

# JOHN R. HEBERGER

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## EDUCATION

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- PhD** University of Pittsburgh, Graduate School of Public Health  
Expected June 2023  
Epidemiology  
*Dissertation:* “Updating empirical evidence for injury burden estimates to improve safety in the US mining industry”  
*Advisor:* Dr. Thomas Songer  
*Committee:* Dr. Jeanine Buchanich, Dr. Eveyln Talbott, Dr. Joel Haight, Dr. Gerald Poplin  
GPA: 4.0
- MS** University at Buffalo, The State University of New York  
June 2013  
Epidemiology  
*Master’s Thesis:* “A case-case comparison of ergonomic exposures associated with musculoskeletal injuries in maintenance workers of mineral processing mills and coal preparation plants”  
*Committee:* Dr. Matthew Bonner (chair), Dr. Victor Paquet & Dr. Michael LaMonte  
GPA: 3.77
- MA** University at Buffalo, The State University of New York  
September 2008  
Economics  
GPA: 3.67
- BA** St. John Fisher College, Rochester, NY  
May 2003  
Economics  
Summa Cum Laude with Honors  
Minored in Mathematics  
GPA: 3.74

## HONORS AND AWARDS

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### **2018 International Ergonomics Association/Liberty Mutual Medal in Occupational Safety and Ergonomics**

For co-authored paper titled, "Development of Ergonomics Audits for Bagging, Haul Truck, and Maintenance and Repair Operations in Mining," published in *Ergonomics*.

This medal recognizes outstanding original research leading to the reduction or mitigation of work-related injuries and/or to the advancement of theory, understanding, and development of occupational safety research. The IEA/Liberty Mutual Medal winners are selected by an international review committee established by the IEA. <https://www.iea.cc/award/index.html>

### **2018 NIOSH Alice B. Hamilton Award**

*Exposure & Risk Assessment Category*, Honorable Mention for leadership through science by publishing the co-authored paper titled, "Development of Ergonomics Audits for Bagging, Haul Truck, and Maintenance and Repair Operations in Mining," published in *Ergonomics*.

The Alice B. Hamilton Awards for Occupational Safety and Health recognize the scientific excellence of technical and instructional materials by NIOSH scientists and engineers in the areas of biological science, engineering and physical science, human studies, and educational materials.

### **2018 The US Department of Health and Human Services Green Champion Award**

Environmental Stewardship - Individual - Honorable Mention for designing and building LED light fixtures for the Mining Program's exhibit display cabinets which eliminates the use of 720 C batteries per mining exposition.

The HHS (Health and Human Services) Green Champions Awards honors outstanding HHS employees involved in sustainability projects throughout the Department of Health and Human Services (HHS).

### **2013 International Ergonomics Association/Liberty Mutual Medal in Occupational Safety and Ergonomics**

For co-authored paper titled, "Examining the Interaction of Force and Repetition on Musculoskeletal Disorder Risk: A Systematic Literature Review", published in *Human Factors*.

This medal recognizes outstanding original research leading to the reduction or mitigation of work-related injuries and/or to the advancement of theory, understanding, and development of occupational safety research. The IEA/Liberty Mutual Medal winners are selected by an international review committee established by the IEA. <https://www.iea.cc/award/index.html>

### **2008-2010 National Institute for Occupational Safety and Health (NIOSH) Training Fellowship**

Awarded and completed fellowship program to learn core competencies of injury prevention, epidemiology, and industrial hygiene with a uniquely varied educational experience featuring academic courses, OSHA-endorsed continuing education training, and interaction with OS&H professionals. Field experience completed through a safety and health program internship with Ascension Industries.

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## **RESEARCH EXPERIENCE**

### **National Institute for Occupational Safety and Health**

2013 to present

Pittsburgh Mining Research Division– Pittsburgh, PA Full-time, 40 hrs./wk.

Human Systems Integration Branch

## Epidemiologist

- **NIOSH Long Term Training Program** **August 2019-December 2021**
  - Accepted into the highly competitive program. Training is in epidemiology, with focus on injury epidemiology, at the PhD level.
  - See University of Pittsburgh transcript for detailed class list and grades.
- **Injury Cost Models** **November 2015 - August 2019**
  - Lead the research, development, and implementation of economic web applications designed to bring awareness of the excessive costs of occupational injuries and fatalities in the mining industry. Collaborated with programmers, technical contractors, NIOSH ERSO, and NIOSH Center for Workers' Compensation Studies to develop useful content for our stakeholders and to confirm that subject matter is scientifically sound. Updated and validated models, secured and updated all data for models, and applied human interface guidelines to make the web applications intuitive and consistent. Wrote introductions, technical guides, and user's guides, as well as peer reviewed publications, trade publications, and presented results at conferences.
  - *Safety Pays in Mining* demonstrates how avoiding occupational injuries can impact the success of a company, as it estimates the total cost of occupational injuries to a company and their effect on profitability.
  - The *Fatalities Cost in Mining* web application estimates the economic burden associated with occupational fatalities in the mining industry. These cost estimates represent the societal cost of occupational fatalities which is made up of income that was not received and incurred medical expenses, which affect the GDP (Gross Domestic Product) and other national economic measures.
- Contributed epidemiological knowledge of occupational injury, environmental health and behavioral risk assessment to the development and design of ergonomics audit modules for bagging, maintenance and repair and haul truck operation tasks. Contributed significant content for the bagging audit from knowledge acquired during previous research activities, including identifying hazards during the bagging process and multiple solutions. Researched and wrote the Lock out /Tag out questions and recommendation sections for the maintenance and repair audit.
- Served as Chair of the NIOSH Pittsburgh Safety & Health Committee, which assists the NIOSH Pittsburgh's Environmental Safety & Health program. Organize and lead monthly safety walk-throughs to identify and remediate occupational safety and health hazards in the work environment. Researched and provided solutions for internal occupational safety issues.

Office of Mine Safety and Health Research – Pittsburgh, PA  
Human Factors Branch  
Musculoskeletal Disorder Prevention Team – Team Leader: Patrick G. Dempsey, PhD

Full-time, 40 hrs./wk.

### **Behavioral Scientist/Student Trainee (Epidemiology)**

- Served as task lead on a research study to determine the ability of commercially available refuge alternatives to accommodate an injured miner strapped to common stretchers. Drafted and designed Human Subjects Internal Review Board protocol, which was approved by NIOSH. Conducted all necessary protocol development testing and completed human subject experimentation in July 2013. Factorial repeated measures ANOVA statistical analysis was performed and indicated a statistically significant increase in time when using the splint stretcher. Results also indicated that refuge alternative door design plays a role in increased times to enter airlock with a stretcher. Results and recommendation write up published in *Journal of Safety, Health, and Environmental Research*.
- Served as task lead on the food and water analysis for the Human Factors assessment of refuge alternatives. Examined the MSHA (Mine Safety and Health Administration) regulations for food and water rations in refuge alternatives and how refuge alternative manufacturers implement these regulations. We identified shortcomings with the current regulations and implementation and provide suggestions to mitigate these deficiencies, as described in the trade publication *Coal Age*.
- Assisted with an oxygen consumption research study to develop a model to determine oxygen consumption when crawling to and deploying a refuge alternative. No contemporary oxygen consumption data was available for the purposes of designing breathing air supply equipment specifically for mine escape. Drafted and designed Human Subjects Internal Review Board protocol, which was approved by NIOSH. Learned to use COSMED cardio-pulmonary diagnostic system which measures breath-by-breath respiration data. Conducted all necessary protocol development testing. Completed human subject experimentation in July 2013. Results were used to develop models that can be used by breathing air supply manufacturers to aid in the design of devices that would be capable of producing sufficient on-demand oxygen to allow miners to perform self-escape. Results and recommendation write up is published in *SME Transactions*.
- Collaborated to analyze ten years of MSHA fatality reports to identify patterns in the causes of the fatalities, factors that contributed to the incidents and tasks performed during the incidents to develop intervention strategies to reduce the occurrence of fatalities. We identified meaningful hazard patterns in the fatalities and developed intervention strategies to reduce the occurrence of fatalities. Methods and results were published in *Industrial Engineer* and *IIE Transactions on Occupational Ergonomics and Human Factors*.

- Contributed to three different palletizing and bagging lab/field studies. Assisted with data collection, writing laboratory protocols and set up, participant recruiting and scheduling, overseer and amendment writer of NIOSH institutional review board approvals, and data analysis. The field assessment revealed the spinal loads generated from palletizing bags and the reduction in loads when using vacuum hoists. The small bag palletizing study identified a significant decrease in spinal loading when palletizing from the end of the conveyor rather than the side. The bulk bag lab study results were published in the *International Journal for Industrial Ergonomics*. Field assessment results were published in the *Proceedings of the Human Factors and Ergonomics Societies 55<sup>th</sup> Annual Meeting* and the small bag palletizing study results and write up were published in the *International Journal of Industrial Ergonomics*.
- Served as task lead on the analysis of the materials property of materials commonly used in mining environments for grated metal walkways. Learned and mastered the use of the Portable Inclinable Articulated Strut Tribometer (PIAST), developed statistical design for the research, authored research protocol, and conducted the analysis. These materials properties are necessary to determine the slip potential for workers required to walk on these surfaces at various angles of incline predisposing them to injuries due to the environment. Recommendations associated with this research will enhance occupational safety and health and injury control of the workers who frequently utilized incline grated metal walkways. Results of this research were published in *IIE Transactions on Occupational Ergonomics and Human Factors*.
- Served as task lead on the task of quantifying specific exposures to maintenance and repair workers for over ten different mining tasks. Recorded videos of mine workers performing work tasks, necessary for exposure assessment analysis. Learned and mastered the use of Multimedia Video Task Analysis software which was used to analyze the videos. Oversaw the development of a coding scheme to quantify specific risks for injury. Analyzed surveillance data from the Mine Safety and Health Administration Accident, Injury and Illness reports to ascertain most prevalent injuries and tasks performed when these injuries were sustained. Used epidemiological and ergonomics knowledge to determine associated risk factors for these injuries. Conducted final analysis to quantify exposures to these risk factors, which would be expected for maintenance and repair workers who perform the associated tasks. Completed final analysis and disseminated results in the form of publications and presentations.
- Collected ergonomic risk factor exposure data from miners as part of the Development and Evaluation of an Ergonomics Audit Tool for Mitigating Ergonomics Deficiencies in Mining project. Conducted numerous exposure assessments at mine sites examining mining tasks such as small bagging, bulk bagging, machine maintenance and repair, and the operation and maintenance of mining haulage vehicles. Used tribometers, force gauges, goniometers, insole pressure sensors, video, and other ergonomic assessment tools to measure exposures. Contributed to the design of reliability studies for these operations to ensure reliable

results when used by the mining population.

- Served as Vice Chair of the NIOSH Pittsburgh Safety & Health Committee, which assists the NIOSH Pittsburgh Environmental Health & Safety team. Lead Human Factors Branch biweekly safety walk-throughs to identify potential safety hazards. Researched and provided guidance on internal occupational safety issues.

**Master's Thesis**, University at Buffalo, The State University of New York  
Buffalo, NY  
Advisor: Dr. Mathew Bonner

2013

This thesis work used a multi-level approach to examine the epidemiological factors associated with musculoskeletal injuries, including acute and cumulative injuries, due to the exposure of mine workers to ergonomic and occupational safety and health risks factors. Fifty videos from five maintenance activities were analyzed with task analysis software (MVTA) to quantify exposures to known ergonomic risk factors, and therefore estimate risk of associated injuries. Surveillance data from the Mine Safety and Health Administration's Accident, Injury, and Illness reports were used to make case to case comparisons among the mining population responsible for maintenance and repair work. This analysis examined the disproportionate ratios of occupational safety and health injuries between mineworker populations who perform maintenance and repair work to those who perform other job tasks.

## **PUBLICATIONS**

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### *NIOSH Outputs & Publications*

**Heberger, J.R.** & Fritz, J. (2019). Fatalities cost in Mining. Pittsburgh, PA: U.S (United States). Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, version 1.0, 2019 Mar: software.  
<https://www.cdc.gov/niosh/mining/works/coversheet2093.html>

**Heberger, J.R.** & Schall, J.E. (2017). Technology News 558 - Safety pays in mining: a web application that demonstrates the financial impact of injuries. Pittsburgh, PA: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (Department of Health and Human Services) (NIOSH) Publication No. 2017-170, 2017 Jul; :1-2.  
<https://www.cdc.gov/niosh/mining/UserFiles/works/pdfs/2017-170.pdf>

NIOSH. Safety Pays in Mining. (2017). Pittsburgh, PA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH), 2017 Feb.  
<https://www.cdc.gov/niosh/mining/content/economics/safetypays.html>.

NIOSH. Safety and Health Toolbox Talks; When and where you need them. (2016). By Eiter, B., Mallett, L.G., & **Heberger, J.R.** Pittsburgh, PA: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, 2016 Aug NIOSH.

ErgoMine: Ergonomics Audits for Mining Bagging, Haul Truck, and Maintenance and Repair Operations. (2016). By Dempsey, P.G., Pollard, J.P., Porter, W.L., Mayton, A., **Heberger, J.R.**, Reardon, L., Fritz, J.E. & Young, M. Pittsburgh, PA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH), 2016 Apr. <http://www.cdc.gov/niosh/mining/works/coversheet1906.html>.

### ***Journal Publications***

McAdams, R.J., Acevedo-Fontanez, A.I., Arcury-Quandt, A.E., & **Heberger, J.R.**, (2022). Head injuries among children treated in US emergency departments. In review for *Clinical Pediatrics*.

**Heberger, J.R.**, Nasarwanji, M.F., Pollard, J.P., & Kocher, L.M. (2022). The necessity for improved hand and finger protection in mining. *Mining, Metallurgy & Exploration*. <https://doi.org/10.1007/s42461-022-00557-5>.

**Heberger, J.R.**, (2018). “Demonstrating The Financial Impact Of Mining Injuries With The *Safety Pays In Mining* Web Application.” *Mining Engineering*, Official publication of the Society for Mining, Metallurgy & Exploration Inc. December; 70 (12), 37-43.

Dempsey, P. G., Pollard, J., Porter, W. L., Mayton, A., **Heberger, J. R.**, Gallagher, S., ... & Drury, C. G. (2017). Development of Ergonomics Audits for Bagging, Haul Truck, and Maintenance and Repair Operations in Mining. *Ergonomics*, 60 (12) pp. 1739-1753.

**Heberger, J.R.** & Pollard, J.P. (2016). Evaluating the Use of Stretchers in Mobile Refuge Alternatives, *Journal of Safety, Health, and Environmental Research*, 12 (2), pp. 298-306.

Nasarwanji, M.F., Reardon, L.M., **Heberger, J.R.** & Dempsey, P.G. (2016). Analysis of physical demands during bulk bag closing and sealing. *International Journal for Industrial Ergonomics*, Vol. 53, pp. 363-371.

Pollard, J.P., **Heberger, J.R.**, & Dempsey, P.G. (2016). Development of a Model to Determine Oxygen Consumption when Crawling. *2015 Transactions of the Society for Mining, Metallurgy & Exploration*, Vol. 338, pp. 441-447.

Pollard, J.P., **Heberger, J.R.**, & Dempsey, P.G. (2015). Slip Potential for Commonly Used Inclined Grated Metal Walkways. *IIE Transactions on Occupational Ergonomics and Human Factors*. 3(2), 115-126.

Gallagher, S. & **Heberger, J.R.** (2015). The effects of operator position, pallet orientation, and palletizing condition on low back loads in manual bag palletizing operations. *International Journal for Industrial Ergonomics*. May (47), 84-92.

Reardon, L.M., **Heberger, J.R.**, & Dempsey, P.G. (2014). Analysis of Fatalities during Maintenance and Repair Operations in the U.S. Mining Sector. *IIE Transactions on Occupational Ergonomics and Human Factors*. (2), 27-38.

Pollard, J.P., **Heberger, J.R.**, & Dempsey, P.G. (2014). Maintenance and Repair Injuries in US Mining. *Journal of Quality in Maintenance Engineering*. 20(1), 20-31.

Gallagher, S. & **Heberger, J.R.** (2013). Examining the Interaction of Force and Repetition on Musculoskeletal Disorder Risk: A Systematic Literature Review. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 55(1), 108-124.

### **Conference Papers**

#### Peer-Reviewed

**Heberger, J. R.**, Nasarwanji, M. F., Paquet, V., Pollard, J. P., & Dempsey, P. G. (2012). Inter-Rater Reliability of Video-Based Ergonomic Job Analysis for Maintenance Work in Mineral Processing and Coal Preparation Plants. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56(1), 2368-2372.

Gallagher, S., Pollard, J.P., Manke, N., & **Heberger, J.R.** (2011). Field Assessment of Biomechanical and Physiological Demands in Sand and Limestone Bagging Operations. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 55(1), 1002-1006.

#### Pre-Prints

**Heberger, J.R.**, “The Economic Burden of Fatal Occupational Injuries to Miners in the United States – Fatalities Cost in Mining,” Pre-Prints for 2019 Society for Mining, Metallurgy & Exploration, Feb. 24-27, 2019, PAPERID-3044511

### **Trade Publications**

**Heberger, J.R.** (2017). What's the Cost of an Injury? A new app from NIOSH, Safety Pays in Mining, estimates costs of common mining injuries. *Aggregates Manager*, October 2017, 22 (10), pp. 8-11.

Mayton, A. & **Heberger, J.R.** (2015). Underground Mine Refuge Alternatives: A Look at Food, Water, and Sanitation Requirements. *Coal Age*. 120 (9), 40-43.



**Heberger, J.R.** & Gallagher, S. (2015). NIOSH study highlights ergonomics of bag palletizing. *Modern Materials Handling*. August 2015.

Reardon, L.M., **Heberger, J.R.**, & Dempsey, P.G. (2014). Fatal hazard patterns in mining maintenance and repair work. *Industrial Engineer*. 46(8), 53.

## **PRESENTATIONS AND POSTERS**

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**Heberger, J.R.** & Wurzelbacher, S. (2022). *Mining Injuries 2012-2019: Using Workers' Compensation Claims Data from 36 States to Identify Rates and Costs Associated with Nature of Injury, Event/Exposure, and Body Part Affected*. Submitted to the CSTE Annual Conference, June 21, Louisville, KY.

**Heberger, J.R.**, Nasarwanji, M.F., Pollard, J.P., & Kocher, L.M. (2022). *Hand and Finger Injuries in the U.S. Mining Industry, 2011-2017*. Accepted for presentation at the SME Annual Conference, March 1, Salt Lake City, UT.

**Heberger, J.R.** (2019). *Estimating the Economic Burden of Fatal Occupational Injuries to Miners in the United States*. Presented at the NIOSH Intramural Science meeting, July 31, Morgantown, WV.

**Heberger, J.R.** (2019) *Overview of NIOSH Mining Injury Surveillance*. Presented at the CSTE Annual Conference, June 3, Raleigh, NC.

**Heberger, J.R.** (2019) *Fatalities Cost in Mining - Estimating the Economic Burden of Fatal Occupational Injuries to Miners in the United States*. Presented at the CSTE Annual Conference, June 3, Raleigh, NC.

**Heberger, J.R.** (2018) *Demonstrating the financial impact of mining injuries using workers' compensation data with the Safety Pays in Mining web application*. Presented at the CSTE Annual Conference, June 12, West Palm Beach, FL.

**Heberger, J.R.** (2018) *Demonstrating the financial impact of mining injuries with the Safety Pays in Mining web application*. Presented at the SME Annual Conference, February 26, Minneapolis, MN.

**Heberger, J.R.** & McWilliams, L.J. (2016) *Using Surveillance Information for Health and Safety Planning*. Presented at the NIOSH Safety and Health Workshops at MineExpo 2016, September 28, Las Vegas, NV.

**Heberger, J.R.** & Dempsey, P. G. (2015). *How Can Fatality Reports be Used to Develop Workplace Safety Audits?* Poster presented at the NIOSH Intramural Science meeting, August 5, Cincinnati, OH.

**Heberger, J.R.**, & Biddle, E. A. (2015). *Safety Pays in Mining: a tool to estimate the cost and impact of occupational injuries and illnesses to mining companies*. Presented

at the National Occupational Injury Research Symposium (NOIRS 2015), May 19, Camp Dawson, WV.

**Heberger, J.R.**, & Biddle, E. A. (2015). *The Economic Burden of Occupational Mining Fatalities in the United States, 2000-2012*. Poster presented at the National Occupational Injury Research Symposium (NOIRS 2015), May 20, Camp Dawson, WV (West Virginia).

**Heberger, J. R.**, Nasarwanji, M. F., Paquet, V., Pollard, J. P., & Dempsey, P. G. (2012). Inter-Rater Reliability of Video-Based Ergonomic Job Analysis for Maintenance Work in Mineral Processing and Coal Preparation Plants. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56(1), 2368-2372.

**Heberger, J.R.**, & Pollard, J. P. (2011). *Machine maintenance and repair injuries in mining mills and preparation plants*. Poster presented at the National Occupational Injury Research Symposium (NOIRS 2011), Morgantown, WV.

Bykowska, A., Rodriguez, E.A., Shen, W., Snyder, A., **Heberger, J.R.**, & Temple, J.L. (2009). *The influence of collegiate athletes on fruit eating behavior during school breakfast*. Poster presented at Sigma Xi Research Day, University at Buffalo, SUNY, Buffalo, NY.

#### **PROFESSIONAL AFFILIATIONS**

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Council of State and Territorial Epidemiologists (CSTE), 2018-Present  
Associate Member  
Occupational Health Subcommittee member

#### **AD HOC REVIEWER**

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- *American Journal of Industrial Medicine* (Wiley)
- *Applied Ergonomics* (Elsevier)
- *Ergonomics* (Taylor & Francis)
- *International Journal of Industrial Ergonomics* (Elsevier)
- *Mining, Metallurgy & Exploration* (Springer)
- *Safety and Health at Work* (Elsevier)

#### **REFERENCES**

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