



**The University of Iowa
Heartland Center for Occupational Health & Safety**

**Summary Annual Report
July 1, 2015 - June 30, 2016**

**NIOSH Training Grant
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Submitted by:

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SECTION I

ERC Summary

The mission of the Heartland Center for Occupational Health and Safety, a NIOSH Education and Research Center, is to help reduce injuries, illnesses, and fatalities of workers in Federal Region VII (Iowa, Kansas, Missouri and Nebraska) and beyond by expanding and strengthening the occupational health and safety workforce with well-trained practitioners and well-informed professionals. Since its inception in 2000, the Heartland Center for Occupational Health and Safety (the Center) has served as a resource for Federal Region VII and the US, providing interdisciplinary graduate, postgraduate, and residency training, continuing education and outreach for practitioners and researchers in occupational health and safety (OHS) professions. The major rationale for the Center is to address dual problems in Federal Region VII: higher than US-average rates of occupational disease and injury and shortages of trained OHS professionals. This Center is well positioned to address OSH issues unique to the region by preparing trainees with knowledge and experience in the discipline areas most relevant to the needs of workers. The Center has 6 graduate-level training programs, including agricultural safety and health, ergonomics, industrial hygiene, occupational epidemiology, occupational injury prevention, and occupational medicine. The Center's active continuing education and outreach programs reach thousands of practitioners, utilizing both traditional educational media and methods as well as innovative distance-education technology. The strengths of the Heartland Center include the breadth and depth of its faculty, a strong emphasis on interdisciplinary training and research, an active Continuing Education (CE) Program, and committed institutional support for Center activities.

Relevance

The training of over 40 graduate-level students by Center faculty directly influences the number of trained occupational health and safety professionals available to Federal Region VII and elsewhere in the United States. Our graduates obtain jobs in industry, academia, and government agencies. The CE Program, which serves nearly 1200 professionals annually, improves their ability to reduce the high regional rates of occupational disease and injury. The Center also reaches out to over 13,000 regional businesses involving around 411,000 workers through a unique outreach program that provides consultation, continuing education, and current OSH information to increase awareness of occupational health and safety and reduce illness and injury.

Key Personnel

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ERC Web Link

<http://www.public-health.uiowa.edu/heartland/>

SECTION II

The 2015–16 reporting period comprised several high-impact accomplishments of Center faculty, staff, and trainees in the following training programs:

Agricultural Safety and Health

- **Trainees Ashlee Johannes (MS, 2016) and DeAnn Scott-Harp (MS, 2017)**, led a project for Iowa’s Center for Agricultural Safety and Health (I-CASH) to evaluate health and safety concerns related to volunteer labor on a local farm. I-CASH partnered with Grow: Johnson County (GJC), a collaborative hunger-relief and food gardening education project that works to combat food insecurity by growing food to be donated to local hunger-relief agencies and by teaching practical gardening and food production skills. Johannes and Scott-Harp visited the worksite and interviewed the farm director and project director to gain an understanding of their concerns. Site visits continued throughout the summer where planting, weeding, and other farm tasks were observed and recorded. Photos and notes taken will be instrumental in the development of several educational materials for this farm, which could also be adapted for use by other farms that use volunteer labor.
- In addition to occupational hazards, farmworkers in Iowa experience chronic health conditions (e.g., diabetes, obesity and hypertension) at greater rates than the general population. **Trainee Ashlee Johannes (MS, 2016)** partnered with Proteus Inc., a non-profit migrant healthcare organization, to identify occupational and non-occupational injuries and illnesses among farmworkers in Iowa and their use of healthcare services. Healthcare organizations provide an opportunity to disseminate safety messages in addition to treating injuries and illnesses. Johannes presented this project at the International Society for Agricultural Safety and Health (ISASH) Conference in June 2016.
- Agricultural Safety and Health students attended ISASH and the Midwest Rural Agricultural Safety and Health (MRASH) Conferences. **Trainee DeAnn Scott-Harp (MS, 2017)** participated in a discussion panel about education in ASH and **trainee Josie Rudolphi (PhD, 2017)** presented a poster entitled “Safety and Health Education in Agriculture” at ISASH. **Trainee Ashlee Johannes (MS, 2016)** presented a poster entitled “New Routes to Agricultural Safety and Health Awareness” at MRASH. All students participated in a networking reception with potential employers at the MRASH conference.

Ergonomics

- Ergonomics program **trainee Maya Ramaswamy (PhD, 2017)** has been awarded a prestigious, nationally competitive Boren Fellowship to study at VIT University in Tamil Nadu, India during the 2017 calendar year. David L. Boren Scholarships and Fellowships are sponsored by the National Security Education Program, a major federal initiative designed to build a broader and more qualified pool of U.S. citizens with foreign language and international skills. In conjunction with her language studies, Ms. Ramaswamy will conduct research aimed at reducing the burden of occupational health problems (particularly musculoskeletal outcomes) among tea plantation workers in rural India. Applicants for Boren awards are required to describe how their proposed international project relates to US national security. In her application, Ms. Ramaswamy made a strong case that understanding the burden of occupational injury among this population and developing interventions impacts the sustainability of a key regional economic driver which, in turn, can positively influence US national security.

Industrial Hygiene

- **Past trainee Kim Anderson (MS 2010, PhD 2013)** and faculty member, Renee Anthony, won the David Swift Award for the best paper of 2015 in the *Journal of Occupational and Environmental Hygiene*, 12(4):245-255. The paper, entitled “An Empirical Model of Human Aspiration in Low-Velocity Air Using CFD Investigations”, synthesized data from Ms. Anderson’s MS thesis and PhD dissertation to describe the lessons learned from Dr. Anthony’s long-term research studies to relate the

inhalation of large particles to the design of inhalable samplers. Ms. Anderson accepted a position as an Assistant Professor at SUNY Albany in fall 2016

- ERC faculty, Thomas Peters, Industrial Hygiene and Nathan Fethke, Ergonomics, teamed with **ergonomics trainee Mahmoud Metwali (PhD, 2017)** to develop an intervention to reduce back strain and fume exposure during stud welding. This work was published in the *Annals of Occupational Hygiene*, 2016, 60(3)387-401 and a photograph taken during the project was featured on the cover of the journal. Stud welding is a demanding job performed in an awkward, bent posture with the face positioned in a plume composed of metal fume. An alternative system was devised to allow the work to be conducted in an upright position that reduces back strain and fume exposure.
- ERC faculty member, Matt Nonnenmann, Industrial Hygiene and Agricultural Safety and Health, is developing new methods to characterize bioaerosol exposures using whole genome DNA sequencing and Real-Time quantitative polymerase chain reaction (PCR) technology during agricultural work. A recently published study has identified the relative abundance and diversity of bacteria in inhalable aerosol during work in broiler chicken production. This research is published in the *Journal of Microbial Biotechnology* (DOI: 10.1111/1751-7915.1238). Also, new bioaerosol hazards are being identified and characterized with the detection and quantification of worker exposure to influenza virus aerosol during the veterinary care of swine (*PloS one* 11.2 (2016): e0149083).

Occupational Epidemiology

- **Past Trainee Carissa Rocheleau (PhD, 2009)** is currently an epidemiologist at the Division of Surveillance, Hazard Evaluations, and Field Studies at the National Institute for Occupational Safety and Health. Her pre-doctoral training in both reproductive and occupational epidemiology are put to use in her cutting edge research on how hazards in the workplace can affect the reproductive health of workers, as well as the health of their children. She collaborates with a number of national studies, including the National Birth Defects Prevention Study and Nurses' Health Study (2nd and 3rd cohorts) as well as other occupational cohort studies.

Occupational Injury Prevention

- Public health and nursing are fields that complement each other well. While nurses traditionally care for individual patients, public health professionals influence the health of communities and populations. As an occupational health nurse, **past trainee Nathan Gross (PhD, 2016)** has been able to combine these two fields throughout his educational and professional experiences. During his time as a Master's student in Occupational Health Nursing, he had the opportunity to be an OSHA graduate nurse intern at the U.S. Department of Labor in Washington D.C. Through this experience he attended senate committee hearings on occupational health issues, met the Assistant Secretary for the U.S. Department of Labor/Head of OSHA, and led a project that involved creating a guidance document for disaster response and recovery workers. His PhD research involved examining factors associated with injury incidence and injury severity in an occupational health clinic population of manufacturing workers. Dr. Gross is currently the lead nurse in an occupational health clinic, where he has a hand in the treatment and case-management of occupational injuries. He is working to improve corporate occupational health policy, develop consistent treatment and case management protocols, and ultimately improve injury outcomes. Dr. Gross was the recipient of the 2016 Craig Zwerling-Nancy Sprince Scholarship for Occupational Health and Safety.

Occupational Medicine Residency

- **Past trainee Steven Rippentrop (MD, MPH, MHA, 2016)** completed the Masters of Hospital Administration during his Occupational Medicine Residency Training Program (he had previously completed the Masters of Public Health degree). He was recruited by the Office of the Vice President for Health Affairs at the University of Iowa to develop a network of

occupational medicine providers in the State of Iowa. He will also have a faculty appointment in the Division of Pulmonary, Critical Care, and Occupational Medicine in the Department of Internal Medicine at the Carver College of Medicine of the University of Iowa.

- Fred Gerr, MD, Program Director, received the Central States Occupational and Environmental Medicine Association “National Leadership Award”. This award is presented to an individual who has made a significant contribution to the specialty and has taken steps to promote the specialty on a national level through research, education and/or by increasing awareness of the value of the specialty. Dr. Gerr provided the keynote address at the Central States annual meeting.

Continuing Education

- The Continuing Education Program partnered with several labor organizations and employers to host the second annual Hawkeye on Safety Conference, held October 1, 2015. In its second year, the conference grew dramatically, from 387 participants to 494. The course content included electrical safety, fall protection, trenching and excavation safety, safety communication, confined spaces, lockout/tagout, and updates on OSHA regulations, among other topics. Partnering organizations for Hawkeye on Safety 2015 included Carpenters Local 1260; Chicago Regional Council of Carpenters; Iowa’s Building Trades Unions; Laborers Health and Safety Fund; Altorfer, Inc.; Built by Pros; Cedar Rapids & Iowa City Building Trades; Gilbane Building Company; The Weitz Company; Local Union 125 Plumbers & Pipefitters; McComas-Lacina Construction LC; Miron Construction Co., Inc.; T&K Roofing & Sheet Metal Company, Inc.; Iowa Energy Forum, Iron Workers Local 89, J.H. Findorff & Son Inc., Millwright Local Union 2158; Mortenson Construction; TrueNorth Construction Specialty Group; and the University of Iowa Facilities Management.