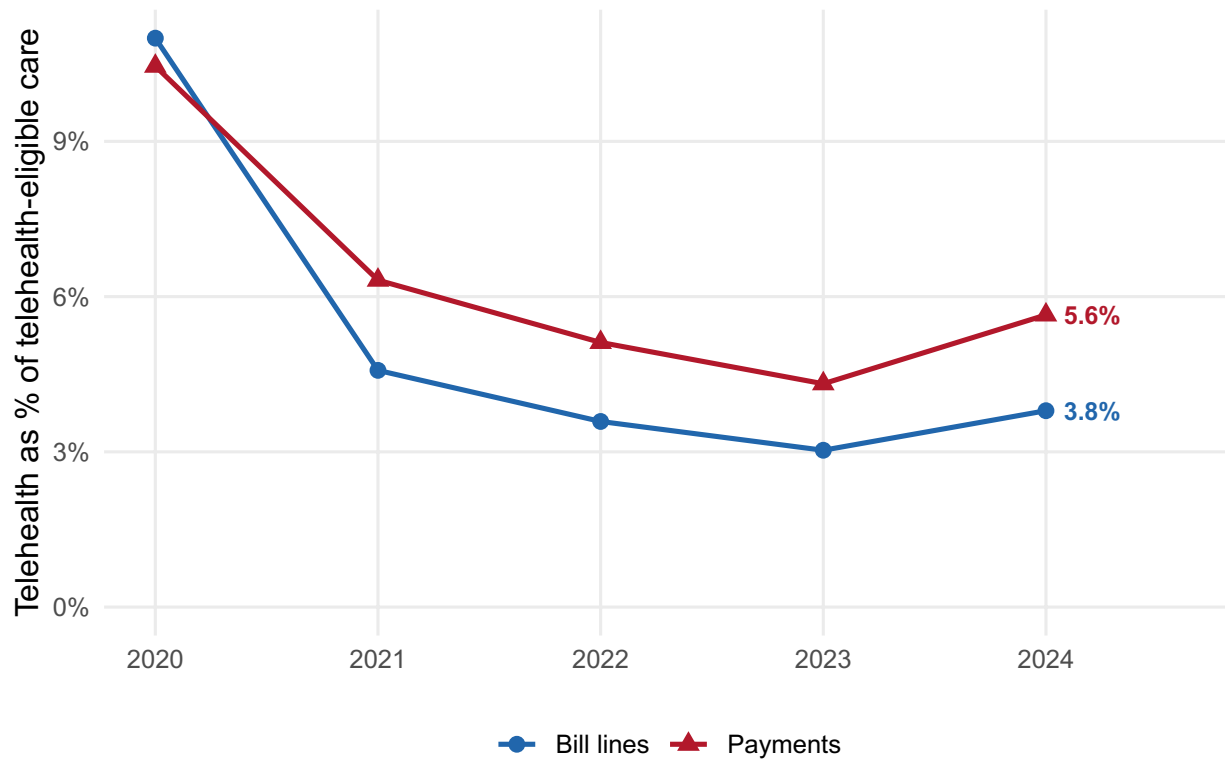
Although timeliness of care did not change dramatically during the pandemic, we did find increases in the distance that injured workers traveled for several widely used categories of in-person care (including physical medicine, behavioral health, and orthopedic and musculoskeletal care). The distance traveled for other types of care, including E&M and physical medicine, increased substantially in the post-pandemic period. In the 2023-2024 post-pandemic period, average distance traveled for every type of care, except that the distance traveled for chiropractic care remained above the pre-pandemic average.

7. Special Topic: Telehealth Adoption and Impacts on Access to Care

As noted in Chapter 5, health care payers substantially expanded coverage of telehealth in response to the COVID-19 pandemic. California issued guidance in line with federal efforts to increase telehealth availability through executive orders addressing privacy concerns, other compliance issues, and billing clarity. DWC adopted the CMS telehealth-approved services list as part of the OMFS in 2020 (California Commission on Health and Safety and Workers' Compensation, 2020; Executive Department State of California, 2020; U.S. Department of Health and Human Services, 2021), and has continued to follow CMS policies regarding which services are covered as telehealth (California Commission on Health and Safety and Workers' Compensation, 2020).

As described in Chapter 2, we used procedure codes to identify telehealth-eligible services (those on the CMS list in each year, in addition to selected Healthcare Common Procedure Coding System (HCPCS) codes that are delivered through telehealth by definition). We then examined place-of-service codes, modifier codes, and revenue codes to identify services that were billed as actually being delivered through telehealth. Most of the analyses in this chapter focus on telehealth utilization conditional on receipt of services on the CMS telehealth-eligible list. Because the focus of this chapter is primarily on the delivery mode of care received, we do not restrict the sample to accepted specific injury claims, as we did in earlier chapters on patient-level access measures. Unless otherwise noted, we include all cases care in our analysis.

Figure 7.1. Telehealth as a Share of Telehealth-Eligible Care, Statewide, 2020-2024



SOURCE: 2020-2024 WCIS.

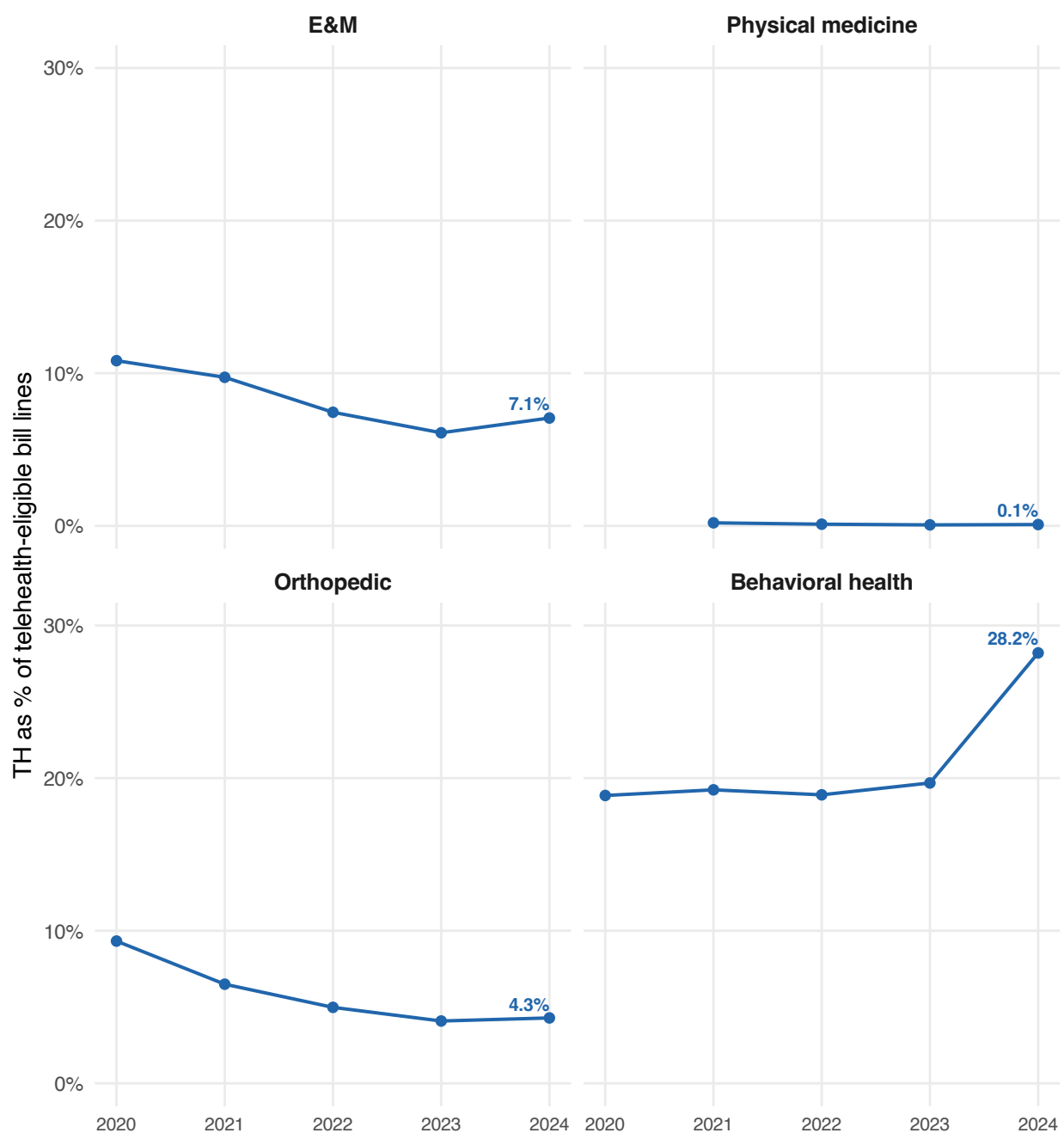
NOTES: Each series is telehealth as a percentage of telehealth-eligible care, statewide, by service year. “Bill lines” is the share of telehealth-eligible bill lines that were delivered as telehealth; “Payments” is the share of the amount paid for telehealth-eligible care that was delivered as telehealth. Telehealth-eligible services are those on the CMS telehealth-approved list for the service year; the eligible share is effectively zero before 2020, so the series begin in 2020.

Telehealth Utilization from 2020 to 2024

Figure 7.1 presents the share of all telehealth-eligible bill lines provided through at-home telehealth by service year. The share of telehealth-eligible care actually provided as telehealth declined from 11% in 2020 to 3% in 2023 before rebounding slightly to 3.8% in 2024. Payments followed a similar trajectory.

Figure 7.2 reports telehealth adoption (again as a percentage of eligible bill lines) by major type of service. E&M telehealth utilization declined gradually from 11% in 2020 to 6% in 2023, then increased to 7% in 2024. Physical medicine (which we defined to include only active physical medicine) had almost no telehealth utilization. Orthopedic bill lines also saw declines in telehealth utilization after the pandemic without any increase in 2024. Telehealth utilization is highest in behavioral health, reaching 28% of bill lines in 2024 after a sharp increase in utilization among psychologists.

Figure 7.2. Telehealth Adoption (% of bill lines) by Visit Type, 2020-2024

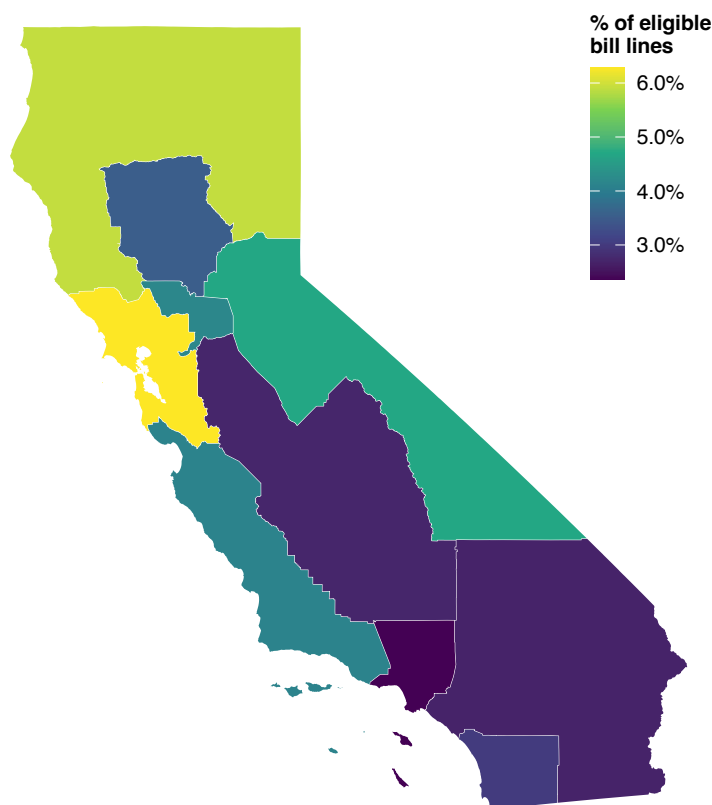


SOURCE: 2020-2024 WCIS.

NOTES: Each panel reports the percentage of telehealth-eligible bill lines that were actually delivered as telehealth, by type of service. 2024 N telehealth-eligible lines: E&M = 4,107,426; Physical Medicine = 5,822,906; Chiropractic = 558,642; Orthopedic/MSK = 627,263; Neurology = 40,727; Psychology = 266,661; Psychiatry = 60,123; Behavioral Health = 326,784

Regional Differences in Telehealth Utilization

Figure 7.3. Telehealth as a percentage of telehealth-eligible bill lines, by DWC region, 2024



SOURCE: 2024 WCIS.

NOTES: Cell values are the percentage of telehealth-eligible bill lines that were delivered as telehealth in 2024, by DWC region (denominator = telehealth-eligible bill lines in the region). Darker (yellow) shades indicate higher telehealth adoption; darker (purple) shades indicate lower adoption. The “California Statewide” and “Out of California” totals are omitted from the map.

Figure 7.3 shows how telehealth utilization (relative to eligible bill lines) varies across regions. As found in earlier research on telehealth use by the Workers’ Compensation Insurance Rating Bureau (WCIRB, 2023), which analyzed service years 2020-2021, telehealth use is highest in the Bay Area (6.3% of eligible bill lines in 2024). However, we find that telehealth use in 2024 was nearly as high in North State-Shasta (5.9%), and was above the statewide average (3.8%) in the Eastern Sierra/Foothills (4.7%), Central Coast (4.1%), and Sacramento Valley (4.2%). Consistent with the WCIRB’s early findings, we see continued low telehealth use in Los Angeles (2.4%), the Central Valley (2.7%), and the Inland Empire (2.7%).

Figure 7.4. Telehealth as a Percentage of Telehealth-Eligible Bill Lines for Evaluation & Management, by DWC Region, 2024

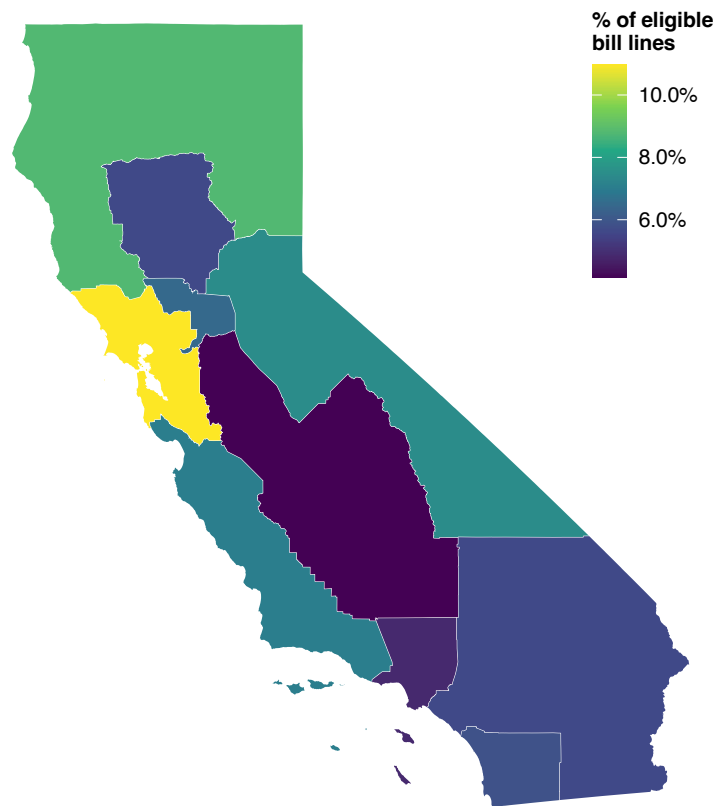
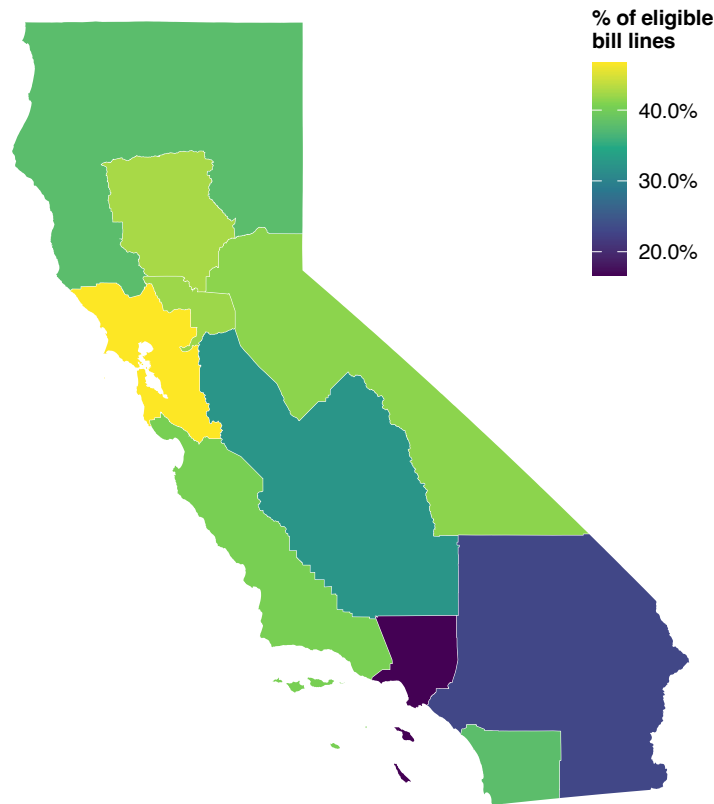


Figure 7.4 shows the rate of telehealth among eligible E&M bill lines in 2024: patterns are very similar to the overall telehealth adoption rates shown in Figure 7.3. In Figure 7.5 (next page) we focus more narrowly on behavioral health, and find some differences from the regional picture for E&M visits. Telehealth adoption for behavioral health in the Central Valley (32%) is actually above the statewide average (28%), while adoption is especially low in the Inland Empire (23%) and Los Angeles (17%).

Figure 7.5. Telehealth as a Percentage of Telehealth-Eligible Bill Lines in Behavioral Health, by DWC Region, 2024



Comparison to Prior Studies

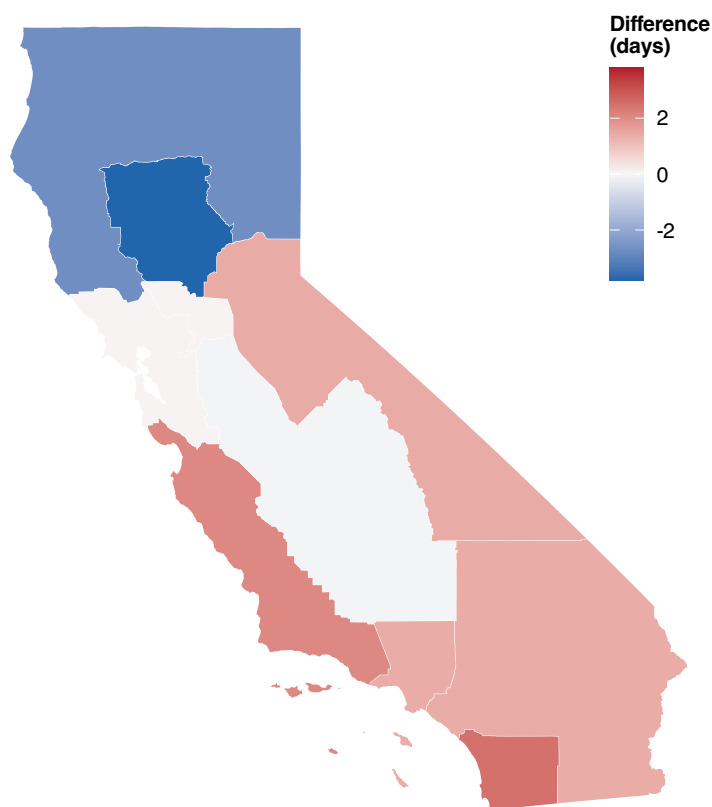
The Workers' Compensation Insurance Rating Bureau (WCIRB) previously examined telehealth services in California's workers' compensation system from 2018 through the third quarter of 2022 (WCIRB, 2023). The WCIRB study found that the telehealth claims remained higher in 2021 and 2022 than in 2018 and 2019, with over 80% of telehealth services being used for E&M services (WCIRB, 2023). Overall, 1.2% of workers' compensation medical payments in the third quarter of 2022 were for telehealth services, compared to a 0.3% during the 2018-19 "pre-pandemic period" in the study and a high of 2.8% in the second quarter of 2020 (WCIRB, 2023). The study found that the largest portion of telehealth services was provided by psychologists, psychiatrists, and neurologists, and also noted that other providers, such as surgeons, may have used telehealth services in lieu of in-person follow-up appointments (WCIRB, 2023). The WCIRB also found geographic variation in workers' compensation payments for telehealth services, with more urban areas (Sacramento, San Francisco Bay Area, Central Coast, Greater Los Angeles, and San Diego regions) having a larger share of telehealth

services payments than other, more rural regions of the state (including the Central Valley) (WCIRB, 2023).

Timeliness by Telehealth Involvement on Claim

We also examine how timeliness of care varies with telehealth use within each region by calculating the difference in the average timeliness of E&M between telehealth and non-telehealth claims. Using claims with 2024 injury dates, we classify a claim as a telehealth claim if it received any telehealth (not necessarily E&M). The results, in Figure 7.6, show that the association between telehealth and E&M timeliness differs substantially across the state.

Figure 7.6. Difference in Days to First E&M visit, Telehealth Versus Non-Telehealth Users, by DWC Region, 2024



SOURCE: 2024 WCIS.

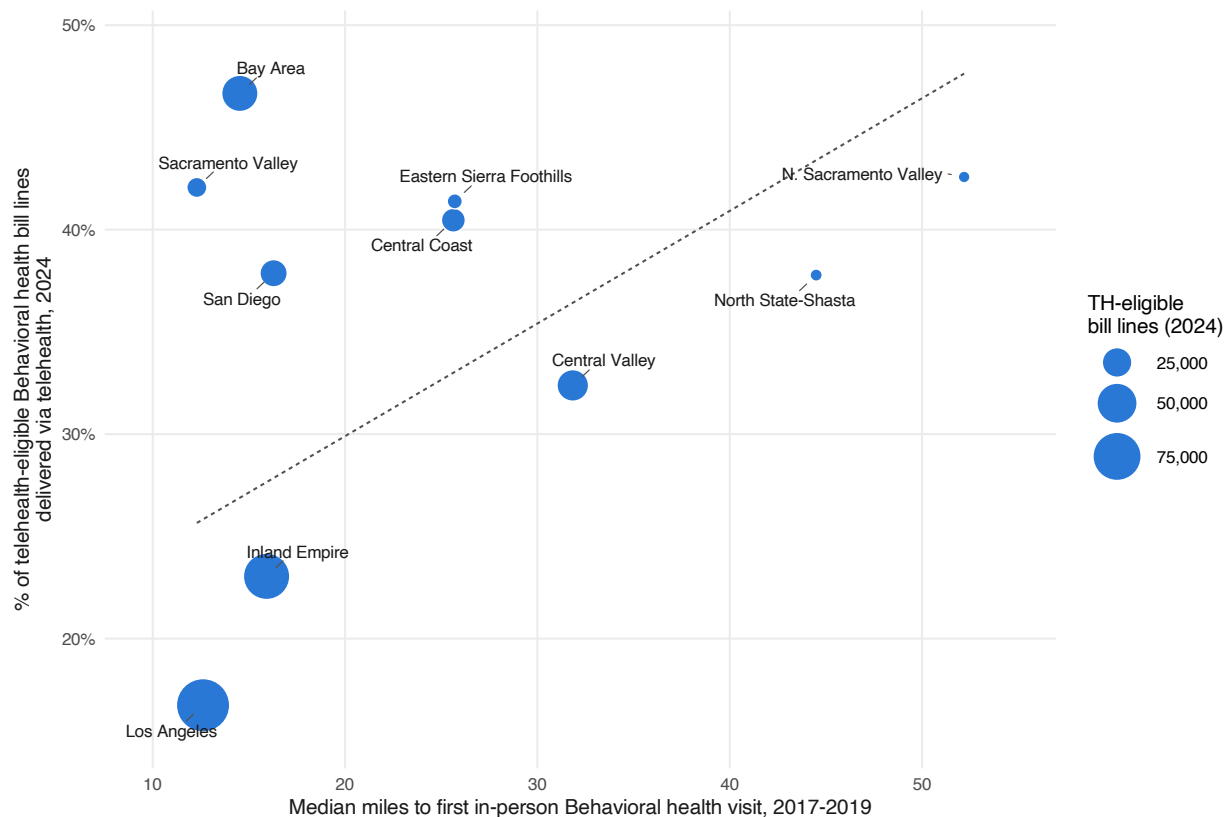
NOTES: Map reports within-region difference in average days from claim report to first E&M visit between claims with telehealth users claims with no telehealth users among injured workers with at least one telehealth-eligible bill line. A positive difference (red) means telehealth users had a higher duration to the first E&M visit than non-users; a negative difference (blue) means telehealth users had a lower duration to the first E&M visit. The statewide average time to the first E&M visit in 2024 was 8.8 days.

Telehealth claims had shorter times to the first visit in the North Sacramento Valley and North State-Shasta, but had longer times to the first visit in the Inland Empire and especially San Diego. This difference in the timeliness-telehealth relationship might be consistent with different interpretations: it may suggest that telehealth has a more beneficial effect on access in the North Sacramento Valley and North State-Shasta, but it could also suggest that the nature of selection into telehealth may differ across regions (for example, if telehealth is less accessible or less preferred relative to in-person care in San Diego and the Inland Empire, so that patients seeking telehealth do so only after encountering in-person access problems).

Telehealth Adoption and Distance to Care for Behavioral Health

If telehealth adoption were a response to access challenges, we might expect to see higher telehealth adoption in regions with longer in-person travel distances. In Figure 7.7, we explore this possibility by comparing telehealth adoption as of 2024 to the regional median travel distance for behavioral health visits. Because distance traveled in 2024 is observed only for a self-selected group of patients who do not use telehealth, we use the regional pre-pandemic average distance as a proxy for the availability of in-person care that is not affected by telehealth.

Figure 7.7. Telehealth Share of Behavioral Health Bill Lines (2024) Versus Median Pre-Pandemic (2017-2019) Distance to First Behavioral Health Visit, by DWC region



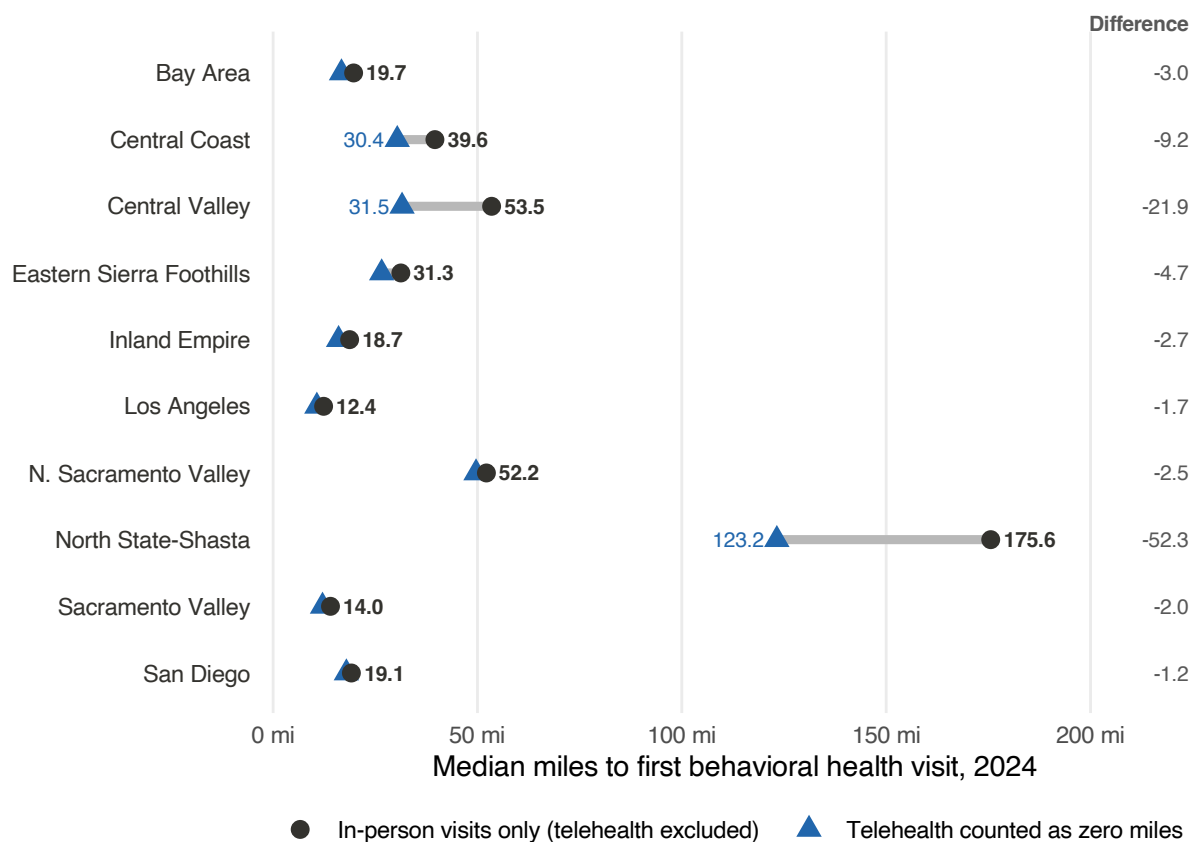
SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Figures plot share of telehealth-eligible behavioral health bill lines delivered as telehealth against the median distance traveled for in-person behavioral health before the pandemic (2017-2019). Points are weighted by count of telehealth-eligible bill lines. The dashed line is a weighted least squared line of best fit.

Figure 7.7 shows modestly higher telehealth adoption for behavioral health in regions where patients traveled farther to behavioral health in the pre-pandemic period. (The median was chosen for consistency with the figures in Chapter 3, but the distance-telehealth relationship estimated using the mean was similar.) However, the figure also highlights the substantial gap between telehealth use in Los Angeles and the Inland Empire and other areas (such as the Bay Area, Sacramento Valley, and San Diego) with similar pre-pandemic distances traveled to behavioral health care.

To quantify the contribution of telehealth to reduced travel distance for behavioral health, we calculated the average distance traveled to the first behavioral health visit under two alternative distance measures: the distance to the first in-person visit, and a modified measure that treats at-home telehealth as having a travel distance of zero. Results are shown in Figure 7.8.

Figure 7.8. Median Distance to the First Behavioral Health Visit With and Without Telehealth Visits Included, By DWC Region, 2024



SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Each row is a DWC region of the injured worker's residence, in alphabetical order. The dark circle is the median distance to the first IN-PERSON visit of this type (telehealth visits excluded); the blue triangle is the median with telehealth visits counted at zero miles. The "Difference" column reports the gap. These distance statistics include all claims (not just accepted specific injury claims).

In most regions, the average distance traveled to the first visit when telehealth is included is very similar to the average with telehealth excluded. In North State-Shasta, the Central Coast, and the Central Valley, however, there are more substantial reductions in travel time. We caution that estimates from North State-Shasta are based on a relatively small number of injured workers with in-person behavioral health (192 patients in 2024); sample sizes are larger for the Central Coast (931) and Central Valley (1,967).

Chapter Summary

Our analysis provided an updated look at telehealth utilization and new evidence on its association with measures of access. Overall, telehealth adoption declined for several years after initial adoption of broader telehealth reimbursement policy in 2020, but it increased in 2024 for behavioral health services. The principal limitation of this analysis is that our ability to identify telehealth care depends on correct use of billing codes by providers and payers. We note that the patterns of telehealth use across types of care appears plausible, however.

Telehealth use among eligible services remains unevenly distributed across the state, with lower utilization in Los Angeles, the Inland Empire, and the Central Valley for telehealth-eligible claims overall. We saw in Chapter 4 that the Inland Empire and Central Valley have the fewest providers and fewest physicians per 10,000 patients out of all the large regions examined. Utilization of telehealth for behavioral health services was higher in the Central Valley than in the Inland Empire, however, and our comparison of distance traveled for behavioral health with and without telehealth visits included suggests that telehealth use in the Central Valley and, to a lesser extent, in the Central Coast, may have helped injured workers seeking behavioral health services to access care with less driving required.

8. Conclusion

This study is the first of four annual reports on access to care in California workers' compensation. Using administrative billing data from the WCIS, we examined trends in access at the patient level (timeliness of care and distance traveled) and at the provider level (participation in workers' compensation, caseloads, and network agreement coverage). The empirical analyses reported here are meant to establish an updated baseline for regular tracking of access measures in the coming years.

Summary of Key Findings

At the statewide level, access to care for the typical (median) injured worker with an accepted specific injury claim has largely been stable over the last few years. The median time to the first E&M visit has remained at one day after the report of injury since 2019, and median travel distances moved only modestly. This stability, however, coexisted with widening differences in distance traveled to in-person care: driving distances for E&M and physical medicine increased for workers in suburban areas and, especially, for workers in rural areas, while distances for urban workers held relatively steady.

Provider participation in the workers' compensation system has been subject to more change in recent years. The total number of participating providers was essentially flat between 2022-23 and 2024, but this stability masked meaningful shifts in the composition of the workforce. Participation shifted away from physicians, chiropractors, and psychologists and toward nurse practitioners, physician assistants, and acupuncturists. Declines in physician participation were widespread across specialties, including primary care and surgery. Workers' compensation provider supply has also not kept pace with the broader growth in California's health care workforce, and provider supply relative to the patient population remains lowest in the Central Valley and Inland Empire. Access challenges were especially pronounced in behavioral health, where travel distances are longest and network integration is lowest.

Open Questions

These descriptive findings raise questions that this year's report was not designed to answer. The most important is a puzzle: We found declining provider participation and shifts away from key provider types and specialties, yet patient-level access measures have largely remained stable. One possible explanation is that increasing participation by nurse practitioners and physician assistants has helped offset declining physician participation, particularly for timely initial E&M visits. However, advance practice professionals may be limited in their ability to provide some types of care—most notably physical therapy and surgery—that are widespread in

workers' compensation. The critical question is whether and when declining provider participation will result in widespread and measurable access problems for injured workers. A related question is what explains lower-than-predicted provider participation in Los Angeles and, especially, the Inland Empire, where workers' compensation provider supply falls below the level that would be expected given supply in the general health care system.

Priorities for Future Reports

Future annual reports will provide regular updates to the core measures established here and will examine specific structural features of California's approach to care delivery that could not be addressed within the scope of this first report. Topics slated for closer examination include utilization review, the Independent Medical Review and Independent Bill Review processes, and Medical Provider Networks—features that system participants have identified as potential sources of friction affecting provider participation and access to care. These analyses were deferred in agreement with DIR because they require additional data collection.

In the meantime, several patterns merit ongoing attention from policymakers: the divergence between stable median access and increasing travel distance for workers in rural and suburban areas; the structural shift in the provider workforce and the concentration of care among a smaller number of providers; and regional disparities in provider supply.

Appendix A: Methods and Data Construction Details

WCIS Medical Bill Processing

Under a data sharing agreement, DIR provided RAND with extracts of the WCIS medical billing data (covering 2017 and later service years) and FROI data (covering 2005 and later injury dates). Medical billing data received from DIR were organized by bill year. To process this data, we merged the bill files, line-level files (professional, dental, institutional, and prescription), line payment files, adjustment files, and diagnosis/procedure files together. Date of injury was calculated by using FROI data if available. When FROI data was unavailable for a given JCN, date of injury was assigned as the date appearing most frequently across all bills for that JCN, prioritizing dates after January 1, 2005. This approach was required for fewer than 3% of all lines. We then checked for duplicates based on multiple criteria:

1. bills and lines that had flags for duplicate adjustment reason codes (18, 193, B13),
2. duplicate bill_ids with multiple med_bill_idn values, and
3. line records on separate bills sharing the same JCN, service date, total charge per line, place of service code, and procedure code/National Drug Code.

Records identified as probable duplicates were excluded from the final analytic file. Most excluded lines had a paid amount of zero, as when duplicate records differed in paid amount, lines with non-zero paid values were generally retained over lines with zero or missing paid values. When multiple duplicate lines had non-zero paid values, we retained the record associated with the most recent relevant date among: (1) insurer received bill, (2) insurer paid bill, or (3) transmission date.

We also reconciled bill level records that either had no line level detail or were missing line payment detail so that these payments were represented in line level paid totals. This reconciliation brought line paid sums closer to the overall bill paid sums.

Tables A.1 to A.3 provide a year-by-year comparison of total quantities (bills, paid amounts, bill lines) between the raw data received from DIR (Table A.1), the processed bill line-level data after de-duplication (Table A.2). Table A.3 reports the share of each total retained in the processed data. De-duplication and other processing reduces the number of unique bills by 6% to 10% and the number of unique bill lines by 6% to 15%, but retains over 99% of total paid amounts from the original data.

Table A.1. Original Data Received from DIR

Bill Year	Bill Count	Sum of Bill Paid	Line Count	Sum of Line Paid
2017	10,912,749	\$2,652,436,822	31,165,536	\$2,549,159,312
2018	11,174,312	\$2,846,337,363	32,037,097	\$2,746,813,136
2019	11,299,633	\$2,893,991,938	31,958,880	\$2,802,955,731
2020	11,595,607	\$2,980,857,230	31,950,842	\$2,894,899,809
2021	12,295,360	\$3,277,877,550	33,187,324	\$3,196,119,832
2022	11,798,153	\$3,401,491,684	31,557,965	\$3,324,799,271
2023	12,025,765	\$3,631,093,030	31,772,572	\$3,556,673,958
2024	12,047,730	\$3,803,928,848	31,209,936	\$3,731,259,460
2025	11,724,586	\$3,757,107,360	29,708,494	\$3,688,482,220

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Table A.2. Data After Merging and Removing Duplicates

Bill Year	Bill Count	Sum of Bill Paid	Line Count	Sum of Line Paid after De-Duplication	Sum of Line Paid after Reconciling Bills with No Lines (Final)
2017	9,981,741	\$2,637,477,477	27,455,501	\$2,530,969,369	\$2,633,315,651
2018	10,253,140	\$2,829,068,535	28,186,732	\$2,725,911,696	\$2,824,581,934
2019	10,266,517	\$2,877,286,661	27,755,593	\$2,782,605,291	\$2,872,345,141
2020	10,358,274	\$2,961,484,883	27,068,687	\$2,870,092,905	\$2,955,621,769
2021	11,043,228	\$3,258,320,068	28,436,985	\$3,171,660,332	\$3,252,974,541
2022	10,740,530	\$3,379,360,226	27,622,133	\$3,296,146,132	\$3,372,362,031
2023	11,043,387	\$3,604,421,011	28,309,708	\$3,524,063,439	\$3,598,092,853
2024	11,182,071	\$3,785,381,803	28,397,621	\$3,708,243,245	\$3,780,494,746
2025	11,109,136	\$3,737,760,923	27,855,224	\$3,664,652,899	\$3,732,374,975

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Table A.3. Percent of Original Totals Retained in Processed Data

Bill Year	Bill Count	Sum of Bill Paid	Line Count	Sum of Line Paid after Duplication	Sum of Line Paid after Reconciling Bills with No Lines (% based on original Sum of Bill Paid)
2017	91.5%	99.4%	88.1%	99.3%	99.3%
2018	91.8%	99.4%	88.0%	99.2%	99.2%
2019	90.9%	99.4%	86.8%	99.3%	99.3%
2020	89.3%	99.4%	84.7%	99.1%	99.2%
2021	89.8%	99.4%	85.7%	99.2%	99.2%
2022	91.0%	99.3%	87.5%	99.1%	99.1%
2023	91.8%	99.3%	89.1%	99.1%	99.1%
2024	92.8%	99.5%	91.0%	99.4%	99.4%
2025	94.8%	99.5%	93.8%	99.4%	99.3%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

First Reports of Injury

DIR also provided RAND with an extract of 33,321,123 transaction-level FROI for injury dates from 2005 to the present. Although this study focuses on medical care from 2017 forward, data on FROI from years before 2017 were needed for analysis of workers who received care in 2017-2025 but had earlier injury dates. Using maintenance type codes (MTC) on the FROI transactions, we removed FROI that were submitted prior to receiving a FROI with MTC 01 (“Cancel”), eliminating 5,067 FROI transactions. We rolled up the FROI to one record per JCN, retaining information from the most recently submitted FROI in cases where conflicting information was submitted across records for the same case. This process left us with 14,769,574 FROI (one per JCN), eliminating 18,551,549 transaction-level records.

Sample Sizes and Characteristics of Study Population

Table A.4 compares the number of injured workers by injury year in our analysis sample to the number of first reports of injury filed. Overall, 71% of the first reports of injury have 1 or more medical bills reported to the WCIS; the proportion of FROI with medical bills ranges between 67% (in 2022) and 75% (in 2019). Some of the variation across years—particularly the lower rates from 2020 through 2022—may be explained by indemnity-only claims associated with COVID-19.

Table A.4. First Reports of Injury, Workers with Medical Billing Data, and Unique workers' compensation Patients by Year

Year	WC Patients (Any Date of Injury)	First Reports of Injury	First Reports of Injury with 1+ Medical Bills	% in Analysis Sample
Year Definition	Service Year	Injury Year	Injury Year	Injury Year
2017	875,933	707,375	491,903	69.5%
2018	920,129	718,908	527,544	73.4%
2019	936,107	727,333	544,231	74.8%
2020	875,310	684,811	465,562	68.0%
2021	915,734	720,413	500,831	69.5%
2022	934,269	784,529	517,365	65.9%
2023	932,357	716,259	512,403	71.5%
2024	928,703	702,477	494,605	70.4%
Total	Not Reported	5,762,105	4,054,444	70.4%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Table includes all claims without restricting based on nature of injury or claim denial status.

Patient-level access measures use workers with injury dates from 2017-2024. Provider participation measures use bills with service dates from 2017-2024 (regardless of the patient's injury year). 2025 data were omitted due to concerns about the completeness of WCIS medical billing data from 2025 at the time when the data were extracted.

Table A.5 (next page) provides basic descriptive statistics for workers injured in 2017-2024, comparing the full set of FROI pooled across all 8 injury years to the subset that matched at least 1 medical bill. Table A.5 shows some differences: cases with no medical bills reported are 11 percentage points more likely to be from self-insured employers and are more likely to be from the Public Administration, Retail Trade, or Health Care and Social Assistance industries. Most notably, these FROI without medical bills are 15 percentage points more likely to be COVID-19 claims, which may explain some of the differences in industry and other characteristics.

Table A.5. Comparison of All First Reports of Injury with the Medical-Bill Analysis Sample, 2017–2024 Injury Dates

Group	Characteristic	All FROI	Matched (analysis sample)	Not matched
Age	Mean age at injury (14-99)	40.9	41.2	40.3
Sex	% female	43.1%	42.7%	44.1%
Nature of injury	Specific injury - other	44.4%	45.6%	41.5%
Nature of injury	Specific injury - sprain/strain/fracture	36.9%	41.1%	26.8%
Nature of injury	Occ. disease - physical	1.6%	1.4%	2.0%
Nature of injury	Mental	2.4%	1.9%	3.6%
Nature of injury	Cumulative injury - physical	5.7%	5.4%	6.5%
Nature of injury	Multiple physical	3.0%	3.1%	2.8%
Nature of injury	COVID-19	5.9%	1.4%	16.6%
Nature of injury	Missing/invalid	0.1%	0.1%	0.2%
Body part injured	Head	9.8%	9.7%	10.0%
Body part injured	Neck	2.2%	2.4%	1.9%
Body part injured	Upper extremity	32.4%	35.4%	25.3%
Body part injured	Trunk - back or spine	12.4%	13.7%	9.5%
Body part injured	Trunk - other	7.9%	5.2%	14.3%
Body part injured	Lower extremity	17.9%	19.4%	14.4%
Body part injured	Multiple, mental, or other	17.3%	14.2%	24.6%
Body part injured	Missing/invalid	0.1%	0.1%	0.2%
Self-insured	% self-insured	33.9%	30.5%	41.8%
NAICS industry sector	Agriculture, Forestry, Fishing and Hunting	3.3%	3.3%	3.3%
NAICS industry sector	Mining, Quarrying, and Oil and Gas Extraction	0.1%	0.1%	0.2%
NAICS industry sector	Utilities	0.5%	0.5%	0.5%
NAICS industry sector	Construction	4.8%	5.3%	3.4%
NAICS industry sector	Manufacturing	9.2%	10.0%	7.2%
NAICS industry sector	Wholesale Trade	3.5%	3.8%	2.7%
NAICS industry sector	Retail Trade	12.3%	11.8%	13.6%
NAICS industry sector	Transportation and Warehousing	6.0%	6.1%	5.6%
NAICS industry sector	Information	1.3%	1.3%	1.4%

Group	Characteristic	All FROI	Matched (analysis sample)	Not matched
NAICS industry sector	Finance and Insurance	2.1%	2.1%	2.3%
NAICS industry sector	Real Estate and Rental and Leasing	1.5%	1.6%	1.3%
NAICS industry sector	Professional, Scientific, and Technical Services	2.5%	2.7%	2.2%
NAICS industry sector	Management of Companies and Enterprises	0.2%	0.2%	0.1%
NAICS industry sector	Administrative/Support and Waste Mgmt/Remediation	7.9%	8.3%	6.9%
NAICS industry sector	Educational Services	6.7%	7.0%	6.1%
NAICS industry sector	Health Care and Social Assistance	11.7%	11.4%	12.6%
NAICS industry sector	Arts, Entertainment, and Recreation	2.1%	2.0%	2.3%
NAICS industry sector	Accommodation and Food Services	7.5%	7.6%	7.2%
NAICS industry sector	Other Services (except Public Administration)	2.7%	2.8%	2.6%
NAICS industry sector	Public Administration	11.9%	10.3%	15.6%
NAICS industry sector	Missing/invalid	2.2%	2.0%	2.7%
DWC region	Bay Area	16.8%	16.7%	17.1%
DWC region	Central Coast	6.5%	6.7%	6.1%
DWC region	Central Valley	12.4%	12.7%	11.8%
DWC region	Eastern Sierra Foothills	1.8%	1.7%	1.9%
DWC region	Inland Empire	21.3%	21.2%	21.5%
DWC region	Los Angeles	25.2%	25.1%	25.2%
DWC region	N. Sacramento Valley	1.2%	1.2%	1.1%
DWC region	North State-Shasta	1.3%	1.3%	1.3%
DWC region	Sacramento Valley	4.4%	4.4%	4.5%
DWC region	San Diego	7.6%	8.0%	6.8%
DWC region	Out of California	1.2%	0.9%	1.9%
DWC region	Missing/invalid	0.3%	0.0%	1.1%
N (observations)	Unweighted N	5,762,105	4,054,444	1,707,661

NOTES: All FROI = all first reports of injury for 2017-2024 injuries. Matched = FROI cases that link to one or more medical bills (the analysis sample used in Tables 1-3); Not matched = FROI cases with no linked medical bill. Columns are computed over all injury years combined. Age, sex, self-insured, nature of injury, body part, and industry come from the FROI. Region uses the worker-residence region for matched cases and the FROI residence ZIP crosswalk for unmatched cases; within each categorical block, percentages sum to 100 within a column. "NAICS" = North American Industry Classification System.

We would not expect the two populations to be identical since injuries with no medical bills are likely to be systematically different from those with bills reported (e.g., indemnity-only COVID claims, minor injuries with no care billed to workers' compensation, or claims that are denied in full before the worker receives any care). More importantly, the region distribution between matched and unmatched claims is very similar, which provides some reassurance that regional comparisons are not driven by differential missingness of medical billing data.

Tables A.6, A.7 and A.8 below report these descriptive statistics by year of injury for cases in our patient-level analytic file, including claims that are denied and those with CT or other non-specific natures of injury. In the 2022-2024 period that we focus on in Chapter 3, most case characteristics are stable across years. The notable exception is the share of claims for cumulative trauma injuries and claims with multiple injuries reported. Between 2022 and 2024, cumulative trauma increased from 5.2% of claims to 6.4% of claims, multiple physical injuries increased from 2.9% to 3.4% of claims, and mental injuries increased from 1.9% to 2.5% of claims. These claims are more complex and more frequently contested than specific injury claims, as we discuss in the report.

Table A.6. Demographics and Injury Type by Year of Injury, Patient-Level Analysis Sample

Group	Characteristic	2017	2018	2019	2020	2021	2022	2023	2024	Total
Age	Mean age at injury (14-99)	41.4	41.2	41.3	41.4	41.0	41.2	41.2	41.1	41.2
Sex	% female	43.4%	43.6%	43.9%	40.9%	41.5%	42.3%	42.8%	43.0%	42.7%
Nature	Specific injury - other	45.3%	46.4%	46.8%	42.4%	44.8%	46.0%	46.4%	46.4%	45.6%
Nature	Specific injury - sprain/strain/fracture	42.4%	42.0%	41.2%	39.4%	42.0%	41.1%	40.5%	40.2%	41.1%
Nature	Occ. disease - physical	1.5%	1.5%	1.7%	1.6%	1.1%	1.3%	1.3%	1.3%	1.4%
Nature	Mental	1.7%	1.8%	1.9%	1.7%	1.7%	1.8%	2.2%	2.4%	1.9%
Nature	Cumulative injury - physical	5.6%	5.1%	5.2%	5.9%	4.8%	5.0%	5.5%	6.1%	5.4%
Nature	Multiple physical	3.3%	3.0%	3.2%	3.0%	2.8%	2.9%	3.4%	3.4%	3.1%
Nature	COVID-19	0.0%	0.0%	0.0%	6.0%	2.7%	1.9%	0.6%	0.2%	1.4%
Nature	Missing/invalid	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
Body part	Head	9.3%	9.5%	9.6%	8.7%	9.2%	9.7%	10.4%	11.0%	9.7%
Body part	Neck	2.4%	2.4%	2.4%	2.2%	2.2%	2.2%	2.5%	2.7%	2.4%
Body part	Upper extremity	36.5%	36.9%	36.2%	33.7%	35.1%	35.0%	35.0%	35.0%	35.4%
Body part	Trunk - back or spine	14.0%	13.9%	13.7%	13.6%	14.1%	13.5%	13.5%	13.4%	13.7%
Body part	Trunk - other	4.6%	4.6%	4.5%	7.6%	5.5%	5.3%	4.7%	4.6%	5.2%
Body part	Lower extremity	18.7%	19.0%	19.3%	18.1%	19.7%	20.0%	20.0%	19.8%	19.4%
Body part	Multiple, mental, or other	14.2%	13.7%	14.1%	15.9%	14.1%	14.2%	13.9%	13.4%	14.2%
Body part	Missing/invalid	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sample size	Number of claims	491,903	527,544	544,231	465,562	500,831	517,365	512,403	494,605	4,054,444

SOURCE: 2017-2024 WCIS.

NOTES: Analysis sample = injured workers with at least one medical bill (JCN-year enhanced file), by year of injury. Age is the mean age at injury, restricted to ages 14-99. Percent female is the share of all cases in the column with recorded sex female. Within each group of categories the categories and "Missing/invalid" are column percentages summing to 100. Variables are drawn from the FROI. "Nature" = WCIO [Workers' Compensation Insurance Organizations] nature of injury code. "Body part" = WCIO body part of injury code.

Table A.7. Self-Insured Status and Industry by Injury Year, Patient-Level Analysis Sample

Group	Characteristic	2017	2018	2019	2020	2021	2022	2023	2024	Total
Self-insured	% self-insured	30.8%	29.6%	30.1%	31.3%	30.5%	31.0%	30.5%	30.3%	30.5%
NAICS industry sector	Agriculture, Forestry, Fishing and Hunting	3.2%	3.6%	3.5%	3.8%	3.5%	3.0%	2.9%	2.9%	3.3%
NAICS industry sector	Mining, Quarrying, and Oil and Gas Extraction	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
NAICS industry sector	Utilities	0.6%	0.5%	0.6%	0.5%	0.5%	0.4%	0.4%	0.5%	0.5%
NAICS industry sector	Construction	4.6%	5.5%	5.5%	5.7%	5.5%	5.4%	5.2%	5.3%	5.3%
NAICS industry sector	Manufacturing	8.2%	10.3%	10.5%	10.8%	10.7%	9.9%	9.9%	9.5%	10.0%
NAICS industry sector	Wholesale Trade	3.2%	3.3%	3.3%	3.4%	3.6%	4.6%	4.6%	4.3%	3.8%
NAICS industry sector	Retail Trade	9.9%	11.3%	11.1%	11.9%	12.1%	12.6%	12.9%	12.7%	11.8%
NAICS industry sector	Transportation and Warehousing	4.7%	5.1%	5.5%	6.8%	7.8%	6.9%	6.1%	6.0%	6.1%
NAICS industry sector	Information	1.8%	1.6%	1.4%	1.1%	1.1%	1.1%	1.1%	0.8%	1.3%
NAICS industry sector	Finance and Insurance	1.5%	1.8%	1.9%	2.0%	2.3%	2.4%	2.4%	2.1%	2.1%
NAICS industry sector	Real Estate and Rental and Leasing	1.4%	1.5%	1.7%	1.5%	1.5%	1.5%	1.6%	1.8%	1.6%
NAICS industry sector	Professional, Scientific, and Technical Services	2.5%	2.5%	2.7%	2.5%	2.7%	2.7%	2.7%	2.9%	2.7%
NAICS industry sector	Management of Companies and Enterprises	0.4%	0.2%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%
NAICS industry sector	Administrative/Support and Waste Mgmt/Remediation	7.3%	8.5%	8.5%	8.3%	8.8%	8.5%	8.3%	8.0%	8.3%
NAICS industry sector	Educational Services	6.9%	7.3%	7.6%	4.5%	6.0%	7.5%	7.8%	8.2%	7.0%

Group	Characteristic	2017	2018	2019	2020	2021	2022	2023	2024	Total
NAICS industry sector	Health Care and Social Assistance	10.3%	11.0%	11.1%	13.5%	11.7%	10.8%	11.1%	11.7%	11.4%
NAICS industry sector	Arts, Entertainment, and Recreation	2.0%	2.1%	2.2%	1.4%	1.7%	2.1%	2.3%	2.4%	2.0%
NAICS industry sector	Accommodation and Food Services	7.2%	8.2%	8.2%	6.4%	7.0%	7.6%	8.0%	8.1%	7.6%
NAICS industry sector	Other Services (except Public Administration)	2.7%	3.1%	3.1%	2.8%	2.5%	2.5%	2.7%	2.8%	2.8%
NAICS industry sector	Public Administration	10.2%	10.2%	10.6%	12.2%	10.3%	9.8%	9.4%	9.5%	10.3%
NAICS industry sector	Missing/invalid	11.4%	2.4%	0.8%	0.6%	0.3%	0.3%	0.3%	0.3%	2.0%
N (observations)	N (observations)	491,903	527,544	544,231	465,562	500,831	517,365	512,403	494,605	4,054,444

SOURCE: 2017-2024 WCIS.

NOTES: Analysis sample = injured workers with at least one medical bill (JCN-year enhanced file), by year of injury. Percent self-insured is the share of cases with the FROI self-insured indicator = Yes. Industry is the 2-digit NAICS sector from the FROI industry code; within the block the sectors and "Missing/invalid" are column percentages summing to 100. Sector labels follow the 2017 NAICS classification.

Table A.8. DWC Region of Worker Residence by Injury Year, Workers with 1+ Medical Bill in WCIS

Region Name	2017	2018	2019	2020	2021	2022	2023	2024	Total
Bay Area	15.4%	18.1%	17.4%	15.5%	16.3%	16.2%	16.1%	16.0%	16.4%
Central Coast	5.4%	6.6%	6.8%	6.9%	7.0%	6.8%	6.5%	6.6%	6.6%
Central Valley	9.8%	11.8%	12.1%	13.1%	13.2%	13.2%	13.4%	13.2%	12.5%
Eastern Sierra Foothills	1.4%	1.7%	1.7%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%
Inland Empire	17.3%	20.2%	20.5%	21.7%	21.7%	22.0%	21.9%	21.8%	20.9%
Los Angeles	22.9%	25.6%	25.7%	25.4%	24.1%	24.5%	24.9%	25.0%	24.8%
N. Sacramento Valley	1.1%	1.3%	1.2%	1.2%	1.3%	1.2%	1.1%	1.1%	1.2%
North State-Shasta	1.2%	1.3%	1.3%	1.3%	1.3%	1.2%	1.2%	1.3%	1.3%
Sacramento Valley	3.6%	4.5%	4.4%	4.4%	4.4%	4.4%	4.4%	4.5%	4.3%
San Diego	6.7%	8.0%	7.9%	7.8%	8.0%	7.9%	8.0%	8.1%	7.8%
Out of California	0.8%	0.9%	0.9%	0.8%	0.9%	0.9%	0.8%	0.8%	0.8%
Missing/invalid	14.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%
N (observations)	491,903	527,544	544,231	465,562	500,831	517,365	512,403	494,605	4,054,444

SOURCE: 2017-2024 WCIS.

NOTES: Analysis sample = injured workers with at least one medical bill (JCN-year enhanced file), by year of injury. Region is the DWC region of the worker's 5-digit ZIP code of residence. ZIP code was taken from FROI if available. Most common ZIP code on medical bills was assigned if ZIP code on FROI was unavailable. "Out of California" = a ZIP code was reported but is outside California; "Missing/invalid" = no usable residence ZIP. Column percentages sum to 100.

Additional Details of Measure Construction

This section provides additional details on measure construction, including lists of codes used to define categories used in the study.¹

Code Sets

Table A.9. DWC Region Definitions, Count of Injured Workers, and Share Urban/Suburban/Rural

DWC Region	Counties	Injured workers with 1+ medical bill, 2024 Injury year	Urban %	Suburban %	Rural %
Los Angeles	Los Angeles	123,894	87	6	7
Inland Empire	Imperial, Orange, Riverside, San Bernardino	107,935	54	32	14
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma	79,056	70	15	15
Central Valley	Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare	65,244	31	9	60
San Diego	San Diego	39,933	70	21	9
Central Coast	Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Ventura	32,488	24	30	47
Sacramento Valley	Sacramento, Yolo	22,491	71	12	17
Eastern Sierra Foothills	Inyo, Mariposa, Mono, Nevada, Placer, Tuolumne, Alpine, Amador, Calaveras, El Dorado	8,437	17	14	69
North State-Shasta	Del Norte, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Trinity	6,192	4	7	90
N. Sacramento Valley	Butte, Colusa, Glenn, Sutter, Tehama, Yuba	5,481	6	9	85
All regions		491,151	60	17	23

SOURCE: Authors' calculations, 2024 WCIS.

NOTES: County definitions from DWC. Table excludes workers with missing or out-of-state residential ZIP code.

Table A.10 describes the mapping from taxonomy codes to the provider and physician specialty categories used in this report. Four provider types not reported separately in the main text had at least 500 individual (non-organizational) NPIs with 1+ bill line in 2024: Student in an Organized Health Care Education/Training Program (N = 1,148), Dentist (764), Specialist (635), and Single Specialty (500). Four physician specialties not reported separately in the main text

had at least 500 individual physician NPIs with a paid workers' compensation bill line in 2024: Diagnostic Radiology (5,299), Cardiovascular Disease (1,570), Hospitalist (936), and Anatomic Pathology & Clinical Pathology (533). These groups are named by their NUCC taxonomy specialization, or by classification where the taxonomy code has no subspecialization. Organizational NPIs are excluded.

Table A.10. Taxonomy Codes for Provider and Physician Specialty Classification

Provider Category	Taxonomy codes (NUCC)
All Physicians	All codes beginning 207, 208, or 209; plus 204E, 204F, 204C, 204D, 204R, 202C, 202D, 202K
Chiropractors	All codes beginning 111N
Nurse Practitioners	All codes beginning 363L
Physician Assistants	363A00000X; 363AM0700X; 363AS0400X
Physical Therapists	All codes beginning 2251
Acupuncturists	171100000X
Psychologists	All codes beginning 103T; plus 103G00000X (Clinical Neuropsychologist)
Primary Care (physician)	208D00000X (General Practice); all codes beginning 207Q (Family Medicine); 207R00000X (General Internal Medicine, base only); 208000000X (General Pediatrics, base only)
Emergency Medicine (physician)	All codes beginning 207P
Anesthesiology (physician)	All codes beginning 207L
Orthopedic Surgery (physician)	All codes beginning 207X
Other Surgery (physician)	All codes beginning 2086 (General Surgery and subspecialties), 208C (Colon & Rectal Surgery), 207T (Neurological Surgery), 207V (Obstetrics & Gynecology), 207W (Ophthalmology), 207Y (Otolaryngology), 2082 (Plastic Surgery), 208G (Thoracic Surgery), or 2088 (Urology)
Physical Medicine & Rehabilitation (physician)	All codes beginning 2081
Preventive Medicine (physician)	All codes beginning 2083 (includes Occupational Medicine, Public Health, and Aerospace Medicine subspecialties)
Neurology (physician)	2084N0400X; 2084N0402X (Child Neurology); 2084N0600X (Clinical Neurophysiology); 2084N0008X (Neuromuscular Medicine); 2084A2900X (Neurocritical Care); 2084P0005X (Neurodevelopmental Disabilities)
Psychiatry (physician)	2084P0800X; 2084P0802X (Addiction); 2084P0804X (Child & Adolescent); 2084F0202X (Forensic); 2084P0805X (Geriatric); 2084P0015X (Psychosomatic)

NOTES: Provider categories are assigned from the NUCC health-care provider taxonomy code appearing most often on an NPI's bill lines in a given service year. The physician specialty categories are subsets of All Physicians. Categories are not mutually exclusive at the grouping level: Other Surgery excludes Orthopedic Surgery, which is reported separately. Oral & Maxillofacial Surgery (204E) and Transplant Surgery (204F) are also excluded to allow comparison to the AHRF "Total Surgical Specialties" grouping after Orthopedic Surgery is removed from the Total Surgical Specialties count in AHRF.

Table A.11. Procedure and Provider Type Criteria for Classifying Visits

Visit Type	Procedure Codes (CPT/HCPCS)	Provider Taxonomy Codes
E&M (evaluation & management)	99202–99205 (new patient office/outpatient); 99212–99215 (established patient); 99201, 99211 (historical, deleted 2021); 99241–99245 (consultations); 99441–99443 (telephone E&M); 99421–99423 (online digital E&M, physician); 98970–98972 (online digital E&M, non-physician); G2012 (virtual check-in)	Procedure code only.
Physical Medicine (PM)	98925–98929 (osteopathic manipulation); 98940–98943 (chiropractic manipulation); 97810–97814 (acupuncture); 20560–20561 (dry needling); 97010–97039 and G0283 (passive modalities); 97110–97128, 97131–97160, 97173–97799 (active therapies); 97161–97168 (PT/OT evaluation, 2017+); 95851–95852 (functional assessment); 97001–97004 (historical PT/OT eval, deleted 2017)	Procedure code only.
Orthopedic	RBCS Musculoskeletal major procedure set (1,213 CPT/HCPCS codes): principally the 20100–29916 musculoskeletal surgery series (e.g., 2xxxx incision, excision, repair, arthroscopy of shoulder, arm, wrist, hand, pelvis, hip, femur, knee, leg, ankle, foot); spinal procedures 22010–22899 and 63001–63746; peripheral-nerve procedures 64568–64999; plus select category-III/T codes (0095T, 0098T, 0163T–0165T, 0309T, 0396T, 0466T) and HCPCS G0412–G0415.	OR rendering provider was orthopedic-surgeon (taxonomy 207X*).
Behavioral Health	RBCS Behavioral Health Services procedure set (166 CPT/HCPCS codes): psychiatric diagnostic evaluation 90791–90792; psychotherapy 90832–90840, including family and group therapy 90846–90853; other psychiatric services 90865–90899; psychological and neuropsychological testing 96101–96146; health-behavior assessment and intervention 96150–96168; adaptive-behavior and cognitive services 97127–97158; smoking-cessation and substance-use screening and counseling 99406–99409 and G0396–G0397; collaborative-care management 99492–99494 and G0512; plus category-III/T codes, HCPCS H0001–H0038, T1007, and G-codes for depression and alcohol screening (G0443–G0447), opioid-use-disorder treatment (G2067–G2074), and behavioral-health integration (G2214).	OR rendering provider was psychologist (103T*, 103G00000X) or psychiatrist (2084P0800X and subspecialties).

NOTES: A bill line is assigned to a visit type if its procedure code is in the listed set OR (where noted) the rendering provider's taxonomy matches the provider leg (see Provider Taxonomy Code Sets). E&M and Physical Medicine are procedure-based only. Code ranges (e.g., 97010–97039) denote all codes in the inclusive range. The Orthopedic/Musculoskeletal procedure set (1,213 codes) is summarized here; the full code set can be found in the RBCS documentation.

Table A.12. Code Sets Used to Identify Care Delivered as Telehealth

Field	Codes Included
Modifier codes	93, 95, GT, FQ, FR (scanned across HCPCS and jurisdiction modifier fields)
Place of service codes	02 (telehealth, non-home); 10 (telehealth, patient home)
Revenue codes	780; 0780

NOTES: A bill line is counted as telehealth-delivered when it meets any of the criteria above and the procedure is on the CMS Medicare telehealth-eligible list for that service year.

Geography and Distance Measures

To measure the distance traveled by injured workers to obtain care, we used ArcGIS Pro with the Network Analyst extension to calculate travel between the worker's ZIP code and the provider's ZIP code. Specifically, we used the Origin-Destination (OD) Cost Matrix tool to estimate network-based travel between population-weighted ZIP code centroids representing the worker's residential ZIP code and the provider's location ZIP code (ESRI, undated). Where population-weighted ZIP codes are unavailable, we use unweighted ZIP code centroids. Our primary measure of distance is the driving distance (in miles) along the road network.

Tables A.13 and A.14 describe the fields and data sources used to determine the rendering provider and the provider ZIP code for analysis of provider supply by region. Table A.15 describes the availability of provider location information from different data sources used in alternative distance measures and the percentage of observations affected by winsorization at 150 miles.

Table A.13. Distribution of the Source of the Provider ZIP Code: 2024

ZIP code source	Individual NPIs	% of individual NPIs
WCIS facility ZIP code	56,077	75.2%
WCIS billing ZIP code	1,680	2.3%
NPPES practice location	2,324	3.1%
NPPES business mailing address	122	0.2%
PPEF practice location	91	0.1%
Outside California	14,304	19.2%
No location information	1	0.0%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Table A.14. Distribution of the Source of the Provider NPI: 2024

NPI source	Bill lines	% of bill lines
Rendering provider NPI, line level	9,967,137	35.5%
Rendering provider NPI, bill level	15,113,790	53.8%
Billing provider NPI	1,998,444	7.1%
No NPI reported	1,018,892	3.6%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Table A.15. Availability of Each Provider-Location Source for the Distance Measure, by Type of Visit: 2024 Injuries

Visit type	Claims with an in-person distance	% with a WCIS facility ZIP code	% with an NPPES practice location	% with a PPEF practice location	% winsorized at 150 miles
E&M	422,344	87.2%	88.6%	2.2%	6.9%
Physical medicine	214,625	83.5%	82.4%	5.8%	7.9%
Orthopedic	64,147	87.5%	89.8%	5.9%	4.0%
Behavioral health	22,008	87.3%	91.0%	11.9%	9.1%

Appendix B: Supplementary Results and Sensitivity Analyses

This appendix contains tables with estimates of statistics that were reported graphically in the body of the report, as well as some sensitivity analyses reporting findings under alternative measure definitions. Results are organized by chapter.

Supplementary Results on Timeliness and Distance Traveled (Chapter 3)

Sample Sizes for Patient-Level Access Measures (Chapter 3)

Table B.1. Sample Sizes and Measure Coverage for E&M Visits, Accepted Specific-Injury Claims, by Year of Injury

Year of injury	Claims with a medical bill	Claims with an E&M visit within 1 year	% with an E&M visit within 1 year	Claims with any distance	Claims with in-person distance	% of claims with any distance that have in-person distance
2017	405,625	356,710	87.9%	357,141	357,025	100.0%
2018	438,998	389,650	88.8%	393,462	393,260	99.9%
2019	448,732	399,845	89.1%	402,571	402,153	99.9%
2020	355,105	320,439	90.2%	321,601	315,430	98.1%
2021	408,207	367,294	90.0%	367,732	362,781	98.7%
2022	423,514	379,971	89.7%	379,788	375,927	99.0%
2023	419,375	376,457	89.8%	376,005	372,513	99.1%
2024	400,350	359,551	89.8%	358,140	353,995	98.8%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Table restricted to accepted specific-injury claims. "Claims with a medical bill" is the number of claims with at least one medical bill line. "Claims with an E&M visit within 1 year" counts claims with at least one such visit within 365 days of the date the injury was reported to the employer. "Claims with any distance" counts claims for which a distance could be computed to the first visit, i.e. the union of in-person and telehealth visits. "Claims with in-person distance" counts those with a distance to a first in-person visit measured (i.e., in-state ZIP codes for both the patient and the location where care was received).

Table B.2. Sample Sizes and Measure Coverage for Physical Medicine Visits, Accepted Specific-Injury Claims, by Year of Injury

Year of injury	Claims with a medical bill	Claims with a Physical medicine visit within 1 year	% with a Physical medicine visit within 1 year	Claims with any distance	Claims with in-person distance	% of claims with any distance that have in-person distance
2017	405,625	166,684	41.1%	167,789	167,786	100.0%
2018	438,998	185,143	42.2%	188,648	188,645	100.0%
2019	448,732	190,137	42.4%	194,525	194,521	100.0%
2020	355,105	165,770	46.7%	167,350	167,289	100.0%
2021	408,207	190,048	46.6%	191,355	191,214	99.9%
2022	423,514	190,733	45.0%	192,033	191,856	99.9%
2023	419,375	186,615	44.5%	187,264	187,211	100.0%
2024	400,350	180,302	45.0%	179,379	179,342	100.0%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Table restricted to accepted specific-injury claims. "Claims with a medical bill" is the number of claims with at least one medical bill line. "Claims with a PM visit within 1 year" counts claims with at least one such visit within 365 days of the date the injury was reported to the employer. "Claims with any distance" counts claims for which a distance could be computed to the first visit, i.e. the union of in-person and telehealth visits. "Claims with in-person distance" counts those with a distance to a first in-person visit measured (i.e., in-state ZIP codes for both the patient and the location where care was received).

Table B.3. Sample Sizes and Measure Coverage for Orthopedic Visits, Accepted Specific-Injury Claims, by Year of Injury

Year of injury	Claims with a medical bill	Claims with an Orthopedic visit within 1 year	% with an Orthopedic visit within 1 year	Claims with any distance	Claims with in-person distance	% of claims with any distance that have in-person distance
2017	405,625	64,272	15.8%	72,984	72,972	100.0%
2018	438,998	64,873	14.8%	75,112	75,090	100.0%
2019	448,732	60,141	13.4%	72,260	72,173	99.9%
2020	355,105	52,692	14.8%	61,514	61,306	99.7%
2021	408,207	55,592	13.6%	65,160	65,063	99.9%
2022	423,514	53,774	12.7%	63,642	63,574	99.9%
2023	419,375	51,195	12.2%	59,708	59,662	99.9%
2024	400,350	47,628	11.9%	51,474	51,439	99.9%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Table restricted to accepted specific-injury claims. "Claims with a medical bill" is the number of claims with at least one medical bill line. "Claims with an Orthopedic visit within 1 year" counts claims with at least one such visit within 365 days of the date the injury was reported to the employer. "Claims with any distance" counts claims for which a distance could be computed to the first visit, i.e. the union of in-person and telehealth visits. "Claims with in-person distance" counts those with a distance to a first in-person visit measured (i.e., in-state ZIP codes for both the patient and the location where care was received).

Table B.4. Sample Sizes and Measure Coverage for Behavioral Health Visits, Accepted Specific-Injury Claims, by Year of Injury

Year of injury	Claims with a medical bill	Claims with a Behavioral health visit within 1 year	% with a Behavioral health visit within 1 year	Claims with any distance	Claims with in-person distance	% of claims with any distance that have in-person distance
2017	405,625	7,047	1.7%	12,736	12,692	99.7%
2018	438,998	7,429	1.7%	13,572	13,493	99.4%
2019	448,732	8,247	1.8%	14,940	14,782	98.9%
2020	355,105	7,315	2.1%	12,772	12,571	98.4%
2021	408,207	8,942	2.2%	14,555	14,261	98.0%
2022	423,514	9,095	2.1%	14,653	14,349	97.9%
2023	419,375	9,293	2.2%	13,463	13,138	97.6%
2024	400,350	8,133	2.0%	9,890	9,722	98.3%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Table restricted to accepted specific-injury claims. "Claims with a medical bill" is the number of claims with at least one medical bill line. "Claims with a Behavioral health visit within 1 year" counts claims with at least one such visit within 365 days of the date the injury was reported to the employer. "Claims with any distance" counts claims for which a distance could be computed to the first visit, i.e. the union of in-person and telehealth visits. "Claims with in-person distance" counts those with a distance to a first in-person visit measured (i.e., in-state ZIP codes for both the patient and the location where care was received).

Table B.5. Claims with a First Visit Beyond Truncation Window for Timeliness in Selected Years of Injury, by Visit Type

Visit type and year of injury	Claims with a medical bill	Claims with a visit, any date	Claims with a visit within 183 days	Claims with a visit within 365 days	% of claims with a visit beyond 183 days	% of claims with a visit beyond 365 days
E&M, 2017	405,625	362,725	352,562	356,710	2.8%	1.7%
E&M, 2022	423,514	382,376	376,971	379,971	1.4%	0.6%
E&M, 2024	400,350	360,490	356,263	359,551	1.2%	0.3%
Physical medicine, 2017	405,625	173,081	160,693	166,684	7.2%	3.7%
Physical medicine, 2022	423,514	194,720	184,832	190,733	5.1%	2.0%
Physical medicine, 2024	400,350	182,000	174,370	180,302	4.2%	0.9%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. "Claims with a visit, any date" counts claims with at least one qualifying visit at any point after the injury was reported to the employer. Truncation at 365 days is our main timeliness measure; truncation at 183 days is used for sensitivity analysis.

Timeliness of Care (Chapter 3)

Tables in this subsection report statistics and statistical test results on timeliness cited or shown graphically in Chapter 3.

Table B.6. Mean and Median Days from Injury Report to the First Visit, California Statewide: 2022-2024 Injuries

Year of injury	E&M Mean	E&M Median	Physical medicine Mean	Physical medicine Median
2022	8.9	1	35.2	17
2023	8.2	1	34.9	17
2024	8.8	1	35.3	16
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	0.001	<0.001	0.057	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days.

Table B.7. Percentage of Claims Whose First E&M Visit Exceeded Each Day Threshold, California Statewide: 2022-2024 Injuries

Days from injury report to first visit	2022	2023	2024	p-value, 2024 vs. 2022-23
More than 0 days	54.8%	54.1%	53.5%	<0.001
More than 1 day	40.1%	39.3%	38.6%	<0.001
More than 3 days	29.4%	28.5%	27.9%	<0.001
More than 7 days	18.3%	17.3%	17.0%	<0.001
More than 14 days	11.4%	10.7%	10.6%	<0.001
More than 30 days	6.4%	5.9%	6.0%	0.021

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Each row is the percentage of claims with a qualifying visit within 365 days whose first visit came more than that many days after the injury was reported to the employer. \

Table B.8. Percentage of Claims Whose First Physical Medicine Visit Exceeded Each Day Threshold, California Statewide: 2022-2024 Injuries

Days from injury report to first visit	2022	2023	2024	p-value, 2024 vs. 2022-23
More than 0 days	88.6%	88.8%	88.0%	<0.001
More than 1 day	83.0%	83.3%	82.1%	<0.001
More than 3 days	76.9%	76.9%	75.0%	<0.001
More than 7 days	66.6%	66.3%	64.5%	<0.001
More than 14 days	53.7%	53.3%	52.2%	<0.001
More than 30 days	33.8%	33.5%	33.4%	0.112

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Each row is the percentage of claims with a qualifying visit within 365 days whose first visit came more than that many days after the injury was reported to the employer. The p-value is from a chi-squared test for the difference between 2024 and the 2022-2023 proportions.

Timeliness of Care by Region

Table B.9. Median Days from Injury Report to the First E&M Visit, by DWC Region: 2022-2024 Injuries

Worker residence region	2022	2023	2024	p-value, 2024 vs. 2022-23
Bay Area	1	1	1	0.003
Central Coast	1	1	1	0.114
Central Valley	1	1	1	<0.001
Eastern Sierra Foothills	2	2	2	0.002
Inland Empire	0	0	0	<0.001
Los Angeles	0	0	0	<0.001
N. Sacramento Valley	2	2	2	0.180
North State-Shasta	5	5	5	0.531
Sacramento Valley	2	1	1	<0.001
San Diego	1	1	0	<0.001
California statewide	1	1	1	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. Region is the worker's residence; workers residing outside California are excluded from the regional rows but included in the statewide total.

Table B.10. Mean Days from Injury Report to the First E&M Visit, by DWC Region: 2022-2024 Injuries

Worker residence region	2022	2023	2024	p-value, 2024 vs. 2022-23
Bay Area	10.0	8.6	9.3	0.779
Central Coast	7.9	7.7	8.3	0.047
Central Valley	7.7	7.1	8.0	<0.001
Eastern Sierra Foothills	11.8	12.4	11.0	0.033
Inland Empire	8.6	8.2	8.8	0.002
Los Angeles	9.0	8.4	8.6	0.479
N. Sacramento Valley	10.0	10.8	12.9	<0.001
North State-Shasta	17.7	16.2	16.0	0.218
Sacramento Valley	8.8	8.0	8.1	0.282
San Diego	7.3	7.3	7.7	0.036
California statewide	8.9	8.2	8.8	0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. Region is the worker's residence; workers residing outside California are excluded from the regional rows but included in the statewide total.

**Table B.11. Median Days from Injury Report to the First Physical Medicine Visit, by DWC Region:
2022-2024 Injuries**

Worker residence region	2022	2023	2024	p-value, 2024 vs. 2022-23
Bay Area	18	17	17	<0.001
Central Coast	32	33	31	<0.001
Central Valley	27	27	26	<0.001
Eastern Sierra Foothills	29	32	30	0.391
Inland Empire	15	14	14	<0.001
Los Angeles	12	12	11	<0.001
N. Sacramento Valley	43	44	44	0.264
North State-Shasta	51	56	45	<0.001
Sacramento Valley	18	18	17	0.110
San Diego	9	8	8	0.123
California statewide	17	17	16	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. Region is the worker's residence; workers residing outside California are excluded from the regional rows but included in the statewide total.

**Table B.12. Mean Days from Injury Report to the First Physical Medicine Visit, by DWC Region:
2022-2024 Injuries**

Worker residence region	2022	2023	2024	p-value, 2024 vs. 2022-23
Bay Area	34.2	33.1	33.4	0.557
Central Coast	49.8	52.2	51.5	0.478
Central Valley	45.8	44.4	44.8	0.580
Eastern Sierra Foothills	48.3	51.9	47.3	0.045
Inland Empire	34.2	33.0	34.0	0.166
Los Angeles	29.4	29.6	29.6	0.768
N. Sacramento Valley	60.8	64.4	64.6	0.286
North State-Shasta	72.5	75.9	65.6	<0.001
Sacramento Valley	32.7	32.5	33.4	0.216
San Diego	25.9	25.4	27.9	<0.001
California statewide	35.2	34.9	35.3	0.057

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Days from the date the injury was reported to the employer to the date of the first qualifying visit, truncated at 365 days. Region is the worker's residence; workers residing outside California are excluded from the regional rows but included in the statewide total.

Timeliness for Non-Specific and Denied Claims (Chapter 3)

Table B.13. Median and Mean Days from Injury Report to the First E&M Visit, by Nature of Injury and Claim Denial Status, California Statewide: 2022-2024 Injuries

Nature of injury Claim denial status	Specific Accepted	Specific Denied	Non-specific Accepted	Non-specific Denied
Median days to first E&M visit	Median days to first E&M visit	Median days to first E&M visit	Median days to first E&M visit	Median days to first E&M visit
Median days, 2022 injuries	1	4	2	27
Median days, 2023 injuries	1	4	2	27
Median days, 2024 injuries	1	5	2	29
p-value, 2024 vs. 2022-23 average	<0.001	0.094	<0.001	<0.001
Mean days, 2022 injuries	8.9	37.7	23.1	66.2
Mean days, 2023 injuries	8.2	37.6	24.8	64.5
Mean days, 2024 injuries	8.8	37.2	22.8	65.9
p-value, 2024 vs. 2022-23 average	0.001	0.498	0.003	0.527

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first E&M visit, truncated at 365 days. Specific injuries are sprains, strains, fractures, and other specific traumatic injuries; non-specific claims are occupational disease, mental, cumulative trauma, and multiple-injury claims. Each p-value is for the difference between 2024 and the 2022-2023 average within that column (Wilcoxon rank-sum for the median, t-test for the mean).

Table B.14. Median and Mean Days from Injury Report to the First Physical Medicine Visit, by Nature of Injury and Claim Denial Status, California Statewide: 2022-2024 Injuries

Nature of injury Claim denial status	Specific Accepted	Specific Denied	Non-specific Accepted	Non-specific Denied
Median days, 2022 injuries	17	34	26	53
Median days, 2023 injuries	17	34	26	49
Median days, 2024 injuries	16	35	24	49
p-value, 2024 vs. 2022-23 average	<0.001	0.809	<0.001	0.118
Mean days, 2022 injuries	35.2	69.4	51.4	86.5
Mean days, 2023 injuries	34.9	68.7	51.7	84.3
Mean days, 2024 injuries	35.3	66.5	49.2	80.5
p-value, 2024 vs. 2022-23 average	0.057	0.015	<0.001	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Time to first visit is the number of days from the date the injury was reported to the employer to the date of the first PM visit, truncated at 365 days. Specific injuries are sprains, strains, fractures, and other specific traumatic injuries; non-specific claims are occupational disease, mental, cumulative trauma, and multiple-injury claims. Each p-value is for the difference between 2024 and the 2022-2023 average within that column (Wilcoxon rank-sum for the median, t-test for the mean).

Table B.15. Number of Claims With 1+ Medical Bill, by Nature of Injury and Claim Denial Status, California Statewide: 2022-2024 Injuries

Nature of injury Claim denial status	Specific Accepted	Specific Denied	Non-specific Accepted	Non-specific Denied
N claims, 2022 injuries	423,514	27,103	35,802	20,804
% of 2022 claims	81.7%	5.2%	6.9%	4.0%
N claims, 2023 injuries	419,375	25,890	41,211	22,657
% of 2023 claims	81.7%	5.0%	8.0%	4.4%
N claims, 2024 injuries	400,350	28,060	37,179	27,732
% of 2024 claims	80.9%	5.7%	7.5%	5.6%

Distance Traveled to Care

Figures B.1 through B.4 show box-and-whisker plots for the distance traveled to the four types of care examined in Chapter 3. The boxes show the median and the interquartile range, the whiskers show the 10th and 90th percentiles, and the red diamond markers show the mean. These figures may be of interest to readers seeking more detail on how the distribution of distance traveled has changed beyond the median and mean statistics reported in Chapter 3.

Figure B.1. Box-and-Whisker Plot for Distance Traveled to First In-Person E&M Visit, by Year, 2022-24

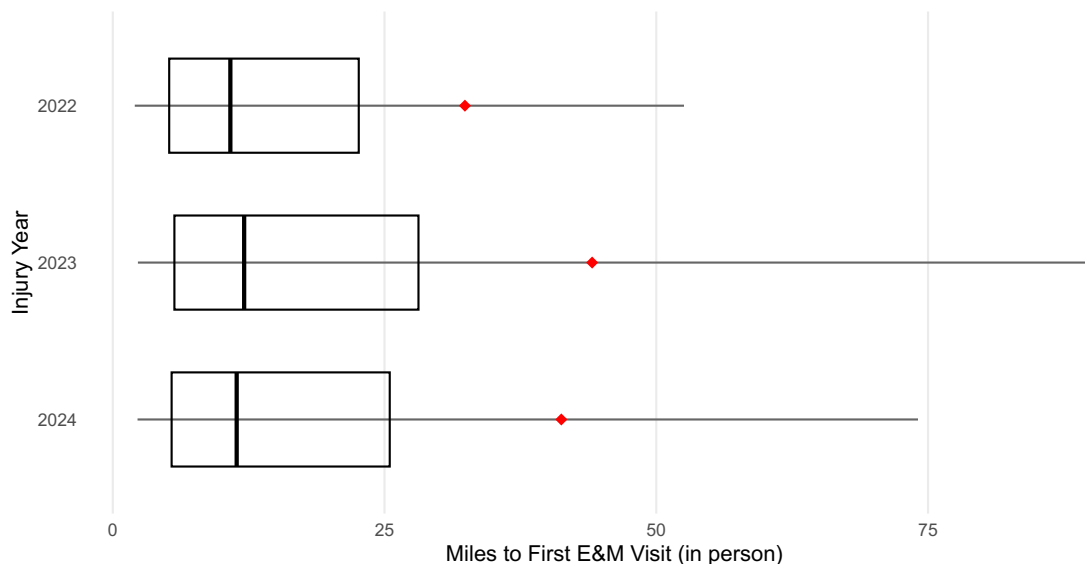


Figure B.2. Box-and-Whisker Plot for Distance Traveled to First In-Person Physical Medicine Visit, by Year, 2022-24

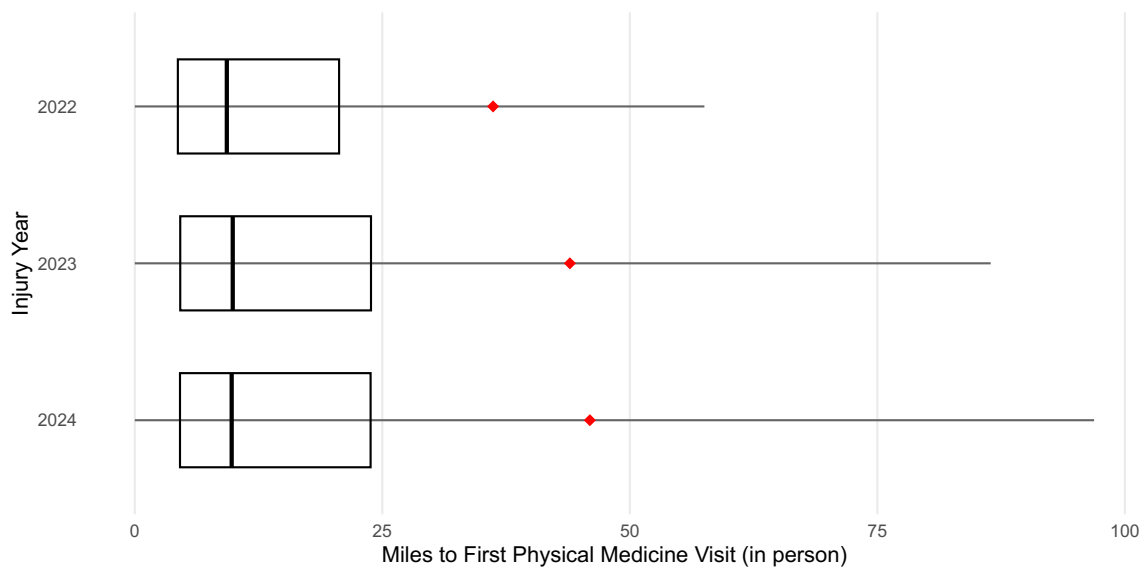


Figure B.3. Box-and-Whisker Plot for Distance Traveled to First In-Person Orthopedic Visit, by Year, 2022-24

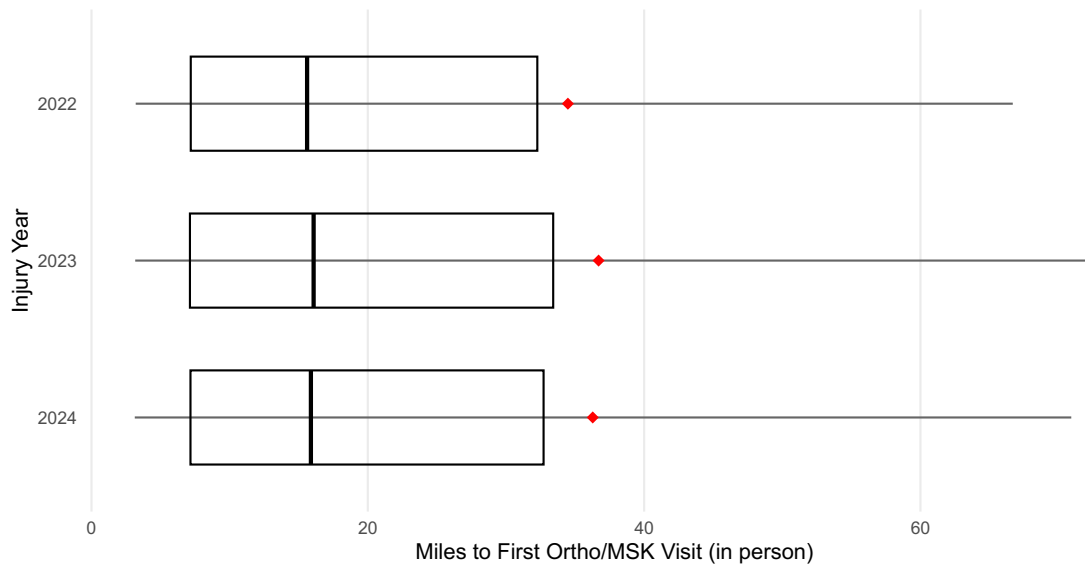
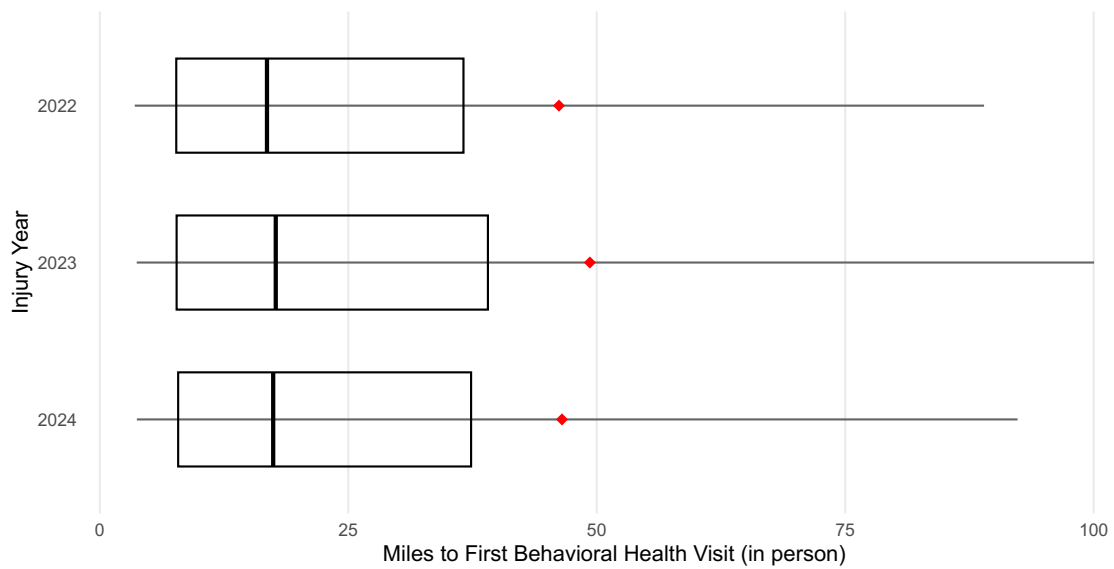


Figure B.4. Box-and-Whisker Plot for Distance Traveled to First In-Person Behavioral Health Visit, by Year, 20242-2024



Distance Traveled by Population Density (Urban/Suburban/Rural)

Table B.16. Mean Miles Traveled to the First In-Person E&M Visit, by Residence ZIP Code Density and Year of Injury

Year of injury	Urban	Suburban	Rural
2017	29.7	33.4	38.1
2018	26.6	31.2	36.0
2019	22.1	27.4	33.8
2020	19.3	24.3	31.3
2021	20.7	26.2	33.6
2022	27.8	34.1	42.8
2023	38.3	44.4	58.5
2024	35.0	43.0	56.3
Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	<0.001	<0.001	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the ZIP code of the first in-person visit.

Table B.17. Mean Miles Traveled to the First In-Person Physical Medicine Visit, by Residence ZIP Code Density and Year of Injury

Year of injury	Urban	Suburban	Rural
2017	29.0	31.7	34.2
2018	26.2	29.4	34.3
2019	26.2	29.7	38.6
2020	26.3	30.7	40.1
2021	27.3	34.4	42.0
2022	31.1	38.7	49.2
2023	38.2	46.6	59.3
2024	40.4	47.1	61.8
Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	<0.001	<0.001	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the ZIP code of the first in-person visit.

Table B.18. Mean Miles Traveled to the First In-Person Orthopedic Visit, by Residence ZIP Code Density and Year of Injury

Year of injury	Urban	Suburban	Rural
2017	22.3	30.2	44.2
2018	21.6	30.3	45.2
2019	21.5	29.4	44.1
2020	22.0	30.0	43.4
2021	24.3	33.3	45.2
2022	27.8	35.3	48.9
2023	29.1	37.2	53.0
2024	29.0	36.3	52.2
Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	0.261	0.953	0.108

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the ZIP code of the first in-person visit.

Table B.19. Mean Miles Traveled to the First In-Person Behavioral Health Visit, by Residence ZIP Code Density and Year of Injury

Year of injury	Urban	Suburban	Rural
2017	23.7	33.4	51.4
2018	23.1	38.0	53.8
2019	24.3	35.9	57.2
2020	29.0	38.4	63.2
2021	32.4	45.5	70.2
2022	35.8	47.8	76.4
2023	39.4	49.2	75.6
2024	35.0	46.4	77.8
Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	0.045	0.402	0.525

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the ZIP code of the first in-person visit.

Table B.20. Claims with In-Person Distance Observed, by Visit Type, ZIP Code Population Density, and Year of Injury

Visit type and residence ZIP density	2017	2018	2019	2020	2021	2022	2023	2024
E&M, urban	225,089	283,123	290,265	232,103	253,383	264,787	264,700	254,473
E&M, suburban	58,169	75,612	78,252	66,068	73,452	74,953	74,029	70,959
E&M, rural	78,170	100,369	103,976	88,975	98,511	99,752	97,872	93,428
Physical medicine, urban	122,668	143,715	149,524	129,485	141,075	143,115	141,460	136,211
Physical medicine, suburban	29,159	35,146	36,764	32,994	36,810	36,818	36,475	35,227
Physical medicine, rural	35,656	41,874	43,791	39,984	44,339	43,692	42,659	41,336
Orthopedic, urban	54,215	55,295	53,093	46,021	46,726	46,463	44,318	37,260
Orthopedic, suburban	14,584	15,159	15,078	13,429	13,923	13,255	12,400	11,058
Orthopedic, rural	18,276	19,341	19,873	18,047	18,949	18,245	17,322	15,076
Behavioral health, urban	15,176	16,415	18,127	15,624	16,034	16,647	16,033	13,837
Behavioral health, suburban	3,228	3,555	4,072	3,950	4,156	4,330	4,240	3,599
Behavioral health, rural	3,832	4,212	4,724	4,541	4,919	4,957	4,866	4,305

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims.

Sensitivity Analysis for Distance; Winsorization and Alternative Provider Locations

Table B.21. Mean Miles Traveled to the First In-Person Visit, Winsorized at 150 Miles, California Statewide, by Year of Injury

Year of injury	E&M	Physical medicine	Orthopedic	Behavioral health
2017	22.8	20.3	24.1	26.0
2018	21.6	19.4	24.2	26.6
2019	19.6	19.8	24.3	26.9
2020	18.6	20.2	25.0	29.8
2021	19.1	20.8	25.9	30.7
2022	22.9	23.0	27.7	32.2
2023	28.5	26.6	28.9	34.0
2024	26.7	27.0	28.5	32.9
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	<0.001	<0.001	0.271	0.790

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the first in-person visit, winsorized at 150 miles; telehealth visits are excluded.

Table B.22. Mean Miles Traveled to the First In-Person Visit, Winsorized at 150 Miles, by DWC Region: 2024 Injuries

Worker residence region	E&M	Physical medicine	Orthopedic	Behavioral health
Bay Area	41.9	41.5	33.6	31.8
Central Coast	28.0	31.9	32.3	57.6
Central Valley	36.2	35.1	41.0	65.9
Eastern Sierra Foothills	45.3	47.7	43.3	43.2
Inland Empire	19.0	19.2	27.8	27.9
Los Angeles	14.1	15.3	16.9	18.7
N. Sacramento Valley	40.9	36.6	48.7	65.0
North State-Shasta	45.4	41.2	52.8	97.4
Sacramento Valley	44.1	44.3	33.1	27.0
San Diego	19.7	22.6	20.4	27.8

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is driving distance in miles from the worker's residence ZIP code to the first in-person visit, winsorized at 150 miles; telehealth visits are excluded.

Table B.23. Median Miles Traveled to the First In-Person E&M Visit Under Alternative Distance Definitions, California Statewide, by Year of Injury

Year of injury	Main measure All claims	Facility location only	Main measure NPPES sample	NPPES measure NPPES sample
2017	10.8	9.7	10.2	18.5
2018	10.6	9.6	10.4	18.7
2019	10.2	9.6	10.1	19.4
2020	10.2	9.8	10.2	20.1
2021	10.2	9.8	10.2	20.6
2022	10.8	10.1	10.6	20.5
2023	12.1	10.2	12.0	20.6
2024	11.4	10.0	11.2	21.7
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	<0.001	<0.001	0.015	<0.001
Sample size	Sample size	Sample size	Sample size	Sample size
N observations, 2024	422,344	368,437	374,109	374,109

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is to the first in-person visit

Table B.24. Median Miles Traveled to the First In-Person Physical Medicine Visit Under Alternative Distance Definitions, California Statewide, by Year of Injury

Year of injury	Main measure All claims	Facility location only	Main measure NPPES sample	NPPES measure NPPES sample
2017	8.8	7.9	8.3	14.2
2018	8.7	7.9	8.3	14.6
2019	8.7	8.0	8.4	14.5
2020	8.9	8.2	8.5	15.2
2021	8.9	8.3	8.6	15.2
2022	9.3	8.5	8.9	14.7
2023	9.9	8.5	9.4	14.4
2024	9.8	8.5	9.3	15.2
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	<0.001	0.241	<0.001	<0.001
Sample size	Sample size	Sample size	Sample size	Sample size
N observations, 2024	214,625	179,216	176,912	176,912

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is to the first in-person visit

Table B.25. Median Miles Traveled to the First In-Person Orthopedic Visit Under Alternative Distance Definitions, California Statewide, by Year of Injury

Year of injury	Main measure All claims	Facility location only	Main measure NPPES sample	NPPES measure NPPES sample
2017	13.8	12.8	13.5	20.8
2018	14.1	13.3	14.1	21.0
2019	14.5	14.0	14.4	21.6
2020	15.0	14.4	14.9	22.9
2021	15.0	14.3	15.1	22.9
2022	15.6	14.7	15.7	23.4
2023	16.1	14.7	16.2	23.5
2024	15.9	14.6	15.9	23.9
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	0.872	0.106	0.878	<0.001
Sample size	Sample size	Sample size	Sample size	Sample size
N observations, 2024	64,147	56,102	57,598	57,598

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is to the first in-person visit

Table B.26. Median Miles Traveled to the First In-Person Behavioral Health Visit Under Alternative Distance Definitions, California Statewide, by Year of Injury

Year of injury	Main measure All claims	Facility location only	Main measure NPPES sample	NPPES measure NPPES sample
2017	15.6	14.0	15.1	23.9
2018	15.7	14.3	15.3	24.5
2019	15.8	14.4	15.6	26.2
2020	16.9	15.6	16.6	29.0
2021	16.5	14.8	16.3	28.0
2022	16.8	14.9	16.6	28.4
2023	17.7	15.4	17.6	31.7
2024	17.4	15.9	17.5	31.0
Significance	Significance	Significance	Significance	Significance
p-value, 2024 vs. 2022-23 average	0.470	0.001	0.148	<0.001
Sample size	Sample size	Sample size	Sample size	Sample size
N observations, 2024	22,008	19,221	20,032	20,032

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Accepted specific-injury claims. Distance is to the first in-person visit

Supplementary Results on Provider Participation (Chapter 4)

Provider Caseload

Table B.27. Mean and Median Number of Injured Workers Treated per Provider, by Provider Type, California Statewide: 2022-2024

Provider type	Mean 2022	Median 2022	Mean 2023	Median 2023	Mean 2024	Median 2024
Physicians	30.6	2	31.3	2	31.3	2
Chiropractors	35.6	4	35.4	4	39.9	5
Acupuncturists	44.6	6	47.3	6	49.0	7
Psychologists	28.6	5	32.9	6	35.8	6
Physical Therapists	34.0	4	34.0	4	36.7	4
Nurse Practitioners	33.9	1	38.4	1	42.1	1
Physician Assistants	63.0	3	58.5	3	55.0	3

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Providers with at least one paid workers' compensation bill line in the service year. Caseload is the number of distinct injured workers (claims) the provider billed for in the service year.

Table B.28. Mean and Median Number of Injured Workers Treated per Provider, by Physician Specialty, California Statewide: 2022-2024

Provider type	Mean 2022	Median 2022	Mean 2023	Median 2023	Mean 2024	Median 2024
Primary Care	20.0	1	20.5	1	19.3	1
Emergency Med	22.2	11	20.8	11	18.1	10
Anesthesiology	14.4	3	13.8	3	13.2	3
Orthopedic Surgery	56.2	3	56.0	3	57.2	3
Other Surgery	10.4	2	11.7	2	11.9	2
PM and R	69.7	3	67.8	2.5	69.0	3
Preventive Med	258.9	6	265.9	6	276.1	8
Neurology	26.9	2	24.6	1	36.5	2
Psychiatry	21.3	1	24.7	2	26.9	2

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: Providers with at least one paid workers' compensation bill line in the service year. Caseload is the number of distinct injured workers (claims) the provider billed for in the service year.

Provider Agreement Coverage

Table B.29. Percentage of Payments Covered by an MPN or PPO Agreement, All Providers, California Statewide, by Year

Year	% of payments under an MPN or PPO agreement
2017	66.7%
2018	67.7%
2019	65.7%
2020	66.9%
2021	66.8%
2022	66.8%
2023	68.5%
2024	68.9%

SOURCE: RAND analysis of 2017-2024 California WCIS.

NOTES: Individual providers with at least one paid workers' compensation bill line in the service year. A bill line is counted as covered when its provider-agreement code is Y (PPO) or P (MPN). Shares are payment-weighted.

Table B.30. Percentage of Payments Covered by an MPN or PPO Agreement, by Provider Type and Year

Provider type	2017	2018	2019	2020	2021	2022	2023	2024
Acupuncturists	64.7%	69.6%	70.7%	70.6%	67.9%	67.2%	68.5%	70.8%
Chiropractors	63.7%	66.2%	66.2%	66.0%	61.6%	61.3%	62.3%	61.5%
Nurse Practitioners	65.9%	67.6%	67.0%	68.2%	69.1%	67.3%	70.1%	73.9%
Physical Therapists	77.1%	78.6%	75.0%	74.6%	76.1%	76.1%	77.5%	76.6%
Physician Assistants	70.6%	72.2%	72.2%	73.1%	72.0%	72.1%	76.5%	76.3%
Physicians	67.0%	67.5%	65.5%	67.0%	67.1%	67.5%	69.1%	69.9%
Psychologists	50.1%	48.4%	47.4%	46.2%	43.5%	39.2%	36.5%	37.8%

SOURCE: RAND analysis of 2017-2024 California WCIS.

NOTES: Individual providers with at least one paid workers' compensation bill line in the service year. A bill line is counted as covered when its provider-agreement code is Y (PPO) or P (MPN). Shares are payment-weighted.

Table B.31. Percentage of Payments Covered by an MPN or PPO Agreement, by Physician Specialty and Year

Physician specialty	2017	2018	2019	2020	2021	2022	2023	2024
Anesthesiology	62.1%	65.8%	63.4%	65.7%	66.5%	67.3%	68.7%	68.3%
Emergency Medicine	71.3%	70.9%	68.9%	69.4%	69.6%	72.6%	73.8%	74.3%
Neurology	65.3%	63.9%	62.2%	66.5%	63.1%	64.5%	64.1%	66.3%
Orthopedic Surgery	66.1%	67.2%	67.0%	69.3%	68.0%	67.8%	66.7%	65.7%
Other Surgery	69.6%	70.5%	68.0%	68.3%	66.3%	68.8%	69.5%	71.6%
PM and R	64.8%	65.6%	63.1%	63.9%	63.1%	65.2%	65.6%	68.4%
Preventive Med	77.2%	82.3%	81.5%	79.0%	83.3%	83.5%	85.1%	84.8%
Primary Care	68.5%	67.0%	63.8%	65.0%	64.7%	63.9%	67.3%	68.5%
Psychiatry	49.9%	45.0%	41.5%	40.3%	42.6%	42.4%	41.3%	42.5%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Supplementary Results on Provider Participation by Region (Chapter 5)

Provider Participation by Type of Provider and Region

Tables in this section report provider participation per 10,000 workers' compensation patients and the number of licensed providers per 10,000 population in 2023 as reported in the AHRF. These statistics underlie the scatter plots in Chapter 5.

Table B.32. Provider Supply in Workers' Compensation and General Health Care System, All Physicians, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	8,264	146,000	566.0	36,616	7,618,352	48.1
Central Coast	2,019	61,943	325.9	6,248	2,308,581	27.1
Central Valley	3,624	121,564	298.1	8,021	4,329,469	18.5
Eastern Sierra Foothills	1,042	15,772	660.7	2,689	887,269	30.3
Inland Empire	5,432	197,896	274.5	22,746	7,942,053	28.6
Los Angeles	8,599	240,704	357.2	35,182	9,864,220	35.7
N. Sacramento Valley	481	11,012	436.8	784	502,686	15.6
North State-Shasta	695	12,881	539.6	1,113	614,092	18.1
Sacramento Valley	1,903	37,904	502.1	6,738	1,804,455	37.3
San Diego	2,921	66,349	440.2	12,951	3,296,097	39.3
California statewide	43,530	932,357	466.9	133,088	39,167,274	34.0

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.33. Workers' Compensation and All-Payer Provider Supply, Chiropractors, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	433	146,000	29.7	3,048	7,618,352	4.0
Central Coast	180	61,943	29.1	925	2,308,581	4.0
Central Valley	188	121,564	15.5	654	4,329,469	1.5
Eastern Sierra Foothills	67	15,772	42.5	379	887,269	4.3
Inland Empire	401	197,896	20.3	2,369	7,942,053	3.0
Los Angeles	529	240,704	22.0	3,105	9,864,220	3.1
N. Sacramento Valley	25	11,012	22.7	140	502,686	2.8
North State-Shasta	47	12,881	36.5	196	614,092	3.2
Sacramento Valley	89	37,904	23.5	385	1,804,455	2.1
San Diego	151	66,349	22.8	1,191	3,296,097	3.6

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
California statewide	2,400	932,357	25.7	12,392	39,167,274	3.2

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.34. Workers' Compensation and All-Payer Provider Supply, Nurse Practitioners, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	395	146,000	27.1	5,904	7,618,352	7.7
Central Coast	104	61,943	16.8	1,130	2,308,581	4.9
Central Valley	288	121,564	23.7	2,564	4,329,469	5.9
Eastern Sierra Foothills	65	15,772	41.2	489	887,269	5.5
Inland Empire	324	197,896	16.4	4,871	7,942,053	6.1
Los Angeles	509	240,704	21.1	7,352	9,864,220	7.5
N. Sacramento Valley	33	11,012	30.0	343	502,686	6.8
North State-Shasta	86	12,881	66.8	460	614,092	7.5
Sacramento Valley	118	37,904	31.1	1,234	1,804,455	6.8
San Diego	153	66,349	23.1	2,793	3,296,097	8.5
California statewide	3,011	932,357	32.3	27,140	39,167,274	6.9

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.35. Workers' Compensation and All-Payer Provider Supply, Physician Assistants, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	590	146,000	40.4	2,955	7,618,352	3.9
Central Coast	248	61,943	40.0	1,033	2,308,581	4.5
Central Valley	446	121,564	36.7	1,409	4,329,469	3.3
Eastern Sierra Foothills	123	15,772	78.0	303	887,269	3.4
Inland Empire	714	197,896	36.1	3,308	7,942,053	4.2

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Los Angeles	822	240,704	34.1	3,571	9,864,220	3.6
N. Sacramento Valley	36	11,012	32.7	260	502,686	5.2
North State-Shasta	115	12,881	89.3	316	614,092	5.1
Sacramento Valley	190	37,904	50.1	666	1,804,455	3.7
San Diego	314	66,349	47.3	1,482	3,296,097	4.5
California statewide	4,794	932,357	51.4	15,303	39,167,274	3.9

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Provider Participation by Physician Specialty and Region

Table B.36. Workers' Compensation and All-Payer Provider Supply, Primary Care, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	2,017	146,000	138.2	8,860	7,618,352	11.6
Central Coast	461	61,943	74.4	1,871	2,308,581	8.1
Central Valley	1,072	121,564	88.2	2,517	4,329,469	5.8
Eastern Sierra Foothills	265	15,772	168.0	858	887,269	9.7
Inland Empire	1,227	197,896	62.0	5,845	7,942,053	7.4
Los Angeles	1,981	240,704	82.3	7,653	9,864,220	7.8
N. Sacramento Valley	110	11,012	99.9	254	502,686	5.1
North State-Shasta	249	12,881	193.3	392	614,092	6.4
Sacramento Valley	392	37,904	103.4	1,708	1,804,455	9.5
San Diego	573	66,349	86.4	2,834	3,296,097	8.6
California statewide	9,751	932,357	104.6	32,792	39,167,274	8.4

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.37. Workers' Compensation and All-Payer Provider Supply, Emergency Medicine, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	847	146,000	58.0	1,684	7,618,352	2.2
Central Coast	253	61,943	40.8	359	2,308,581	1.6
Central Valley	395	121,564	32.5	453	4,329,469	1.0
Eastern Sierra Foothills	190	15,772	120.5	245	887,269	2.8
Inland Empire	535	197,896	27.0	1,107	7,942,053	1.4
Los Angeles	791	240,704	32.9	1,554	9,864,220	1.6
N. Sacramento Valley	79	11,012	71.7	49	502,686	1.0
North State-Shasta	122	12,881	94.7	76	614,092	1.2
Sacramento Valley	222	37,904	58.6	430	1,804,455	2.4
San Diego	374	66,349	56.4	720	3,296,097	2.2
California statewide	4,334	932,357	46.5	6,677	39,167,274	1.7

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.38. Workers' Compensation and All-Payer Provider Supply, Anesthesiology, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	1,057	146,000	72.4	1,635	7,618,352	2.1
Central Coast	253	61,943	40.8	323	2,308,581	1.4
Central Valley	294	121,564	24.2	316	4,329,469	0.7
Eastern Sierra Foothills	93	15,772	59.0	142	887,269	1.6
Inland Empire	664	197,896	33.6	1,207	7,942,053	1.5
Los Angeles	1,013	240,704	42.1	1,861	9,864,220	1.9
N. Sacramento Valley	34	11,012	30.9	45	502,686	0.9
North State-Shasta	49	12,881	38.0	60	614,092	1.0
Sacramento Valley	208	37,904	54.9	356	1,804,455	2.0
San Diego	354	66,349	53.4	657	3,296,097	2.0

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
California statewide	4,758	932,357	51.0	6,602	39,167,274	1.7

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.39. Workers' Compensation and All-Payer Provider Supply, Orthopedic Surgery, by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	446	146,000	30.5	820	7,618,352	1.1
Central Coast	156	61,943	25.2	204	2,308,581	0.9
Central Valley	206	121,564	16.9	170	4,329,469	0.4
Eastern Sierra Foothills	68	15,772	43.1	84	887,269	0.9
Inland Empire	307	197,896	15.5	574	7,942,053	0.7
Los Angeles	613	240,704	25.5	875	9,864,220	0.9
N. Sacramento Valley	29	11,012	26.3	30	502,686	0.6
North State-Shasta	42	12,881	32.6	43	614,092	0.7
Sacramento Valley	118	37,904	31.1	173	1,804,455	1.0
San Diego	178	66,349	26.8	356	3,296,097	1.1
California statewide	3,412	932,357	36.6	3,329	39,167,274	0.8

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.40. Workers' Compensation and All-Payer Provider Supply, Other Surgery (MD Only), by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	834	146,000	57.1	4,918	7,618,352	6.5
Central Coast	209	61,943	33.7	842	2,308,581	3.6
Central Valley	353	121,564	29.0	1,030	4,329,469	2.4
Eastern Sierra Foothills	79	15,772	50.1	350	887,269	3.9
Inland Empire	549	197,896	27.7	2,931	7,942,053	3.7

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Los Angeles	885	240,704	36.8	5,157	9,864,220	5.2
N. Sacramento Valley	57	11,012	51.8	117	502,686	2.3
North State-Shasta	63	12,881	48.9	129	614,092	2.1
Sacramento Valley	193	37,904	50.9	955	1,804,455	5.3
San Diego	294	66,349	44.3	1,570	3,296,097	4.8
California statewide	3,988	932,357	42.8	17,999	39,167,274	4.6

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Table B.41. Workers' Compensation and All-Payer Provider Supply, Neurology (MD Only), by DWC Region: 2023

Provider practice region	WC providers treating injured workers	Injured workers treated	WC providers per 10,000 injured workers	All providers in the region	Region population	All providers per 10,000 population
Bay Area	142	146,000	9.7	756	7,618,352	1.0
Central Coast	27	61,943	4.4	81	2,308,581	0.4
Central Valley	52	121,564	4.3	91	4,329,469	0.2
Eastern Sierra Foothills	13	15,772	8.2	41	887,269	0.5
Inland Empire	119	197,896	6.0	354	7,942,053	0.4
Los Angeles	179	240,704	7.4	690	9,864,220	0.7
N. Sacramento Valley	3	11,012	2.7	8	502,686	0.2
North State-Shasta	4	12,881	3.1	7	614,092	0.1
Sacramento Valley	45	37,904	11.9	128	1,804,455	0.7
San Diego	65	66,349	9.8	249	3,296,097	0.8
California statewide	836	932,357	9.0	2,405	39,167,274	0.6

SOURCE: RAND analysis of 2023 California WCIS and AHRF.

Supplementary Results on Telehealth (Chapter 7)

Table B.42. Total, Telehealth-Eligible, and Telehealth Bill Lines, California Statewide: 2020-2024

Service year	All bill lines	Telehealth-eligible bill lines	Telehealth bill lines	% of eligible lines delivered by telehealth
2020	26,824,570	4,222,072	464,215	11.0%
2021	28,179,243	10,449,268	478,045	4.6%
2022	27,335,709	10,281,939	368,813	3.6%
2023	28,011,478	10,576,229	320,564	3.0%
2024	28,098,263	10,793,726	409,654	3.8%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: All workers' compensation bill lines with a service date in the year; medical-legal lines are excluded. A line is telehealth-eligible if its procedure code appears on the DWC telehealth-eligible list; it is a telehealth line if it also carries a telehealth modifier, place of service, or revenue code.

Table B.43. Telehealth-Eligible Bill Lines and the Share Delivered by Telehealth, by DWC Region and Service Type: 2024

Worker residence region	All services eligible bill lines	All services % delivered by telehealth	E&M eligible bill lines	E&M % delivered by telehealth	Behavioral health eligible bill lines	Behavioral health % delivered by telehealth
Bay Area	1,590,754	6.3%	636,177	11.0%	39,954	46.7%
Central Coast	656,651	4.1%	259,619	7.0%	15,046	40.5%
Central Valley	1,257,648	2.7%	522,749	4.2%	29,028	32.4%
Eastern Sierra Foothills	132,420	4.7%	53,405	7.5%	4,625	41.4%
Inland Empire	2,252,746	2.7%	784,350	5.7%	68,840	23.0%
Los Angeles	2,913,223	2.4%	998,665	4.9%	93,310	16.7%
N. Sacramento Valley	95,708	3.5%	40,152	5.7%	2,189	42.6%
North State-Shasta	110,482	5.9%	48,732	8.8%	2,475	37.8%
Sacramento Valley	355,395	4.2%	151,842	6.5%	9,785	42.1%
San Diego	737,766	3.0%	274,123	5.9%	20,597	37.9%
California statewide	10,180,996	3.4%	3,795,073	6.4%	289,292	28.4%

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

Table B.44. Mean Days from Injury Report to the First E&M Visit, Telehealth Users Versus Non-Users, by DWC Region: 2024 Injuries

Worker residence region	Claims with an E&M visit	% telehealth users	Telehealth users: mean days	Non-users: mean days	Difference (users - non-users)	p-value on the difference
Bay Area	56,480	16.0%	6.5	6.4	0.1	0.706
Central Coast	23,488	5.4%	7.1	5.0	2.1	<0.001
Central Valley	48,843	7.9%	5.2	5.3	-0.1	0.767
Eastern Sierra Foothills	5,575	10.0%	8.5	7.1	1.4	0.076
Inland Empire	75,658	5.3%	6.6	5.2	1.4	<0.001
Los Angeles	82,476	6.3%	6.7	5.3	1.4	<0.001
N. Sacramento Valley	3,424	7.1%	4.8	8.6	-3.8	<0.001
North State-Shasta	3,394	10.1%	9.1	11.8	-2.7	0.013
Sacramento Valley	16,095	8.8%	5.7	5.7	0	0.846
San Diego	29,989	6.6%	7.6	5.1	2.5	<0.001

SOURCE: RAND analysis of 2017-2024 California WCIS FROI and medical billing data.

NOTES: "Telehealth user" = claim with 1+ E&M bill line delivered by telehealth.

Abbreviations

AAMC	Association of American Medical Colleges
ADA	American Dental Association
AHRF	Area Health Resources Files
AMA	American Medical Association
APRN	Advanced Practice Registered Nurse
BETOS	Berenson-Eggers Type of Service
CHCF	California Health Care Foundation
CHSWC	California Commission on Health and Safety and Workers' Compensation
CMS	Centers for Medicare & Medicaid Services
COVID-19	Coronavirus Disease 2019
CPT	Current Procedural Terminology
CWCI	California Workers' Compensation Institute
DIR	California Department of Industrial Relations
DO	Doctor of Osteopathic Medicine
DWC	Division of Workers' Compensation
E&M	Evaluation and Management
FIPS	Federal Information Processing Standards
FROI	First Report of Injury
HCPCS	Healthcare Common Procedure Coding System
HIPAA	Health Insurance Portability and Accountability Act
HMO	Health Maintenance Organization
HRSA	Health Resources and Services Administration
HUD	U.S. Department of Housing and Urban Development
IBR	Independent Bill Review
IMR	Independent Medical Review
JCN	Jurisdiction Claim Number
MD	Doctor of Medicine
MPN	Medical Provider Network
MSK	Musculoskeletal
MTC	Maintenance Type Code
MTUS	Medical Treatment Utilization Schedule
NAICS	North American Industry Classification System
NP	Nurse Practitioner

NPI	National Provider Identifier
NPPES	National Plan and Provider Enumeration System
NUCC	National Uniform Claim Committee
OD	Origin-Destination (Cost Matrix)
OMFS	Official Medical Fee Schedule
PA	Physician Assistant
PM	Physical Medicine
PM and R	Physical Medicine and Rehabilitation
PPEF	Public Provider Enrollment File
PPO	Preferred Provider Organization
PT	Physical Therapist
RBCS	Restructured BETOS Classification System
RUCC	Rural-Urban Continuum Codes
UR	Utilization Review
USDA	U.S. Department of Agriculture
USPS	U.S. Postal Service
WC	Workers' Compensation
WCIO	Workers' Compensation Insurance Organizations
WCIRB	Workers' Compensation Insurance Rating Bureau
WCIS	Workers' Compensation Information System
WCRI	Workers Compensation Research Institute

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