



PENNSYLVANIA
Compensation Rating Bureau

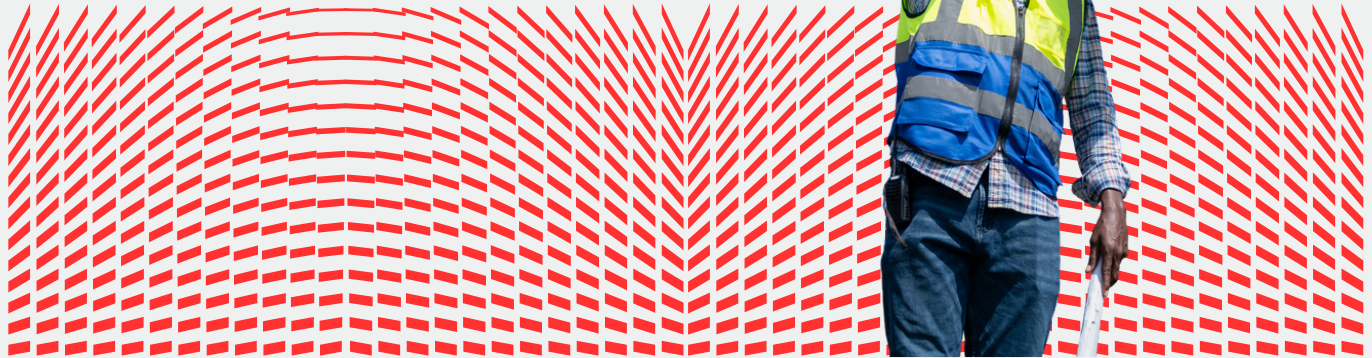
Impact of Excessive Heat on Workers Compensation Claims



**An analysis of Pennsylvania data
2005-2024**

Prepared & presented by PCRB's Actuarial Research Department
May, 2026

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Introduction

This report examines the relationship between temperature fluctuations and heat-related workers' compensation claims in Pennsylvania, with a focus on how excessive heat may influence workplace safety, claim frequency, and claim severity over time.

As periods of extreme heat become more common and prolonged, understanding how rising temperatures impact workers and employers has become increasingly important across the workers' compensation industry. While heat-related injuries are most often associated with outdoor industries such as construction, agriculture, and landscaping, elevated temperatures can affect a broad range of occupations and working environments.

To better understand this relationship, this analysis combines workers' compensation claims data with statewide temperature data spanning Policy Years 2005–2024. The study evaluates claims associated with heat exposure and temperature extremes, using average daily air temperature data sourced from the Pennsylvania State Climatologist. Particular attention was given to identifying heat-related claims through combinations of nature and cause of injury codes, while also accounting for the limitations and complexities associated with seasonal employment patterns, classification code interpretation, and inconsistent heat index data across regions.

The findings provide insight into how excessive heat may contribute to workplace injuries and workers' compensation costs, while also highlighting areas where additional data and future research may further improve understanding of environmental impacts on workplace safety.



Data Used in the Analysis

*For 90/99, only claims identified as heat-related are included.

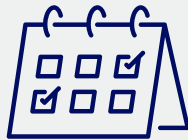
Period	Policy Year 2005-2024
Temperature Data Source	Pennsylvania State Climatologist
Metric	Air Temperature
Claim Data Source	Unit Data, Medical Data Call
Nature of Injury	32-Heat Prostration; 90-Multiple Physical Injuries Only
Cause of Injury	03-Temperature Extremes; 99-Other
Nature/Cause Pairings Applied	32/03, 32/99 and 90/03*
# of Classes Included	263

Assumption: Industries like agriculture, construction, and landscaping tend to have higher employment levels during warmer months.

Key Findings

Analysis of Pennsylvania workers' compensation data indicates a measurable relationship between rising temperatures and heat-related workplace injuries. While heat-related claims remain a relatively small portion of overall claims activity, the findings suggest that excessive heat continues to present a growing workplace safety concern with operational and cost implications for employers and carriers alike.

Heat-Related Claims Rise as Temperatures Climb Above 85°F



1.4% annual increase in heat-related claims as a percentage of total claims



Overall average severity is \$3,700 for heat-related claims with 96% being medical-only claims.

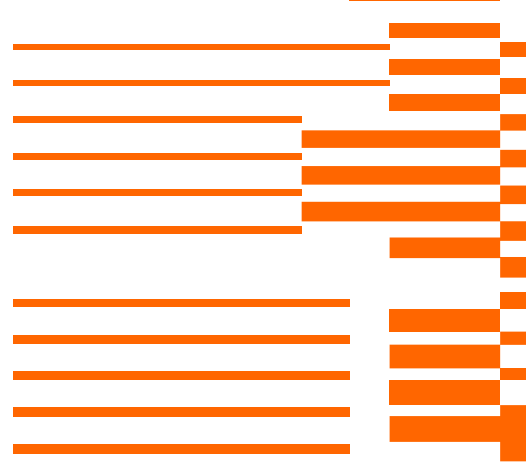


Construction-related jobs had the highest percentage of heat-related claims.



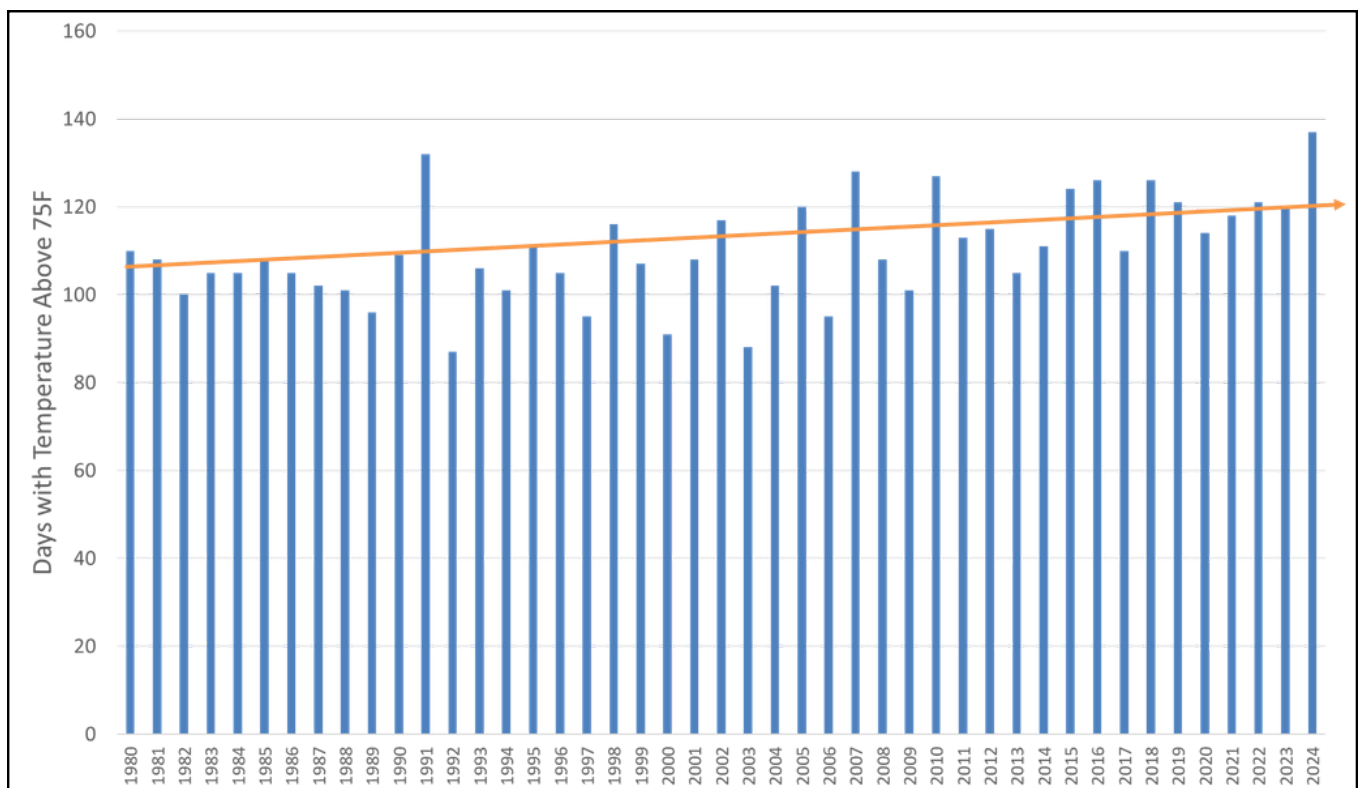
Significant rise in claims when temperatures shift from below to above 85°F.

Number of Days Above 75°F Per Year

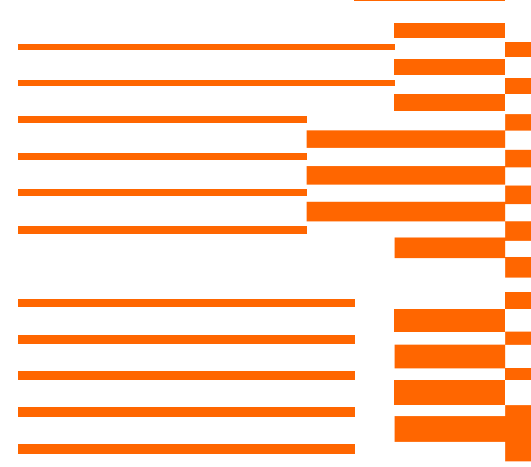


Over the period from 1980 to 2024, the number of days above 75°F has increased at a rate of about 0.5 days per year, or roughly 0.4% annually, indicating a gradual upward trend despite year-to-year variability.

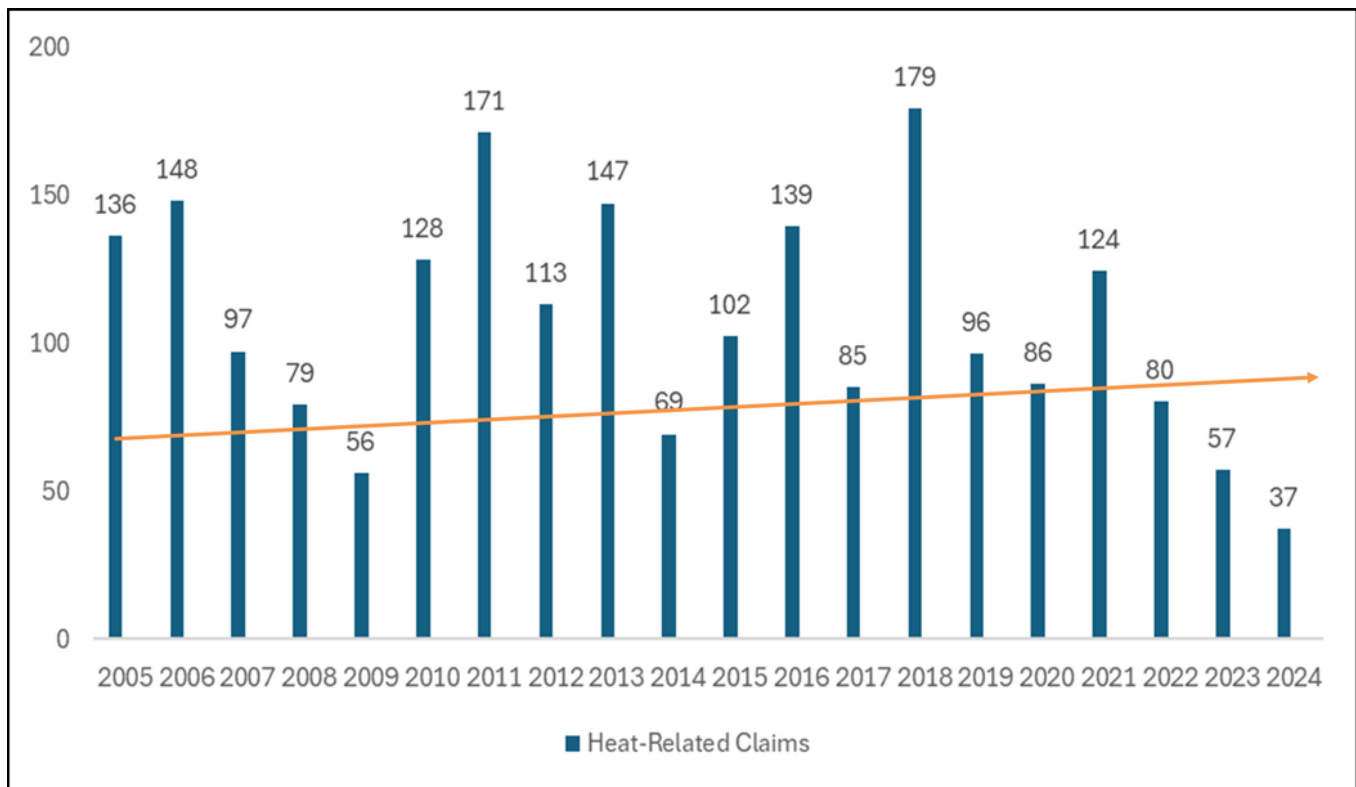
This translates to approximately 20 additional days over the full 40+ year period.



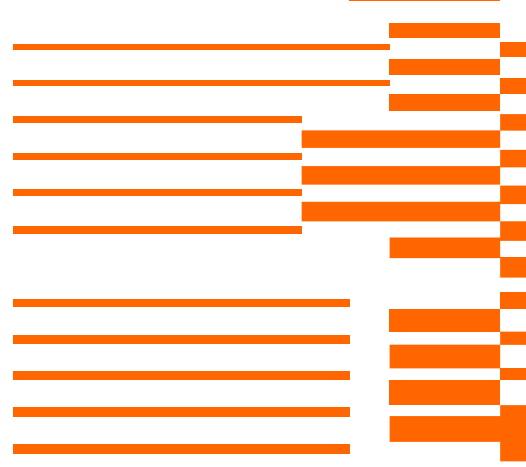
Distribution of Heat-Related Claims By Year



The annual number of heat-related claims varies significantly over the period, ranging from a low of 37 claims in 2024 (least mature year) to a high of 179 claims in 2018. While fluctuations occur year to year, the overall raw claim data lacks any consistent pattern.

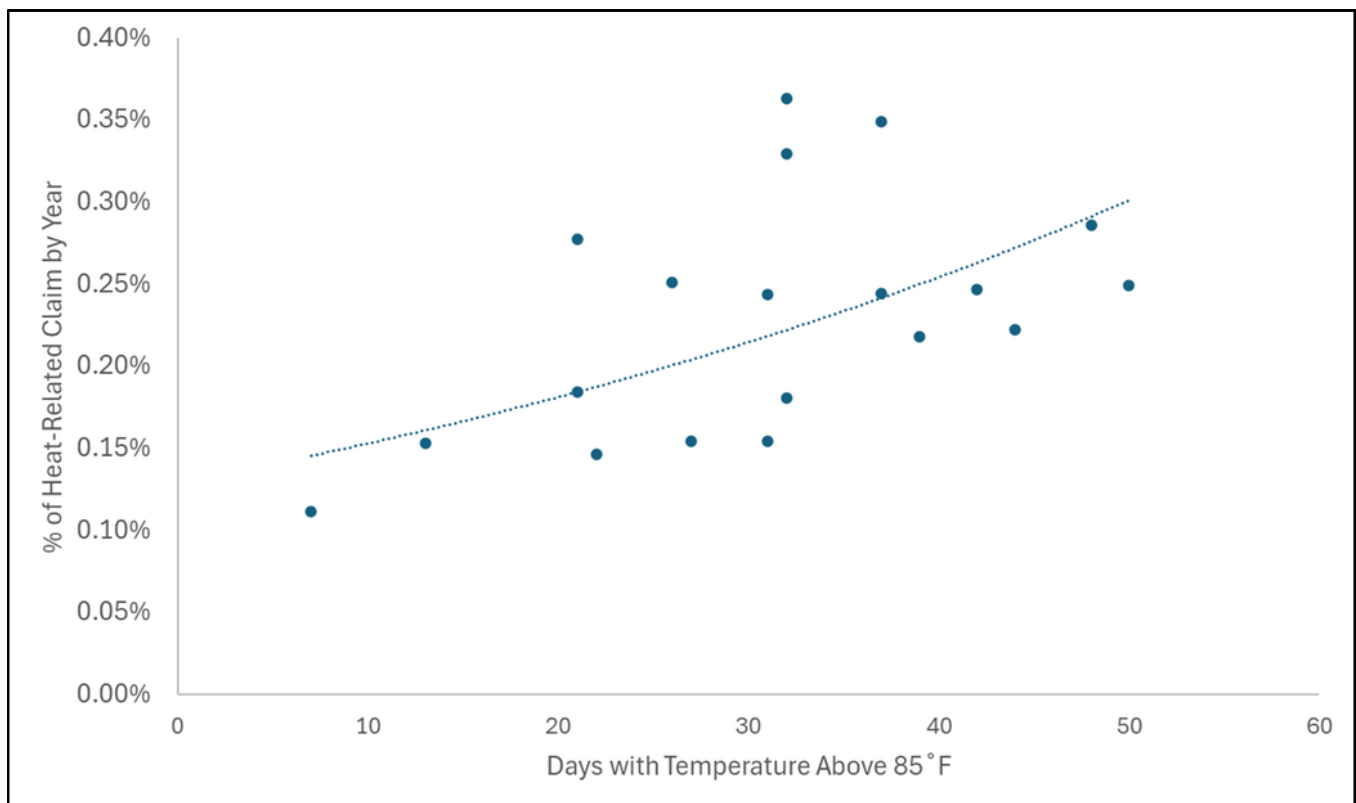


Percentage of Heat-Related Claims vs. Days Above 85°F

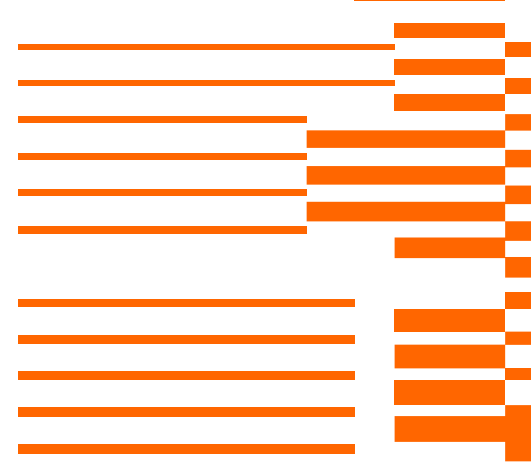


The chart shows a positive relationship or moderate correlation between the number of days with temperatures above 85°F and the percentage of heat-related claims. As the number of hot days increases, the share of heat-related claims also tends to increase.

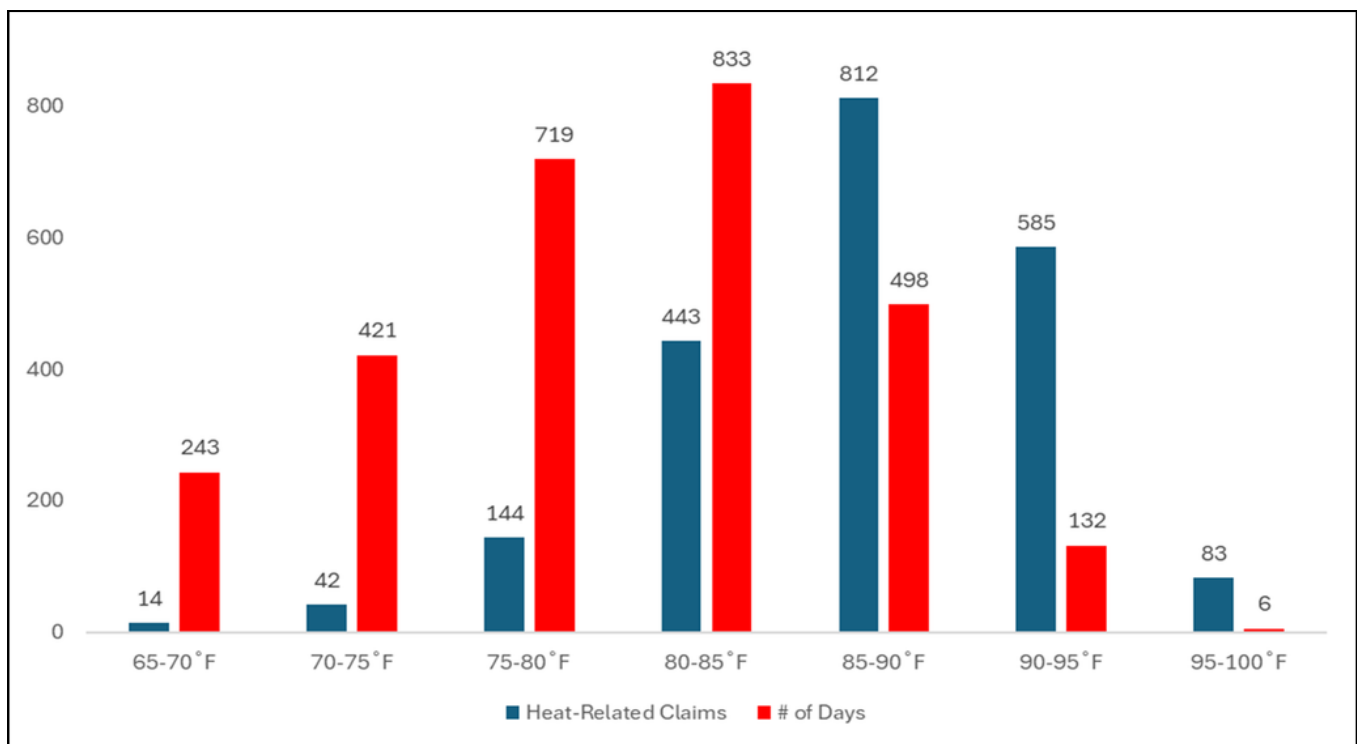
The trendline indicates roughly a 1.7% increase in heat-related claims for each additional day above 85°F.



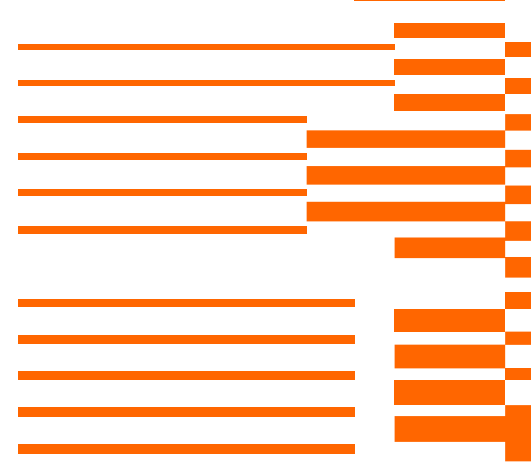
Distribution of Heat-Related Claims by Temperature Ranges



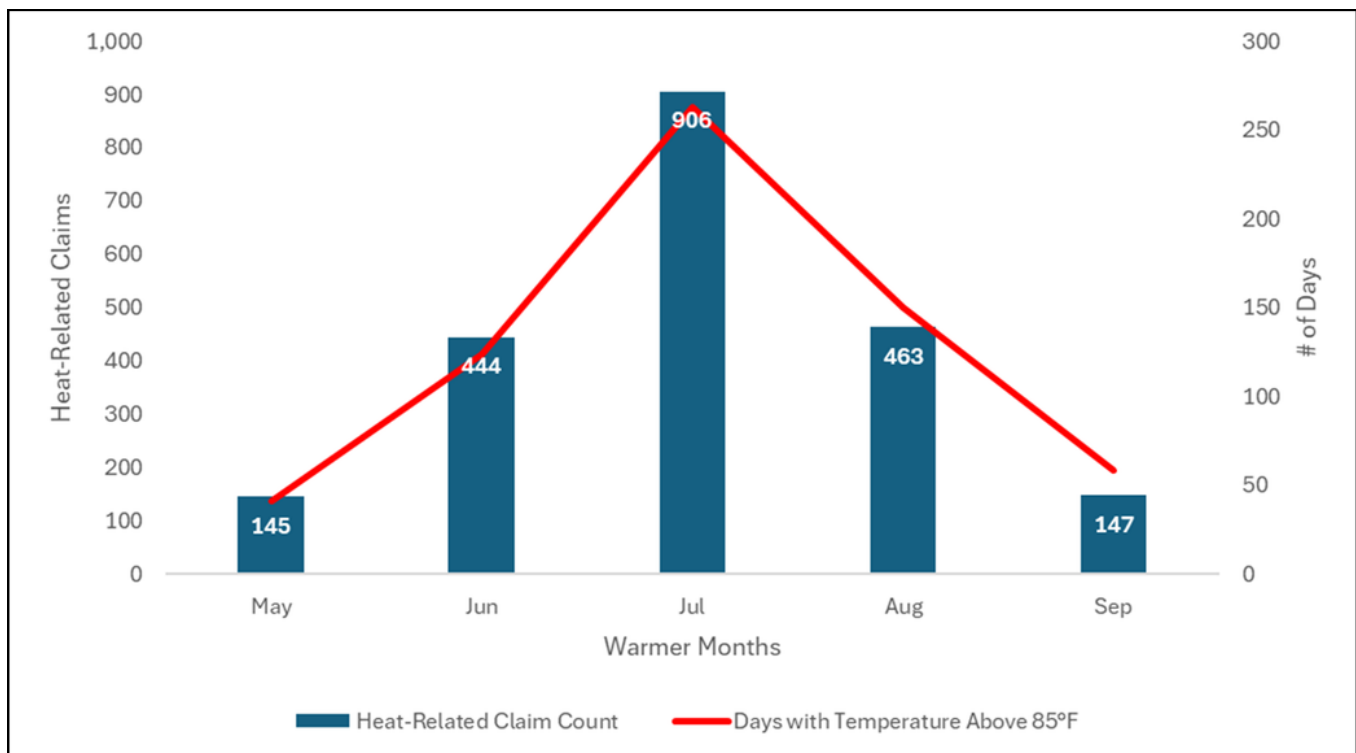
The analysis, based on data accumulated from 2005 to 2024 in months from May to September, shows a clear trend of increasing workers' compensation claims as temperatures rise. Claims peak when daily maximum temperatures range between 85°F and 90°F. Interestingly, up to 85°F, there are more hot days than claims, but above 85°F, this trend reverses, with claims outpacing the number of hot days.



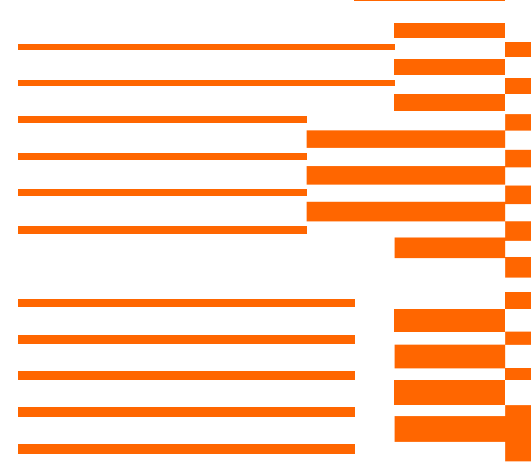
Heat-Related Claims vs Days with High Temperature



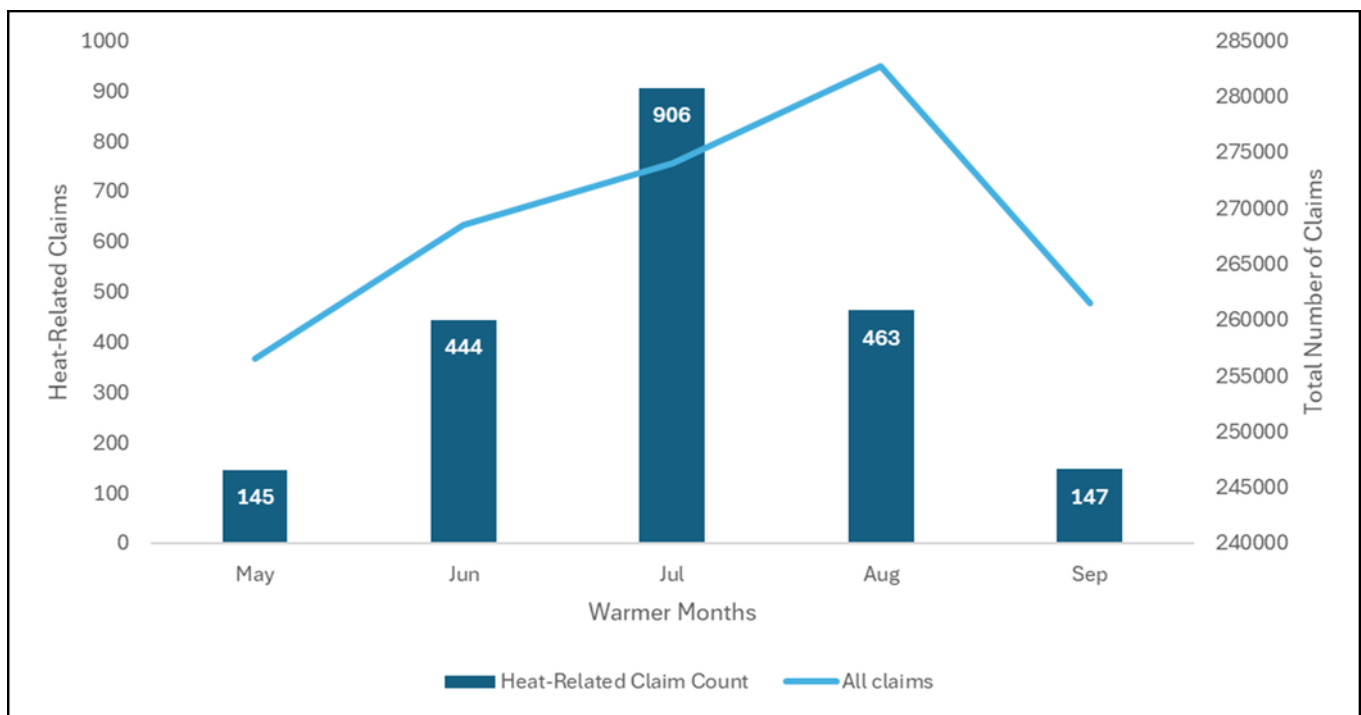
The data from 2005 to 2024 shows a clear pattern relating to the number of days with temperatures above 85°F increases (months May to September), and the corresponding rise in heat-related claims. Months with more high-temperature days tend to see more heat claims.



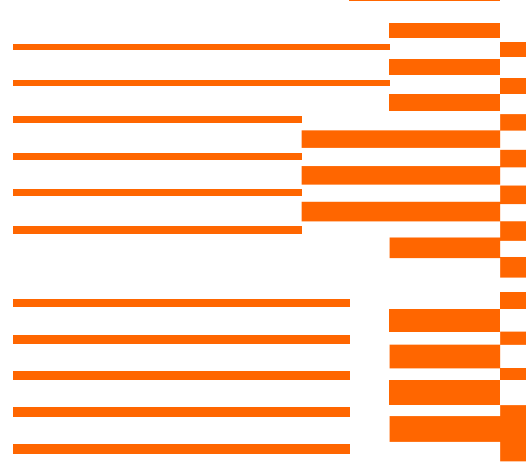
Comparison of Total Claims and Heat-Related Claims



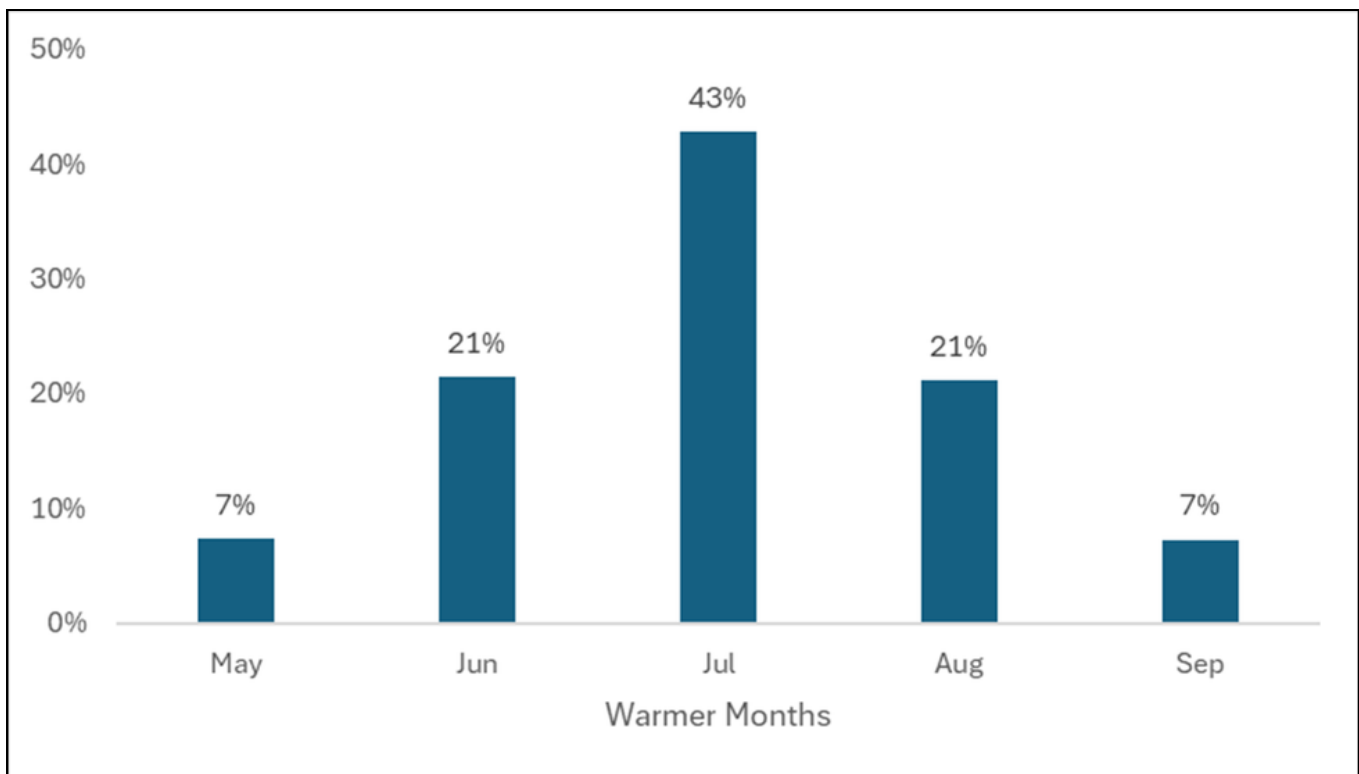
Heat-related claims (2005-2024) increase in tandem with the total number of claims by month. It is important to investigate how much seasonality of workers contributes to this rise in claims during warmer months.



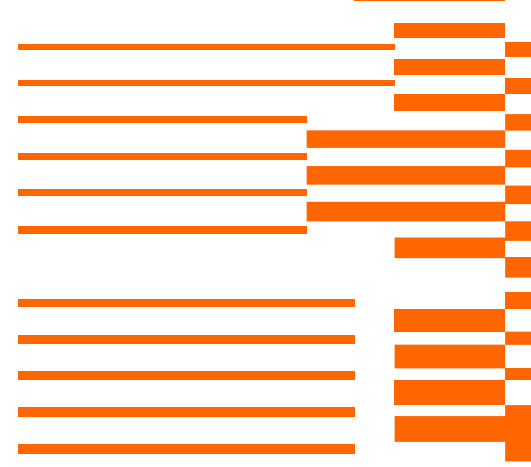
Percentage of Heat-Related Claims by Month



This view is adjusted for seasonality to account for workforce variations during summer months and assumes the number of claims reflects the number of workers. The percent of heat-related claims continue to be more frequent in June, July, and August compared to May and September. This suggests that temperature, rather than seasonality alone, is driving the rise in heat-related injuries.



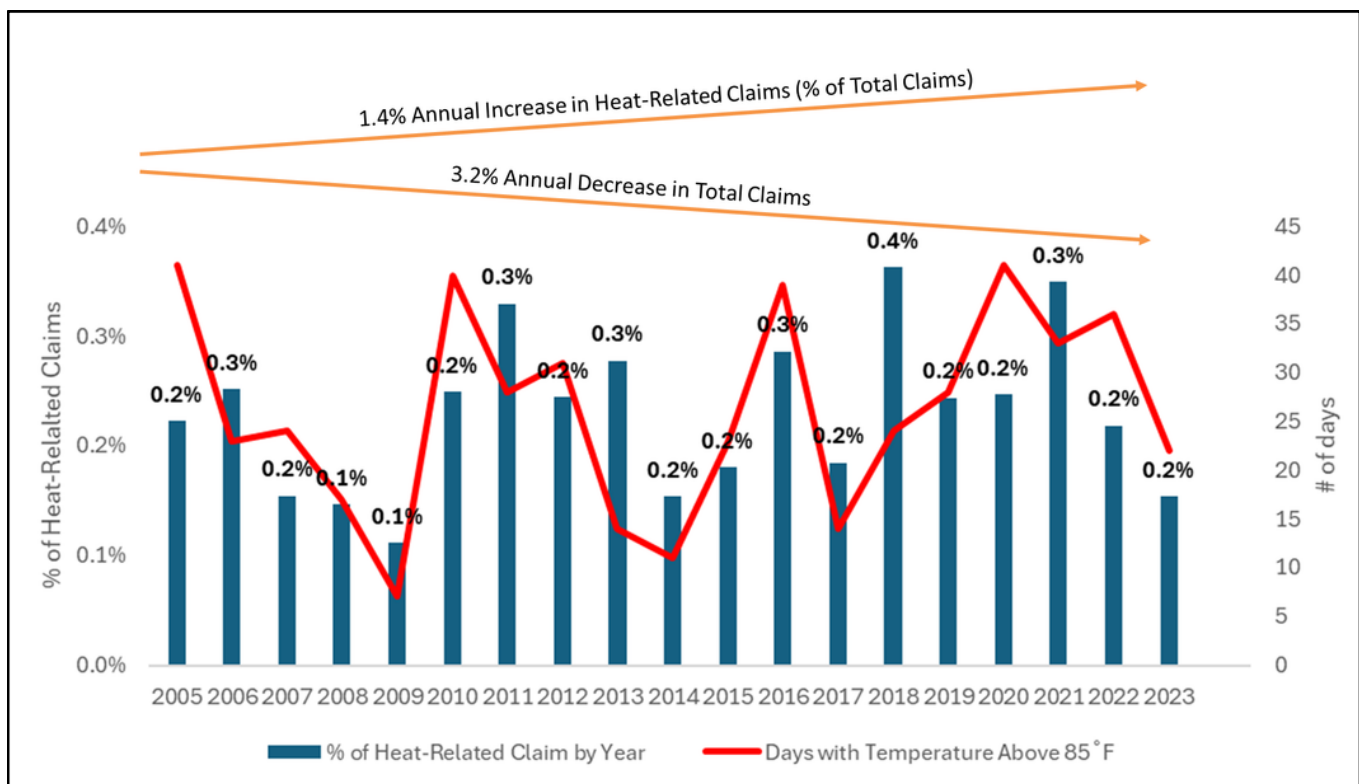
Percentage of Heat-Related Claims vs Days with High Temperature



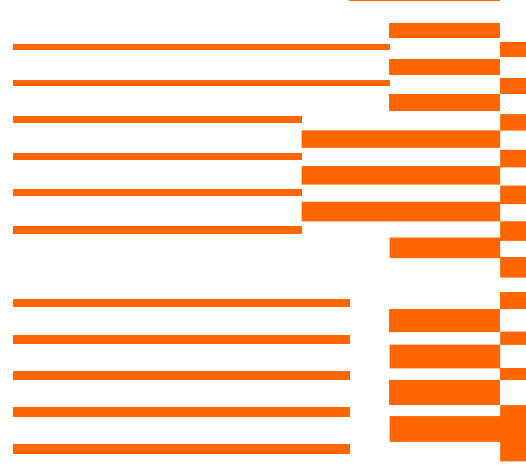
From 2005 to 2023 there is a clear correlation between the % of heat-related claims and the number of days with temperatures above 85 °F.

Total claims have dropped annual by 3.2%, resulting in a 1.4% annual increase in heat-related claims as a % of total claims.

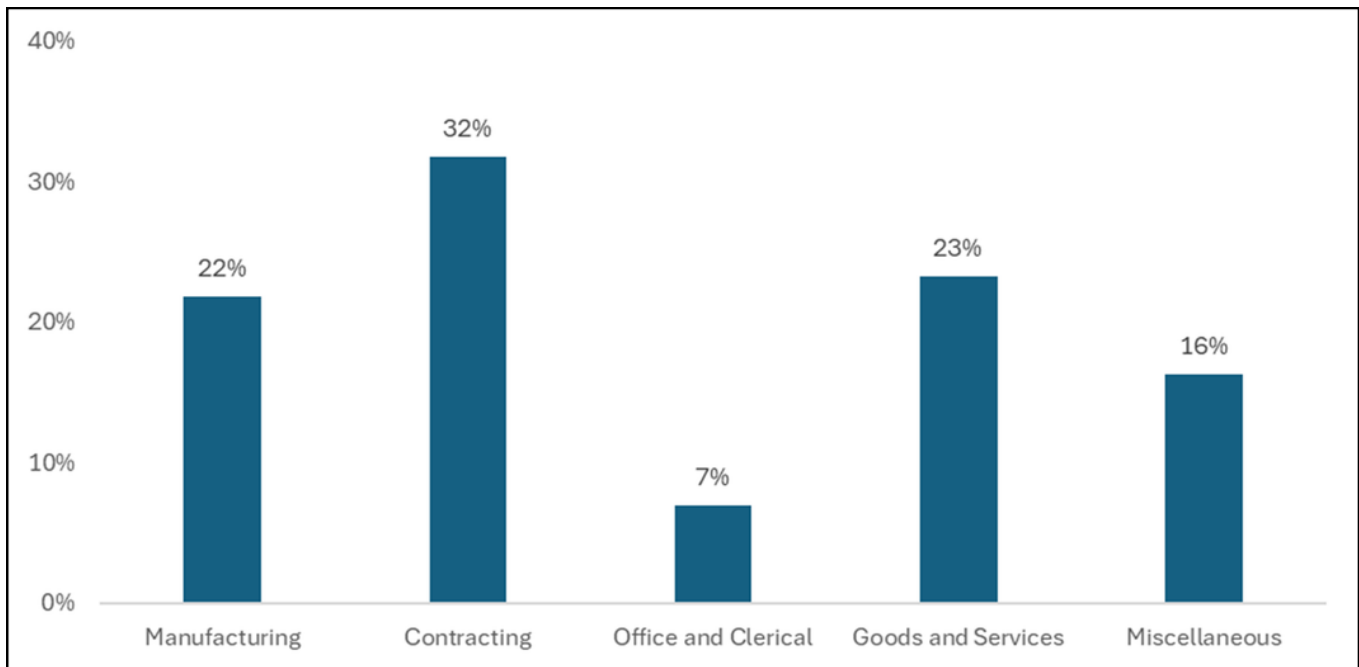
This suggests that although overall claim frequency has declined over time, heat-related claims have remained relatively persistent and influenced by the number of high-temperature days..



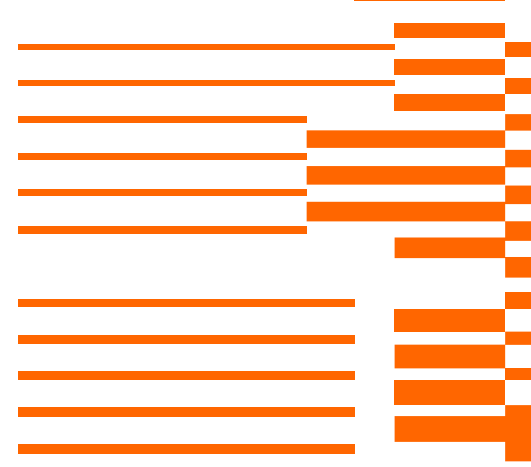
Percentage of Heat-Related Claims by Industry Group



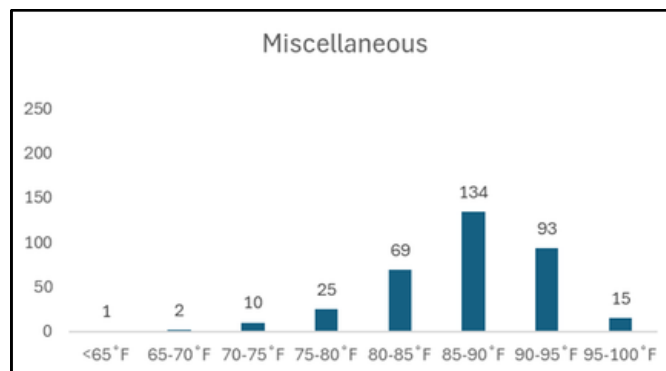
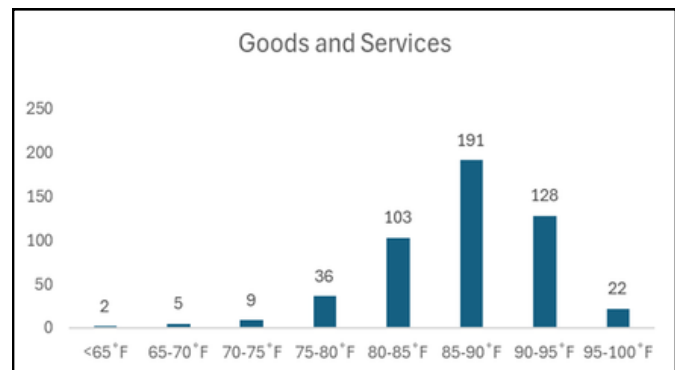
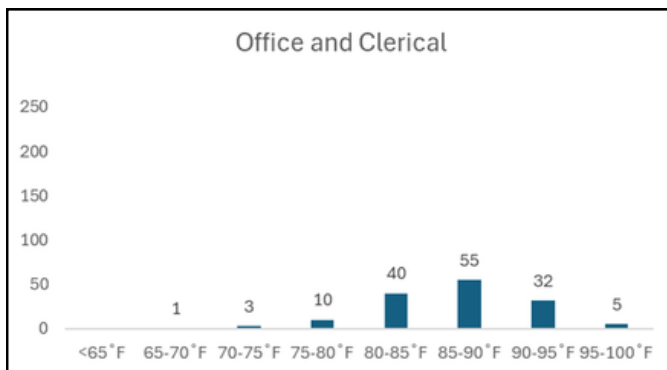
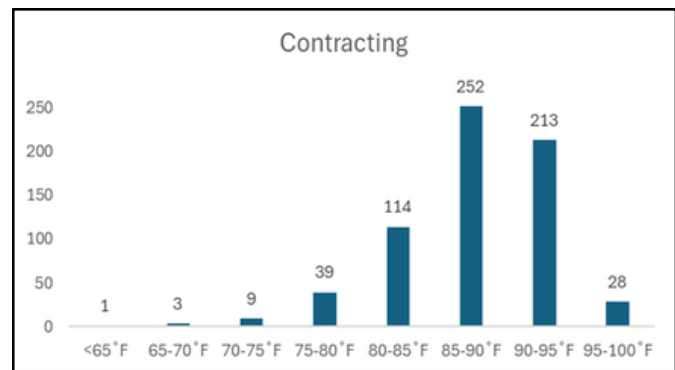
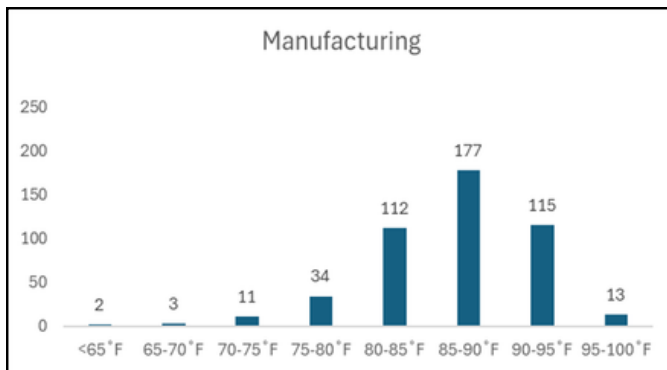
The data shows that the Contracting industry group has the highest percentage of heat-related claims, followed by the Goods and Services group. The Contracting group includes all construction-related jobs, which are particularly vulnerable to excessive heat.



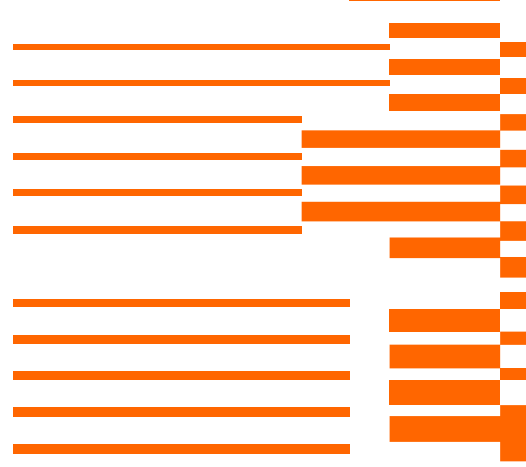
Distribution of Heat-Related Claims by Industry Group



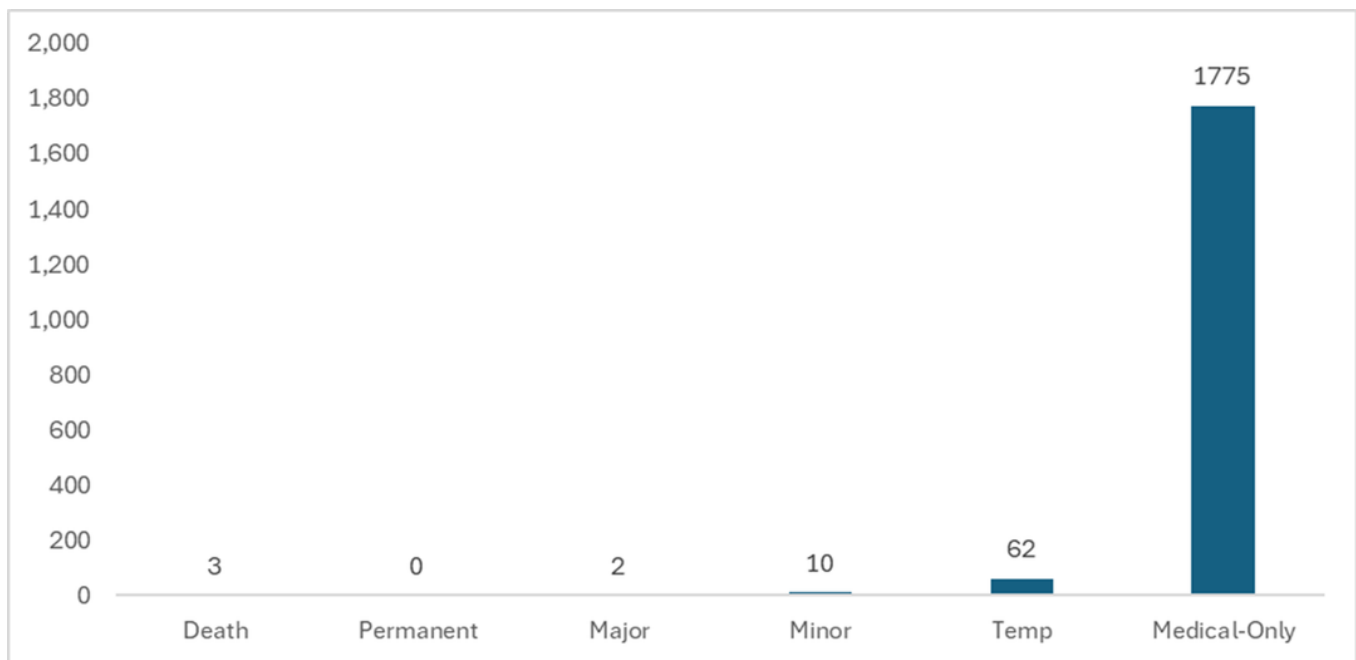
These graphs illustrate the distribution of heat-related claims across different temperature ranges for each industry group. There is a notable increase in claims when temperatures rise from below 80°F to above 80°F across all industry groups.



Distribution of Heat-Related Claims by Type of Injury



The majority of heat-related injuries are less severe, with an average claim severity of \$3,700. 96% of these claims are medical-only, indicating that most injuries require minimal treatment and no loss time from work.



Impacts of Heat-Related Claims on Loss Costs



Heat-related claims remain a limited contributor to overall system loss costs despite increased environmental exposure concerns.

~\$344K

Estimated Annual Heat-Related Losses

Based on average annual claim frequency and severity.

System-Level Impacts

- Average annual losses remain negligible relative to total system costs.
- Gradual environmental cost changes are inherently reflected in ratemaking processes.
- No statistically significant difference was identified between overall loss cost declines and heat-related class declines.

Operational & Safety Perspective

- Heat-related claims do not currently appear to create system cost deficiencies.
- Prevention and mitigation efforts remain important to worker safety outcomes.
- Continued awareness and workplace adaptation efforts are encouraged.



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