

Washington Occupational Injury and Illness Surveillance and Prevention Program

Washington State Department of Labor and Industries Safety and Health Assessment and Research for Prevention (SHARP) Program

Principal Investigator: David Bonauto, MD, MPH

Annual Report of Accomplishments and Outcomes, July 1, 2016-June 30, 2017

Washington Fundamental Occupational Safety and Health Surveillance Program

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The goal of Washington State's fundamental occupational safety and health surveillance program is to provide information for action to improve the occupational safety and health of Washington's 3.3 million workers working at any of the 177,000 employers within the state.

1. The *Occupational Health Indicator data* describes the occupational health status of the Washington State working population. Washington collaborates with other NIOSH funded states to publish the indicator data on the CSTE website.

Output: Washington State publishes data on the CSTE Occupational Health Indicators on the Washington Department of Labor and Industries website in advance of its publication on the CSTE website. We publish quarterly to semiannual web-based updates of the most current indicator data available for Washington State. The most recent information (during this reporting period) was collected in May 2017. Updates are available at: [SHARP safety publications](#).

2. The OHI program recently developed the *immediate inpatient hospitalizations surveillance system*, which links hospital discharge data to workers' compensation claims for workers who have an acute inpatient hospitalization on or within one day of work-related injury. The system provides descriptive data regarding high-risk injuries, allows WA to assess the completeness of mandated employer reporting of such cases, and to inform injury prevention efforts.

Output: We published a technical report describing immediate inpatient work-related hospitalizations (linked to WC) in Washington State for 2014. The report details the case definition and linkage methods, and provides information on claim information (costs, time loss), demographics, injury characteristics, industry and occupation, and claims rates. Claims linked to immediate hospitalizations differed in type of event/exposure and nature of injury (more acute/traumatic) than all other claims filed.

- The most common injury type (event or exposure) was "Fall from Elevation" (22%). The most common nature of injury were "Fractures" or "Fractures and Other Injuries" (53%).
- The Construction and Agriculture, Forestry, Fishing, and Hunting industry sectors had the highest numbers and rates of immediate work-related hospitalizations.

Output: An overview of the development and implementation of the immediate inpatient hospitalizations surveillance system was presented at the 2017 CSTE Annual Conference in Boise, ID.

Intermediate Outcome: While analyzing the 2014 data, SHARP received a stakeholder request to present data on hospitalizations in Crop & Animal Production Agriculture at the annual Agricultural Health & Safety Forum. In response to this request an additional output was created that looked at several years of hospital admissions linked to WC claims data (2011-2015) of workers employed in a limited range of North

American Industry Classification System (NAICS) subsectors (111, 112) and industry groups (1151-1152). A technical report (described below) and PowerPoint presentation were created and presented to the group. Those in attendance included members of: state agencies, the WA Farm Bureau, Latino labor representatives, academic partners, the Dairy Federation, and safety & health staff from private orchards. The presentation was well-received.

Output: In response to stakeholder request, a sub-analysis of the immediate inpatient hospitalizations surveillance system data was conducted (described above – hospital discharge data linked to WC claims).

- There were 305 immediate work-related hospitalizations in WA workers in Crop/Animal Production Agriculture during the 5-year period 2011-2015.
- Claims rates were seasonal peaking in the 2nd and 3rd quarters of the calendar year.
- “Falls from Elevation” were a leading cause of immediate inpt. Hospitalizations (27%); the majority involving ladders. Transportation Accidents involving Tractors were another leading cause of injury.

3. The Washington Occupational Injury and Illness surveillance program serves as a resource for federal, state and local public health partners. The following outputs have occurred during the most recent project period.

- Washington’s surveillance program director served on the National Academies Committee for Developing a Smarter National Surveillance System for Occupational Safety and Health in the 21st Century. The committee report is expected in Fall of 2016.
- Washington’s Governor issued an executive order to state agencies to assist the Washington Department of Health on suicide prevention. Using the Washington Occupational Mortality Database the occupational surveillance program produced a ‘SHARP Stat’ identifying occupations with a greater proportion of deaths from suicide compared to all other employed workers.
- Testimony was provided to the Washington State House of Representatives’ Labor and Workplace Standards Committee on the workplace safety issues of temporary agency labor.

4. Washington State has collected and coded Industry and Occupation (I/O) data from 1997 through 2013 on the Washington State Behavioral Risk Factor Surveillance System (BRFSS), allowing us to analyze a wide variety of conditions by I/O. This history and expertise allows us to help other states interested in developing this capacity. Since 2011, Washington has added an occupational injury and illness question to BRFSS, which circumvents employer reporting by collecting data directly from the worker. Ms. Anderson co-chairs the BRFSS -I/O workgroup with Dr. Aaron Sussell of NIOSH. Ms. Anderson and other SHARP epidemiologists also participate in the WA State BRFSS Technical Advisory Committee (TAC).

Output: Data from the WA BRFSS 2011-2014 characterizing worker self-reported work-related injury or illness was published in CDC’s Weekly Morbidity & Mortality Weekly Report.

Output: Increasing numbers of Americans rely on cell phones (only) and have no landlines, and these households may differ from those who use landlines (solely or in combination with cell phones). We published a technical report exploring the characteristics of the WA working population from 2012-2014 based on household phone usage using WA BRFSS respondents.

- During 2012-2014, 17.2% of respondents to the WA BRFSS were cell only; a greater proportion of the working respondents (23%) were cell only as compared to the nonworking population (11%).
 - These respondents were more likely to be younger, male, lower income, unmarried, self-employed, and non-White.

Output: A poster that summarizes these differences in the working population by household cell only or landline usage, based on the technical report was presented at the 2017 CSTE Annual Conference in Boise, ID. The poster was selected as a finalist for the outstanding poster presentation award.

Output: A “SHARP Stat” was published that examined the percent of workers reporting frequent mental distress by occupation using WA BRFSS 2011-2014 data. An estimated 8.9% of the employed population experienced “frequent mental distress.” There were differences by occupation groups, with Service, Sales, Production, and Office & Administrative Support occupations having significantly higher proportions of mental distress than the reference group (Management, Business, & Financial).

Output: We recode the record-level I/O codes into 11 industry and 11 occupation categories, which are given to the Washington State Department of Health for distribution as part of the public use dataset to interested researchers. This promotes the visibility/usage of I/O (and worker health issues in general) as being a key component of public health.

Major Outputs:

Anderson NJ, Wuellner SE. 2017. Immediate Work-Related Inpatient Hospitalizations in Crop & Animal Production Agriculture: Washington State, 2011-2015. Technical Report #96-03-2017. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington, USA. Available at: [Hospitalized Crop & Animal Production Report.](#)

Anderson NJ, Wuellner SE, Bonauto DK. 2017. Immediate Inpatient Hospitalizations for Work-Related Injury – Washington State, 2014. Technical Report #96-04-2017. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington, USA. Available at: [Work-related Hospitalizations Report.](#)

McHugh A, Marcum J, Bonauto D. 2016. BRFSS 2012-2014: Demographic and Employment Characteristics of Cell Phone Only Respondents. Technical Report #96-1-2016. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington, USA. Available at: [Cell Phone Demographic and Employment Report.](#)

Marcum JL, Chin B, Anderson NJ, Bonauto DK. 2017. Self-Reported Work-Related Injury or Illness — Washington, 2011–2014. MMWR Morb Mortal Wkly Rep 2017; 66:302–306. DOI: [Washington's Work-related Injury or Illness Report.](#)

SHARP. 2016. SHARP Stats: Mental Distress by Occupation. Washington State Behavioral Risk Factor Surveillance System (WA BRFSS) 2011-2014. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington, USA. Available at: [WA BRFSS Mental Distress Report.](#)

SHARP. 2017. SHARP Stats: Suicide by Occupation. Washington State Occupational Mortality Database. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington, USA. Available at: [Suicide by Occupation Report.](#)

Washington Fatality Assessment and Control Evaluation (WA FACE) Program

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The goal of the Washington State FACE program is to prevent workplace fatalities through surveillance, incident investigations, and targeted prevention activities.

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1. Outputs: Improving safety through targeted distribution of new WA FACE Materials

A. Prevention resources on the web: Created new WA FACE prevention resources for employers, health and safety professionals, and workers.

- 12 Fatality/Injury Narratives
- 12 Fatality/Injury Slideshows
- 4 Spanish language Fatality Narratives and Slideshows
- 3 Logging Industry Injury Alerts
- 1 Logging Hazard Alert
- 5 Fatality Investigation Reports
- 2016 Washington State Work-Related Fatalities Report

B. Prevention resources communicated by mail to specific employers: Mailed over 4400 prevention messages to employers at risk of specific hazards using addresses in WA State workers' compensation.

WA FACE Fatality Narratives:

- 447 copies of *Orchard Laborer Falls from Aerial Lift* mailed to employers of orchard workers
- 263 copies of *Glazier Foreman Falls from Stepladder* mailed to employers of glaziers
- 447 copies of *Orchard Laborer Severely Injured When Thrown from Bin Carrier* mailed to orchard employers
- 433 copies of *Roofing Contractor Falls 25 Feet from Church Roof* mailed to roofing employers
- 312 copies of *Farm Laborer Caught in Hay Baler* mailed to hay farm employers
- 433 copies of *Roofer Falls 19 Feet from Roof* mailed to roofing employers
- 373 copies of *Dairy Laborer Dies when Loader Falls into Manure Pit* mailed to dairy and livestock employers
- 280 copies of *Construction Laborer Falls when Ladder Breaks* mailed to non-residential building construction employers
- 419 copies of *Pipelayer Dies when Trench Wall Collapses* mailed to pipelaying and sewer installation employers
- 353 copies of *Truck Driver Hauling Grain Dies When Truck Crashes* mailed to wheat and cereal grain farm employers
- 254 copies of *Carpenter Falls 60 Feet from Bridge Concrete Form* mailed to employers in bridge, bulkhead, and tunnel construction
- 228 copies of *Truck Driver Crushed When Unsecured Equipment Falls From Trailer* mailed to custom farm services employers

WA FACE Investigation Reports:

- 414 copies of a one-page version of *Coffee Stand Owner Dies When Leak from Propane Cylinder Causes Fire* was sent to drive-through coffee stand employers

- 208 copies of a one-page version of *Forest Crew Worker Electrocuted While trying to Cut Tree Fallen on High-Voltage Power Line* was sent to pre-commercial tree thinning and tree care employers
- 218 copies of a one-page version of *Fertilizer Company Worker Crushed to Death by Falling Concrete Ecology Block* was sent to bark, soil, fertilizer, and concrete wholesale and retail employers
- 218 copies of full version of *Bark Company Owner Dies After Being Crushed By Ecology Block Wall* was sent to bark, soil, fertilizer, and concrete wholesale and retail employers
- 315 copies of full version of *Orchard Tractor Operator Dies When Run Over by Rotary Mower After Falling From Tractor* was sent to orchard employers

WA FACE Hazard Alerts:

- 252 copies of *Hazard Brief: Logging – Road Builders Can Create Hazards for Loggers & Cutters* was sent to logging road construction or maintenance employers

C. Prevention resources communicated by email distribution:

- 6 Fatality/Injury Narratives to Construction Narrative distribution list (current subscribers = 1155)
- 5 Fatality/Injury Narratives to Agriculture Narrative distribution list (current subscribers = 560)
- 4 Fatality Investigation Reports to Fatality Investigation Report distribution list (current subscribers = 910)
- Washington State Work-Related Fatalities Report 2016 sent to all 3 distribution lists

D. Prevention resources communicated through social media:

WA FACE prevention resources were shared via social media to over 38,000 followers. The primary account holders to post WA FACE material were WA State Dept. of Labor and Industries, NIOSH FACE, and NIOSH Construction. Resources were also shared by local news reporters and other safety and health institutions.

E. Prevention resources presented and distributed at conferences and meetings:

- Attended 11 monthly meetings of the Puget Sound Area Safety Summit. Presented updates on recent deaths in construction, provided FACE construction-related products for attendees to take.
- Attended the WA Dept. of L&I Agriculture Safety and Health Forum (10/25/2016 – Yakima, WA). Presented on WA fatalities in agriculture to attendees from business, labor, and government.
- Attended the WA Governor’s Industrial Safety and Health Advisory Board 2017 Construction Safety Day (5/12/2017 – Puyallup, WA). Sponsored a booth to distribute WA FACE material and provide information to attendees.
- WA FACE documents were distributed at 3 meetings of the Washington Industrial Safety and Health Act (WISHA) Advisory Committee, and 4 meetings of the Washington State Labor Council

F. Supporting the 2017 National Safety Stand-Down to Prevent Falls in Construction campaign: Supported the campaign by gathering and leveraging several partners. Prevention resources used and efforts included:

- Developed and sent mailing that provided Stand-Down information to over 2300 Washington construction employers
- Provided WA Dept. of L&I with resources for the WA State Stand-Down website (www.lni.wa.gov/Safety/Topics/AToZ/StandDown)
- Produced a 30-minute informational presentation about the 2017 Stand-Down for members of the Puget Sound Area Safety Summit
- Presented information about the Stand-Down to attendees at WA Dept. of L&I Contractor Training Days
- Worked with WA Dept. of L&I’s Division of Occupational Safety and Health (DOSH) to craft daily email messages that were sent during the week of the Stand-Down to over 14,000 employers
- Developed an online survey to evaluate participants’ Stand-Down experiences

2. Outcomes: Improving Safety through targeted use of WA FACE Materials

A. Prevention resources used in industry training and publications:

- The Washington Logger Safety Initiative sent to their email LISTSERVE (current subscribers = 316):
 - Logging Injury Narrative 92-22-2016, *Timber Cutter Struck by Falling Fir Tree*
 - Fatality Investigation Report 52-38-2016, *Forest Crew Worker Electrocuted While Trying to Cut Tree Fallen on High-Voltage Power Line*
 - Logging Injury Narrative 92-23-2017 *Shovel Operator Dies When Shovel Rolls Down a Ridge*
 - Logging Injury Narrative 92-24-2017 *Choker Setter Struck by Falling Chunk*
 - Hazard Brief 94-01-2017 *Road Builders Can Create Hazards for Loggers & Cutters*
- Fatality Investigation Report 52-37-2016, *Coffee Stand Owner Dies When Leak from Propane Cylinder Causes a Fire*:
 - Featured and linked to in an article on HeraldNet news site, www.heraldnet.com/news/new-details-out-in-propane-fire-that-killed-everett-barista
 - Featured in January 2017 WA L&I Small Business Newsletter
 - Linked to on the Washington Association of Building Officials website: www.wabo.org
 - Linked to on the Washington State Association of Fire Marshals' website: [Fatal coffee stand fire report](#)
 - WA FACE facilitated a presentation on Propane Cylinder Safety in the Workplace by U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) staff to WA Dept. of L&I employees, which included information from the Fatality Investigation Report.
- WA FACE Fatality Narratives posted to the US Dept. of Energy OPEXSHARE online operating experience library (<https://opexshare.doe.gov>):
 - Fatality Narrative 71-155-2017 *Construction Laborer Falls when Ladder Breaks*
 - Fatality Narrative 71-158-2017 *Carpenter Falls 60 Feet from Bridge Concrete Form*
- Washington Contract Loggers Association featured content from Logging Injury Narrative 92-24-2017 *Choker Setter Struck by Falling Chunk* in the June 2017 issue of Springboard Magazine
- JJ Keller & Associates Workplace Safety Advisor Newsletter featured content from Fatality Narrative 71-155-2017 *Construction Laborer Falls when Ladder Breaks* in their April 2017 newsletter
- Produced two articles for the National Truckers Association Safety Issues blog (www.nationaltruckers.com):
 - Truck Driver Dies When Struck By Logs Being Loaded Onto a Trailer
 - Truck Driver Crushed When Unsecured Conveyor Belt Tables Fall Off Trailer

B. Safety improvements among employers resulting from WA FACE resources:

EMPLOYER FEEDBACK FROM EVALUATIONS SENT WITH INVESTIGATION REPORTS

Publications Sent	1. Bark Company Owner Dies After Being Crushed by Ecology Block Wall 2. Orchard Tractor Operator Dies When Run Over by Rotary Mower After Falling From Tractor
Total Responses	54
Usefulness: % Rated good to excellent	98%
% will use for trainings/ toolbox talks	89%
% will use to identify hazards	56%
% will make changes to worker training	79%

WA FACE new publications and state website resources, July 1, 2016 – June 30, 2017:

PUBLICATION TYPE	PUBLICATION NUMBER
Fatality/ Injury Narratives	
Orchard Laborer Falls from Aerial Lift	71-148-2016
Glazier foreman Falls from Stepladder	71-149-2016
Orchard Laborer Severely Injured When Thrown from Bin Carrier	71-150-2016
Roofing Contractor Falls 25 Feet from Church Roof	71-151-2016
Farm Laborer Caught in Hay Baler	71-152-2016
Dairy Laborer Dies when Loader Falls into Manure Pit	71-153-2016
Roofer Falls 19 Feet from Roof	71-154-2016
Construction Laborer Falls when Ladder Breaks	71-155-2016
Pipelayer Dies when Trench Wall Collapses	71-156-2017
Truck Driver Hauling Grain Dies When Truck Crashes	71-157-2017
Carpenter Falls 60 Feet from Bridge Concrete Form	71-158-2017
Truck Driver Crushed When Unsecured Equipment Falls From Trailer	71-159-2017
Fatality/ Injury Slideshows	
Orchard Laborer Falls from Aerial Lift	71-148-2016s
Glazier foreman Falls from Stepladder	71-149-2016s
Orchard Laborer Severely Injured When Thrown from Bin Carrier	71-150-2016s
Roofing Contractor Falls 25 Feet from Church Roof	71-151-2016s
Farm Laborer Caught in Hay Baler	71-152-2016s
Dairy Laborer Dies when Loader Falls into Manure Pit	71-153-2016s
Roofer Falls 19 Feet from Roof	71-154-2016s
Construction Laborer Falls when Ladder Breaks	71-155-2017s
Pipelayer Dies when Trench Wall Collapses	71-156-2017s
Truck Driver Hauling Grain Dies When Truck Crashes	71-157-2017s
Carpenter Falls 60 Feet from Bridge Concrete Form	71-158-2017s
Truck Driver Crushed When Unsecured Equipment Falls From Trailer	71-159-2017s
Logging Injury Alerts	
Timber Cutter Struck by Falling Fir Tree	92-22-2016
Shovel Operator Dies When Shovel Rolls Down a Ridge	92-23-2017
Choker Setter Struck by Falling Chunk	92-24-2017
Hazard Alerts	
Hazard Brief (Logging): Road Builders Can Create Hazards for Loggers & Cutters	94-01-2017
Investigation Reports	
Fertilizer Company Worker Crushed to Death by Falling Concrete Ecology Block	52-36-2016
Coffee Stand Owner Dies When Leak from Propane Cylinder Causes a Fire	52-37-2016
Forest Crew Worker Electrocuted While Trying to Cut Tree Fallen on High-Voltage Power Line	52-38-2016
Bark Company Owner Dies After Being Crushed by Ecology Block Wall	52-39-2016
Orchard Tractor Operator Dies When Run Over by Rotary Mower After Falling From Tractor	52-40-2017
Other	
Washington State Work-Related Fatalities Report 2016	93-02-2017
National Truckers Association Safety Issues Blog article- (www.nationaltruckers.com):	
• Truck Driver Dies When Struck By Logs Being Loaded Onto a Trailer	
• Truck Driver Crushed When Unsecured Conveyor Belt Tables Fall Off Trailer	
Spanish Translations of Fatality/Injury Narratives and Slideshows	
Capataz vidriero cae desde una escalera	71-149-2016
Contratista de techos cae del techo de una iglesia desde 25 pies de altura	71-151-2016
Trabajador de lecherías muere cuando cargador cae en pozo de estiércol	71-153-2016
Techador cae de un techo, desde 19 pies de altura	71-154-2016

Identifying Risk of Musculoskeletal Disorders in Home Health Care in Washington

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Many aspects of health care delivery are migrating into the home. However, the factors of the work environment that contribute to care provider injury are not fully understood. A human-systems approach will be utilized to characterize musculoskeletal risks of home health care aides (HHCAs), using both primary (interviews and site visits) and secondary (workers' compensation claims) data sources. These data will inform the development of tools and education materials for the prevention of musculoskeletal injuries and will be distributed to those who may affect change including employers, employees and client population. The interactions of the human-system constructs of the care provider, care recipient, job tasks, the external environment (physical, social, policy) and artifacts (equipment, devices and supplies) to musculoskeletal injury risk will be assessed. These data will be used to develop an HHCA hazard assessment tool and educational materials. A stakeholders group will be utilized throughout the development process to ensure the accuracy and applicability of the materials. The evaluation of the usability of the tool and educational materials will be accomplished through follow-up interviews of agencies and HHCAs.

Characterization of the Burden of WMSDs:

Workers' compensation claims data are being used to characterize the burden of WMSDs. A peer-reviewed publication by co-investigators occurred in February 2017 (see below). WMSD technical reports will be published for 2006-2014, 2010-2018 and 2012-2020. The release of the first WMSD Report, using 2006-2014 WC data is in process. To diminish the burden of publication of a print based report, the development of an electronic, searchable, user-friendly format for the WMSD report has begun. Table templates, using the program Tableau, are complete. The data extraction of workers' compensation data is complete and will be used to populate the Tableau tables. The program has been coordinating data visualization work with the NIOSH Center for Workers Compensation Studies.

Marcum J, Adams D. Work-related musculoskeletal disorder surveillance using the Washington workers' compensation system: Recent declines and patterns by industry, 1999-2013. *Am J Ind Med* 2017; 60:457-471.

Injured Home Health Aide Interviews:

A preliminary series of interviews with injured home health aides helped inform our approach to both the industry-wide survey and site-visit worker observations. Potential cases are identified from a monthly extraction of workers' compensation claims data. Fewer new WC cases of WMSDs are occurring than anticipated; as such, interviews of injured home health aides are being completed at a slower pace.

Outputs:

- 81 WMSD workers' compensation cases in study to date
- 12 WMSD injured worker interviews completed
- 10 direct refusals to participate in injured worker interviews
- 27 WMSD injured workers screened as outside scope
- 21 WMSD injured workers unable to contact
- 11 WMSD injured workers currently attempting to contact

Agency Representative Focus Groups

The purpose of the focus group (4-12 participants) is to serve as exploratory research that will inform the creation of the study's industry-wide home health care survey and agency representative interviews.

Outputs:

- 28 administrators/organizations
- Methods of recruitment included:
 - Presenting at a Home Care Association of Washington board meeting
 - Calling past and present members of the Home Care Association of Washington
 - Publishing a recruitment notice in the newsletter of the Home Care Association of Washington
- A focus group was held in the summer of 2016.

Home Health Aide Interviews

The purpose of the home health aide interviews (4-12 participants) is to serve as exploratory research that will inform the creation of the study's industry-wide home health care survey and agency representative interviews.

Outputs:

- 4 home health interviews completed. No further recruitment efforts have been made as the minimum number of participants has been reached.
- Methods of recruitment: Recruitment was passive, researchers did not recruit home health aides directly – instead home health aides called researchers. Interview dissemination was achieved through utilization of the Home Health Advisory Committee and other industry stakeholders.

Industry-Wide Home Health Aide Survey

Industry representative data regarding the home health aide experience is very limited. To help fill the gap, an industry-wide survey of home health aides in Washington State will be developed and administered.

Qualitative analyses of the agency representative focus groups, non-injured home health aide interviews and injured home health aide interviews will inform the survey's development.

Outputs

- Survey Development: Analyses of interviews with injured and non-injured HHAs and agency focus groups has begun:
 - Analysis of 1 non-injured HHA interviews completed
 - Analysis of 2 injured HHA interviews completed
- Recruitment: Working with the WA Department of Health (WA DOH), who certifies all home health aides, a list containing the mailing addresses of all certified HHA's has been obtained. Additionally, WA DOH has granted permission to use their listservs of certified nursing assistants (CNAs) and registered nursing assistants (NARs), and of agencies for recruitment.

Home Health Advisory Committee:

The advisory committee established a partnership with administrators and home health aides, whose purpose is to advise and inform the development of and the review of survey instruments and educational materials to ensure the relevance and accuracy of the documents. Since the departure of the research investigator who was responsible for this committee left, no new activities have been organized.

Washington: Trucking Injury Reduction Emphasis through Surveillance (TIRES) Program

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The Washington State trucking industry has some of the highest costs and rates for work-related injuries of any industry sector. Previous research by the SHARP Program revealed that the most common and costly injuries in trucking are musculoskeletal disorders, falls, motor vehicle collisions and injuries from being struck by or against an object. From case follow-up interviews, SHARP determined that these injuries occurred during four work activities: loading and unloading activities including manual handling, securing the load, entering and exiting the cab, and walking around the job site. Subsequently, we determined that many of injuries during these four activities are caused in part by: lack of control of the site of work, co-worker support issues, equipment maintenance or mismatch issues, company support and training. Determining and targeting the root cause of injuries is the continuing mission of TIRES and has been the driving force of reaching industry employers and workers through KeepTruckingSafe.org.

Developing new products for surveillance and prevention:

The past year has been one of development, as we are preparing to launch a pilot intervention in the trucking industry in the fourth and fifth years of the grant. We have completed a draft of seven **Safety Program modules**, the cornerstone of our intervention. The content of these modules are in development as a web application tool, that will allow small-medium trucking companies to create custom, dynamic safety programs, with little or no formal training. We are also in the process of mapping out the interactive eLearning modules that will accompany this Safety Program. We are **developing a host of survey instruments** for the intervention as well as general usability and process criteria for evaluating the usefulness of our Safety Program.

Site Visits:

We have initial buy-in from two companies to serve as pilot intervention companies. We have learned quite a bit about company culture, safety culture, co-worker support as well as how day-to-day work for truck drivers, safety managers and dispatchers work within small trucking companies.

Injured worker interviews:

We have limited our potential interviews of injured workers to smaller employers in local general and specialized freight trucking, to match the design of our intervention pilot. From July 1, 2016 through June 30, 2017, we have completed 39 interviews, out of a potential pool of 113, for a response rate of 34.5%.

Outputs:

Outputs are developed through a collaborative process using information obtained from worker and employer surveys, data extracted from injured worker claims and interviews and the direct guidance of the TIRES steering committee, which consists of industry stakeholders such as employers, industry associations, labor groups and trainers, and insurers. All materials are developed to support industry best practices and to enhance the safety training of large and small employers.

For the period from July 1, 2016 to June 30, 2017, these outputs included:

- **Online simulation training tools (2)** - Interactive, educational resource to be used by drivers and training personnel. We created a pre-trip inspection training and one on how to properly crank the landing gear.
- **It really happened (1)** – Tells the true story of an injured truck driver with prevention tips.
- **Poster (1)** – Download and printable safety poster.

- **Website** – Our website has been redesigned, which after 11 years has hundreds of documents, tips and many web pages. www.KeepTruckingSafe.org. **Website had 3,400* users over the past year.**
- **Social media** - We continue marketing and outreach using social media tools such as Twitter, YouTube and the TIRES Blog. **Blog had 1,400* users last year. @TruckSafe has 1,375 followers.**
- **Outreach** – The TIRES team participates in industry events such as the Washington Truck Driving Associations’ (WTA) Truck Driving Championships. We have presented at WTA safety meetings on various safety related topics and we have become a regular presence at the Washington State Governor’s Industrial Safety and Health Conference. We presented safety trainings for the third year in a row at a local company and the “Secure Your Load” Safety Event.

Intermediate Outcomes

All TIRES publications are distributed through voluntary avenues, meaning people need to sign up to receive our materials or download them from our web pages, therefore, visits to our web sites are an accurate representation of the usefulness of the materials. During the past year, we had on average **over 3,400 unique visits** to our web pages at TIRES Website, and **3,024 page views** at L&I website for trucking materials.

TIRES was featured in NIOSH’s Surveillance Program Highlights as a significant contributor to trucking industry training programs all over the nation.

The online simulation tools were developed in response to stakeholder requests for interactive trainings to meet the challenge of training younger drivers who believe they are invincible (e.g. Don’t Jump) and experienced drivers (e.g. Ratchet vs. Lever Binders) who don’t want to change from the way things have always been done. We’ve also created an interactive training for safety directors and company owners that want to improve the safety climate of their companies, practice their skills on a pre-trip inspection or properly crank the landing gear. We don’t know how many companies have downloaded to their company web sites or trainings, since the option is available and free to the public. We’ve been told by company safety personnel that they are using them in their new hire trainings. Our simulations are also available on external websites (e.g., SafetyDriven CA) where they can be downloaded. We do not have a count of those downloads.

Leveraging social media - Our Twitter account was launched on October 20, 2011. We currently have **1,375 followers**. Our YouTube training videos have been viewed over **5,000 times**. 10 blog articles were posted highlighting special events, new training material and to honor each truck driver killed in Washington. The TIRES blog had **1,400 users over the past year**.

Occupational safety and health professionals use TIRES educational materials:

- TIRES work and images were featured in an L&I SHIP grant-funded project titled: Safe Practices Loading, Driving, & Unloading Log Trucks. Grant recipients InstructoVision, Washington Trucking Associations, Log Truckers Conference & McKay & Son Logging, NDC Timber, Pat Rabey Trucking, Inc. [Log truck loading grant on SHIP grant website](#)
- TIRES training materials are used as a major component of Washington Teamsters Training, train-the-trainer program for the trucking and construction industries.
- TIRES has been contacted by other states’ (AL, MT, MN, and even Canada) workers’ compensation programs to partner with TIRES to develop additional training materials and to use the materials already developed. Trucking injuries are similar across the globe so by sharing data and strategies, we’ve collaborated to make our materials even better.
- KeepTruckingSafe.org website is being shared by a national insurer to clients in WA and CA.
- Featured in the NIOSH Surveillance Program Highlights.
- TIRES provides training materials on an as needed basis to the Washington Trucking Associations.

Occupational Respiratory Disease (ORD) Surveillance in Washington State

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Annual Report of Accomplishments and Outcomes, July 1, 2016 – July 31, 2017

The goal of Washington's Occupational Respiratory Disease (ORD) surveillance program is to characterize the burden of respiratory disease, direct prevention resources to areas where the greatest impact can be achieved in Washington State and contribute to national efforts for occupational respiratory disease surveillance. Expected outcomes of this program include an improved understanding of occupational respiratory disease burden, targeted prevention activities conducted in the agricultural and manufacturing sectors, and the capacity to identify and take action on new or unexpected exposures and at-risk populations.

SURVEILLANCE ACCOMPLISHMENTS

Work-related asthma surveillance

- A total of 86 valid work-related asthma cases were identified by the WRA surveillance system this year. Sixty-four cases were dispositioned by telephone interview (13 cases) or with workers' compensation medical records (41 cases) and were classified as work-aggravated asthma (43), work-related asthma with insufficient data to classify (14), new onset asthma with seven cases identified as occupational asthma and no cases of reactive airways dysfunction syndrome. The remaining 22 cases will be classified next year after their medical records have matured for 12 months.

Expanded respiratory disease surveillance

- *Case capture* methods for the following diseases were developed and finalized this past year: Silicosis, Asbestosis Related Disease, Valley fever, Legionnaires' disease, Chronic Obstructive Pulmonary Disease (COPD), and Pneumoconiosis/Pneumonitis. Case capture methods are unique for each disease and include keywords, occupational injury and illness classification system codes, and disease diagnostic codes. Using one to four years of historic claims data, multiple iterations of case capture and case review were performed to finalize these case capture research methods.
- *Case validation* methods requiring objective medical evidence (i.e. chest scan, blood test) were developed and tested using one to four years of historic workers' compensation medical records. The diseases (captured/validated positive) include: Silicosis (44 captured/4 positive); Asbestosis Related (60/14); Valley fever (31/2); and Legionnaires' (28/0). As anticipated, the workers' compensation medical records used in our system provide sufficient objective evidence to validate cases. Case validation methods for COPD and Pneumoconiosis/Pneumonitis will be finalized in the coming year.
- A beta-version of an Access database with a 'dashboard' for viewing, tracking, and dispositioning all respiratory disease cases has been developed and tested.

Intermediate Outcomes and Partnerships

- *Industry partnership.* We have an ongoing partnership with a coffee roasting manufacturer to ascertain diacetyl exposure. In the past year, we collaborated with NIOSH Respiratory Health Division to complete a 4-day industrial hygiene exposure assessment.
- *Valley fever disease prevention.* SHARP is collaborating with the Washington Dept. of Health to promote our common surveillance and prevention goals regarding Valley fever. In the Spring of 2017, SHARP published 3 educational documents directed to workers, employers and clinicians. Our occupational effort directly supported the health department's previous marketing efforts to raise awareness about this important emerging disease for Washington.

- *Legionnaires' disease prevention.* SHARP is collaborating with the Washington Dept. of Health on a common goal to prevent Legionnaires' disease. SHARP participated in a joint training with WA-OSHA and the health department on Legionella investigations. Subsequently, SHARP provided support to three separate institutions following confirmed Legionnaires' disease cases.
- *Prevention of respiratory disease through the pursuit of safer chemical alternatives.* SHARP jointly advocated with the Washington Dept. of Ecology with two chemical manufactures concerning the need for safer carwash chemicals. SHARP participated in site-visit training on safer chemicals used in a bus wash facility and cross-agency promotion of 'green chemistry' for professional staff at both agencies.

Educational Impact

- Surveillance data was integrated into 6 educational alerts published this year:
 - *Work-Related Asthma (general brochure)*
 - *Isocyanate-based foam and Work-Related Asthma*
 - *Marijuana and Work-Related Asthma*
 - *Valley Fever now in Washington State – Information for Clinicians*
 - *Valley Fever – Information for Employers*
 - *Valley Fever – Information for Workers (English/Spanish)*

Presentations

- April 2017, Annual NIOSH/State Occupational Lung Disease Surveillance meeting, Austin, TX
- April 2017, University of Washington Environmental & Occupational Health Sciences Department: *Occupational respiratory disease surveillance, guest lecture, Seattle, WA*
- June 2017, Council for State and Territorial Epidemiologists Conference: *Creation and Evaluation of Enhanced Occupational Respiratory Disease Surveillance Methods in WA State*
- June 2017, NORA Expanding Research Partnerships State of the Science: *Respiratory disease awareness and prevention in the US hop harvest industry, Denver, CO*

Publications

Impact¹ of SHARP publications concerning occupational respiratory surveillance and prevention

Article	Year Pub	Reads	Citations
Isocyanate exposure below analytical detection when a paint brush and roller are used to apply moisture-cure polyurethane paint	2015	9	0
Respiratory disease associated with occupational inhalation to hop (<i>Humulus Lupulus</i>) during harvest and processing	2014	44	2
Distribution of asthma by occupation: WA State BRFSS Data, 2006-2009	2014	25	8
Prevention guidance for isocyanate-induced asthma using occupational surveillance data	2013	82	7
Work related asthma in WA State	2011	14	8
Surveillance of WA OSHA exposure data to ID uncharacterized or emerging occupational health hazards	2010	29	3

¹Reads and Citations provided by researchgate.net (July 21, 2017).