



# Using Workers' Compensation Data and Systems to Improve Safety and Health

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*The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention nor participating states and other partners.*

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# Presentation Outline

- WC system potential
- WC study updates
  - Claim Trends
  - Risk-Exposure Assessment
  - Prevention Effectiveness
  - Health Services
  - Outreach
- Partnership opportunities



# NIOSH Center for Workers' Compensation Studies (CWCS) Mission

- Maximize the use of WC data and systems to improve workplace safety and health
- Build partnerships between public health, insurance, employer, and worker communities



# Workers' Compensation System Prevention Potential



*Claims*



*Health Services*



*Risk Assessment*



*Risk Control*



*Outreach*

***Insights for employers and workers***

# What Works to Prevent Workplace Injuries and Improve Injured Worker Recovery?

- **Insurance Organizations = Research Partners**
  - <https://pubmed.ncbi.nlm.nih.gov/30121100/>
  - **Impact** employees and employers directly
  - **Collect** WC claims and system data
  - **Fund**
    - Medical provider services
    - Safety intervention grants
    - Risk control services
    - Safety/health and return to work program development
    - Training

# Claims



# WC Claim Systems

- Largest databases of workplace injuries in the US
- Several types of reports

First report of injury

Subsequent report of injury

Medical reports



- Millions of claims containing:

- Narratives describing how injury occurred
- Industry and occupation
- Diagnoses, treatments
- Patient demographics, including unique person ID
- Disability types
- Costs



# State WC Claims Data Studies

- NIOSH \$5M grant for WC claims analyses
  - Developed collaborations between state WC bureaus, departments of health, and unemployment insurance (UI)
  - Trend data by industry and cause
  - CA, MA, OH, TN, MI funded
  
- Most states linked WC data to UI data via the Federal Employer Identification Number (FEIN)
  - Employer industry and # of employees
  - WC claim counts and rates at employer and industry level



## Links to WC Grant Reports:

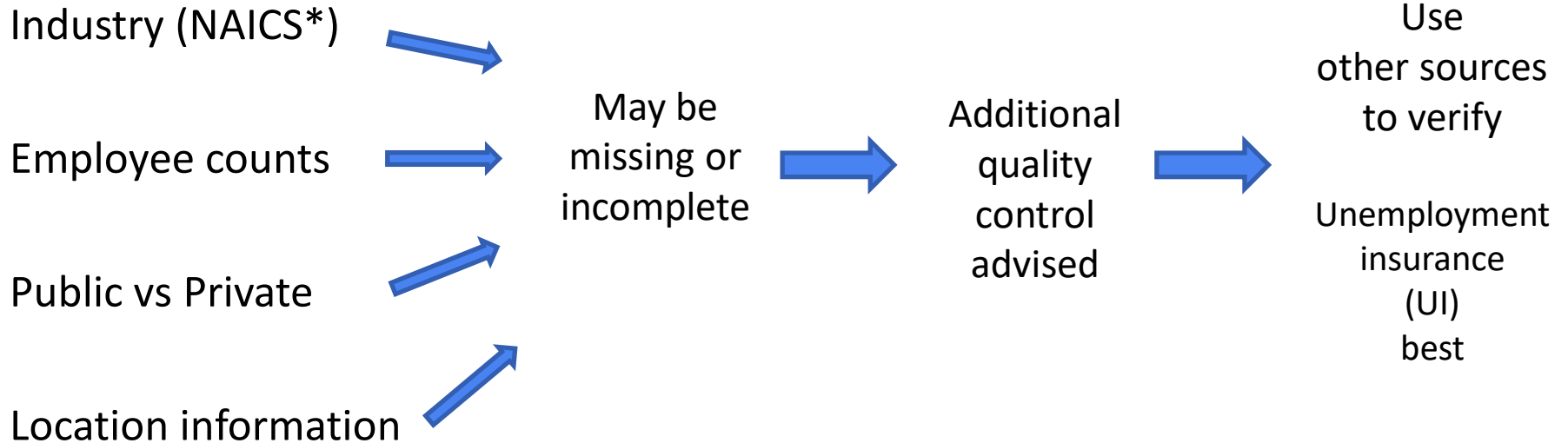
- [MA](https://www.mass.gov/doc/dph-dia-and-dls-release-new-study-on-utilization-of-workers-compensation-data/download) <https://www.mass.gov/doc/dph-dia-and-dls-release-new-study-on-utilization-of-workers-compensation-data/download>
- [TN](https://sites.google.com/site/tennesseewc20142016/) <https://sites.google.com/site/tennesseewc20142016/>
- [MI](https://mitracking.state.mi.us/) <https://mitracking.state.mi.us/>

# Key WC Data Fields- Conclusions from WC Grants

- **Injury Codes and Incident Narratives**
  - Generally complete, accurate, useful
  - Crosswalks between Workers' Compensation Insurance Organization (WCIO) and Bureau of Labor Statistics (BLS) Occupational Injury and Illness Classification System (OIICS) codes possible at the 1-digit level
  - Incident narratives can be auto-coded - several free algorithms available to use
  
- **Worker Data**
  - Limited but complete, accurate, useful
  - Occupation narratives can be auto-coded to Standard Occupation Codes (SOC)
  - Crosswalks being developed between manual class codes and SOC and industries

# Key WC Data Fields- Conclusions from WC Grants, cont'd

## Employer Data



\*NAICS= North American Industry Classification System

# CWCS Insurance Partner Claims Studies

- **Ohio Bureau of Workers' Compensation (OHBWC)**
  - CWCS and OHBWC formed partnership in 2010
  - Conduct claims analyses to understand injury-illness causes by industry/occupation
  - Identify what programs and services work best to prevent injuries and ensure worker recovery and return to function
  
- **WC Database Developed with CWCS**
  - 2001 to 2020
  - >2 million claims
  - OHBWC is the largest US exclusive state fund- insures 2/3 Ohio workers
  - Small- & medium-sized private and public employers
  - North American Industry Classification System (NAICS) Industry codes
  - Employer size (estimated full-time equivalents, FTEs)
  - Occupations, manual class codes



# Recent CWCS-OHBWC Claims Analyses

## ■ Multi-Industry

- Rates methods <https://pubmed.ncbi.nlm.nih.gov/27667651/>
- Basic cause, 2001-2015 <https://pubmed.ncbi.nlm.nih.gov/28953071/>
- Detailed cause, 2007-2017 <https://doi.org/10.1016/j.jsr.2021.08.015>

## ■ High-Risk Industries

- Ambulance services <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.22917>
- Temporary services <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23049>
- Schools <https://doi.org/10.1007/s41542-020-00057-2>
- Nursing homes <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23193>
- Landscaping services <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23261>
- Firefighting <https://doi.org/10.1016/j.jsr.2023.01.014>
- Construction <https://authors.elsevier.com/c/1hUGV56Wabeu9>

## ■ Injury-Illness Diagnoses

- Traumatic brain injuries <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23073>

## Next Up:

### ■ Multi-Industry

- Costs

### ■ High-Risk Industries

- Law enforcement
- Oil and gas
- Trucking transportation

### ■ Injury-Illness Diagnoses

- ICD-9 to -10 transition impact
- Eye injuries
- Respiratory illnesses
- Mental-related

### ■ Cause/Source

- Motor vehicle
- Ladders

# CWCS Insurance Partner Claims Studies, Cont'd

## ■ **NCCI** (National Council on Compensation Insurance)

- Injury cost & frequency by cause, nature, part of body
  - Hearing loss claims- national estimate <https://doi.org/10.1055/s-0043-1769587>
  - Multiple outcomes for several industries, including mining, oil/gas
- Opioids, COVID



## ■ **WCRI** (Workers Compensation Research Institute)

- Injury cost & frequency by cause, nature, part of body
- Opioids, COVID



## ■ **IAIABC** (The International Association of Industrial Accident Boards and Commissions)

- Claims measure surveys, COVID
- Research and standards, return-to-work, medical committees



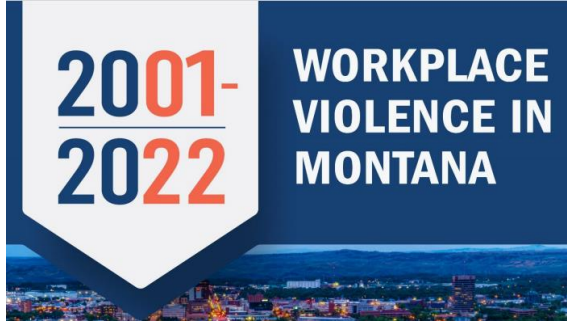
## ■ **OWCP** (Federal Office of Workers' Compensation Program)

- Claims count and cost analyses

 U.S. DEPARTMENT OF LABOR

Office of Workers' Compensation Programs

# Montana - Claims Study Example



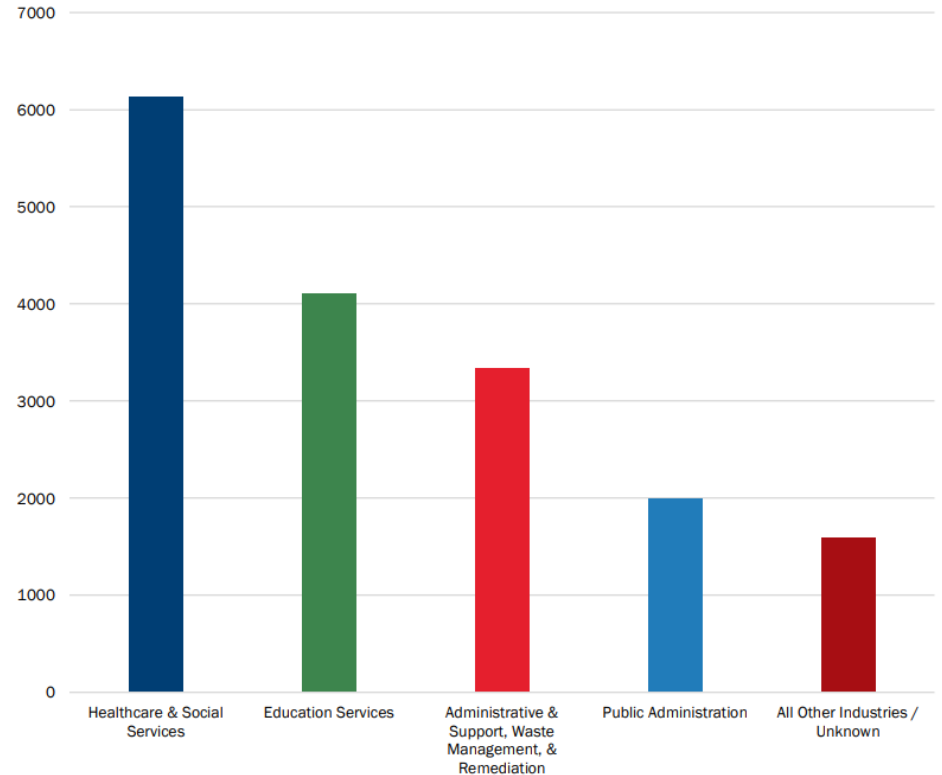
Analysis and  
Interpretation  
of Workers'  
Compensation  
Data

By Andrew Matheison,  
DLI Research Analyst



- <https://erd.dli.mt.gov/docs/research/work-comp-research/Workplace-Violence-in-Montana.pdf>

Figure 3: Injuries from Violence by Industry



# COVID-19 WC Claim Studies

- Many states and organizations sharing WC COVID data
- NIOSH hosting monthly calls and funding several studies
- Analyzing IAIABC COVID survey results

## ■ NIOSH Funded WC Study Goals

- How is the illness related to worker factors (occupation, age, job tenure, sex) and employer factors (industry, firm size, geographic region)?
- What is the impact on injured worker care and the overall WC system?
- What are the long-term illness impacts on workers?
  - Detailed diagnoses, treatments, disability, costs, work status, hospitalizations, deaths and other outcomes

## ■ Partners

- Six states (CA, IL, MI, OH, WA, WI); Workers' Compensation Research Institute (WCRI)

## ■ Outputs

- Ongoing data being shared in several states, formal reports from partners
- Presentations 2/25/22 NIOSH [webinar](#) and 12/8/22 NIOSH [meeting](#)
- See [CWCS COVID WC Summary](#) for links to state reports



<https://www.wcrinet.org/reports/the-early-impact-of-covid-19-on-workers-compensation-claim-composition>

<https://www.wcrinet.org/reports/the-early-impact-of-covid-19-on-medical-treatment-for-workers-compensation-non-covid-19-claims>

<https://www.wcrinet.org/reports/long-covid-in-the-workers-compensation-system-early-in-the-pandemic>



# New NIOSH WC Cost Data Calculators in Development

- Mean, median, 25<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, 95<sup>th</sup>, 99<sup>th</sup> percentile claim costs
- Nature, cause, and part of body of injury
- Multiple industries
  - All sectors combined, other individual sectors such as construction, manufacturing, healthcare, and services, wholesale/retail trade, transportation
- All WC claim types
  - Medical-Only
  - Temporary Total Disability
  - Permanent Partial Disability
  - Permanent Total Disability
  - Death
- Data Partners:
  - NCCI, Ohio BWC, Workers Compensation Research Institute (WCRI)

# WC Claims Data Solutions

- Machine learning
- Narrative text mining
- Data visualization



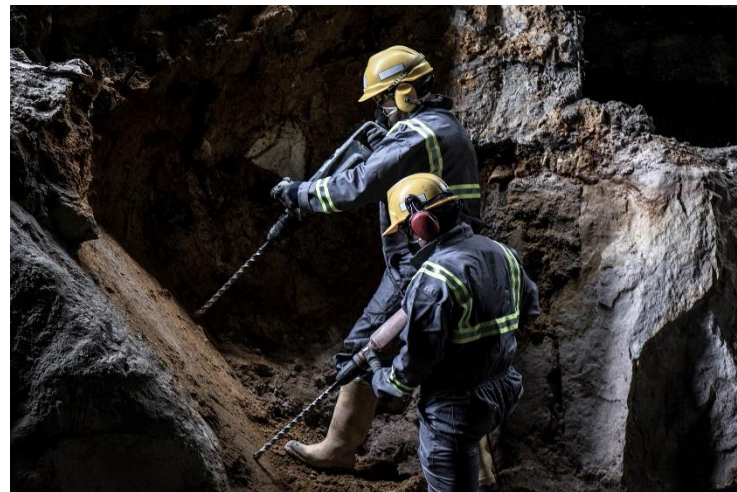
# WC Claims Machine Learning

## ■ Cause

- Adaptable to any narrative data and code set
  - Basic Cause
    - <https://www.ncbi.nlm.nih.gov/pubmed/23206504>
  - Detailed Cause\*
    - <http://www.ncbi.nlm.nih.gov/pubmed/26745274>

## ■ Industry/Occupation

- [CDC - NIOSH Industry and Occupation Computerized Coding System \(NIOCCS\)](#)



## \*Detailed Cause coder Updated 1/23

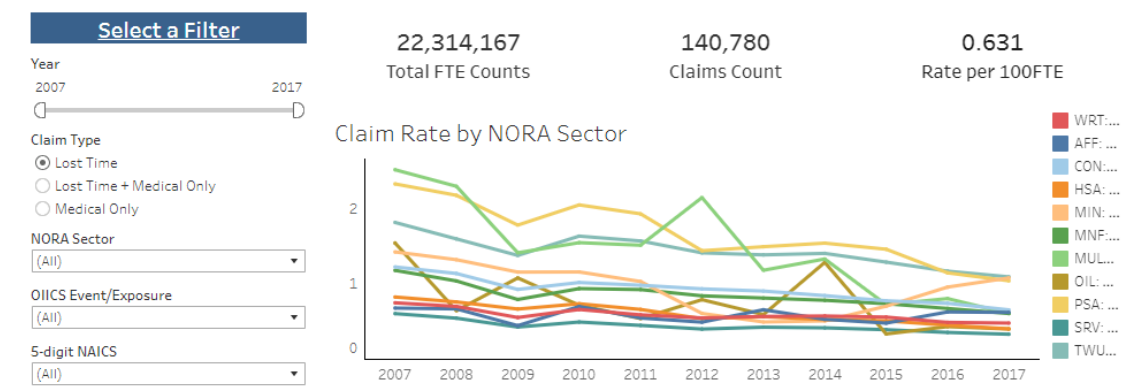
- 93% positive predictive validity
- Trained on >50k WC claims
- Sharing with interested parties, contact [cwcs@cdc.gov](mailto:cwcs@cdc.gov)

# WC Claims Data Visualization

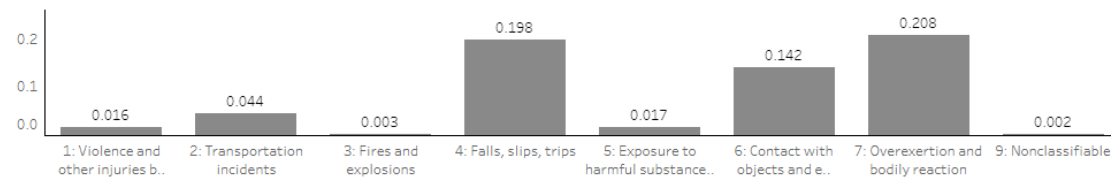
- CWCS offers free DV services

- OH example

## Workers' compensation claim counts and rates by injury event/exposure among state-insured private employers in Ohio



Claim Rate by OIICS Event/Exposure

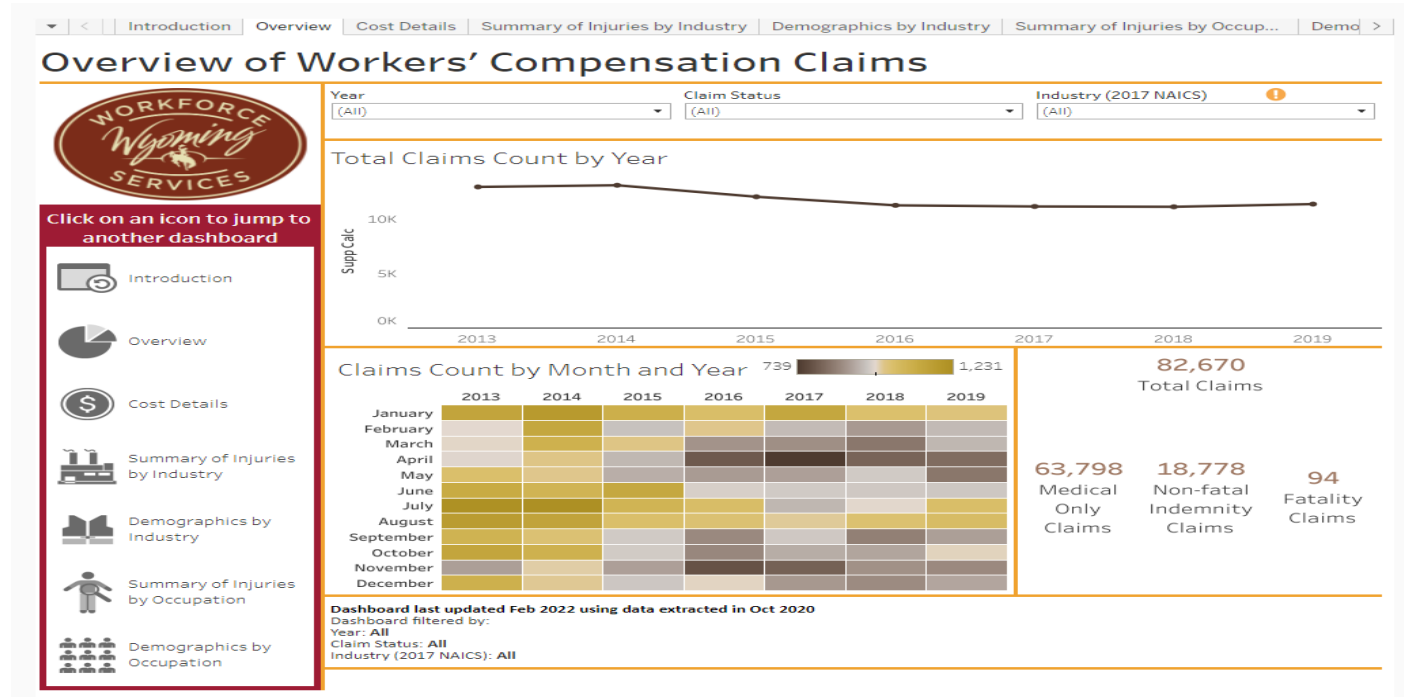


OIICS Event/Exposure	Claims Count	Claims %	Rate	NORA Sector	NAICS Code & Description
1: Violence and other injuries by persons or a..	3,511	2.49%	0.016		
2: Transportation incidents	9,914	7.04%	0.044	WRT: Wholesale and Retail Trade	42311- Automobile and Other Motor Vehicle Mercha
3: Fires and explosions	563	0.40%	0.003		
4: Falls, slips, trips	44,252	31.43%	0.198		42312- Motor Vehicle Supplies and New Parts Merc
5: Exposure to harmful substances or environ..	3,895	2.77%	0.017		
6: Contact with objects and equipment	31,699	22.52%	0.142		
7: Overexertion and bodily reaction	46,406	32.96%	0.208		
9: Nonclassifiable	540	0.38%	0.002		

# WC Claims Data Visualization

- CWCS offers free DV services

- WY example



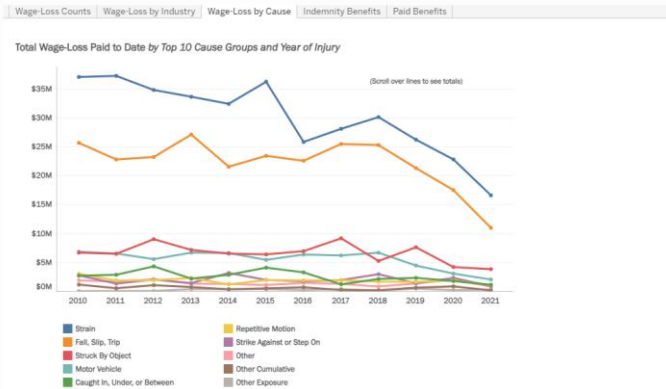
[https://public.tableau.com/app/profile/wy.occupational.epi/viz/WYWorkersComp\\_2013-2019/CostDetails](https://public.tableau.com/app/profile/wy.occupational.epi/viz/WYWorkersComp_2013-2019/CostDetails)

# Montana - Data Visualization Example

Montana Department of LABOR & INDUSTRY  
Employment Standards Division / Data Dashboards / Work Related Injuries that Resulted in Paid Wage Loss

## Work Related Injuries that Resulted in Paid Wage Loss

Other Data Dashboards

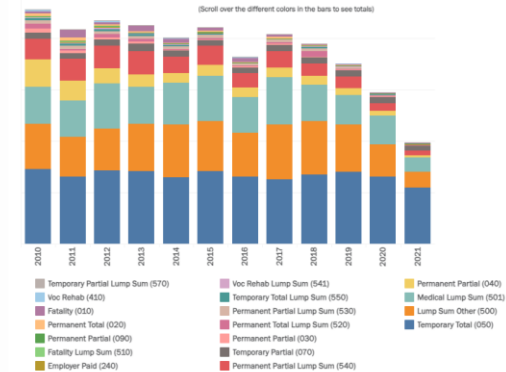


Montana Department of LABOR & INDUSTRY  
Employment Standards Division

Other Data Dashboards

Wage-Loss Counts | Wage-Loss by Industry | Wage-Loss by Cause | Indemnity Benefits | Paid Benefits

### Indemnity Benefits Paid to Date for Work-Related Injuries by Benefit Type and Injury Year



Includes Subsequent Report of Injury (SROI) data, for injury calendar years, received by the Employment Relations Division. Paid indemnity includes any payments to injured workers for benefits.

<https://erd.dli.mt.gov/data-dashboards/wage-loss-benefits>

# NIOSH Tools and Services

- **Auto-Coders**
  - Basic cause
  - Detailed cause
  - Industry - Occupation
- **Crosswalks**
  - WCIO X OIICS
  - Manual class codes X SOC X NAICS
- **Denominator Methods**
- **Data Viz and Analysis Services**



**FREE**

Request Here:  
[cwcs@cdc.gov](mailto:cwcs@cdc.gov)

# Risk and Exposure Assessment





# Insurer Risk Assessment Studies

- Insurers collect occupational risk and exposure data in many industries
  - <https://www.ncbi.nlm.nih.gov/pubmed/29580189>
- Opportunity to improve usability of data within insurers and for research
- Insurers creating standardized air and noise sampling forms
  - <https://www.ncbi.nlm.nih.gov/pubmed/29985777>
- American Industrial Hygiene Association (AIHA) now partnering on this effort



# Prevention Effectiveness



# Safety Intervention Grants

- Ohio BWC Safety Intervention Grant (SIG) since 1999- provides funds for employers to put in place engineering controls
- Program significantly reduced affected employee claims and costs
- Since 2014, the program has provided \$75 million to over 2,500 employers
- Many other organizations have developed similar safety grants

## List of Funded Safety Grant Programs

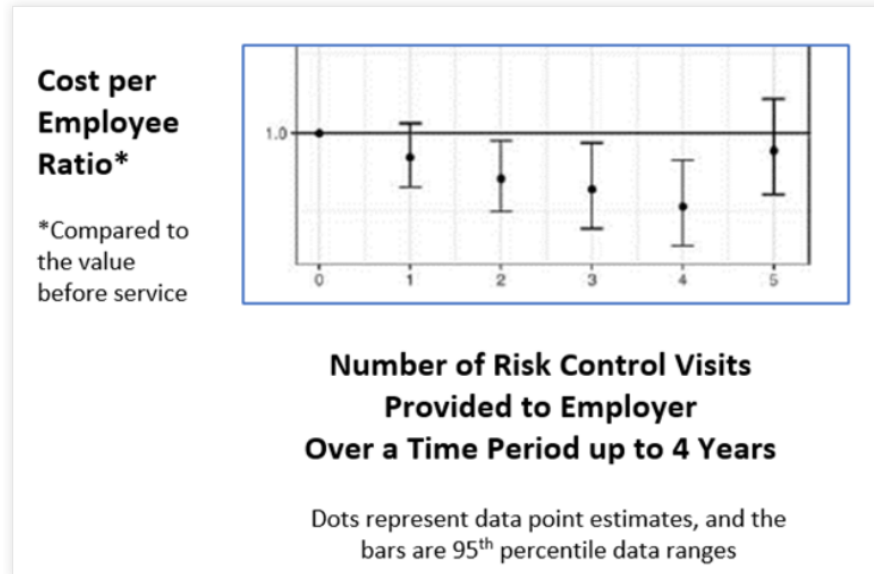
- [Georgia Municipal Association Safety Grants](#)
- [Iowa Municipalities Workers' Compensation Association Safety Study Grant](#)
- [Kentucky League of Cities Workers' Compensation Safety Grant](#)
- [Michigan Occupational Safety and Health Workplace Improvement to Safety and Health Grant Program](#)
- [Minnesota Department of Labor and Industry Safety Grant Program](#)
- [Missouri Employer Mutual Safety Grants](#)
- [Montana State WC Fund Non-Profit Employer Safety Grant](#)
- [North Dakota Workforce Safety & Insurance Ergonomic Initiative Grant](#)
- [Ohio Bureau of Workers' Compensation Safety Intervention Grant](#)
- [Pinnacol Safety Grant Program](#)
- [Texas Mutual Safety Grants](#)
- [Utah Labor Commission Workplace Safety Grant](#)
- [Utah Workers' Compensation Fund Insurance Safety Grant](#)
- [Washington State Department of Labor and Industries Safety and Health Investment Projects Grant Program](#)
- [Workers' Compensation Trust Safety Grants](#)

<https://blogs.cdc.gov/niosh-science-blog/2023/01/10/safety-grants/>

# Insurer Risk Control Services

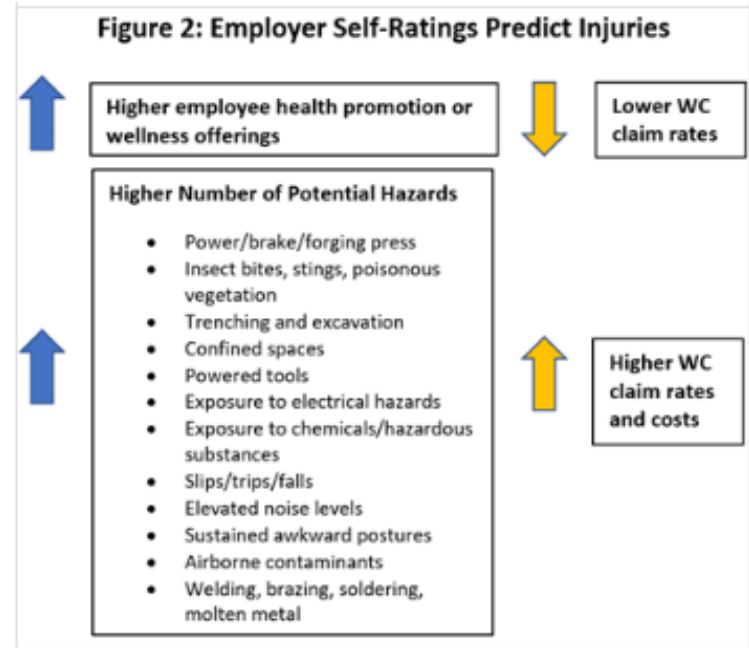
- WC insurers are the largest providers of health/safety services in the US
- Analyzed 2004-2017 Ohio BWC claims data from 4,606 employers that received risk control visits over time
- Service was effective in reducing WC cost rates and controlling and reducing severe injuries for serviced employers

Figure 1: Impact of Multiple Risk Control Service Visits



# Safety Program Evaluations

- 2,295 employers completed multiple safety program self-assessment surveys from 2012 – 2015
- Evaluate how survey responses were associated with WC claims
- Self-ratings predicted future injuries
- Surveys are useful for developing prevention programs



<https://blogs.cdc.gov/niosh-science-blog/2022/07/07/evaluating-safety-practices/>

# Health Services



# Health Services Research

- Assess the impact of healthcare factors on worker health outcomes:
  - Functional status, return-to-work, pain, RX use, and cost
- Healthcare factors under study include:
  - Access and quality of care
  - Conventional and alternative treatments
  - Care coordination, re-injury
  - Injury cause and diagnoses
  - Patient occupation/industry, employer size
- Current studies:
  - OHBWC chiropractic effectiveness
  - WA Labor and Industries (L&I) physical therapy (PT) impact



# Preventing Opioid Use Disorders Among Workers

- Current NIOSH Studies

- OHBWC on opioid RX in construction and other industries
- NAVIPPRO (National Addictions Vigilance Intervention and Prevention Program)
  - <https://www.ibhsolutions.com/research-data/navipro-research-analytics/>
- WY Miners' Hospital
- Review of cannabis reimbursement by workers' compensation insurance in the U.S. and Canada
  - <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23294>



<https://www.cdc.gov/niosh/topics/opioids/default.html>

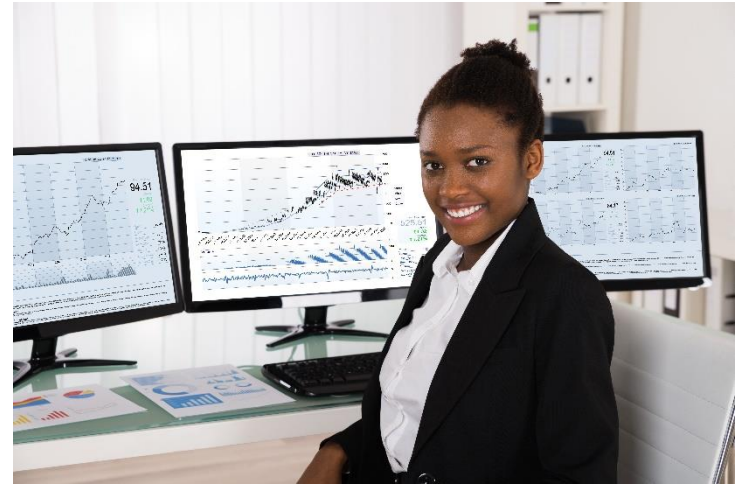


# Outreach



# Outreach

- Connect insurer, public health, employer, and worker communities
  - WC analyses meetings-
    - Monthly COVID
    - Annual Hybrid 12/7/23
  - Webinars
  - Disseminate research findings for prevention and emerging hazards



<https://www.cdc.gov/niosh/topics/worker-comp/cwcs/publications.html>

# Opportunities for Collaborations



*Claims*



*Health Services*



*Risk Assessment*



*Risk Control*



*Outreach*

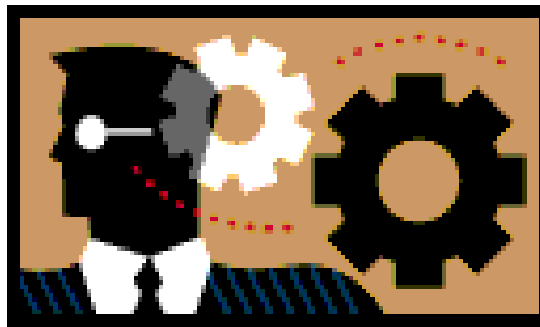
***Insights for employers and workers***

# Contact Information

## CWCS Website

<http://www.cdc.gov/niosh/topics/workercomp/cwcs>

[cwcs@cdc.gov](mailto:cwcs@cdc.gov)



For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.