Using Workers' Compensation Data for Surveillance of Occupational Injuries and Illnesses – Ohio, 2005–2009[1]

Alysha Meyers, PhD§, Steve Wurzelbacher§, PhD, Steve Bertke§, PhD Mike Lampl*, MS, Dave Robins*, Jennifer Bell§, PhD
§National Institute for Occupational Safety and Health, *Ohio Bureau of Workers' Compensation, Division of Safety & Hygiene

Introduction

The Ohio Bureau of Workers' Compensation (OBWC) is the largest of four, exclusive, state-run workers' compensation (WC) systems in the United States. All public Ohio employers and private employers (except sole proprietorships or partnerships) with less than 500 employees must purchase WC insurance from the state of Ohio. Other private employers have the option to self-insure for WC insurance. OBWC provides WC insurance for approximately two-thirds of Ohio workers but a lower proportion of Wholesale and Retail Trade (WRT) industry sector workers. One long-term goal of a partnership between OBWC and the National Institute for Occupational Safety and Health (NIOSH) is to develop an occupational illness and injury surveillance system by joining OBWC's WC data with denominator data (number of employees) from another state agency. To demonstrate the new system NIOSH generated incidence rates for OBWC WC outcomes, especially for musculoskeletal disorders (MSDs), for single-location employers in the Wholesale and Retail Trade Sectors and described sub-sector trends for 2005–2009. MSDs caused by ergonomic hazards are common among workers and result in pain, disability, and substantial cost to workers and employers (Bureau of Labor Statistics, 2011; Liberty Mutual Research Institute for Safety, 2011). Based on data from the 2010 Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII), a disproportionately higher rate of MSDs resulting in lost workdays occurs in the WRT industry sector compared with other industry sectors (Bureau of Labor Statistics, 2011).

Methods

Claims data for this system were extracted from the OBWC data warehouse; denominator data (number of employees) and North American Industry Classification System (NAICS) codes came from the Ohio Department of Jobs and Family Services (ODJFS). Joining the databases was complex. ODJFS data are arranged by employer location, whereas OBWC data are arranged by policy number. OBWC claims cannot be linked to a particular location if the policy includes more than one location. Therefore, these analyses focused on single-location employers in the WRT industry sector. Among OBWC-insured policies, the vast majority are for employers with a single-location. (2009 OBWC-insured WRT policies: single-location — 31,599 and multiple-location — 882). To join single-location denominator data to single-location OBWC policy data, NIOSH and OBWC first developed a method to identify active policies by year. ODJFS' quarterly data were annualized to calculate the average number of employees per employer. Single-location ODJFS data were joined to OBWC policy data by year (2005–2009) using Employer Identification Numbers (i.e. Federal Tax Identification Numbers) common to both databases. Rarely (< 1% of policies), more than one OBWC policy matched to one ODJFS employer; in those cases the employer's data were excluded.

[1] The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health or the Ohio Bureau of Workers' Compensation.

With few exceptions, MSDs were defined according to the BLS case definition. Coded injury/illness diagnosis data and narrative text on causation were used to identify MSD claims; a Bayesian auto-coding technique (Lehto et al., 2009) used both data elements to identify MSDs by using a 'training' and 'testing' set of manually coded claims. The sensitivity and specificity of this auto-coding technique were 0.90 and 0.98 respectively. Auto-coded MSD claims were flagged for manual, expert review when the injury/illness diagnosis was not an MSD. Lost-time claims for MSDs were defined as claims for MSDs resulting in more than seven days away from work. Rates of MSDs were calculated per 10,000 employees and tests of trends over time were calculated using Poisson regression. Disallowed and dismissed claims were excluded from all analyses.

Results

The proportion of all claims attributable to MSDs was relatively stable at approximately 20% across the 5-year period of 2005–2009; the proportion of MSD lost-time claims decreased from 37% in 2005 to 32% in 2009. From 2005–2009, the majority of claimants were men, 25-54 years of age, and worked for employers with 11-249 employees. The largest number of MSD claims occurred among Merchant Wholesalers of Durable Goods.

The rate of MSDs resulting in a claim or a lost-time claim decreased significantly ($P < .05$) from 2005–2009 for all WRT industry sector employers but not for all WRT industry subsectors. Overall, the respective rates of all MSD claims and lost-time MSD claims per 10,000 employees decreased from 86.3 and 28.7 in 2005 to 52.8 and 14.1 in 2009. Employers with more employees tended to have higher incidence rates of MSDs. From 2005–2009 lost-time MSD rates per 10,000 employees for three subsectors were in the highest five every year: Merchant Wholesalers of Nondurable Goods (2009: 29.2), Furniture and Home Furnishings Stores (2009: 21.7), and Merchant Wholesalers of Durable Goods (2009: 15.5) (Figure 1). The high lost-time MSD rates per 10,000 employees in these three subsectors were consistently attributable to high rates in five 4-digit NAICS industry subsector groups: a) in Merchant Wholesalers of Nondurable Goods high rates were attributable to Alcoholic Beverage Merchant Wholesalers (2009: 114.8) and Grocery and Related Product Wholesalers (2009: 30.9); b) in Furniture and Home Furnishings Stores high rates were attributable to Furniture Stores (2009: 27.2); and c) in Merchant Wholesalers of Durable Goods high rates were attributable to Metal and Mineral Merchant Wholesalers (2009: 28.0) and Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (2009: 25.4).

Discussion

Improved surveillance of work-related MSDs is a national priority identified in NIOSH National Occupational Research Agenda (National Institute for Occupational Safety and Health (NIOSH) Office of the Director, 2012). This project demonstrates how WC claims data can be used for public health surveillance. The results indicate that while the rate of MSDs among workers employed by smaller (< 500 employees) Ohio employers declined from 2005 to 2009 for most WRT industry subsectors, workers in some subsectors are still experiencing relatively high rates of MSDs. The factors responsible for the downward trend in incident MSDs in most WRT industry subsectors are unclear.

A downward trend for incident MSDs from 2005–2009 was also observed in the BLS SOII (Bureau of Labor Statistics, 2011). Based on OBWC data, the WRT industry subsector with the highest rate of lost-time MSDs for five straight years (2005–2009) was Merchant Wholesalers of Nondurable Goods. Similarly, Merchant Wholesalers of Nondurable Goods had one of the three highest rates of MSDs among all WRT industry subsectors over the same 5-year period in the BLS survey (Bureau of Labor Statistics, 2011). In both cases these high rates were attributable to high rates among Alcoholic Beverage Merchant Wholesalers and Grocery and Related Product Wholesalers. Based on OBWC data, from 2005–2009 Furniture and Home Furnishing Stores had one of the three highest rates of MSDs for three years and one of the five highest rates for all

years. Similarly, in the BLS survey, Furniture and Home Furnishing Stores had one of the five highest rates of MSDs for the same 5-year period (Bureau of Labor Statistics, 2011). From 2005–2009 Building Material and Garden Equipment and Supplies Dealers had one of the three highest rates of MSDs based on the BLS survey and during the same time period that subsector was among the five highest OBWC lost-time MSD rates for four of five years. In contrast, from 2005–2009, Food and Beverage Stores had one of the five highest rates of MSDs in the BLS survey but were never among the five highest subsectors among OBWC data. Given the differences between the BLS survey and the OBWC claims data, it is not surprising that the relative MSD rates may vary. Cases in the BLS survey results are from OSHA logs and describe injuries/illnesses for employers of all sizes at one location among workers who missed at least one day of work. In contrast, OBWC cases are all for WC claims and describe injuries/illnesses for small, single-location employers among workers who did and did not miss work. Also, the majority of Food and Beverage Stores' employers may be chains that tend to self-insure and/or have multiple-locations and therefore these employers would not be represented by this project.

Workers in the higher risk subsectors of WRT are exposed to physical risk factors for MSDs such as overexertion or repetitive motion (Anderson et al., 2010). Work tasks in high risk subsectors such as Furniture and Home Furnishings Stores, Alcoholic Beverage Merchant Wholesalers, and Grocery and Related Product Wholesalers commonly include lifting and transporting large heavy objects such as furniture or kegs of beer. OSHA has created ergonomic training tools that outline prevention activities for Beverage Delivery and Grocery Warehousing (OSHA, 2012). Some interventions (e.g. stair-climbing dollies, keg handling equipment, forklifts) to reduce exposures exist for many but not all manual material handling tasks in these subsectors.

The findings from this project are subject to at least three limitations. First, this project is only representative of smaller employers (<500 employees) with a single location in Ohio. Second, the Bayesian auto-coding method used to identify MSDs introduces the potential for non-differential misclassification. However, misclassification is not expected to create bias in MSD rates by WRT industry subsector. Third, underreporting is an expected limitation of WC data. Studies have estimated that WC claims data underreports work-related injuries/illnesses by 40–80% (Weddle, 1996; Pransky et al., 1999; Morse et al., 2000). While underreporting may affect the magnitude of the rates, it is unknown whether the relative differences observed between WRT industry subsector or employer sizes were affected by underreporting.

The findings from this project suggest that the incidence of MSDs has declined from 2005 to 2009 among small WRT employers in Ohio. The data also indicate that relatively higher rates of MSDs occur in the Alcoholic Beverage Merchant Wholesalers, Grocery and Related Product Wholesalers, Furniture Stores, Metal and Mineral Merchant Wholesalers, and Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers industry subsector groups. The WRT industry subsector findings are consistent with national BLS surveillance data. Targeted interventions to reduce exposure to ergonomic hazards in these subsectors should continue to be developed and implemented to effectively prevent MSDs. Given the large workforce employed in WRT industry sector, declines in MSDs could substantially reduce the national injury/illness burden.

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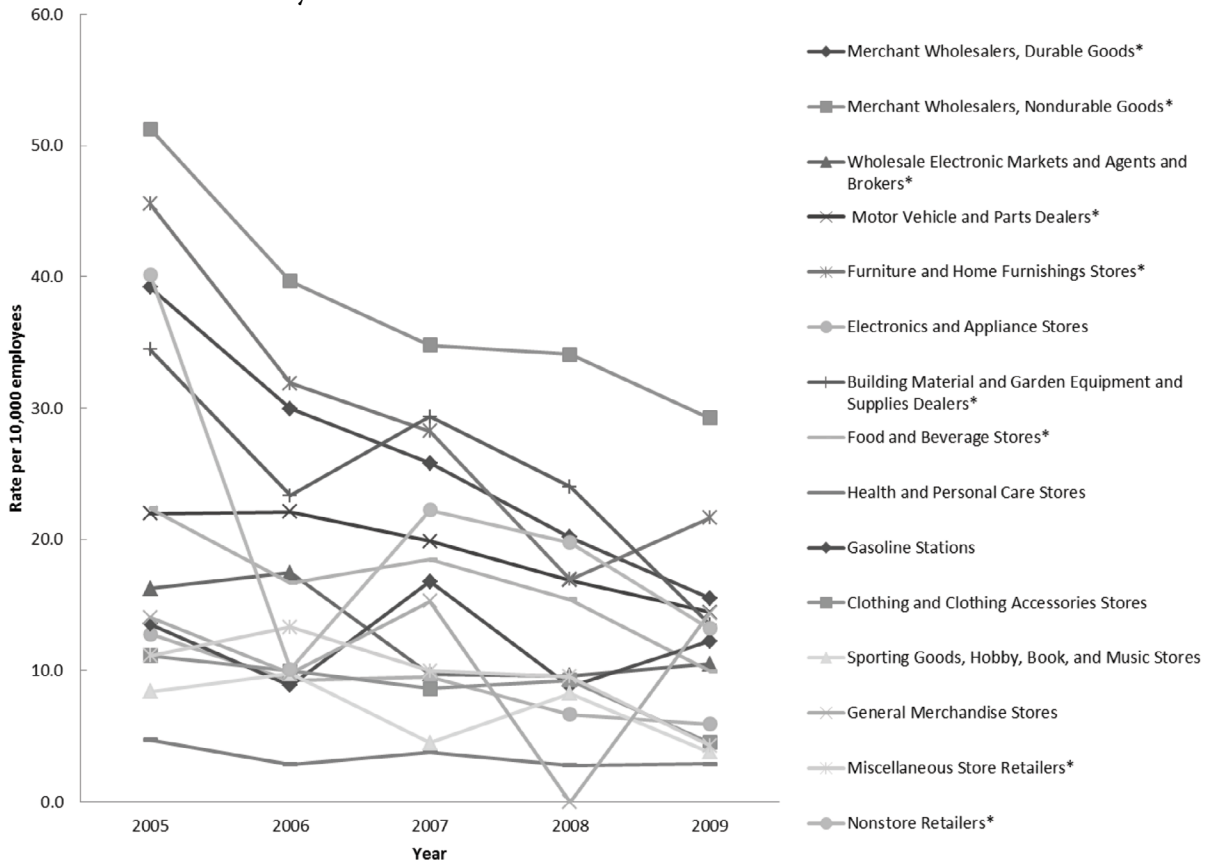
Figure 1. Rates of lost-time musculoskeletal disorders per 10,000 employees among Wholesale and Retail Trade industry subsectors



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David F. Utterback and Teresa M. Schnorr, Editors

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