



NATIONAL OCCUPATIONAL RESEARCH AGENDA (NORA)

NATIONAL OCCUPATIONAL RESEARCH AGENDA FOR WHOLESALE AND RETAIL TRADE

August 2018

Developed by the NORA Wholesale and Retail Trade Sector Council

For more information about the National Occupational Research Agenda (NORA), visit the web site: <https://www.cdc.gov/niosh/nora/>

For monthly updates on NORA, subscribe to NIOSH eNews at www.cdc.gov/niosh/eNews

Disclaimer

This is a product of the National Occupational Research Agenda (NORA) Wholesale and Retail Trade Sector Council. It does not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, or U.S. Department of Health and Human Services.

INTRODUCTION

What is the National Occupational Research Agenda?

The National Occupational Research Agenda (NORA) is a partnership program to stimulate innovative research and workplace interventions. In combination with other initiatives, the products of this program are expected to reduce the occurrence of injuries and illnesses at work. Unveiled in 1996, NORA has become a research framework for the Nation and the National Institute for Occupational Safety and Health (NIOSH). Diverse parties collaborate to identify the most critical issues in workplace safety and health and develop research objectives for addressing those needs.

NORA enters its third decade in 2016 with an enhanced structure. The ten sectors formed for the second decade will continue to prioritize occupational safety and health research by major areas of the U.S. economy. In addition, there are seven cross-sectors organized according to the major health and safety issues affecting the U.S. working population. While NIOSH is serving as the steward to move this effort forward, it is truly a national effort. NORA is carried out through multi-stakeholder councils, which are developing and implementing research agendas for the occupational safety and health community over the decade (2016-2026). Councils address objectives through information exchange, partnership building, and enhanced dissemination and implementation of evidence-based solutions.

NORA groups industries into ten sectors using North American Industry Classification System (NAICS) codes. The Wholesale and Retail Trade (WRT) sector encompasses three NAICS groupings (42, 44, & 45). Wholesale Trade (NAICS 42) comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise [NAICS 2013a]. Retail Trade (NAICS 44 & 45) comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise [NAICS 2013b].

What are NORA Councils?

Participation in NORA Councils is broad, including stakeholders from universities, large and small businesses, professional societies, government agencies, and worker organizations. Councils are co-chaired by one NIOSH representative and another member from outside NIOSH.

Statement of Purpose

NORA councils are a national venue for individuals and organizations with common interests in occupational safety and health topics to come together. Councils will start the third decade by identifying broad occupational safety and health research objectives for the nation. These research objectives build from advances in knowledge in the last decade, address emerging issues, and are based on council member and public input. Councils will spend the remainder of the decade working together to address the agenda through information exchange, collaboration, and enhanced dissemination and implementation of solutions that work.

Although NIOSH is the steward of NORA, it is just one of many partners that make NORA possible. Councils are not an opportunity to give consensus advice to NIOSH, but instead a way to maximize resources towards improved occupational safety and health nationwide. Councils are platforms that help build close partnerships among members and broader collaborations between councils and other organizations. The resulting information sharing and leveraging efforts promotes widespread adoption of improved workplace practices based on research results.

Councils are diverse and dynamic, and are open to anyone with an interest in occupational safety and health. Members benefit by hearing about cutting-edge research findings, learning about evidence-based ways to improve safety and health efforts in their organization, and forming new partnerships. In turn, members share their knowledge and experiences with others and reciprocate partnerships.

Wholesale and Retail Trade Council

The NORA Wholesale and Retail Trade (WRT) Sector Council was formed in 2006 for the second decade of NORA. The goal was to promote dialogue and facilitate the development of partnerships to improve occupational safety and health for wholesale and retail businesses. During the second decade the WRT Council developed a detailed research agenda, co-sponsored a series of three national workshops on interventions, and established sub-groups to evaluate solutions for preventing musculoskeletal disorders and traumatic injuries affecting high-risk WRT occupations, among other notable accomplishments. In the third decade of NORA, the WRT Council comprises about 40 members, and includes representation from federal and state governmental agencies, academia, industry, labor, trade associations, insurance, professional and not-for-profit organizations, and experts/consultants. A list of the current WRT Council members is included as Appendix A.

The WRT Council assesses the occupational safety and health needs of the wholesale and retail trade sector. The council encourages new research and promotes the adoption of effective, evidence-based workplace interventions. Input from a wide variety of stakeholders is critical to assessing the state of the field, for conducting new research, and for communicating findings to make positive changes in the workplace. Comments on sector objectives and the direction of research and prevention activities are always encouraged.

To keep the members and colleagues of the WRT sector informed on topics of importance, a quarterly news bulletin was developed for the WRT community during the second decade of NORA. In January of 2015, the News Bulletin was refreshed with a new look and set of topics on WRT solutions and best practices. Invitations to join the external council were also issued in the quarterly newsletter and distributed to organizations (e.g., trade associations, labor-union, safety and health professionals, and small business chambers of commerce). The purpose is to ensure broad representation across the different WRT subsectors and to individuals who had shown interest in the work of the Council. Copies of past issues are available at: <https://www.cdc.gov/niosh/nora/councils/wrt/bulletins.html>.

At its first two meetings in this NORA decade, the WRT Council discussed its vision for the coming years. The Council seeks to:

- Increase awareness about important safety and health concerns for workers in the WRT sector
- Foster research to fill gaps in knowledge
- Translate research into general use
- Provide a broad range of stakeholders, including employers and labor, with knowledge and tools they can use so that WRT workers can do their jobs safely and live healthy and productive lives.

What does the National Occupational Research Agenda for Wholesale and Retail Trade represent?

The National Occupational Research Agenda (NORA) for Wholesale and Retail Trade (WRT) is intended to identify research, information, and actions most urgently needed to prevent occupational injuries and illnesses in the WRT sector. This Agenda provides a vehicle for stakeholders to describe the most relevant issues, research gaps, and safety and health needs for the sector. It is meant to be broader than any one agency or organization. It identifies the priorities for the entire country and all of its research and development entities, whether government, higher education, or industry. Because the agenda is intended to guide national occupational health and safety efforts for the WRT sector, it cannot at the same time be an *inventory* of all issues worthy of attention. The omission of a

topic does not mean that topic was viewed as unimportant. However, those who developed this agenda did believe that the number of topics should be small enough so that resources could be focused on a manageable set of objectives, thereby increasing the likelihood of real impact in the workplace.

NIOSH used the agendas created by the sector and cross-sector NORA councils to help inform the development of the [NIOSH Strategic Plan](#). Programs used the [burden, need and impact method](#) to write research goals that articulate and operationalize the components of the NORA sector and cross-sector Agendas that NIOSH will take up. NORA agendas and the NIOSH Strategic Plan are to be separate but linked.

Who are the target audiences?

The target audiences include stakeholders and partners who have a desire to reduce work-related injuries and illnesses in the WRT sector. Stakeholders and partners include persons, groups, or organizations that have a direct or indirect stake in occupational safety and health in the WRT sector. They are essential for implementing the WRT agenda. The national WRT agenda is intended to inspire decision makers and program planners to include the WRT topics in their top priorities, and to guide researchers to relevant topic areas for research proposals. Table 1 provides the potential target audience.

Stakeholders and partners also include the employers and owners of WRT business. Wholesale Trade consists of 384,939 establishments, whereas Retail Trade consists of 991,049 establishments. Perhaps the most important of the targeted audience is the 21,336,222 workers in the WRT sector. Wholesale employees account for 5,966,237 with 15,369,985 retail employees [Census Bureau 2014-2015]

Table 1. Wholesale and Retail Trade (WRT) Potential Target Audiences

Audience Type	Target Audience
Research entities	<ul style="list-style-type: none"> • Federal research agencies • Research foundations • State supported sources • Workers compensation insurance research organizations • Industry research organizations • Private sector loss control (loss prevention) and insurance
Public and private researchers	<ul style="list-style-type: none"> • Government researchers • Academic researchers • Association and organization researchers
Wholesale and retail trade organizations	<ul style="list-style-type: none"> • Trade associations • Regulatory agencies involved with Federal, State, and local levels • Nonprofit organizations and community, etc.
Safety and health practitioners	<ul style="list-style-type: none"> • Professional associations • Individual safety, industrial hygiene, and engineering practitioners • Consensus standards groups • Other professionals with safety and health interest (economists, physicians)
Others	<ul style="list-style-type: none"> • Government agencies and trade associations, focused on small businesses • Local economic development organizations

How was the research agenda developed?

The NORA WRT Council brings together individuals and organizations to share information, form partnerships, and promote adoption and dissemination of solutions that work. The WRT Council began to develop the national agenda for WRT during virtual meetings held in January and March of 2017. Meetings included presentations on the purpose of NORA and its evolution over the first two decades, progress on NORA WRT goals from the previous decade, and the most current injury and illness data from Bureau of Labor Statistics (BLS) and other sources of information. Discussion focused on changes over the last decade in both wholesale and retail jobs, changes in workforce demographics, and changes associated with organizational and psychosocial stressors. One of the important discussion points was how to improve outreach to the WRT stakeholders and partners through translation of research findings into practice for the larger WRT community. Council members' ideas were synthesized into five overarching strategic objectives which formed the basis for this agenda: (1) preventing musculoskeletal disorders, (2) traumatic injuries, (3) work-related violence, and (4) motor-vehicle crashes. While these first four topics were all covered in the WRT agenda during the second decade of NORA, the fifth objective focusing on (5) health work design and well-being has been introduced as a priority for the third decade of NORA. Public comments on the draft agenda were sought through a public docket identified in the Federal Register. No public comments were received.

THE OBJECTIVES

Objective 1: Reduce occupational musculoskeletal disorders (MSDs), i.e., overexertion injuries among WRT workers.

While there have been some improvements in the WRT injury/illness rates over the last decade, musculoskeletal disorders (MSDs) continue to adversely affect the WRT workforce with persistently high incidence rates (IRs). Specifically, the IR in 2015 for MSDs in Wholesale Trade was 38.4/10,000 full-time-employees (FTE) and 36.2/10,000 FTE for Retail Trade [BLS 2016a]. The Retail subsectors in 2015 with the highest IRs for MSDs included (1) building materials and gardening stores, (2) general merchandise (department) stores, (3) food and beverage stores, and (4) furniture and home furnishing stores. Similarly, the Wholesale subsector with highest IR for MSD were those employers who function as merchants-of-nondurable goods [BLS 2015a]. Within the WRT sector, 36% of the injuries in 2015 resulted from overexertion and bodily reaction (a proxy for MSDs) [BLS 2015b].

Musculoskeletal disorders are associated with high costs to employers such as absenteeism, lost productivity, and increased health care, disability, and workers' compensation costs [NRC/IOM 2001]. A recent study estimated the average cost of all MSD cases in all NORA sectors at \$7,775 per case in 2004 dollars. After adjusting this cost to 2014 dollars, the average cost of MSDs in the WRT sector is estimated at approximately \$9,743 per case [Bhattacharya 2014]. Using the BLS estimate of approximately 63,000 WRT reported cases of MSDs in 2014, the total cost is estimated to be about \$614 million [Bhattacharya 2014]. MSDs have a large economic impact on society that includes the cost of treatment and the related indirect costs of productivity losses. According to the findings of the Liberty Mutual Research Institute, in 2017 overexertion was the number one cause of workplace injuries and illnesses, costing the nation about \$13.8 billion in direct cost and accounting for 23% of all workplace injuries [Liberty Mutual 2017].

Research on the prevention of overexertion injuries and MSDs is organized around four public health stages of research, namely: (1) improving surveillance of MSD hazards/exposures, (2) conducting etiological research into the causes of MSDs, (3) developing interventions and evaluations, and (4) translation and dissemination of research findings into usable products. Surveillance data from sources such as BLS can be used to prioritize wholesale and retail trade sub-sectors according to the number and rates of overexertion injuries and MSDs. Etiological research is needed to advance our understanding of the mechanisms that cause muscle fatigue, and soft tissue injuries. Etiological research also includes the study of job design and personal factors. Intervention research studies are needed to assess the effectiveness of changes in the design and layout of the workplace and on the effectiveness of various engineering control devices that purport to reduce the physical stresses. Finally, research is needed to improve methods for disseminating research findings to the WRT stakeholders.

Objective 2: Reduce traumatic injuries that arise from safety hazard, such as slips, trips, falls, and contact-with-objects among WRT workers.

Slips trips and falls (STFs) and contact-with-objects (CWOs) represent the second and third leading cause of workplace safety injuries in the WRT sector, behind overexertion injuries. Together STFs and CWOs account for 49% of all injuries in the WRT sector in 2015 [BLS 2015b]. BLS categorizes the fall related injuries according to where the fall occurred, either to a lower level or to the same level. Based on 2015 workers compensation data, the combination of falls on the same level and falls to a lower level accounted for nearly 26% of the injuries to the workers in all private sector industries with a direct cost of approximately \$16 billion annually [Liberty Mutual 2017]. CWOs, also known as struck-by injuries, accounted for 7% of all injuries to workers in all private sector industries and \$4.4 billion in direct costs [Liberty Mutual 2017]. The majority of the CWO injuries were attributed

to being struck-by an object or piece of equipment, such as a forklift with an incidence rate (IR) of 18.1/10,000 full-time-employees (FTE) [BLS 2015a]. WRT employees at risk to STFs and CWOs include not only those who work in sales and material handling jobs, but also those who work in office environments where conditions also exist that can cause STFs and CWOs.

Research is needed to evaluate safety interventions for the WRT sector. This will include interventions that are designed to reduce the incidence of safety-related hazards that include STFs and CWOs. In order to evaluate the effectiveness of interventions designed to prevent injuries from STFs and CWO, the investigator needs to consider the interactions of cognitive, behavioral, biomechanical factors as well as the principles of friction, lubrication and wear [Maynard 2003]. The human-factors model provides an effective means for evaluating such complex interactions between workers and their work environment. Research topics could include the following: (1) an assessment of the sensory information that an employee must process, (2) an assessment of the cognitive demands posed by the task, and (3) an assessment of the ability of the worker to respond in a safe manner with his/her musculoskeletal system [Salvendy 2012]. Investigators need to study how various organizational policies and practices impact workers' behavior. The goal is to develop organizational practices that reinforce safe behavior to avoid preventable injuries from STFs and CWOs [Neal et al. 2000]. The literature offers numerous workplace solutions and interventions designed to reduce STFs and CWOs, but there are limited studies evaluating the effectiveness of the solutions for preventing STFs and CWOs. Rivara [2000] noted that studies that are designed to evaluate effectiveness of these solutions are often confounded by on-going changes in the workplace, such as new management, changes in the pay structure, and even changes in weather, all of which can affect the incidence of STFs and CWOs. Cost benefit studies are needed to demonstrate the economic incentive for adopting different types of prevention strategies for STFs and CWOs. Once effective solutions for preventing STFs and CWOs have been developed, there is also a need to translate those research findings into readily understood prevention and protective measures to assess how well the information is reaching different ethnic populations, age groups, and those whose primary language is not English.

Objective 3: Prevent work-related violence in the WRT sector

Assaults and violent acts are more common in the Retail sector than in the Wholesale sector. Although retail work is generally safe, there are some retail business that have higher rates of violence due to the nature of their business and their location. During a period from 2003 to 2008, homicides due to violence were the leading cause of work-related fatalities in the Retail sector [BLS 2011]. In 2016, there were 148 fatalities due to violence in the Retail sector, which accounted for 52% of all fatalities, a disproportionate number in comparison to the average across all private industries (15% of fatalities). Retail businesses with the most violence-related fatalities included gasoline stores and convenience stores [BLS 2016b]. There were three Retail store categories that stood apart with higher IRs than had been reported in previous years; namely: pharmacies and drug stores with an IR of 2.6/10,000 FTE, clothing and clothing accessories stores with an IR of 3.9/10,000 FTE, and shoe stores with an IR at 11.6/10,000 FTE. With the exception of the clothing stores in previous years, neither of the other two Retail stores had a sufficient number intentional violence cases to generate even a publishable value [BLS 2016b].

In 1993, a National Academy of Science report on violence, its causes, and its prevention asserted that "violence arises from interactions among individuals' psychosocial development, their neurological and hormonal differences, and social processes" [NAP 1993]. To understand the social process, one has to analyze the sociological and demographic characteristics of those communities and organizations where violence is known to occur [NAP 1993]. Cole et al. [1997] suggested that researchers investigate those organizational factors in the workplace that contribute to an unhealthy organizational climate. The rationale was that unhealthy workplace conditions can cause some individuals to engage in interpersonal aggression and violence. More recently, a NIOSH report from a conference on the prevention of workplace violence identified four research strategies. They

included the following: (1) Identify successful workplace violence (WPV) prevention strategies, (2) Identify barriers and challenges to and strategies for implementing WPV prevention, (3) Identify major research and information dissemination gaps in WPV prevention efforts, and (4) Identify existing and potential partners and their roles in advancing WPV prevention [NIOSH 2006].

Objective 4: Reduce motor vehicle crashes (MVCs) among WRT workers

The risk of work-related transportation and motor vehicle crashes (MVCs) is relevant for both “professional drivers” (e.g. truck and bus drivers) as well as for lay drivers in the WRT sector where employees use passenger vehicles, such as for local deliveries of auto parts or when real estate agents drive clients to view homes for sale. OSHA notes that across all industry sectors “more workers are killed every year in motor vehicle crashes than any other cause” [OSHA 2012]. In 2015 and 2016, transportation incidents were the leading cause of fatalities in the wholesale sector, accounting for an average of 60% of all fatalities, and the second leading contributor (behind workplace violence) in the retail sector, accounting for an average of 23% of all fatalities [BLS 2015c; BLS 2016b]. The transportation and material moving occupations in Wholesale Trade had the highest number of nonfatal occupational injuries involving days away from work (30,790 reported cases) when compared to other occupational groups in 2016, accounting for 56% of all wholesale injuries [BLS 2016d]. The WRT sector had 8,140 reported cases of nonfatal occupational injuries from transportation incidents for 2015 [BLS 2015d]. Wholesale had 3,830 reported cases with an incidence rate of 6.8/10,000 full-time-equivalent (FTE), whereas retail had 4,310 cases of transportation incidents with an incidence rate of 3.7/10,000 FTE [BLS 2015a; BLS 2015b]. Clearly, the wholesale dealers and merchants are at a high risk for both fatal and nonfatal transportation related injuries.

Research is needed to evaluate not only policy, program, and training interventions for WRT drivers, but also on the nature of the vehicles and the drivers’ abilities. Vehicle failures are often difficult to detect unless the vehicle is examined on a regular schedule by an experienced mechanic. Similarly, the drivers need to undergo refresher training on a periodic schedule to ensure both vehicle and driver are in optimal condition for travel where wholesale and retail deliveries are involved. Given the diversity of the WRT workforce, research is needed to determine which anthropometric factors are important when selecting a vehicle that will ensure the driver is able to operate the vehicle safely in emergency situations. Research is needed to identify the risk factors that are responsible for the unusually high transportation IRs in a series of wholesale and retail sub sectors that include the following WRT businesses: (1) Fuel dealers, (2) Automotive parts and accessories, (3) Lumber and construction supply merchant wholesalers, (4) Automotive parts and accessory stores, (5) Grocery and related product wholesalers, (6) Motor vehicles and parts wholesalers, (6) Druggists goods and merchant wholesalers, and (7) Nurseries/garden/farm supply stores [BLS 2016c]. Finally, research is needed to determine the economic impact of MVCs in the WRT sector, taking into account both direct and indirect costs of fatal and nonfatal injuries. A reduction in MVCs or elimination of MVCs will benefit workers by providing a safe and secure workplace [NIOSH 2016].

Objective 5: Advance our knowledge of the role of organizational and stress-related risk factors in the prevention of musculoskeletal and other safety related injuries among WRT workers.

Organizational risk factors include those policies, procedures, work practices and culture of the organization that are now recognized as risk factors for work-related musculoskeletal disorders (MSDs) [Hauke et al. 2011]. Certain aspects of work organization are also known to cause psychosocial stressors. Work place stressors can arise from noisy and poorly illuminated work areas. Other workplace stressors can arise from excessive workloads, poor safety climate, lack of supervisory support, non-standard work hours that can cause work-life interference [Sauter

et al. 1990; WHO 2003]. Organizational stressors are known to affect worker well-being and their job satisfaction. Researchers began to find that organizational stressors affected the muscles and tendons of workers [Laird 1933]. As job pressures increased from machine pacing, investigators noted that employees' muscle tensions increased, causing biomechanical stress on tendons, synovial membranes, joints, and nerves, thereby increasing the risk of musculoskeletal disorders [Arndt 1987]. Similarly, WRT employees are also subject to increased work pacing and fatigue when they are facing large numbers of customers who need help during the holiday shopping rush. Although the extent of the burden posed by organizational stressors to the health and well-being of WRT employees has yet to be fully quantified, researchers have learned from a national survey that over 40% of the employees who worked in retail jobs reported that their "current job has a bad impact on their health" [NPR/RWJF/Harvard 2016]. Similarly, the findings from a National Health Interview Survey (NHIS), identified low back pain, a musculoskeletal disorder, as the most common cause of work disability in Retail Trade [CDC 2015].

According to an International Labor Organization (ILO) report the topic of "psychological stress and its work related precursors" have receiving inadequate attention from researchers who are studying the causes of work-related musculoskeletal disorders [Niu 2010, p. 75]. Not only is there a need to assess the magnitude of the burden posed by organizational risk factors on the health and well-being of WRT workers, there is a need to clarify how the organization of work influences the onset and reports of musculoskeletal and other safety-related injuries that affect WRT workers [Oakman et al. 2014]. Research is also needed to evaluate the effectiveness of interventions that focus on preventing musculoskeletal and other safety related injuries among WRT workers. One barrier to the study of intervention effectiveness that deal with organizational changes has been the dilemma of controlling concomitant changes in the workplace and environment. Some common concomitant changes include: new management, different insurance carriers, weather changes, and changing in economic conditions; all of which can confound assessments of organizational interventions. Finally, there is also a need to translate research findings into readily understood prevention and protective measures to assess how well the information is reaching different ethnic populations, age groups, and those whose primary language is not English.

REFERENCES

- Arndt R [1987]. Work pace, stress, and cumulative trauma disorders. *J Hand Surg Am* 12(5):866-869.
<https://www.sciencedirect.com/science/article/pii/S0363502387802514>
- Bhattacharya A [2014]. Costs of occupational musculoskeletal disorders (MSDs) in the United States. *Int J Ind Ergon* 44: 448–454. <http://www.sciencedirect.com/science/article/pii/S0169814114000468?via%3Dihub>
- BLS [2011]. Assaults and Violent Acts in the Private Retail Trade Sector, 2003—2008. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/opub/mlr/cwc/assaults-and-violent-acts-in-the-private-retail-trade-sector-20032008.pdf>
- BLS [2015a]. TABLE R8. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by industry and selected events or exposures leading to injury or illness, private industry, 2015. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/iif/oshwc/osh/case/ostb4760.pdf>
- BLS [2015b]. TABLE R4. Number of nonfatal occupational injuries and illnesses involving days away from work by industry and selected events or exposures leading to injury or illness, private industry, 2015. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/iif/oshwc/osh/case/ostb4756.pdf>
- BLS [2015c]. TABLE A-1. Fatal occupational injuries by industry and event or exposure, all United States, 2015, ctb0295, xlsx, Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/iif/oshcfoi1.htm>
- BLS [2016a]. Table 1. Number, median days away from work, and incidence rate for nonfatal occupational injuries and illnesses involving days away from work by ownership, industry, musculoskeletal disorders, and event or exposure, 2015. In: *Nonfatal occupational injuries and illnesses requiring days away from work, 2015*. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/news.release/pdf/osh2.pdf>
- BLS [2016b]. Census of Fatal Occupational Injuries (CFOI) TABLE A-1. Fatal occupational injuries by industry and event or exposure, all United States; Washington, D.C.: U.S. Department of Labor, Bureau of Labor Statistics. (ctb0304) xlsx, <https://www.bls.gov/iif/oshcfoi1.htm>
- BLS [2016c]. TABLE R8. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by industry and selected events or exposures leading to injury or illness, private industry, 2016. (R8 cd-r8) xlsx. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics <https://www.bls.gov/iif/oshcdnew2016.htm>
- BLS [2016d]. TABLE R4. Number of nonfatal occupational injuries and illnesses involving days away from work by industry and summary occupational groups, private industry, 2016, (cd-r4) xlsx. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/iif/oshcdnew2016.htm>
- CDC [2015]. National Health Interview Survey (NHIS), Occupational Health Supplement (OHS), 2015. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, <https://www.cdc.gov/niosh/topics/nhis>
- Cole LL, Grubb PL, Sauter SL, Swanson NG, Lawless P [1997]. Psychosocial correlates of harassment, threats and fear of violence in the workplace. *Scand J Work Environ Health* 23(6):450-457.
http://www.sjweh.fi/show_abstract.php?abstract_id=268

National Occupational Research Agenda for Wholesale and Retail Trade

Hauke A, Flintrop J, Brun E, Rugulies R [2011]. The impact of work-related psychosocial stressors on the onset of musculoskeletal disorders in specific body regions: A review and meta-analysis of 54 longitudinal studies. *Work Stress* 25(3):243-256. <http://www.tandfonline.com/doi/abs/10.1080/02678373.2011.614069>

Laird DA [1933]. The influence of noise on production and fatigue, as related to pitch, sensation level, and steadiness of the noise. *J Appl Psychol* 17(3):320–330. <https://www.cabdirect.org/cabdirect/abstract/19342700505>

WHO [2003]. *Work organisation and stress: Systematic problem approaches for employers, managers and trade union representatives*. By Leka S, Griffiths A, Cox T. Nottingham, UK: World Health Organization, Institute of Work, Health and Organisations, http://www.who.int/occupational_health/publications/en/oehstress.pdf

Liberty Mutual [2017]. *Liberty Mutual workplace safety index 2017*. Hopkinton, MA: Liberty Mutual Research Institute for Safety. <https://business.libertymutualgroup.com/business-insurance/Documents/Services/Workplace%20Safety%20Index.pdf>

Maynard WS [2003]. Tribology: preventing slips and falls in the workplace. *Occup Health Saf* 71(9):134-140. <https://ehscp.wildapricot.org/resources/Documents/2003Conference/WayneMaynardITSC/Tribology%20session2003.pdf>

NAICS [2013a]. *North American industry classification system: 2012 definition, wholesale trade*. Washington, DC: U.S. Department of Commerce, U.S. Census Bureau, https://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart_code=42&search=2012%20NAICS%20Search

NAICS [2013b]. *North American industry classification system: 2012 definition, retail trade*. Washington, DC: U.S. Department of Commerce, U.S. Census Bureau, <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=44&search=2012>.

National Research Council [1993]. *Understanding and Preventing Violence: Volume 1*. Reiss, Jr AJ, Roth JA Eds. Washington, DC: National Academies Press. <https://www.nap.edu/catalog/1861/understanding-and-preventing-violence-volume-1>

Neal A, Griffin MA, Hart PM [2000]. The impact of organizational climate on safety climate and individual behavior. *Saf Sci* 34(1):99-109. [https://doi.org/10.1016/S0925-7535\(00\)00008-4](https://doi.org/10.1016/S0925-7535(00)00008-4)

NIOSH [2006]. *Workplace Violence Prevention: Strategies and Research Needs*. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2006–144, <https://www.cdc.gov/niosh/docs/2006-144/default.html>

NIOSH [2016]. *Center for Motor Vehicle Safety. Resources: Motor Vehicle Crash Data*. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, <https://www.cdc.gov/niosh/motorvehicle/resources/crashdata/facts.html>

Niu S [2010]. Ergonomics and occupational safety and health: An ILO perspective. *Appl Ergon* 41(6):744-753, <http://www.sciencedirect.com/science/article/pii/S0003687010000499>

NPR/RWJF/Harvard [2016]. *The Workplace and Health, May 2016: A national survey*. New York, NY: National Public Radio, Robert Wood Johnson Foundation, and Harvard, TH Chan School of Public Health. <https://www.npr.org/documents/2016/jul/Workplace-Health-Poll.pdf>

National Occupational Research Agenda for **Wholesale and Retail Trade**

NRC/IOM [2001]. Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities. By National Research Council (US) and Institute of Medicine (US) Panel on Musculoskeletal Disorders and the Workplace. Washington, DC: National Academies Press (US). <https://www.ncbi.nlm.nih.gov/books/NBK222425/>

Oakman J, Macdonald W, Wells Y [2014]. Developing a comprehensive approach to risk management of musculoskeletal disorders in non-nursing health care sector employees. *Appl Ergon* 45(6):1634-1640, <http://www.sciencedirect.com/science/article/pii/S0003687014001033>

OSHA [2012]. Distracted Driving No Texting. Washington, DC: U.S. Department of Labor, Occupational Safety and Health Administration, OSHA 3416-09R, <https://www.osha.gov/Publications/3416distracted-driving-flyer.pdf>

Rivara FP, Thompson DC [2000]. Prevention of falls in the construction industry: evidence for program effectiveness. *Am J Prev Med* 18(4): 23-26, <http://www.sciencedirect.com/science/article/pii/S0749379700001379>

Salvendy G [2012]. Handbook of human factors and ergonomics. New York, NY: John Wiley & Sons.

Sauter SL, Murphy LR, Hurrell JJ [1990]. Prevention of work-related psychological disorders: A national strategy proposed by the National Institute for Occupational Safety and Health (NIOSH). *Am Psychol* 45(10):1146, <https://www.cdc.gov/niosh/docs/89-137/pdfs/89-137.pdf>

U.S. Census Bureau [2014-2015]. Number of Establishments with Corresponding Employment Change by Employment Size of the Enterprise for the United States, Industries (4-digit NAICS): 2014-2015. Washington, DC: U.S. Department of Commerce, U.S. Census Bureau, <https://www.census.gov/data/tables/2015/econ/susb/2015-susb-employment.html>

WRT SECTOR COUNCIL MEMBERSHIP

Last Name	First Name	Organization
Anderson	Vern P.	National Institute for Occupational Safety and Health
Baker	Brent	National Institute for Occupational Safety and Health
Bent	Steve	International Assoc of Workforce Professionals
Bhattacharya	Anasua	National Institute for Occupational Safety and Health
Bowers	Mike	Northgate Markets
Bowman	Bob	Macy's Corp. Services
Brightwell	Steve	Consultant
Brittain	Jacque	LP Magazine
Chun	HeeYoung	CDC
Cunningham	Thomas	National Institute for Occupational Safety and Health
Davis	Kermit	U. of Cincinnati
Galante	James	Southworth Products Corp.
Hanneken	Renee	Winn-Dixie
Hornback	Darrell	UFCW
Hoyle	Jeff	The Ergonomics Center of North Carolina
Lampl	Mike	Ohio Bureau of Workers' Compensation
Lavender	Steven A.	Ohio State Univ.
Lowe	Brian	National Institute for Occupational Safety and Health
Luckhaupt	Sara	National Institute for Occupational Safety and Health
Marion	Karl	Private Ergonomic Consultant
Mashayekhi	A	Teamsters
Maynard	Wayne	Liberty Mutual
McGlothlin	Tim	The Ergonomics Center of North Carolina
Mei-Lu	Lin	National Safety Council
Menendez	Cammie C.	National Institute for Occupational Safety and Health
Mikitaka	Michael J. CMP, CAE	Warehousing Education & Research Council (WERC)
Moore	Libby	National Institute for Occupational Safety and Health
Mooser	Stephen	RWDSU/UFCW
Morata	Thais	National Institute for Occupational Safety and Health
Nigam	Jeannie	National Institute for Occupational Safety and Health
Ommerich	S	Ohio State University
Pangburn	Doug	Macy's Corporate Services, Inc.
Pantry	Sheila	Sheila's Pantry
Penniman	Lyn	OSHA
Peter	Rob	Publix Super Markets, Inc.
Pfirman	Donna	National Institute for Occupational Safety and Health
Rabovsky	John	Liberty Mutual
Robbins	Robyn	UFCW International Union
Roberts	Brian	C N A Insurance
Ross	Julie,	CRM, CIC

National Occupational Research Agenda for **Wholesale and Retail Trade**

Last Name	First Name	Organization
Rutkowski	E	AIHA
Scholl	Juliann	National Institute for Occupational Safety and Health
Schulte	Paul	National Institute for Occupational Safety and Health
Sherman	Dean	Target
Shewmake	Tiffin	Center for Retail Compliance, RILA
Shor	Glenn	Calif. Div. of Workers' Comp.
Smith	Gene	The Loss Prevention Foundation
Suter	John	Hanover Insurance Company
Sweeney	Marie	National Institute for Occupational Safety and Health
Synder	Robert	Safety Risk Assessment
Testo	Alyssa	LHSFNA
Wigington	Daryl	Ben E. Keith Co.
Wirth	Oliver	National Institute for Occupational Safety and Health