

NIOSH Training Project Grants Annual Report July 1, 2016- June 30, 2017
University of Arizona Industrial Hygiene Training Program
T01 OH009631, PI: Jefferey Burgess, MD MS MPH

1. TPG Summary

Our long-term objective is to increase the number of trained Industrial Hygienists in the workforce, with a particular focus on the Southwest.

Under the Occupational Safety and Health Act, NIOSH is tasked with supporting professional level Occupational Safety & Health (OSH) training to ensure a steady stream of trained OSH professionals to serve the needs of the American workplace. The Industrial Hygiene (IH) Training Program Grant at the University of Arizona assists NIOSH in meeting its goal of supplying qualified professional personnel by providing Master's level graduate training in IH, one of the four original core occupational safety and health areas.

With more than a thirty year history of providing graduate level IH training, the University of Arizona's Mel & Enid Zuckerman College of Public Health continues to be a leader in the IH field. Its key academic program focuses are the MPH (ABET Accredited) and the MS in IH, but doctoral level IH study is also available (though not NIOSH supported), and undergraduate Public Health students in the Environmental and Occupational Health (EOH) track are exposed to IH course material. The IH Program is administratively housed in the Environmental and Occupational Health Program within the Department of Community, Environment and Policy of the Mel & Enid Zuckerman College of Public Health (MEZCOPH).

The continuation of a high quality IH program in the Southwest is important to meet the strong demand for well-trained occupational health professionals in a region of the United States that is experiencing high growth. This is the only such program in Arizona and there are no IH programs in the neighboring states of New Mexico and Nevada. Furthermore, the southwest is the home of the majority of the metal and non-metal mining in the USA, which is an inherently dangerous industry. The Arizona program also serves an important function as a primary source of information, research, and professional development opportunities for the region's practicing IH professionals. The purpose of the MPH/MS degrees is to prepare students for IH careers involving professional IH practice. IH and EOH are fundamental parts of our national public health system.

- 2. Relevance:** Environmental & Occupational Health (EOH) is a core part of the field of Public Health, and Industrial Hygiene is a key part of EOH, so the program relevance is inherent in the academic program content.

3. Key Personnel

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- 8) K. Reynolds, PhD, teaching/research faculty – (520) 626-8230; reynolds@u.arizona.edu
- 9) M. Verhougstraete, PhD, teaching/research faculty – (520) 6210-0254; mverhougstraete@email.arizona.edu

4. **Website link**

<https://publichealth.arizona.edu/academics/masters/mph/eoh>

5. **High Impact Stories**

The program recently hired two tenure-eligible faculty members, Dr. Griffin and Dr. Reiss, both Certified Industrial Hygienists with over ten years of practice in IH. This represents a significant investment in our IH program and will help us improve our teaching, research and service in this area. Dr. Griffin is currently pursuing research in cancer prevention in the fire service and thermal stress in mining while Dr. Reiss is pursuing research topics in time-resolved exposure assessment and biomonitoring for chemical exposures.

One of our students who recently graduated from the MPH program has transitioned into our PhD program and is continuing her innovative research on housing and exposure assessments to pesticides, heat and zoonotic organisms among farm workers in Northern Mexico and Southern Arizona. To date, her findings have influenced the farm owner to improve the living and working conditions of his employees, and has prompted talks with the Secretary of Labor in Mexico. Her findings have been communicated back to communities at community teach-ins and workshops; at professional meetings including the American Society of Safety Engineers and the International Society of Exposure Science; with local stakeholders including county health departments, NGOs, and universities; and binational audiences such as the Binational Collaboration for Healthy Communities in the Arizona-Sonora Region. Her research to date was funded by the Western Center for Agricultural Health and Safety, Southern California NIOSH Education and Research Center, Southeast Arizona Area Health Education Center and MEZCOPH. Moving forward, she will seek to expand the research to include the development of new pesticide bio-monitoring methods, modeling of chemical and microbial exposures, assessment of chronic kidney disease prevalence in the southwest, pesticide exposure surveillance in the general Mexico population (similar to NHANES), and the development of a binational farm worker health and safety research/advocacy group.

MEZCOPH offers six week-long service-learning courses that combine community service with topical instruction, preparation and reflection. One of these courses, the Rural Health Service Learning Course, is offered in collaboration with the University of Arizona Extension to introduce the students to mental and physical health, water and land issues, and occupational related hazards in a rural agriculture community. In 2017, the nine graduate students in the course learned about community gardening through the partnership with Our Neighbors Farm & Pantry. In addition, the students learned about food banks and the allocation of resources within a rural community. The students were also given an opportunity to assist with gardening and distributing food from the food pantry. The Extension connects our students with community partners, such as the Boys and Girls Club, to allow our students an opportunity to teach a hand hygiene lesson to children. The Rural Health Service Learning Course also partners with

Freeport-McMoRan Mining Company, and introduces the students to environmental issues experienced in the rural, mining town of Morenci, Arizona. Students learn the current practices and community values as well as the history of the community and struggles of social and environmental justice in the region.

All of our 2016/2017 graduates from the MPH-IH program have transitioned successfully to paid employment with prestigious organizations (e.g., Honeywell Industries, Los Alamos National Laboratory, Amazon, etc.) or are working toward their PhD. In 2016/2017, two of our students have received sponsorship scholarship to attend the American Industrial Hygiene Association's conference and education sessions in Baltimore, MD and Seattle, WA. Another student received the 2017 AIHA General Local Section Scholarship during this budget period. One of our MS students, who has now transitioned into our PhD program, won the award for "best poster highlighting original research" at the MEZCOPH research poster forum in May 2017. The student evaluated the efficiency of a passive air purification unit/system on airborne microbial contamination in a controlled chamber environment, working under Professors Reynolds and Verhougstraete.

The program has continued its occupational safety and health research work with both the U.S. fire service and the U.S. mining industry. In addition, we are currently exploring ways to capitalize on the strengths of our faculty focused on additional environmental health topics including microbiology. This will be unique among IH programs in the U.S. and will allow us to train EH and IH professionals to serve critical industries including health care and food services in infection control and surface contamination prevention. We currently have two MS and PhD students working on research projects in infection control at the nexus of microbiology and IH and are confident we can expand this work in the near future to meet this important need.