OSC|12
Ohio Safety Congress & Expo

WELL AT HOME. SAFE AT WORK.

256 NIOSH: Latest Research in Ergonomics

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Thursday, March 29, 3:45 to 4:45 p.m.

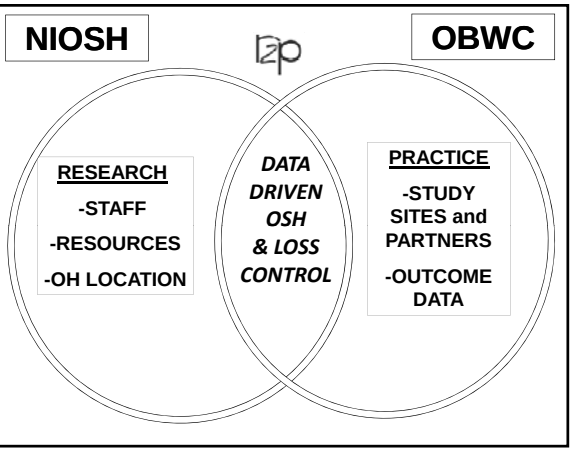
Ohio | Bureau of Workers' Compensation

Ohio BWC – NIOSH Research Collaboration Update

"The findings and conclusions in this report/ presentation have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy."

Why work together?

- **NIOSH emphasizing "research to practice" to develop:**
  - **Reliable and valid exposure assessments**
  - **Effective programs and controls**
  - **Sound economic analyses for the business case of health/ safety**
- **Ohio BWC practicing OSH and seeking partners to help develop evidence based solutions**

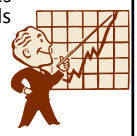


BWC- NIOSH Vision: Sustained partnership

- Protect Ohio workers from workplace injury and illness
- Evaluate effectiveness of BWC sponsored programs based on reductions in injuries and illnesses and return-on-investment
  - Safety Grants
  - Drug Free Safety Programs
  - Safety Council Incentive Program

BWC- NIOSH Vision: Build capacity

- Improve injury and illness prevention strategies based on Ohio's employer and employee needs and injury data
- Continue to develop and disseminate industry specific best practices based on scientific data research
- Analyze BWC data to determine optimal allocation of limited resources to areas of greatest potential impact



Current BWC- NIOSH Project:

Evaluating the Effectiveness of OSH Program Elements in the Wholesale-Retail Trade (WRT) Sector

WRT Quick Facts

- In Ohio in 2009, there were 779,303 WRT employees in 52,214 establishments
  - **Retailers** (72% of above) sell to the public from stores
  - **Wholesalers** (28%) sell to other businesses from warehouses or offices
- Many WRT companies also deliver goods and/or install merchandise
- Ohio BWC insures the majority of WRT companies in the state

Musculoskeletal Disorders (MSDs)

- Nature of injury/ illness:
  - Sprains, strains, tears
  - Musculoskeletal system and connective tissue diseases/ disorders

AND

- Event or exposure leading to injury/ illness:
  - Bodily reaction/bending, climbing, crawling, reaching, twisting
  - Overexertion
  - Repetition

BLS 2000

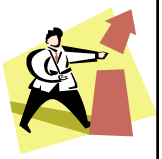
Musculoskeletal Disorders (MSDs) in WRT Sector

- In 2009 WRT sectors employ over 20 million workers
  - Over 200,000 cases with days away from work or restricted duty (DAW)
- **In 2008, MSDs accounted for 28% DAW cases**
- Among all sectors, the WRT sector had some of the highest rates of MSD DAW cases

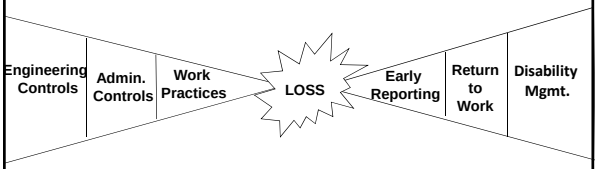
BLS 2008 ; BLS 2009a; BLS 2009b

WRT Project Overview

- A multi-phase research study between Ohio BWC and NIOSH to:
  - Identify crucial MSD and safety control program elements and practices in WRT sector
    - High effectiveness
    - High return on investment



Effective Program: Goal Integration



Reduce Injury/illness frequency

Reduce Injury/illness severity

LOSS PREVENTION **LOSS REDUCTION**

WRT Project Aims

- 1: Identify past injury/ illness trends
- 2: Determine past effectiveness of OSH controls
- 3: Determine effectiveness of OSH programs moving forward
- 4: Determine effectiveness of MSD engineering controls moving forward

Aim 1: Identify Past Injury/ Illness Trends

- Generate WRT sector incidence rates for outcomes (MSDs etc.) from 2001-2009
  - Workers comp case incidence
  - Lost time case incidence
  - Cost per employee per year

- Describe industry trends, high risk industry segments
- Provide benchmarking information for companies

Rate Making Challenge

- Injury/ illness rates are usually presented as
  - # cases per 10,000 employees per year
  - For different industries based on the North American Industry Classification System (NAICS)
- Ohio BWC does not collect number of employees per company or the NAICS
  - Payroll used for premium
  - NCCI code system for industry

Rate Making Solution

- But… another Ohio state agency does collect this information as part of the quarterly census of employment and wages (QCEW)
- Ohio BWC was able to receive data through an agreement
- Now allows workers compensation trending for all industry types in Ohio

Claim Coding Challenge

- **Across sectors, NIOSH strategic goals include preventing:**
  - Musculoskeletal disorders (MSDs)
  - Acute traumatic injuries caused by slips, trips, and falls (STFs)
- **Objectives**
  - Describe industry trends (NAICS 3-digit level) from 2001-2009
  - Develop rates of workers' compensation claims caused by MSDs or STFs
  - Prioritize NIOSH research and Ohio BWC prevention practice
- **Challenges**
  - No coded causation claims data fields prior to 2007
  - > 2 million claims

Text Mining Solution

- **Solution**
  - NIOSH developed an automated text mining approach that uses naïve Bayesian statistical methods
  - Based on claim narrative and injury/illness category
  - The approach is fast, accurate, and reliable
- **Results**
  - The Bayesian technique uses a prediction model and accurately predicts causation ~ 90% of the time
    - Sensitivity: MSD=89%, STF=88%
    - Specificity: MSD=97%, STF=91%
  - Applied method to 16,000 claims in < 5 minutes

WRT MSD Claims
Ohio BWC-Insured Single-Location Establishments+

	2005 N (% total)	2006 N (% total)	2007 N (% total)	2008 N (% total)	2009 N (% total)
All claims	3019 (22)	2639 (21)	2407 (21)	1964 (20)	1552 (20)
Lost-time claims	1006 (37)	781 (36)	709 (34)	570 (30)	413 (32)

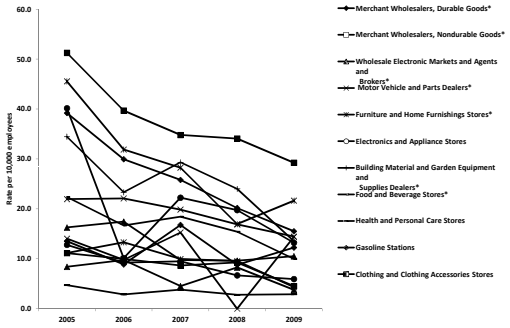
+In 2009 , there were 31,599 WRT Ohio BWC-Insured Single-Location Establishments with 289,441 employees

Rate of MSD Claims
(per 10,000 employees)

	2005	2006	2007	2008	2009	Trend
All claims	86.3	76.6	71.6	60.8	52.8	-0.12*
Lost-time claims	28.7	22.7	21.1	17.7	14.1	-0.15*

*Statistically significant, p-value < 0.001

Lost-time MSD rates
by WRT sub-sector (2005–2009)



Aim 2:
Determine past effectiveness of OSH controls

- Analyze the effectiveness and cost-benefit of BWC sponsored MSD and safety controls (Safety Grants)
  - OBWC funded ~1,500 engineering interventions since 1999
  - Most were ergonomic related controls
  - All sectors from 1999-2007 then WRT alone

Initial Analysis

- Focused on period 2004-2008, over 400 companies
- Compare WC claims for affected employees 2 years before and after the Safety Grant was implemented
- Appears to be a significant decline in number of WC claims after the intervention
  - Analysis adjusted for overall decline in all claims across industries from 2004-2008

Aim 3: Determine effectiveness of OSH programs moving forward

- 5,000 WRT companies will complete surveys to rate their OSH programs (organizational policies, procedures, practices)
- Analyze how programs are associated with past and future WC claims from 2012-2014
- Identify OSH elements that are most effective in reducing future WC claims
- Provide companies with evidence- based benchmarking tool

Survey Status

- Pilot tested survey with 6 Ohio BWC-insured WRT companies and 3 large self-insured WRT companies
- Final online survey has been developed
  - 75 questions
  - 12 minute average to complete
- Expect to collect data beginning in January 2012

Aim 4: Determine effectiveness of MSD engineering controls moving forward

- Determine the effectiveness and cost-benefit of MSD interventions
  - BWC will sponsor controls through Safety Grants
  - 2:1 matching, up to $40k per company
  - 400 participants
  - 40 companies
  - From 2012-2014

Powered, stair climbing hand truck or truck lift gates

Still Recruiting Now!

- Need companies performing delivery/ installation of large or stacked items:
  - Appliances, furniture, vending machines, copiers, ATMs, safes, furnaces, water heaters, AV equipment, beverages, construction materials, carpets, landscaping materials, etc.
- The study will analyze the effects of adding equipment to the delivery/ installation process

Target Interventions

- Can be any intervention affecting material handling during delivery/ installation
  - **Main sought**:
    - Stair-climbing powered hand trucks, manual hand trucks with brakes, truck-lift gates
  - **Others possible**:
    - Portable jib cranes, piggyback forklifts, custom equipment, etc.

Main Outcomes: Self Reported MSD Symptoms

- NIOSH will ask employee volunteers from each employer to answer surveys to rate back and shoulder pain before and after using the engineering controls.
  - Brief online surveys, collected 4x a year
  - Employees paid $5 each survey
- NIOSH will not share personal identifying information of the volunteer employees with BWC or employers.

Other Company Outcomes

- For affected employees:
  - WC claims
  - Absenteeism
  - Turnover
  - Quality
  - Productivity
- Compared before and after the intervention

Current Status

- 5 companies have been approved
  - 4 HVAC, 1 Vending
  - Total of ~50 affected employees
  - 12% of 400 employee goal
- Many others in process

For More Information

- Online
  - http://www.ohiobwc.com/employer/programs/safety/EmpGrantsWRT.asp
- Contact your BWC ergonomics consultant or
- Mike Lampl, BWC
  - Michael.L.1@bwc.state.oh.us
- Steve Wurzelbacher, NIOSH
  - srw3@cdc.gov

Planned Study Outputs for all WRT Projects

- Share evidenced-based best practices through NIOSH and OBWC channels
  - Web tools, publications
  - Scientific journals
- Allow companies to develop optimal strategies to
  - Reduce the physical and financial burden of MSDs and other work related injuries/ illnesses

Research Team

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Questions?

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OSC 12