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WCIRB Geo Study

A Report on California Regional Differences



wcirb.com





How to use this workbook

Open the interactive workbook in Adobe Reader.

Navigate through the document using the navigation buttons on the top of the screen.

Have fun!

Please note: Interactivity is not available on smartphones or on tablet devices. You must use Adobe Reader for the full functionality to work.





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About the WCIRB

For over 100 years, the Workers' Compensation Insurance Rating Bureau of California (WCIRB) has been California's trusted, objective provider of actuariallybased information and research integral to a healthy California workers' compensation system.

As a licensed rating organization and the California Insurance Commissioner's designated statistical agent, the WCIRB performs a number of functions, including collection of premium and loss data on every workers' compensation insurance policy, examination of policy documents, inspection of insured businesses, and test audits of insurer payroll audits and claims classifications. This data is used to advise the Insurance Commissioner and other stakeholders of the costs of providing workers' compensation benefits.

The WCIRB is a California unincorporated, private, nonprofit association comprised of all insurers licensed to transact workers' compensation insurance in California and has over 400 members. No state money is used to finance its operations.

For more information, please visit <u>wcirb.com</u>.

Let us know what you think by emailing us at <u>ActuarialResearch@wcirb.com</u>.







Executive

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What's New Interactive Map



2021 WCIRB Geo Study A Report on California Regional Differences

Executive Summary

The California workers' compensation system is established, administered and interpreted on a statewide basis. Nevertheless, there are sharp differences in cost characteristics across regions of the state. This report highlights those differences.

Key findings include:

- Even after controlling for regional differences in wages and industry mix, indemnity claim frequency is significantly higher in the Los Angeles (LA) Basin and significantly lower in the San Francisco Bay Area.
- Regional differences in indemnity claim frequency have been fairly consistent over time and across industries. During all available years, the LA/Long Beach region has had the highest frequency and the Peninsula/Silicon Valley region has had the lowest. The difference between these regions has grown over time. Since 2013, the largest improvement in relative indemnity claim frequency has been the Stockton/Modesto/Merced and Fresno/Madera regions, and the greatest deterioration has been the San Bernardino/West Riverside, Imperial/Riverside and the Orange County regions.
- The share of open indemnity claims has decreased substantially in all regions since 2013. The largest decreases have been in the LA Basin regions that had the highest initial open indemnity claim shares. These changes have narrowed regional differences over time.
- The share of open claims with permanent disability at 66 months is higher in Northern California regions. The Sonoma/Napa, Bay Area and Santa Cruz/Monterey/Salinas regions have the highest shares of open claims while the Imperial/Riverside region has the lowest share.
- The share of indemnity claims with incurred costs greater than \$250,000 at third report level is higher in regions that tend to have lower indemnity frequency.
- The share of cumulative trauma claims as a percent of all claims is highest in the Santa Monica/San Fernando Valley and LA/Long Beach regions. The share of cumulative trauma claims are generally higher in the Southern California regions, and that gap has generally widened over time.
- Medical-legal costs are significantly higher in the LA Basin, Orange County and Santa Monica/San Fernando Valley regions than in the remainder of the state.
- Paid allocated loss adjustment expenses (ALAE) are significantly higher in Southern California regions.
- Many COVID-19 indemnity claims reported with paid indemnity have no reported paid medical benefits for all regions with the highest shares in the Ventura, LA/Long Beach and San Gabriel Valley/Pasadena regions.
- Over 55% of COVID-19 indemnity claims are from the health care sector with the highest shares in the Sacramento and Imperial/Riverside regions.



<u>What's New</u> Interactive Maps

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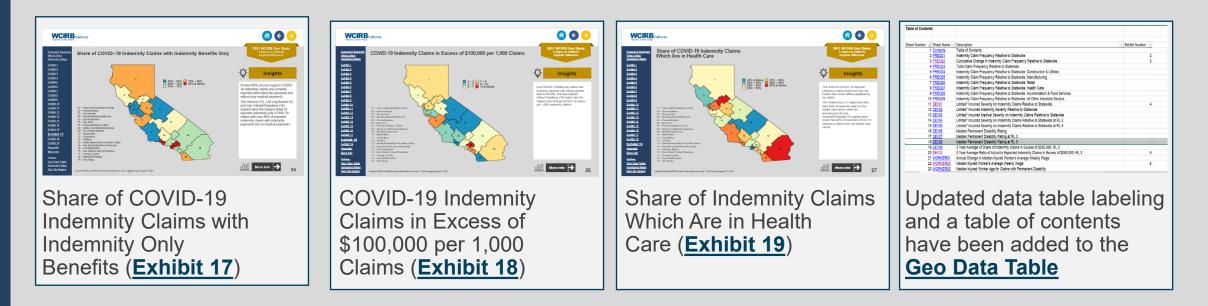
<u>Appendix</u> More Info



2021 WCIRB Geo Study A Report on California Regional Differences

What's New

Three new maps, data available at 66 months (5th report level) and other supplementary data are provided in this year's study, including:



A <u>mapping of nine-digit zip codes</u> and regional wage differentials to the study regions shown in <u>Exhibit 1</u> are available on the <u>WCIRB Geo Study</u> page on <u>wcirb.com</u>. More information about the development of the maps and the data underlying the maps is included in the <u>Technical Appendix</u> to this report.



Interactive Maps

What's New

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2021 WCIRB Geo Study A Report on California Regional Differences

Interactive Maps

Interactive versions of the geographic maps are now available in html format on the WCIRB Geo Study page on the WCIRB website.







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More Info

Online: Geo Data Table Interactive Maps Geo Zip Region

Basis of Analysis

2021 WCIRB Geo Study A Report on California Regional Differences

WCIRB staff have developed a dataset that allows estimates of the incidence of exposures and claims by classification and region. The dataset was developed by linking the WCIRB's unit statistical and medical transactional datasets with external data that complements the WCIRB's unit statistical data by providing refined geographical information.

External data was used to control for regional wage differentials, industry mix and the number of workers at each location. WCIRB staff developed geographic regions that reflect high degrees of medical provider commonality while at the same time being robust, credible and independent of the claim cost measures under study. The **Technical Appendix** describes the methodologies used in the study in greater detail.

This enriched dataset comprises seven policy years of data. For this study, the WCIRB used the experience of policy years 2013 to 2019, which covers policies incepting January 1, 2013 through December 31, 2019 and includes injuries occurring on those policies. Claims due to COVID-19 were excluded from exhibits except where specifically included.

Results

This study is based on first report level unit statistical data for policy year 2019 that was linked with the WCIRB's medical transactional data and Dun and Bradstreet Hoovers (D&B Hoovers) data. The D&B Hoovers data was used to geolocate exposures by classification.

Additional unit statistical data from third report level for policy years 2013 to 2017 and from fifth report level for policy years 2013 through 2015 underlies some exhibits and supplementary data tables.

The WCIRB's medical transaction data was used to geolocate claims. The WCIRB's indemnity transaction data was used to study claims from the 2020 and 2021 accident years. The methods used in this study are discussed in greater detail in the **Technical Appendix**.



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2021 WCIRB Geo Study

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Exhibits



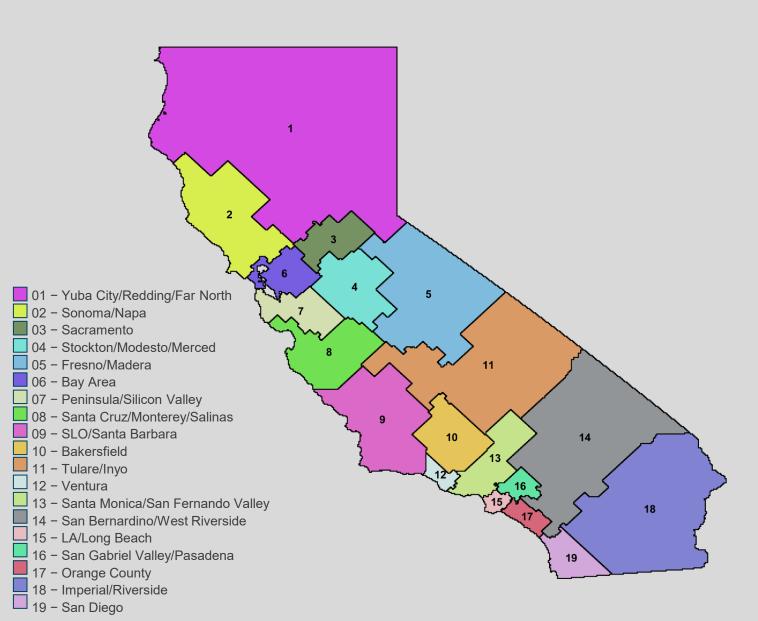




Interactive Maps Geo Zip Region









A Report on California

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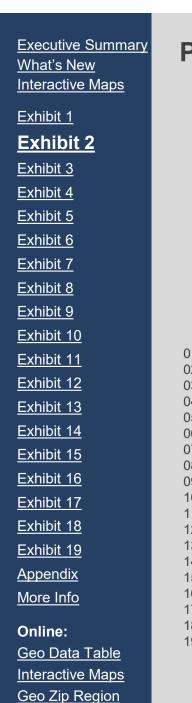
This map of the regions was developed by WCIRB staff.

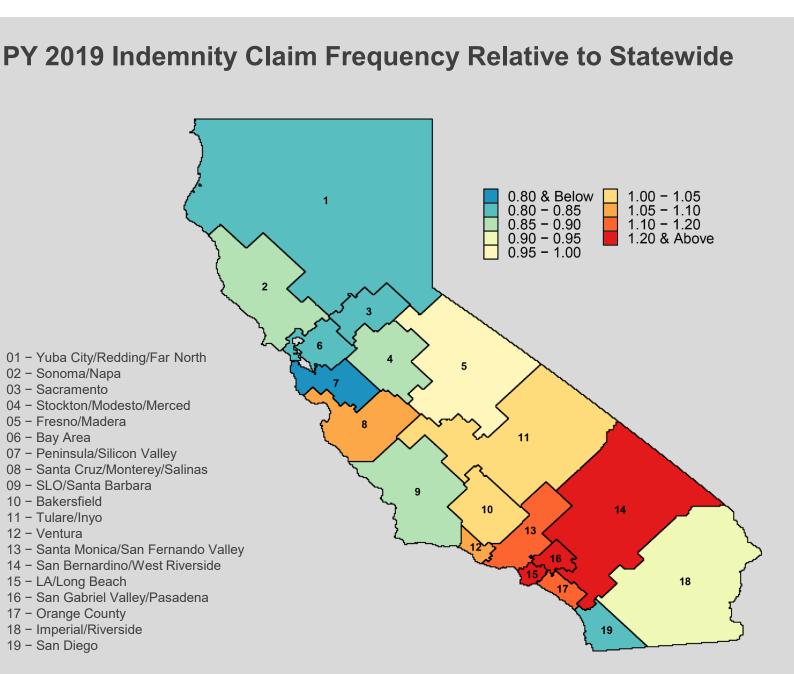
A mapping of nine-digit zip codes to the study regions is available on the WCIRB Geo Study page on the WCIRB website.

The mapping also provides the regional wage relativities used to normalize payrolls across regions.









2021 WCIRB Geo Study A Report on California Regional Differences



Claim frequencies for the Los Angeles area continue to be significantly higher than the statewide average, while claim frequencies for the Bay Area are lower even after controlling for industry mix and wage level differences.

The LA/Long Beach (15) region has the highest claim frequency, over one-quarter above average.

The Peninsula/Silicon Valley (07) region has the lowest frequency, 28% below the statewide average claim frequency.

While more volatile, regional patterns are similar by industry and are shown in the Geo Data Table.



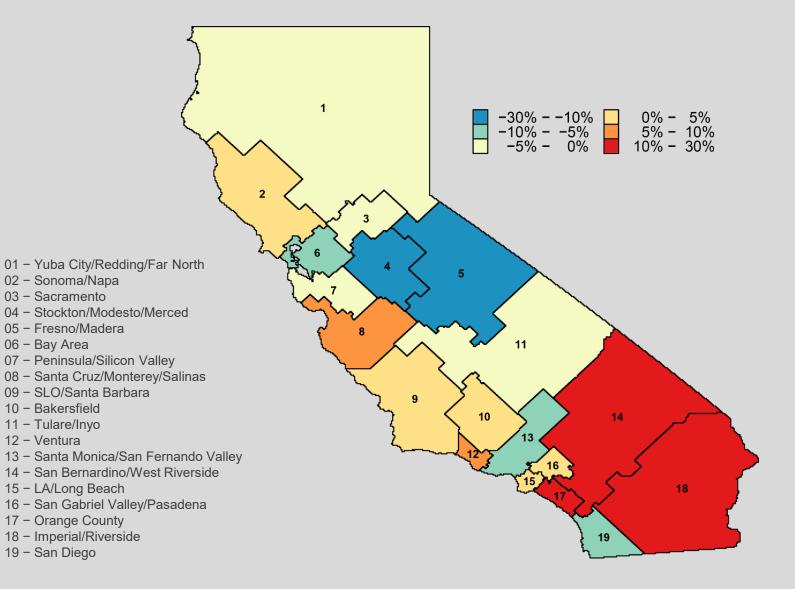
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Geo Zip Region

PY 2013 to 2019 Change in Indemnity Claim Frequency Relativity



2021 WCIRB Geo Study A Report on California Regional Differences



Regional differences in indemnity claim frequency have been relatively stable, although regions with a smaller volume of data are subject to larger changes.

Relativities in San Bernardino/West Riverside (14), San Gabriel Valley/Pasadena (16) and Orange County (17) increased in 2019.

Relativities in

Stockton/Modesto/Merced (04), SLO/Santa Barbara (09), Tulare/Inyo (11), Ventura (12), LA/Long Beach (15) and Imperial/Riverside (18) decreased in 2019.







Executive Summary What's New Interactive Maps Exhibit 1 Exhibit 2 Exhibit 3 Exhibit 4 Exhibit 5 Exhibit 6 Exhibit 7 Exhibit 8 Exhibit 9 Exhibit 10 Exhibit 11 02 - Sonoma/Napa Exhibit 12 03 - Sacramento Exhibit 13 05 - Fresno/Madera Exhibit 14 06 - Bay Area Exhibit 15 Exhibit 16 09 - SLO/Santa Barbara 10 - Bakersfield Exhibit 17 11 - Tulare/Invo Exhibit 18 12 - Ventura Exhibit 19 Appendix 15 – LA/Long Beach More Info 17 – Orange County 18 - Imperial/Riverside **Online:** 19 - San Diego Geo Data Table

Interactive Maps

Geo Zip Region

Limited* Incurred Severity on Indemnity Claims Relative to Statewide

0.96 & Below 1.02 - 1.04 0.96 - 0.981.04 - 1.061.06 - 1.08 0.98 - 1.001.00 - 1.021.08 & Above 01 – Yuba City/Redding/Far North 5 04 - Stockton/Modesto/Merced 07 - Peninsula/Silicon Valley 08 - Santa Cruz/Monterey/Salinas 9 10 14 13 - Santa Monica/San Fernando Valley 14 - San Bernardino/West Riverside 18 16 - San Gabriel Valley/Pasadena

2021 WCIRB Geo Study A Report on California Regional Differences



Regional differences in indemnity claim severity are more muted than for claim frequency. The severity relativities shown are adjusted for classification mix.

The highest severity cost region in the state is Bakersfield (10), 15% above average.

The lowest severity costs are in the Imperial/Riverside (18) region, over 12% below average.

Regional relativities in severities at mature levels (42 and 66 months from policy inception) continue to be very similar to those shown at 18 months maturity for the same policy years (tabs **SEV04** and **SEV05** in the <u>2021 WCIRB</u> <u>Geo Study - Exhibits (XLS)</u>).

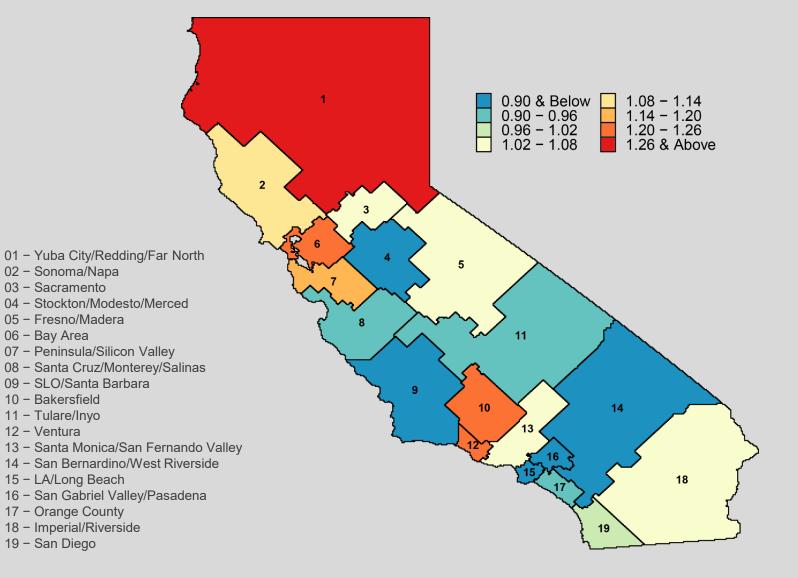






Geo Zip Region

3-Year Average Ratio of Actual to Expected Indemnity Claims in Excess of \$250,000: RL 3



2021 WCIRB Geo Study A Report on California Regional Differences



After adjustment for industry mix, regions with lower indemnity frequency tend to have a higher share of large claims.

The Yuba City/Redding/Far North (01) region has the highest share of large claims, with or without adjustment for industry mix.

The LA/Long Beach (15) region has a below average share of large claims, with or without adjustment for industry mix.

These claims may serve as a leading indicator of extremely large claims. See the multi-jurisdictional study of **Countrywide Mega Claims** for more information.

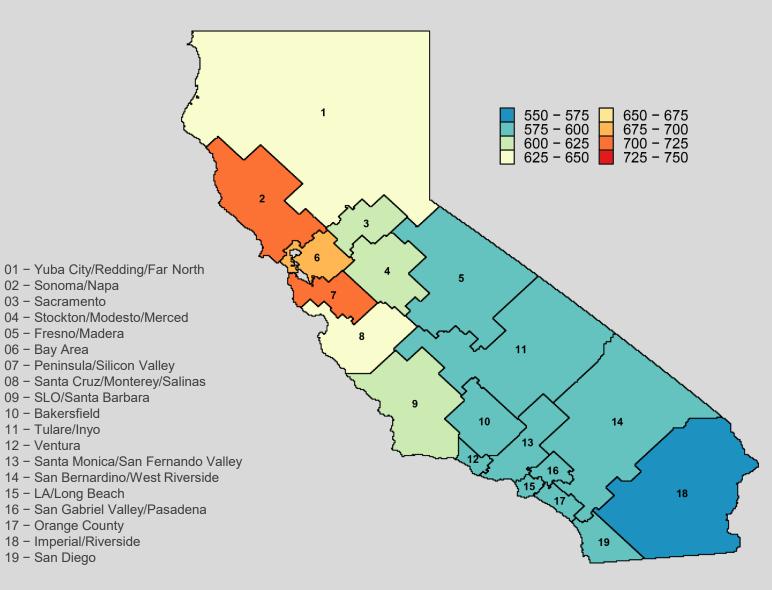






Geo Zip Region

Median Injured Worker's Average Weekly Wage



2021 WCIRB Geo Study A Report on California Regional Differences



Wage levels remain highest in Sonoma/ Napa (02), the Bay Area (06) and the Peninsula/Silicon Valley (07).

Wages are lower throughout most of the central and southern part of the state.

All regions experienced growth in injured worker median wages in 2019.



14





Geo Zip Region

19 - San Diego

Permanent Disability Claims as a Share of Indemnity Claims 24% - 26% 📃 32% - 34% 26% - 28% 34% - 36% 28% - 30% 36% - 38% 30% - 32% 2 01 - Yuba City/Redding/Far North 5 02 - Sonoma/Napa 03 - Sacramento 04 - Stockton/Modesto/Merced 05 - Fresno/Madera 06 - Bay Area 07 - Peninsula/Silicon Valley 08 - Santa Cruz/Monterey/Salinas 09 - SLO/Santa Barbara 9 10 - Bakersfield 10 14 11 - Tulare/Invo 12 - Ventura 13 - Santa Monica/San Fernando Valley 14 - San Bernardino/West Riverside 15 – LA/Long Beach 18 16 - San Gabriel Valley/Pasadena 17 – Orange County 18 - Imperial/Riverside

2021 WCIRB Geo Study A Report on California Regional Differences



The shares of indemnity claims that are permanent disability claims are higher in Southern California than in Northern California.

In all Northern California (01 through 08) regions, less than 30% of indemnity claims involve permanent disability, while in some Southern California regions (09, 10, 12, 13), more than 35% involve permanent disability.

As permanent disability claims are more costly than temporary indemnity claims, regional differences in their shares explain some of the regional differences in average claim severity.





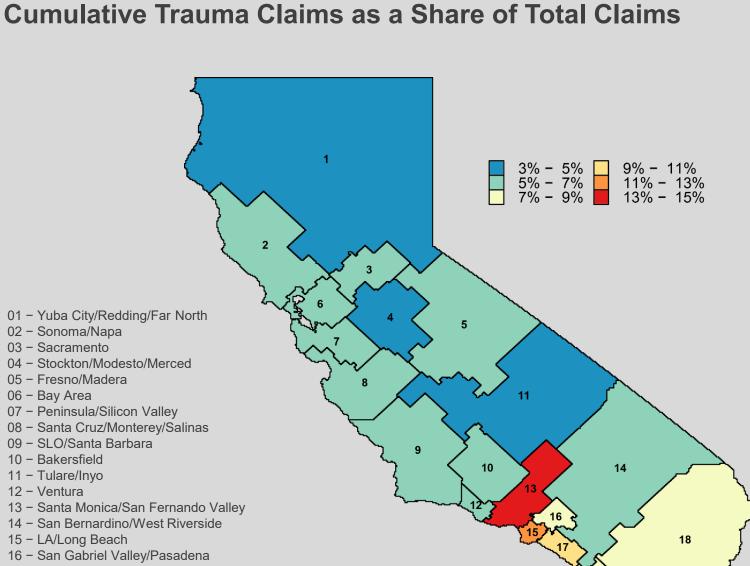


2021 WCIRB Geo Study

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Regional Differences

Insights



- 17 Orange County
- 18 Imperial/Riverside
- 19 San Diego

The share of total claims involving cumulative trauma or occupational disease increased significantly in 2019.

Cumulative trauma claims frequently involve multiple body parts or a specific injury, are usually litigated, are often initially denied in part or in whole and are often filed on a post termination basis.

The incidence of cumulative trauma claims is significantly higher in the LA

area and most other parts of Southern

Regional differences are very similar at later maturities (42 and 66 months) as they are at earlier maturities (tabs CLAIM07 and CLAIM08 in the 2021 WCIRB Geo Study - Exhibits (XLS)).



California.

Interactive Maps Geo Zip Region



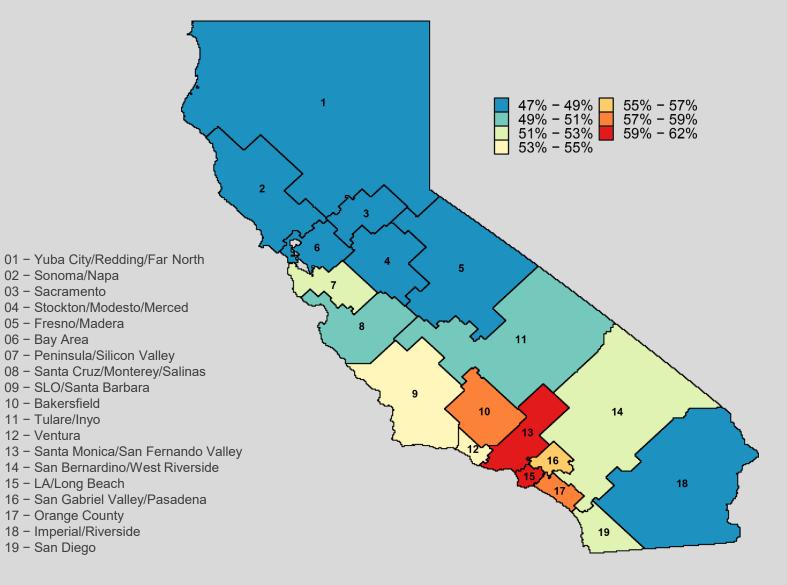


Geo Zip Region

06 - Bay Area

12 - Ventura

Open Share of Indemnity Claims



2021 WCIRB Geo Study A Report on California Regional Differences

Insights

The share of indemnity claims that are open at first report level (18 months maturity) is significantly higher in Southern California.

This remains one of the largest regional differences observed in the state.

Regional differences in the open share of indemnity claims are similar at later maturities (42 and 66 months) as they are at early maturities (18 months) although the size of the difference decreases (tabs CLAIM13 and CLAIM14 in the 2021 WCIRB Geo Study -Exhibits (XLS)).







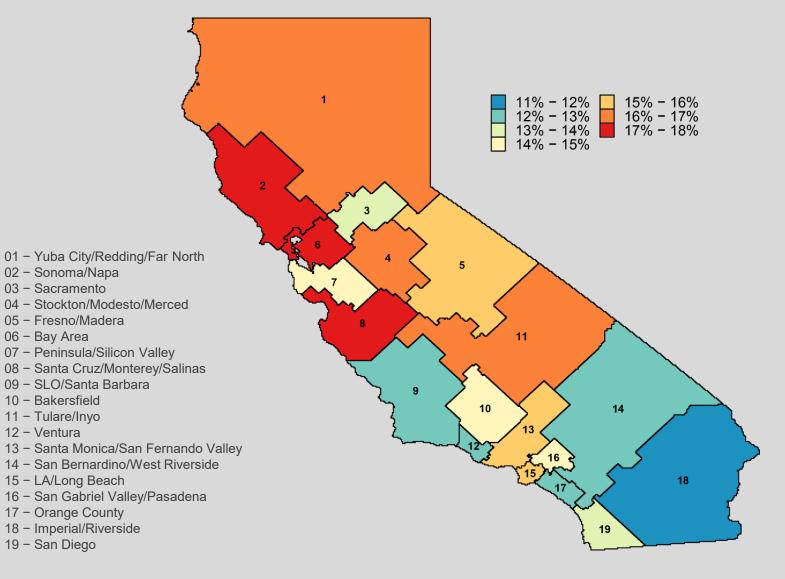
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Online:

Geo Data Table Interactive Maps

Geo Zip Region

Open Share of Permanent Disability Claims at RL 5



2021 WCIRB Geo Study A Report on California Regional Differences



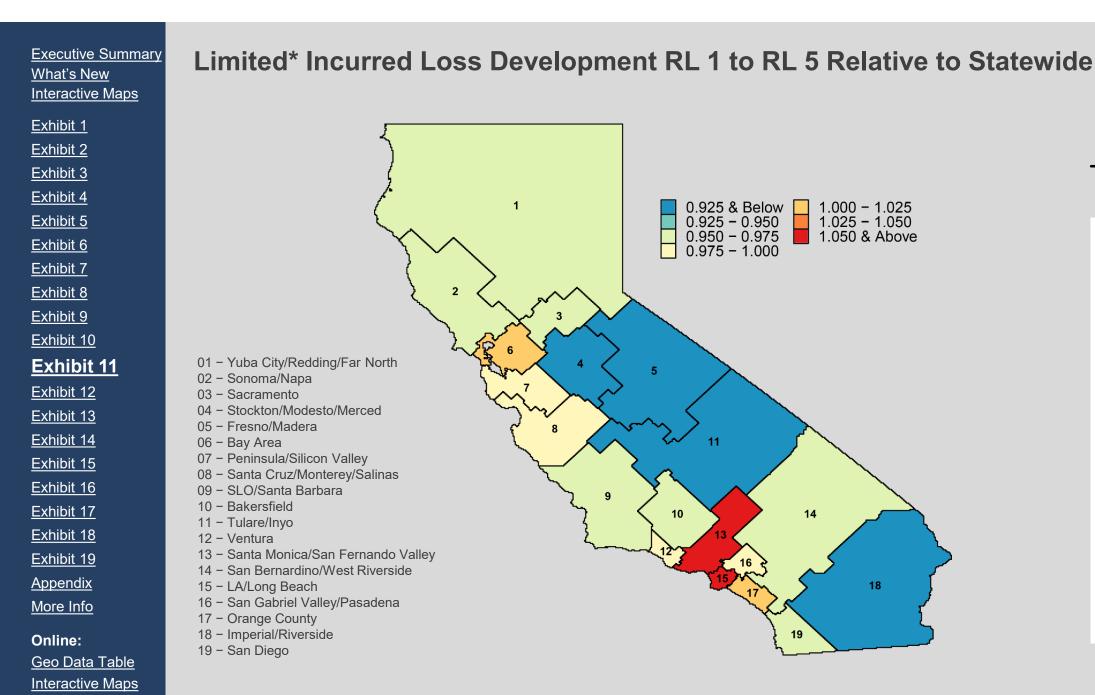
The share of permanent disability claims that are open at fifth report level (66 months maturity) is slightly higher in Northern California.

Regional differences in the relative shares of open permanent disability claims are similar at 42 months, but different from 18 months where more PD claims are open in Southern California (tabs **CLAIM12** and **CLAIM17** in the <u>2021 WCIRB Geo</u> <u>Study - Exhibits (XLS)</u>).









2021 WCIRB Geo Study A Report on California Regional Differences

کُلِ⁻ Insights

The regional differences in loss development are relatively modest. Urban regions tend to have higher loss development.

Loss development is somewhat higher in the Los Angeles Basin than most of the rest of the state. This could be related to the higher proportion of cumulative trauma claims discussed earlier.

The LA/Long Beach (15) region has the highest loss development, while the Fresno/Madera (05) region has the lowest.

These differences are similar to those for development from RL 1 to RL 3 (tab DEV01 in the **2021 WCIRB Geo Study - Exhibits (XLS)**).



Geo Zip Region





Online:

Geo Data Table Interactive Maps

Geo Zip Region

03 - Sacramento

06 - Bay Area

10 - Bakersfield

11 - Tulare/Inyo

19 - San Diego

12 - Ventura

Medical Legal Share of Paid Medical

4.5% & Below 4.5% - 5.0% 6.0% - 7.0% 7.0% - 8.0% 5.0% - 5.5% 8.0% & Above 5.5% - 6.0%01 – Yuba City/Redding/Far North 5 02 - Sonoma/Napa 04 - Stockton/Modesto/Merced 05 - Fresno/Madera 07 - Peninsula/Silicon Valley 08 - Santa Cruz/Monterey/Salinas 09 - SLO/Santa Barbara a 14 10 13 - Santa Monica/San Fernando Valley 14 - San Bernardino/West Riverside 15 – LA/Long Beach 18 16 - San Gabriel Valley/Pasadena 17 – Orange County 18 - Imperial/Riverside

2021 WCIRB Geo Study A Report on California Regional Differences



Medical-legal reports account for a significantly greater share of paid medical in the Los Angeles Basin than in the rest of the state.

Medical-legal costs decreased for all regions relative to paid medical costs.

Both the share of paid medical for medical-legal reports and regional differences have generally been consistent over time.

The information is this summary generally pre-dates the significant changes to the medical-legal fee schedule adopted effective April 1, 2021.

More Info





Geo Zip Region

Median Paid ALAE on Permanent Disability Claims 2,150 - 2,400 2,400 - 2,650 2,650 - 2,900 1,150 - 1,400 1,400 - 1,650 1,650 - 1,900 1.900 - 2.150

9

10

14

- 01 Yuba City/Redding/Far North
- 02 Sonoma/Napa
- 03 Sacramento
 - 04 Stockton/Modesto/Merced
 - 05 Fresno/Madera
 - 06 Bay Area
 - 07 Peninsula/Silicon Valley
 - 08 Santa Cruz/Monterey/Salinas
 - 09 SLO/Santa Barbara
 - 10 Bakersfield
 - 11 Tulare/Invo
- 12 Ventura
- 13 Santa Monica/San Fernando Valley
 - 14 San Bernardino/West Riverside
 - 15 LA/Long Beach
 - 16 San Gabriel Valley/Pasadena
 - 17 Orange County
 - 18 Imperial/Riverside
 - 19 San Diego





Paid ALAE is significantly higher in the Los Angeles Basin. The lowest ALAE costs tend to be in the more rural areas of the state.

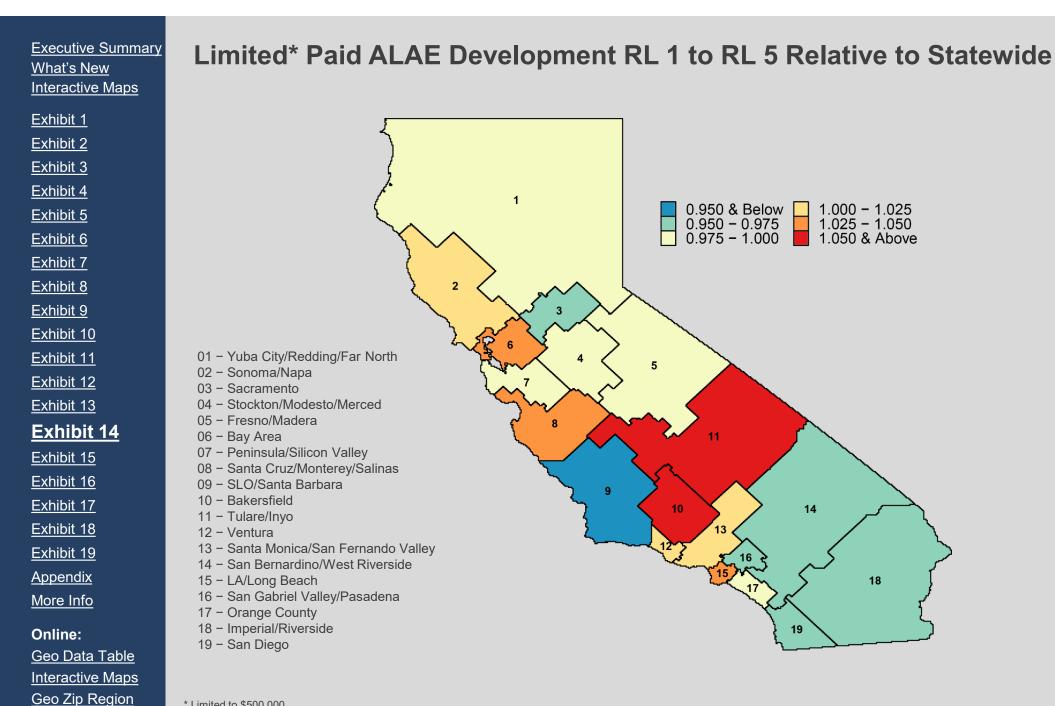
The statewide median paid ALAE decreased modestly in 2019 after increases from 2013 through 2018. Most regions experienced decreases in 2019.

Regional differences in median paid ALAE were more modest at both 42 months (tab ALAE02 in the 2021 WCIRB Geo Study - Exhibits (XLS)) and at 66 months (tab ALAE03). Median paid ALAE decreased at 66 months. This suggests that recent observed increases at earlier maturity levels (18 months) may in part be indicative of accelerating ALAE payments with the speed-up in claim settlements.









2021 WCIRB Geo Study A Report on California **Regional Differences**



Paid ALAE development is highest in the Tulare/Inyo (11), Bakersfield (10) and LA/Long Beach (15) regions and lowest in the SLO/Santa Barbara (09) region.

Regional differences in paid ALAE development are smaller than for other metrics such as claim frequency. They are relatively consistent with the differences in development from RL 1 to RL 3. (tab ALAE14 in the 2021 WCIRB Geo Study - Exhibits (XLS)).



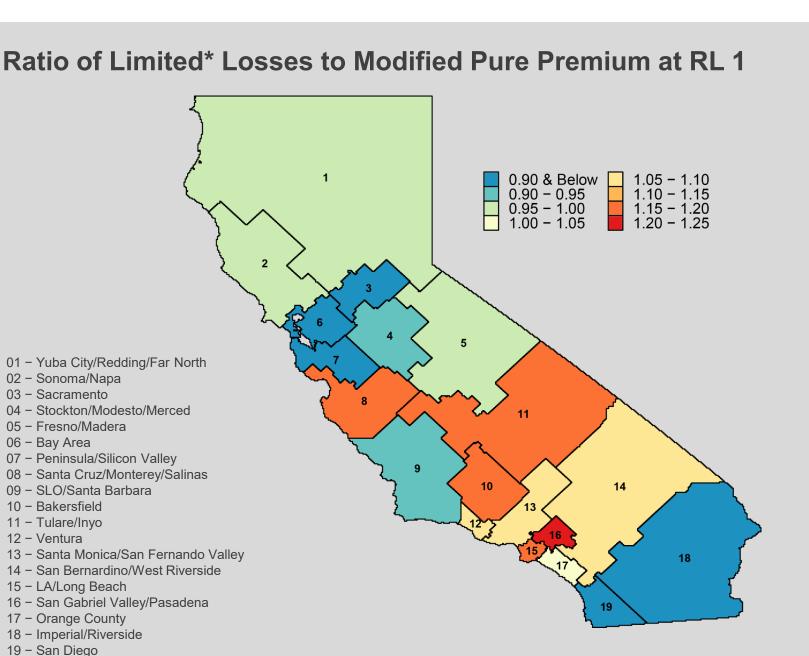




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Geo Data Table Interactive Maps Geo Zip Region

* Limited to \$500,000



2021 WCIRB Geo Study A Report on California Regional Differences



Limited loss ratios are highest in the San Gabriel Valley/Pasadena (16) region and lowest in the Sacramento (03), Imperial/Riverside (18), San Diego (19), Bay Area (06) and Peninsula/Silicon Valley (07) regions.

These differences in limited loss ratios are largely driven by regional differences in indemnity frequency rates discussed previously.

Regional patterns are generally similar but somewhat more varied at (42 months–tab LR02 in the <u>2021 WCIRB</u> <u>Geo Study - Exhibits (XLS)</u>).

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Geo Zip Region

Ratio of Limited* Losses to Modified Pure Premium at RL 5 1.05 - 1.10 0.90 & Below 0.90 - 0.951.10 - 1.15 1.15 - 1.20 0.95 - 1.001.00 - 1.051.20 & Above 2 ۵ 10 14 13 - Santa Monica/San Fernando Valley 18

- 01 Yuba City/Redding/Far North
- 02 Sonoma/Napa
- 03 Sacramento
- 04 Stockton/Modesto/Merced
- 05 Fresno/Madera
- 06 Bay Area
- 07 Peninsula/Silicon Valley
- 08 Santa Cruz/Monterey/Salinas
- 09 SLO/Santa Barbara
- 10 Bakersfield
- 11 Tulare/Invo
- 12 Ventura
- - 14 San Bernardino/West Riverside
 - 15 LA/Long Beach
 - 16 San Gabriel Valley/Pasadena
 - 17 Orange County
 - 18 Imperial/Riverside
 - 19 San Diego

* Limited to \$500,000





2021 WCIRB Geo Study A Report on California **Regional Differences**



Limited loss ratios are highest in the LA/Long Beach (15) region at 26% above the statewide average and lowest in the Fresno/Madera (05), Sacramento (03) and Imperial/Riverside (18) regions at more than 18% below the statewide averages.

These differences in limited loss ratios are largely driven by regional differences in indemnity frequency rates discussed previously.

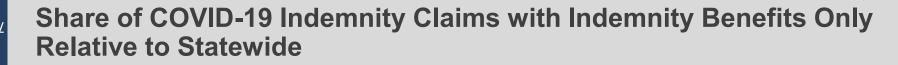
Regional patterns are generally similar but greater than at earlier maturity levels (18 and 42 months) (Exhibit 15 and tab LR02 in the 2021 WCIRB Geo Study - Exhibits (XLS)).





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Geo Zip Region



0.85 - 0.90 0.90 - 0.95 0.95 - 1.00 1.00 - 1.05 1.05 - 1.10 1.10 - 1.15 01 - Yuba City/Redding/Far North 02 - Sonoma/Napa 03 - Sacramento 04 - Stockton/Modesto/Merced 05 - Fresno/Madera 06 - Bay Area 07 - Peninsula/Silicon Valley 08 - Santa Cruz/Monterey/Salinas 09 - SLO/Santa Barbara q 10 - Bakersfield 14 10 11 - Tulare/Inyo 12 - Ventura 13 - Santa Monica/San Fernando Valley 14 - San Bernardino/West Riverside 15 – LA/Long Beach 18 16 - San Gabriel Valley/Pasadena 17 – Orange County 18 - Imperial/Riverside 19 - San Diego

2021 WCIRB Geo Study A Report on California Regional Differences



Many of each region's COVID-19 indemnity claims are currently reported with indemnity payments but without any medical payments. This percentage of these claims may decrease as claims mature.

The Ventura (12), LA/Long Beach (15) and San Gabriel/Pasadena (16) regions have the highest share of reported indemnity-only COVID-19 claims at more than 12% above the statewide average.

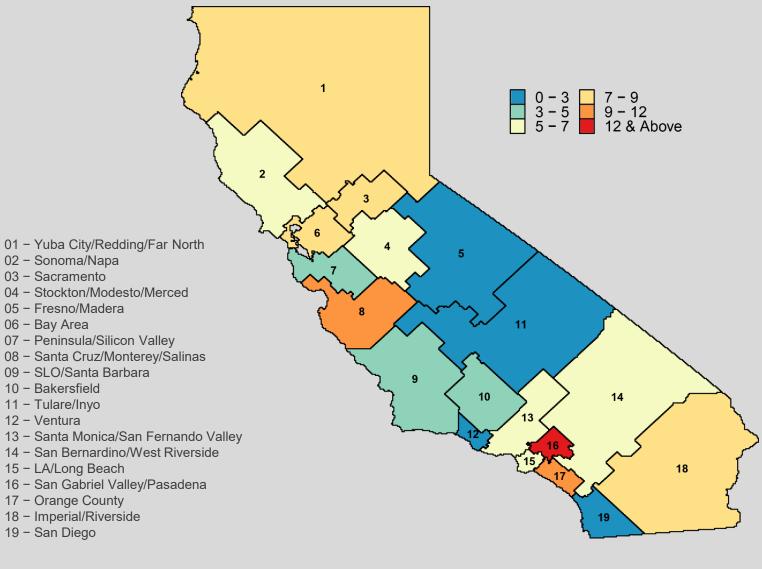






Geo Zip Region

COVID-19 Indemnity Claims in Excess of \$100,000 per 1,000 Claims



2021 WCIRB Geo Study A Report on California Regional Differences



Few COVID-19 indemnity claims are currently reported with losses greater than \$100,000. The San Gabriel Valley/Pasadena (16) region has the highest rate of large COVID-19 claims per 1,000 indemnity claims.

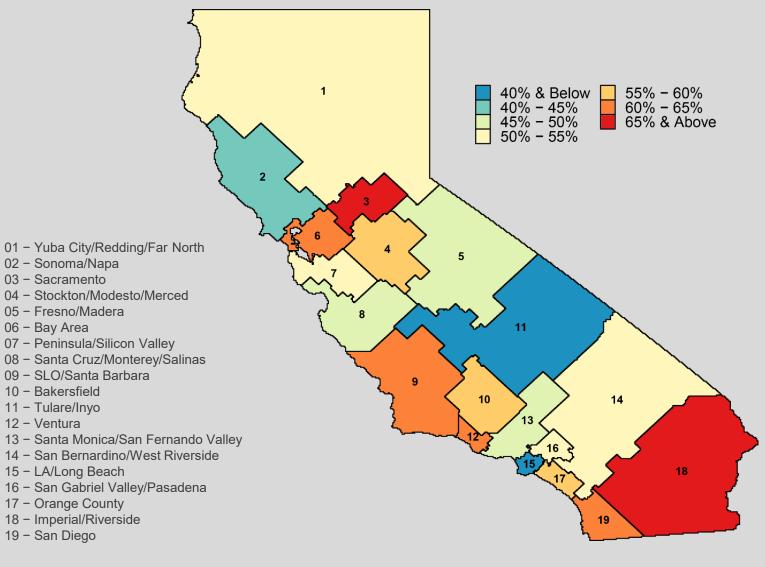






Geo Zip Region

Share of COVID-19 Indemnity Claims Which Are in Health Care



2021 WCIRB Geo Study A Report on California Regional Differences



The share of COVID-19 reported indemnity claims which are from the health care sector differs significantly by region.

The Tulare/Inyo (11) region has less than 20% of reported claims in the health care sector while the Sacramento (3) and Imperial/Riverside(18) regions have more than 65% of reported COVID-19 indemnity claims from the health care sector.







2021 WCIRB Geo Study

A Report on California Regional Differences

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2020 WCIRB Geo Study A Report on California

Regional Differences

Technical Appendix

Increasing evidence of geographical differences in California workers' compensation claim costs led WCIRB staff to develop a database that could provide refined estimates of regional claim frequencies and other claim cost differentials. This database resolves two problems with Unit Statistical Report (USR) data, which does not provide geographic information for exposures or claims.

The first problem is determining the appropriate allocation of USR exposures by classification to geographic locations. This problem was resolved by linking the WCIRB's USR data to D&B Hoovers data, which provides information on employer locations, including the industries at each location and estimates of the number of employees at each location. The second problem is determining the appropriate allocation of claims to employer locations. This problem was resolved by using the geographic information for select data available in the WCIRB's medical data call (MDC). The resulting triple-linked database – USR, MDC and D&B Hoovers – provides an enriched database that allows for more refined analyses of geographical differences across California.

In addition to the three primary data sources used to form the triple-linked database, WCIRB staff also utilized the following sources:

- WCIRB policy and inspection report data (for names and addresses)
- WCIRB indemnity transaction data (for accident year 2020 and 2021 claims)
- Occupational Employment Survey (to develop regional wage adjustments)
- Self-Insurance Rosters of the Division of Workers' Compensation's Office of Self-Insured Plans (to identify D&B Hoovers records without associated workers' compensation policies)

Methods of Linkage – USR to D&B Hoovers

Multiple methods were used to link USR and D&B Hoovers data. Linkages were established using employer names (including owner/proprietor, Doing Business As and parent company names), addresses and Federal Employer Identification Numbers. A protocol was established among linkage methods to avoid ambiguity. Ambiguously matched data was excluded from the study...

Over time, the availability of contemporaneous D&B Hoovers and USR data has ameliorated many of these problems and allowed for enhanced USR-D&B Hoovers match rates. In the 2021 study, approximately 92% of the target policy year's data was successfully matched.

In parallel with linking the USR and D&B Hoovers data, WCIRB staff also matched D&B Hoovers data to the self-insurance rosters published by the California Division of Workers' Compensation's Office of Self-Insured Plans. Self-insured employers identified in the D&B Hoovers data were then excluded from matching with USR data to increase the overall guality of the matching.

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Methods of Linkage – USR to MDC

The USR data was linked with MDC data using insurer, policy and claim number matching. While more straightforward, the linkages between these datasets are not complete. Not all insurers participate in MDC. For the study period, approximately 11% of insured data was not in MDC because the insurer did not participate in MDC. Matching was performed and employer experience was included at the policy level. For example, for an employer insured by two insurers, one of which participated in MDC while the other did not participate in MDC, only the experience of the insurer that participated in MDC was included. Further, only claims that were medically active and for which data was submitted to MDC are available in MDC. USR claims for which there were no medical payments captured in MDC will not be available to match with MDC. Settlements paid directly to injured workers, for example, typically would not be captured in MDC. The claim experience captured in the study, therefore, represents a subset of all claim experience. No regional biases were detected due to excluding this data.

Geolocating Exposures

Exposures were allocated to locations recognizing regional wage differentials (developed from the Occupational Employment Survey) and the relative number of employees estimated by D&B Hoovers to be at each location. Each classification's exposures were allocated to locations using the industries at the location provided by D&B Hoovers. Note that the regional wage differentials are by county – not by WCIRB region. The regional wage differentials used in the study are provided in the zip code-to-region mapping.

Geolocating Claims

Claims were allocated to locations at which the claim's classification had exposure allocated. Claims were located to the nearest such location by calculating the location of each claim's "center of medical services" determined from MDC

observations. All MDC features were used to geolocate claims. Features were weighted in proportion to their accuracy in geolocating so that features that provide good geolocating information receive greater weight than features that provide poor geolocating information. The average number of MDC observations used to geolocate a claim was 24.8.

Identifying Optimal Geographic Units of Analysis

A market area approach was used to identify economically cohesive geographical units. To identify economically cohesive geographical units, WCIRB staff examined the "correlation" of medical providers among geographic units. The idea is that regions utilizing common providers form a more natural geographic unit.

To identify economically cohesive geographical units, WCIRB staff first identified the minimum number of claims required in a geographic unit for reasonably stable results. A selection of 130 claims was made based on reviewing the clustering patterns for geographical units with greater claim volumes and identifying the volumes below which the ability to detect previously identified and stable clusters deteriorated. The average geolocated claim's number of MDC observations used in geolocating was 24.8, so the expected number of geolocating MDC observations for a geographic unit with 130 claims was 3,224.

Staff then developed a customized grid for the state for which each cell had at least 130 claims. Cells varied in geographic area as required to include at least 130 claims. Cells smaller than 1.3mi² in geographic area but with more than 130 claims were not subdivided. The provider "correlation" matrix for the grid was then calculated. If two geographic units had half of the providers in common, then the "correlation" between the two units was 0.50. The provider "correlations" range between zero and unity. The statewide average provider "correlation" across the grid was 0.12.





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Unity less the provider "correlation" was used as a measure of dissimilarity between geographic units. Cluster analysis using Ward's 2D linkage criterion was then performed using this measure of dissimilarity. The cluster analysis algorithm first divided the state into two clusters such that the dissimilarity within the clusters is minimized. This process was repeated iteratively for each division until a desired number of clusters was reached. WCIRB staff evaluated a range of clusters and selected 19 as striking a good balance between robustness in the geographic units' results and the level of refinement. The average provider "correlation" for the selected 19 geographic regions is 0.40.

A mapping of U.S. Postal Service nine-digit zip codes to the study regions is available in the Research and Analysis section of the WCIRB website. The mapping includes the regional wage differentials. Note that an accurate mapping requires the use of the nine-digit, or zip plus 4, codes. Regions are not uniquely identified at the five-digit zip code level, and five-digit zip codes may map to multiple regions.

WCIRB Indemnity Transaction Data

The WCIRB began the mandatory collection of indemnity transaction data from most carriers for transactions beginning April 1, 2020. Data from these carriers is expected to represent 88% of claims in the insured market. Detailed transaction information is reported for each first report of injury (FROI) and subsequent report of injury (SROI) as reported to the Division of Workers' Compensation (DWC). This data is reported well before USR or MDC data is available, in some cases the day after the injury occurs. FROI and SROI records are reported for medical only and expense only claims as well as indemnity claims. For this report, FROI records reported with accident dates from April 1, 2020 through August 31, 2021 were used to identify claims coded as arising from exposure to COVID-19 and combined with information from the SROI records for those claims. Claims were located based on the employer zip code and the zip code of the injury site which are listed in the most recent FROI record submitted for each claim. Zip codes outside of California were excluded.

In future reports, indemnity transaction data will be available for the policy year underlying the majority of the report. The WCIRB intends to use this information to refine claim locating protocols and provide additional insight into claim costs and other regional trends.

Let us know what you think about this study by emailing us at **ActuarialResearch@wcirb.com**.





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Exhibit 2: Indemnity Claim Frequency Relative to Statewide

- This map shows the regional indemnity claim frequency relative to statewide. The expected statewide frequencies were developed at a classification level, so relativities are adjusted for industry mix.
- The regional indemnity claim frequency relativities for policy years 2013 through 2019 are provided on tab FREQ01 in the 2021 WCIRB Geo Study – Exhibits (XLS).
- The regional total claim frequency relativities (not mapped) for policy years 2013 through 2019 are provided on tab FREQ03.
- The regional indemnity claim frequency relativities by industrial sector for policy years 2013 through 2019 are provided on tabs FREQ04 through **FREQ09**.



Exhibit 3: Policy Year 2013-2019 Change in Indemnity Claim Frequency Relativity

- This map shows the percentage point change in indemnity claim frequency relativity from policy year 2013 to policy year 2019.
- The data underlying this map as well as changes in prior policy years are provided on tab FREQ02 in the 2021 WCIRB Geo Study – Exhibits (XLS).



Exhibit 4: Limited Incurred Severity on Indemnity Claims Relative to Statewide

- This map shows total incurred severity on indemnity claims, controlled for classification mix, relative to statewide.
- These severities are at first report level, with all losses limited to \$500,000, and are not necessarily the severities ultimately expected as claims mature.
- The regional total incurred severity relativities for indemnity claims for policy years 2013 to 2019 are provided on tab SEV01, for policy years 2013 to 2017 at third report level on tab SEV04 and for policy years 2013 to 2015 at fifth report level on tab SEV05 in the 2021 WCIRB Geo Study - Exhibits (XLS).
- The regional incurred indemnity severity relativities for policy years 2013 to 2019 are provided on tab SEV02.
- The regional medical incurred severity relativities for indemnity claims for policy years 2013 to 2019 are provided on tab SEV03.



Exhibit 5: 3-Year Average Ratio of Actual to Expected Indemnity Claims in Excess of \$250,000: RL 3

- This map shows the PY 2015-2017 average share of indemnity claims which are incurred in excess of \$250,000 at third report relative to expected count adjusted for industry mix.
- To adjust for industry mix, expected excess claim count shares were developed at the classification level.
- The regional shares of claims for PY 2013-2015, 2014-2016 and 2015-2017 are provided on tab SEV10.



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Exhibit 6: Median Injured Worker's Average Weekly Wage

- This map shows the policy year 2019 median injured worker's wage for claims with permanent disability. The median injured worker's wage for policy years 2013 to 2019 is provided on tab WORKER02 in the 2021 WCIRB Geo Study – Exhibits (XLS).
- Annual changes in median injured worker's wages for policy years 2014-2019 are provided on tab **WORKER01**.
- The median injured worker's age for claims with permanent disability for policy years 2013 to 2019 is provided on tab WORKER03.



Exhibit 7: Permanent Disability Claims as a Share of Indemnity Claims

- This map shows the policy year 2019, at first report level, regional shares of indemnity claims that are permanent disability.
- Each region's permanent disability share of indemnity claims for policy years 2013 to 2019 are provided on tab CLAIM01 in the 2021 WCIRB Geo Study – Exhibits (XLS). Each region's indemnity claim share of total claims for policy years 2013 to 2019 (not mapped) are provided on tab CLAIM02.
- Each region's permanent disability share of indemnity claims for policy years 2013 to 2017 at third report level are provided on tab CLAIM03 and for policy years 2013 to 2015 at fifth report level are tab CLAIM04.
- Higher shares of more costly indemnity claims explain some of the cost differences observed in <u>Exhibit 4</u>.



Exhibit 8: Cumulative Injury & Occupational Disease Claims as a Share of Total Claims

- This map shows the share of all claims (including medical only claims) that are cumulative trauma or occupational disease by region for policy year 2019.
- These shares are at first report level and do not reflect the shares ultimately expected. The cumulative injury shares by region for policy years 2013 to 2019 are provided on tab CLAIM05 in the 2021 WCIRB Geo Study – Exhibits (XLS).
- Changes in the cumulative injury share are provided on tab CLAIM06. Third report values of cumulative injury share are provided on tab CLAIM07 and fifth report values of cumulative injury share on tab CLAIM08.



Exhibit 9: Open Share of Indemnity Claims

- This map shows each region's share of indemnity claims that were reported as open at first report level for policy year 2019.
- The regional open shares for indemnity claims at first report level for policy years 2013 to 2019 are provided on tab CLAIM09, at third report level are provided on tab CLAIM13 and at fifth report level are provided on tab CLAIM14 in the 2021 WCIRB Geo Study – Exhibits (XLS).
- The regional open shares for all claims at first report level for policy years 2013 to 2019 are provided on tab CLAIM09, at third report level are provided on tab CLAIM15 and at fifth report level are provided on tab CLAIM16.
- The regional open shares for permanent disability claims at first report level for policy years 2013 to 2019 are provided on tab CLAIM12, at third report level are provided on tab CLAIM17 and at fifth report level are provided on tab CLAIM18.



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Exhibit 10: Open Share of Permanent Disability Claims at RL 5 Compared to Statewide

- This map shows each region's share of indemnity claims that are permanent disability and were reported as open at fifth report level from 2013 to 2019 relative to statewide.
- The relative shares of permanent disability claims reported as open at third report level are provided on tab CLAIM17 in the 2021 WCIRB Geo Study – Exhibits (XLS).



Exhibit 11: Limited* Incurred Loss Development Relative to Statewide: RL 1 to RL 5

- This map shows regional indemnity claim count development relativities from first report level to fifth report level for policy year 2015.
- This development includes incurred but not reported claims, as well as claims initially categorized as medical-only at first report level that had an indemnity payment or reserve at third report level.
- The relativities from RL 1 to RL 3 for policy years 2013 to 2017 are provided on tab **DEV01** and for policy years 2013 to 2015 from RL 1 to RL 5 on tab **DEV02** in the 2021 WCIRB Geo Study – Exhibits (XLS).
- The regional indemnity claim count development relativities for policy years 2013 to 2017 from RL 1 to RL 3 are provided on tab **DEV05** and for policy years 2013 to 2015 from RL 1 to RL 5 are provided on tab **DEV06**.



Exhibit 12: Paid Medical for Medical Legal as a Share of Total Paid Medical

- This map shows the policy year 2019 share of paid medical accounted for by medical-legal reports.
- Medical-legal reports are used to address disputed issues and are expected to be more frequent for permanent disability claims.
- The incidence of medical-legal reports beyond that explained by differences in permanent disability shares suggests a degree of litigiousness.
- The regional values of medical-legal as a share of total paid medical report for policy years 2013 to 2019 are provided on tab MDC01 in the 2021 WCIRB Geo Study – Exhibits (XLS). These values relative to statewide are provided on tab MDC02. The regional shares of indemnity claims with a medical-legal report for policy years 2013 to 2019 are provided on tab MDC03.
- The regional median permanent disability rating is provided in tab SEV06 for first report, in tab SEV07 for third report and in tab SEV08 for fifth report.



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Exhibit 13: Median Paid ALAE on Permanent Disability Claims

- This map shows the regional median paid allocated loss adjustment expense (ALAE) per permanent disability claim for policy year 2019.
- The regional median paid ALAE per permanent disability claim for policy years 2013 to 2019 at first report is provided on tab ALAE01, at third report on tab ALAE02 and at fifth report on tab ALAE03 in the <u>2021 WCIRB Geo Study – Exhibits (XLS)</u>.
- The regional average paid ALAE per permanent disability claim for policy years 2013 to 2019 at first report is provided on tab ALAE07, at third report on tab ALAE08 and at fifth report on tab ALAE09.
- The regional paid ALAE shares of incurred losses on permanent disability claims at first are provided on tab **ALAE04**, at third report on tab **ALAE04** and at fifth report on tab **ALAE05**.
- The paid ALAE shares of incurred losses on permanent disability claims. The paid ALAE shares of incurred losses on permanent disability claims.



Exhibit 14: Limited* Paid ALAE Development Relative to Statewide: RL 1 to RL 5

- This map shows regional paid ALAE development relativities from first report level to third report level for policy year 2015.
- Each claim's actual paid ALAE is limited to \$500,000
- The regional paid ALAE development relativities from RL 1 to RL 3 for policy years 2013 to 2017 are provided on tab ALAE14 in the 2021 WCIRB Geo Study – Exhibits (XLS). The regional paid ALAE development relativities from RL 1 to RL 5 for policy years 2013 to 2015 are provided on tab ALAE15.



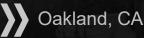
Exhibit 15: Ratio of Limited* Losses to Modified Pure Premium

- This map shows regional loss ratio relativities after application of experience rating for experience rated employers for policy year 2019.
- Expected losses contemplate a \$500,000 per claim limit and are controlled for classification mix and regional wage level differences. Each claim's actual losses are limited to \$500,000.
- The limited losses are compared to the modified pure premium for those risks, which is the premium generated at the approved advisory pure premium rates adjusted by the applicable experience modifications.
- <u>Exhibit 15</u> combined with <u>Exhibit 16</u> provides the most comprehensive picture of regional cost differentials.
- The regional loss ratio relativities for policy years 2013 to 2019 are provided on tab LR01, for policy years 2013 to 2016 at third report on tab LR02 and for policy years 2013 to 2015 at fifth report on tab LR03 in the 2021 WCIRB Geo Study – Exhibits (XLS).



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Exhibit 16: Ratio of Limited* Losses to Modified Pure Premium at RL 5

- This map shows regional loss ratio relativities after application of experience rating for experience rated employers for policy year 2015.
- Expected losses contemplate a \$500,000 per claim limit and are controlled for classification mix and regional wage level differences. Each claim's actual losses are limited to \$500.000.
- The limited losses are compared to the modified pure premium for those risks, which is the premium generated at the approved advisory pure premium rates adjusted by the applicable experience modifications.
- Exhibit 15 combined with Exhibit 16 provides the most comprehensive picture of regional cost differentials.



Exhibit 17: Share of COVID-19 Indemnity Claims with Indemnity Benefits Only Relative to Statewide

- This map shows the share of SROI (Subsequent Report of Injury) indemnity claims where the injury arose out of exposure to COVID-19 and where there are paid indemnity benefits but no reported medical benefits.
- Claims were identified as arising from COVID-19 if coded using the nature of injury or cause of injury of 83.
- This includes total claims and accident dates from April 1, 2020 through August 31, 2021.
- The regional shares of indemnity claims arising from exposure to COVID-19 with paid indemnity benefits but no reported medical benefits are provided on tab TI02 in the 2021 WCIRB Geo Study -Exhibits (XLS).
- The regional shares of indemnity claims arising from exposure to COVID-19 with both paid indemnity and medical benefits are provided on tab TI01.

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- This map shows the rate of SROI (Subsequent Report of Injury) indemnity claims per 1,000 claims where the injury arose out of exposure to COVID-19 and the paid medical and indemnity benefits are reported as greater than \$100,000.
- Claims were identified as arising from COVID-19 if coded using the nature of injury or cause of injury of 83.
- This includes total claims and accident dates from April 1, 2020 through August 31, 2021.
- The regional rates of indemnity claims in excess of \$100,000 arising from exposure to COVID-19 are provided on tab TI04 in the 2021 WCIRB Geo Study - Exhibits (XLS)



Exhibit 19: Share of COVID-19 Indemnity Claims Which Are in Health Care

- This map shows the share of SROI (Subsequent Report of Injury) indemnity claims where the injury arose out of exposure to COVID-19 and where the classification is from the health care sector.
- Claims were identified as arising from COVID-19 if coded using the nature of injury or cause of injury of 83.
- This includes total claims and accident dates from April 1, 2020 through August 31, 2021.
- The regional shares of indemnity claims arising from exposure to COVID-19 which are identified as being from the health care sector are provided on tab TI05 in the 2021 WCIRB Geo Study -Exhibits (XLS).



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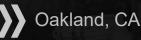


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