

# Challenges for Today's Worker—The Big Three

Environmental Impact | Physical Space | Mental Health

**Patrick Coate, PhD**

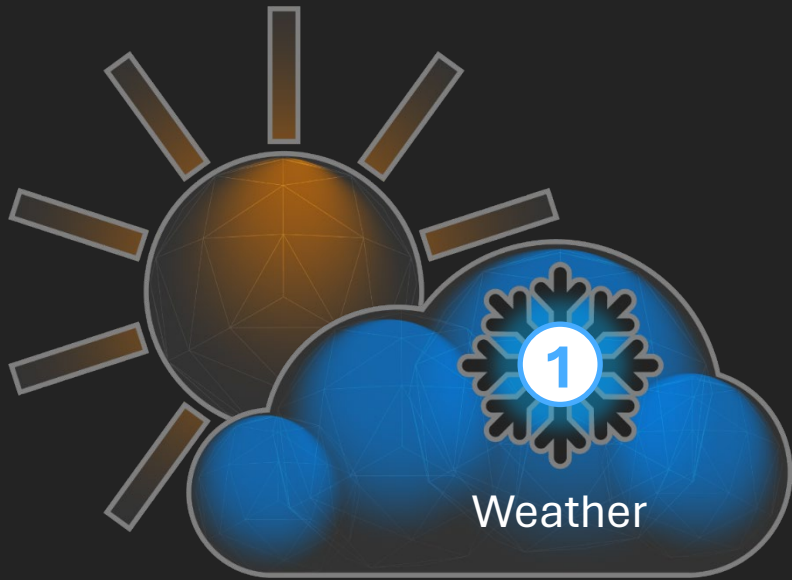
Senior Economist  
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Assistant Actuary  
NCCI



# Challenges for Today's Worker



Weather

Increasingly hazardous working conditions due to record-breaking temperatures and extreme weather

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Mental Health

3

Concerns for worker well-being as diagnosed mental disorders reach all-time highs

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Workplace Safety

Work injuries associated with specific movements and activities persist across industries

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# Environmental Conditions

1

Weather



Cold and wet conditions, in particular, lead to more slip and fall incidents.

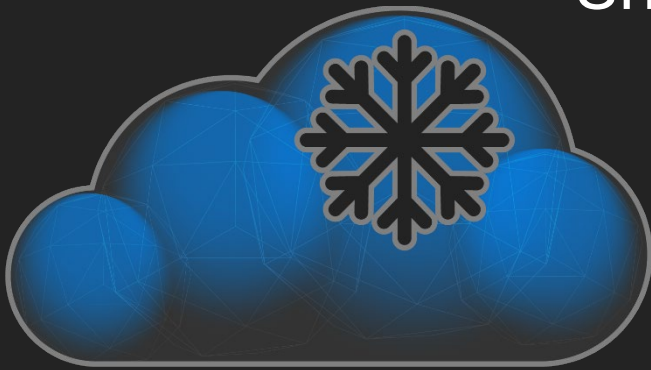


Hot weather increases injuries most in outdoor sectors, especially construction.

# Extreme Weather and Work Injuries: Roadmap

Impacts of adverse weather are of  
interest to WC/insurance

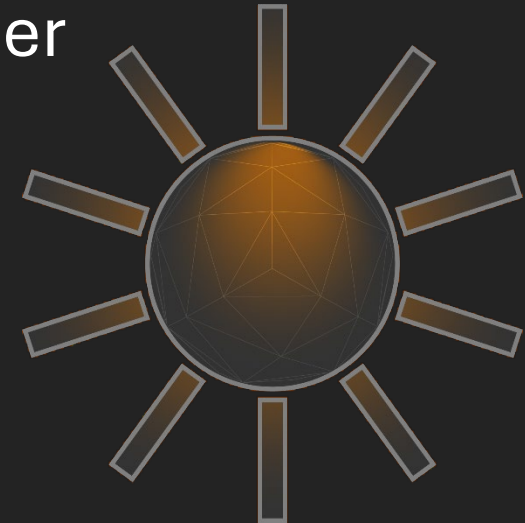
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Show relationship between weather  
conditions and work injuries

20+ years of data, 35 states

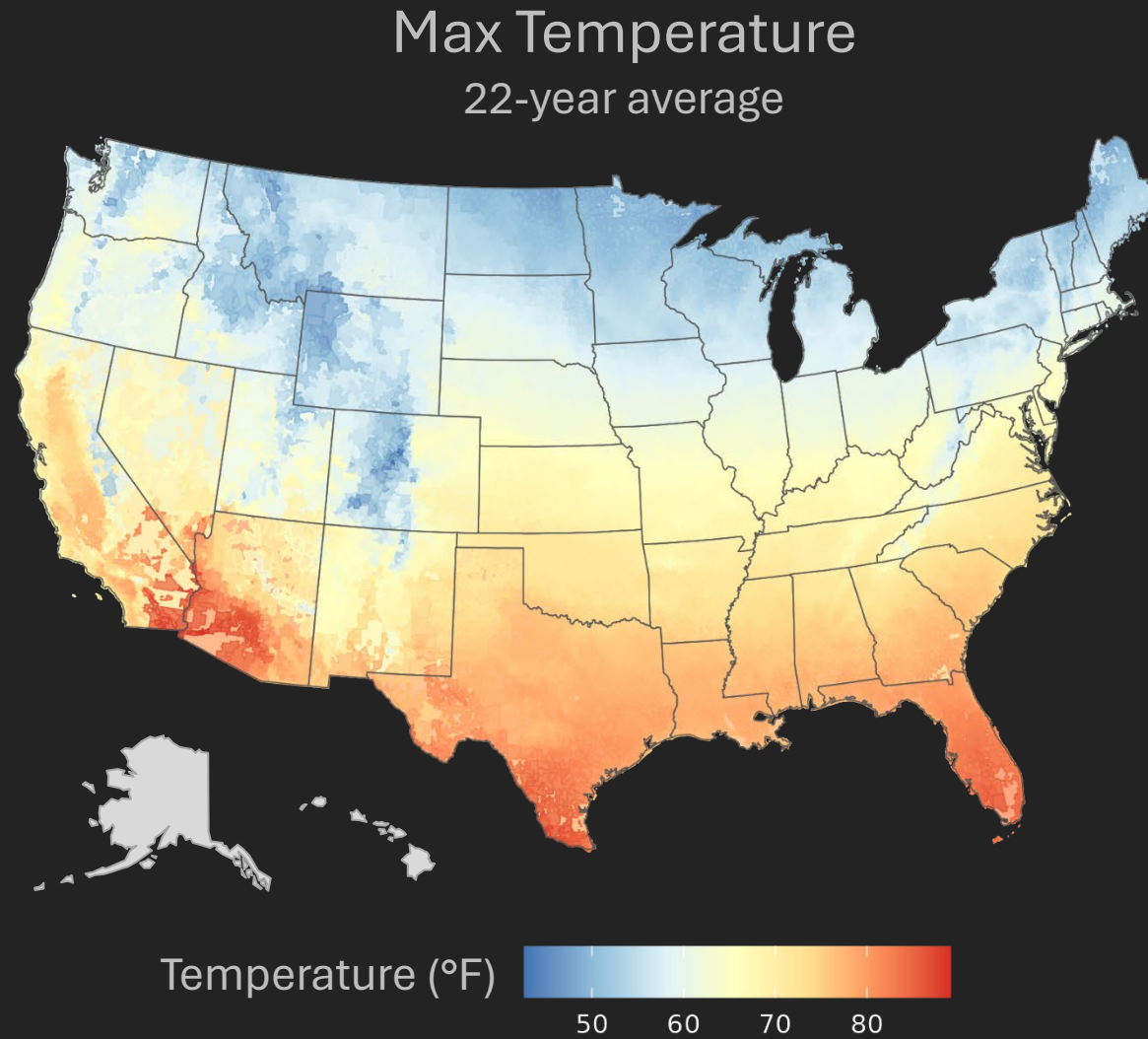
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What are the overall impacts of  
extreme weather?

Scenario analyses

# Different places have different extreme weather exposure



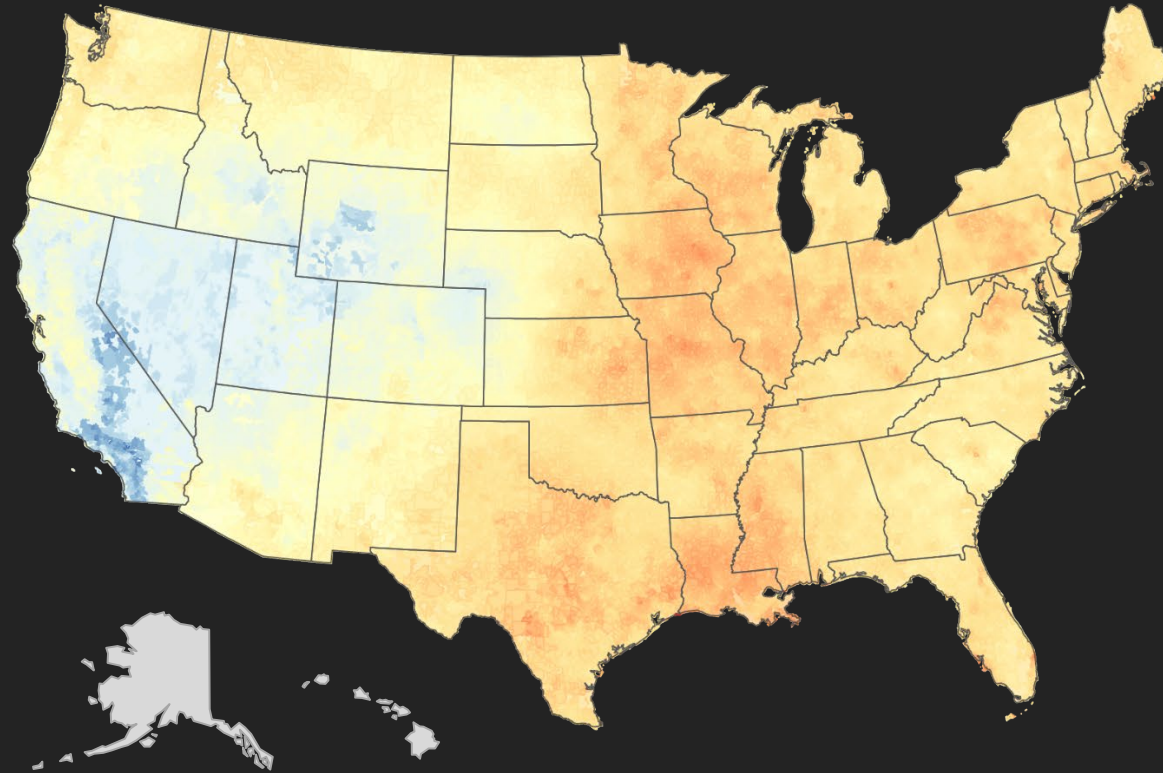
Sources: PRISM Climate Data; NCCI

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**AIS**  
2024

# Workers in 2023 experienced hotter temperatures than usual

Change in Max Temperature  
2023 vs 22-year average



Change in temperature (°F)



-6 -3 0 3 6

Sources: PRISM Climate Data; NCCI

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# Modeling Strategy



Compare claims to mild-weather baseline, all else equal

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Consider precipitation as well as temperature

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Investigate effects by sector and cause

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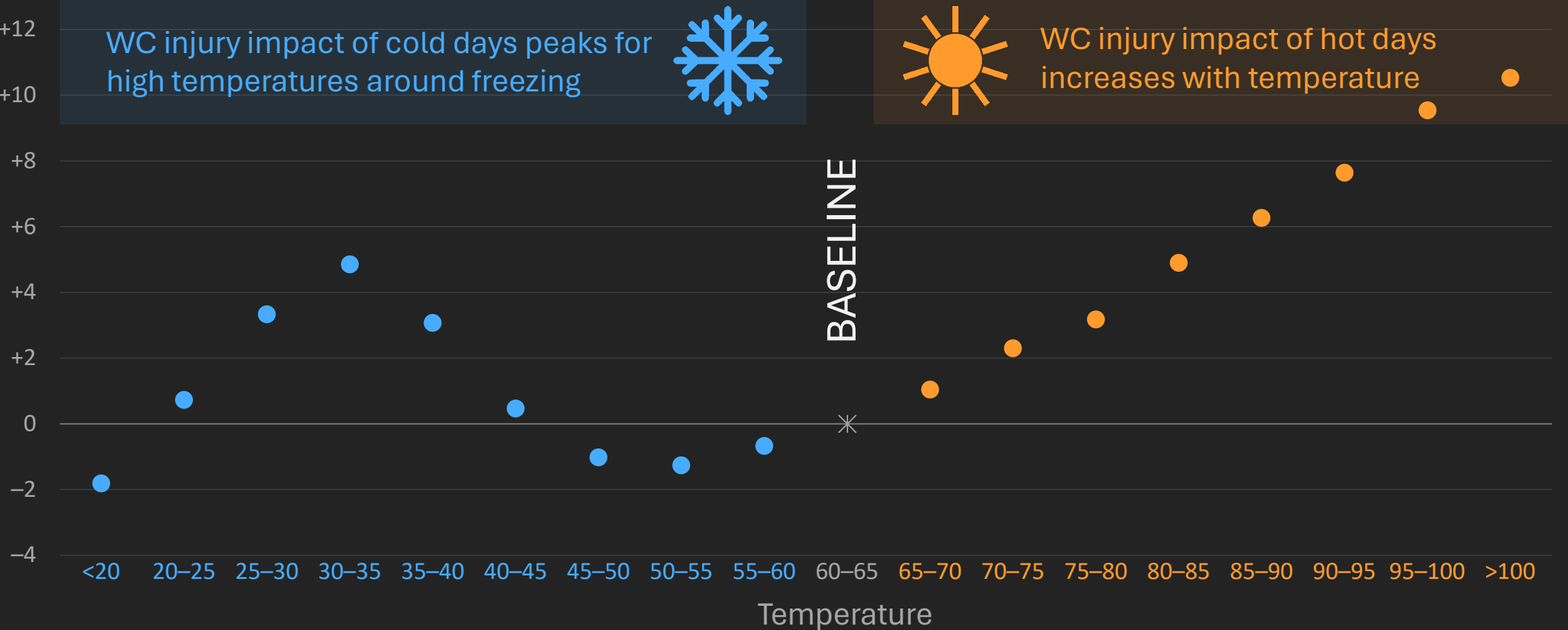


Focus on all claims, not just directly weather related



# Impact on Claims: Temperature

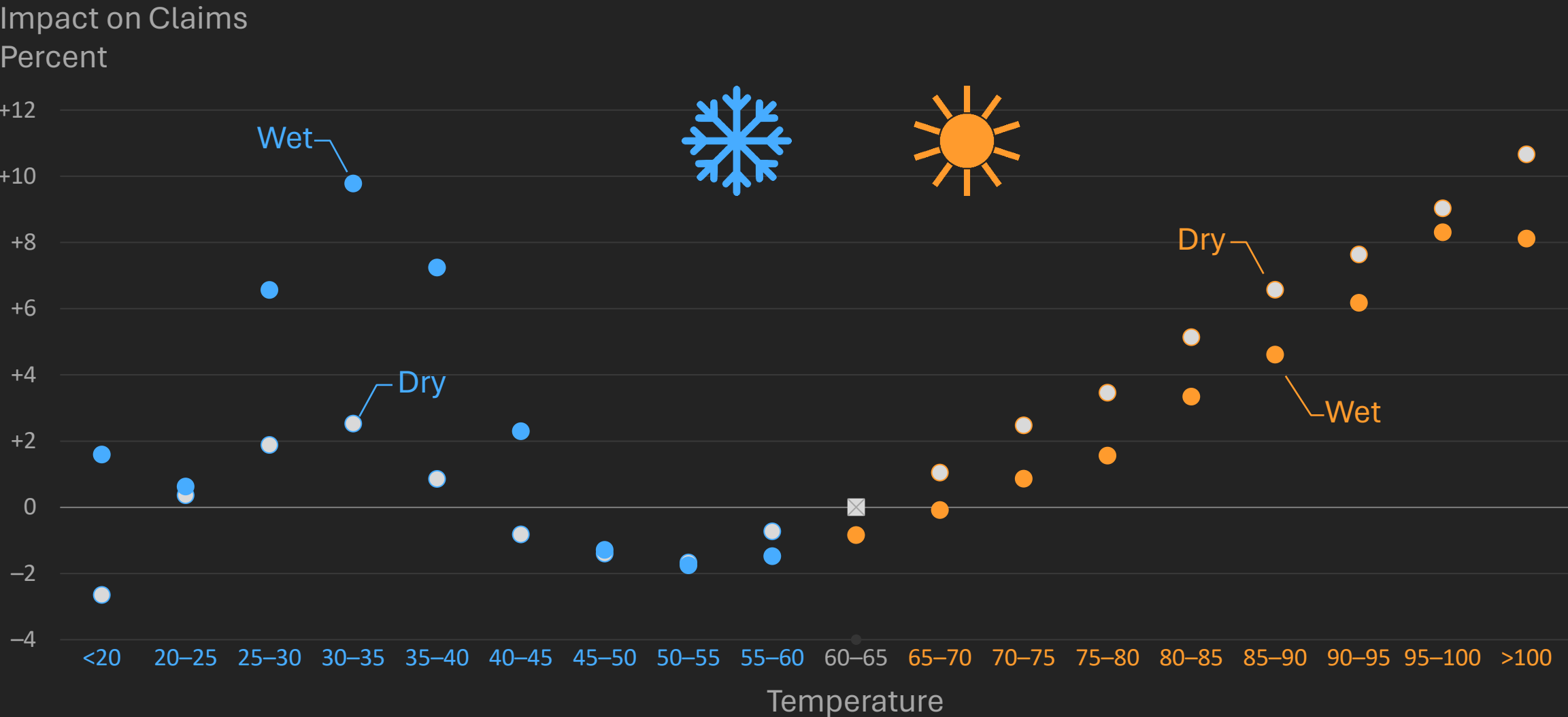
Impact on Claims  
Percent



Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022




# Impact on Claims: Temperature and Precipitation

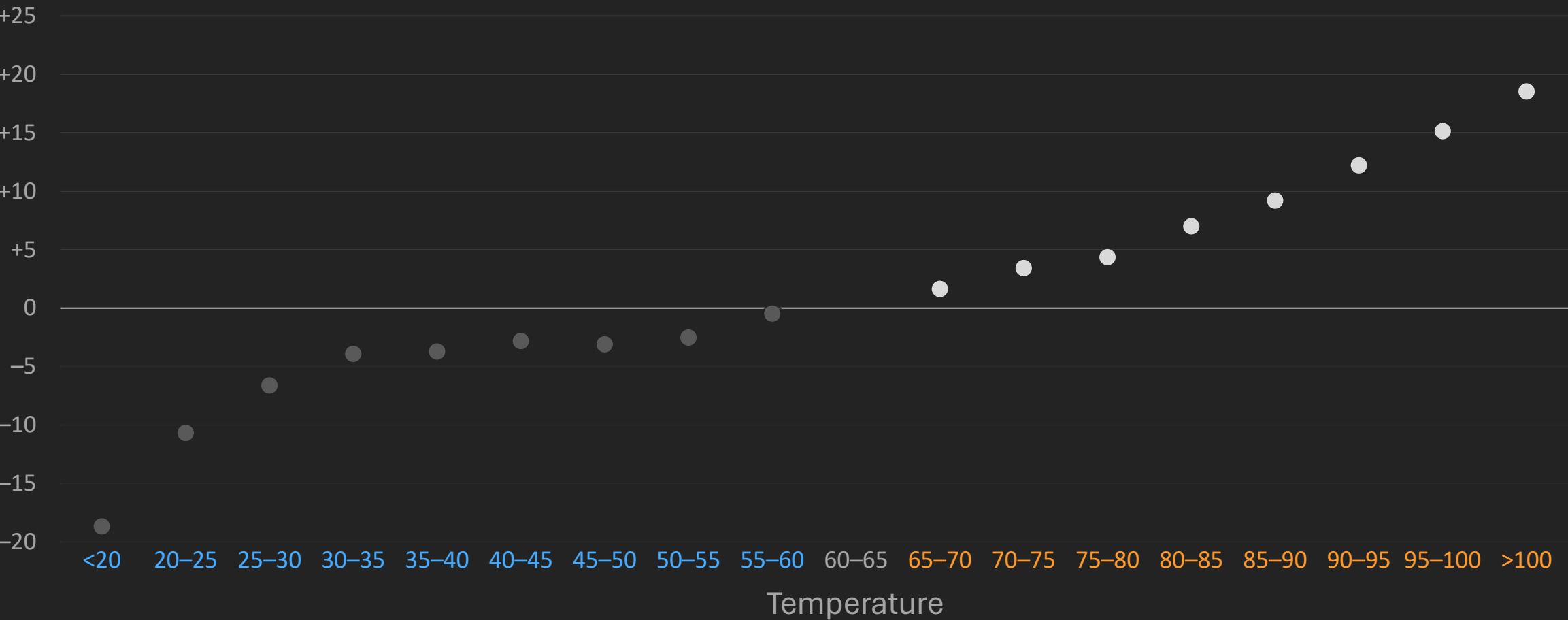


Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact on Claims: Sector

Impact on Claims  
Percent


Construction 

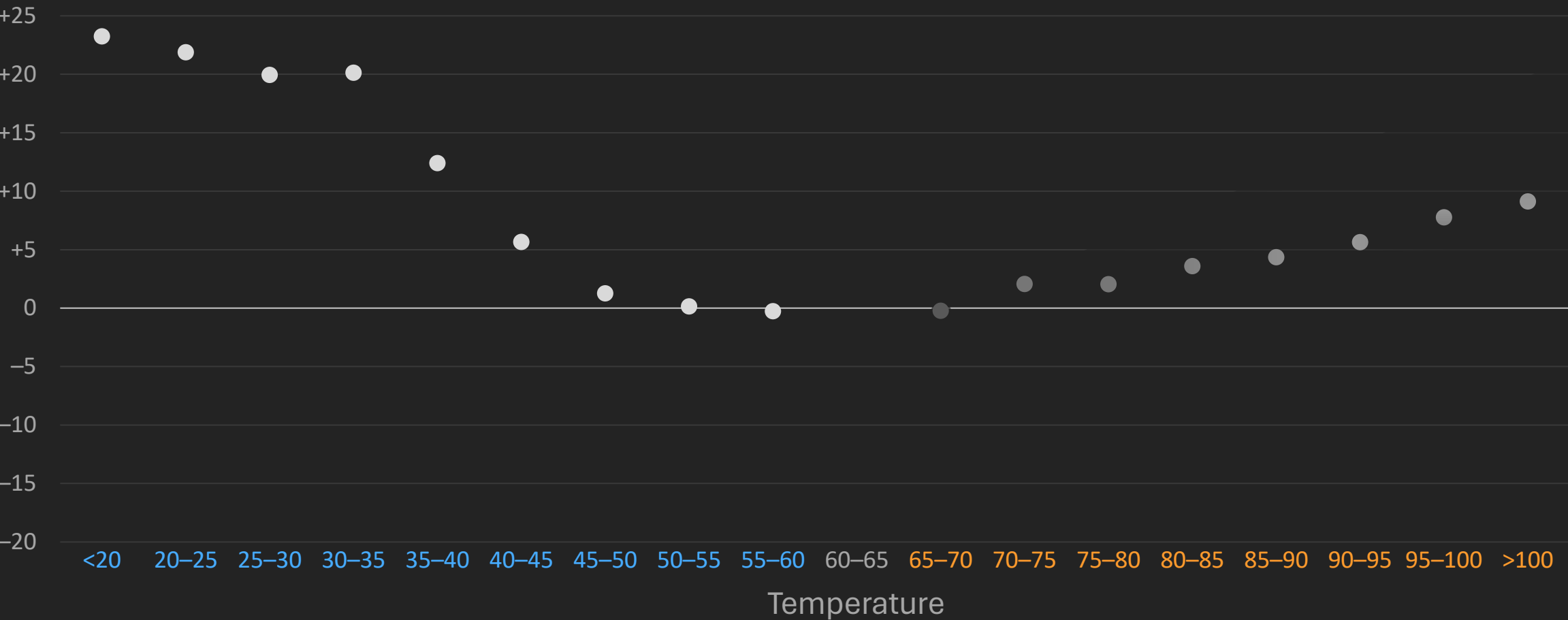


Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact on Claims: Sector

Impact on Claims  
Percent

Transportation 

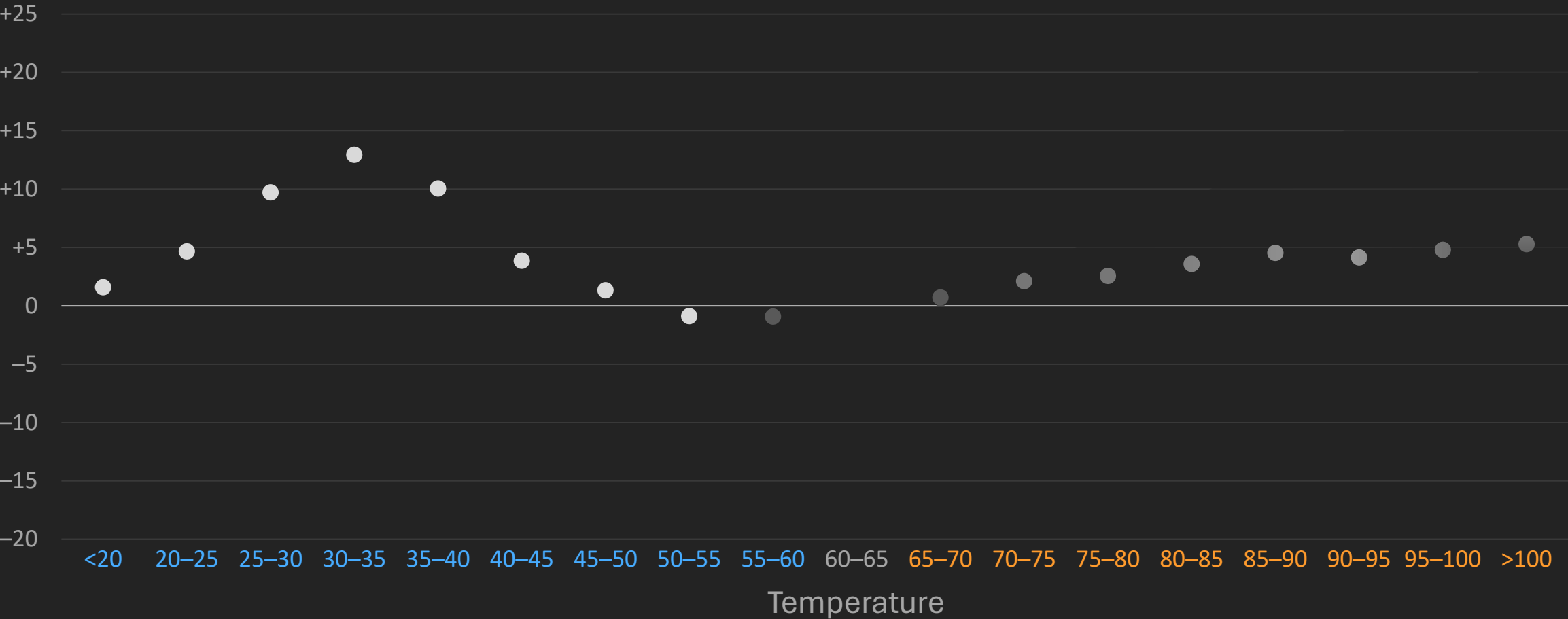


Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact on Claims: Sector

Impact on Claims  
Percent

Office



Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022



# Impact on Claims: Sector



Construction: **warm weather** impact nearly 2x

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Transportation: significant impacts for both **hot** and **cold**

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Office: largest impacts around **freezing** temperatures

# Impact on Claims: Cause of Injury



Contact: over 10% more injuries on the **hottest** days

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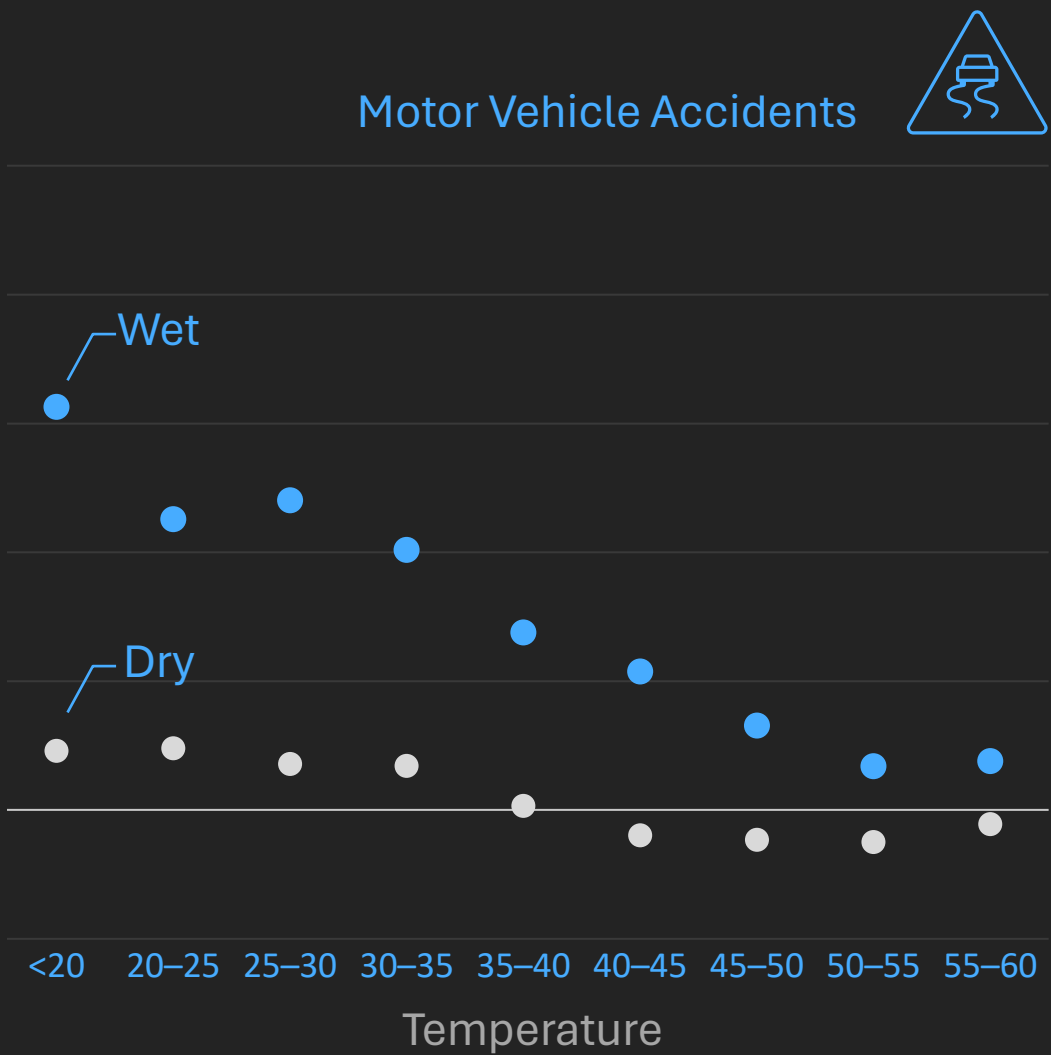
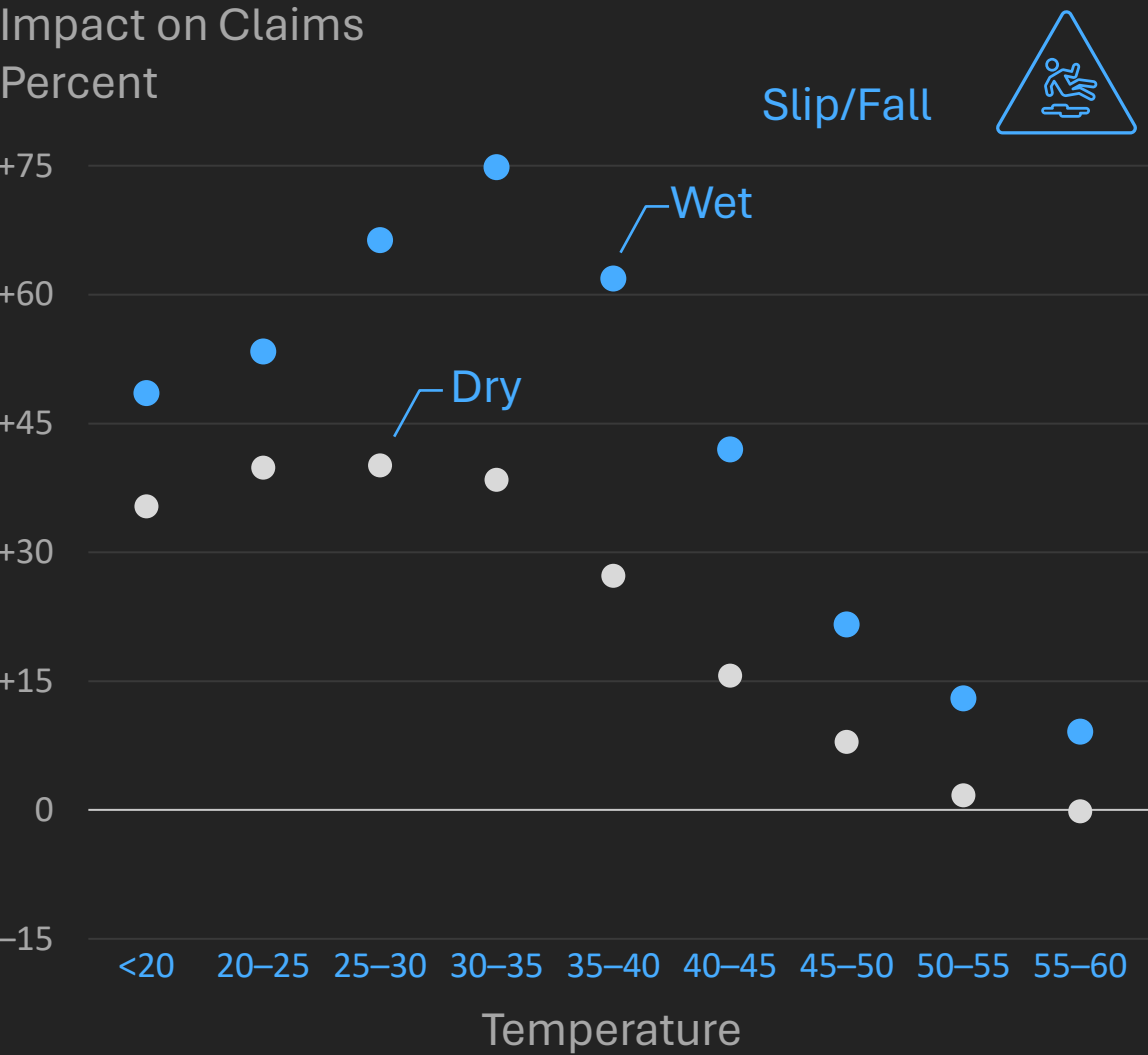
Strains: smaller weather impacts than other major causes

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Slip/Fall: many more injuries on days at or below **freezing**

# Impact on Claims: Cause and Precipitation



# What Are the Overall Impacts of Weather on WC Claims?

How much does adverse weather impact claim rates *in general*?

Comparison: actual seasonal weather to mild baseline

How much *extra* impact on claims from increased severe weather?

Comparison: average season to a more extreme season

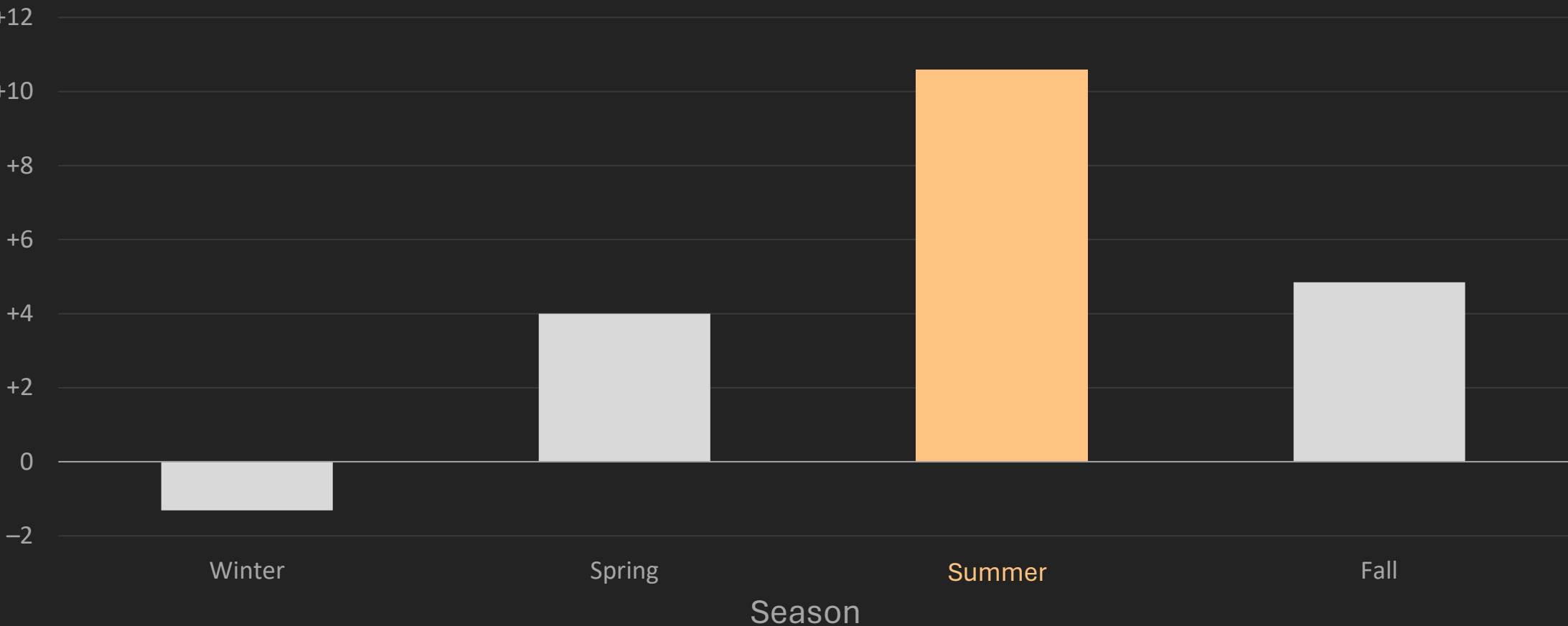
Two example scenarios:





# Impact of Heat on Construction-Related Injuries by Season

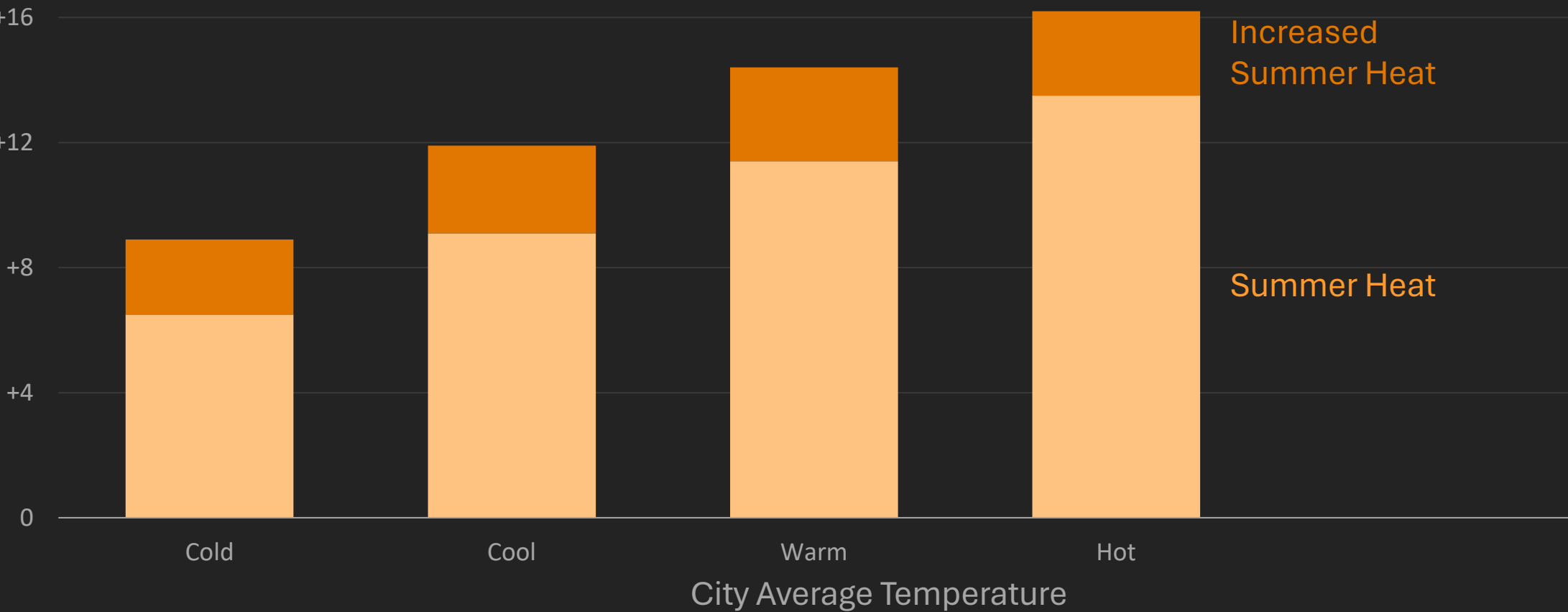
Impact on Claims  
Percent



Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact of Heat on Construction-Related Injuries by City Type

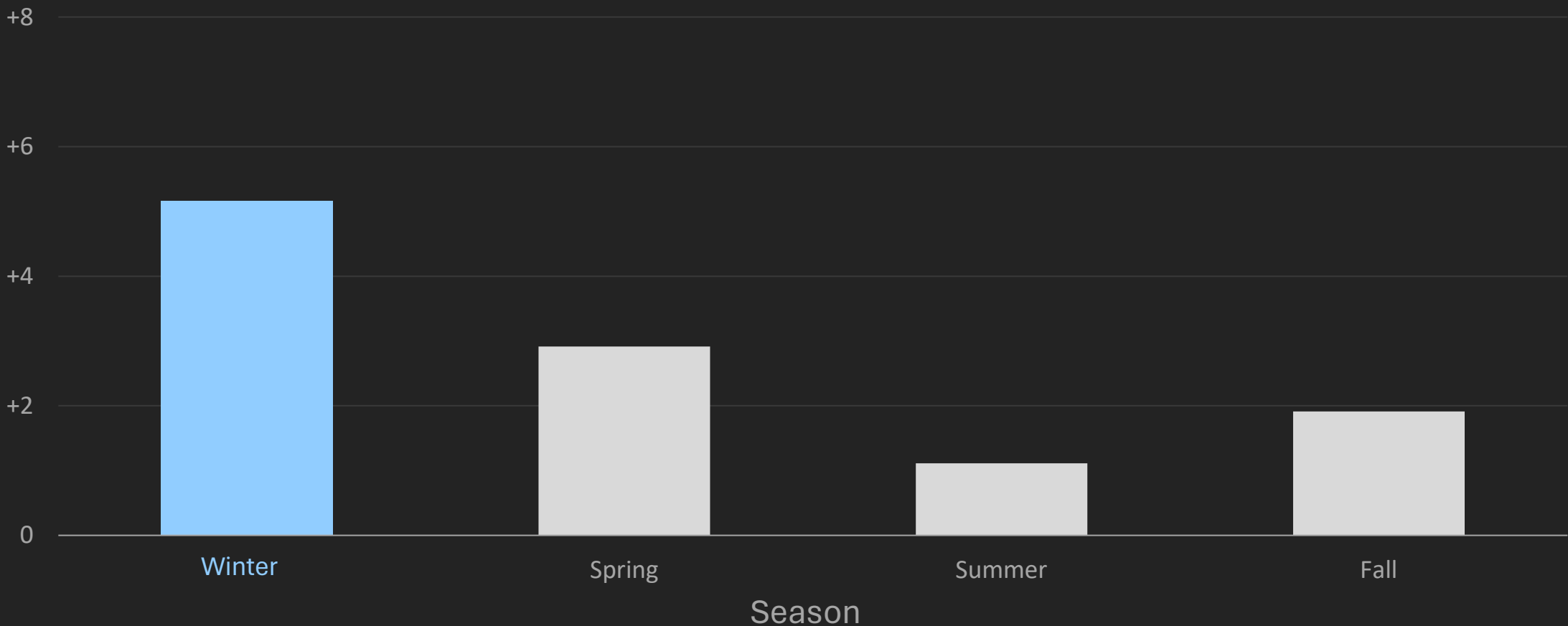
Impact on Claims  
Percent



Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact of Precipitation on Slip/Fall Injuries by Season

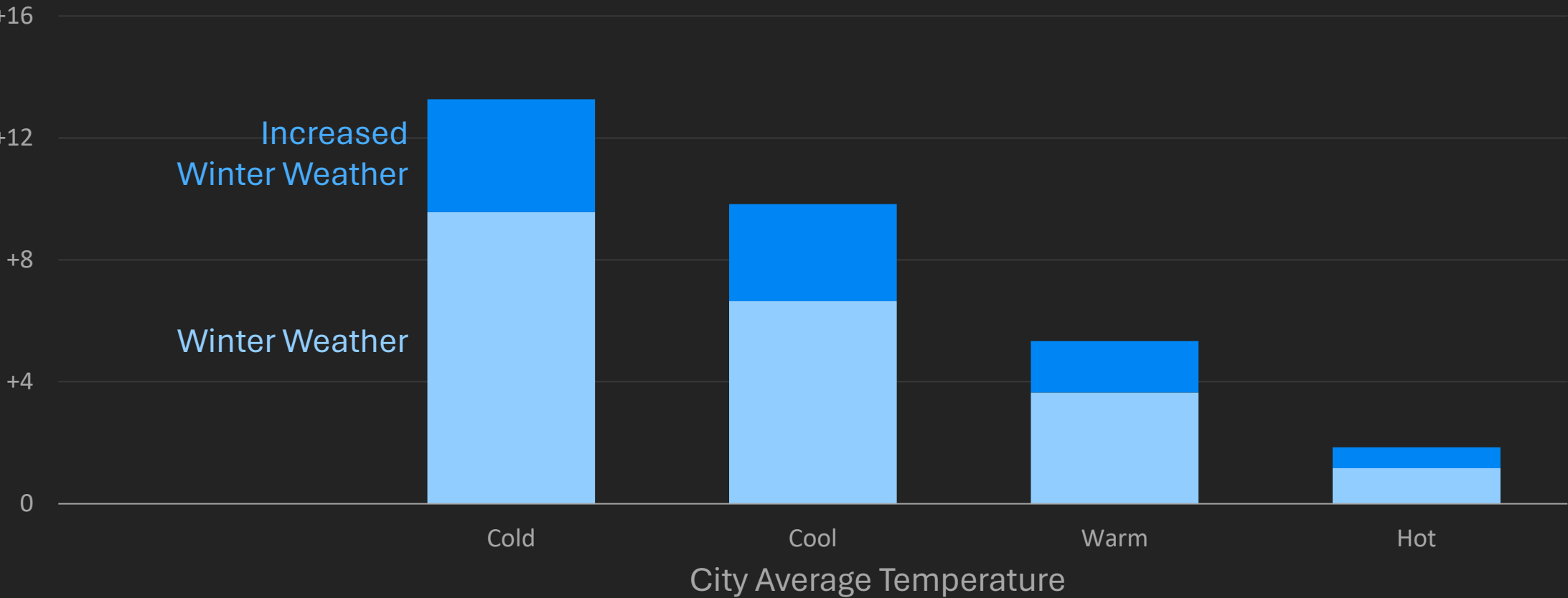
Impact on Claims  
Percent



Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022

# Impact of Winter Precipitation on Slip/Fall Injuries by City Type

Impact on Claims  
Percent

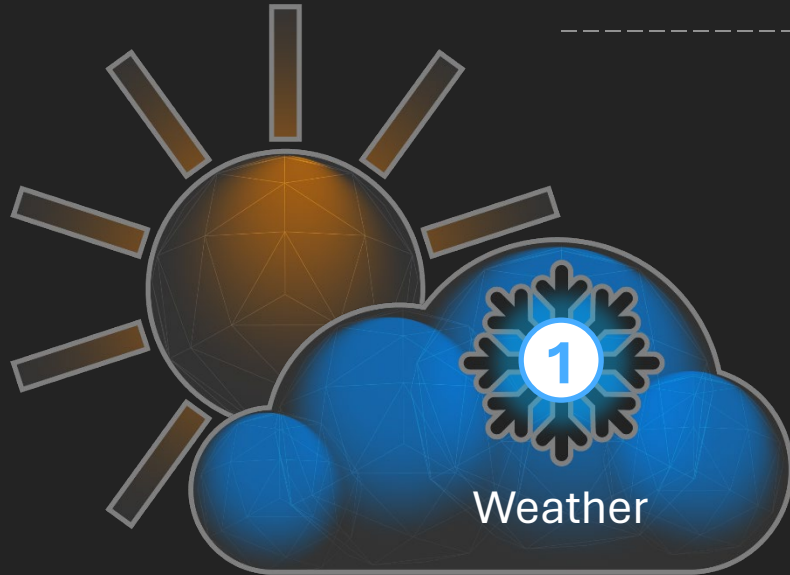


Sources: NCCI Policy Data; NCCI Statistical Plan Data; PRISM Climate Data; 2001-2022



# Insights

More WC injuries on both **hot** and **cold (and wet)** days



Meaningful **overall effects**,  
most impactful for specific  
types of injuries and jobs

**Precipitation impacts** concentrated in colder areas,  
but **increased heat** could affect all regions

How can technology make the  
workplace safer?

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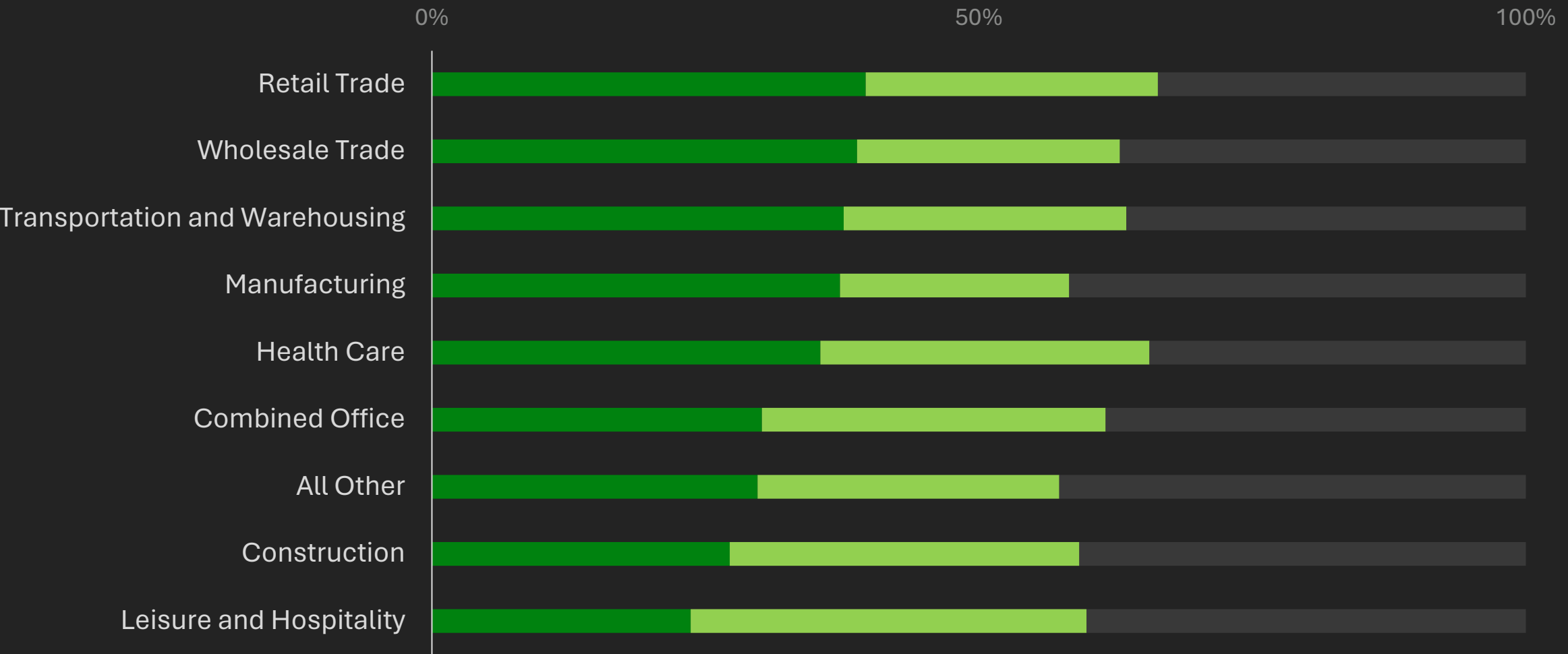
What makes it unsafe?

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2

Workplace Safety

# Lost-Time Claim Shares for **Strains**, **Slips/Falls**, and **Other** Causes of Injury by Industry



Source: Based on NCCI’s Statistical Plan Data where industry sector is derived from NAICS codes reported in NCCI’s Policy Data; accident years 2017–2022; includes all states where NCCI provides ratemaking services for private carriers and state funds.



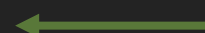
**PUSHING**



**TWISTING**



**60%** of strains are  
caused by



**PULLING**



**LIFTING**

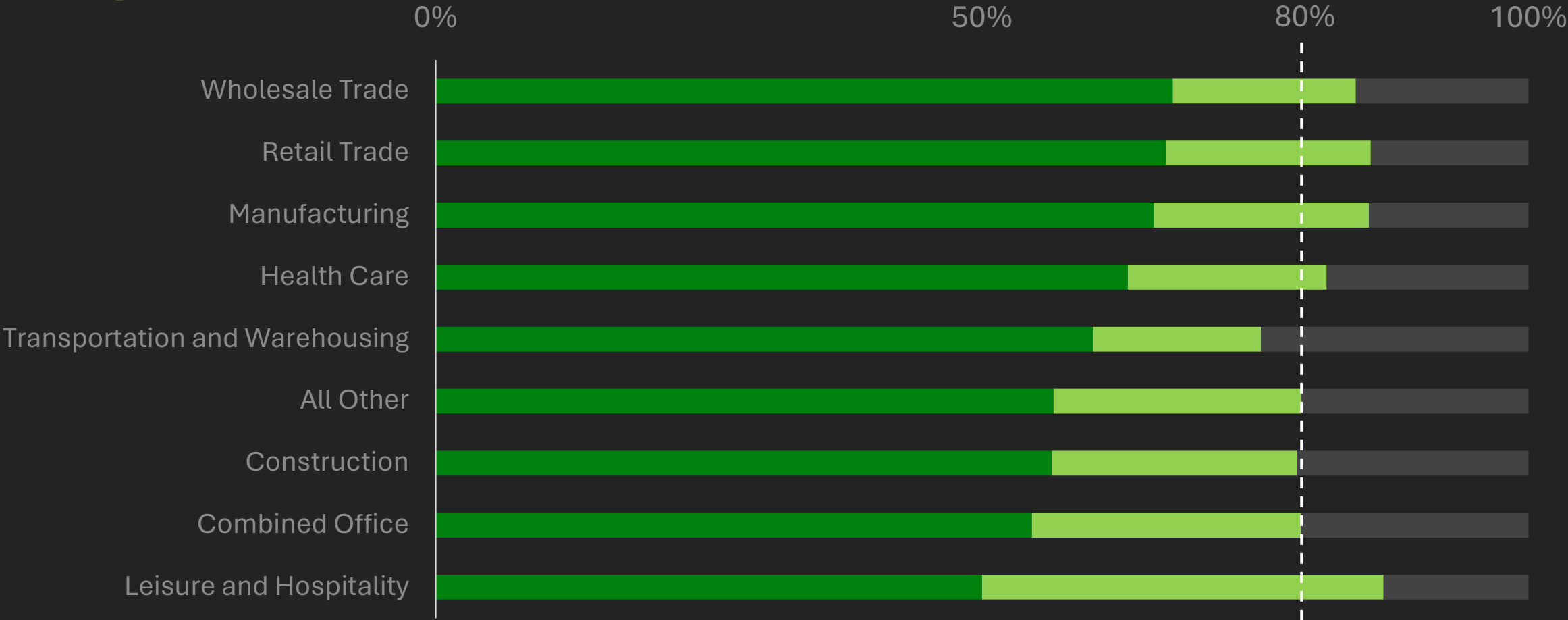


Causes more than **HALF** of all **Low Back Pain** injuries





# 80% of Low Back Pain Injuries Are Caused by **Strains** or **Slips/Falls**



Source: Based on NCCI’s Statistical Plan Data and Medical Data Call where industry sector is derived from NAICS codes reported in NCCI’s Policy Data; accident years 2017–2022; includes all states where NCCI provides ratemaking services for private carriers and state funds.

# Insights

Strains, slips, and falls  
are the most prevalent  
causes of injury across  
industry sectors

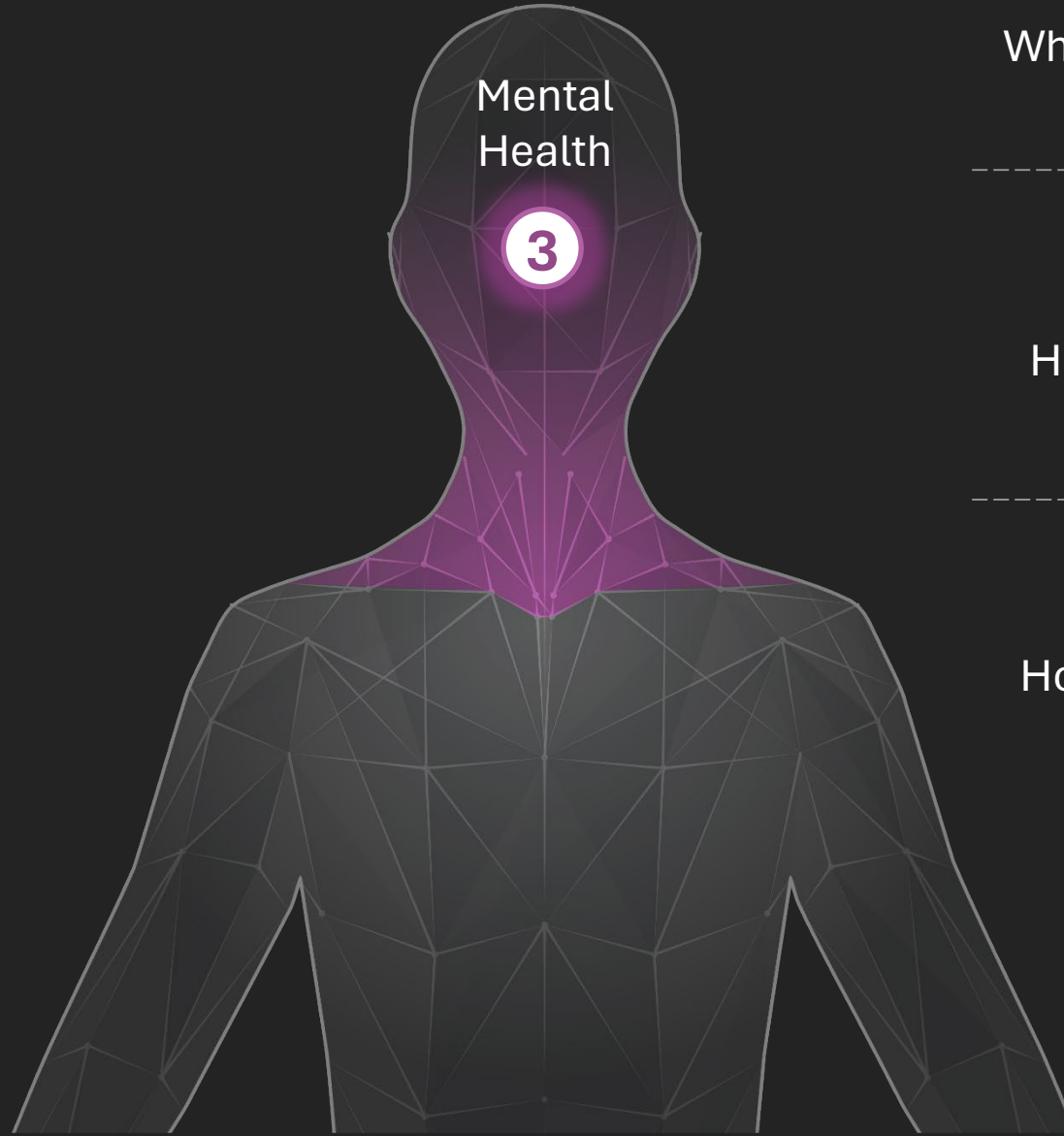
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This suggests broader  
applications for safety  
technologies that prevent or  
mitigate these injuries

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2

Workplace Safety  
What makes it unsafe?



Mental  
Health

3

I  
What is a mental claim?

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II  
How many are there?

-----

III  
How do they develop?

# Three Types of Psychological Injuries Recognized in WC

Caused by physical  
injury

..... **Physical-Mental (PM)**  
physical injury with accompanying mental injury

Caused by mental  
injury

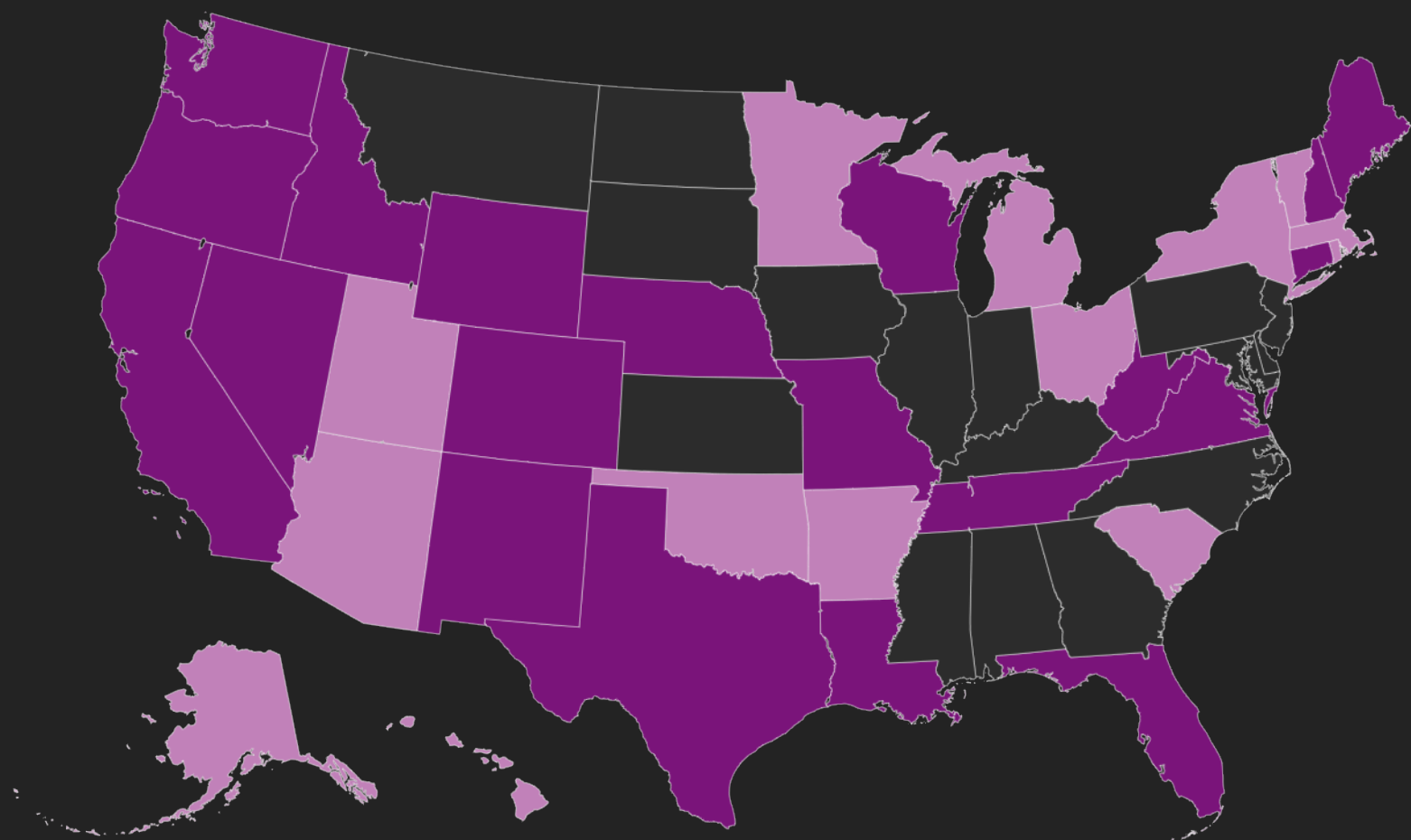
< **Mental-Physical (MP)**  
mental injury with accompanying physical injury

< **Mental-Mental (MM)**  
mental-only injury with no accompanying physical injury

|  
What is a mental claim?  
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# States that **Enacted** Legislation Relating to **MM** Injuries

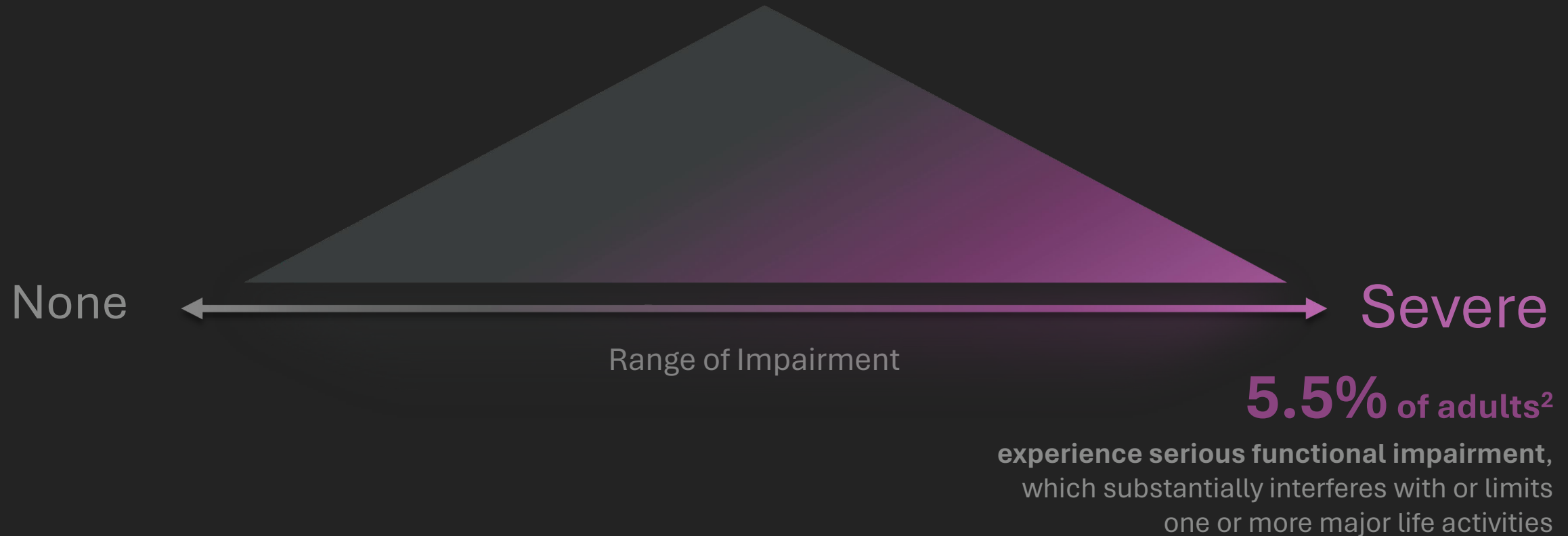
Changes from 2018 to 2024



■ Coverage-Enacted ■ Coverage - No Change □ None per Statute or Not Specified

# The Spectrum of Mental Health

“**1 in 5** adults in the US live with a diagnosable mental illness<sup>1</sup>”

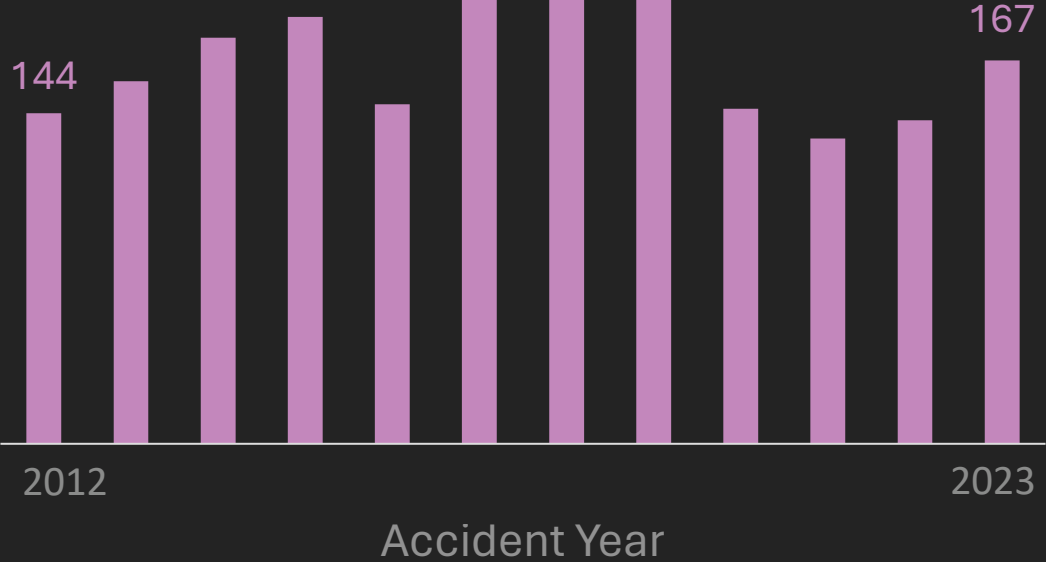
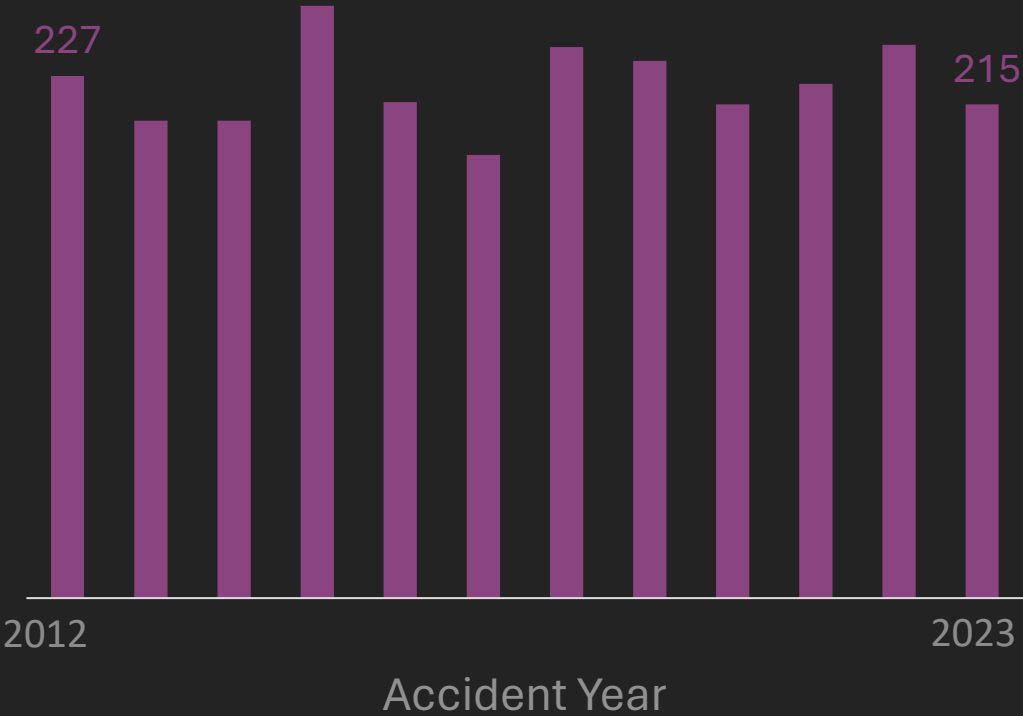


1 22.8% based on 2021 research from the [National Institute of Mental Health](#)

2 Based on 2021 research from the [National Institute of Mental Health](#)

# MM and MP Do Not Exhibit a Trend Across Accident Years

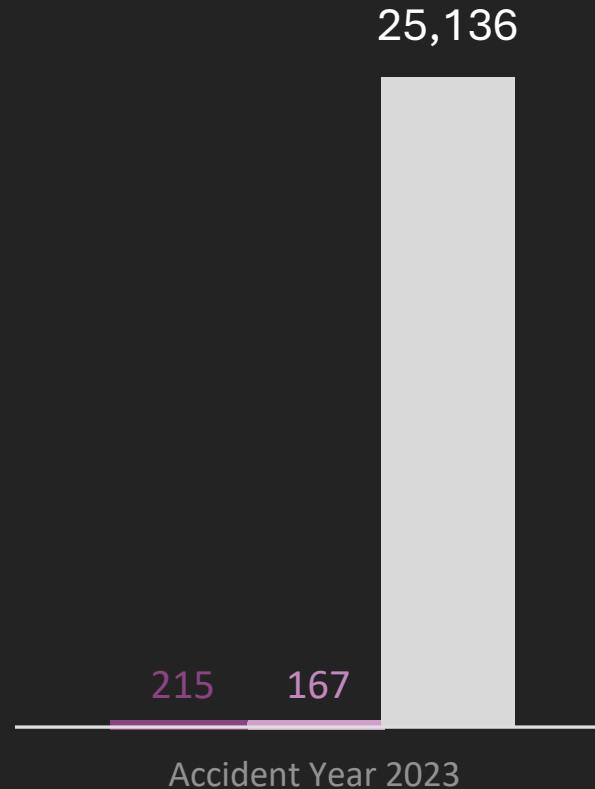
Lost-Time Claim Counts by Accident Year



Source: Based on data from NCCI's Statistical Plan, Medical Data Call, and Indemnity Data Call; includes all states where NCCI provides ratemaking services for private carriers and state funds, excluding TX; lost-time claim counts are developed to ultimate

# MM and MP Are a Small Portion Relative to PM

## Lost-Time Claim Counts



Source: Based on data from NCCI's Statistical Plan, Medical Data Call, and Indemnity Data Call; includes all states where NCCI provides ratemaking services for private carriers and state funds, excluding TX; lost-time claim counts are developed to ultimate



# How are **PM** claims categorized in our analysis?



## Mental

**claims that are diagnosed with mental disorders**

Includes workers who are **also** diagnosed with a behavioral disorder due to substance use



## Behavioral

**claims that are diagnosed with substance use disorders**



## Treated

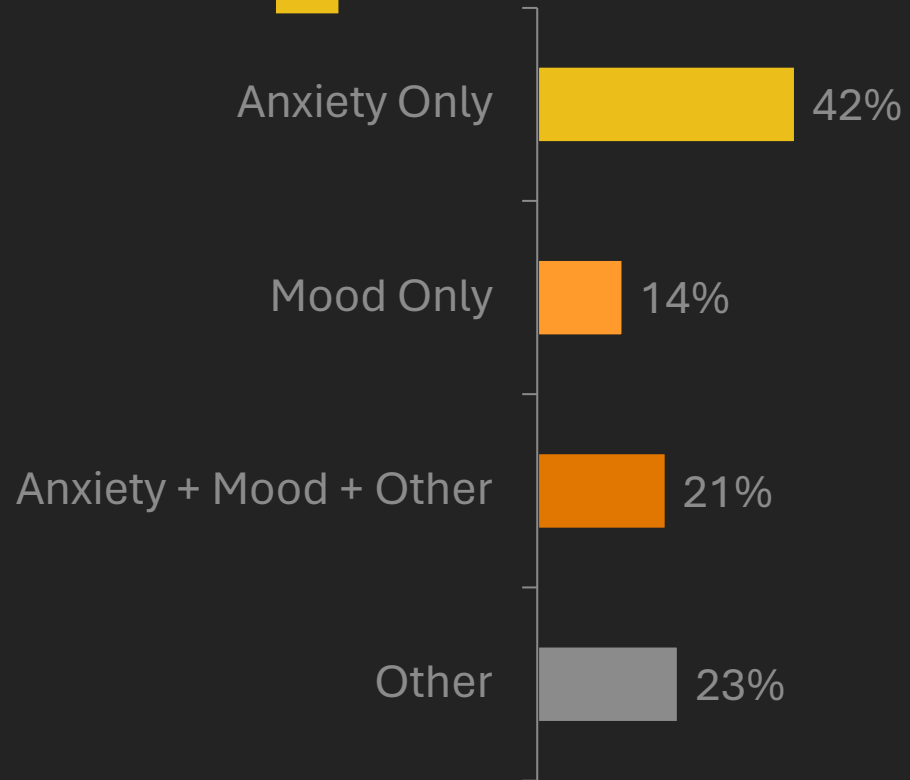
claims that are *not diagnosed* with mental or behavioral disorders, but receive *psychological treatment or evaluation*

Source: Primary and secondary ICD-10 codes reported in NCCI's Medical Data Call as of April 2024 are used to identify mental and behavioral disorders following the classifications in DSM-5-TR®

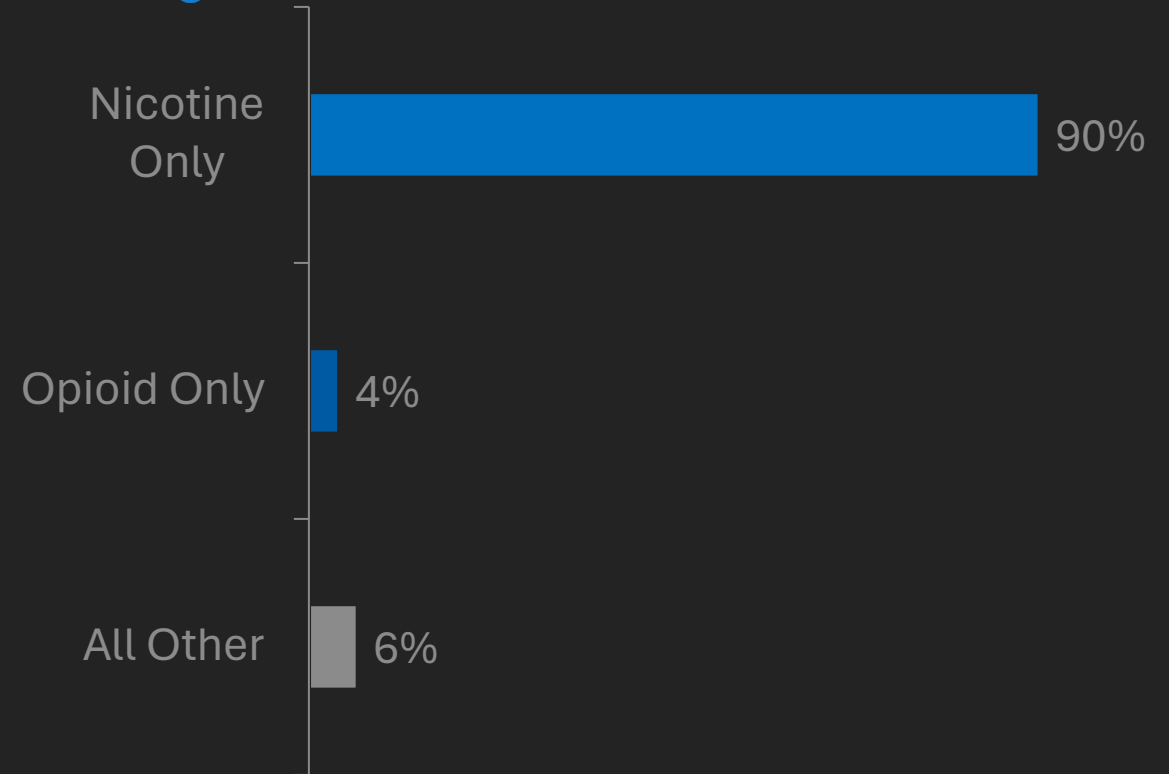
# Anxiety and Nicotine Diagnoses Dominate Their Respective Mental Health Cohorts



## Mental



## Behavioral



Source: Lost-time claims are from accident years 2012–2023

||

How many are there?



**Mental**



**Behavioral**



**Treated**

# Shares of **PM** Counts Are Stable Over Time

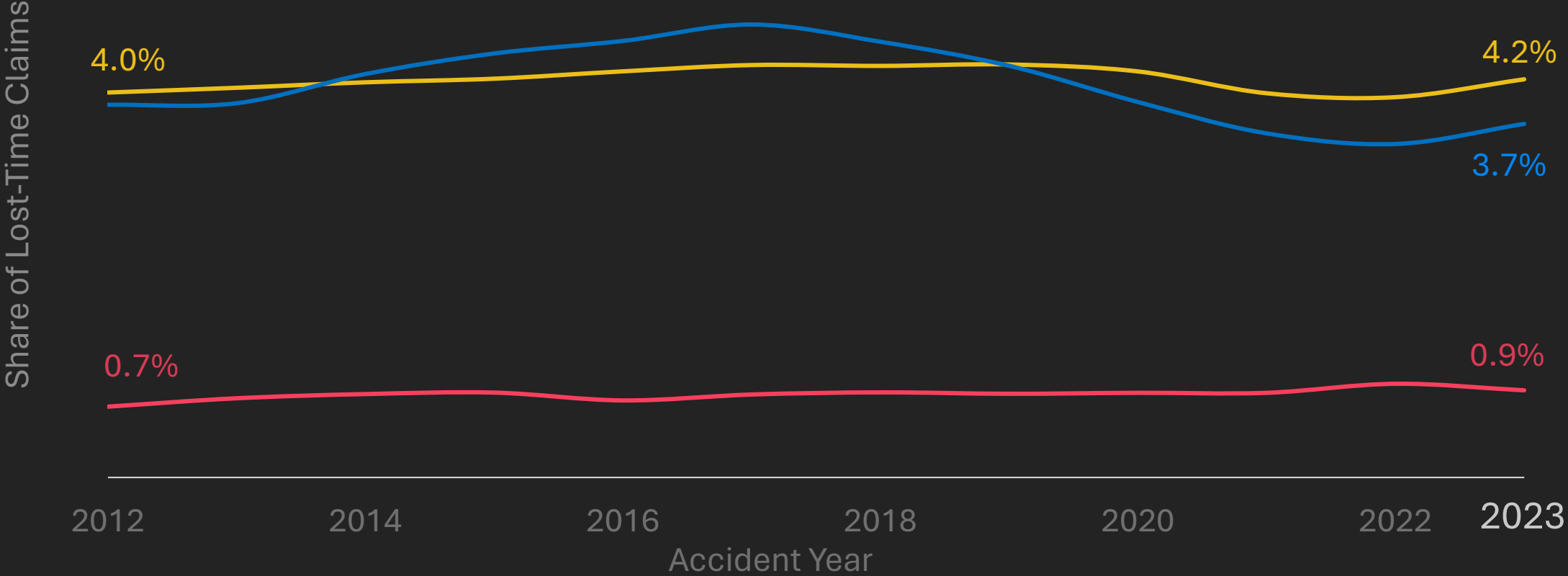
## Mental, Behavioral, and Treated



Source: The share is the ratio of developed-to-ultimate PM lost-time claim counts to developed-to-ultimate lost-time claims

# PM Claim Count Shares by Cohort

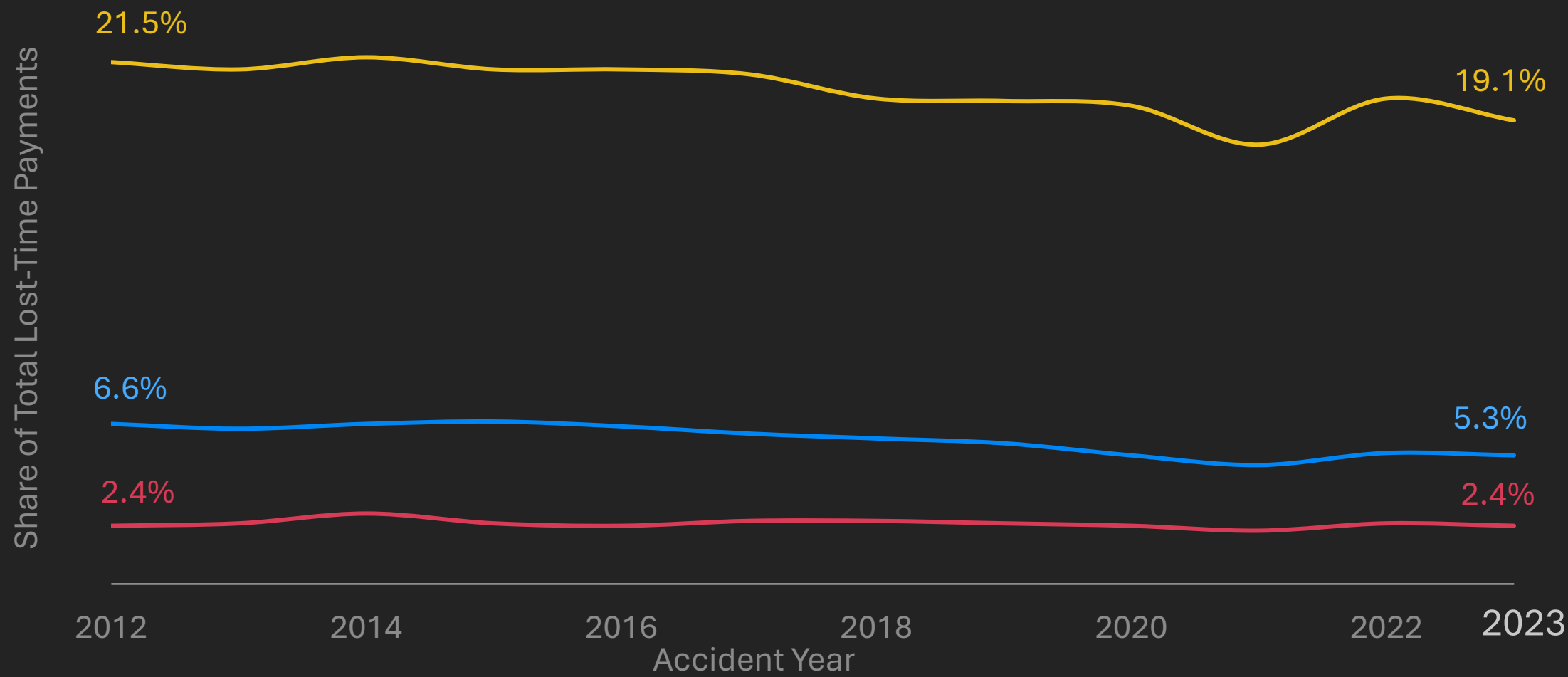
Mental, Behavioral, and Treated



Source: For each mental health cohort, the share is the ratio of developed-to-ultimate lost-time mental claim counts to developed-to-ultimate lost-time claims

# PM Claim Dollar Shares by Cohort

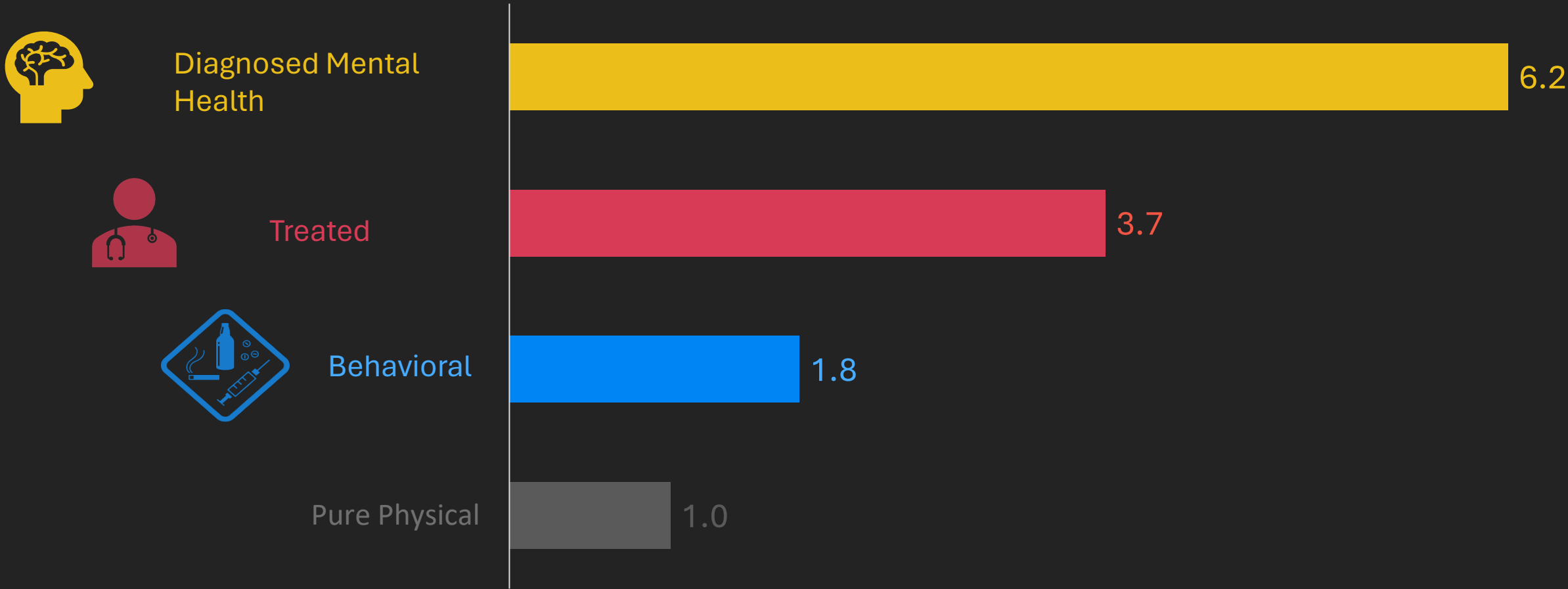
Mental, Behavioral, and Treated



Source: For each mental health cohort, the share is the ratio of developed-to-ultimate indemnity and medical incurred amounts to developed-to-ultimate indemnity and medical amounts for all lost-time claims

# Diagnosed Mental Health Claims Have the Highest Severity

## Lost-Time Severity Differentials

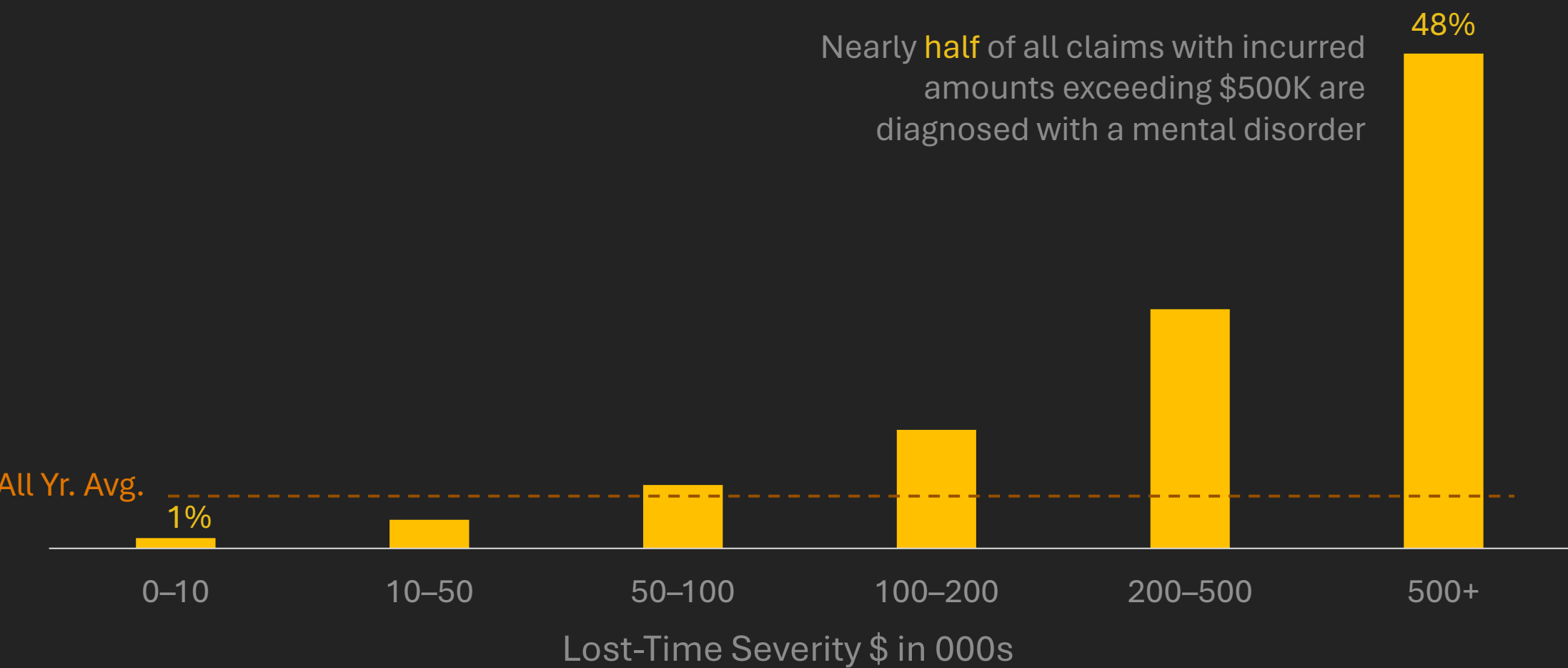


III

How do they develop?

Source: Based on incurred amounts and lost-time claim counts developed to ultimate from accident years 2012–2023

# Share of Claims Diagnosed With a Mental Disorder Increases With Claim Size

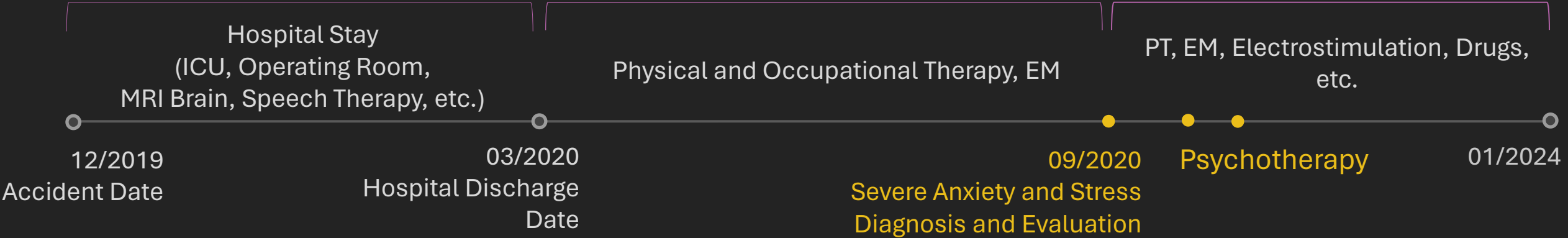


Source: Based on accident years 2012–2018, diagnosis status as of 5 years after the accident date; claim dollars as of NCCI’s Statistical Plan Data, 4th report

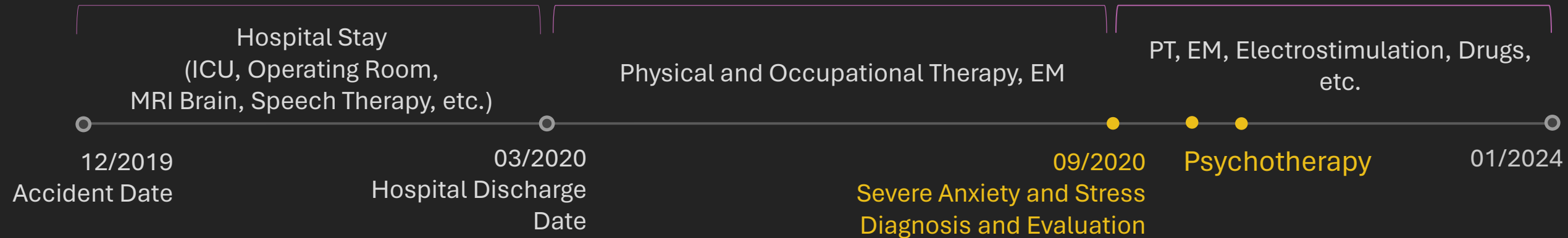


# Case Study 57-year-old male with traumatic subdural hemorrhage without loss of consciousness

After a lengthy hospital stay and physical therapy (PT) with evaluation and management (EM), the patient is diagnosed with severe anxiety and provided treatment in the form of a psych evaluation

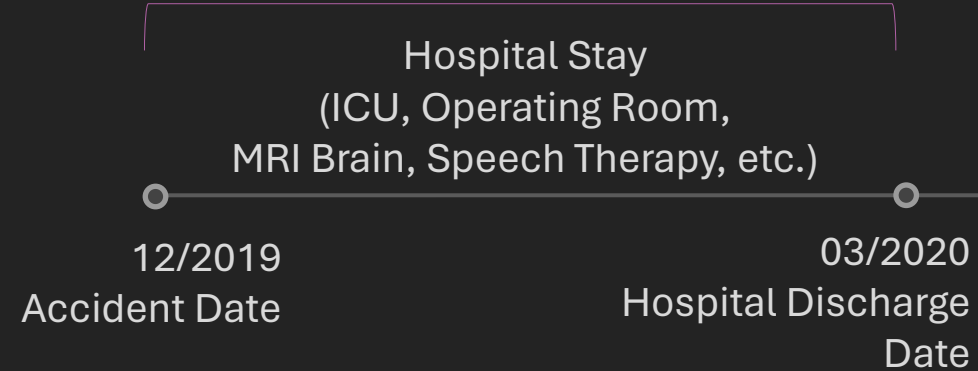


# 5 Key Claim Characteristics



# 5 Key Claim Characteristics

1



# 5 Key Claim Characteristics

1



Initial treatment costs are often characterized by a large share for **inpatient** stays



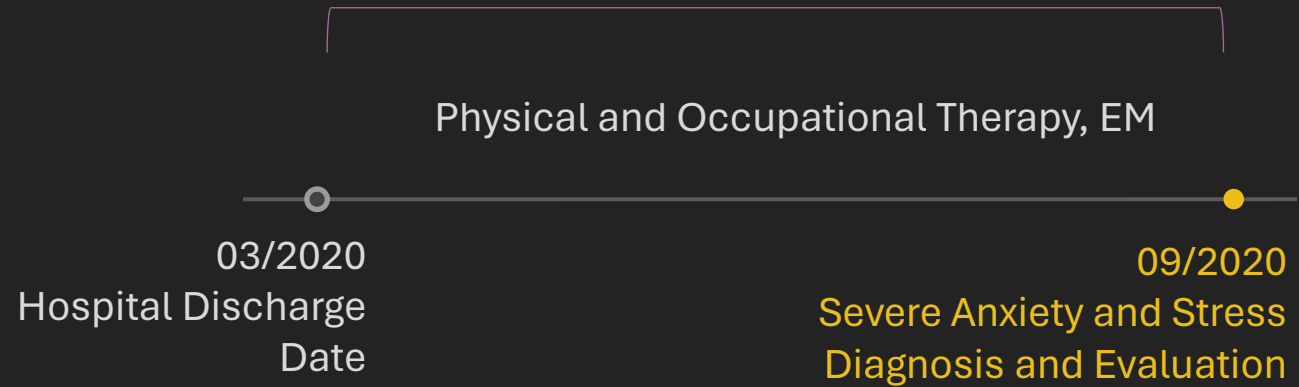
**41%** of expenditures are for inpatient treatments in the first year of the claim



Compare to 14% for Pure Physical claims

# 5 Key Claim Characteristics

## 2



# 5 Key Claim Characteristics

# 2



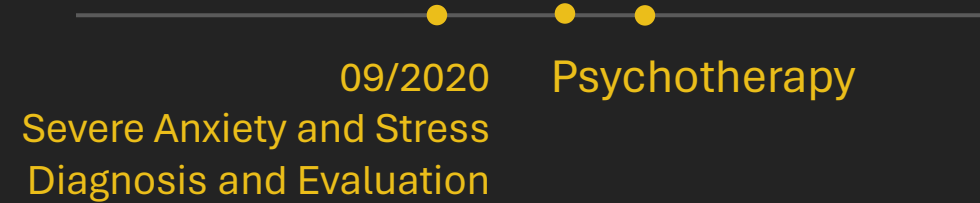
Extensive **Physical** and **Occupational Therapy** treatments



Physician utilization for these claims is **60%** higher than their Pure Physical counterparts

# 5 Key Claim Characteristics

3



# 5 Key Claim Characteristics

3

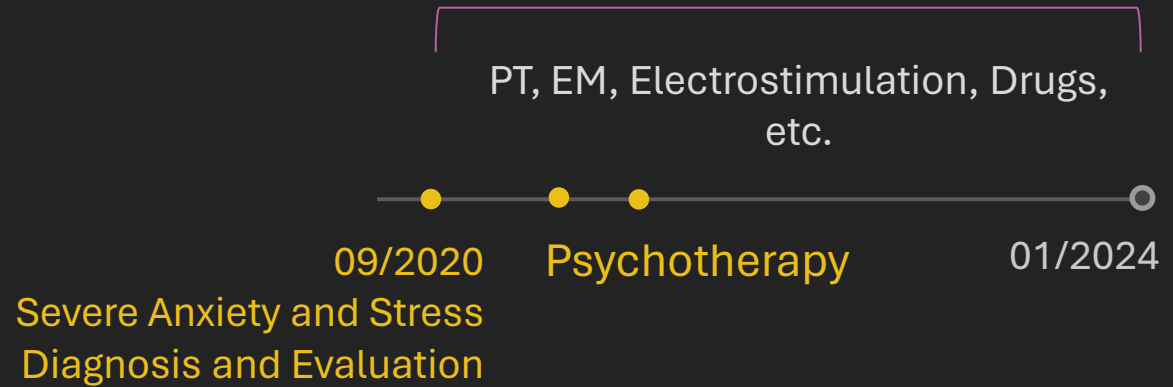


73% of mental claims are diagnosed within 12 months of injury



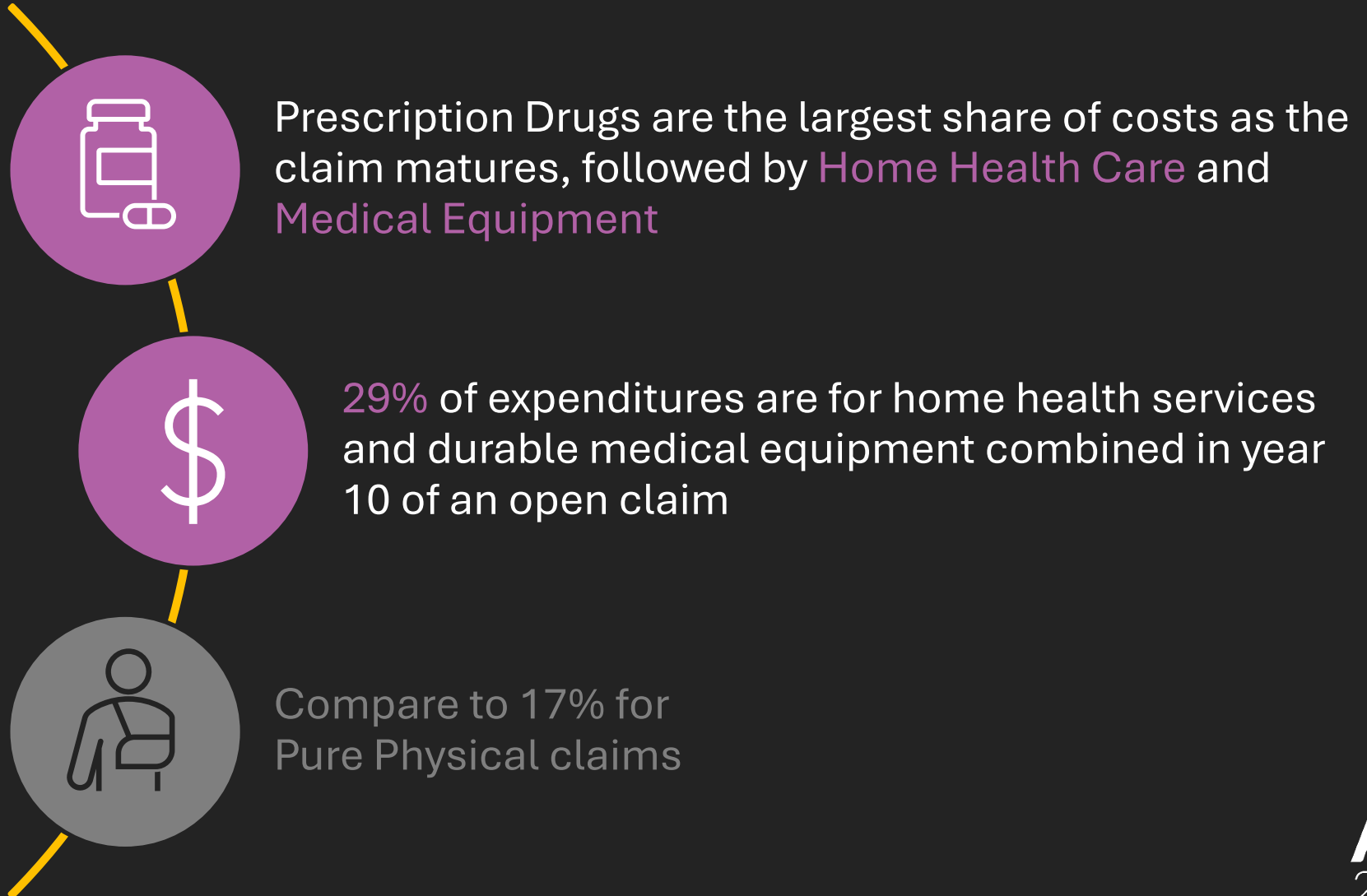
# 5 Key Claim Characteristics

4

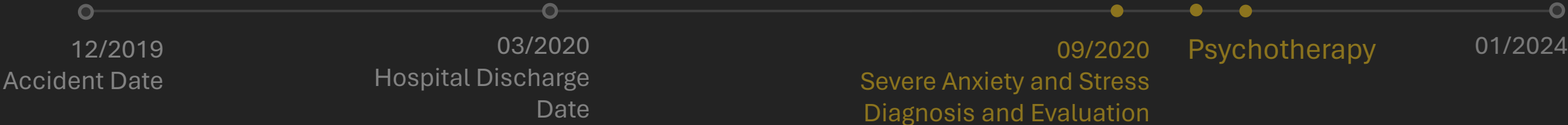


# 5 Key Claim Characteristics

# 4

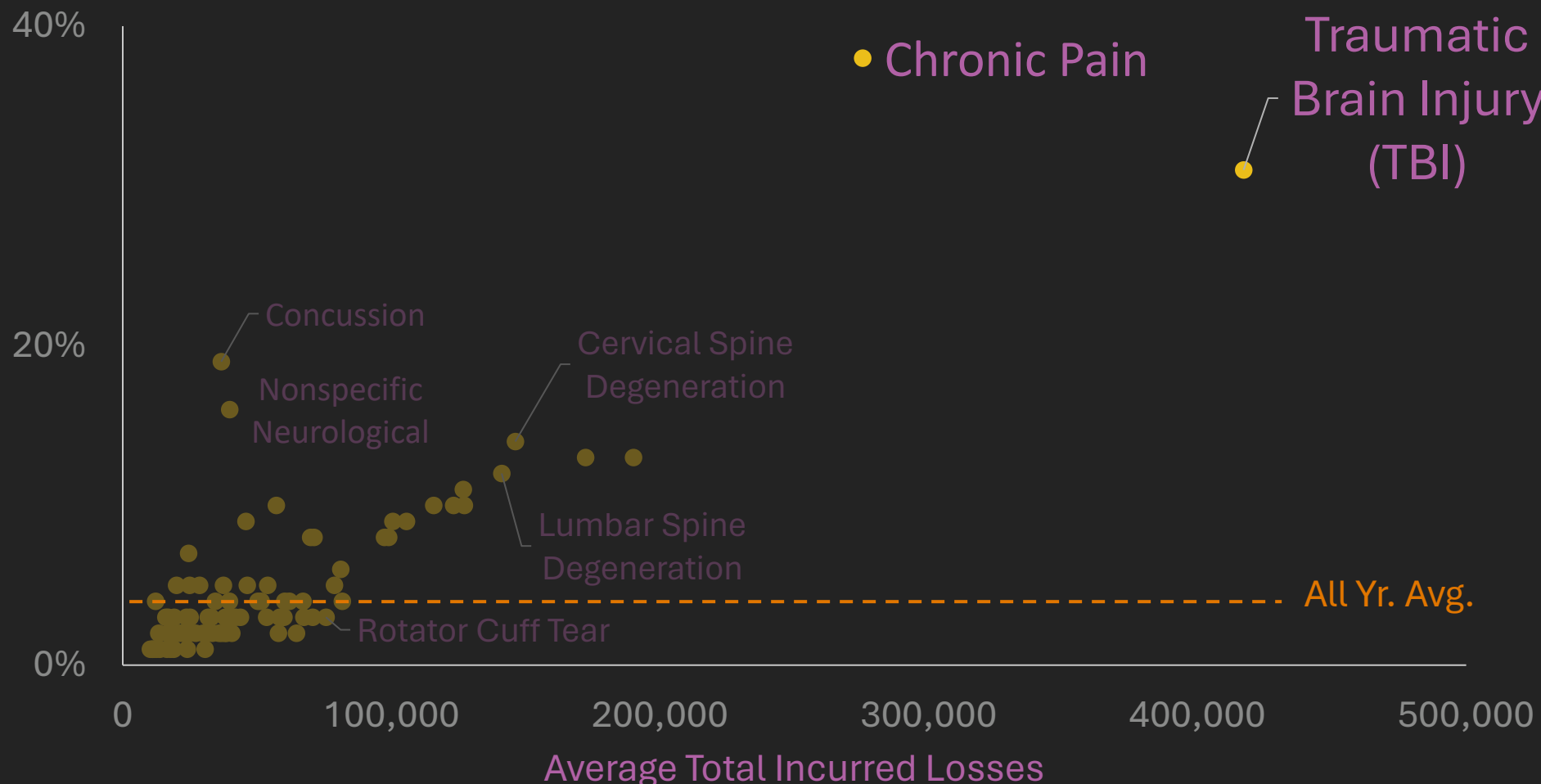


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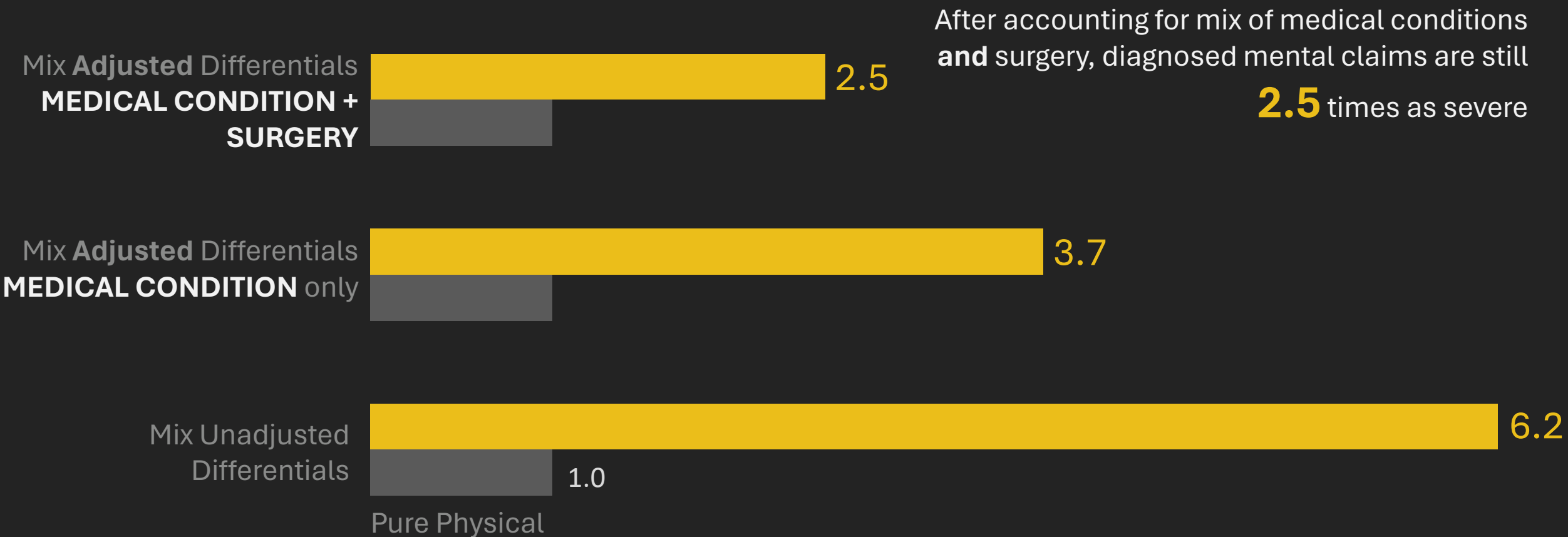
# Share of Claims Diagnosed With Mental Disorders Varies by Medical Condition

5



Source: Based on accident years 2012–2018, diagnosis status as of 5 years after the accident date; claim amounts as of NCCI’s Statistical Plan Data, 4th report

# Mix Adjusted Severity Differentials Show that **Mental Claims** still have Higher Severity



# Insights

I

What is a mental claim?

20 states have enacted legislation regarding mental injuries in the workplace since 2018

Anxiety is the most common mental disorder for diagnosed PM claims, followed by mood

II

How many are there?

MM and MP lost-time claim shares are consistently low

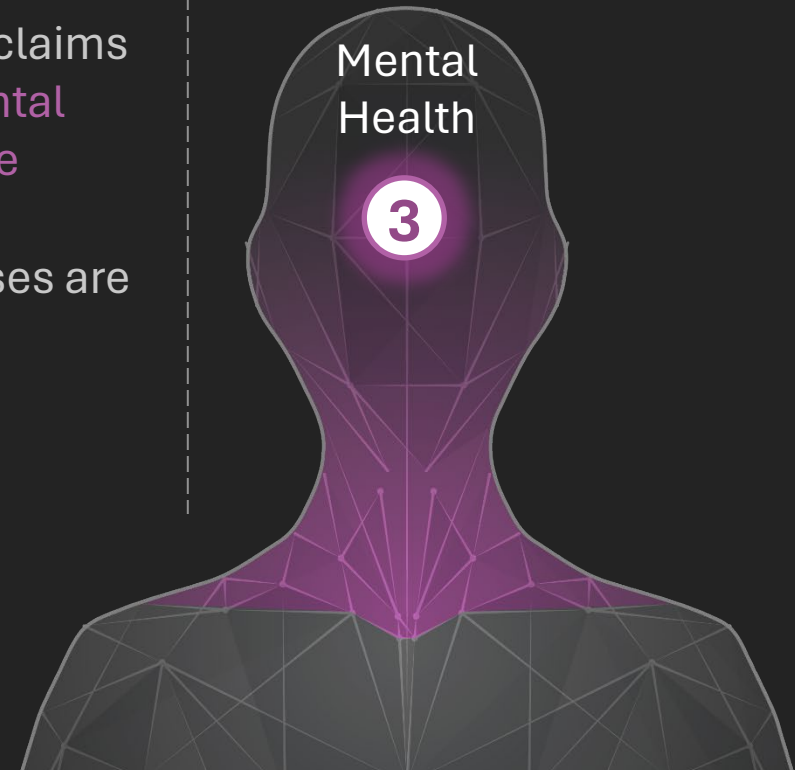
The share of lost-time claims diagnosed with mental disorders is stable

Vaping-related diagnoses are on the rise

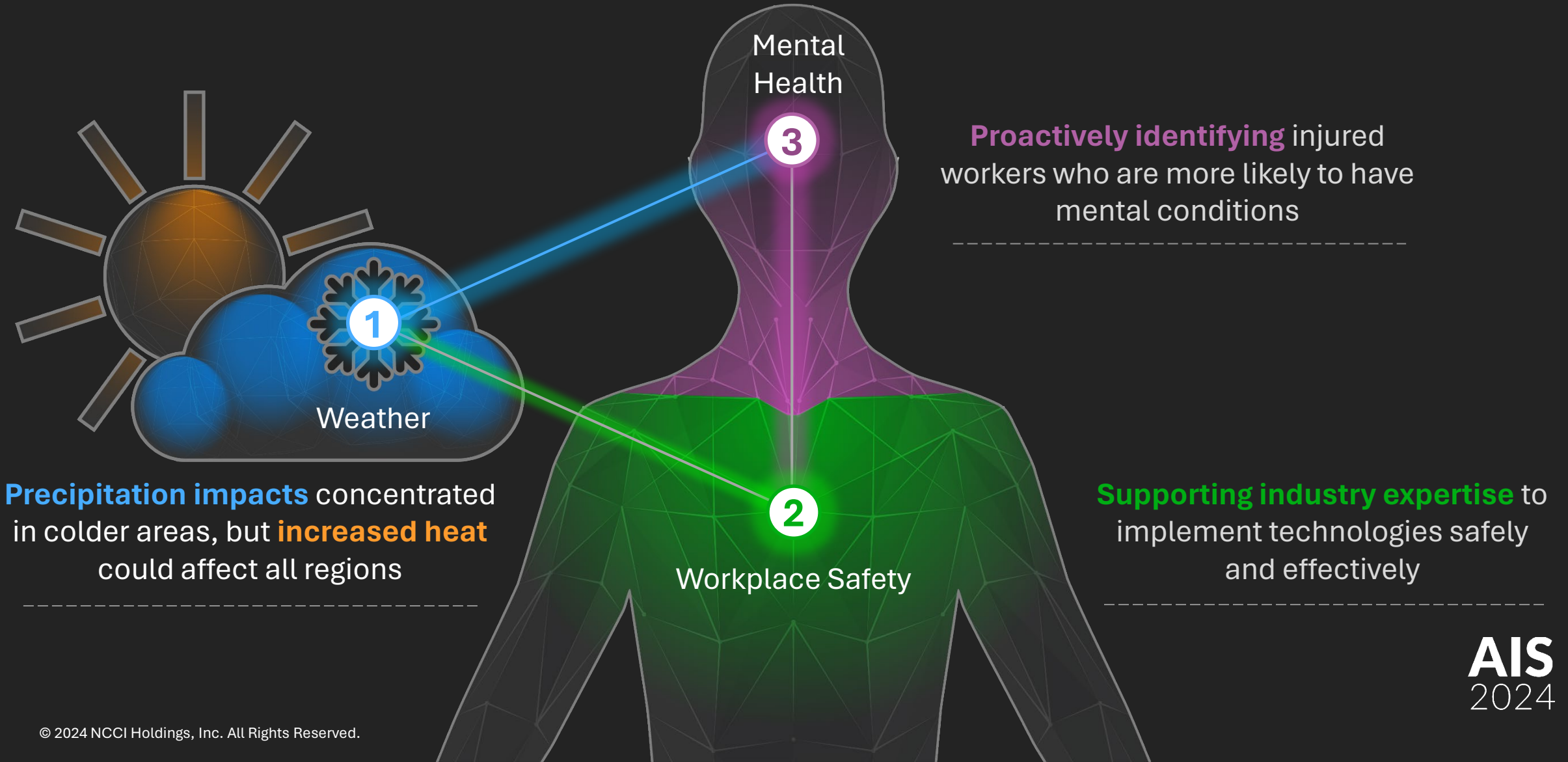
III

How do they develop?

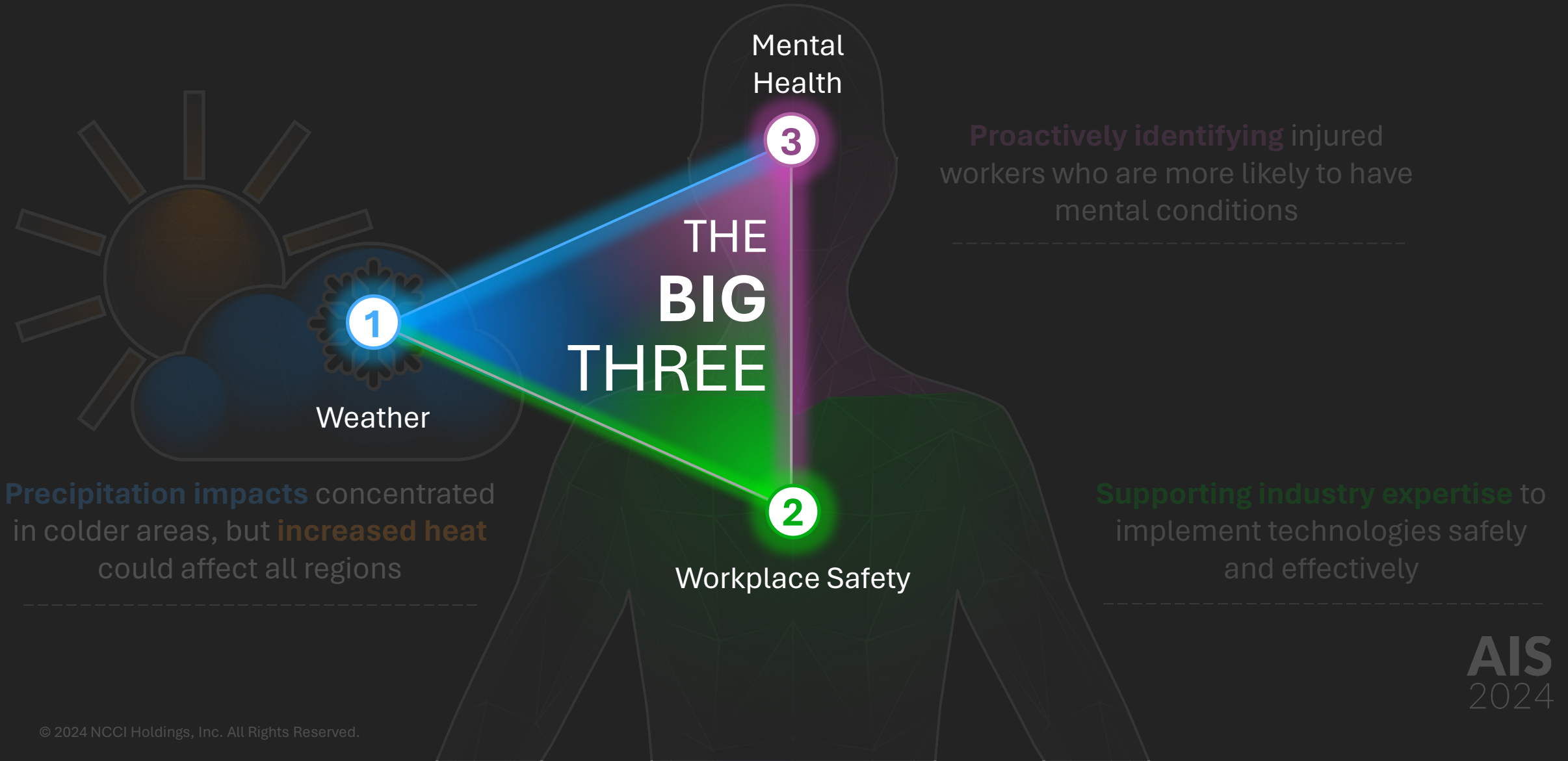
High severity medical conditions like TBI or Chronic Pain have the highest shares of mental diagnoses



# Rising to the Challenges in WC



# Rising to the Challenges in WC







*The Source You Trust*

# Annual Insights Symposium **2024**



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