ILLINOIS EDUCATION AND RESEARCH CENTER FOR OCCUPATIONAL SAFETY AND HEALTH

ANNUAL REPORT

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II. Introduction and Executive Summary

A. Major Accomplishments

The Illinois ERC has identified regional needs through a variety of methods: including national and regional injury and illnesses data, capacity in the region to address the needs and unique industrial sector challenges in our region, and has made a significant impact in meeting the regional and national needs for occupational safety and health training. As seen by the number of trainees, continuing education offerings, publications, presentations, and our relationships with other academic programs and community partners, we have been advanced the field of occupational safety and health in our region and in the US.

Of particular note, we have 40 full time pre-doctoral trainees, 12 part time pre doctoral trainees and 6 postdoctoral occupational medicine residents, resulting in a total of 58 trainees in the five academic training programs. In the last year, we have graduated 2 ASH, 2 HSAT, 8 IH, 1 OHN and 4 OM. Our continuing education programs trained 4360 trainees in 145 courses. Faculty, staff, and students published 68 papers, book chapters, or books and made 44 scientific presentations.

We believe that the Illinois ERC is functioning in a highly interdisciplinary and cohesive manner that allows us to accomplish far more than would be possible by a collection of individual programs. The programs are well integrated with each other and are designed to foster interdisciplinary interaction in the teaching, research, and service components of our mission. We have demonstrated the integration and interdisciplinary nature of our work through the program planning and evaluation processes of the ERC Executive Committee, the advancement of distance education to reach trainees and others at our other campuses and throughout the world, our interdisciplinary research training program, and our commitment to interdisciplinary training. While innovation is integrated into all of our activities, the collegiality and effectiveness of the Executive Committee in program planning and evaluation is particularly noteworthy, as evidenced by the publications, co-teaching, collaborative research, and the success of transitioning our interdisciplinary occupational safety and health core courses to reach trainees outside of Chicago. Additionally as with our vision and leadership in creating the PPRT program in the 1990s, we are equally pleased with our vision for the Targeted Research Training Program which we have successfully developed and institutionalized over the past four years.

The quality and interdisciplinary character of the Illinois ERC is outstanding. The resources and environment are exceptional. The Illinois ERC is located at the University of Illinois at Chicago (UIC). UIC was formed in 1982 by the consolidation of two U. of I. campuses: the Medical Center campus, which dates back to the 19th century, and the comprehensive Chicago Circle campus which replaced, in 1965, the two-year undergraduate Navy Pier campus that had opened in 1946 to educate returning veterans. UIC is the only public research one university in Chicago. The annual budget of UIC is approximately $1.3 billion dollars with approximately $307 million in extramural research expenditures. There are 15,148 undergraduates, 6,766 graduate students, and 2,439 professional students at UIC. UIC has the tradition of opening the doors of higher education for students from every ethnic/racial group, religion, gender, sexual orientation, physical condition, and age. UIC's tradition of diversity was recognized in the 1999 issue of *US News & World Report's* "America's Best Colleges" in which UIC was named as one of the most racially diverse colleges in the nation, ranking 6th out of 228 universities. Additionally in 2000, NASPA, the association of university student affairs administrators, named UIC as winner of the Celebrating Diversity Award for the Midwest region.

UIC has excellent computer and library facilities. The Academic Computing and Communications Center (ACCC) provides the entire UIC community with ready access to both mainframe and personal computers. Public computer laboratories are available throughout campus with personal computers containing a variety of software packages, access to the Internet and electronic mail. ACCC strongly

encourages the use of its facilities for instructional purposes and provides assistance to faculty who wish to integrate computers and computing into their courses. The Library of Health Sciences has facilities in Chicago, Peoria, Rockford, and Urbana and facilitates extensive electronic access to its collections.

The CON OHN program has the unique ability to offer its classes at all five campuses of UIC, which allows students outside the Chicago Metropolitan Area to participate and contributes to increasing the nursing workforce in medically underserved areas of Illinois. The campuses are located throughout Illinois in Chicago, Rockford, Peoria, Quad Cities, and Urbana-Champaign. This allows great diversity among students and staff, and increasing opportunities for enrollment and research. As the nursing shortage spreads, increased opportunities for nursing enrollment and distribution of graduates are imperative throughout our region. Nursing shortages are apparent in urban and rural settings, giving UIC's five-campus locale an important advantage. Use of advanced instructional technology allows us to extend the program to areas outside our 5 campuses, nationally and internationally.

We have an outstanding training staff with exceptional experience in occupational safety and health teaching, service, and research. The Illinois ERC has 42 faculty in five academic training, three continuing education, and two research training programs. With the addition of the proposed programs OEE and OS programs, we will have 51 faculty contributing to the training mission of the Illinois ERC. Of the 51 faculty and staff members in the Illinois ERC, 20 are tenure/ tenure-track faculty with at least partial state funded salary support.

B. Significant Changes since FY 2006 Annual Report (July 1, 2006 – June 30, 2007)

Dr. Shannon Lizer, was appointed director of the Occupational Health Nursing program in 2003. In August 2006, Dr. Lizer accepted another position and reduced her commitment to the University of Illinois at Chicago. Dr. Arlene Miller is the Department Head in Public Health, Mental Health and Administrative Nursing. She is fully committed to the OHN program and plans to serve as program director until a permanent director can be identified. She is assisted by Jacqueline Wuellner, MPH, RN, who serves as Deputy Director of the OHN program.

After many years of training residents in occupational medicine, including many of the leaders in occupational medicine in the US, the residency program at Stroger Hospital of Cook County will close due to budget cuts at the hospital. Effective August 31, 2007, the ERC will have one occupational medicine program at the University of Illinois at Chicago.

Dr. Serap Erdal was promoted to Associate Professor, with tenure in 2006.

The Agricultural Safety and Health Minor was approved by the department and college and is expected to have University approval in Fall 2007.

We have revised the delivery of two of the interdisciplinary core courses, Fundamentals of Industrial Hygiene and Occupational Diseases to use distance based technology and allow trainees in Urbana and Rockford, and others at any location to take the courses. The Fundamentals of Industrial Hygiene was taught this way in Fall 2006 and was successful in integrating distance based technology into a traditional classroom setting. The Occupational Diseases course was taught for the first time in Spring 2007 and was also very successful. In addition to making the course available to trainees in the University of Illinois system, we opened this course to international participants. One student from Sri Lanka participated in all of the class sessions and found the course very useful and the technology reasonable easy to use. One of our ongoing outreach projects involves working with the Chicago Department of Public Health and other partners to encourage lead safe work practices during home renovation. One aspect of the program involved pilot testing outreach to hardware stores, a source of supplies and information for small

contractors. The project involved checking hardware stores to determine if they carry the recommended supplies for lead safe work practices. The second part of the project involved meeting with hardware store personnel to discuss lead safe work practices, to ask them to carry the necessary supplies, to ask them to put up a lead safe work practices poster in their paint and/or window department, and to distribute brochures with instructions to customers. The program was very successful and has led to EPA funding to expand the program to other cities in Illinois. The results of the program were also instrumental in supporting passage of lead poisoning prevention act which included language requiring small businesses to post and distribute information on lead safe worker practices.

C. ERC Website (including links to programs and faculty/staff directory)

http://uic.edu/sph/glakes/ce2/index.html

III. Program Progress Reports

A. Program Title: Center Wide Activities (Administration, Interdisciplinary Coordination, Diversity Recruitment)

B. Program Director: Lorraine M. Conroy, ScD, CIH

C. Program Description

1. Introduction

The Illinois Occupational and Environmental Health and Safety Education and Research Center (Illinois ERC) exists to improve, promote, and maintain the health of workers and communities by applying innovative and interdisciplinary approaches to:

- prepare professionals to be leaders in occupational and environmental safety and health who will direct and manage occupational and environmental safety and health programs, teach other occupational and environmental health professionals, and research issues pertinent to occupational and environmental safety and health;
- provide continuing education to occupational and environmental health and safety professionals and outreach to workers and communities to improve their knowledge, skills, and awareness of key issues in occupational and environmental safety and health, devoting special attention to the problems and needs of at risk and underserved workers and communities;
- contribute to the knowledge base in occupational and environmental safety and health by preparing doctoral students, performing faculty and student research on problems of regional, national, and global significance, and disseminating the results of their research; and
- serve as a regional information resource.

2. Objectives

The overall objective of the Administrative Core is to provide a supportive structure for accomplishing the activities of the Center. The specific objectives are to:

1. Provide leadership to all aspects of the ERC
2. Coordinate and integrate the components and activities in the Center;
3. Assess productivity, effectiveness, and appropriateness of Center activities;
4. Organize Center planning and evaluation activities;
5. Organize the internal executive committee and external advisory committee;
6. Keep records and coordinate preparation of reports to NIOSH; and
7. Coordinate interactions with other ERCs, NIOSH, and others

3. Program Administration

The Occupational and Environmental Health and Safety Education and Research Center (Illinois ERC) is comprised of 13 programs. There are 5 continuing academic programs: Industrial Hygiene (IH), Hazardous Substances (HSAT), Occupational Medicine at the University of Illinois at Chicago (OM-UIC), Occupational Health Nursing (OHN), Agricultural Safety and Health (ASH-A). Two new academic programs are proposed with this application: Occupational Safety (OS) and Occupational Epidemiology (OE) There are three continuing education and outreach programs: Continuing Education in industrial hygiene, occupational medicine, occupational health nursing, and occupational safety (CE); Hazardous Substances (HST); and Agricultural Safety and Health (AgCEO). The ERC also has Center Wide Activities including a Center Administrative Core, Outreach, Diversity Recruitment, and Interdisciplinary Coordination (CWA), as well as a Pilot Projects Research Training program (PPRT) and Targeted Research Training program (TRT).

Lorraine M. Conroy, ScD, CIH is the Director of the Illinois ERC and also serves as program director for Targeted Research Training program. Dr. Conroy is Associate Professor of Environmental and

Occupational Health Sciences. She has an undergraduate degree in Chemical Engineering and MS and ScD degrees in Environmental Science and Physiology, with a concentration in Industrial Hygiene, from Harvard University School of Public Health. She has been at UIC since 1988 where she started as Assistant Professor and was promoted to Associate Professor (with tenure) in 1995. Her research interests include characterizing workplace contaminant sources, ventilation system model development and validation, and workplace exposure assessment. She is a research advisor to IH and OHN trainees, teaches EOHS 421 Fundamentals of Industrial Hygiene and co-teaches EOHS 523 Engineering Controls. She received the Golden Apple award for excellence in teaching in 1994 and is a member of Delta Omega, the public health honor society. Dr. Conroy serves on the Occupational Medicine Residency Advisory Committee and on the Hull House Museum Advisory Board. Dr. Conroy took over leadership of the ERC in 2000. Since that time, the ERC has experienced growth in the size of the academic programs, continued improvement in all program areas, introduction of additional research training activities, and increased funding. She has helped recruit new program directors in occupational medicine(Susan Buchanan) and occupational health nursing (Shannon Lizer) and has mentored both of these directors in improving their programs and advancing their careers at UIC. She was selected by the Vice-Provost for Faculty Affairs to participate in a year long Academic Leadership Program sponsored by the Committee for Institutional Cooperation (CIC). The CIC is a consortium of 12 research universities, including the members of the Big Ten Conference, UIC, and the University of Chicago. From 2004-2006, Dr. Conroy served as vice-chair and chair of the Association of University Programs in Occupational Health and Safety, an association of the sixteen ERCs. Under her leadership, the organization was instrumental in assisting NIOSH with a review of the current funding formula for ERCs and developing a vision for ERCs in the 21st century.

The ERC has an Executive Committee that meets monthly and is comprised of the ERC Director, Deputy Director, and directors and deputy directors of each ERC program area. Table III show roles and responsibilities within the ERC.

Leslie Nickels, MEd, serves as Deputy Director of the Illinois ERC and Director of Continuing Education and Outreach programs. Ms. Nickels works on program development, evaluation, research, technical assistance and outreach. Special continuing education program areas include hazardous substances and agriculture health and safety. Ms. Nickels has over 20 years of experience in health and safety. Before becoming Program Director for CE Ms. Nickels was Program Director for Occupational and Environmental Health for the Chicago Health Department. Prior to this she was the Area Manager for the Safety Inspection and Education Program for the Illinois Department of Labor. In both of these capacities Ms. Nickels was responsible for enforcing health and safety standards, conducting training programs and developing policies to protect workers health and safety. Ms. Nickels has a Master of Education degree and has completed courses in graduate training in industrial hygiene. Additionally Ms. Nickels is a PhD candidate in curricular studies at the University of Illinois at Chicago College of Education.

Peter Scheff, PhD, CIH, is the Director of the Industrial Hygiene Program. He is Professor of Environmental and Occupational Health Sciences (EOHS) within the School of Public Health. Dr. Scheff has been on the faculty since 1989 and has directed the industrial hygiene program since the fall of 2002. His research interests include evaluation and control of the indoor environment, air quality management, exposure assessment and environmental statistics. He is also director of the Region V Center of the EPA's Air Pollution Training Institute, one of five regional training centers nationwide.

Arlene Miller, PhD, RN, FAAN, is Director of the Occupational Health Nursing Program and is Professor and Department Head of Public Health, Mental Health and Nursing Administration.. Dr. Miller has a master’s degree in Public Health Nursing and a doctorate in Counseling Psychology. She has been a Family Nurse Practitioner for over 20 years. She teaches an interdisciplinary doctoral-level cross-cultural research methods course, and has examined relationships among acculturation and health in immigrant

women and their husbands. She is presently conducting a study of acculturation, social ties, and health literacy among female immigrant home care workers from the former Soviet Union and the Philippines. She has been Principal Investigator on a federally funded longitudinal study of women from the former Soviet Union, "Post-Migration Health and Behavior Change in Midlife Women."

Susan Buchanan, MD, MPH is Director of the Occupational Medicine Program. She had been a practicing Family Physician for ten years before returning to public health. Her primary appointment is in the Environmental and Occupational Health Sciences Division of the UIC School of Public Health. Her current research covers the occupational hazards and injuries of Chicago day laborers and temporary agency workers. Her work in this area has been published in New Solutions, the Archives of Environmental and Occupational Health, and Public Health Reports. She continues clinical practice in the UIC Department of Family Medicine and in University Health Services, the UIC employee health clinic.

Robert Aherin, PhD, CSP is the Director of the Agricultural Safety and Health Academic Program He is a Professor in the Agricultural and Biological Engineering Department within the College of Agriculture, Consumer and Environmental Sciences (ACES) located at the Champaign/Urbana campus and is a member of the graduate college. He is also an Adjunct Professor with the School of Public Health. He has degrees in Occupational Safety and Health, Agriculture and Education. He has over 30 years experience in education and research in the agricultural safety and health area. He is a Certified Safety Professional and has held numerous professional leadership positions. He has been president of the National Institute for Farm Safety, chaired the American Society of Agricultural Engineers safety committee, served on the National Safety Councils' Agricultural Division Executive Committee and served on a national agricultural child injury prevention task force. Dr. Aherin help found the Illinois Network for Agricultural Safety and Health which consists of professionals throughout the state who have interest and responsibilities in this area. He served as the organization's first chair for two years when it formed in 1992.

Rosemary Sokas, MD, MOH is the Director of the Pilot Projects Research Training Program. Dr. Sokas is currently a Professor and Director of the Division of Environmental and Occupational Health Sciences at UIC. Dr. Sokas joined UIC in November 2002, following six years in government service, initially as Director of the Office of Occupational Medicine at OSHA and, most recently, as Lead Medical Officer and Associate Director for Science at NIOSH, CDC, where she coordinated the interface between science and policy, facilitated the implementation of the National Occupational Research Agenda, and assisted in the response to the terrorist attacks of September 11, and subsequent anthrax attacks. Prior to that, she served on the faculty at the University of Pennsylvania, School of Medicine and at the George Washington University School of Medicine and School of Public Health and Health Sciences. Her research includes education intervention effectiveness evaluation, the interface between clinical medicine and public health, and work addressing the needs of low-wage, high-risk workers. She is currently conducting extramurally-funded research exploring the impact of training on construction workers and exploring occupational exposures among home care workers. She directs the Illinois Public Health Research Fellowship program that supports 12 postdoctoral trainees and 4 pre-doctoral students throughout the UIC SPH in establishing transdisciplinary research careers with an emphasis on reducing health disparities and promoting environmental justice.

The ERC is administratively part of the Environmental and Occupational Health Sciences (EOHS) division at the SPH. The OHN program is in the Department of Public Health, Mental Health, and Administrative (PMA) Nursing in the College of Nursing. Arlene Miller, PhD is the Department Head in PMA Nursing and she reports to the Dean of the College of Nursing. The ASH-A program is in the College of Agricultural, Consumer, and Environmental Sciences at the University of Illinois at Urbana-Champaign (UIUC). The OM program is administered through the EOHS Division but enjoys

considerable financial and administrative support from the Graduate Medical Education (GME) department in the College of Medicine. All other programs are in the EOHS Division. Rosemary Sokas, MD, MOH is the Division Director in EOHS and she reports to the Dean of the School of Public Health.

Overall coordination and integration of activities within the ERC is done through the Center Wide activities. The Center Director has responsibility for coordination of program activities, interdisciplinary activities , diversity recruitment, and targeted research training. The PPRT Program is directed by Dr. Sokas.. The Center Director reviews the recommendations of the PPRT review committee and communicates with NIOSH regarding human subjects approval and funding decisions. The Outreach Program is directed by Ms. Nickels and includes faculty and staff from all programs in the ERC. Other activities such as strategic planning and overall program evaluation are conducted by the ERC executive committee under the direction of the Center Director, who chairs the committee. Working groups, comprised of executive committee members and others, are formed as needed to perform specific activities. For example, during the last two years, the executive committee had three working groups to perform specific tasks. One working group, led by Dr. Conroy, conducted the ERC-wide needs assessment in preparation for this application. Another working group, led by Dr. Buchanan, worked on improving the ERC web pages, and the third working group, led by Ms. Nickels, worked on accessibility of ERC interdisciplinary core courses and the seminar for students in Rockford and Urbana.

Our advisory board is instrumental in helping us define the needs of our region and to advise us on innovative and effective ways to meet that need. Membership on the ERC Advisory Board represents all disciplines and includes representatives from government, industry, and labor. The Advisory Board is chaired by Dr. Linda Murray and meets 1-3 times per year. A number of members have retired during the current project period. We are in the process of recruiting new members, specifically we are identifying new members to represent the Chicago Federation of Labor, the OSHA consultation program in Illinois, the Central States Occupational Medicine Association, and the local section of American Association of Occupational Health Nurses. Current members of the external advisory board are listed in Table IV.

Recordkeeping for the ERC is the responsibility of the ERC administrator (B. Harper-Smith). She is responsible for scheduling meetings, keeping meeting minute and for all recordkeeping related to appointments, communication with NIOSH, and grant submissions. Recordkeeping for each of the programs is the responsibility of the program directors and deputy directors. They are assisted in this task by the ERC administrator and by the academic coordinators in the divisions or departments where the program is located. The deputy director of the PPRT program keeps records of awards and outcomes for that program as described in the PPRT section of this application.

D. Program Activities and Accomplishments

1. Interdisciplinary Coordination

Interdisciplinary interaction is coordinated by the ERC Director with assistance from the ERC executive committee. Several core activities form the basis for interdisciplinary interaction among trainees in each of the ERC programs. These include common coursework, occupational health and safety seminar, occupational history tours, occupational medicine clinic, plant visits, and research.

Common Coursework
Course requirements for each of the core areas include a set of common courses that trainees must take. These include:
EOHS421 Fundamentals of Industrial Hygiene*
EOHS482 Occupational Safety Science
EOHS558 Industrial Toxicology

EOHS551 Occupational Diseases[1*]
EPID403 Introduction to Epidemiology: Principles and Methods
BSTT400 Biostatistics I
[1]IH trainees must take EOHS558 or EOHS551 although many trainees take both courses
*Classroom based course accessible through Internet.

These courses allow students to be in class with trainees from all disciplines in the Illinois ERC. Several courses are designed to allow students to work together on common problems in occupational safety and health. One of the assignments in the EOHS529 Industrial Hygiene Lab II class is to develop and deliver a 2 hour course in laboratory health and safety to entering EOHS students, including the IH and OM trainees. This activity provides real-world practice for the IH trainees and meets the training requirement UIC Environmental Safety and Health Office's Chemical Hygiene Plan. In EOHS421 Fundamentals of Industrial Hygiene, students are required to complete a number of assignments and a project as a group. The groups are assigned in order to ensure that each group has trainees from each of the programs in the ERC. The project is to work as an interdisciplinary team to review the literature and develop an occupational exposure limit for a chemical or physical agent. Standard setting requires the input of a multidisciplinary team to ensure that the standard will protect against adverse health effects, will be technically feasible, and will be enforceable. Other group assignments are to investigate and characterize exposures and hazards and to recommend control measures to reduce exposures associated with offset printing. These assignments involve reviewing the literature as well as touring an offset printing facility.

Occupational and Environmental Health Seminar Series
The ERC conducts a seminar series on topics related to occupational and environmental health and safety. A schedule of seminar topics for the 2002-2006 academic years is presented in Table VII of this section. Trainees are required to participate in the seminar and graduating trainees are strongly encouraged to present their research results in this forum. Faculty participation in the seminar is also expected.

In 2005-2006 reporting period, a needs assessment of trainees revealed that participation of some students was limited by geographic barriers. To overcome this barrier, the EOHS 551 classroom course was offered using real time computer based technology. Additionally, an interdisciplinary subcommittee of the Executive Committee was established to explore using real-time computer based technology to offer other courses. A pilot project in 2005-2006 recommended that this technology be used to deliver EOHS421 and the interdisciplinary seminar series. EOHS421 Fundamentals of Industrial Hygiene, EOHS 551 Occupational Diseases, and the weekly interdisciplinary seminar were offered using Centra, a web-based synchronous program that allows students to participate in a classroom session from any computer. EOHS421 was delivered, in Fall 2006, to a group in the classroom and to others logged in off-site. As a pilot, the technology was used but only faculty and staff from the ERC accessed the course remotely, i.e., during the initial test, no credit seeking students were enrolled at remote locations. The pilot testing was very successful and the program was then used during the Spring 2007 semester for both EOHS551 and the weekly interdisciplinary seminar. We are exploring options, including the use of Centra to make EOHS482 Occupational Safety Science and EOHS558 Industrial Toxicology accessible to students in Rockford and Urbana.

Occupational History Tours
In Spring 2000, the CEO program began offering Occupational History tours of Chicago. Two tours per year are offered. The first is a tour of sites related to the Haymarket demonstration for an 8-hour workday, and subsequent events. This tour is conducted near the May 1 anniversary date and includes trainees as well as faculty, staff, other SPH students, and community members. The second tour is conducted near Labor Day and visits the Pullman Historic District in Chicago. Both tours are generally led by noted labor historian William Adelman, Professor Emeritus, University of Illinois Institute for Labor and Industrial Relations or by a labor historian identified through the Chicago Labor History Society.

Occupational Medicine Clinic
The occupational medicine programs conducts three clinic sessions per week. This is one of the primary clinical training activities for OM trainees. The clinic offers an ideal opportunity for interdisciplinary training. Industrial hygiene, occupational health nursing, and occupational medicine trainees attend the clinic. The IH and OHN trainees work with the residents and attending physicians to elicit information on work history and possible workplace exposures. They research occupational health issues related to the cases presented in clinic and develop recommendations for controlling exposure. All trainees in the core academic program are required to participate in the Occupational Clinic program. Trainees from the non-core programs will be encouraged to participate and the opportunity is open to all students in EOHS. With the closing of the Stroger Hospital OM program, the number of occupational medicine clinic session will be reduced to two; one at Stroger Hospital and one at UIC. The third clinic session will be replaced by the Friday morning occupational lung disease clinic at Stroger Hospital.

Plant Visits
With assistance from Nancy Quick, an advisory board member and Compliance Assistance Officer for the West Chicago OSHA office, the occupational medicine program initiated a monthly plant visit experience. This program began several years ago. Once a month, the weekly OM conference deals with an industrial process. The following Friday, trainees and OM rotators visit an industrial plant. The industrial sites are identified by advisory board members and adjunct faculty members. These conferences and plant visits are open to trainees and faculty in all programs in the Center. These activities had been coordinated by Cile Buckley, the industrial hygienist in the division of occupational medicine at Stroger Hospital. Following the closing of that program, Ms. Buckley will no longer be available to perform this task. Dr. Conroy will work with a graduate assistant to arrange the plant visits. Industrial hygiene trainees will be responsible for researching the industrial process and preparing a presentation for the OM trainees and others. IH trainees will work in pairs and each pair will be expected to make one presentation per semester. Drs. Scheff, Franke, and Conroy will advise the IH students in this activity.

Research Training
Interdisciplinary research training in the ERC is described in the Targeted Research Training program section.

2. Diversity Recruitment

The University of Illinois at Chicago is the largest public institution of higher learning in the Chicago area with Research I institutional status. The faculty at the University of Illinois appreciates the need for programs that address minority issues. They recognize that the need for research scientists who are interested in minority health problems and in public health could not be greater.

The ERC makes every attempt to recruit and train minority students in an effort to address the under-representation of minority and special populations in the occupational safety and health professional workforce.

The involvement of minorities, especially African-American and Hispanics/Latinos, in public health is discouragingly low. Despite some successes in areas of Public Health such as Community Health Sciences, minority students are under-represented in the fields of Environmental and Occupational Health Sciences and in Epidemiology and Biostatistics, fields that are critically important to public health. Despite a more than 35% combined representation in the United States population, African-Americans, Hispanics/Latinos, and American Indians have received less than 15% of the science and engineering degrees (NSF, 1999) and in 1998 they had less than 5% of the scientific doctorates (Mervis, 1998). Some

major contributing factors to this deficit are thought to be disparities in the educational preparation, proportionally lower success at the high school and college level, and low recruitment into non-medical graduate programs (Smith, 2000). Many minority undergraduate and graduate students, for example, hold full time jobs while in school and have fewer financial and educational resources supporting them. The long hours required for research, lack of funds for travel to conferences and meetings, and years required for the development of successful research careers create barriers and reduce incentives.

In addition to the efforts of the faculty in the ERC, there are programs within the University that compliment and enhance the efforts of the ERC. The Urban Health Program (UHP) was created to recruit, retain and graduate students from groups underrepresented in the health professions, specifically African Americans, Hispanics, and Native Americans who desire to practice in underserved urban areas. The ultimate goal is to train a cadre of underrepresented health professionals, Masters and Doctoral graduates dedicated to improving the quality and availability of health care services in underserved urban areas.

The UHP reaches students at an early stage in their education and helps them develop the basic skills necessary to prepare for a career in the health professions. Promising underrepresented and economically disadvantaged students are identified from kindergarten through high school, junior colleges, and universities/colleges who exhibit the interest and potential for completing a health education curriculum.

The Urban Health Program provides essential support systems for the retention of students through graduation. These programs are implemented to increase the numbers of students in the health careers pipeline. Each of the Health Sciences Colleges (including Public Health), the Early Outreach Program and Support Units develop specific programs aimed at increasing the numbers of underrepresented biomedical researchers and health care professionals prepared to work in urban communities. Each college has a UHP Director whose charge is to monitor academic progress of the UHP students in their colleges and to provide a series of activities, programs and seminars that prepare the UHP students for their future academic and professional roles.

The Health Careers Opportunity Programs Club (HCOP-C) at the University of Illinois at Chicago College of Medicine in conjunction with Chicago State University provides an opportunity for students to experience various health and biomedical careers. Participants are provided with monthly field trips, mini-workshops, and roundtable and panel discussions that focus on topics related to a wide variety of health and biomedical careers. Topics cover academic requirements and career opportunities (Medicine, Osteopathy, Veterinary Medicine, Optometry, Pharmacy, Podiatry, and Public Health), biomedical careers and Masters/Ph.D. programs. Structured hands-on clinical and laboratory experiences are also organized for the students. The School of Public Health actively participates in the program on a school wide basis across all divisions. A number of summer residents are mentored by faculty in the Environmental and Occupational Health and Sciences division.

Recruitment occurs in each of the academic programs through a variety of mechanisms. Our needs assessment indicates that graduates had heard about OHS and about our program by word of mouth, on-line, from other students or graduates, from their college counselor, and from co-workers. Graduates reported choosing UIC because they wanted to live in Chicago, available funding for graduate students, program options, and faculty. Students selected their respective disciplines of study because some had prior work experience in the field and wanted more advanced study; knowledge gained will help achieve goals of working with employers to improve working conditions for employees; the belief that occupational health and safety is a human right, it is a broad field that incorporates many areas of science and policy, and the field allows for prevention of injuries and illnesses at a population level. Several students in IH chose the discipline after applying to graduate school to study environmental health. Acceptance into the program was the first time they had heard about IH as a career option.

Students chose to study at the University of Illinois because of recommendation by an alumni of the UIC program, the reputation for rigorous training, the potential for receiving grants, diversity, they wanted to be in Chicago, research interests of the professors, available funding, job and career potential. Trainees who completed their undergraduate program at UIC, felt "lucky to have heard about program but feel there is very little information available to UIC undergraduates."

Dr. Conroy and the ERC executive committee will work with the UHP coordinator at the School of Public Health to ensure that opportunities in the ERC are included in the recruitment activities of the UHP at the SPH. A list of typical outreach activities of the Urban Health Program in the SPH is provided in Table V. Dr. Conroy and the ERC Executive Committee will continue to work with Francisco Piña, Recruitment and Urban Health Programs Coordinator, in the Graduate College at the University of Illinois at Chicago Mr. Piña has responsibility for coordinating efforts to recruit qualified students into MS and PhD programs across the UIC campus. Table VI shows the Graduate College recruiting schedule for AY2007-2008.

The ERC will develop recruiting materials that will be provided to the Urban Health Program coordinators in the Graduate College and the SPH. Additionally, student recruitment is a strategic priority for the SPH and we will work with the other programs in the SPH to develop school-wide recruitment strategies. Dr. Conroy or other faculty in the Illinois ERC will accompany the UHP coordinator to some of the planned recruitment events.

The efforts of the UIC and SPH Urban Health and Health Careers Opportunities programs have resulted in a diverse student body. Data from the Graduate College Demographics Report show that 22.9% of the public health nursing students are from minority groups, and 21% of PhD students in the College of Nursing are from minority groups. The demographics of the School of Public Health are even more encouraging, with 23.9 % of all SPH students representing minority groups. In EOHS, 40% of the MS and 29.4% of the PhD students are from minority groups. In Epidemiology, 12.5% of the MS and 19.4% of the PhD students are from minority groups.

Through these collaborations, outreach activities, and contact with students, our faculty strives to bridge the gap and increase the enrollment of qualified, underrepresented students so that we may work together towards the common goal of the School of Public Health - people serving people so they may live healthier lives

E. Program Products

Publications by faculty and trainees are listed in Appendix A.
Interdisciplinary seminar schedule is given in Appendix B.

F. Future Plans

We continue to make progress on our Measures of Effectiveness. We included a chart of activities related to the goals of the Center in our last competitive renewal. We update the activities and outcomes on this chart regularly. We will be conducting a regional needs assessment in Academic Year 06-07 and will incorporate the results of that assessment into our Measures of Effectiveness, defining new goals and activities as warranted.

The ERC executive committee will evaluate the success and limitations of the pilot testing and finalize plans for making the core ERC courses and weekly seminar accessible to non-Chicago based students.

We are proposing a new program in Occupational Epidemiology with this application. We believe this is a particularly opportune time for building an Occupational and Environmental Epidemiology program at UIC for several reasons. First, the leaders of the Division of Epidemiology and Biostatistics (Leslie Stayner) and of the Division of Environmental and Occupational Health (Rosemary Sokas) are both former employees of NIOSH with extensive experience in conducting epidemiologic research on occupational health and safety issues. Faculty and students from the two divisions are already collaborating on research studies in several key areas of occupational and environmental epidemiology including studies of occupational injuries, cancer, intervention research, air and water pollution. However, the scope of collaboration among faculty of the two divisions has been limited and there is substantial room for growth in this area.

Steven Lacey, PhD, CIH, CSP joined the EOHS faculty in 2004. Beginning in 2005 he has had a joint appointment in the Department of Mechanical and Industrial Engineering, where he teaches two courses, Safety Engineering and Ergonomics. We are proposing to offer a Master of Science (MS) and Doctorate in Philosophy (PhD) degree in occupational safety. The concentration in Occupational Safety at the University of Illinois at Chicago is a viable, fully-functioning degree option administratively housed within the Division of Environmental and Occupational Health Sciences (EOHS), and exists in partnership with the Department of Mechanical and Industrial Engineering (MIE).

Appendix A: Publications and Presentations

Publications

Continuing Education and Outreach
Zanoni J, Kaufman K, McPhaul K, Nickels L, Hayden M, Glassman M, Vega L, Sokas R (OMF), Lipscomb J. Personal Care Assistants and Blood Exposure in the Home Work Environment: Focus Group Findings Progress in Community Health Partnerships. 2007;2:125-32.

Industrial Hygiene
Erdal, S. (IHF), Berman, L (IHT). (2005) Occupational Exposure Environment, Risk Factors, and Hazard Awareness of Metal Sculptors and Artist Welders in the U.S., Journal of Environmental Health Research April 2006.

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Hanxia Liu, Qinghua Zhang, Zongwei Cai, An Li (IHF), Yawei Wang, Guibin Jiang. Separation of Polybrominated Diphenyl Ethers, Polychlorinated Biphenyls, Polychlorinated Dibenzo-P-Dioxins and Dibenzo-Furans in Environmental Samples using Silica Gel and Florisil Fractionation Chromatography. Analytica Chimica Acta 557, 314-320, 2006

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Jacobs (IHF) DE. A Qualitative Review of Housing Hazard Identification Protocols in the U.S. Environ Res 102(1) 13-21, Sept 2006

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Lacey, S., Conroy, L., et al. Dust emission rates from food processing. Submitted and under review, Ann Agric Environ Med (2006).

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Li, A (IHF), Rockne KJ, Sturchio NC, Song W, Ford JC(IHT), Buckley DR, Mills, WJ: Polybrominated Diphenyl Ethers in the Sediment of the Great Lakes. 4 – Influencing Factors, Trends, and Implications. Environmental Science and Technology 40(24), 7528 - 7534, 2006

Turyk, M., Curtis (IHT), L., Scheff (IHF), P., Contrares, A., Coover, L., Hernandez, E., Freels, S., and Persky, V.: Environmental Allergens and Asthma Morbidity in Low Income Children, Journal of Asthma 43:453-457, 2006.

Yawei Wang, An Li (IHF), Hanxia Liu, Qinghua Zhang, Weiping Ma, Wenlu Song, Guibin Jiang. Development of Quantitative Structure Gas Chromatographic Relative Retention Times Models on Different Stationary Phases for 209 Polybrominated Diphenyl Ether Congeners. Journal of Chromatography A 1103, 324-328, 2006

Anrubio Vega, E.J., Bravo Alvarez, H., Brezonik, P.L., Chan, R.M., Fitz, D.,Grosjean, D., Hernández Téllez, J.,Kahl, J., Keener, T.C., López Portillo, M., Lu, M., Paredes Maury, S., Nakamura, S., Ortega Morales, B.O., Pescador, L., Reyes Trujeque, J., Sánchez Alvarez, P, Scheff (IHF), P., Soso Echeverria, R., Soto Ayala, R., and Vazquez Botello, A.: A Summary of the International Workshop on the Influences of Air Quality on the Mayan Heritage Sites in Mesoamerica. Environmental Management, February, pp 24-30, 2007.

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G.M. Marsh, A.O. Youk, J.M. Buchanich, M. Cunningham, N.A. Esmen (IHF), T.A. Hall, M.L. Phillips: Mortality patterns among industrial workers exposed to chloroprene and other substances: I. General mortality patterns, Chemico-Biological Interactions, 166:285-300(2007)

G.M. Marsh, A.O. Youk, J.M. Buchanich, S. Erdal (IHF), N.A. Esmen (IHF): Work in the Metal Industry May Help Explain Nasopharyngeal Cancer Mortality Excess among Workers Exposed to Formaldehyde Reg Tox and Pharm. (Accepted for Publication - 2007).

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L.E. Pascal, D.M. Tessier (IHF). Activation of MAP kinases in by hexavalent chromium, manganses and nickel in human lung epithelial cells. Submitted to Toxicology Letters.

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Michael Rizzo and Peter A. Scheff (IHF): Utilizing A Chemical Mass Balance and Positive Matrix Factorization to Determine Influential Species and Examine Possible Rotations in Receptor Modeling Results. Accepted for publication, Atmospheric Environment, May, 2007.

Michael Rizzo and Peter A. Scheff: Fine Particulate Source Apportionment Using Data from the USEPA Speciation Trends Network in Chicago, Illinois: Comparison of two Source Apportionment Models. Accepted for publication, Atmospheric Environment, March, 2007.

N. A. Esmen (IHF), K. J. Kennedy, T. A. Hall, M. L. Phillips, and G. M. Marsh: Classification of Worker Exposures, Chemico-Biological Interactions, 166:245-253(2007)

N. A. Esmen (IHF), S. E. Lacey (IHF) and R. P. Hancock: The Role of Social Concerns in Public Health: The Journal of Royal Society for the Promotion of Health (Submitted)

N. A. Esmen (IHF), T. A. Hall, M. L. Phillips and G M Marsh, Chemical process based reconstruction of exposures for an epidemiological study: I. Theoretical and Methodological issues, Chemico-Biological Interactions, 166:254-263(2007)

N. A. Esmen, T.A. Hall, M.L. Phillips, E.P. Jones, H.Basara, G.M. Marsh, J.M. Buchanich, Chemical process based reconstruction of exposures for an epidemiological study: II. Estimated exposures to Chloroprene and Vinyl Chloride, Chemico-Biological Interactions, 166:264-276(2007)

T. A. Hall, N. A. Esmen (IHF), E. P. Jones, H. Basara, M. L. Phillips, G. M. Marsh, A. O. Youk, J. M. Buchanich, and R C. Leonard,, Chemical process based reconstruction of exposures for an epidemiological study: III. Analysis of Industrial Hygiene Samples Chemico-Biological Interactions, 166:277-284(2007)

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Yawei Wang, Qinghua Zhang, An Li (IHF), Hanxia Liu, Guogang Li, Guibin Jiang, Jingtian Hu. Polybrominated Diphenyl Ethers in Sewage Sludge of Wastewater Treatment Plants in China. Chemosphere, 68(9), 1683-1691, 2007

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Wilbur, J., Shaver, J., Buntin, M. Kogan, J., Wang, E. (2006). Menopausal transition symptoms in midlife women living with fibromyalgia and chronic fatigue. Health Care for Women International, 27(7), 600-614.

Occupational Medicine
Buchanan S, Krantz A, Klempner S, Alvarado R, Wesseling C, Fernandez E, Frost L. Use of a national reporting system for occupational injury in Costa Rica. Int Journal Occ Env Health 2006;12:142-146

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Irina Dardynskaia, Elena Lukyianova, Yuri Antipkin, Daniel Hryhorczuk, Zoreslava Shkiriak-Nyznyk, Natalia Chislovska, and Marta Matwyshyn-Fuoco. Prevalence of symptoms of bronchial asthma among children from three Ukrainian cities with unfavorable ecological; conditions (preliminary data). Lik. Sprava, February, 2007 (in press)

Monaghan P, Forst L, Harris C, Luque J, Bryant C. Evaluating a Community Health Workers Program among Hispanic Migrant Farm Workers. In review, 2007

Patel M, Williamson R, Dorevitch S, Buchanan S. Pilot Study Investigating the effect of the static mganetic field from a 9.4 Tesla MRI on the Vestibular System. AJOEM, In review.

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Presentations

Agricultural Health and Safety Academic
Morehouse, E., Reed, D., Aherin, R. (2006) Injury experiences of farm women over 50. 2006 proceedings of the National Institute for Farm Safety Annual Conference, Sheboygan, WI, June, 2006.

Industrial Hygiene
An Li (IHF) Final Report: Chronology of PBDE Air Deposition in the Great Lakes from Sedimentary Records. Invited Seminar, USEPA Region 5, Chicago. June 13, 2006.

An Li (IHF) Long Range Transport and In-Situ Degradation of PCBs in the Great Lakes. The 3rd International Symposium on Persistent Toxic Substances. Beijing, China. October 22-26, 2006.

Cali, Salvatore (IHF), An Investigation of an Outbreak of Rare Fungal Infections at a Dialysis Clinic, Platform Presentation at American Industrial Hygiene Conference, May 15, 2006

Cali, Salvatore (IHF), Peter Scheff (IHF), Rosemary Sokas (OMF), Use of the Superfund/Elutriator Method to Determine Asbestos Structure Concentrations in Beach Sand, Platform Presentation at American Industrial Hygiene Conference, May 17, 2006

Esmen, N., Lacey, S., et al. Validation of near-field vapour exposure prediction equations for unventilated chemical industrial processes. Abstract and presentation accepted for the British Occupational Hygiene Society Conference, Newcastle, UK, April 2006.

Lacey, S., Espinosa, R., et al. Development of a geospatial time dependent information system for industrial hygiene. Abstract and presentation accepted for the American Industrial Hygiene Conference and Exposition, Chicago, IL, May 2006.

An Li (IHF) PBDEs and PCBs in the sediments of the Great Lakes: Distributions, trends, influencing factors, and implications. Great Lakes Research: Environmental Issues for a Freshwater Ecosystem (CINF Division), 233rd American Chemical Society National Meeting, Chicago, IL, March 25-29, 2007

Cali (IHF),Salvatore, L. Porter-Thomas, P. Scheff (IHF), D. Tessier (IHF), L. Conroy (IHF): Exposure Assessment for Metals in a Police Department Firing Range while Using Different Types of Ammunition, platform presentation at AIHCe Conference, June, 2007, Philadelphia PA

Cali, Salvatore (IHF), Sara Wuellner, Peter Scheff (IHF). "Preliminary results: Time Series Analysis of Incidents and Complaints at Hartford, IL" Presentation at 2007 Region 5 – ATSDR/States Meeting, Oregon, IL, May 14 – 16, 2007

Pascal L and Tessier DM: 42th Annual Meeting of the Society of Toxicology, Salt Lake City, UT March 9-13. "Cytotoxicity and cytokine production in lung epithelial cells in vitro following chromium and manganese exposure." Poster No. 1443.

Occupational Medicine
Buchanan S. Reproductive Hazards in the Workplace. Oral presentation at Chicago Medical Director's Club, December 4, 2006

Dorevitch S. American Public Health Association, Boston, MA. Science, Politics and Air Quality Policy. November, 2006

Dorevitch S. American Thoracic Society International Conference, San Diego, CA. Elemental and organic carbon in PM2.5 are associated with exhaled nitric oxide and exhaled carbon monoxide in inner-city asthmatics. May, 2006

Dorevitch S. American Thoracic Society International Conference, San Diego, CA. Exhaled carbon monoxide in inner-city asthmatics is associated with ambient ozone concentrations two days earlier. May, 2006

Dorevitch, S. May, 2006, American Thoracic Society International Conference, San Diego, CA. Elemental and organic carbon in PM2.5 are associated with exhaled nitric oxide and exhaled carbon monoxide in inner-city asthmatics

Duvall K. Conference Coordinator and Presenter, "Art Classroom Health and Safety for Art Educators" Springfield, IL April 4, 2006

Eric Frumin, MA, Joan Moriarty, MS, Pamela Vossenas, MPH, John Halpin, MD, MPH, Peter Orris, MD, MPH, Niklas Krause, MD, PhD, MPH Laura Punnett, Sc.D.,Workload-Related Musculoskeletal Disorders among Hotel Housekeepers: Employer Records Reveal a Growing National Problem, Presented to the NIOSH national NORA symposium, April, 2006

Forst L, Zanoni J. Eye Injuries in Latino Farm Workers. Poster Presentation. Immigration Conference. University of Illinois at Chicago. April 2006

Forst L. Presenter. Eye Injuries in Latino Farm Workers. National Farm Medicine Center, Marshfield Clinic, Wisconsin. March 2006

Halpin J (OMR), Buchanan, S., Orris P., Hotel Housekeeper Injuries: Analysis In The Face Of Incomplete Data, (Abstract) International Commission on Occupational Health, Milan, Italy June 2006

Halpin J (OMR), Orris P."Occupational Burn Injury in an Acute Care Clinic", abstract submitted to the Annual AOHC meeting in May, 2006.

Halpin J (OMR), Orris, P."Hotel Housekeeper Injuries: Analysis In The Face Of Incomplete Data", abstract accepted for presentation at the Annual ICOH meeting in June, 2006.

Halpin J (OMR). Presentation to the University of Illinois Department of Internal Medicine, Grand Rounds presentation, "Clinical Aspects of Avian Flu from an Occupational Health Perspective." January, 2006.

Halpin J. Presentation to the University of Illinois Department of Internal Medicine, Grand Rounds presentation, "Clinical Aspects of Avian Flu from an Occupational Health Perspective." January, 2006.

Halpin, J (OMR) and Orris P: Musculoskeletal Disorders among Hotel Housekeepers: Employer Records Reveal a Growing National Problem, Presented to the NIOSH national NORA symposium, April, 2006

Halpin, J., Buchanan, S., Orris P., Hotel Housekeeper Injuries: Analysis In The Face Of Incomplete Data, (Abstract) International Commission on Occupational Health, Milan, Italy June 2006

Karandikar A (OMR)., Sokas R., Occupational Dermatitis: Controlling Dermal Exposures at the Workplace OSHA Safety Day: Safety and Health Conference, Sugar Grove, IL March 16, 2006

Karandikar A. (OMR), Sokas R., Your Lungs, Your Work, Your Life: What You should know about Work-Related Asthma OSHA Safety Day: Safety and Health Conference, Sugar Grove, IL March 16, 2006

Karandikar A., Sokas R., Occupational Dermatitis: Controlling Dermal Exposures at the Workplace OSHA Safety Day: Safety and Health Conference, Sugar Grove, IL March 16, 2006

Karandikar A., Sokas R., Your Lungs, Your Work, Your Life: What You should know about Work-Related Asthma OSHA Safety Day: Safety and Health Conference, Sugar Grove, IL March 16, 2006

Krantz A. “Work-Related Asthma: What the practitioner needs to know”: Illinois Department of Public Health/Illinois Public Health Association “Beat Asthma In Illinois” Conference, Decatur, Illinois, October 18, 2006

Orris, Peter, DDT-Malaira: When a Debate is not a Debate, 11th World Congress on Public Health/8th Brazillian Congress on Collective Health, August 23. 2006, Rio de Janeiro, Brazil

Orris, Peter: Asbestos, Health, Environment and Justice: Cancer and the Environment, and the International Legislative Protection of Ecosystems, An International Web Conference of the International Academy of Environmental Sciences, Venice, Italy, November 23, 2006

Sokas, Rosemary. "Trainers' Evaluation of the SmartMark Curriculum for the OSHA 10-hour Course", APHA, Philadelphia, 12/12/06.

Sokas, Rosemary. Presentation. "Vulnerable Working Populations: A Framework", SOTAC, Chicago, 10/30/06

Buchanan S. Blood Lead Levels in Chicago Day Laborers Performing Demolition. Presentation at American Industrial Hygiene AIHce Conference, Philadelphia, Pennsylvania. June 2007

Halpin J (OMR), Buchanan, S., Orris P., Hotel Housekeeper Injuries: Analysis of OSHA mandated Injury Log Data II Congreso Salud Del Trabajo, Havana, Cuba, March, 2007

Halpin, J., Buchanan, S., Orris P., Hotel Housekeeper Injuries: Analysis of OSHA mandated Injury Log Data II Congreso Salud Del Trabajo, Havana, Cuba, March, 2007

Krantz A., L. Sadowski, Anderson, J. Wuellner, and P. Blanc. Work Disability in Low-Income Asthma Patients. American Thoracic Society International Conference, San Francisco, May 20, 2007
Orris, P Neurotoxicity and Safer Substitution of Mercury in Health Care, II Congreso Salud Del Trabajo, Havana, Cuba, March, 2007

Orris, P. Occupational Medicine Residency Training in the US: UIC/CCH Experience, 3rd Postgraduate Conference On Occupational Health, Cartagena, Colombia, May 27-8, 2007

Cohen (OMF), R., “Panelist – Concencus Conference on Guidelines for Diagnosis, Treatment, and Rehabilitation of Black Lung Disease” U.S. Department of Health and Human Services, Health Resources and Services Administration. January 29-30th, Bethesda, Md.

Cohen (OMF), R., “Pulmonary Function Testing – Sixteen Hour Review Course” State of West Virginia Black Lung Clinics Program, May 11-12, Scarbro, West Virginia.

Cohen (OMF), R., Course Director - NIOSH Spirometry Course. Chicago, Illinois. October 10-11th. Chicago Illinois

Occupational Safety
Buchanan S. “Overuse Musculoskeletal Disorders.” presented to UIC engineering students September 2006.

Appendix B: Interdisciplinary Seminar Schedule

	Fall 2006	
08/30/06	Welcome and Introduction to Illinois Education and Research Centers	Lorraine Conroy
09/06/06	Sedimentation in the Laurentian Great Lakes as Determined by Alpha Spectroscopy	Justin Ford
09/13/06		
09/20/06	Electromagnetic field exposure in Non-destructive testing	Julia Lippert
09/27/06	Brownfields and Public Health	Laurel Berman
10/04/06	Asbestos Litigation	Daniel O'Connell
10/11/06	Dean's Forum: Youth, Violence, and Social Justice: An Ecological Approach	Dr. William Ayers
10/18/06	Domestic Violence and the Workplace	Sarah Katula
10/25/06	Folk Remedies and Public Health	Salvatore Cali
11/01/06	Movie- Those Who Know Don't Tell: The Ongoing Battle for Worker's Health and Follow up Discussion	Leslie Nickels
11/08/06	Health and Safety Among South African Miners	Todd Schoonover, EOHS
11/15/06	Dean's Forum: Hospital Readiness for the Pandemic Flu	William Chamberlin, MD. and John J. DeNardo, MPH, FACHE
11/22/06	Movie: Influenza 1918, The Worst Epidemic in US History and follow up discussion	Lorraine Conroy
11/29/06	Occupational Hazards Among Chicago Day Laborers	Susan Buchanan, MD, MPH
	Spring 2007	
01/17/07	Special Session: Training Grant Program Evaluation	Lorraine Conroy, ScD, CIH
01/24/07	Health Disparities and Water Resources	Sylvia Hood Washington, PhD
01/31/07	MAPK Activation in Human Bronchial Epithelial Cells In Vitro Following Exposure to Mild Steel Welding Fumes	Bogdan Catalin (trainee)
02/7/07	No Seminar	
02/14/07	Dean's Forum: Implications of the "War on Terrorism" for Public Health	Barry S. Levy, MD, MPH
02/21/07	NORA Seminar Series: Occupational Safety and Health Issues for Day Laborers in Seattle	Noah Seixas, PhD
02/28/07	Occupational Health Issues in Disaster Response	Michelle Watters, MD, PhD, MPH
03/7/07	Dean's Forum: U.S. Policy on Multilateral Environmental Agreements on Chemicals Management	David E. Brown, MBA
03/14/07	OSHA Overview	Bill Coulehan, Compliance Assistance Specialist, OSHA
03/21/07	Formula for Disaster: Investigation of chemical plant security.	PBS NOW program hosted by David Brancaccio
04/04/07	Current Issues in Asbestos Disease Epidemiology	Leslie Stayner, PhD
04/11/06	Dean's Forum: Global Warming and Its Impact on Public Health	Jonathan Patz, MD, MPH
04/18/06	NORA Seminar Series: Acute and Chronic Poisoning from Exposure to Chlorpyrifos Impregnated in Plastic Bags for Use on Banana Plantations	Inike Wessling, PhD
04/25/07	An Epidemiologic Study of the Role of Asbestos Fiber Dimensions inDetermining Respiratory Disease Risk in Exposed Workers	Leslie T. Stayner, PhD,
05/02/07	Review of the article "Occupational Medicine Physicians in the United States: Demographics and Core Competencies," published by Baker, et al, in the current issue of the Journal of Occupational and Environmental Medicine	Samuel Dorevitch, MD, MPH

A Program Title: Pilot Projects Research Training

B Program Director: Rosemary Sokas, MD, MOH

C Program Description:

The purpose of the Illinois ERC Pilot Project Research Training Program (PPRTP) is to encourage new investigators to develop research careers that will address the priority areas described by the National Occupational Research Agenda (NORA).

The PPRTP uses a peer-reviewed process to competitively award funding to PhD candidates, post-doctoral fellows, junior faculty (assistant or associate professor level with less than 10 years of prior occupational health research experience) and senior faculty who are new to the field of occupational health. A formal mentorship requirement was added in 2005 and must now be demonstrated in the application.

The research training objectives of this program are to:

1) Develop research expertise and capacity in new investigators entering the field of occupational safety and health; and
2) Encourage established investigators from other fields to apply their expertise to NORA occupational safety and health topics.

This program provides extramural research funding for occupational safety and health. The funding is used to generate pilot data that can be developed into peer-reviewed publications and to more formal extramural grant applications that are critically important for career development. The experience gained by the applicants, geared towards preparing them for future extramural grant applications, is extremely important, as is the feedback provided through the rigorous review process. However, it is ultimately the relatively high success rate afforded by the program that engenders the enthusiasm required to sustain the intellectual enterprise.

The PPRT program also contributes to a high standard of responsible conduct in science training by requiring a high level of review for human subjects and other restricted research.

This program provides an opportunity for new researchers to:

- Learn how to develop their ideas into competitive proposals;
- Plan research time lines, budgets, and task completion;
- Perform their own research under the supervision of a mentor;
- Develop presentations, posters, and publications from the results of their own research;

Develop new proposals for expanded research based on their original findings.

D. Program Activities and Accomplishments

The program collaborated with the University of Iowa's TPGs, until that institution established its own Education and Research Center in 2002. Nancy L. Sprince, MD, MPH, a Professor of Occupational and Environmental Health and Internal Medicine at University of Iowa College of Public Health, served on the Research Committee during its first years. Richard Steffen, PhD, Associate Professor in the Agriculture Department at Illinois State University and Dr. Robert Aherin, Professor in the College of Agricultural, Consumer, and Environmental Sciences and is the Director of the Agricultural Safety and Health Program at UIUC provide a strong agricultural safety vision to the committee.

Outreach to the local TPGs resulted in two proposals received from the TPGs at Purdue University in Indiana and University of Wisconsin-Stout, which were successful in the competitive review and received awards. The award at Purdue was withdrawn by the PI for internal reasons.

The PPRTP has also reached out to other institutions, including successful awards to the University of Iowa and the Department of Physical Therapy at Marquette University and the Department of Occupational Therapy at the University of Wisconsin-Milwaukee.

Outreach has included all Divisions within the UIC School of Public Health, all Colleges in UIC, as well as the two additional campuses within the University of Illinois system. Pilot grants have been awarded to investigators in Community Health Sciences, Epidemiology/Biostatistics, Applied Health Sciences, Pharmacy, and the Biological Resources Laboratory. Awards were also made to the Agricultural and Biological Engineering Department at the University of Illinois Urbana-Champaign, in addition to awardees in the Illinois ERC, including industrial hygiene, occupational health nursing and occupational medicine trainees as well as faculty members. In addition to enhancing the research capacity of the principal investigators, these awards funded graduate students at the Master's and Doctoral levels to work as Research Assistants on the research projects, amplifying the impact of the research training.

On April 21, 2004, Illinois ERC hosted a symposium of nine presentations by NIOSH funded Pilot Project Research Training Grantees, with the participation of the Heartland Center for Occupational Health & Safety at the University of Iowa. The Heartland Center presenters participated via televised distance conference technology. Twenty-six persons attended the symposium at UIC. The symposium generated a great deal of interest from participants and served to highlight the research training opportunities offered by the PPRT program. Plans are currently underway to schedule a second NORA pilot project research symposium for Spring, 2008, to highlight recently completed projects and to encourage follow-up grant applications, with a particular focus on the relationship between the pilot project and subsequent career development (K award) or formal pilot project (R-03) award applications. The addition of the Illinois Public Health Research Fellowship to UIC SPH has enhanced the mentoring capabilities of UIC faculty and has overall increased interest in research career development.

The program has demonstrated a continuous, steady increase in the project outcomes after project completion. In general, the number and quality of applications submitted are increasing, with minor variation in numbers that may be based on funding rates for the preceding year.

E. Program Products

The PPRTP program at UIC is currently in its ninth year of funding (as of FY 2008). Including the funding expected for FY2008, to date, 43 awards have been given to fund 39 projects since the inception of the ERC Pilot Project Research Training Program in 1999 (FY2000). Two of these awards were withdrawn by the PIs, and one award failed to obtain human subjects protection approval from NIOSH for an international research project.

Funded projects have helped support twenty (20) junior faculty, one post-doctoral fellow, eight (8) PhD student principal-investigators, and thirty (30) student research assistants for one semester or more. The projects have generated six (6) subsequent grant proposals based on the pilot project research findings, four (4) of which were successfully funded, twenty-five (25) presentations at regional or national meetings, thirteen (13) reports/abstracts/posters or papers, and fifteen (15) peer-reviewed publications. Four (4) Pilot Projects received supplementary funding from other sources and fifteen (15) resulted or are expected to result in findings used toward MS or PhD theses.

A summary of this information is available in Table 5.

The PPRT program tracks the history of PPRT research that leads to other research projects through the quantitative assessment presented in the section above and in a less direct manner by following the growth of the original projects into even more interesting lines of study.

The pilot funds have directly resulted in two successful research career awards; in each case, the pilot awards encouraged a series of intermediate outcomes first. The "Immunologic Risk Factors for Laboratory Animal Allergen" study was initially funded in July, 2001. Since that time, the project has developed from a relatively small project involving a single investigator to a series of projects involving several other departments and investigators. Two veterinarians at UIC became interested in allergen and irritant levels in the animal research facility studied in the original project. Investigations have been conducted in which mouse and rabbit allergen concentrations, as well as total dust and airborne endotoxin have been measured. One of these projects was the basis of a research study by a veterinary medicine trainee, and another was the basis for a masters degree thesis by an industrial hygiene trainee. An intervention study that employed a relatively low-cost engineering control of allergen level exposure to workers at the facility has also been performed. In addition, a PhD student in immunology and another masters degree student participated in a study of in vitro responses of lymphocytes of workers in the same facility. The research plan from the original project led to the development of a proposal for a successful NIH K08 award of $584,886 in direct funds.

Another example is of a continuation of a PPRTP line of inquiry is a group of studies related to welding and welding fume exposure health outcomes. Initial funding from the PPRT program allowed the construction and testing of a welding fume exposure chamber. The subsequent studies focused on a number of aspects of welding work, including laboratory characterization of welding fume and emission, occupational exposures, exposures to artist-welders, and studies of the mechanisms of metal exposures on lung epithelial cytotoxicity. The investigator for the initial study received federal funding for a NIOSH K01 career development award of $240,237 for a study of welding fume characterization and deposition. Four MS theses were generated from related studies, while another PPRTP welding study generated data used for the investigators' PhD thesis.

F. Future Plans

New program evaluation procedures that will be included for the future include: Additional quantitative tracking of the summary scores over time for all applicants to review as potential predictors of other products, and conduct of brief follow-up phone interviews for both the successful and the unsuccessful applicants for process evaluation one year after the application process.

The PPRTP Appendix that follows includes:

- Table 1: A summary of Pilot Project (PPRT) Applications and Awards by institution
- Table 2: A summary of funded projects by fiscal year that the projects were funded
- Table 3: A summary of all proposals received and funded or not funded by year and institution
- Table 4: A list of all reported manuscripts generated from the PPRT Program awards
- Table 5: Summary of Program Products
- Table 6: All Pilot Projects

Table 1: Breakdown of Institutional Pilot Project (PPRT) Applications and Awards

	# of applicants	# funded	% with successful awards
Total	64	43	67.2%
Within ERC	42	30	71.4%
Within UIC	46	33	71.7%
Outside UIC and ERC	12	7	58.3%

Table 2: Pilot Project (PPRT) Applications and Awards

Fiscal Year	Applications	Awards	Available Award Funds
2000	7	4	$43,840
2001	4	3	$43,468
2002	5	5	$74,533
2003	5	4	$66,311
2004	10	5	$63,244
2005	11	5 (4)*	$66,795 ($50,894)*
2006	5	5*	$79,139*
2007	8	7 (5)**	$58,750**
2008	9	5	$59,975
Totals: 9 years	64	43 (40)	$540,154

Notes:
*One FY 2005 proposal awarded $15,901was later withdrawn by the PI. These funds were carried over to FY 2006 for award.
**One FY 2007 proposal awarded $2,854 was later withdrawn by the PI, and one proposal awarded $4,439 did not receive IRB approval from NIOSH. These funds were carried over to 2008 for award.

Table 3: Application Title, PI, and Institution of all PPRT Applications Received

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
FY 2000					
Teacher Assaults: Risk Factors and Compensation Costs	Pamela Levin, Faculty	UIC Dept. of Public Health, Mental Health, and Administrative Nursing	Factors Affecting Seeking and Use of Health Risk Information	Andrew Garman, Faculty	Rush University, Health Systems Management
An Exposure Assessment Method to Simulate Coughing in a Workplace	John Franke, Faculty	UIC Environmental & Occupational Health Sciences	Ergonomic Evaluation as an Intervention in the Sheet Metal Trade	Chris Zimmerman, Faculty	Concordia University, Wisconsin, Physical Therapy
An Analysis of the Prevalence, Cause, and Cost of Injury to Fire Fighters	Surrey Walton, Faculty	UIC College of Pharmacy	Truck Drivers' Health, Health Barriers, & Health Environment	Debby A. Renner, PhD Student	University of Iowa, College of Nursing
Intelligent Safety Sensing and Controls for Off-road Equipment	Qin Zhang, Faculty	UI-Urbana/Champaign Department of			

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
		Agricultural Engineering			
FY 2001					
Human Exposure to a Mixture of Dust and Ammonia	Patrick T. Shaughnessy, Faculty	U. of Iowa, Dept. of Occupational and Environmental Health	Development and Pilot Testing of a Questionnaire to Study Lower Back Pain in Nurses	George Byrns, Faculty	Illinois State University, Dept. of Health Sciences
Intelligent Safety Sensing and Controls for Off-road Equipment	Qin Zhang, Faculty	UI-Urbana/Champaign Department of Agricultural Engineering			
Occupational Lung Disease in Ukrainian Coal Miners	Robert Cohen, Faculty	UIC Environmental & Occupational Health Sciences			
FY 2002					
Occupational Lung Disease in Ukrainian Coal Miners	Robert Cohen, Faculty	UIC Environmental & Occupational Health Sciences			
Immunologic Risk Factor for Laboratory Animal Allergy	Samuel Dorevitch, Faculty	UIC Environmental & Occupational Health Sciences			
Enhancing the Detection of PAH Metabolites	An Li, Faculty	UIC Environmental & Occupational Health Sciences			
Investigation of Sampling Performance of Thoracic Size-selective Sampling	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences			
Characterization and Modeling of Dust Exposures at an Agricultural Facility	Steve Lacey, Research Trainee, PhD candidate	UIC Environmental & Occupational Health Sciences			
FY 2003					
Source Apportionment of PAHs in Chicago Residence Homes	An Li, Faculty	UIC Environmental & Occupational Health Sciences	Impact of Development on Occupational Health & Safety in Micro Firms	Debby Mir, Senior Research Associate	UIC College of Urban Planning & Public Administration

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
Study of the Effect of Welding Processing Parameters on Fume Composition and Emission Rate	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences			
Mechanisms of Lung Epithelial Cytotoxicity due to Metal Exposure	Daniel Tessier, Faculty	UIC Environmental & Occupational Health Sciences			
Immunologic Risk Factor for Laboratory Animal Allergy	Samuel Dorevitch, Faculty	UIC Environmental & Occupational Health Sciences			
FY 2004					
Adaptive Tractor Overturn Prediction System (ATOPS)	Tony Grift, Faculty	UI-Urbana/Champaign Department of Agricultural Engineering	The Impact of the Organization of Police Work on Morbidity	David Marder, Faculty	UIC University Health Services
Laboratory Animal Allergen Production and Transport in a Working Animal Research Facility	James Artwohl, Academic Staff	UIC Biological Resources Laboratory	Prevalence and Risk Factors for Wheezing Among 6 & 7 yr old Children in Ukraine	Marta Matwyshyn, Student	UIC Environmental & Occupational Health Sciences
Pesticide Toxicity to Lung Epithelium as a Factor in Chemically-Induced Asthma	Daniel Tessier, Faculty	UIC Environmental & Occupational Health Sciences	Farm Injuries, Chronic Diseases, and Health Status of Farmers	Shannon Lizer, Faculty	UIC Dept. of Public Health, Mental Health, and Administrative Nursing
Effectiveness of Standing Conditions in Reducing Fatigue & Discomfort	Stephanie Opel, Graduate Research Student	University of Wisconsin, Milwaukee	Characterization and Quantification of Food Processing Work Environments	Kurt A. Rosentrater, Faculty	Northern Illinois University, Department of Engineering Technology
Enhancing the Detection of PAH Metabolites	An Li, Faculty	UIC Environmental & Occupational Health Sciences	Testing and Validation of an Exposure Chamber	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences
FY 2005					
Comparison of the prevalence of sensitization to common allergens in workers exposed and unexposed	Leslie M. Tharenos, Resident Physician	UIC Environmental & Occupational Health Sciences	Occupational Safety Beliefs and Behaviors in Latino Day Laborers	Susan Buchanan, Faculty	UIC Environmental & Occupational Health Sciences

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
to animal allergens					
Assessment of Exposure of Artist Welders to Welding Fumes	Laurel Berman, PhD candidate	UIC Environmental & Occupational Health Sciences	Characterizing Exposure to ergonomic risk factors in physical therapy	Kathleen Rockefeller, PT, ScD, MPH, MS	UIC College of Applied Health Sciences
Risk factors associated with trunk musculoskeletal disorders in female flight attendants	Hyeonkyeong Lee, PhD candidate, MS, RN	UIC College of Nursing Public Health, Mental Health, and Administrative Nursing	Assessing the Environmental Fate and Potential Human Exposure of PBDEs in the Great Lakes Region	Wenlu Song, PhD Candidate	UIC Environmental & Occupational Health Sciences
NON-CHOLINERGIC EFFECTS OF CHLORPYRIFOS ON LUNG EPITHELIUM	Daniel M. Tessier, Assistant Professor	UIC Environmental & Occupational Health Sciences	Congerner specific PCB analysis for IH air samples	William Mills, Adjunct Faculty	UIC Environmental & Occupational Health Sciences
Effect of Occupational Exposure to Welding Particulates on Autonomic Heart Regulation*	Frank Rosenthal, Associate Professor for Brent L. Yeagy, PhD Candidate	Purdue University School of Health Sciences	TESTING AND VALIDATION OF AN EXPOSURE CHAMBER for PARTICULATE MATTER EMISSION AND EXPOSURE STUDIES	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences
			Chronic Disease, Perceived Health, and Farm Injury In Older Illinois Farmers	Shannon Lizer, Faculty	UIC Dept. of Public Health, Mental Health, and Administrative Nursing
FY2006					
Welding Fume Exposure Characterization Methods	Todd Schoonover, PhD candidate	UIC-SPH, EOHS			
Exposure to ergonomic risk factors in physical therapy	Kathleen Rockefeller, PT, ScD, MPH, MS	UIC College of Applied Health Sciences			
Risk Assessment of health outcomes in workers with past	Irina Dardynskaia	UIC-SPH, EOHS			

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
exposure to dioxins in UFA Russian Federation (pilot phase)					
Workers' Centers Role in Accessing Occupational Health Services	Leslie Nickels	UIC-SPH, EOHS			
QUANTIFICATION OF MUSCULOSKELETAL LOADING AND ITS SUBJECTIVE PERCEPTION IN THE HEALTH CARE PROFESSION	John Dzissah PhD	Department of Industrial Management, University of Wisconsin–Stout			
FY2007					
Biomechanical Analysis of Performing Ultrasounds*	Darcie Olson, Project Assistant	University of Wisconsin - Milwaukee Occupational Therapy	Airborne Pollutant Dispersion Characteristics in Working Environments	Aijun Wang, PhD Candidate	University of Illinois at Urbana-Champaign Agricultural and Biological Engineering
Evaluate Occupational Exposure to Contaminants in Truck Cabins	Xinlei Wang, Assistant Professor	University of Illinois at Urbana-Champaign Ag. and Bio. Engineering			
Shift rotation and risk of acute injury among healthcare workers	Douglas J. Myers, Postdoctoral Research Fellow	Duke			
Demonstrating Effectiveness of Informed Informal Interaction	Joseph Zanoni, PhD Student	UIC College of Education, Curriculum and Instruction			
Occupational Surveillance in Illinois: A Pilot Project Using Work Comp Data	Lee Friedman (Previously Ben-Michael), PhD Candidate	UIC, SPH, EOHS			
Nasopharyngeal Cancer and Occupation in Chengdu, China**	Francis Song, MD, Occupational	University of Illinois at Chicago Occupational			

FUNDED PROPOSALS			PROPOSALS NOT FUNDED		
Project Title	Principal Investigator	Institution	Project Title	Principal Investigator	Institution
	Medicine Resident	Medicine			
Association of H. pylori IgG antibodies and allergic sensitization	Linda Rosul, PhD Student	UIC School of Public Health Epidemiology and Biostatistics			
FY2008					
Cognitive Stress, Mental Attentiveness and Muscle Fatigue	PI: Sandra K. Hunter, PhD, Assistant Professor	Marquette University Physical Therapy	Characterization of heated metalworking fluid aerosol	PI: Chirag Patel, PhD Candidate	Univ. of IL.-Chicago School of Pub. Health, Environmental and Occup. Health Sci.
Biological Exposure Assessment in a Brain Cancer Case-Control Study	PI: Jo Anna M. Shimek, PhD Candidate	University of Illinois at Chicago, EOHS	Role of Medical Interpreters in Traumatic Occupational Injuries	PI: Deborah Masters, Masters Candidate	University of Illinois at Chicago, College of Nursing – Dept of PMA
Occupational Hazard and Injury Surveillance in Chicago Temporary Agency workers	PI: Susan Buchanan, Residency Director	Univ. of Illinois at Chicago, Occupational Medicine	Collecting and Translating Incident and Injury Data in the Horseracing Industry	PI: Karin J. Opacich, PhD,MHPE, OTR/L, FAOTA, Project EXPORT Director	University of Illinois-Rockford, National Center for Rural Health Professions
Falls Prevention among Home Care Workers in Illinois: Needs Assessment	PI: Naoko Muramatsu, Associate Professor	UIC SPH, CHS Community Health Sciences	VPTV TECHNIQUE FOR MEASURING THE EXHALED DROPLET MOVEMENTS	PI: Yigang Sun, Senior Research Engineer	University of Illinois at Urbana-Champaign Agricultural and Biological Engineering
Work and Adaptation Experiences of Registered Nurses from the Philippines	PI: Jorgia Briones Connor, PhD Candidate	University of Illinois at Chicago, College of Nursing			
Counts	43		21		
* Investigator withdrew project after award					
**IRB Application declined by NIOSH account foreign research					

Table 4: Reported Pilot Project Research Training Manuscripts

Levin, P.F., Martinez, M.Q., Walcott-Mcquigg, J., Chen, S.P., Amann, M., & Guenette, C (in press). Teacher Assault Injuries and Related Compensation Costs. AAOHN Journal
Walton, SM, Conrad, KM, Furner, SE and Samo, D, "Cause, Type, and Cost of Injury to Fire Fighters" American Journal of Industrial Medicine, 2003; 43(4): 454-458
Guo, L., Q. Zhang, and S. Han, 2002. Agricultural machinery safety alert system using ultrasonic sensors. Journal of Agricultural Safety and Health, 8(4): 385-396
O'Shaughnessy PT, Mehaffy JM, Watt J, Sigurdarson S, Kline JN. Characterization of a hooded exposure apparatus for inhalation of gases and aerosols. Am Ind Hyg Assoc J, 1:161-166, March 2004
Sigurdarson ST, O'Shaughnessy PT, Watt JA, Kline JN. Experimental Human Exposure to Inhaled Grain Dust and Ammonia: Towards a Model of Concentrated Animal Feeding Operations. Am J Ind Med. 2004 Oct;46(4):345
Lacey, S., Conroy, L., L. Forst, J. Franke, R. Wadden, D. Hedeker. Personal dust exposures at a food processing facility. J Agromedicine, 11:49-58 (2006)
An Li, Todd M. Schoonover, Qimeng Zou, Felice Norlock, Lorraine M. Conroy, Peter A. Scheff, and Richard A. Wadden. Polycyclic Aromatic Hydrocarbons in Residential Air of Ten Chicago Area Homes: Concentration Levels and Influencing Factors. Atmospheric Environment, 39(19), 3491-3501, 2005
Philip Bzdusek, Erik R. Christensen, An Li, Qimeng Zou. Source Apportionment of Sediment PAHs in Lake Calumet, Chicago: Application of Factor Analysis with Nonnegative Constraints Environ. Sci. Technol. (accepted)
L.E. Pascal, D.M. Tessier. Activation of MAP kinases in human lung epithelial cells by selected metals. In Preparation
L.E. Pascal, D.M. Tessier. Mechanism of death in lung epithelial cells following metal exposure. In Preparation
X. Wang, D.M. Tessier. Activation of MAP kinases in human lung epithelial cells by the organo-phosphate insecticide chlorpyrifos. In Preparation
Lee, H.K., Wilbur, J., Conrad, K., & Miller, A. A focus group as A final step in preparation for a survey to examine risk factors associated with work-related musculoskeletal disorders in flight attendants. AAOHN Journal (Submitted)
Dorevitch, Samuel MD, MPH; Tharenos, Leslie MD, MPH; Demirtas, Hakan PhD; Persky, Victoria MD; Artwohl, James DVM; Fortman, Jeffrey D. DVM, Inverse association between rural environment in infancy and sensitization to rodents in adulthood, Annals of Allergy, Asthma, & Immunology, Volume 98(5), May 2007, pp 440-446

Table 5: Summary of Program Products

	Totals all awards to date
Projects Funded to Date	43
Awardee Institutions/ Departments	• University of Illinois at Chicago/Dept. of Public Health, Mental Health, and Administrative Nursing • University of Illinois at Chicago/Division of Environmental & Occupational Health Sciences • University of Illinois at Chicago/College of Pharmacy • University of Illinois at Urbana/Champaign Department of Agricultural Engineering • University of Iowa/Dept. of Occupational and Environmental Health • University of Wisconsin-Milwaukee/ Department of Occupational Therapy • Purdue University/School of Health Sciences • University of Illinois at Chicago/College of Applied Health Sciences • University of Illinois at Chicago/Biological Resources Laboratory • University of Wisconsin–Stout/Department of Industrial Management • University of Illinois at Chicago/Division of Epidemiology • University of Illinois at Chicago/College of Education, Curriculum and Instruction • Marquette University/Physical Therapy • University of Illinois at Chicago/Community Health Sciences
Total Amount of Awards	$540,154
# of projects involving Student Funding	17
# students funded	29.5
# proposals generated	6
# additional funding generated	4
# presentations given	25
# of reports/abstracts/posters/papers generated	13
# publications generated	15
# of awards receiving supplemental funding	4
# of findings/data toward degree	15

Table 6: Summary of Pilot Project Research Grant Awards

Pro-ject #	Project Title	Principal Investi-gator	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes: Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
2000-01	**Teacher Assaults: Risk Factors and Compensation Costs**	Pamela Levin, Faculty	UIC Dept. of Public Health, Mental Health, and Administrative Nursing	4/00-6/01	$13,697.00	UIC Expedited initial & continuing review; Mar 3, 2000 & Mar 3, 2001; Protocol #H-2000-0098	Traumatic Occupational Injuries	One MPH candidate, funded 2 semesters; One DrPH candidate funded, 1 semester.	2	The data collection tool and approach was used in a grant application titled: Workplace violence and problem drinking among nurses. National Institute on Alcohol Abuse and Alcoholism, 1 R01AA015779-01, 2005-2010. Not scored			A report was provided to Human Resources at the Chicago Public Schools	Levin, P.F., Martinez, M.Q., Walcott-Mcquigg, J., Chen, S.P., Amann, M., & Guenette, C (in press). Teacher Assault Injuries and Related Compensation Costs. AAOHN Journal.	Project funding was supplemented by funding obtained from the UIC Great Cities Faculty Seed Fund.		
										Nurses experience with workplace harassment: A feasibility study. Rush University College of Nursing Research Resource Fund.2004-2005	Nurses experience with workplace harassment: A feasibility study. Rush University College of Nursing Research Resource Fund, 2004-2005		Poster presentation was given March, 2001 at the Midwest Nursing Research Society Meeting, Cleveland, OH				
													Poster presentation: Levin, P.F., Quigley, M., Walcott-McQuigg, J., Chen, S.P., Amann, M., & Guenette, C. (2004, November). Teacher assault injuries. Meeting of the American Public Health Association, Washington, DC. and Rush University Forum for Research and Clinical Investigation (2005, April)., Chicago, IL.				
													Levin, P.F., Quigley, M., Walcott-McQuigg, J., Chen, S.P., Amann, M., & Guenette, C. (2004, October). Compensation costs related to teacher assault injuries. Poster presentation at the National Congress of the State of the Science in Nursing Research, Washington, DC				
2000-02	**An Exposure Assessment Method to Simulate Coughing in a Workplace**	John Franke, Faculty	UIC Environmental & Occupational Health Sciences	11/99-4/02	$13,550.00	N/A	Exposure Assessment Methods; Infectious Diseases; Indoor Environment										
2000-03	**An Analysis of the Prevalence, Cause, and Cost of Injury to Fire Fighters**	Surrey Walton, Faculty	UIC College of Pharmacy	12/99-11/00	$8,400.00	N/A, Feb 1, 2000; Registered as research involving 'persons' but not 'human subjects'	Social & Economic Consequences of Workplce Illness & Injury	One research assistant, @ 50%, one semester	1			Walton, SM, Conrad, KM, Furner, SE and Samo, D, "Analysis of the Cause, Type, and Cost of Injury to Fire Fighters", IRMA Coffee & Conversation, Fitness and Wellness, Where Do You Begin?; Chicago, IL; September, 2000.		Walton, SM, Conrad, KM, Furner, SE and Samo, D, "Cause, Type, and Cost of Injury to Fire Fighters" American *Journal of Industrial Medicine, 2003; 43(4): 454-458.*			
												Conrad, KM, Reichelt, PA, Lavender S, Walton SM, Reducing Musculoskeletal Injuries in the Fire Service: Getting from There to Here", Chicago Area Health Services Research Meeting, Chicago, IL, May 2003.					
2000-04	**Intelligent Safety Sensing and Controls for Off-road Equipment**	Qin Zhang, Faculty	UI-Urbana/Champaign Department of Agricultural Engineering	4/00-6/01	$8,193.00	N/A	Control Technology & PPE	One graduate student @ 30%, one year, and one Ph.D. candidate, was partially funded by this project	1.25	NIOSH research grant proposal, *Intelligent Shared-control Safety Protection Technology for Mobile Agricultural Machinery*		Oral presentation at 2001 ASAE Annual Meeting, Sacramento, CA, July, 2001	Guo, L. S., Q. Zhang, and S. Han, 2001. Safety Detecting System using ultrasonic sensors, ASAE Paper 01-3135, ASAE, St. Joseph, MI.	Guo, L., Q. Zhang, and S. Han, 2002. Agricultural machinery safety alert system using ultrasonic sensors. *Journal of Agricultural Safety and Health* , 8(4): 385-396.			

Pro-ject #	Project Title	Principal Investigator, Other	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
Total FY 2000:	**4**				**$43,840.00**			**3**	**4**	**3**	**1**	**3**	**5**	**3**	**1**	**0**	**0**
2001-01	**Human Exposure to a Mixture of Dust and Ammonia**	Patrick T. Shaughnessy, Faculty	U. of Iowa, Dept. of Occupational and Environmental Health	7/00-6/01	$15,518.00	Ulowa Full Board Review & Continuing Review; Oct 9, 2000 & Oct 9, 2001, ID #200007075	Asthma & Chronic Pulmonary Disease	One research assistant, @ 50% for one semester	1		"Exposure of Grain Dust and Ammonia to Asthmatic Subjects: A CAFO Model" Sigurarson ST, Kline, JN, O'Shaughnessy PT. Pilot grant supported by the NIEHS funded Environmental Health Sciences Research Center. College of Public Health, University of Iowa.	Research apparatus at American Industrial Hygiene Conference & Exposition, San Diego, CA Abstract # 48, Mehaffy, J. O'Shaughnessy PT Characterization of a novel human exposure apparatus	Sigurdarson ST, O'Shaughnessy PT, Watt JA, Kline JN. Experimental Human Exposure to Inhaled Grain Dust and Ammonia: A Model of Concentrated Animal Feeding Operations. Abstract: American Journal of Respiratory and Critical Care Medicine, 2003 167(7) A504.	O'Shaughnessy PT, Mehaffy JM, Watt J, Sigurdarson S, Kline JN. Characterization of a hooded exposure apparatus for inhalation of gases and aerosols. Am Ind Hyg Assoc J, 1:161-166, March 2004			
														Sigurdarson ST, O'Shaughnessy PT, Watt JA, Kline JN. Experimental Human Exposure to Inhaled Grain Dust and Ammonia: Towards a Model of Concentrated Animal Feeding Operations. Am J Ind Med. 2004 Oct;46(4):345.			
2001-02	**Intelligent Safety Sensing and Controls for Off-road Equipment**	Qin Zhang, Faculty	UI-Urbana/Champaign Department of Agricultural Engineering	4/00-6/01	$11,950.00	N/A	Control Technology & PPE	1 PhD candidate partial funding	1								See award 2000-04
2001-03	**Occupational Lung Disease in Ukrainian Coal Miners**	Robert Cohen, Faculty	UIC Environmental & Occupational Health Sciences	7/00-6/01	$16,000.00	UIC Expedited initial & continuing review; Dec 4, 2000 & Dec 4, 2001; Protocol #2000-0578	Surveillance, Occupational Chronic Obstructive Lung Disease					27th ICOH International Congress on Occupational Health, Iguassu Falls, Brazil, February 23-28, 2003, abstract accepted for Free Paper Session: PREVALENCE OF RESPIRATORY DISEASE IN UKRAINIAN COAL MINERS, Cohen, R.A., Basanets, A., Besonova, N. Latishef, E., Lysenko, O., Kundiev, Y.	Cohen R. Kennedy K. Mukhin V. Conroy L. Levels Of Respirable Coal Mine Dust Ukrainian Coal Mines. Amer J Respir Crit Care Med 165: Suppl 8: A532, 2002		Co-funded by a Fogarty grant		
													Cohen R. Basanets A. Besonova N. Latishef E. Oliynyk I. Shulzhenko I. Velho V. Kundiev Y. Prevalence Of Radiologic Pneumoconiosis In Active Ukrainian Coal Miners. Amer J Respir Crit Care Med 165: Suppl 8: A529, 2002					
Total FY 2001:	**3**				**$43,468.00**			**2**	**2**	**0**	**1**	**2**	**3**	**2**	**1**	**0**	**1**
2002-01	**Occupational Lung Disease in Ukrainian Coal Miners**	Robert Cohen, Faculty	UIC Environmental & Occupational Health Sciences	1/02-6/02	$16,000.00	UIC Expedited initial & continuing review; Dec 4, 2000 & Dec 4, 2001; Protocol #2000-0578	Surveillance, Occupational Chronic Obstructive Lung Disease										See award 2000-04

Pro-ject #	Project Title	Principal Investigator, Other	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
2002-02	**Immunologic Risk Factor for Laboratory Animal Allergy**	Samuel Dorevitch, Faculty	UIC Environmental & Occupational Health Sciences	1/02-6/02	$15,844.00	UIC Initial review; Nov 5, 2001; Protocol #2001-0349	Allergic & Irritant Dermatitis; Asthma & Chronic Obstructive Pulmonary Disease	Student funding: 1 RA @ 12.5%	1			Occupational Medicine Grand Rounds, June 4, 2003			Supplemental funding from "Asthma and Demolition in Chicago Public Housing (NIEHS K 08 ES 113202-01)		
2002-03	**Enhancing the Detection of PAH Metabolites**	An Li, Faculty	UIC Environmental & Occupational Health Sciences	8/01-6/02	$15,975.00	UIC Expedited review; Aug 16, 2001; Protocol #2001-0487	Exposure Assessment Methods	One RA, 2 semesters	1								
2002-04	**Investigation of Sampling Performance of Thoracic Size-selective Sampling**	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences	1/02-6/02	$15,621.00	UIC Expedited Review; Nov 15, 2001; Protocol #2001-0709	Exposure Assessment Methods	Two RAs, 1 semester	2			Investigations of Sampling Performance of Thoracic Personal Samplers in Woodworking Facility (Brown, Conroy, Franke and Erdal) presented at AIHA Local Section, Chicago, 3/6/2002.				Data used to complete Leezah Brown MS degree	
												Investigations of Sampling Performance of Thoracic Personal Samplers in Woodworking Facility (Brown, Conroy, Franke and Erdal) presented at UIC Environmental Symposium, Chicago, November, 2001.					
												Investigation of Sampling Performance of Thoracic Personal Samplers in a Woodworking Facility, (Brown and Erdal) presented at AIHA Conference and Exposition, June, 2002					
2002-05	**Characterization and Modeling of Dust Exposures at an Agricultural Facility**	Steve Lacey, Research Trainee, PhD candidate	UIC Environmental & Occupational Health Sciences	8/01-6/02	$11,093.00	UIC Expedited Review; Aug 9, 2001; Protocol #2001-0506	Special Populations/Exposure Assessment Methods	One RA, 1 semester	1			Presented at June, 2002 American Industrial Hygiene Conference and Exposition, and awarded best student paper		Lacey S, Conroy L, Franke J, Wadden R, Hedeker D, Forst L: Personal dust exposures at a food processing facility. J Agromedicine 11: 49-58 (2006).		Data used to complete PI's PhD degree	
Total FY 2002:	**5**				**$74,533.00**			**4**	**5**	**0**	**0**	**5**	**0**	**1**	**1**	**2**	**1**
2003-1	**Source Apportionment of PAHs in Chicago Residence Homes**	An Li, Faculty	UIC Environmental & Occupational Health Sciences	7/02-6/03	$14,246.00	N/A	Indoor Environment	1 PhD candidate, 2 semesters	1					An Li (IHF), Todd M. Schoonover (IHT), Qimeng Zou, Felice Norlock (IHT), Lorraine M. Conroy (IHF), Peter A. Scheff (IHF), and Richard A. Wadden (IHF). Polycyclic Aromatic Hydrocarbons in Residential Air of Ten Chicago Area Homes: Concentration Levels and Influencing Factors. Atmospheric Environment, 39(19), 3491-3501, 2005			

Pro-ject #	Project Title	Principal Investigator, Role	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
														Felice Norlock, Jae-Kil Jang, Qimeng Zou, Todd Schoonover, and An Li. Large Volume Injection PTV-GC-MS Analysis of Polycyclic Aromatic Hydrocarbons in Air and Sediment Samples. Journal of Air & Waste Management Association 52:19-26, 2002			
2003-2	**Study of the Effect of Welding Processing Parameters on Fume Composition and Emission Rate**	Serap Erdal, Faculty	UIC Environmental & Occupational Health Sciences	7/02-6/03	$17,806.00	N/A	Exposure Assessment Methods and Mixed Exposures	One RA, 2 semesters	1	NIOSH proposal for "Fundamental study of welding fume inhalation", 2005	NIOSH Award for "Fundamental study of welding fume inhalation", amount: $240,237; Funding period: 08/01/05-07/31/08					Data used to complete MS degree for Srinivas Durgham	Durgham, Srinivas MS Thesis: Design, Testing and Validation of an Exposure Chamber for Welding Fume Emission Characterization Studies
2003-3	**Mechanisms of Lung Epithelial Cytotoxicity due to Metal Exposure**	Daniel Tessier, Faculty	UIC Environmental & Occupational Health Sciences	7/02-6/03	$17,277.00	N/A	Asthma and COPD	One RA, 2 semesters	1			Cytotoxicity of Chromium(VI) and Manganese to Lung Epithelial Cells In Vitro, Presented by Laura Pascal at the 25th Midwest Environmental Chemistry Workshop, UIC, October 4, 2002.	L.E. Pascal, D.M. Tessier (IHF), 2004. Cytotoxicity of chromium(VI) and manganese to lung epithelial cells in vitro. Tox. Letters 147(2)143-151.	L.E. Pascal, D.M. Tessier. Activation of MAP kinases in human lung epithelial cells by selected metals. *In Preparation*.		Data used to complete PhD degree for Laura Pascal	Pascal, Laura E. 10/2003. Cytotoxicity of Metals in Welding Fumes as a Factor in Occupational Lung Disease. PhD Dissertation.
												Pascal, L.E., D.M. Tessier, 2003. Cytotoxicity and cytokine production in lung epithelial cells*in vitro* following chromium and manganese exposure. 42th Annual Meeting of the Society of Toxicology, Salt Lake City, UT March 9-13. Abstract No. 1443.	42th Annual Meeting of the Society of Toxicology, Salt Lake City, UT March 9-13. "Cytotoxicity and cytokine production in lung epithelial cells *in vitro* following chromium and manganese exposure." Poster No. 1443.	L.E. Pascal, D.M. Tessier. Mechanism of death in lung epithelial cells following metal exposure. *In Preparation*.			
												American Industrial Hygiene Association Conference and Exposition, San Diego, CA June 1-6, 2002. "Cytotoxicity of heavy metals in welding fumes as a factor in occupational asthma."					
												Occupational & Environmental Health & Safety Education and Research Center, University of Illinois Chicago April 21, 2004. "Metal Induced Cellular Signaling in Lung Epithelium."					
2003-4	**Immunologic Risk Factor for Laboratory Animal Allergy**	Samuel Dorevitch, Faculty	UIC Environmental & Occupational Health Sciences	7/02-6/03	$16,982.00	UIC Initial review; Nov 5, 2001; Protocol #2001-0349	Allergic & Irritant Dermatitis; Asthma & Chronic Obstructive Pulmonary Disease	Two RA, 1 PhD, 1 semester	3	1	Successful application for K08-ES11302 award, (Total direct: $584,886), proposal developed from the research plan for this pilot project.	Chicago Branch of the Association for Advancement of Laboratory Animal Science, Maywood, IL, March 2005		Dorevitch, Samuel MD, MPH; Tharenos, Leslie MD, MPH; Demirtas, Hakan PhD; Persky, Victoria MD; Artwohl, James DVM; Fortman, Jeffrey D. DVM, Inverse association between rural environment in infancy and sensitization to rodents in adulthood, Annals of Allergy, Asthma, & Immunology, Volume 98(5), May 2007, pp 440-446		Findings used toward MS degree for Lilia Chen, 2005	Four projects related to animal research facilities and allergens generated, including two Pilot Projects and one NORA project

Pro-ject #	Project Title	Principal Investigator, Other	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
																Findings used toward MS degree for Shilpa Nadgouda, 2005	
Total FY 2003:	**4**				**$66,311.00**				**6**	**2**	**2**	**5**	**2**	**5**	**0**	**3**	**3**
2004-1	**Adaptive Tractor Overturn Prediction System (ATOPS)**	Tony Grift, Faculty	UI-Urbana/Champaign Department of Agricultural Engineering	7/03-7/04	$15,686.12	N/A	Traumatic Injuries										
2004-2	**Laboratory Animal Allergen Production and Transport in a Working Animal Research Facility**	James Artwohl, Academic Staff	UIC Biological Resources Laboratory	7/03-7/04	$15,049.38	Animal welfare assurance ACC# 03-141	Asthma and Chronic Obstructive Pulmonary Disease; Indoor Environment; Mixed Exposures; Control Technology and Personal Protective Equipment; Exposure Assessment Methods	2 RAs 25% for 2 mos, 1 RA 25% for 4 mos	3								
2004-3	**Pesticide Toxicity to Lung Epithelium as a Factor in Chemically-Induced Asthma**	Daniel Tessier, Faculty	UIC Environmental & Occupational Health Sciences	7/03-7/04	$13,069.94	N/A	Asthma & COPD	1 RA 50% for 6 mos	1					X. Wang, D.M. Tessier. Activation of MAP kinases in human lung epithelial cells by the organo-phosphate insecticide chlorpyrifos. *In Preparation.*		Data used towards MS degree, Laura Pascal	
2004-4	**Effectiveness of Standing Conditions in Reducing Fatigue & Discomfort**	Stephanie Opel, Graduate Research Student	University of Wisconsin, Milwaukee	7/03-7/04	$8,994.91	UW Milwaukee Protocol #04-02-051	Intervention Effectiveness										
2004-5	**Enhancing the Detection of PAH Metabolites**	An Li, Faculty	UIC Environmental & Occupational Health Sciences	7/03-7/04	$10,443.36		Exposure Assessment Methods	1 RA 25% for 12 mos	1								
Total FY 2004:	**5**				**$63,243.71**			**3**	**5**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**
2005-1	Comparison of the prevalence of sensitization to common allergens in workers exposed and unexposed to animal allergens	Leslie M. Tharenos, Resident Physician	UIC SPH	7/04-7/05	$7,894.00		Allergic and Irritant Dermatitis, Asthma and COPD, Mixed Exposures, Indoor Environment	Self	1			L Tharenos and Dorevitch S. Prevalence of occupational allergies among workers with and without exposure to high molecular weight sensitizing agents. American College of Occupational and Environmental Medicine Annual Scientific Meeting, Washington, DC. May 2005.				Data used for capstone for MPH degree	Completion of residency research requirement

Pro-ject #	Project Title	Principal Investigator	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
												L Tharenos. Prevalence of occupational allergies among workers with and without exposure to high molecular weight sensitizing agents. Capstone presentation, UIC-SPH, May 2005.					
2005-2	Assessment of Exposure of Artist Welders to Welding Fumes	Laurel Berman, PhD candidate	UIC EOHS	7/04-7/05	$11,583.00	Expedited application approved in 2003, Protocol # 2003-0666	Mixed Exposures; Special Populations at Risk; Exposure Assessment Methods					Berman, L. (IHT). The Exposure of Artist Welders to Metal Fume, Part I and II. Presented at the Tri-State Sculptors Conference, Winston-Salem, NC, October, 2004	Erdal, S., Berman, L. (2005) Occupational Exposure Environment, Risk Factors, and Hazard Awareness of Metal Sculptors and Artist Welders in the U.S., Journal of Environmental Health Research April 2006.			Data used toward PhD degree for Laurel Berman (PI)	Berman, Laurel Thesis: Welding Fume Exposure Assessment under Isolated Process Conditions; University faculty intends to continue using the exposure chamber, which was used to generate laboratory-based welding emission factors.
												Berman, L. (IHT). The Exposure of Artist Welders to Metal Fume, Part I. Presented at the American Industrial Hygiene Association Local Section Meeting, February, 2005					
												Metal Sculptors: Occupational Environment and Risk Factors Presented by Dr. Serap Erdal at the American Industrial Hygiene Association Conference and Exposition, Chicago Illinois, May 13 2006.					
												Welding Fume Exposure Assessment of Welders Working in Isolation Presented by Dr. Laurel Berman at the American Industrial Hygiene Association Conference and Exposition, Chicago Illinois, May 13 2006.					

Pro-ject #	Project Title	Principal Investigator, Author	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
2005-3	Risk factors associated with trunk musculoskeletal disorders in female flight attendants	Hyeonkyeong Lee, PhD candidate, MS, RN	UIC College of Nursing Public Health, Mental Health, and Administrative Nursing	7/04-7/05	$15,418.94	Expedited application approved My 21, 2004, Protocol # 2004-0329	Low back disorders/ musculoskeletal disorders of the upper extremities	RA plus 90 hours for research assistant	1.25			Lee, H.K., & Wilbur, J. (2005). Risk factors Associated with trunk work–related musculoskeletal disorders in female flight attendants: Focus group study. Poster presented at the Association of American Occupational Health Nurses 2005 Symposium & Expo, Minneapolis, MN, 5/3-5, 2005		Lee, H.K., Wilbur, J., Conrad, K., & Miller, A. (Submitted). A focus group as A final step in preparation for a survey to examine risk factors associated with work-related musculoskeletal disorders in flight attendants. AAOHN Journal	The research project was additionally funded by American Association of Occupational Health Nurses New Investigator Grant for implementing test-retest survey of the selected measures and an additional mailing (third mailing proposed on the initial research protocol) for a high response rate (1/1/05-12/31/05, $3,000)	Data used for Hyeonkyeong Lee (PI) PhD thesis	PhD Thesis
												Lee, H.K., & Wilbur, J. (2005). Risk factors for Work-related musculoskeletal disorders (WMSDs) in flight attendants. Presented at the American Industrial Hygiene Conference & Expo, Anaheim, CA, 5/24-26, 2005, Airline Ergonomics Round Table session		Lee, H., Wilbur, J., Conrad, K., & Mokadam, D. (2006). Prevalence and severity of work-related musculoskeletal disorders among female flight attendants working on long haul international flights in one major U.S. airline. Aviation, Space, and Environmental Medicine, 77, 1283-87.			
														Lee, H. (2006). Self-reported cabin environment and work-related musculoskeletal disorders (WMSDs) among female flight attendants on long-haul international flights. Korean Journal of Aerospace and Environmental Medicine, 16(1), 2-8.			
2005-4	NON-CHOLINERGIC EFFECTS OF CHLORPYRIFOS ON LUNG EPITHELIUM	Daniel M. Tessier, Assistant Professor	UIC EOHS	7/04-7/05	$15,998.53	No human subjects	asthma & COPD									Data used toward MS degree for Pralhad Gawde	
2005-5	Effect of Occupational Exposure to Welding Particulates on Autonomic Heart Regulation	Frank Rosenthal, Associate Professor for Brent L. Yeagy, PhD Candidate	Purdue University School of Health Sciences	7/04-7/05		Project withdrawn	): Mixed exposures, Special populations at risk, exposure assessment methods	**Note: The project PI declined the award before project funding released**									PI withdrew, funding returned and carried over for next fiscal year
Total FY 2005:	**5**				**$50,894.47**			**3**	**2**	**0**	**0**	**8**	**1**	**3**	**1**	**4**	**4**
2006-1	Welding Fume Exposure Characterization Methods	Todd Schoonover, Research Specialist and PhD Candidate	UIC-SPH, EOHS	7/05-7/06	$15,972.80	No human subjects	Exposure Assesment / Mixed Exposures	1.00	0.25							Data will be used toward PhD thesis	
2006-2	Exposure to ergonomic risk factors in physical therapy	Kathleen Rockefeller, PT, ScD, MPH, MS	UIC College of Applied Health Sciences	7/05-7/06	$15,308.57	Expedited review	musculoskeletal disorders; exposure assessment; health care	1, 9 mos	0.25	RO3 application, NIOSH			Submitted to American Physical Therapy Association Combined Sections Meeting, Feb 07, Boston				
													Submitted to World Physical Therapy Conference, Vancouver BC, June 2007American Physical Therapy Association Combined Sections Meeting, Feb 07, Boston				

Project #	Project Title	Principal Investigator, Dept	Institution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes: Student Funding	# students funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supplemental funding	# of findings/data toward degree	Miscellaneous Project Outcomes
2006-3	Risk Assessment of health outcomes in workers with past exposure to dioxins in UFA Russian Federation (pilot phase)	Irina Dardynskaia	UIC-SPH, EOHS	7/05-7/06	$15,986.67	Expedited review	Risk assessment										
2006-4	Workers' Centers Role in Accessing Occupational Health Services	Leslie Nickels	UIC-SPH, EOHS	7/05-7/06	$15,879.00	Expedited review	Intervention Effectiveness Research and Special Populations					AIHCe					
2006-5	QUANTIFICATION OF MUSCULOSKELETAL LOADING AND ITS SUBJECTIVE PERCEPTION IN THE HEALTH CARE PROFESSION	John Dzissah PhD	Department of Industrial Management, University of Wisconsin–Stout	7/05-7/06	$15,991.91	Pending	Musculoskeletal, Subjective perception, Work characteristics										
Total FY 2006:	**5**				**$79,138.95**			**2**	**2**	**1**	**0**	**1**	**2**	**0**	**0**	**1**	**0**
	Biomechanical Analysis of Performing Ultrasounds	Darcie Olson, Project Assistant	University of Wisconsin - Milwaukee Occupational Therapy			Project withdrawn	1, 4 & 5	Note: The project PI declined the award before completing IRB review									
	Evaluate Occupational Exposure to Contaminants in Truck Cabins	Xinlei Wang, Assistant Professor	University of Illinois at Urbana-Champaign Ag. and Bio. Engineering		$15,933.00	Expedited review	Indoor Environmental Quality, Transportation (Injury)	1 RA @ 25%, 6 mos; undergrad 60 hrs	2								
	Shift rotation and risk of acute injury among healthcare workers	Douglas J. Myers, Postdoctoral Research Fellow	UIC School of Public Health, Epidemiology		$5,452.92	Expedited review	Organization of Work, Traumatic Injuries	2 RA hourly, 150 hr each	2								
	Demonstrating Effectiveness of Informed Informal Interaction	Joseph Zanoni, PhD Student	UIC College of Education, Curriculum and Instruction		$15,976.44	Expedited review	Special Populations at Risk, Vulnerable Immigrant Workers, Intervention Effectiveness	None				AIHCe				Data will be used toward PhD thesis	
	Occupational Surveillance in Illinois: A Pilot Project Using Work Comp Data	Lee Friedman (Previously Ben-Michael), Research Assistant Professor	UIC, SPH, EOHS		$15,415.49	Expedited review	Disease and injury, exposure assessment methods, surveillance methods, intervention effectiveness	Self	1								
	Nasopharyngeal Cancer and Occupation in Chengdu, China	Francis Song, MD, Occupational Medicine Resident	University of Illinois at Chicago Occupational Medicine			Expedited review approved by UIC, rejected by NIOSH	Mixed exposures, Industrial sector: manufacturing	Note: The project did not receive clearance for release of funds from NIOSH									

Pro-ject #	Project Title	Principal Investigator, Other	Instit-ution	Project Period	Award amount	IRB Status	Primary NORA Topic	Project Outcomes Student Funding	# stu-dents funded	# proposals generated	# additional funding generated	# presentations given	# of reports/abstracts/posters/papers generated	# publications generated	# of supple-mental funding	# of findings/data toward degree	Miscell-aneous Project Outcomes
	Association of H. pylori IgG antibodies and allergic sensitization	Linda Rosul, PhD Student	UIC School of Public Health Epidemiology		$5,972.40	Full review	Infectious Disease, Allergies, Asthma and COPD, Mixed Exposures,	None								Data will be used toward PhD thesis	
Total FY 2007:	**7**				**$58,750.25**				**3**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**
	Cognitive Stress, Mental Attentiveness and Muscle Fatigue	PI: Sandra K. Hunter, PhD, Assistant Professor	Marquette University Physical Therapy		$16,000.00	Full review approved to June 21, 2008 Protocol # HR-1143											
	Biological Exposure Assessment in a Brain Cancer Case-Control Study	PI: Jo Anna M. Shimek, PhD Candidate	University of Illinois at Chicago, EOHS		$15,579.00	Pending										Data will be used toward PhD thesis	
	Occupational Hazard and Injury Surveillance in Chicago Temporary Agency workers	PI: Susan Buchanan, Residency Director	Univ. of Illinois at Chicago, Occupational Medicine		$7,990.65	Expedited - Complete??											
	Falls Prevention among Home Care Workers in Illinois: Needs Assessment	PI: Naoko Muramatsu, Associate Professor	UIC SPH, CHS Community Health Sciences		$15,991.52	Protocol #2007-0339 approved for development only; no human subjects until further review											
	Work and Adaptation Experiences of Registered Nurses from the Philippines	PI: Jorgia Briones Connor, PhD Candidate	University of Illinois at Chicago, College of Nursing		$4,413.40	Pending										Data will be used toward PhD thesis	
Total FY 2008:	**5**				**$59,974.57**				**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
Totals all awards to date	**43**				**$540,154**			**17**	**30**	**6**	**4**	**25**	**13**	**15**	**4**	**15**	**9**

A. Program Title: NORA Research Support

B. Program Director: Lorraine M. Conroy, ScD, CIH

C. Program Description (Include description of: goals and objectives; responsible conduct of science training; faculty participation; curricula.)

1. Goals and Objectives

The overall goals of the proposed training are to provide trainees with research training, in general, and with training that entails interdisciplinary expertise and interaction. The specific objectives of the overall research training are to provide training in:

1. qualitative research methods
2. quantitative research methods
3. research ethics
4. research project planning, implementation logistics, and budgeting
5. publication.

We are accomplishing these goals and objectives through interdisciplinary teams focused on one or more NORA priority areas. Teams are formed by ERC faculty who collaborate to establish the mission, set practical goals and protocols for executing them, and recruit students whose interests, needs and assets fit the group's agenda. Each team must be interdisciplinary and must include at least two trainees. The team leader works with the academic program directors to identify appropriate trainees. Proposals for new teams are submitted by ERC faculty and reviewed by the Illinois ERC Executive Committee on a yearly basis, deciding on appropriate resource allocation from the overall Targeted Research Training budget. In the first year of the program, a model team was developed, evaluated, and refined, in order to more clearly define achievement goals for the program. The "mixed exposures" group was established by a large, interdisciplinary subset of faculty members to take advantage of faculty expertise and available resources, as well as to exploit opportunities with partners outside of the School of Public Health. The first group consisted of a team of faculty from medicine, hygiene, and toxicology that evaluated metal exposures in a manufacturing facility that had served as a site for training OM residents. Groups of students and faculty planned an array of research projects, and traveled to the facility to do exposure monitoring and health outcomes monitoring among welders. In the second year, the "mixed exposures" group added veterinarians to the group and did assessments of laboratory environments where animal research was being conducted, doing air monitoring for antigenic materials, and monitoring personnel for allergic health outcomes. Between the two projects, some 14 students received research training ranging from design, protocol development, ethical considerations, program implementation, qualitative and quantitative assessment of the work, and manuscript writing. Based on the success of this program, a second program was added in the realm of vulnerable populations. Through this mechanism, faculty were able to bring in many outside parties from non-profit organizations to partner on an array of projects that led to training of six trainees and several post docs. Several of the projects led to publication and collaborative grant writing, falling under the rubric of Community Based Participatory Research. Many of the meetings of this group involved presentations of grant proposals, manuscripts, and protocols, which have subsequently leveraged further funding for faculty and students.

The Targeted Research Training program provides a stable mechanism to support interdisciplinary research training. It provides a small amount of salary support to encourage faculty in the Illinois ERC to work on interdisciplinary teams, and more importantly, provides some incentive to bring faculty, staff, and students from complementary disciplines onto the interdisciplinary teams. The IOM (2000) report "Safe Work in the 21st Century" highlighted the need to broaden the field of occupational safety and health to include other disciplines such as economics, psychology, social work, etc. Our teams have made a concerted effort to expand the scope of our work to include these disciplines, and it is already paying off

in terms of broadening both the vision and the expertise that comes about from bringing transdisciplinary expertise to bear on occupational health and safety problems. Collaborative proposals have been written as a direct result of actively engaging in team activities.

The team approach allows for more effective and consistent research training of students in the ERC. By being a part of the team, trainees will have access to a larger group of faculty who can provide formal and/or informal training and mentorship. The team approach allows for review of progress by more than the trainee's research advisor. The research advisor will continue to have the primary responsibility of training and mentoring the student, but will be supported by an interdisciplinary team. The teams have regular meetings. The meetings are devoted to developing new projects, meeting with community partners, reviewing literature relevant to their team's goals and objectives, inviting outside experts to present new methods or research results, reviewing research proposals, presentations, or publications prior to submission.

2. Responsible Conduct of Science Training

The work groups are an important source of training in the responsible conduct of science. Many of the projects conducted through the group involve human and/or animal subjects. In accordance with university requirements, all researchers and students are required to receive formal training in human research subject protection and protection of health information. If applicable, training in the humane use of animals is also required. The formal university training is enhanced by the work group, where ethical concerns in specific protocols are discussed. Junior faculty and/or trainees are often responsible for completing the protocols, but are mentored by more experienced researchers in the work group.

3. Faculty Participation

ERC faculty are involved in all aspects of NORA research training. Each work group is comprised of ERC faculty, faculty from other disciplines where appropriate, and trainees. The composition of the current work groups is given in the next section.

D. Program Activities and Accomplishments

The NORA Research Training program supports research training in all capacities across a broad spectrum of research disciplines. Administrative support is often management of data and Internal Review Board documents. Technical support in the form of tools, technology, and knowledge enables exposure assessments and worker health protection to cooperating partners. The support is provided to interdisciplinary research teams comprised of faculty and trainees in the ERC. The program continues the coordination of training and research among students, faculty, and staff in the ERC and from other disciplines. Trainees involved in projects are specifically trained from hypothesis to technical details in preparation for studies. Components of each activity are executed by trainees, other graduate students, and post-doctoral fellows who will then analyze samples and data for potentially use as thesis, dissertation, or research topics. Two strong interdisciplinary teams have emerged through this effort. One group is focused on research training and research related to Mixed Exposures, Exposure Assessment, and Respiratory Disease (Mixed Exposure group) and the other is focused on research training and research related to Intervention Effectiveness and Special Populations at Risk (Intervention Effectiveness group).

1. Mixed Exposure Group

Table 4 shows the participants in the Mixed Exposure Group. The group is working on several projects assessing health outcomes related to mixed exposures. The mixed exposures vary by setting but are composed of complex mixtures of particulate matter, and in many cases, simultaneous exposure to irritant gases. The projects fall into four general areas: welding (complicated mixture of metal particles with ozone and nitrogen dioxide); concentrated animal feeding operations (organic dust and endotoxin with

ammonia); laboratory animal facilities (organic dust and endotoxin with ammonia); and demolition (particulate matter).

New Welder Field Study
Several new cohorts were contacted in the pursuit of a suitable population of welders new to the profession. One was selected as suitable to execute a successful field study. The cohort consists of welders in training and just entering the welding and pipe fitting profession. The rationale is that this cohort is likely to have had little to no welding exposure and will be better suited to investigate early and more subtle health effects associated with welding fume exposure. A new research proposal was drafted and submitted to the UIC Institutional Review Board and subsequently approved. The new proposal involves the recruitment of forty non- smoking welder trainee research volunteers. Volunteers will be asked to undergo a battery of health effects measures before and after four hours of welding instruction and will wear personal exposure monitors during instruction. Area monitoring and a facility assessment will also be conducted to try to relate the amount of welding with welding fume area concentrations.

Cellular responses to metal exposure
We have been conducting *in vitro* studies examining the effects of metals on lung epithelial cells. One study looked at direct toxicity and cellular signals in the presence of chromium, hexavalent chromium, nickel, and manganese. The study was the basis for a PhD trainee (IH). An MS trainee (IH) has extended the initial research to examine the effects when cells are exposed to welding fumes. He has been developing methods of collecting air samples of welding fume and processing them in a way that they can be used in *in vitro* studies.

Agriculture Exposure
Data analysis and manuscript preparation for the field project conducted in Jan 04 is continuing. One IH trainee is using the data for his MS thesis. An OHN trainee completed the NIOSH spirometry course and used some of the data in her research methods course.

Laboratory Animal Exposure
We have completed a study to determine occupational exposures to and emission rates of various animal related agents in a rabbit housing room. Another project to determine emission rates and occupational exposures as well as the effects of changing the cage design was conducted during this time. One IH trainee used the data for her MS thesis. We expect 2 publications to result from this project. Another project looking at the development of allergies in workers in an animal housing facility was also conducted. These data are being analyzed for publication. Three IH trainees, one OM trainee, an undergraduate biology student, and a post-doctoral fellow in veterinary medicine, along with 3 ERC faculty and staff members and two faculty veterinarians were involved in these projects.

Demolition
A study characterizing the size, composition, and concentration of dust generated during demolition of high-rise public housing buildings was conducted. The project involved measuring dust concentrations upwind and downwind of demolition, detailed observations of demolition activities, and measurement of oxidative stress in a panel of public housing residents during the demolition. Five ERC faculty and staff members and 8 IH trainees were involved in the project. The results of this study were published: *Dorevitch S, Demirtas H, Perksy VW, Erdal S, Conroy L, Schoonover T, Scheff PA: Demolition of highrise public housing increases particulate matter air pollution in communities of high-risk asthmatics. J Air Waste Manag Assoc. 2006 Jul;56(7):1022-32.*

Table 4. Mixed Exposure Group

Lorraine Conroy, ScD, CIH	Working group leader; ERC Director; Associate Professor, Environmental and

	Occupational Health Sciences (IH)
Todd Schoonover, MS, CIH	Research Coordinator, EOHS (IH)
Samuel Dorevitch, MD, MPH	Research Assistant Professor, EOHS and Epidemiology (OM)
Daniel Tessier, PhD	Assistant Professor, EOHS (Tox)
Peter Scheff, PhD, CIH	Professor, EOHS (IH)
Serap Erdal, PhD	Associate Professor, EOHS (IH)
Linda Forst, MD, MPH	Associate Professor, EOHS (OM)
Lilia Chen	MS trainee (IH)
David Vinson	MS trainee (IH)
Srinivas Durgam	MS student (IH)
Kimberly Hopp	MS trainee (IH)
Joy Schnackenbeck	MS trainee (IH)
Julie Plavka	MS trainee (IH)
Laura Pascal	PhD trainee (IH, Tox)
Bogdan Catalin	MS trainee (IH, Tox)
Robert Malcolm	MS trainee (IH)
Jeffrey Fortman, DVM	Director, UIC Biological Resources Laboratory (animal research facility)
James Artwohl, DVM	Clinical Veterinarian, UIC Biological Resources Laboratory
Tara Ooms, DVM	Post-doctoral fellow, UIC Biological Resources Laboratory
Cong Zhao, MD	OM trainee
Leslie Tharenos, MD	OM trainee

2. Intervention Effectiveness and Special Populations at Risk

Table 5 shows the participants in the Intervention Effectiveness group. This group is focused on projects that identify occupational health and safety issues in special populations at risk, identifies available resources and services and barriers to obtaining services, establishes partnerships, and develops interventions in collaboration with partners.

Integration of Clinical Occupational Services and Labor Rights Training and Prevention

The goal of this project is to improve workplace safety and health for low-wage immigrant workers with three objectives: 1) to improve identification of occupational hazards among outreach volunteers at the Chicago Interfaith Workers' Rights Center; 2) to identify appropriate referral needs and enable at risk workers to access occupational medicine services; and 3) to improve the ability of the occupational medicine clinic staff to identify and refer patients for follow up at the Interfaith Workers' Center for counseling and follow up. A series of interventions with evaluation of the outcomes are planned. The project involves 1 IH trainee, 2 SPH students, 2 CDC-funded post-doctoral fellows, and 2 ERC faculty members.

Occupational injury, hazards among immigrant and minority workers in Chicago

The goal of this project is to reduce day laborers exposure to hazards on the job. Components include working with advocacy groups to create good worker health and safety practice and increase day laborers access to occupational health services.

Intervention effectiveness for reducing injuries and illnesses through workers centers in Chicago

The focus of this project is day and temporary laborers working in informal sector (employers generally "under the radar"). They are mostly Latino males, work in dangerous occupations (demolition, construction, and landscaping), and face a variety of work, community and home issues. An intervention to reduce injuries and illnesses in this group is planned. The intervention will be conducted in

collaboration with 4 worker centers in Chicago. The project involved two IH trainees and two faculty from the working group.

Blood lead levels and clothing dust wipes for lead in day laborers
Pilot project of blood lead levels and clothing dust wipes for lead in day laborers who perform demolition. The project involved 1 IH staff member, 1 OM faculty member, and 1 PhD student. Lead poisoning prevention during remodeling and renovation The project focused on reducing generation of lead using lead safe work practices (LSWP). Components include working with suppliers (hardware and paint stores) to ensure supplies available and promoted; working with renovators and remodelers to increase awareness and change behaviors in the use of LSWP; and work with day laborers to increase awareness of LSWP in construction. The ultimate goal is to harmonize public health, small business and worker implementation of LSWP. The project involved 4 students in EOHS and 1 faculty member.

Intervention Research to Reduce Eye Injuries in Latino Farm Workers
This goal of this project, which is collaborative between UIC, U S Florida, Florida A & M University, is to develop, evaluate, and disseminate a model for reducing traumatic injuries to Florida citrus workers. Currently drafting two manuscripts for publication, and planning a collaborative proposal for funding. this project involved 2 faculty and staff members.

Intervention Research to Reduce Burns in Food Vendors
Research is being undertaken to characterize burns among food vendors at O'Hare Airport as the first step in an intervention project. Most of the workers are minimum wage, and Latino. This project was used by an OM resident as his capstone research project.

Occupational Injuries in Hispanic Workers
This project will be utilizing datasets from IDPH and Illinois Workers Compensation Commission to look at specific sentinels (burns, carpal tunnel, death, pneumoconiosis, traumatic injuries) and Latino workers. This project was part of the research project of one PhD student.

Table 5. Intervention Effectiveness Group

Leslie Nickels, MEd	Working group leader; ERC Deputy Director; Director of Continuing Education and Outreach
Nadine Remington	MS trainee (IH), working group coordinator
Rosemary Sokas, MD, MPH	Division Director and Professor, EOHS
Susan Buchanan, MD, MPH	Clinical Assistant Professor, EOHS and Family Medicine; OM Residency Director, UIC(OM)
Linda Forst, MD, MPH	Associate Professor, EOHS (OM)
Joseph Zanoni, MILR	Associate Director, Continuing Education and Outreach
Kathleen Rospenda, PhD	Assistant Professor, Psychology, UIC Department of Psychiatry
Kaori Fujishiro, PhD	Post-doctoral fellow, EOHS
Butch DeCastro, PhD	Post-doctoral fellow, EOHS
Julia Lippert	MS trainee (IH)
Lezah Brown-Ellington	PhD student (IH)
Rachel Rubin, MD, MPH	Adjunct Assistant Professor, EOHS; OM Residency Director, Stroger Hospital (OM)
Virginia Warren	Research specialist, ERC
Katherine Bissell	Chicago Interfaith Workers' Rights Center
Anne Buckley	Industrial Hygienist, Stroger Hospital of Cook County (IH)
Anne Evens Program	Director, Lead Poisoning Prevention, Chicago Department of Health

Karen Conrad, PhD	Research Associate Professor, UIC School of Public Health (OHN)
Michele Issel, PhD	Clinical Associate Professor, Community Health Sciences, UIC SPH
Pamela Levin, PhD	Clinical Assistant Professor, Rush College of Nursing (OHN)
Jose Oliva	National Network of Worker's Centers
John Halpin	OM trainee
Douglas Myers, ScD	Post-doctoral Fellow, Epidemiology
Linda Murray, MD, MPH	Co-medical Director, Ambulatory Care, Cook County Bureau of Health Service

3. Interdisciplinary Research Seminar Series

To support the work of the interdisciplinary work groups, we developed and are delivering a research seminar series that was included into our weekly interdisciplinary seminar. In the second year of the program, we have held special two-hour seminars with an informal meeting/reception following the seminar. This allows a longer discussion of the topic than could be had during the one-hour weekly seminar. We invited four recognized researchers and/or policy makers to present on topics related to the proposed interdisciplinary research. In order to include the widest possible audience for these research seminars, we presented the seminars via computer link to remote sites (University of Illinois campuses in Urbana, Rockford, Peoria, and Quad Cities).

E. Program Products

Table 6 shows manuscripts resulting from NORA research training support. Table 7 shows presentations and abstracts, and Table 8 shows student research projects.

F. Future Plans (Include in summary form plans for the next budget period.)

On the heels of success of the two interdisciplinary work groups, a third team will be added that will address "occupational surveillance." Faculty has established links with State agencies to receive datasets that will allow extensive occupational surveillance in Illinois. This work will dovetail with the Occupational Safety program and the Occupational Epidemiology program that are being proposed in this ERC Competitive Renewal. We have already begun work in the realm of occupational amputations, surveillance of Hispanic workers, and evaluation of OSHA efforts in the State and across the US.

During the next year, we are also proposing to continue the research seminar series, where we will invite recognized researchers and/or policy makers to present on topics related to the proposed interdisciplinary research. We will continue to computer-link the seminars to other campuses (University of Illinois campuses in Urbana, Rockford, Peoria, and Quad Cities) in order to include the widest possible audience. We are proposing on research seminar every other month during the academic year.

Table 6. Manuscripts

Erdal (IHF), S. and L. Berman (IHT). Occupational Exposure Environment, Risk Factors, and Hazard Awareness of Metal Sculptors and Artist Welders in the U.S. Submitted to International Journal of Environmental Health Research. (in press)

Dorevitch S, Demirtas H, Perksy VW, Erdal S, Conroy L, Schoonover T, Scheff PA: Demolition of high-rise public housing increases particulate matter air pollution in communities of high-risk asthmatics. J Air Waste Manag Assoc. 2006 Jul;56(7):1022-32.

Dorevitch, S. (OMF), Demirtas, H., Scheff, P (IHF) and Persky, V.: Bias and Confounding in Longitudinal Measures of Exhaled Monoxides. Journal of Exposure Science and Environmental Epidemiology, 23-Sep-2006.

Lacey (IHT), (IHF), S., Forst, L., et al. Eye injury in migrant farm workers and suggested hazard controls. Submitted and under review, J Ag Safety and Health (2006).

Lacey, S., Conroy, L., et al. Dust emission rates from food processing. Submitted and under review, Ann Agric Environ Med (2006).

Lacey SE, Conroy LM, Forst LS, Franke JE, Wadden RA, Hedeker DR.: Personal dust exposures at a food processing facility. J Agromedicine. 2006;11(1):49-58.

Forst, L.(OMF), Martinez, I., Lacey (IHT), (IHF), S., et al. Barriers and benefits of protective eyewear use by Latino farm workers. Accepted for publication, J Agromedicine (2006).

Buchanan, et al.: Collaboration with a Worker Center in Day Labor Occupational Research. American Journal of Public Health. In press.

Conroy, LM, Schoonover, TM, Chen, L, Dorevitch, S.: Effect of cage top use on airborne concentrations of particulate matter, endotoxin, and mouse urinary protein in an animal research facility. In preparation

Chen, L, Conroy, LM, Schoonover: Modeling allergen, dust, and endotoxin emissions from laboratory mice. In preparation

Schoonover, TM, Conroy, LM, Plavka, J, Dorevitch S, Erdal, S: Personal Exposure to Metals, NO2, and O3 in a Production Welding Facility. In preparation.

Malcolm, R, Conroy, LM, Schoonover, TM, Dorevitch, S: Personal exposures and health outcomes in a swine facility. In preparation.

Table 7. Abstracts

Authors	Title	Association
Zanoni	Workers' Centers Qualitative Inquiry and Antonio Gramsci and Peer Education	UIC College of Educ. Conference
Zanoni	Day Laborer Learning: Analysis Of Worker Centers' Focus Groups	Intl. Commission on Occ. Health
Zanoni	Workers' Centers as sites of critical capacity and cultural development of vulnerable immigrant workers	Sociology and Equity Studies in Education
K Fujishiro, B de Castro, JL Oliva	A Conceptual Model for Minority Worker Experiences: Identifying Problems of Work Organization	NORA Symposium, Poster 0097
CC Cho, E Sweitzer, J Oliva, J Nevarez, J Zanoni,RK Sokas	An Interfaith Workers' Center Approach to Workplace Rights	NORA Symposium, Poster 0096
LA Nickels, J Zanoni, N Remington, J Lippert	Understanding the Philosophical, Organizational, and Educational Role of Workers' Centers for Developing and Sustaining Programs on Workplace Health and Safety	NORA Symposium, Poster 0098
Schoonover	Control of Allergen, Endotoxin, and Particulate Matter in a Laboratory Animal Facility	American Industrial Hygiene Association
Malcolm	Particulate Matter and Endotoxin in a swine facility	American Industrial Hygiene Association
Berman, et al.	Welding Fume Exposure of Welders Working in Isolation	American Industrial Hygiene Association
Berman, et al.	Metal Sculptors: Occupational Environment and Risk Factors	American Industrial Hygiene Association

Table 8. Student Research Projects

Project	Setting	Trainee
Markers of inflammation, pulmonary function	Welding, Demolition	David Vinson, IH trainee, (MS), Cong Zhao OM trainee (MPH), Jorgia Conner, OHN trainee (PhD)
Laboratory characterization of welding fume	Welding	Laurel Berman, IH Trainee (PhD), Srinivas Durgam, IH student (non-trainee, MS), Todd Schoonover
Metals exposure, relationship of area and personal metals	Welding	David Vinson, IH trainee, (MS), Joy Schnackenbeck, IH Trainee (MS), Kimberly Hopp, IH Trainee (MS)
Area concentrations of bio-relevant aerosols	Welding, Woodworking, Demolition	Kimberly Hopp, IH Trainee (MS)

Biomarkers of exposure in welding study	Welding	David Vinson, IH trainee, (MS)
Welding fume collection and in-vitro epithelial cell exposure study	Welding/Toxicology	Bogdan Catalin, IH trainee (MS)
Spirometry, Occupational history and respiratory health (questionnaire)	Swine Confinement	Jorgia Connor, OHN Trainee (PhD)
Personal exposure and workplace characterization	Swine Confinement	Robert Malcolm, IH Trainee (MS)
EBC endotoxin in exposed and unexposed populations	Swine Confinement	Todd Schoonover, Research project Coordinator
Measures of asthma severity	Demolition, public housing residents	Cong Zhao, OM trainee (MPH)
Comparison of the prevalence of sensitization to common allergens in workers exposed and unexposed to animal allergens	Laboratory animal handlers	Leslie Theranos, OM trainee (MPH)
Mouse allergen, dust, and endotoxin exposures before and after cage design change	Laboratory animal handlers	Lilia Chen, IH trainee (MS)
Understanding worker centers in Chicago: a qualitative/descriptive analysis	Intervention effectiveness, working with workers centers	Nadine Remington, IH trainee (MS)

A Program Title: Industrial Hygiene

B Program Director: Peter A. Scheff, PhD, CIH

C Program Description

Description: The Environmental and Occupational Health Sciences Division (EOHS), within the University of Illinois School of Public Health, presently (June 2007) consists of 18 faculty and approximately 70 graduate students. Industrial hygiene training is carried out within this Division, and has been in existence since 1972. In 2006-2007, 37 students were in the IH program in all degree categories (MS, MPH, and PhD). Since 1987 there have been 251 IH students in all degree programs, 92 of whom received full or partial NIOSH traineeship support. Over ninety-five percent of these graduates are actively working in the IH field. Forty-five graduates or students currently in the program are Certified Industrial Hygienists. The IH MS/MPH program has been ABET accredited since 1993 and has been re-accredited to September 30, 2008.

Goals: The two major goals of the academic training program are: (1) to develop industrial hygiene practitioners with as much practical experience as possible within the limits of an academic program; and (2) to provide a cadre of trainees, who have aptitude for research, with research training in occupational and environmental health. The research-trained group has the capability of entering into research-type activities in industry, as consultants, or in academe. The thrust of the IH training is to give students both an overall appreciation of the whole process of disease detection and risk evaluation leading to hazard control, and a competence in using the methods specific to the IH field. The overall emphasis of the training program is to give our students analytical and quantitative skills to aid them in solving occupational and environmental health problems. The IH program has held a relatively steady enrollment during the 2003-2007 project period. For the next 5 year project period, our specific goals include:

- Maintain the commitment to the integration of research and hands on-experience within the academic IH training program.
- Maintain the extramural funding base to support the commitment to research in Industrial Hygiene.
- Maintain the current level of minority participation in the IH program.
- Strengthen our collaboration with the UIC Epidemiology and Biostatistics program.
- Develop a research and teaching collaboration with the proposed Occupational Safety program and the College of Engineering.

Curriculum: IH program curricula are summarized in appendix A.
Publications: IH faculty and student publications are summarized in appendix B.
Faculty: IH program faculty are summarized in appendix C.

Responsible Conduct of Research: In an effort to support the research endeavors of School of Public Health investigators, advance their own interest in research, and ensure that research at the University of Illinois is carried out in accord with the highest ethical standards, all faculty and students are required to receive formal training in human research subjects protection, the protection of health information, and if applicable, training in the humane use of animals in research and teaching. This formal training is organized through the Office for the Protection of Research Subjects, which also provides administrative support for the review and approval of research protocols involving humans, animals, and recombinant DNA or infectious agents. This training in research integrity, ethical behavior, and responsible conduct is also underscored in the classroom. The Office for the Protection of Research Subjects maintains a training data base of human subject protection and research ethics and notifies faculty and students when additional training is required. Finally, the large amount of funded research that supports many students and offers practical training also provides practical opportunities to understand the application of human research protection.

D. Program Activities and Accomplishments

- Dr Serap Erdal was promoted to Associate Professor with Tenure and obtained a K award from NIOSH.
- EOHS IH trainees won the student chapter of the year award at the 2007 American Industrial Hygiene Conference.
- Adjunct Professor Dr Dave Jacobs, CIH, joined the EOHS faculty and obtained a grant from HUD to study lead emissions from residential housing demolition.
- Drs. Sam Dorevitch and Peter Scheff obtained a grant from the Metropolitan Water Reclamation District of Greater Chicago to study the health implications of non-contact recreation on the Chicago Area Waterways.
- Dr. Steve Lacey, CIH, was recognized by the AIHA for the outstanding contributions of the Future Leaders committee to the IH profession.
- Salvatore Cali received a contract from the Illinois Department of Public Health to perform Beach Sanitary Survey for swimming water quality at 63rd Street Beach in Chicago.

Current research projects that support IH trainees include:

- Graduate Training in Air Pollution, (P. Scheff, PI) funded by the U.S. Environmental Protection Agency and the Lake Michigan Air Directors Consortium to deliver short courses for professionals in the air quality management field.
- Asthma And Demolition in Chicago Public Housing (S. Dorevitch, PI) funded by the National Institute for Environmental Health Science.
- Comparative Life Cycle Impacts of Bio and Petroleum Based Lubricants (T. Theis, PI) funded by the National Science Foundation.
- Epidemiologic Study of Recreational Use of the Chicago Area Waterways (S. Dorevitch, PI) funded by the Water Reclamation District of Greater Chicago.
- UIC and Chicago State MS/PHD Bridge to Future (N. Esmen, PI) funded by the National Institute of General Medical Sciences.
- Exposure Reconstruction For A brain Cancer Epidemiological Study (N. Esmen, PI) funded by the Pratt and Whitney Corporation.
- Fundamental Study of Welding Fume Inhalation (S. Erdal, PI) funded by the National Institute for Occupational Safety and Health.
- Tungsten Industry Pilot Study (N. Esmen, PI) funded by the University of Pittsburgh.
- Exposure Reconstruction for September 2001 Pentagon Attack (S. Lacey, PI) funded by a sub-contract with the Johns Hopkins University.
- Analysis of PBDEs In Human Placenta: Enhancing Sensitivity And Reducing Cost (An Li, PI) funded by the National Institute for Environmental Health Science.
- Exterior Lead Dust In Single Family Housing Demolition: A Multi-Site Investigation (D. Jacobs, PI) funded by HUD.
- SPORE 2-Genetic/Environmental Risk & Outcomes for Brain Tumors (F. Davis, PI) funded by a subcontract with Duke University.

The following IH students were active in the program during the July, 2006-June, 2007 period.

- Maya Barr, MS: Graduated 12/06, Thesis: Retrospective Analysis of Hexavalent Chromium Exposures in Electrochemical Milling in Jet Engine Workers. (Advisor: Dr. Nurtan Esmen, Dr. Steven Lacey)
- Bogdan Catalin, MS: Graduated 12/06, Thesis: MAP kinase activation in human bronchial epithelial cells in vitro following exposure to mild steel welding fumes (advisor Dr Dan Tessier)
- Juan Nevarez, MS: Graduated 05/07, Thesis: Occupational Surveillance of Pesticide Poisonings from the Illinois Poison Center Database. (advisor Dr Linda Forst)
- Julia Lippert, MS: Graduated 12/06, Thesis: Electromagnetic field exposure in a nondestructive testing operation. (Advisor: Dr. Steven Lacey, Dr. Nurtan Esmen)
- Nadine Remington, MS: Graduated 05/07, Thesis: Understanding Worker Centers in Chicago: A Qualitative Analysis. (Advisor: Dr. Lorraine Conroy)

- Charles Dula, (MS trainee) Thesis: Sensitivity Analysis For Exposure Reconstruction Using Task Performance Time Study Data (Advisor Dr Nurtan Esmen)
- Tara Alcazar (MS trainee): Travel Award of $650 from the International Society of Exposure Analysis for travel to International Society of Exposure Analysis 2007 Conference at Durham, NC, Oct 14-18, 2007; Thesis: Worker Recall for Epidemiology. (Advisor: Dr. Nurtan Esmen, Dr. Steven Lacey)
- Robert Malcolm (MS trainee): Best in Session for the Graduate Student Posters, American Industrial Hygiene Conference and Exposition, Chicago, IL (May, 2006), Thesis: Personal Exposure to Dust, Endotoxin and Ammonia in a Swine Confinement Facility. (Advisor: Dr. Lorraine Conroy)
- Dyan Doughty (MS trainee): Thesis research on the control of exposure to animal allergens in a large animal care facility. (Advisor: Dr. Lorraine Conroy)
- Carolina Priester (MS trainee): Thesis research on the performance of variable air volume hoods. (Advisor: Dr. Lorraine Conroy)
- Lezah Brown-Ellington (PhD candidate): Dissertation research on Psychosocial Issues as Predictors of Occupational Injury, Illness and Assault. (Advisor Dr Rosemary Sokas)
- Sam Bigger (MS trainee): Received an AIHF scholarship in 2006. His thesis research is with the Pratt and Whitney jet engine project (Advisor: Dr. Nurten Esmen, Dr. Steven Lacey)
- John Breskey (MS trainee): 2006 winner of the Michael Bruton Workplace Safety Foundation Scholarship; Several awards/scholarships in 2007. (Advisor: Dr. Serap Erdal)
- Shanna Horvatin (MS trainee): First year NIOSH HSAT trainee (Advisor Dr Peter Scheff).
- Joanna Shimek (PhD candidate): Proposal "Biological Exposure Assessment in a Brain Cancer Case-Control Study" approved for competitive funding for Illinois ERC NIOSH Pilot Project Research Training Program. (Advisor: Dr. Serap Erdal)
- Alison Welch (MS trainee): Currently working and collecting thesis data on HUD funded project "Exterior Lead Dust in Single Family Housing Demolition". (Advisor: Dr. Peter Scheff)
- Chirag Patel (PhD candidate): Funded and research in Pratt and Whitney project (Advisor: Dr. Nurten Esmen, Dr. Steven Lacey)
- Justin Ford (PhD candidate): Currently working with Drs Scheff and Dorevitch on a study of secondary contact in the Chicago area waterways, funded by the Water Reclamation District of Greater Chicago. (Advisor Drs. Peter Scheff and Sam Dorevitch)
- Danita Larry, MS: Graduated 05/07; Thesis: Endotoxin concentrations in settled dust sample from homes and schools in the Chicago metropolitan area. (Advisor Dr. Dan Tessier)
- Todd Brown, MPH: Graduated 05/07; Capstone: Outcomes of Interfaith Workers' Center's Case Referrals to OSHA. (Advisor Dr. Rosemary Sokas)
- Kirk Baker, PhD: Graduated 05/07; Dissertation: Performance of a Regulatory Modeling System for PM2.5 Sulfate and Nitrate and Relationships to Performance of Meteorological Variables and Deposition Processes. (advisor Dr. Peter Scheff) Two papers have been published on this work to date.
- Maria Gutierrez (PhD candidate) Funded and research in Pratt and Whitney project (Advisor: Dr. Nurten Esmen, Dr. Steven Lacey)
- Todd Schoonover (PhD candidate): field coordinator for Epidemiologic Study of Recreational Use of the Chicago Area Waterways. (Advisor Dr Lorraine Conroy)
- Sara Wuellner (PhD candidate): project coordinator for Epidemiologic Study of Recreational Use of the Chicago Area Waterways (Advisor Dr Peter Scheff)
- Anders Ableman (PhD candidate) (Advisor Dr Serap Erdal)
- Michelle Colledge (PhD candidate) Dissertation Dissertation: Estimating emissions and ambient concentrations of hydrogen sulfide from a C&D waste facility: Warren Recycling Landfill, Warren Twsp, Ohio. (Advisor Dr Peter Scheff)

Diversity: Diversity is a core value at the School of Public Health. The College's Statement of Values emphasizes justice, diversity and respect. The College has a very successful Health Careers Opportunity Program (HCOP) which encourages minorities to consider careers in public health and supports summer workshops and courses to help prepare minorities for success in graduate school. HCOP has traditionally been a bridge for minorities to enter the EOHS program. The Great Lakes Centers for Occupational and

Environmental Safety and Health (GLC), a Center that is located in the EOHS facility and that works closely with EOHS, supports many IH trainees and specifically addresses minority issues. The GLC mission statement states in part “we devote special attention to the problems and needs of minority and disadvantaged workers and communities, the specific occupational and environmental safety and health needs of our region, and to the development of innovative and interdisciplinary approaches to addressing these needs.”

The UIC Graduate College’s Summer Research Opportunities Program (SROP) focuses on minority student recruitment and transition from undergraduate to graduate study by providing a cohort of students with a structured summer research experience. The students that come from across the country arrive in Chicago during mid-summer and are matched with a faculty member and execute a research project, presenting their results at the end of their residence. The past three SROP students that worked with our faculty have all returned for graduate study in our Division. The SROP has proven to be a stable source of minority student recruitment.

The industrial hygiene training program has been very successful in the recruitment and retention of minority students. For the current reporting period, Danita Murray-Larry and Juan Nevarez completed the MS program, Todd Brown completed the MPH program, Charles Dula, Carolina Priester, and Tara Alcazar were enrolled in the MS program and Lezah Brown-Ellington was enrolled in the PhD program. New minority students who entered the program included Andres Saldana (MS student), Chirag Patel (PhD student) and Diana Trinadad (MPH student).

E. Program Products:

Faculty and student publications are presented in appendix B. The IH program sponsored 10 classroom and 8 online CE courses. A total of 261 trainees attended IH CE courses.

F. Future Plans (Include in summary form plans for the next budget period.)

Activities planned for the July 1, 2007 to June 30, 2008 period.

- Complete the NIOSH competitive renewal process for the ERC.
- Apply for ABET reaccreditation and complete the required self-study.
- Continue to seek grants and contracts in appropriate fields of study to provide support and experience for students.

Appendices

A. Program curricula including general course requirements and sample curricula for each funded academic program.

Academic - Required Courses for MS in Industrial Hygiene

Course #	Name	Semester Credit
EOHS405	Environmental Calculations	2
EOHS421	Fundamentals of Industrial Hygiene	2
EOHS428	Industrial Hygiene Laboratory I	2
EOHS529	Industrial Hygiene Laboratory II (Field Studies)	2
EOHS523	Industrial Hygiene: Engineering Control/Ventilation	4
EPID400 or 403	Principles of Epidemiology	3
BSTT400	Biostatistics I	4
BSTT401	Biostatistics II	4
EOHS584	Radiation Protection	3
EOHS431	Air Quality Management I	3
EOHS438	Air Quality Laboratory	2
EOHS424	Environmental Acoustics	2
EOHS482	Occupational Safety Science	2
EOHS570	Hazardous Materials Management	3
either EOHS455	Environmental and Occupational Toxicology	3
and EOHS554	Occupational and Environmental Epidemiology	2
or EOHS551	Occupational and Environmental Diseases I	4
Research:		
IPHS598	Research in Public Health Sciences	16

Required + Research = 42-43 + 16 = 58-59 semester Credits

All MS students who receive NIOSH traineeship support complete this full curriculum as full-time students. The curriculum typically takes two full years to complete. Traineeship support is given in the first year of the program and renewed for students who make satisfactory progress during their first year in the program. NIOSH trainees are also supported as a Research Assistant (RA) on an extramural research grant or as a Teaching Assistant (TA) from University funds. Note that students starting in the fall of 2007 will be required to take EPID 403 to fulfill the epidemiology requirement. Trainees are encouraged (and most do) to attend the annual meeting of the American Industrial Hygiene Association and present the results of their thesis research. Travel support for IH trainees is available through the NIOSH grant and the Graduate College at UIC. In addition to the required coursework and research, all students who accept NIOSH traineeship support are also required to:

- Participate in the weekly interdisciplinary seminar. The seminar brings together all ERC trainees and is a mix of occupational and environmental health topics. Thesis degree students are also asked to present the results of the research at the seminar.
- Participate in Occupational Medicine Clinic (on a rotating basis this usually works out to once/3 weeks). IH students are actively involved in the clinic and assist physicians with exposure related issues.
- Participate in at least one extended field test. The IH program emphasizes hands-on, field research training. In addition to the MS thesis which frequently has a field research component, IH trainees are required to help with at least one major field research project. Recent projects include an exposure characterization of lead dust near single family demolition, an assessment of exposure and biological response to welding fume, characterization of particulate matter emissions from public housing demolition, Aspergillus exposure in a large, tertiary care hospital, organic dust exposure in a swine production facility, and evaluation of an intervention to reduce

animal allergen exposures in an animal care facility.

Academic - Required Courses for MPH in Industrial Hygiene

Course #	Name	Semester Credit
EOHS405	Environmental Calculations	2
EOHS400	Principles of Environmental Health Sciences	3
CHSC401	Behavioral Sciences in Public Health	3
EPID400 or 403	Principles of Epidemiology	3
BSST400	Biostatistics I	4
HPA400	Principles of Management in Public Health	3
CHSC400	Public Health Concepts and Practice	3
EOHS421	Fundamentals of Industrial Hygiene	2
EOHS428	Industrial Hygiene Laboratory I	2
EOHS431	Air Quality Management I	3
EOHS438	Air Quality Laboratory	2
EOHS570	Hazardous Materials Management	3
EOHS584	Radiation Protection	3
EOHS529	Industrial Hygiene Laboratory II (Field Studies)	2
EOHS523	Industrial Hygiene: Engineering Control/Ventilation	4
EOHS424	Environmental Acoustics	2
EOHS482	Occupational Safety Science	2
IPHS698	Master of Public Health Capstone Experience	1
IPHS650	Field Experience in Public Health	3-5
either EOHS455	Environmental and Occupational Toxicology	3
and EOHS554 or	Occupational and Environmental Epidemiology	2
EOHS551	Occupational and Environmental Diseases I	4
Recommended electives:		
EPID401	Quantitative Methods in Epidemiology I	3
BSTT401	Biostatistics II	4
EOHS440	Chemistry for Environmental Professionals	3

Required + Electives = 54-59 Semester Credits

All MPH students who receive NIOSH traineeship support complete this full curriculum. While most IH students at the master's level are enrolled in the MS program, an occasional MPH student is supported with a NIOSH traineeship. NIOSH trainees in the MPH program are also supported with a RA/TA appointment. Note that MPH students in the IH program starting in the fall of 2007 will be required to take EPID 403 to fulfill the epidemiology requirement. The field experience may also be waived if the student has appropriate professional public health experience. All MPH students are required to complete the capstone experience which includes a poster presentation on a capstone project near the end of their final academic term. The MPH capstone project gives the student an opportunity to demonstrate the integration of core Public Health skills into their discipline, and often includes field projects that provide professional experience to the students. Recent capstones include sampling for metals in a police department firing range, sampling for noise exposure in a railroad maintenance facility, and sampling for low levels of asbestos in sand and soil. In addition to the required coursework, MPH students who accept NIOSH traineeship support are also required to participate with the MS and PhD trainees in all center-wide interdisciplinary activities including the occupational medicine clinic, the weekly interdisciplinary seminar and participation in at least one field research project.

B. Faculty/trainee publications July, 2006-June, 2007 (Industrial Hygiene Trainee (IHT), Industrial Hygiene Faculty (IHF), Occupational Medicine Faculty (OMF):

1. Anrubio Vega, E.J., Bravo Alvarez, H., Brezonik, P.L., Chan, R.M., Fitz, D.,Grosjean, D., Hernández Téllez, J.,Kahl, J., Keener, T.C., López Portillo, M., Lu, M., Paredes Maury, S., Nakamura, S., Ortega Morales, B.O., Pescador, L., Reyes Trujeque, J., Sánchez Alvarez, P, Scheff (IHF), P., Soso Echeverria, R., Soto Ayala, R., and Vazquez Botello, A.: A Summary of the International Workshop on the Influences of Air Quality on the Mayan Heritage Sites in Mesoamerica. Environmental Management, February, pp 24-30, 2007.
2. Clark; Thomas, Gregory D. Huhn, Craig Conover, Salvatore Cali (IHF), Matthew J. Arduino, Rana Hajjeh, Mary E. Brandt, Scott K. Fridkin, MD, Outbreak of Bloodstream Infection With the Mold *Phialemonium* Among Patients Receiving Dialysis at a Hemodialysis Unit, Accepted for Publication, *Infection control and hospital epidemiology*, November 2006, vol. 27, no. 11.
3. Davis, F.G., Williams, L., Erdal (IHF), S., and D.D. Bigner. 2006. Characterization of Work Exposures to a Subset of Known and Suspected Animal Neurocarcinogens using the National Occupational Health Survey (1980-1983). International Journal of Environmental and Occupational Health. 12(1):16-23.
4. Dorevitch, S. (OMF), Demirtas, H., Scheff, P (IHF) and Persky, V.: Bias and Confounding in Longitudinal Measures of Exhaled Monoxides. Journal of Exposure Science and Environmental Epidemiology, February 7, 2007.
5. Turyk, M., Curtis, L., Scheff, P (IHF)., Contrares, A., Coover, L., Hernandez, E., Freels, S., and Persky, V.: Environmental Allergens and Asthma Morbidity in Low Income Children, Journal of Asthma 43:453-457, 2006.
6. Dorevitch, S.(OMF), Demirtas, H., Perksy, V., Erdal, S., Conroy, L., Schoonover, T. and Scheff, P (IHF): Demolition of High-Rise Public Housing Increases Particulate Matter Air Pollution in Communities of High-Risk Asthmatics. Journal of the Air & Waste Management Association, 56:1022-1032, July, 2006.
7. Erdal (IHF), S. and L. Berman (IHT). Occupational Exposure Environment, Risk Factors, and Hazard Awareness of Metal Sculptors and Artist Welders in the U.S. Submitted to International Journal of Environmental Health Research. (in press)
8. Erdal (IHF), S. and A. Carolla (IHT). Assessment of the Health Protectiveness of the Risk-Based Soil Remediation Standards of the Midwestern States. Submitted to the Human and Ecological Risk Assessment. (in press)
9. Erdal (IHF), S., D. Hryhorczuk (IHF), and L. Berman (IHT). Multi-media PCB Emissions Inventory for the Great Lakes Region in the U.S. Air and Waste Management Association Journal. Accepted for publication.
10. N. A. Esmen (IHF), K. J. Kennedy, T. A. Hall, M. L. Phillips, and G. M. Marsh: Classification of Worker Exposures, Chemico-Biological Interactions, 166:245-253(2007).
11. N. A. Esmen (IHF), T. A. Hall, M. L. Phillips and G M Marsh, Chemical process based reconstruction of exposures for an epidemiological study: I. Theoretical and Methodological issues, Chemico-Biological Interactions, 166:254-263(2007)
12. N. A. Esmen, T.A. Hall, M.L. Phillips, E.P. Jones, H.Basara, G.M. Marsh, J.M. Buchanich, Chemical process based reconstruction of exposures for an epidemiological study: II. Estimated exposures to Chloroprene and Vinyl Chloride, Chemico-Biological Interactions, 166:264-276(2007)
13. Forst, L., Martinez, I., Lacey, S. (IHF), et al. Barriers and benefits of protective eyewear use by Latino farm workers. Accepted for publication, J Agromedicine (2006).
14. T. A. Hall, N. A. Esmen (IHF), E. P. Jones, H. Basara, M. L. Phillips, G. M. Marsh, A. O. Youk, J. M. Buchanich, and R C. Leonard,, Chemical process based reconstruction of exposures for an epidemiological study: III. Analysis of Industrial Hygiene Samples Chemico-Biological Interactions, 166:277-284(2007)
15. Jacobs (IHF) DE and Nevin R. Validation of a Twenty-Year Forecast of U.S. Childhood Lead Poisoning: Updated Prospects for 2010, Environ Res 102(3) 352-364, Nov 2006.

16. Jacobs (IHF) DE. A Qualitative Review of Housing Hazard Identification Protocols in the U.S. Environ Res 102(1) 13-21, Sept 2006
17. Wu F, Karol MH, Jacobs (IHF) DE, Mitchell CD, Miller D.Improving Indoor Environmental Quality for Public Health: Impediments and Policy Recommendations, Environ Health Perspect. 115: 953-957 (2007)
18. Jacobs (IHF) DE, Kelly T, Sobolweski J. Linking Public Health, Housing and Indoor Environmental Policy: Successes and Challenges at Local and Federal Agencies in the U.S., Environ Health Perspect. 115:976-982 (2007).
19. Lacey (IHF) SE, Conroy (IHF) LM, Schoonover TM, Franke (IHF) JE, Hedeker DR, Forst (OMF) LS: Dust emission rates from food processing. Ann Agric Environ Med 13:251–257 (2006).
20. Lacey (IHF) S, Conroy (IHF) L, Franke (IHF) J, Wadden R, Hedeker D, Forst (OMF) L: Personal dust exposures at a food processing facility. J Agromedicine 11: 49-58 (2006).
21. An Li (IHF), Karl J. Rockne, Neil C. Sturchio, Wenlu Song, Justin C. Ford (IHT), David R, Buckley, William J. Mills. Polybrominated Diphenyl Ethers in the Sediment of the Great Lakes. 4 – Influencing Factors, Trends, and Implications. Environmental Science and Technology 40(24), 7528 - 7534, 2006
22. Pelka-Mucha, A., Hryhorczuk (OMF), D., Serdyuk, A., Nakonechny, J., Zvinchuk, A., Erdal (IHF), S., Caudill, M., Scheff (IHF), P., Lukyanova, E., Shkiryak-Nyzhnyk, Z. and Chislovska, N.: Urinary 1-Hydroxypyrene as a Biomarker of PAH Exposure in Three-Year-Old Ukrainian Children. Environmental Health Perspectives, 114(4): 603-607, 2006.
23. M Rizzo (IHT) and PA Scheff(IHF): Utilizing A Chemical Mass Balance and Positive Matrix Factorization to Determine Influential Species and Examine Possible Rotations in Receptor Modeling Results. Accepted for publication, Atmospheric Environment, May, 2007.
24. M Rizzo (IHT) and PA Scheff (IHF): Fine Particulate Source Apportionment Using Data from the USEPA Speciation Trends Network in Chicago, Illinois: Comparison of two Source Apportionment Models. Accepted for publication, Atmospheric Environment, March, 2007.
25. Yawei Wang, Qinghua Zhang, An Li (IHF), Hanxia Liu, Guogang Li, Guibin Jiang, Jingtian Hu. Polybrominated Diphenyl Ethers in Sewage Sludge of Wastewater Treatment Plants in China. Chemosphere, 68(9), 1683-1691, 2007

C. Program Faculty.

Contributing Faculty to the Industrial Hygiene Program			
Faculty	Position	Research Area	Contribution to IH Program, % (Teaching, Research, Other)
Peter A. Scheff, Ph.D., CIH (#3197), QEP	Professor and Director of Industrial Hygiene	Characterization and modeling of ambient and workplace air quality; bio-aerosol characterization; environmental modeling and exposure assessment.	Time commitment - 60% - Teaches, EOHS405 Environmental Calculations and EOHS431 Air Quality Management; research advisor; short courses; Director of Air Pollution Training Institute program at UIC.
Lorraine M. Conroy, Sc.D., CIH (#5500)	Associate Professor	Design of ventilation systems; TB control criteria; determination of workplace exposure to toxic chemicals; industrial welding.	Time commitment - 50% - Director of ERC; Teaches EOHS421 Fundamentals of IH); Co-Teaches EOHS523 Eng. Control/Ventilation; research advisor; short courses)
Nurtan A. Esmen, Ph.D.,	Professor	Application of engineering principles and mathematics to occupational and environmental health problems with special emphases on aerosol physics, exposure estimation and characterization.	Time commitment - 25% - teaches EOHS 557, Design and Analysis of Experiments, senior research mentor and research advisor.
Rosemary Sokas, M.D., MOH	Professor and Director, EOHS	Applied, translational occupational safety and health organizational work targeting small businesses and vulnerable populations	Time commitment – 10% Teaches EOHS400 Introduction to Environmental Health Sciences; Field research; Director of the academic program.
Salvatore Cali, MPH CIH (#7423)	Senior Research Specialist	Indoor and Industrial air quality, bio-aerosols, lead and asbestos.	Time commitment - 25% - Deputy Director of Industrial Hygiene; teaches EOHS428 IH Laboratory; mentors students on field studies and capstones, and contributes to short courses and outreach activities.
John E. Franke, Ph.D., PE, CIH (#1464)	Research Assistant Professor	Workplace characterization and estimation of personal exposure; TB confinement; emission factors.	Time commitment – 25% - Teaches EOHS570 Hazardous Materials Management and co-teaches EOHS523 Engineering Controls; field research advisor.
Steven E. Lacey, Ph.D., CIH (#16269)	Research Assistant Professor	Exposure reconstruction; exposure modeling; injury prevention.	Time commitment – 25% - Teaches IE341 Ergonomics and Human Factors, and IE461 Safety Engineering, and co-teaches EOHS 408 Biological, Chemical, Explosives, and Nuclear Weapons as Public Health Threats; research advisor.
John Standard, M.S., MPH, CIH (#2164), CSP	Lecturer	Hazard evaluation and safety control	Time commitment - 10% - Teaches EOHS482 Occupational Safety Science.
Michael Selway, M.S., CIH (#2695)	Lecturer	Noise evaluation and control; field studies.	Time commitment - 20% - Teaches EOHS424 Environmental Acoustics and EOHS529 IH Lababoratory II.

Daniel O. Hryhorczuk, M.D., MPH	Professor	Occupational and environmental epidemiology and toxicology.	Time commitment - 10% - Teaches, IPHS554 Occup. & Environ. Epi.; research advisor; short courses.
An Li, Ph.D.	Associate Professor	Environmental Chemistry	Time commitment - 10% - Research advisor; Teaches EOHS440 Chemistry for Environmental Professionals
Dan Tessier, Ph.D.	Assistant Professor	Environmental and Occupational Toxicology	Time commitment -10% - Research advisor; Teaches EOHS455 Environmental and Occupational Toxicology and EOHS 555 - Advanced Topics in Toxicology.
Serap Erdal, Ph.D.	Associate Professor	Exposure assessment, risk analysis	Time commitment - 25% - Research advisor; Teaches EOHS438 Air Quality Lab and EOHS556 Risk Assessment
Linda Forst, MD, MPH	Associate Professor	Worker health; epidemiology of workplace disease, safety and injury.	Time commitment - 10% - Research advisor; Faculty of Occupational Medicine at UIC; teaches EOHS551 Occupational Diseases

A Program Title: Occupational Health Nursing

B Program Director: Arlene A. Miller, PhD, RN, FAAN (interim)

C Program Description

1. Introduction

The University of Illinois (UIC) Occupational Health Nursing (OHN) program began in 1978 when NIOSH funded UIC as an Educational Resource Center (ERC). During the past 28 years, progressive changes in the program's curriculum, leadership and research availability have enhanced and expanded learning opportunities for the OHN students. The UIC OHN program emphasizes the need for nursing leadership and management across systems and policy arenas both nationally and internationally. Based on this, students learn highly flexible and consolidated advanced practice OHN roles, traditional and innovative models for promoting and improving worker health and safety, and leadership for creating efficient and effective occupational health services within a variety of systems. The program also emphasizes OHN competencies by providing a dynamic mix of evidenced-based, interdisciplinary learning programs with innovative long-distance education technologies.

2. Program Objectives

The OHN Program has identified seven objectives to advance OHN education, research, service and practice. They are to:
a) Strengthen enrollment in the OHN programs by recruiting qualified and diverse nursing students in the MS and PhD programs.
b) Prepare OHN students for dynamic leadership roles in personal and occupational health systems within business/industry.
c) Promote accessibility of OHN curriculum across the ERC region.
d) Initiate the advancement of interdisciplinary collaboration among College investigators with Occupational Health related research with core ERC and urban and rural UIC faculty.
e) Enhance international options for UIC OHC research and services. Identify a partner for international studies to increase OHN international experiences and collaboration.
f) Reinforce the utilization of leading edge communication/information technologies for OHN program/product development, marketing, and delivery, including continuing education for OHNs at distant locales.
g) Develop faculty practice options in OHN.
These objectives support the OHN mission statement and aide in the continuing success and development of the UIC OHN program.

3. Responsible Conduct of Science Training

In an effort to support the research endeavors of College of Nursing , all investigators, including all students are required to receive formal training in human research subjects protection, the protection of health information, and if applicable, training in the humane use of animals in research and teaching. This training in research integrity, ethical behavior, and responsible conduct is also underscored in the classroom.

4. Faculty Participation

The Public Health, Mental Health, and Administrative Nursing (PMA) faculty in the College of Nursing (CON) are dedicated to the promotion of excellence for the OHN program. Many PMA faculty members outside the OHN program have research interests that include occupational health topics. These faculty members support and encourage the progression of the OHN program. The OHN and PMA faculty includes Dr. Arlene Miller, Dr. Beverly McElmurry, Ms. Jacqueline Wuellner, Ms. Rebecca Mischak, and Mr. Charles Yingling.

This team is actively involved in research, professional associations, presentations and continuing education offerings at international, national and local levels, occupational health consultations, and peer-reviewed publications. The OHN faculty team assures that occupational health content is articulated at all levels of nursing education at UIC.

Dr. Arlene M. Miller, PhD, RN, FAAN is the interim OHN Program Director. In this role, Dr. Miller oversees the administration of the OHN Program in the areas of academic course work, clinical experiences, research training, interdisciplinary activities, continuing education and outreach efforts, and financial management of the training grant. Dr. Miller has a doctorate in Counseling Psychology and a master's degree in Public Health Nursing. She is Principal Investigator on a federally funded longitudinal study of women from the former Soviet Union, "Post-Migration Health and Behavior Change in Midlife Women." She teaches an interdisciplinary doctoral-level cross-cultural research methods course, and has examined relationships among acculturation and health in immigrant women and their husbands. She recently obtained funding for a preliminary study of acculturation, social ties, and health literacy among female immigrant home care workers from the former Soviet Union and the Philippines.. Dr. Miller is the Public Health, Mental Health, and Administrative Nursing Department Head, at the UIC College of Nursing.

Dr. Beverly McElmurry, EdD, RN, FAAN has contributed to the OHN program by developing an international initiative for the program. She is the Professor and Associate Dean for the Global Health Leadership at UIC. She also serves as Director of the UIC College of Nursing WHO Collaborating Center for International Development of Primary Health Care (PHC). Dr. McElmurry has developed ties to a strong network of international nurse researchers dedicated to promoting leadership for nursing primary health care.

Ms. Jacqueline Wuellner, MPH, RN is the Deputy Director for the UIC OHN Program and the Assistant Study Director for Clinical Data on the Epidemiologic Study of Recreational Use of the Chicago Area Waterways, a multiyear project through the UIC School of Public Health.
As Deputy Director of the OHN Program she is responsible for budget management, practicum placement, interdisciplinary activity coordination, program marketing, student recruitment, web site management, and outreach effort facilitation. She also co-teaches the Introduction to Occupational Health Nursing course (NUPH 400) and serves as faculty advisor to OHN students. Ms. Wuellner has over 30 years nursing experience and since 2000 has been actively involved in environmental and occupational health.

Ms. Rebecca Mischak, APRN-BC is an Occupational Health Nurse Practitioner and Manager at UIC UHS clinic. She is a master's prepared OHNP with over 17 years experience in the field occupational health nursing. Additionally, she is a certified FNP and COHN-S. Ms. Mischak contributions to the UIC OHN program are extensive. She acts as a preceptor for undergraduate and graduate nursing students and offers her widespread occupational health knowledge when collaborating on OHN program syllabi review and updates.

Mr. Charles Yingling, APRN-BC works as a clinical instructor at the UIC CON. He is a 2005 graduate of the UIC OHN program. As UIC faculty he contributes five percent of his time to OHN programs serving as clinical preceptor for OHNP students during their occupational health rotations. Additionally, he acts as a mentor for current OHN students and uses his extensive occupational health knowledge to serve as a chairperson for OHN student's master projects.

5. Curricula

The goal of the OHN program is to prepare nurses for leadership and practitioner roles in an occupational health practice. During the program, each OHN student applies community and public health nursing

principles to the specialty area of occupational health. The student participates in academic coursework, clinical fieldwork, field trips, occupational health clinic observations, and weekly interdisciplinary seminars with other trainees.

Masters degree program of study: The OHN master's candidate completes research methods coursework and conducts research under the guidance of OHN and PMA nursing faculty. Within the masters program there are two OHN concentrations – OHN Leadership/Management and OH Nurse Practitioner (OHNP). The OHN Leadership/Management track is for individuals who desire advanced education in the area of Occupational Health administration. Courses are focused on advancing leadership and management skills. Cynthia Fearns graduated in May 2007 with a concentration in OHN Leadership and Management and Deborah Masters is currently in this track with plans to graduate in Summer 2008. Individuals who desire to be Occupational Health Nurse Practitioners obtain this degree in two different ways depending on their background. Those trainees that have a bachelor degree in nursing enter directly into the graduate program. This curriculum is composed of the traditional Family Nurse Practitioner (FNP) courses, plus five additional occupational health courses. One student, Mary Dahilig, was accepted into the graduate OHN program Fall 2006 but deferred entering until Fall 2007. Four additional students were enrolled in the OHNP program: Sheon MacNeil, Silvia Lara, Liliana Rubio and Amy Bowling. Individuals who have a bachelor degree in fields other than nursing obtain their Master's in Nursing degree by entering the Graduate Entry Program (GEP). The first 18 months of the GEP program prepares the trainee to take the national nursing exam (N-CLEX) and become Registered Nurses (RNs). After passing the exam, the trainee is qualified to begin the traditional OHN/FNP curriculum. In the 2006-2007 academic year, there were two students in the OHN GEP; David Persuad and Joshua Laird-Wilson. Both students successfully completed their core nursing studies, passed the N-CLEX exam for licensure and entered the workforce as RNs. In Fall 2007, both students began their graduate studies in the OHN/FNP program.

Program Curriculum – CON Core Courses: All CON students take five common core (nursing science, policy and professional issues) courses, eight OHN/Public health nursing course departmental core courses, and four core interdisciplinary occupational health courses. In addition, there are two or three advanced management courses required for trainees on the Management/Leadership or CNS track and seven advanced nursing courses for those on the OHNP track. Details are provided in Appendix A.
Doctoral degree program of study: The goal of the OHN doctoral (PhD) research training at UIC is to prepare independent OHN researchers whose work will contribute to the knowledge base in occupational health and whose qualifications will enable them to assume leadership positions within occupational health. In the 2006-2007 academic year there were two PhD trainees with NIOSH funding in the OHN program, Jorgia Connor and Sarah Katula. Ms. Connor's area of research studies the effects of recent immigration to the United States for Philippine female nurses. Ms. Katula's research focuses on the impact of domestic violence on workers while in the workplace.
The doctoral program requires a minimum of 96 semester hours for graduation, which includes advanced coursework in theory, research methods, statistics, and 31 hours of independent research.

D Program Activities and Accomplishments

Objectives: The UIC OHN program has had much success in meeting its objectives during the 2006-2007 academic year:

- Strengthen enrollment in the OHN programs by recruiting qualified and diverse nursing students in the MS and PhD programs. Four new OHN masters students entered the program in Fall 2006. Our current cohort of ten students is comprised of both females and males from divers racial and ethnic backgrounds. In addition to the new MS students, there were three OHN doctoral candidates, one of whom was an international student who returned to her native country to teach in a university nursing program.

- Competency based and flexible learning programs. Extensive competency reviews based on the current occupational health standards as they correlate to AAOHN were conducted by UIC OHN faculty and used as the core structure to guide the CON UIC occupational health nursing program courses. The OHN program is able to serve students living within and outside of the Chicago Metropolitan Area with courses offered at five sites, Chicago, Rockford, Quad Cities, Urbana-Champaign and Peoria. UIC is a leader is distance-learning options and OHN students have the option to take many courses online and/or via videoconference.
- Prepare OHN students for dynamic leadership roles in personal and occupational health systems within business and industry. The UIC OHN curriculum continues to successfully prepare students for employment in occupational health systems as exemplified by the diverse employment opportunities of recent graduates. Recent graduate Cynthia Fearn (2007) is an certified Occupational Health Nurse in industry in Rockford, Illinois.
- Initiate the advancement of interdisciplinary collaboration among college investigators with Occupational Health related research with core ERC and urban and rural UIC and UIUC (Urbana-Champaign) faculty. The structure of the ERC supports interdisciplinary learning and includes Nursing, Industrial Hygiene, Medical, and Industrial Safety courses, students and faculty. The UIC OHN program continues to promote and support interdisciplinary collaboration among College investigators with OHN-related research and expertise.
- Develop faculty practice options in OHN. The UIC Institute for Healthcare Innovation (IHI) in Chicago, directed by Dr. Judith Storjfell, offers numerous opportunities to develop occupational health nursing practice sites.
- Enhance international options for UIC OHN research and services. Identify a partner for international studies as a means of increasing OHN international experiences and collaboration. Creating international options for UIC OHN students continues to be an important mission for the OHN program. Dr. Beverly McElmurry, EdD, RN, FAAN, is an invaluable resource for the UIC OHN program and has contributed time to the development of an OHN international initiative. Her strong ties to the international community facilitated the appointment of PhD graduate Hyeonkeong Lee from Korea to the UIC OHN program as an adjunct faculty. Ms. Lee's research regarding musculoskeletal disorders in female flight attendants has contributed immensely to the UIC OHN program.
- Reinforce utilization of leading edge communication/information technologies for OHN program development, marketing and delivery, including OHN education for OHNs in distant locales. The CON is a leader in distance learning that supports and enables the ability for many OHN management and OHNP courses to be offered online or by videoconference. In the 2006/2007 academic year, EOHS 421 Fundamentals of Industrial Hygiene and EOHS 551 Occupational Diseases, required courses for the OHN program, was added to the list of courses available by videoconference.

E Program Products

Research:

- In July 2007, OHN doctoral trainee Jorgia Connor received funding from pilot project research training program for her dissertation pilot project entitled Work and Adaptation Experiences of Registered Nurses from the Philippines. Her work is categorized under the NORA priority area: changing organization of work.
- OHN doctoral trainee Sarah Katula presented two posters at the annual UIC Research Day (2007) Incorporating Sanctuary, An Opportunity for Healing Environments and Childhood Cancer Survivorship: Building, Analyzing and Applying Evidence.

Publications:

- OHN doctoral Trainee Sarah Katula had 2 articles published during the reporting period:

- Katula, S. (2006). Domestic Violence in the workplace – Part 2: the worksite response. AAOHN, 54 (8), p. 341-344.
- Finnegan, L., Wilkie, D.J., Wilbur, J., Campbell, R.T. Zong, S., & Katula,S. (2007). Correlates of physical activity in young adult survivors of childhood cancers. Oncology Nursing Forum, 34 (5), p. 60-69.

Presentations:

- In 2007, Sarah Katula presented at two separate conferences in DuPage County on domestic violence and empowering women.
- The UIC OHN faculty routinely present lectures on occupational health topics.
- During the 2006-07 academic year, Rebecca Micschak, UIC CON faculty conducted lectures to UIC, Rush and North Park University undergraduate RN students. These lectures served to educate new RNs regarding the role and significance of occupational health nursing and was an opportunity to recruit interested students to the UIC OHN graduate program.

UIC Sponsored Programs:

- In October 2006 the UIC OHN program co-sponsored an occupational nursing state conference with the Illinois Association Occupational Health Nursing (IAOHN). The conference was entitled *Make No Bones About It: Occupational Health Nursing Rules*. Topics included surgical and non-surgical interventions for spinal cord injuries, work hardening and Physical Therapy. Approximately 60 occupational health nurses from throughout Illinois attended and continuing education credits were provided. The OHN program provided participants with information on occupational health nursing and the UIC OHN program.

F. Future Plans

The UIC OHN Program is dedicated to our mission of occupational health and safety for all workers through education, research, and service. Discussed below are our future plans for meeting many of our programs objectives.

1. Continue strengthening enrollment in the OHN programs by recruiting qualified and diverse nursing students in the MS and PhD programs:
   The OHN program marketing plan for the next budget period focuses on recruitment of PhD students, as well as RNs in occupational health settings interested in graduate degrees. The updated plan includes: (a) scheduling faculty presentations to nursing undergraduates in area colleges; (b) distribution of OHN program brochures with ERC continuing education brochures; (c) provision of OHN faculty representation at UIC and departmental graduate student information sessions; (d) offering introductory OHN course to CON undergraduate seniors; (e) placement of program staff at booths at state and local continuing education programs and (f) updating the UIC OHN webpages.
2. Promote accessibility of OHN curriculum across the ERC region.
   The UIC OHN program is dedicated to providing accessibility to its trainees which will enable distance learning for regional trainees. Centra will be used for a fuller, interactive learning experience.
3. Enhance international options for UIC OHN research and services. Identify a partner for international studies to increase OHN international experiences and collaboration. Dr. McElmurry's experience with international research and studies will assist in the development of this program.

A. Program Title: Occupational Medicine, University of Illinois at Chicago

B. Program Director: Susan Buchanan, MD, MPH

C. Program Description

1. Overview

Residents in Occupational Medicine at UIC enter the program after spending their PGY-1 year completing an internship at any ACGME-accredited residency program. The Occupational Medicine program consists of a twelve-month academic phase (PGY2) and a twelve-month practicum phase (PGY3). During both phases, residents are required to attend a two hour conference on Wednesday mornings, a weekly noon conference that is organized by the NIOSH Education and Research Center at the University of Illinois School of Public Health, and at least one half day per week of Occupational Medicine out-patient clinic. In addition, they are incorporated into special projects like health hazard evaluations related to the workplace or general environment, exposure assessments, and development of surveillance programs. Site visits to industries are organized once a month.

During the Academic phase, residents take courses in epidemiology and biostatistics, management, behavioral sciences, industrial hygiene, risk assessment and occupational safety. Courses in occupational diseases and toxicology enhance the ability of the residents to address clinical occupational medicine problems. Residents attend one half-day each of an Occupational Medicine clinic each week and one half-day in the University Health Services (Employee Health) clinic.

The Practicum Phase entails completion of: 1) five industrial rotations; 2) the research project 3) one rotation of OM Consultation Service; 4) four months of electives; 5) minimum of ½-day per week of outpatient OM clinic for the entire year; and 6) presentation of their research/capstone project at the end of the year. In addition to the requirements, listed above, residents prepare and give lectures, supervise junior residents and medical students on the OM Consultation Service and in clinic, participate in special projects, attend depositions on cases related to workers compensation, and attend industrial site visits.

2. Training Objectives and Goals

The main objective is to provide comprehensive training to physicians in Occupational and Environmental Medicine leading to board certification in Preventive Medicine (OM concentration).

Goal 1. Graduates will be able to provide high quality clinical occupational health care to workers from a variety of workplaces settings: manufacturing, mining and construction, transportation, service, and health industries.

Objectives

a. Residents will take classes at the UIC School of Public Health in industrial hygiene, toxicology, and occupational diseases.
b. Residents will spend at least 5 block rotations providing occupational health care to injured workers in a variety of outpatient and workplace occupational medicine clinic settings.
c. Residents will attend at least one UIC/Stroger Occupational Medicine clinic session per week throughout the 2 years of training.
d. Residents will present at least 2 case conference “Clinical Quandaries” per year in which they research a challenging patient seen in clinic and facilitate discussion on the case assessment and management.

Goal 2. Graduates will incorporate objective assessment of the occupational medicine literature into their practices of occupational medicine and will be able to evaluate and conduct epidemiologic research.

Objectives

a. Residents will participate in the monthly journal club and will be prepared to offer an assessment of the selected articles.
b. Residents will take classes at the UIC School of Public Health in epidemiology, biostatistics, and occupational epidemiology.
c. Residents will complete an epidemiologic research project under the mentorship of a faculty advisor. He or she will identify a hypothesis, design the methods, complete the IRB application, and participate in the data analysis. The resident will present the research findings in three stages over the course of the PG-3 year at the Wednesday morning conference sessions: literature review, methods, and final results.
d. Residents will perform literature searches and literature evaluations as part of their patient write-ups when causality between exposure and disease is the clinical issue.

Goal 3. Graduates will be able to function as occupational medicine consultants. They will be able to offer a professional opinion on the link between workplace or environmental exposure and disease incorporating weight of evidence, dose-response, and toxicological information.

Objectives

a. Residents will dictate all new cases seen in the UIC and Stroger occupational medicine clinics. The resident is expected to write an extensive assessment based on a literature search of the subject. The chart notes are reviewed by the attending physician and revisions are made in an interactive process between the attending and resident until the note reflects an evidence-based expert opinion.
b. Residents will spend two rotations on the Stroger/UIC consult service during which they respond to requests for in-hospital occupational and environmental consultations. They evaluate all occupational trauma patients admitted to Stroger Hospital for causality, hazard assessment and Workers Compensation coverage. They also take phone consultations from concerned citizens about environmental exposures and from physicians in the Midwest region about occupational and environmental health care issues.
c. Those residents who desire expertise in Workers Compensation litigation will have the opportunity to rotate with a Workers Compensation attorney.
d. Residents will take classes at the UIC School of Public in occupational diseases, occupational epidemiology, toxicology, and industrial hygiene.

Goal 4. Graduates will be able to participate in occupational and environmental health policy-making at the local, regional, and national levels. They will perform clinical, research, and policy activities with a public health/population level approach.

Objectives

a. Residents will spend two rotations on the Stroger/UIC consult service during which they evaluate all occupational trauma patients admitted to Stroger Hospital. They assess circumstances of injury and workplace hazard assessment. They then notify the regional office of the Occupational Safety and Health Administration for workers who report work conditions that violate OSHA standards.
b. Residents will take classes at the UIC School of Public Health in health policy and administration, the US health care system, community health, and environmental health sciences.
c. Residents will attend the Occupational Medicine monthly Grand Rounds during which policy experts on occupational, environmental, and public health topics present current controversies.

3. Responsible Conduct of Science Training

All trainees are required to complete the UIC Human Subjects Protection Education program. This can be

done by attending the in classroom session called “Investigator 101 Training”, or by completing an online module the “Collaborative IRB Training Initiative.” The residents and faculty of the Occupational Medicine program are 100% compliant with these requirements.
Throughout the year, in the resident’s regularly scheduled Wednesday AM lecture series, various ethical and methodologic issues related to research are discussed.

4. Faculty participation

The Occupational Medicine program continues to have a strong committed faculty. With the closing of the Stroger program we lost three core faculty members. Others have dual appointments at UIC so will continue their work here and one has been rehired. The core faculty includes:

Susan Buchanan, MD, MPH. Program Director, UIC Occupational Medicine Residency
Robert Cohen, MD. Pulmonologist. Medical Director of Stroger Black Lung Clinic Program
Samuel Dorevitch, MD, MPH. Research Asst. Professor, UIC SPH. OM Curriculum, lead physician.
Katherine Duvall, MD, MS. Supervisor OM Clinic, co-director, Health in the Arts Program.
Linda Forst, MD, MPH. Associate Professor, UIC SPH.
Daniel Hryhorczuk, MD, MPH. Professor, UIC SPH, Director, Great Lakes Centers for Occupational and Environmental Safety and Health.
Anne Krantz, MD, MPH. Core OM faculty.
David Marder, MD, MPH. Director, University Health Services, UIC. Core OM faculty.
Peter Orris, MD, MPH.. Director of UIC Occupational Health Services Institute. Core OM faculty.

5. Curriculum – See Overview above.
(See Appendix for a full description.)

D. Program Activities and Accomplishments

The UIC Occupational Medicine program continues to address program needs with an aim to improving resident education. During the past year the program underwent a successful accreditation site visit by the Accreditation Council for Graduate Medical Education. Preparing for the site visit helped the program update its overall goals and objective and its rotation-specific goals and objectives. In addition, the ACGME competencies were incorporated into all evaluation documents. The Wednesday morning conference schedule was revised by Dr. Dorevitch with an eye to addressing not only Occ Med competencies but also preventive medicine topics that have been lacking in previous years. Residents now routinely review national preventive screening guidelines and reference chapters pertaining to health care financing and management.

All three graduates were hired into occupational medicine clinical positions. They all took the Preventive Medicine board exam and are awaiting the results. All completed research projects that are in the process of being written up for publication. The titles are: *Asthma related work disability in low income asthma patients, Efficacy of community interventions in the area of air pollution, Nasopharyngeal Cancer and Occupation in Chengdu, China.* One of the entering residents is a recipient of the ACOEM Occupational Physicians Scholarship Fund award.

A new UIC faculty position was created that allowed one of the Stroger program faculty to continue teaching the residents. Dr. Krantz will precept one of the clinics and participate in the consultation service coverage. Dr. Sam Dorevitch was awarded a large grant from the city of Chicago to evaluate the effects of pollutions to recreational boaters on the Chicago river. Dr. Buchanan became the project director of the Committee for Reproductive Environmental Health in Minority Communities. Dr. Linda Forst developed a new course in Occupational Injury Epidemiology which will be offered in the School of Public Health this spring.

E. Program Products

Publications and Presentations

1. Buchanan S, Nickels L, Morello J. Occupational health among Chicago day laborers: An exploratory study. Arch of Env Occ Health 2005;60:No.5 (Copyright 2006)

2. Forst L, Martinez-Noth I, Lacey S, Bauer S, Skinner S, Zanoni J, Petrea R. Barriers and Benefits of Protective Eyewear Use by Latino Farm Workers. 2006: J Agromed 11(2):11-17

3. Dorevitch S, Demirtas H, Persky VW, Erdal S, Conroy L, Schoonover T, Scheff P: Demolition of high-rise public housing increases particulate matter air pollution in communities of high-risk asthmatics. J Air Waste Management Assoc. 2006 Jul;56(7):1022-32.

4. Friedman LS and Forst L. The Impact of OSHA Recordkeeping Regulation: Changes on Occupational Injury and Illness Trends In The U.S.: A Time Series Analysis. 2006 OEM, Accepted

5. Friedman L and Forst L. Occupational Injury Surveillance of Traumatic Injuries in Illinois Trauma Registry:1995-2003. J Occup Env Med, 2006. Accepted

6. Hryhorczuk D. The Fogarty ITREOH Program: Promoting global environmental and occupational health through training and research (editorial). IJOEH 2006; 12(4):423-424.

7. Dorevitch S, Tharenos L, Demirtas H, Persky VW, Artwohl J, Fortman J: "Inverse association between rural environment in infancy and sensitization to rodents in adulthood." Annals of Allergy Asthma and Immunology. 2007 (e-pub ahead of print May 27, 2007)

8. Dorevitch S, Demirtas H, Scheff P, Persky VW: "Bias and confounding in longitudinal measures of exhaled monoxides." Journal of Exposure Science and Environmental Epidemiology, 2007. (e-pub ahead of print Feb 7, 2007)

9. Patel M, Williamson R, Dorevitch S, Buchanan S. Pilot Study Investigating the effect of the static mganetic field from a 9.4 Tesla MRI on the Vestibular System. AJOEM, In review.

10. Gummin D and Hryhorczuk DO. Hydrocarbons, in Toxicologic Emergencies 7th Edition. Goldfrank LR, Flomenbaum NE, Lewin NA, Howland MA, Hoffman RS, Nelson LS, (ed). McGraw Hll, 2007 (in press).

F. Future Plans

Goals for this reporting period:
a) Improve the resident and faculty evaluation process. The curriculum had been designed to be competency based, addressing both the core resident competencies and the ACGME occupational medicine competencies. The residency will continue to improve its resident and faculty evaluation process. All outside rotation evaluation forms have been re-designed to reflect the competencies. The Selections and Promotions meetings, during which UIC faculty verbally assess each resident, will be re-oriented so residents are assessed based on the competencies. Residents will receive feedback from faculty and program director, both verbal and written, expressed within the six core ACGME competencies. This will allow a formal, structured process of advancement through residency training.

b) Improve the quality of applicants. This is a common problem at the national level as medical schools

continue to leave occupational medicine out of their formal curricula. Several UIC outreach activities have been initiated and will be expanded. 1. Residency website. During the 2006-2007 year a UIC OMR website was developed and a skeleton version is now available on the web. Our goal is to keep the site updated with a current conference schedule and list of recent student and faculty publications. We plan to add more pages and links to the site. 2. Attendance at residency fairs. During the past year the UIC Occ Med residency presented a booth at the UIC residency fair. It was well received and staffers answered many questions about the profession and training program. We hope to continue this annual attendance and expand to other regional residency fairs. 3. Outreach to UIC medical students. Medical students receive lectures in occupational medicine during their Family medicine rotation. During that experience they learn about the role of the occupational medicine service at UIC. As a result, medical students now routinely rotate on the Occ Med Consultation Service as an elective. We hope to expand the service to accommodate more than one student at a time.

c) Increase the volume of consults, both inpatient and telephone calls, to the Occ Med Consultation Service. Since the closing of the Stroger Cook County combined IM/Occ Med residency, the volume of calls to the Consultation service has diminished. We hope to build the volume back up as hospital departments at Stroger are informed that there continues to be an Occ Med presence by the UIC service. We are also reaching out to UIC departments via residency program directors and department heads.

d) Continue to have an active curriculum committee. The committee currently meets every other month and has done so for the past year and a half. As the job market and work environments evolve and change, so do the required skills and knowledge base for OM physicians. The curriculum must be reviewed continuously and changed to provide appropriate training for our residents.

Appendix: Sample Curriculum OMR

The UIC OMR program consists of a 12-month Academic Phase (PG2) and a 12-month Practicum Phase (PG3). During both Phases, residents are required to attend a two-hour conference on Wednesday mornings, a weekly noon conference organized by our NIOSH ERC, and at least ½-day per week of outpatient clinic. In addition, residents are included in special projects like health hazard evaluations related to the workplace and environment contaminations, exposure assessment, and development of surveillance programs. Site visits to local industries are organized approximately once per month. Residents present at least two case presentations and one toxicology conference per year.

During the Academic Phase residents attend the UIC School of Public Health as full-time students. They complete the classroom requirements for a Master of Public Health degree which they receive at the end of the PG-3 year when they have completed their research requirement. They also attend one of the weekly OM clinics plus ½ day session in the University Health Service. Since the academic calendar covers only 8 months of the year, PG-2 residents complete four clinical rotations when classes are not in session.

Required SPH courses include:

EOHS 400 Principles of Environmental and Occupational Health Sciences
Introduction to environmental influences on health such as food, energy, community hygiene, solid and hazardous wastes, air and water pollution, and radiation. The course also introduces the residents to the practices of injury control, industrial hygiene and occupational health.

EPID 403 Introduction to Epidemiology: Principles and Methods
Introduction to descriptive and analytic epidemiology, and determinants of health and disease in populations. Measures of occurrence, association, and statistical testing will be addressed, along with study designs, bias and confounding.

BSTT 400 Biostatistics I
This course introduces the residents to descriptive statistics, basic probability concepts, one- and two-sample statistical inference, analysis of variance, and simple linear regression.

HPA 400 Principles of Management in Public Health
This course provides the residents with a detailed discussion of the conceptual and theoretical foundations to the principles of management with an emphasis on public health and health care settings.

CHSC 400 Public Health Concepts and Practice
It introduces the residents to health programs, the delivery of health services and the role of public health. Delivery of health care, review of health legislation and case study examples are included.

CHSC 401 Behavioral Sciences in Public Health
This course provides grounding in the behavioral sciences with applications to public health. It examines individual, institutional and societal responses to the psychosocial factors influencing health and illness.

EOHS 551 Occupational and Environmental Diseases
This course introduces diseases caused by physical, biological, chemical, and traumatic agents, toxicologic properties, epidemiologic studies, pathophysiology, diagnosis, treatment and prevention of the occupational and environmental diseases and the effects of environmental/occupational stressors on high risk populations.

EOHS 455 Environmental and Occupational Toxicology
General and applied toxicology as it relates to environmental and occupational exposures to hazardous agents. Emphasis on basic principles, specific types of toxicity, and major classes of toxic agents.

EOHS 421 Fundamentals of Industrial Hygiene
This course covers the basic principles of recognition, evaluation and control of chemical, biological and physical agents in the workplace. The course includes the use of preliminary surveys, measurement of exposure, and evaluation of control measures. Standard setting and policy issues are explored, as well.

EOHS 482 Occupational Safety Science
Principles of occupational safety, safety regulations, accident investigation procedures and engineering, behavioral and administrative techniques for occupational accident control.

EOHS 554 Occupational and Environmental Epidemiology
Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards.

IPHS 650 Field Experiences in Public Health
The residents utilize one of their industrial rotations during the Practicum portion of the residency to fulfill this requirement.

IPHS 698 Capstone Project
For residents, this entails a presentation of research completed over the period of residency training. Residents make their research results into a poster session that is shown in a 1/2-day session in the School of Public Health in April.

The Practicum Phase consists of 12 block rotations of one month each, including five blocks of clinical occupational medicine, two blocks of research, one block on the OM Consultation Service, and four blocks of electives. Throughout the year residents spend at least ½-day per week in one of the OM clinics. They also attend the weekly Wednesday conferences, which follow a monthly template:

Week 1, Hour 1 Journal Club
Week 1, Hour 2 Case Presentation/ Core Content Review

Week 2, Hour 1 Corporate Occupational Health
Week 2, Hour 2 Case Presentations/ Rotation Report Back

Week 3, Hour 1 Grand Rounds/ guest lecturer
Week 3, Hour 2 Resident Research Presentations

Week 4, Hour 1 Occupational Medicine/Toxicology Combined Conference
Week 4, Hour 2 Industrial Process Presentation

Required rotations:

UIC/Stroger Cook County Occupational Medicine Consult Service Residents will begin to develop a high level of knowledge and skills in the practice of specialty level Occupational Medicine and also receive exposure to occupational toxicology.
University Health Service The overall goal of the four-week rotation is to provide the resident with mentored experience in all aspects of a university hospital-based employee health service.

Electromotive Diesel, Inc. The overall goal of this rotation is to provide training in the delivery of occupational medicine in a manufacturing setting including the administration of the medical department, and an introduction to the industrial setting and safety programs.
UIC Physical Medicine and Rehabilitation The overall goal of this rotation is to gain expertise in the diagnosis of musculoskeletal injuries and illnesses.

Elective rotations:

Advocate Occupational Health The overall goal of this rotation to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
American Airlines Medical Department, O'Hare Airport The overall goal of this rotation is to familiarize residents with aerospace medicine including the flight environment, the management and administration of airline employee health, and clinical aerospace medicine.
International Truck and Zurich The overall goal of the IT portion of this rotation is to provide training in the delivery of occupational medicine in a manufacturing setting. The overall goal of the Zurich portion of the rotation is to provide experience for residents in advising insurance company approval of claims for clinical testing and procedures.
St. James Occupational Health The overall goal of this rotation is to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
Evanston Northwestern Healthcare Omega Occupational Health The overall goal of this rotation is to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
UIC Medical Center at O'Hare Airport The overall goal of this rotation is to provide residents with clinical and administrative experiences specific to airport workers and travelers.
Agency for Toxic Substances and Disease Registry, Region 5 Office By the end of the rotation residents will be able to demonstrate understanding of environmental health issues in Region 5, assess the current environmental literature, and understand the professional responsibilities of the environmental health personnel at ATSDR.
Workers' Compensation Rotation The overall goal of this rotation is to give the resident experience with the workers compensation system in Illinois from a legal standpoint.
National Institute for Occupational Safety and Health

A. Program Title: Occupational Medicine, Stroger Hospital of Cook County

B. Program Director: Rachel Rubin, MD, MPH

C. Program Description

1. Overview

Almost all of the residents in the SHCC OM Program are enrolled in the combined Internal Medicine/Occupational Medicine Program. This combined residency track is a four-year program where the resident's PGY1 year is spent doing an Internal Medicine internship. This is identical to the internship in the categorical Internal Medicine residency, with the exception that they spend one month on the Occupational Medicine consultation service, which also is credited as an Internal Medicine subspecialty elective. This intern year constitutes the resident's clinical year requirement for Occupational Medicine residency. The residents are certified by the Program Director of Internal Medicine as having met all the requirements of an Internal Medicine internship (PGY1) year.

The second year of the combined program is the academic year of the Occupational Medicine residency as described below. During breaks in the academic schedule, the residents do some inpatient Internal Medicine and Occupational Medicine rotations. The PGY3 year again is solely devoted to Internal Medicine rotations. However, the residents continue attending an Occupational Medicine clinic one half-day per week.

The PGY4 year is the Occupational Medicine practicum year and is described below. Occasionally, the combined program resident after successfully completing his or her Internal Medicine internship elects not to continue in the combined track. In this instance, he/she does two more years of residency, only in Occupational Medicine: the PGY2 academic year and PGY3 practicum year.

The Occupational Medicine program consists of a twelve-month academic phase (PGY2) and a twelve-month practicum phase (PGY4). During both phases, residents are required to attend a two hour conference on Wednesday mornings, a noon conference two to three times monthly that is organized by the NIOSH Education and Research Center at the University of Illinois School of Public Health, and at least one half day per week of Occupational Medicine out-patient clinic. In addition, they are incorporated into special projects like health hazard evaluations related to the workplace or general environment, exposure assessments, and development of surveillance programs. Site visits to industries are organized once a month.

The Academic Phase provides the educational foundation for the Practicum phase and for the future practice of occupational medicine. Courses in epidemiology and biostatistics provide the knowledge and skills that enable the residents to carry out their research projects and to critically evaluate the occupational medicine literature. Courses in management, behavioral sciences, industrial hygiene, risk assessment and occupational safety science provide the residents knowledge and skills to evaluate occupational health programs and to eventually become effective participants and, ultimately, directors of such programs. Courses in occupational diseases and toxicology enhance the ability of the residents to address clinical occupational medicine problems. A capstone project is required as well, to complete the MPH degree. Our residents must complete a research project in their Practicum Year, and this constitutes their capstone. Residents attend one half-day each of an Occupational Medicine clinic and a General Medicine clinic each week. Their fieldwork requirement (200 hours) is completed in their Practicum year as part of their workplace rotations.

The Practicum Phase entails completion of: 1) four industrial rotations (20 weeks); 2) the research project (8 weeks are dedicated to work on this); 3) twelve weeks on the OM Consultation Service; 4) 12 weeks of

electives; 5) minimum of ½-day per week of outpatient OM clinic for the entire year; 6) presentation of their research/capstone project at the end of the year. Residents take on an increasingly responsible role in investigating and correcting occupational health problems in individual patients as well as groups of workers. In addition to the requirements, listed above, residents prepare and give lectures, supervise junior residents and medical students on the OM Consultation Service and in Clinic, participate in special projects, attend depositions on cases related to workers compensation, and attend industrial site visits.

In summary, the combined Internal Medicine/Occupational Medicine program at Cook County Hospital is a four-year residency program where the Occupational Medicine training occurs essentially in the resident's PGY2 and PGY4 years. The PGY2 year is the academic year and the PGY4 year is the practicum year. In the first and third years there are a few educational and clinical activities that overlap or relate to Occupational Medicine. However, for purposes of review of the program the academic and practicum phases are essentially completed in the second and fourth year of the four-year residency. There have been no significant changes in the curriculum since the last progress report was submitted.

2. Training Objectives and Goals

Training objectives and goals continue to be decided jointly by the University of Illinois at Chicago (UIC) Occupational Medicine Program and Stroger Hospital (SHCC) combined Program in Occupational Medicine and Internal Medicine. The main objective is to provide comprehensive training to physicians in Occupational and Environmental Medicine leading to board certification in Preventive Medicine (OM concentration).

Goals for this reporting period:

a. To continue, on an on-going basis, to refine the curriculum to meet the needs of our trainees and of the practicing OM physician. Drs. Rubin, Buchanan and Dorevitch meet semi-monthly to discuss curricular issues.
b. Improve and expand the evaluative methods used to assess the residents' progress.
c. Conduct a patient survey to help assess the quality of care we give our patients in the OM teaching clinics.
d. Increase opportunities for outreach and research with vulnerable populations. There are several on- going projects with immigrant workers that are trainees can be part of.
e. Improve the quality of research training and product in our trainees.
f. Increase the numbers and variety of outreach efforts the trainees organize and participate in.
g. Increase trainee presentations at regional and national meetings.

(Additional curricular educational goals and objectives as codified by the Residency review Committee of the American College of Graduate Medical Education are included in Appendix A.)

3. Responsible Conduct of Science Training

All trainees are required to complete the UIC Human Subjects Protection Education program. This can be done by attending the in classroom session called "Investigator 101 Training", or by completing an on-line module the "Collaborative IRB Training Initiative." Additionally, if the resident's research project is to be conducted at Stroger Hospital, he/she completes an equivalent training program there, as well. The residents and faculty of the Occupational Medicine program are 100% compliant with these requirements.

Throughout the year, in the resident's regularly scheduled Wednesday AM lecture series, during the OM clinics and during the OM Consult Service rotations, various ethical and methodologic issues related to research and practice are discussed.

4. Faculty participation

The Occupational Medicine program continues to have a strong committed faculty. All faculty actively

engage in teaching, research and research mentorship of trainees, clinical supervision and curricular development. The core faculty includes:

Susan Buchanan, MD, MPH. Program Director, UIC Occupational Medicine Residency
Lucille Buckley, MPH. Industrial Hygienist
Jeffrey Coe, MD, PhD. Preceptor. OM private practice
Robert Cohen, MD. Pulmonologist. Medical Director of Stroger Black Lung Clinic Program
Samuel Dorevitch, MD, MPH. Research Asst. Professor, UIC SPH. OM Curriculum, lead physician.
Katherine Duvall, MD, MS. Supervisor OM Clinic, co-director, Health in the Arts Program.
Emeka Ezike, MD, MPH. OM Clinic supervisor.
Linda Forst, MD, MPH. Associate Professor, UIC SPH.
David Hinkamp, MD, MPH. Supervisor OM Clinic, co-director, Health in the Arts Program.
Daniel Hryhorczuk, MD, MPH. Professor, UIC SPH, Director, Great Lakes Centers for Occupational and Environmental Safety and Health.
Patricia Kelleher, MD, MPH. Director, Employee Health Services, Stroger Hospital.
Anne Krantz, MD, MPH. Section Chair, Toxicology. Stroger Hospital. Core OM faculty.
David Marder, MD, MPH. Director, University Health Services, UIC. Core OM faculty.
Linda Rae Murray, MD, MPH. Chair, ERC Advisory Board.
Peter Orris, MD, MPH. Associate Program Director, Stroger OM residency. Director of UIC Occupational Health Services Institute. Core OM faculty.
Rachel Rubin, MD, MPH. Program Director and Division Chair, OM at Stroger Hospital.
Rosemary Sokas, MD, MOH. Professor and Director of Environmental and Occupational Health Sciences at UIC SPH.
Jacquelline Wuellner, RN, MPH. Nurse Manager, Stroger OM Clinics.

5. Curriculum

(See Appendix A for a full description)

D. Program Activities and Accomplishments

1. Progress towards goals and objectives:

Over the last year, the program has added rotations, didactic lectures and demonstrations to enhance the clinical skills now in demand for OM practice. These include rotations with managed care OM practices (i.e. Advocate Occupational Health Services) that focus on urgent care, screening and surveillance of workers as well as a new rotations with Stroger Hospital's Employee Health Service. A splint lab and slit lamp demonstrations and training were provided over the last year. Additional lecture topics on the management and administration of OM practice and of international occupational health practice and ravel medicine were given. DOT and FAA examination requirements were also presented and expreience in conducting these exams were obtained in some of our newer practicum rotations.

A joint SHCC and UIC OM programs Faculty and Curriculum Committee meets regularly. We are discussing the program requirements and comptencies and are documenting which experiences and academic courses fulfill which competencies. Revisions to the curriculum in the residents' academic and/or practicum years have been proposed to better address the competencies. We have reworked our Wednesday AM resident conference series to include a "Core Content Review" where a resident is responsible for reviewing a chapter of Rosenstock and Cullen's textbook in Occupational and Environmental Health. Also, our case conferences have been redisigned to be more evidence-based and clinically relevant. These changes have been well received and the trainees have uniformly found them useful to the needed knowledge base and practice of Occupational Medicine.

2. Trainee Honors, Awards

Fatema Photowala, a fourth year OM resident (graduated 6/30/07) was awarded a "Best Poster of a Clinical Vignette" for the Stroger Hospital Department of Medicine Research Day. In addition, she has secured a prestigious fellowship in Pulmonary/Critical Care at the University of Illinois Medicial Center so she can ultimately pursue a career focusing on occupational lung disease.

3. Faculty Honors, Awards, Appointments

Dr. Rubin sits on the ACGIH TLV committee for chemical substances. She is also the immediate past chair of the Occupational Health and Safety Section of the APHA. Dr. Orris is a gubernatorial appointed member of the State of Illinois' Board of Health, sat on the Governor's Taskforce of Latino Worker's Safety and has recently served on a task force of the Chicago Department of Public Health concerning care for the chronically ill. In addition he a member of the Board of the Illinois Safety Council, the Safer Pest Control Project, and chairs the Public Health Committee of the Chicago Medical Society. Dr. Krantz sits on the Governor's Occupational Asthma Taskforce of the Illinois Asthma Partnership.

4. Trainee Research Projects

Dr. Fatema Photowala graduation date 6/30/07 – research project: PFT changes in Ukrainian retired coal miners.
Dr. Fauzia Abbasi – graduation date 8/23/07 – research project: Analysis of work-related injuries reported the Illinois State Trauma Registry.

5. New Courses

The ERC's Wednesday noon Interdisciplinary Conference is now offered as a one hour credit course at the UIC School of Public Health.

6. Trainee Recruitment/Diversity Efforts

Our selections and promotions committee is committed to recruiting women and minorities. The demographics of our current residents are as follows:

4 Women:	2 Men:
All Asian	1 African, Perm. Res.
2 US citizens, 2 Perm Res.	1 Asian, H1-B

Included in this number are our two 2007 graduates. Both are Asian women, one a US citizen and one a permanent citizen. We have not recruited any new first year residents for the 2007-8 year, as will be explained below.

The Stroger Hospital OM Residency Program, in its 30 year history, has likely had the most diverse set of trainees of any OM program in the country.

E. Program Products

1. Publications and Presentations

The Occupational Medicine program engages in a variety of presentations on various OM topics, throughout the year. Faculty and residents both give introductory, case-based lectures to medical students rotating on the Internal Medicine service, four times a year; Dr. Rubin has given talks on Occupational Lung Diseases to two Family Practice programs in the community; Dr. Krantz gives lectures on Reproductive Toxicology to the graduate program in Reproductive Counseling at Northwestern University; Drs. Rubin and Orris give OM talks on a regular basis to medical students in interns in the Internal Medicine program at Stroger Hospital.

2. CE courses

Dr. Orris is the Director of CME for the Corporate Medical Directors Club of Chicago. CME talks are

given monthly to a group of academic and corporate medical directors. The Wednesday AM OM resident lecture series is available for CME credit, and outside OM physicians regularly attend. Dr. Orris, in his role as advisor to Health Care Without Harm, The Health Schools Campaign and the UNDP/Global Environmental Facility Healthcare Waste Project, regularly gives talks on medical waste. The residents participate in his seminars when logistically feasible.

3. Courses

Dr. Orris co-directs the Occupational and Environmental Health course for MD and MPH students at the Northwestern University Feinberg School of Medicine.

F. Future Plans

The SHCC OM Residency Program is part of the Division of Occupational and Environmental Medicine at the Cook County funded public hospital in Chicago. Over the last year a major fiscal crisis has been playing out, and the Cook County Board of Commissioners voted this past February to de-fund and close our entire Division. The Division was closed this Spring, and the Residency Program officially closed September 1, 2007. Our ACGME accreditation was withdrawn without prejudice, so that if funding is re-established in the future we may be able to restart the training program. The OM faculty members that were primarily based at Stroger Hospital (Drs. Rubin, Orris and Krantz) have remained active on the faculty of the UIC OM residency program and the UIC School of Public Health. The two senior residents both finished successfully this summer and Dr. Rubin has made arrangements for the four remaining residents to finish their OM training at the UIC OM program (two trainees) or elsewhere (one trainee is now at the University of Connecticut). One resident is finishing her Internal Medicine training before deciding whether to continue in OM.

Appendix: Sample Curriculum OMR

The UIC OMR program consists of a 12-month Academic Phase (PG2) and a 12-month Practicum Phase (PG3). During both Phases, residents are required to attend a two-hour conference on Wednesday mornings, a weekly noon conference organized by our NIOSH ERC, and at least ½-day per week of outpatient clinic. In addition, residents are included in special projects like health hazard evaluations related to the workplace and environment contaminations, exposure assessment, and development of surveillance programs. Site visits to local industries are organized approximately once per month. Residents present at least two case presentations and one toxicology conference per year.

During the Academic Phase residents attend the UIC School of Public Health as full-time students. They complete the classroom requirements for a Master of Public Health degree which they receive at the end of the PG-3 year when they have completed their research requirement. They also attend one of the weekly OM clinics plus ½ day session in the University Health Service. Since the academic calendar covers only 8 months of the year, PG-2 residents complete four clinical rotations when classes are not in session.

Required SPH courses include:

EOHS 400 Principles of Environmental and Occupational Health Sciences
Introduction to environmental influences on health such as food, energy, community hygiene, solid and hazardous wastes, air and water pollution, and radiation. The course also introduces the residents to the practices of injury control, industrial hygiene and occupational health.

EPID 403 Introduction to Epidemiology: Principles and Methods
Introduction to descriptive and analytic epidemiology, and determinants of health and disease in populations. Measures of occurrence, association, and statistical testing will be addressed, along with study designs, bias and confounding.

BSTT 400 Biostatistics I
This course introduces the residents to descriptive statistics, basic probability concepts, one- and two-sample statistical inference, analysis of variance, and simple linear regression.

HPA 400 Principles of Management in Public Health
This course provides the residents with a detailed discussion of the conceptual and theoretical foundations to the principles of management with an emphasis on public health and health care settings.

CHSC 400 Public Health Concepts and Practice
It introduces the residents to health programs, the delivery of health services and the role of public health. Delivery of health care, review of health legislation and case study examples are included.

CHSC 401 Behavioral Sciences in Public Health
This course provides grounding in the behavioral sciences with applications to public health. It examines individual, institutional and societal responses to the psychosocial factors influencing health and illness.

EOHS 551 Occupational and Environmental Diseases
This course introduces diseases caused by physical, biological, chemical, and traumatic agents, toxicologic properties, epidemiologic studies, pathophysiology, diagnosis, treatment and prevention of the occupational and environmental diseases and the effects of environmental/occupational stressors on high risk populations.

EOHS 455 Environmental and Occupational Toxicology
General and applied toxicology as it relates to environmental and occupational exposures to hazardous agents. Emphasis on basic principles, specific types of toxicity, and major classes of toxic agents.

EOHS 421 Fundamentals of Industrial Hygiene
This course covers the basic principles of recognition, evaluation and control of chemical, biological and physical agents in the workplace. The course includes the use of preliminary surveys, measurement of exposure, and evaluation of control measures. Standard setting and policy issues are explored, as well.

EOHS 482 Occupational Safety Science
Principles of occupational safety, safety regulations, accident investigation procedures and engineering, behavioral and administrative techniques for occupational accident control.

EOHS 554 Occupational and Environmental Epidemiology
Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards.

IPHS 650 Field Experiences in Public Health
The residents utilize one of their industrial rotations during the Practicum portion of the residency to fulfill this requirement.

IPHS 698 Capstone Project
For residents, this entails a presentation of research completed over the period of residency training. Residents make their research results into a poster session that is shown in a 1/2-day session in the School of Public Health in April.

The Practicum Phase consists of 12 block rotations of one month each, including five blocks of clinical occupational medicine, two blocks of research, one block on the OM Consultation Service, and four blocks of electives. Throughout the year residents spend at least ½-day per week in one of the OM clinics. They also attend the weekly Wednesday conferences, which follow a monthly template:

Week 1, Hour 1 Journal Club
Week 1, Hour 2 Case Presentation/ Core Content Review

Week 2, Hour 1 Corporate Occupational Health
Week 2, Hour 2 Case Presentations/ Rotation Report Back

Week 3, Hour 1 Grand Rounds/ guest lecturer
Week 3, Hour 2 Resident Research Presentations

Week 4, Hour 1 Occupational Medicine/Toxicology Combined Conference
Week 4, Hour 2 Industrial Process Presentation

Required rotations:

UIC/Stroger Cook County Occupational Medicine Consult Service Residents will begin to develop a high level of knowledge and skills in the practice of specialty level Occupational Medicine and also receive exposure to occupational toxicology.
University Health Service The overall goal of the four-week rotation is to provide the resident with

mentored experience in all aspects of a university hospital-based employee health service.
Electromotive Diesel, Inc. The overall goal of this rotation is to provide training in the delivery of occupational medicine in a manufacturing setting including the administration of the medical department, and an introduction to the industrial setting and safety programs.
UIC Physical Medicine and Rehabilitation The overall goal of this rotation is to gain expertise in the diagnosis of musculoskeletal injuries and illnesses.

Elective rotations:

Advocate Occupational Health The overall goal of this rotation to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
American Airlines Medical Department, O'Hare Airport The overall goal of this rotation is to familiarize residents with aerospace medicine including the flight environment, the management and administration of airline employee health, and clinical aerospace medicine.
International Truck and Zurich The overall goal of the IT portion of this rotation is to provide training in the delivery of occupational medicine in a manufacturing setting. The overall goal of the Zurich portion of the rotation is to provide experience for residents in advising insurance company approval of claims for clinical testing and procedures.
St. James Occupational Health The overall goal of this rotation is to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
Evanston Northwestern Healthcare Omega Occupational Health The overall goal of this rotation is to train occupational medicine residents in the delivery of occupational health services to small and medium sized businesses.
UIC Medical Center at O'Hare Airport The overall goal of this rotation is to provide residents with clinical and administrative experiences specific to airport workers and travelers.
Agency for Toxic Substances and Disease Registry, Region 5 Office By the end of the rotation residents will be able to demonstrate understanding of environmental health issues in Region 5, assess the current environmental literature, and understand the professional responsibilities of the environmental health personnel at ATSDR.
Workers' Compensation Rotation The overall goal of this rotation is to give the resident experience with the workers compensation system in Illinois from a legal standpoint.
National Institute for Occupational Safety and Health

A. Program Title: Agricultural Safety and Health Academic

B. Program Director: Robert Aherin

C. Program Description

Goals and Objectives : The goal of the agricultural safety and health academic training program is to provide graduate and undergraduate students who are seeking careers in agricultural and rural-related professions including health professions with a basic foundation in agricultural safety and health. The main program objectives are to 1) provide students with a strong base of understanding of the occupational safety and health hazards and issues facing production agriculture; and 2) familiarize students with the primary injury control methodologies of behavioral persuasion, engineering design, and regulation or enforcement and their related strengths and weaknesses of effecting injury and occupational illness rates among agricultural populations. 3) Students will have an understanding of how to develop a safety management plan for a farm or an agricultural business.
Faculty Participation: Robert Aherin, PhD, CSP has been the Director of the Agricultural Safety and Health Academic Program since its initiation in July, 2000. He is a Professor in the Agricultural and Biological Engineering Department within the College of Agriculture, Consumer and Environmental Sciences (ACES) located at the Champaign/Urbana campus and is a member of the graduate college. He is also an Adjunct Professor with the School of Public Health. He has degrees in Occupational Safety and Health, Agriculture and Education. He is the primary advisor for all trainees and teaches two of the three core agricultural safety and health courses. Robert "Chip" Petrea, PhD has assisted the program director in developing this program since it's inception. He is and agricultural safety and health specialist. He teaches the agricultural illness and disease course and assist in advising trainees. Linda Forst, MD, MPH, MS is an Associate Professor in the UIC College of Medicine, Emergency Medicine. Dr. Forst made available her web based course EOHS 400 Principals of Environmental Health Sciences to our program trainees and two of our trainees took the course during the fall semester. Dr. Lorraine Conroy, the ERC director has made her EOHS 421 Fundamentals of Industrial Hygiene available on the web for agricultural safety and health trainees.
Curricula: The academic program consist of 3 core upper level agricultural safety and health courses, independent study courses, an internship, and 21 other elective courses available throughout the university system. All approved program courses are contained in the listing for the minor that will be implemented in the Spring of 2008. A copy of the minor course curricula is included in the Appendix and list the three core agricultural safety and health courses and the electives in the program. Undergraduates will be required to complete a minimum of 18 hours of courses to receive a minor. Graduate students are generally required to take all three core courses. To obtain graduate credit for these courses graduate students are required to complete a more rigorous project for each course than what is required of the undergraduates participating in the course.

D. Program Activities and Accomplishments

Progress Toward Goals and Objectives

1. There was funding to allow support for partial stipends for two graduate students and three undergraduate trainees. One M.S. graduate trainee graduated in December of 2006. Two new graduate trainees started in the program in the fall of 2006. The two new graduate students each received a partial stipend which utilizes the one stipend that is funded. One of the students is an MS student in community health and her goal is to eventually enter medical school in the state's rural medicine program. She is an excellent student and has a strong personal desire to make a contribution to the agricultural safety and health area. She grew up on a farm and her dad was killed in a farm accident. The second graduate student is a second year Veterinary Medicine student who is specializing in large animals and plans to practice in a rural area specializing in the treatment of

production agricultural animals. Four veterinary students applied for a traineeship this past fall. Three were well qualified and this made it difficult to choose but we selected the student who had the strongest agricultural background and generally the best academic performance. It would have been very beneficial if there would have been at least a second full stipend available to have allowed at least two more of the veterinary student applicants to receive a partial stipend. Two of the three undergraduate trainees held traineeships during the previous year. Thus, there was only one opening for an undergraduate trainee during this program year. The new trainee selected was in the animal science program. She was entering her senior year. Her goal was to take approved courses in the agricultural safety training program that would total 18 hours of credit. She, thus, will have earned an equivalent to a minor. She further anticipated working for a large agricultural company and would utilize her training in this program in her career.

2. One MS trainee graduated in December 2006 with a degree in Human and Community Development. She had been a trainee for two and a half years. She also had a BS degree in animal science and accepted a position as a specialist with a state wide animal protection organization. A portion of her responsibilities addresses animal handling safety issues. She desires to eventually acquire a position that would be at least half time or more devoted to agricultural safety and health. Currently she is limited because of her family situation to by being limited to employment within 50 miles of her home near the University of Illinois. There are one or two eventual possible agricultural safety positions that may come available within the next couple of years in this area that she would be well qualified. Two undergraduate trainees received their BS degrees this past May. One who earned a BS degree in Animal Sciences accepted a position with the Monsanto Corporation as a sales representative. She indicated that when she was interviewing for the position the interviewer was delighted to see she had training in the agricultural safety and health area. A portion of her position involves promoting the safe use of the agricultural products the company sells. This student during her last semester evaluated the safety program at a Monsanto seed processing facility for an independent study course in our program. The other undergraduate student who graduated this past spring earned a BS degree in Technical Systems Management returned to his family farm as he planned. His farm is several thousands of acres and they employ several workers. One of the reasons he wanted to be in the agricultural safety and health traineeship program was to provide him with the knowledge and skill to manage the safety risk in his farming operation. This student was a college JB Scholar which designates him as one of the top academic students in the college. He took two courses in the program under our college honor class program. This meant for him to earn honors credit he had to conduct a more vigorous project in each class than what would be normally expected of most students. His desire is also to get involved in leadership roles in various production agricultural groups. He could likely be very influential in promoting agricultural safety policy and programs among farmers.
3. Trainees participated in the weekly seminars hosted by the Great Lakes Center through our computer based communications system as their schedules permitted. Two of the trainees attended and participated in a regional agricultural safety and health seminar for professionals that was sponsored by the NIOSH Agricultural Center at the University of Iowa.
4. All three-core agricultural safety courses were offered. The three core courses included Agricultural Injuries, Agricultural Illnesses and Diseases, and Analysis and Control of Agricultural Injuries and Illnesses. All three of the core courses are 3 credits and may be taken for graduate credit. Graduate students are required to develop and complete a more rigorous project than what is required of undergraduate students. Three students completed an independent study course on an agricultural safety and health research topic. There were a total of 25 students who completed the courses. Four of the 25 students were graduate students. Students participating in the courses were from a variety of disciplines including agricultural engineering, agricultural technical systems management, horticulture, agricultural education, animal science, agricultural consumer economics and plant sciences. A variety of guest lecturers who had specific areas of expertise have been used in the core agricultural safety and health courses.

5. In addition to the agricultural safety courses the trainees took courses on our approved listing of elective courses for the program. The courses taken during the program year included epidemiology, safety engineering, foundations of health behavior, and basic toxicology. Additionally, for the first time two trainees enrolled in a new web based course EOHS 400 Principals of Environmental Health Sciences that was taught by Dr. Linda Forst of the University of Chicago Great Lakes Center occupational medicine program.
6. The application to offer a minor in agricultural safety and health was approved by our department and college at the end of the previous program year. The application was delayed because of some miss-communication on minor application changes that needed to be made prior to being sent to the University level for final approval. The problem was rectified in the summer of 2007. It is now being reviewed at the campus level. In is anticipated that the program will be approved during this fall 2007 semester or very early in the Spring 2008 semester. Students should be able to officially enroll in the program during the Spring 2008 semester with an official start date of summer or fall of 2008.
7. The program advisory committee met during this program year. A proposal to change the primary focus of the agricultural safety interventions course to how to develop a safety management program for a farm or agricultural business was approved. The committee indicated this would be a significant enhancement to the course and should help meet a great need within the agricultural industry.
8. The NIOSH support has allowed for Dr. Aherin and Dr. Petrea to be provided with teaching appointments so that they can teach the program courses. The support has provided students who have a strong interest in agricultural safety and health a significant academic focus in this area. The funds are preparing professionals who are entering either the agricultural or rural health professions with a more technical and scientific basis in agricultural injury and illness causation and prevention. This should lead to more effective programs and policies in agricultural safety and health.

Faculty Honors, Awards & Appointments

No new honors, awards or appointment changes to report for this year.

Trainee Recruitment Including Diversity Efforts

Traineeships were promoted throughout the University to selected departments who had programs that could lead to careers in some type of agricultural or rural health area. These included all the college of Agriculture, Consumer and Environmental Sciences (ACES), college of Medicine, college of Nursing, the department of Community Health and the College of Veterinary Medicine. Minority students had equal access to the information about the program. Four of the five trainees were females.

E. Program Products

The following are citations of publications and presentations involving program faculty and trainees:

1. Aherin, R.A. & R.E. Petrea. Agricultural academic training program. Paper No. 075013 American Society of Agricultural and Biological Engineers Annual Conference. Minneapolis, Minnesota, June 2007.
2. Forst, L., Martinez, I., Lacey, S., Bauer, S., Skinner, S.,Petrea, R., Zanoni, J. (2006) Barriers and benefits of protective eyewear use by latino farm workers. Journal of Agromedicine, 11 (2), 11-18.
3. Morehouse, E.E, D.B. Reed & R.A. Aherin. Injury experiences of farm women over 50. Paper No. 23-06 National Institute for Farm Safety annual conference, Sheboygan, Wisconsin, June 2006.

Other Related Activities:

1. Bob Aherin served on the advisory committees for the University of Iowa Great Plaines Agricultural Safety and Health Center, The Ohio State University Great Lakes Center for Agricultural Safety and Health and the Southern Illinois University Safety Center.

2. Robert “Chip” Petrea was appointed secretary of the National Institute for Farm Safety. He also is the current chair of the Illinois Network for Agricultural Safety and Health (INASH).

F Future Plans

1. Offer the agricultural illness and disease course for the 2007 fall semester
2. Offer the agricultural injury and the analysis and control courses for the spring 2008semester.
3. Each graduate student will complete at least one agricultural safety and health related study and submit at least one article for publication in a referred journal.
4. Minor receive final university approval and promoted among students during the spring and summer of 2008.
5. Collaborate with other institutions in offering an Agricultural Medicine one week short course for both college credit and CEU’s.
6. Provide opportunities for trainees to participate in collaborative activities with other ERC trainees.
7. Provide opportunities for trainees to attend regional and national conferences and workshops that relate to agricultural safety and/or health or occupational safety and health.
8. Provide internship opportunities for trainees and other students.
9. Meet with program advisory committee.

Appendix

PROPOSAL TO THE SENATE COMMITTEE ON EDUCATIONAL POLICY TO ESTABLISH AN UNDERGRADUATE MINOR IN AGRICULTURAL SAFETY AND HEALTH

Title of the Proposed Minor: Agricultural Safety and Health

Sponsoring Unit(s): Agricultural and Biological Engineering

Proposed Effective Date: Fall 2008

Description of the Program of Study: The proposed minor will be administered through the ABE Department. This is a college-wide minor that is not tied to a major. The minor is designed to provide students with an in-depth understanding of the occupational safety and health issues associated with production agriculture. The program will familiarize students with the primary injury and illness control methodologies of behavioral persuasion and motivation, engineering design, and regulation or enforcement and their related strengths and weaknesses of effecting injury and occupational illness rates among agricultural populations. Additionally, students will develop an understanding of how to develop a safety management plan for an agricultural operation.

Budgetary and Staff Implications: None foreseen, as no additional resources will be required to administer this proposed minor.

Requirements: A minimum of 18 hours must be completed for this minor.

Required Courses for Agricultural Safety and Health Minor	Hours
• TSM 421: *Ag Safety – Injury Prevention*	3
• TSM 422: *Ag Health – Illness Prevention*	3
• TSM 425: *Applying Safety Interventions*	3

A minimum of 3 credit hours is required from the following courses:

• TSM 293 or ABE 293: *Off-Campus Internship*	1-4
• TSM 295 or ABE 396: *Undergraduate Research Thesis*	1-4
• TSM 496 or ABE 295: *Independent Study*	1-4

A minimum of 6 credit hours selected from:

• CHLH 101: *Introduction to Public Health*	3
• CHLH 244: *Health Statistics*	3
• CHLH 274: *Introduction to Epidemiology*	3
• CHLH 304: *Foundations of Health Behavior*	4
• CHLH 469: *Environmental Health*	3 or 4
• CHLH 474: *Principles of Epidemiology*	4
• CHLH 540: *Health Behavior: Theory*	4
• EOHS 400: *Principles of Environmental Health Sciences* (UIC Web)	3
• EOHS 421: *Fundamentals of Industrial Hygiene* (UIC Web)	2
• FSHN 480: *Basic Toxicology*	3
• HDFS 105: *Intro to Human Development*	3
• HRE 415: *Diversity in the Workplace*	4
• HRE 585: *Program Evaluation*	4

- IE 440: *Occupational Biomechanics* 3 or 4
- IE 442: *Safety Engineering* 3
- KIN 262: *Motor Develop, Growth & Form* 3 or 4
- KIN 454: *Growth & Physical Development* 3 or 4
- PSYC 100: *Intro Psych* 4
- PSYC 103: *Intro Experimental Psych* 4
- PSYC 358: *Human Factors* 4
- PSYC 456: *Hum Perf and Eng Psych* 3 or 4

Prerequisites for the Minor: None

Expected Enrollment in the Minor: 40 students are expected to be enrolled once full enrollment is achieved.

Admission to the Minor: Dr. Robert Aherin, Professor and Agricultural Safety and Health Program Leader

Minor Advisor: Dr. Robert Aherin, Professor and Agricultural Safety and Health Program Leader

Certification of Successful Completion: The minor advisor provides the college academic program office with a listing of the program courses for each student who is enrolled in the program to complete in order for them to be certified as completing the requirements for the minor. The college will be notified of any approved changes in a students program by the minor advisor.

Statement for the Catalog:
The Agricultural Safety and Health minor is designed to provide students with an in-depth understanding of agricultural safety and health issues, including how to effectively manage risk. Surveys of agricultural and rural health employers have indicated that a high percentage desire that students in these fields to have academic training in agricultural safety and health. Students will be required to take three core courses; selection of other approved courses in the program will depend on the students' majors and interests. The program will prepare students to professionally address the complex issues associated with agricultural injury and illness control within their related field of interest. Courses in the minor cannot be taken with the Credit/No Credit (CR/NC) option.

A Program Title: Hazardous Substances Academic Training

B. Program Director: Dr. Peter A. Scheff, PhD, CIH

C. Program Description

Description: The Environmental and Occupational Health Sciences Division (EOHS), within the University of Illinois School of Public Health, presently (June 2007) consists of 18 faculty and approximately 70 graduate students. Hazardous Substances Academic Training (HSAT) is carried out within this Division as a specialization of industrial hygiene. In 2006-2007, 37 students were in the IH program in all degree categories (MS, MPH, and PhD). Four of these students were in the HSAT training program. Since its inception, there have been 23 HSAT students in the master's degree programs who received full or partial NIOSH traineeship support. Over ninety-five percent of the IH and HSAT graduates are actively working in the IH field. Forty-five graduates or students currently in the program are Certified Industrial Hygienists. The IH and HSAT MS/MPH programs have been ABET accredited since 1993.

Goals: The primary academic objective of the University of Illinois Hazardous Substances Academic Training (HSAT) program is to train professional research industrial hygienists, with specialized knowledge in the management of hazardous substances, at the Master's Degree level. The two major goals of the academic training program are: (1) to develop industrial hygiene practitioners with specialized training in hazardous waste management, with as much practical experience as possible within the limits of an academic program; and (2) to provide a cadre of trainees, who have aptitude for research, with research training in occupational and environmental health. The research-trained group has the capability of entering into research-type activities in industry, as consultants, or in academe. The thrust of the HSAT training is to give students both an overall appreciation of the whole process of disease detection and risk evaluation leading to hazard control, and a competence in using the methods specific to the field. The overall emphasis of the training program is to give our students analytical and quantitative skills to aid them in solving occupational and environmental health problems. The IH and HSAT programs have held a relatively steady enrollment during the 2003-2007 project period. For the next 5 year project period, our specific goals include:

- Maintain the commitment to the integration of research and hands on-experience within the academic HSAT training program.
- Maintain the extramural funding base to support the commitment to research in Industrial Hygiene and Hazardous Substances Academic Training.
- Maintain the current level of minority participation in the HSAT program.
- Strengthen our collaboration with the UIC Epidemiology and Biostatistics program.
- Develop a research and teaching collaboration with the proposed Occupational Safety program and the College of Engineering.

Curriculum: HSAT program curricula are summarized in appendix A.
Publications: HSAT faculty and student publications are summarized in appendix B.
Faculty: HSAT program faculty are summarized in appendix C.

Responsible Conduct of Research: In an effort to support the research endeavors of School of Public Health investigators, advance their own interest in research, and ensure that research at the University of Illinois is carried out in accord with the highest ethical standards, all faculty and students are required to receive formal training in human research subjects protection, the protection of health information, and if applicable, training in the humane use of animals in research and teaching. This formal training is organized through the Office for the Protection of Research Subjects, which also provides administrative support for the review and approval of research protocols involving humans, animals, and recombinant DNA or infectious agents. This training in research integrity, ethical behavior, and responsible conduct is also underscored in the classroom. The Office for the Protection of Research Subjects maintains a training data base of human subject protection and research ethics and notifies faculty and students when additional training is required. Finally, the large amount of

funded research that supports many students and offers practical training also provides practical opportunities to understand the application of human research protection.

D. Program Activities and Accomplishments

- Dr Serap Erdal was promoted to Associate Professor with Tenure and obtained a K award from NIOSH.
- EOHS trainees won the student chapter of the year award at the 2007 American Industrial Hygiene Conference.
- Adjunct Professor Dr Dave Jacobs, CIH, joined the EOHS faculty and obtained a grant from HUD to study lead emissions from residential housing demolition.
- Drs. Sam Dorevitch and Peter Scheff obtained a grant from the Metropolitan Water Reclamation District of Greater Chicago to study the health implications of non-contact recreation on the Chicago Area Waterways.
- Dr. Steve Lacey, CIH, was recognized by the AIHA for the outstanding contributions of the Future Leaders committee to the IH profession.
- Salvatore Cali received a contract from the Illinois Department of Public Health to perform Beach Sanitary Survey for swimming water quality at 63rd Street Beach in Chicago.

Current research projects that support HSAT trainees include:

- Graduate Training in Air Pollution, (P. Scheff, PI) funded by the U.S. Environmental Protection Agency and the Lake Michigan Air Directors Consortium to deliver short courses for professionals in the air quality management field.
- Asthma And Demolition in Chicago Public Housing (S. Dorevitch, PI) funded by the National Institute for Environmental Health Science.
- Comparative Life Cycle Impacts of Bio and Petroleum Based Lubricants (T. Theis, PI) funded by the National Science Foundation.
- Epidemiologic Study of Recreational Use of the Chicago Area Waterways (S. Dorevitch, PI) funded by the Water Reclamation District of Greater Chicago.
- UIC and Chicago State MS/PHD Bridge to Future (N. Esmen, PI) funded by the National Institute of General Medical Sciences.
- Exposure Reconstruction For A brain Cancer Epidemiological Study (N. Esmen, PI) funded by the Pratt and Whitney Corporation.
- Fundamental Study of Welding Fume Inhalation (S. Erdal, PI) funded by the National Institute for Occupational Safety and Health.
- Tungsten Industry Pilot Study (N. Esmen, PI) funded by the University of Pittsburgh.
- Exposure Reconstruction for September 2001 Pentagon Attack (S. Lacey, PI) funded by a sub-contract with the Johns Hopkins University.
- Analysis of PBDEs In Human Placenta: Enhancing Sensitivity And Reducing Cost (An Li, PI) funded by the National Institute for Environmental Health Science.
- Exterior Lead Dust In Single Family Housing Demolition: A Multi-Site Investigation (D. Jacobs, PI) funded by HUD.
- SPORE 2-Genetic/Environmental Risk & Outcomes for Brain Tumors (F. Davis, PI) funded by a subcontract with Duke University.

The following HSAT students were active in the program during the July, 2006-June, 2007 period.

- Bogdan Catalin, MS: Graduated 12/06, Thesis: MAP kinase activation in human bronchial epithelial cells in vitro following exposure to mild steel welding fumes (advisor Dr Dan Tessier)
- Juan Nevarez, MS: Graduated 05/07, Thesis: Occupational Surveillance of Pesticide Poisonings from the Illinois Poison Center Database. (advisor Dr Linda Forst)
- Charles Dula, (MS trainee) Thesis: Sensitivity Analysis For Exposure Reconstruction Using Task Performance Time Study Data (Advisor Dr Nurtan Esmen)

- Shanna Horvatin (MS trainee): First year NIOSH HSAT trainee (Advisor Dr Peter Scheff).
- Justin Ford (PhD candidate and former HSAT MS student): Currently working with Drs Scheff and Dorevitch on a study of secondary contact in the Chicago area waterways, funded by the Water Reclamation District of Greater Chicago. (Advisor Drs. Peter Scheff and Sam Dorevitch)

Diversity: Diversity is a core value at the School of Public Health. The College's Statement of Values emphasizes justice, diversity and respect. The College has a very successful Health Careers Opportunity Program (HCOP) which encourages minorities to consider careers in public health and supports summer workshops and courses to help prepare minorities for success in graduate school. HCOP has traditionally been a bridge for minorities to enter the EOHS program. The Great Lakes Centers for Occupational and Environmental Safety and Health (GLC), a Center that is located in the EOHS facility and that works closely with EOHS, supports many IH trainees and specifically addresses minority issues. The GLC mission statement states in part "we devote special attention to the problems and needs of minority and disadvantaged workers and communities, the specific occupational and environmental safety and health needs of our region, and to the development of innovative and interdisciplinary approaches to addressing these needs."

The UIC Graduate College's Summer Research Opportunities Program (SROP) focuses on minority student recruitment and transition from undergraduate to graduate study by providing a cohort of students with a structured summer research experience. The students that come from across the country arrive in Chicago during mid-summer and are matched with a faculty member and execute a research project, presenting their results at the end of their residence. The past three SROP students that worked with our faculty have all returned for graduate study in our Division. The SROP has proven to be a stable source of minority student recruitment.

The HSAT and industrial hygiene training programs have been very successful in the recruitment and retention of minority students. For the current reporting period, Danita Murray-Larry (IH) and Juan Nevarez (HSAT) completed the MS program, Todd Brown (IH) completed the MPH program, Charles Dula (HSAT), Carolina Priester (IH), and Tara Alcazar (IH) were enrolled in the MS program and Lezah Brown-Ellington (IH) was enrolled in the PhD program. New minority students who entered the program included Andres Saldana (IH, MS student), Chirag Patel (IH, PhD student) and Diana Trinadad (IH, MPH student).

E Program Products

Faculty and student publications are presented in appendix B. The IH and HSAT programs sponsored 10 classroom and 8 online CE courses. A total of 261 trainees attended IH/HSAT CE courses.

F Future Plans

Activities planned for the July 1, 2007 to June 30, 2008 period.

- Complete the NIOSH competitive renewal process for the ERC.
- Apply for ABET reaccreditation and complete the required self-study.
- Continue to seek grants and contracts in appropriate fields of study to provide support and experience for students.

Appendices

A. Program curricula including general course requirements and sample curricula for each funded academic program.

1. Academic - Required Courses for HSAT Student with NIOSH Traineeship

Course # and Name	Semester Credit
EOHS405 Environmental Calculations	2
EOHS421 Fundamentals of Industrial Hygiene	2
EOHS428 Industrial Hygiene Laboratory I	2
EOHS529 Industrial Hygiene Laboratory II (Field Studies)	2
EOHS523 Industrial Hygiene: Engineering Control/Ventilation	4
EPID400/403 Principles of Epidemiology	3
BSTT400 Biostatistics I	4
BSTT401 Biostatistics II	4
EOHS584 Radiation Protection	3
EOHS431 Air Quality Management I	3
EOHS438 Air Quality Laboratory	2
EOHS424 Environmental Acoustics	2
EOHS482 Occupational Safety Science	2
EOHS570 Hazardous Materials Management	3
EOHS440 Chemistry for Environmental Professionals	3
EOHS455 Environmental and Occupational Toxicology	3
either EOHS556 Risk Assessment in Environmental & Occupational Health	3
or EOHS408 Biological, Chemical, Explosives, and Nuclear Weapons as Public Health Threats	3
Research Credit Hours: IPHS598 Research in Public Health Sciences	16

Credits: Total Required + Research = 47 + 16 = 63 semester Credits

2. HSAT trainees must attend weekly interdisciplinary seminar. The seminar brings together all ERC trainees and is a mix of occupational and environmental health topics. Thesis degree students are also asked to present the results of the research at the seminar.

3. HSAT trainees must attend Occupational Medicine Clinic (on a rotating basis this usually works out to once/3 weeks). HSAT students are actively involved in the clinic and assist physicians with exposure related issues.

4. HSAT trainees must complete the 40-hour hazardous waste worker training course during their 2 years in the program

5. HSAT trainees must participate in at least one extended field test. In addition to the MS thesis which frequently has a field research component, HSAT trainees are required to help with at least one major field research project. Recent projects include an assessment of exposure and biological response to welding fume, characterization of particulate matter emissions from public housing demolition, Aspergillus exposure in a large tertiary care hospital, organic dust exposure in a swine production facility, and evaluation of an intervention to reduce animal allergen exposures in a large animal care facility.

The hazardous waste trainees are also required to complete the 40-hour General Site Worker course and achieve certification. The Institute of Labor and Industrial Relations at the University of Illinois (Urbana) has multiple presentations of this offering, which is structured to meet the requirements of OSHA's Hazardous Waste Operations and Emergency Response Standard (1910.120). In order to maximize hands-on experience, HSAT trainees are required, along with the rest of the IH trainees, to take part in an extended plant tests or an equivalent field test. In response to the advice of key contacts, confined space issues and respiratory protection are covered in the Hazardous Materials Management course. In addition, training in laboratory safety has become an integral part of the Industrial Hygiene field lab (EOHS 529). Students in this course, ordinarily taken in the summer at the end of the first academic year, receive train-the-trainer instruction and develop materials and lesson plans for a laboratory safety short course. The laboratory safety course is subsequently presented by the students in the fall of their second year to the first-year IH students as one of the units of the first industrial hygiene laboratory course (EOHS 428).

Within each course, the curriculum is a general mixture of skills in hazard identification, regulatory interpretation, environmental sampling techniques, sampling results interpretation, control techniques, calculations, modeling, and critical review of literature. The curriculum is structured for completion in two years.

The prerequisites for entering the HSAT program are a full year of general chemistry, at least one semester of organic chemistry, mathematics through differential and integral calculus, and a course in human physiology.

B Faculty/trainee publications July, 2006-June, 2007 (Hazardous Substances Academic Trainee (HSAT), Industrial Hygiene Trainee (IHT), Industrial Hygiene/HSAT Faculty (IHF), Occupational Medicine Faculty (OMF)

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8. Erdal (IHF), S. and A. Carolla (IHT). Assessment of the Health Protectiveness of the Risk-Based Soil Remediation Standards of the Midwestern States. Submitted to the Human and Ecological Risk Assessment. (in press)
9. Erdal (IHF), S., D. Hryhorczuk (IHF), and L. Berman (HSAT/IHT). Multi-media PCB Emissions Inventory for the Great Lakes Region in the U.S. Air and Waste Management Association Journal. Accepted for publication.
10. N. A. Esmen (IHF), K. J. Kennedy, T. A. Hall, M. L. Phillips, and G. M. Marsh: Classification of Worker Exposures, Chemico-Biological Interactions, 166:245-253(2007).
11. N. A. Esmen (IHF), T. A. Hall, M. L. Phillips and G M Marsh, Chemical process based reconstruction of exposures for an epidemiological study: I. Theoretical and Methodological issues, Chemico-Biological Interactions, 166:254-263(2007)
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C Program Faculty.

Contributing Faculty to the Hazardous Substances Academic Training Program			
Faculty	Position	Research Area	Contribution to IH Program, % (Teaching, Research, Other)
Peter A. Scheff, Ph.D., CIH (#3197), QEP	Professor and Director	Characterization and modeling of ambient and workplace air quality; bio-aerosol characterization; environmental modeling and exposure assessment.	Time commitment - 60% - Teaches, EOHS405 Environmental Calculations and EOHS431 Air Quality Management; research advisor; short courses; Director of Air Pollution Training Institute program at UIC.
Lorraine M. Conroy, Sc.D., CIH (#5500)	Associate Professor and Director of ERC	Design of ventilation systems; TB control criteria; determination of workplace exposure to toxic chemicals; industrial welding.	Time commitment - 50% - Director of ERC; Teaches EOHS421 Fundamentals of IH); Co-Teaches EOHS523 Eng. Control/Ventilation; research advisor; short courses)
Nurtan A. Esmen, Ph.D.,	Professor	Application of engineering principles and mathematics to occupational and environmental health problems with special emphases on aerosol physics, exposure estimation and characterization.	Time commitment - 25% - teaches EOHS 557, Design and Analysis of Experiments, senior research mentor and research advisor.
Rosemary Sokas, M.D., MOH	Professor and Director, EOHS	Applied, translational occupational safety and health organizational work targeting small businesses and vulnerable populations	Time commitment – 10% Teaches EOHS400 Introduction to Environmental Health Sciences; Field research; Director of the academic program.
Salvatore Cali, MPH CIH (#7423)	Senior Research Specialist	Indoor and Industrial air quality, bio-aerosols, lead and asbestos.	Time commitment - 25% - Deputy Director of Industrial Hygiene; teaches EOHS428 IH Laboratory; mentors students on field studies and capstones, and contributes to short courses and outreach activities.
John E. Franke, Ph.D., PE, CIH (#1464)	Research Assistant Professor	Workplace characterization and estimation of personal exposure; TB confinement; emission factors.	Time commitment – 25% - Teaches EOHS570 Hazardous Materials Management and co-teaches EOHS523 Engineering Controls; field research advisor.
Steven E. Lacey, Ph.D., CIH (#16269)	Research Assistant Professor	Exposure reconstruction; exposure modeling; injury prevention.	Time commitment – 25% - Teaches IE341 Ergonomics and Human Factors, and IE461 Safety Engineering, and co-teaches EOHS 408 Biological, Chemical, Explosives, and Nuclear Weapons as Public Health Threats; research advisor.
John Standard, M.S., MPH, CIH (#2164), CSP	Lecturer	Hazard evaluation and safety control	Time commitment - 10% - Teaches EOHS482 Occupational Safety Science.
Michael Selway, M.S., CIH (#2695)	Lecturer	Noise evaluation and control; field studies.	Time commitment - 20% - Teaches EOHS424 Environmental Acoustics and EOHS529 IH Lababoratory II.

Daniel O. Hryhorczuk, M.D., MPH	Professor	Occupational and environmental epidemiology and toxicology.	Time commitment - 10% - Teaches, IPHS554 Occup. & Environ. Epi.; research advisor; short courses.
An Li, Ph.D.	Associate Professor	Environmental Chemistry	Time commitment - 10% - Research advisor; Teaches EOHS440 Chemistry for Environmental Professionals
Dan Tessier, Ph.D.	Assistant Professor	Environmental and Occupational Toxicology	Time commitment -10% - Research advisor; Teaches EOHS455 Environmental and Occupational Toxicology and EOHS 555 - Advanced Topics in Toxicology.
Serap Erdal, Ph.D.	Associate Professor	Exposure assessment, risk analysis	Time commitment - 25% - Research advisor; Teaches EOHS438 Air Quality Lab and EOHS556 Risk Assessment
Linda Forst, MD, MPH	Associate Professor	Worker health; epidemiology of workplace disease, safety and injury.	Time commitment - 10% - Research advisor; Faculty of Occupational Medicine at UIC; teaches EOHS551 Occupational Diseases

A Program Area: Continuing Education Program

B Program Director: Leslie Nickels, MEd

Core CE program faculty and staff include Leslie Nickels, MEd, full time, lecturer, academic professional and Program Director of CE and Joseph Zanoni, MILR, full time academic professional and Associate Director for CE. School of Public Health administrative staff who actualize the CE program are Marilyn Bingham, MS and Barbara Harper Smith. Additionally, each academic program area has a faculty or staff member who works with the CE core staff. This includes, Susan Buchanan, MD, MPH, Occupational Medicine; Jackee Wuellner, RN, MPH, Occupational Health Nursing; and Steven Lacey, PhD, Industrial Hygiene and Safety. Faculty in all core program areas are active in CE. Training programs also include targeted initiatives in the area of day laborers and immigrant workers, artists and performers, homecare workers, and school workers. Both the Advisory Committee and Executive Committee members are active in CE program planning and implementation.

C Description

The Illinois ERC has been committed to actualizing the aims and goals of the NIOSH training grants program since 1977. Over the past 30 years we have worked with professional associations, government agencies, other university and college programs, and individuals to understand and address the occupational safety and health training needs in our region, nationally, and internationally. The Illinois ERC has been successful at far exceeding the minimum number of 400 trainees (participants) in continuing education (CE) in the traditional occupational safety and health disciplines as well as reaching others active in health and safety in our region. Over the past four years (2003-2007) the Illinois ERC has offered training courses for 1507 physicians, 644 nurses, 725 industrial hygienists, 2308 safety professionals, and 8716 other occupational safety and health professionals, paraprofessionals, technical workers, and health and safety committee members in all CE programs including hazardous substance training and agricultural health and safety. CE at the Illinois ERC includes supplemental programs in hazardous substance training and agricultural health and safety that enhance our ability to develop and deliver courses that address training needs. However, this program proposal focuses primarily on those aspects of the CE program that are not specific to hazardous substances and agriculture.

The CE program at the Illinois-ERC exists to be a resource on occupational health and safety issues for all and to support the goals and objectives of the NIOSH Training Grants Program and the WHO Global Plan of Action on Workers' Health 2007-2017. Recognizing that there are limited resources, we partner with other programs engaged in education and training; respond to needs, especially in underserved populations, and look to make widely available education, training and technical materials through web-based initiatives such as the GeoLibrary. Towards this goal we embrace the philosophy that communication and cooperation, rather than competition, will reduce injuries and illnesses to workers. The target audience for CE at the Illinois-ERC includes anyone who will benefit from training directly, indirectly, or globally including employers, health and safety experts, employees, government agencies, and communities, consistent with the NIOSH definition of customer (www.cdc.gov/niosh).

The Illinois ERC CE program conducts both asset and needs assessments for addressing health and training issues in our region using a variety of methods on the national and regional level. Over the past 5 years we have conducted local asset/needs assessments: asset assessments include mapping of organizations that provide health and safety training in our region and needs assessments identify opportunities for the Illinois ERC to support the work of these organizations.

Assets in our region include a significant number of national and regional health and safety training focused organizations as well as local health and safety training organizations. We maintain a "map" of potential partners and other occupational safety and health providers in our region. Many of the health and safety providers in our region such as the National Safety Council, National ASSE offices, and the OSHA Training Institute have extensive course offerings. Our relationship with these organizations

includes periodic meetings to discuss needs and participation on planning committees. The Illinois ERC CE program tracks their course content and methods and considers this information in developing a program to complement their offerings. When possible, we participate in courses and events as presenters and/or exhibitors. We enhance the scope of training by other organizations in our region by bringing information about the research community to the practice community. In addition to complementing their programming, we have developed useful training partnerships with many of these organizations as well.

The ways in which we partner with local and regional health and safety training providers are diverse. We have primary partnerships with the American Industrial Hygiene Association Chicago Section; American Association of Occupational Health Nurses Chapters in Illinois; Medical Directors Club of Chicago; and the Illinois Safety Council. Activities include complete partnerships on course development and implementation; co-sponsorship of programs including responsibility for some aspects of the course development and implementation (evaluation, speakers, marketing, etc); registration; continuing education credits; venue; exhibits; and other technical assistance (research, accounting, needs assessment).

The Illinois ERC takes a comprehensive approach to program planning that uses an extensive set of data in an ongoing process. National and regional *needs assessments* are conducted through 1) ERC Continuing Education Directors Survey at national conferences, 2) Illinois-ERC needs assessment survey at regional conferences, 3) periodic comprehensive surveys of targeted populations, 4) local professional associations, 5) course evaluations and participant interviews; 5) advisory committee meetings and key informant discussions, 6) executive committee meetings, 7) regulatory needs, 8) outside requests for courses, and 9) research interventions.

Based on asset and needs assessments and the availability of courses in our region, the Illinois ERC has prioritized target audiences and focused program develop on the needs of these audiences. Priority audiences include:

- practicing experts
- representatives from trade associations, advocacy groups, labor organizations and government agencies
- health and safety committee members
- individuals interested in injury and illness prevention
- educators (GeoLibrary and learning management system)

Courses are developed through a process that includes program area faculty, a curriculum planning committee which may include faculty and others, a course director, and a course manager. New courses have a planning committee and continuing courses are assessed annually for their continued relevancy to the target audiences. As detailed below, the CE program plan primarily includes courses with regional training provider partnerships, courses for health and safety experts (classroom and distance-based courses), and courses for non-experts. In addition, the Illinois-ERC uses web-based courses and training material databases to provide continued access and often nearly real-time training.

All courses provide *continuing education units*. Additionally, where appropriate, courses carry ABIH maintenance points, continuing medical education units, and approval from licensing agencies such as Illinois Emergency Management Agency and certification organizations such as the National Radon Safety Board and the National Environmental Health Association.

While this program has had a significant *impact* by bringing occupational safety and health content to a large and diverse, both expert and non-expert audience, the specific impact on reducing injuries and illnesses has not been measured. However, recent attempts to better understand the impact of continuing education through post course interviews and surveys suggests that participants change the way they work after attending a course.

We have met and expect to continue to meet NIOSH objectives for CE participants by program area. In 2006-2007 we conducted 118 courses for 3,868 participants (excluding agriculture and hazardous substances). See CE-table 12b. Over the past 4 years (2003-2007) we conducted 383 courses for 12,133 participants (excluding agriculture and hazardous substances).

D Program Activities and Accomplishments

CE components include occupational medicine, occupational health nursing, industrial hygiene, and safety as well as targeted programs in Agricultural Safety and Health and Hazardous Substances. CE programs also include initiatives designed to meet the needs of targeted industrial sectors (schools, health care and agriculture) and special populations including personal care assistants, day laborers, temporary workers, artists and performers. While discipline-specific outreach is detailed in the Outreach section of Center Administration, the outreach related to continuing education is described below.

Faculty participation in CE continues to be extensive in occupational medicine, industrial hygiene, nursing, and safety. Faculty have developed and taught in short courses and provide valuable liaison to professional associations.

Program Goals for the past five years were to:

1. Define and address the needs of the occupational and environmental health and safety community in Illinois, Wisconsin, and Indiana by offering short courses and coordinating outreach activities.
2. Continue to develop partnerships with local occupational and environmental health and safety professional associations, government agencies, and non-governmental organizations (advocacy groups, labor organizations and trade associations) to conduct needs assessments and training programs.
3. Develop training and outreach programs using the best learning context including, conferences, workshops, seminars, laboratories, small group activities, one-on-one mentoring, self study, and field trips.
4. Identify the most effective training methods and tools for delivering training including case studies, small group activities, presentations, demonstrations, videos, web-based, CDROM, video conferencing, and problem solving scenarios.
5. Identify underserved and minority populations and develop continuing education and outreach initiatives to meet the needs.
6. Develop teaching and training knowledge and skills in students in the academic program areas.
7. Create interdisciplinary opportunities for faculty, staff, students, and professionals through course and outreach implementation.
8. Increase resources (financial and faculty) for program development and implementation.
9. Evaluate the continuing education program for student satisfaction, instructor and material quality, implementation outcome, and program effectiveness in meeting its goals.

The Illinois ERC has been successful at far exceeding the minimum number of 400 trainees (participants) in continuing education (CE) in the traditional occupational safety and health disciplines as well as reaching others active in health and safety in our region. Over the past four years (2003-2007) the Illinois ERC has offered training courses for 1507 physicians, 644 nurses, 725 industrial hygienists, 2308 safety professionals, and 8716 other occupational safety and health experts, paraprofessionals and technicians, health and safety committee members, engineers, architects, sanitarians, building inspectors, advocates, and workers in all CE programs including hazardous substance training and agricultural health and safety.

We met our first two goals to define and address the needs of the occupational and environmental health and safety community in Illinois, Wisconsin, and Indiana by offering short courses and coordinating activities and partnering with local occupational and environmental health and safety professional associations, government agencies, and non-governmental organizations; by our continuing work with occupational physician organizations to provide programming in occupational medicine and globalization; by partnering with national occupational nursing faculty to present programs to local participants; by presenting the research by industrial hygiene program doctoral students on welding to local professionals; and by presenting the collaborative national research of UIC and UCLA faculty on the occupational safety hazards of day laborers to local community based participatory research partners.

We developed training programs using the best learning context and identified the most effective training methods and tools for delivering training by creating conferences and workshops to meet the needs of our partners. For example we created the UFCW National Conference for Health Care Workers held in Chicago to facilitate the work of professionals providing environmental training by arranging for field trips to specific urban brownfield sites for review and analysis of course participants and to provide the development of distance based learning through the radon continuing education program. Additionally, CE worked with the health and safety committee at a large homecare agency which provides services throughout Illinois to develop and conduct participatory training programs, in English and Russian, for 1200 homecare workers, coordinators and supervisors. Additional training included a train the trainer programs for 40 health and safety committee members, NIOSH trainees, and ERC faculty and staff.

We identified underserved and minority populations, developed continuing education initiatives and developed interdisciplinary teaching and training knowledge and skills. Program focus includes OSHA 10 hour for Spanish speaking day laborers and train the trainer classes for homecare workers.

We increased resources (financial and faculty) for program development and implementation through negotiating a contract with the Illinois Emergency Management Agency for our radon continuing education program which funded a collaboration with the Chicago Department of Public Health (CDPH) to provide an IH trainee to support the CDPH radon measurement program. We continue to evaluate the continuing education program for student satisfaction, instructor and material quality, implementation outcome, and program effectiveness in meeting its goals. One example is a telephone conference this spring with radon field instructors to evaluate the field component of the hybrid courses in measurement and mitigation. One field instructor created a letter for course students which provided ground rules and expectations for their interactions with home owners during the field visits. We decided to implement this letter as policy for all field experiences to enhance the course experience for participants, instructors, and home owners.

In addition to courses, conferences, workshops, etc., program products of note include enhancement of health and safety training curricula for homecare workers including two trainer courses (bloodborne pathogens and infectious diseases); two 7-hour courses for homecare workers (bloodborne pathogens and infectious diseases); violence prevention in health care settings; and three distance based courses for academic and continuing education credit (Principles of Environmental and Occupational Health, Occupational Diseases, and Environmental and Occupational Seminar). Additionally, the GeoLibrary (www.geolibrary.org) continues to be an important product for cataloging and distributing occupational health and safety training materials and practice tools. We provide enhanced communication and marketing related to our bi-weekly occupational medicine seminars through our web site.

In the area of occupational health nursing we will continue our successful partnership with the American Lung Association of Metropolitan Chicago to provide the NIOSH approved Spirometry course and to develop two other occupational health nursing offerings. Additionally, we work with the local AAOHN chapters to support their continuing education programs.

In the area of industrial hygiene we continue our successful collaboration with the Chicago Chapter of AIHA though developing a student chapter at UIC. For example the program on diisocyinates to be held during March, 2007 was designed and conducted by Dr. Lacey in partnership with Robert Safe a member of our Advisory Committee for the local section.

Safety programming is enhanced through the new partnership with the Illinois Safety Council. For many years the Illinois-ERC participated in the planning committee, program development and program evaluation for the ASSE/OSHA annual conference. This program is going through leadership changes. While the Illinois-ERC will continue to participate in this program we are expanding our safety program through a new partnership with the Illinois Safety Council. We have worked with this group for many years, however, in 2006 we became more formally engaged in their training program including program planning, marketing, and continuing education.

In the area of other programming, we plan to continue our successful collaboration with Truman College Business and Industry Services, Northern Illinois University National Safety Education Program,

OSHA Calumet City Area office, and Illinois On-site consultation program to continue our series of OSHA 10 hour general and construction industry classes in Spanish.

Program planning includes needs assessment information obtained from many sources. Historically, occupational safety and health training needs in our region are being assessed through the advisory committee, key informant surveys, surveys conducted at local professional conferences and workshops, and through course evaluations.

Outreach continues to be a significant activity in the Illinois ERC. Coordinated efforts include Healthy Schools, Health in the Arts, Homecare Health and Safety, and Health and Safety in Zoos and Museums.

E. Program Products

Referenced in activities and accomplishments.

F. Future Plans

Program training goals are to:

1. Maintain and develop partnerships with local occupational and environmental health and safety professional associations, government agencies, and non-governmental organizations (advocacy groups, labor organizations and trade associations) to conduct needs assessments and training programs.

Over the next project period we will continue to track organizations providing health and safety training. Local and regional partnerships include: Chicago Chapter American Industrial Hygiene Association, Illinois Safety Council, OSHA, National Safety Education Center at Northern Illinois University, Truman College Business and Industry Services, Medical Directors Club, Respiratory Health Association, Chicago Department of Public Health, Healthy Schools Campaign, Department of Housing and Urban Development, Illinois Department of Public Health, CCDPH, and Wisconsin Safety Council. SEIU, Addus Homecare, Illinois Home Care Council, Illinois Community of Care Program, Illinois Department on Aging, and the Division of Labor Studies at Indiana University Northwest. National partnerships include: CDC, NIOSH, Healthy Homes Coalition, University of Washington, University of Massachusetts Lowell, University of Maryland, as well as University of Michigan ERC. International partnerships include: International Congress on Occupational Safety and Health, National Institute of Occupational Health South Africa, Health Care Without Harm, World Health Organization, and International Labor Organization. We intend to maintain relationships with these organizations adjusting responsibilities as needed. We will develop new program partnerships that focus on the Wisconsin Hygiene Association, University of Wisconsin Milwaukee College of Nursing, AFSCME, India OH, and World Health Organization Collaborating Centers in Occupational Health Education Training and Technical Materials Activity Area members.

2. Develop training and outreach programs using the best learning context including, conferences, workshops, seminars, laboratories, small group activities, one-on-one mentoring, self-study, and field trips. Identify the most effective training methods and tools for delivering training including case studies, small group activities, presentations, demonstrations, videos, web-based, CDROM, video conferencing and problem solving scenarios.

Our training approach is designed to select the best methods and tools for achieving the course objectives. Faculty are also knowledgeable in curriculum design. Course planning includes identifying a course director, forming a planning committee, setting goals and objectives including measuring outcomes, and defining the best methods for conducting a course. Courses reflect our commitment to respecting adult

education principles and creating learner-centered curricula. Frequently this may include a hybrid of methods such as conferences with workshop components (Home Care Conference); courses with a lecture built into small group activities (bloodborne pathogens training); field trips (Labor and Occupational Health Tour); and self-study continuing education (methylparathion on-line CME course).

The Illinois ERC is a leader in using technology for health and safety training. The CE program was in the forefront at the School of Public Health and UIC in offering distance based learning opportunities for continuing education. Distance based technology is an important method of delivery that is ideal for some courses. Currently, even for courses delivered in a class/workshop format, distance technology provides the opportunity to both archive programs and make them available to those who were unable to participate at a specific time and place. In addition to courses designed entirely for Internet delivery, we have also incorporated into most courses an objective for improving computer use by participants in addressing health and safety issues. Over the past five years CE has worked with faculty and staff in all core program areas to develop distance based short courses (both web-based and video-conferencing), web-based conferences, web-based seminar series, and hybrid courses that include web and face to face training. In addition, course materials are created on CDRom to accommodate students that do not have access to fast Internet connections.

3. Maintain, promote, and enhance GeoLibrary, an electronic library of training materials and practice tools.

Over the past three years we have developed an electronic library of training materials and practice tools (www.geolibrary.org). Geolibrary.org is an electronic library of occupational and environmental health training materials and practice tools. This library contains training materials and practice tools which are in the public domain and which are available to the user free of charge. The materials contained in this library come from a wide variety of sources, including, governmental institutes and agencies, academic institutions, corporations, unions, international organizations, and non-governmental organizations. The library user information is available in six languages.

Key features of the library are a comprehensive index of environmental and occupational health topics and advance search features to assist in finding the most relevant materials. Development, maintenance, and promotion of the materials in the library are a major goal for the next funding period. A new feature for 2007-2008 will be the addition of “specialty libraries”. The first specialty library will be *Road Safety for Workers* the development of which is being led by NIOSH. In the next year we anticipate adding one specialty library, adding 500 materials and orienting 10 new contributing editors to the GeoLibrary.

4. Identify underserved and minority populations and develop continuing education and outreach initiatives to meet their needs.

Faculty in the Illinois ERC have active research projects on health and safety issues of underserved and minority populations including homecare workers, immigrant workers, day laborers, and temporary workers. Through the research programs CE has developed important relationships with joint health and safety committees, worker center staff, and worker leaders. Through a partnership with Truman College we have started offering OSHA 500 courses in Spanish for Spanish speaking day laborers and temporary workers. Additionally, Dr. Buchanan has conducted training sessions for day laborers at a Chicago Area workers’ center based on finding from her research. Mr. Zanoni is conducting training programs at 3 workers’ centers on health and safety issues identified through Dr. Buchanan’s and Ms. Nickels research. This intervention effectiveness research will inform us about future training methods.

Under-represented groups have participated in the outreach program through research and intervention with Spanish speaking and other minority workers, through conference development, through academic courses, and through activities coordinated with organized labor. The CE program has documented their participation in the following ways: CE participates in the Chicago Area Workers Rights Initiative which conducted planning meetings and documented the needs and working conditions

of minority workers in sweatshop employment, in the courses participants list their risks and exposures, create risk maps of their workplaces and create action plans to address their concerns. These sources of documentation guide the development and direction of the CE/O program. Additional training programs for underserved populations include training for homecare workers and artists.

Through an employer-union partnership we will continue to develop health and safety curricula in English and Russian and conduct train the trainer sessions for worker leaders who will implement the course with Russian participants. Currently, we have 16 hours of health and safety curricula on topic bloodborne pathogens, infectious disease and routes of entry in Russian. In the next year we will maintain our relationship with Truman College and the worker's centers to continue offering courses and develop 8 hours of curricula on psychosocial stressors in Russian.

5. Develop teaching and training knowledge and skills in students in the academic program areas.

Continuing education will continue to work closely with the academic programs to provide experiences for students in courses to enhance their skills and capabilities. For example, 4 NIOSH trainees participated in the OSHA 511 Standards for General Industry course in March of 2007 held at the UIC School of Public Health in collaboration with the National Safety Education Center. This course augmented the skills that the trainees developed in the health and safety standards course and showed them diverse training methods and materials.

CE has positions in curriculum development for one to three students per year as research assistants. In the past year students have worked on radon, worker's centers, and lead poisoning prevention. In the past students have had opportunities to work on health and the arts, healthy schools, and the GeoLibrary. CE offers students opportunities to participate in all CE courses at no cost and provides field opportunities. In the next year we will offer trainees scholarships to participate in all CE offerings and provide practicum experiences for 4 students.

6. Increase resources (financial and faculty) for program development and implementation.

Additional resources to support CE activities come from other grant support, conference grants, and technical assistance. For example, through a State Indoor Radon Grant (SIRG) from EPA through the Illinois Emergency Management Agency, the CE program was able to create a new internet-based continuing education program with Dr. Amy Mucha describing GIS and its use for radon measurement and mitigation professionals. We plan on submitting two conference grants and will continue to look for grants to support curriculum development and translation.

A Program Title: Hazardous Substance Training Program

B Program Director: Leslie Nickels MEd

The HST program administration is housed at the University of Illinois at Chicago School of Public Health Division of Environmental and Occupational Health Sciences (EOHS). Leslie Nickels, MEd, is the Program Director. Symantha Aydt is the Project Coordinator for the HST Project and the Program Coordinator for the National Institute of Environmental Health Sciences (NIEHS) Worker Health and Safety Cooperative Agreement – University of Illinois Hazardous Material Training Program at the Institute of Labor and Industrial Relations at the University of Illinois at Urbana Champaign (UIUC). At UIUC Greg Evans and Pam Hartke assist Ms. Aydt in the creation, delivery and evaluation of the HST program. At UIC Joseph Zanoni, MILR, is the Associate Director of Continuing Education and Outreach. Additionally, Steven Lacey, PhD, CIH, CSP proposed program director for the Occupational Safety program and Marilyn Bingham, MS, Program Manager provide program support.

C Program Description

The Hazardous Substance Training (HST) Program is part of the Continuing Education (CE) program located at the Illinois Occupational and Environmental Education and Research Center at the University of Illinois-Chicago School of Public Health (Illinois ERC). The main program office is located in Champaign, Illinois and is affiliated with the Institute of Labor and Industrial Relations of the University of Illinois-Urbana Champaign. Courses are offered throughout the State of Illinois for participants from throughout the region.

The HST program develops, conducts and evaluates continuing education programs for public sector employers and employees in Illinois. The goal of the program is to provide training to occupational health and safety professionals, front line workers and managers to improve their knowledge, technical skills, and awareness of key issues related to hazardous substances and emergency responses. This includes remediation, transportation, emergency releases, and the control, reduction and safe handling of hazardous substances. Proposed courses reflect the technical needs of public sector workers. Training is targeted to state, county, municipal employees as well as other governmental jurisdictions with the exception of federal employees.

The HST program was begun on July 1, 1993. The program objectives include continuing to develop excellent instructional materials and training programs that will enable public sector professionals in the field of hazardous substance response and remediation to enhance their job related responsibilities. We will maintain our success by seeking participation from an increased number of government agencies in the Illinois, Northern Indiana and Southern Wisconsin region and assess the need for 40 hour hazardous waste worker training. We will continue to focus our needs assessments on key informant interviews to enhance our training approaches and materials for students as well as sending instructors to classes/conferences to help maintain/enhance their skills and knowledge.

D Program Activities and Accomplishments

Over the past year the HST program has worked with local health and police departments to develop programs for planning and responding to hazardous materials incidents. Program staff have regular discussions with various fire, health, police departments and local emergency planning committees (LEPCs) regarding training opportunities

Over the past year we have continued to reduce the cost of training for public sector employers by developing alternative course delivery schedules as required and by offering partial scholarship policy – in order to assist a greater portion of the population, we have adopted a policy of offering partial scholarships to lower the cost of the programs and to assist more students in receiving grant money. Course participants who attend the 40 hour program are often still need assistance in attending refresher

courses. Thus we are committed to helping maintain training competencies at agencies, institutions or facilities once established. Recently some previously supported participants are loosing their agency support and requesting scholarships.

Additionally the HST program has developed course materials and provided a supervisor course for those who will be managing staff at a site and preparing for response to a hazardous substance event. This course provides an additional 8 hours of training under OSHA 29 CFR 1910.120 and developed a summary of changes pertaining regulations and rulings as well as new technology being developed and products which relate to students. This is developed yearly and handed out to students primarily in refresher courses. Also, developed information from FEMA's National Incident Management System (NIMS) IS-700 course information into our normal 40 hour programs to comply with the NIMS and updated all course materials to comply with NIMS to heighten awareness of the Incident Command (IC) module as implemented by homeland security measures at the state and local levels.

We have started working on establishing a partnership with a community college and their staff to share some of our course materials to reach a larger audience and assisted local government employees by providing specialized training for their employees within their facilities as well as assistance in interpretation of regulation requirements on an as needed basis.

We are continuing to focus training efforts on a systemized approach to addressing hazardous substance incidents in our courses. These programs have been identified as highly important and relevant to public sector agencies in Illinois. A model train exercise was developed for use in our courses this past year. The exercise includes the use of model trains which are set up in a mock accident with placarding, etc. The students are given binoculars and are to recognize the contents of the cars and discuss potential problems or issues based on their observations. We have strived to heighten awareness of local emergency plans and how various entities can take advantage of those plans or at least utilize them to accomplish their objectives

E. Program Products

We have continued to spend time updating courses with new material as well as enhancing our power point presentation that are utilized to standardize our classes. This past year our annual HAZWOPER refresher had included a terrorist case study. Students were asked questions regarding how they would respond or what steps needed to be taken and to identify problems with the noted responses. We provided our participants with the "Update 2006", which is an update of regulations and technologies limited to two pages. The handout summarizes important updates in regulations, technology and products. This past year we also changed the focus of the emergency response refresher by focusing on radiation. As mentioned earlier in this report, we also developed a class exercise this year utilizing model train cars to lead discussions regarding reconnaissance for incidents and identification.

F. Future Plans

The program goals are to continue to develop model instructional materials and training programs that will enable public sector professionals working on hazardous substance response and its remediation to design, implement and evaluate hazardous materials response programs in public sector organizations. We will also attempt to maintain our success in seeking participation from public sector organizations in Illinois and throughout our region. Specific objectives for include:

1) Redesign and development of new courses
2) Create new programs to address the needs of school employees and the populations they serve
3) Expand our course offerings through related media such as on line and other distance based delivery systems

Specific activities include:

- Add courses to our open enrollment schedule.
    - Incident Management System Awareness – 4 hour course
    - Hazardous Communications (HAZCOM) – 3 hour course
    - Supervisor Course - 8 hour course
    - Hazardous Material Awareness course – 3-4 hours

- Develop a course related to best practices related to a Hazardous Material Response. The objective of this course is to discuss incidents & response methods. The duration of the course is projected to be 3-4 hours. We plan to pilot this course prior to offering it on our open enrollment schedule.

- Currently we are in the process of working with the Illinois Chamber of Commerce (ILCOC) and the University of Illinois-ILIR-Center for HR management (CHRM)to develop the safety portion of a Human Resource (HR) certification course.

- Reduce cost of training for public sector employers by offering a partial scholarship policy to lower the overall cost of the programs and to assist more students in receiving grant money..

- We propose to conduct HST training for local health, fire and police departments to support the development programs for planning and responding to hazardous materials incidents.

- We plan to develop specialized training to provide to county and local health departments around the state. Due to recent response efforts around Illinois, health departments are becoming aware of key questions including how to gather volunteers and trainees for preparation and communication.

- Additional future plans include discussions with various police and volunteer fire departments regarding training sessions and opportunities. We continue to see the urban police and fire departments receiving training while the rural departments with volunteer fire departments and hourly-waged policemen receive little or no training. There are different reasons for this lack of training: one is the lack of funding, another is the high turnover rate of the volunteers.

- Develop specialized programs for science teachers and custodial staff and administrators in schools.

- Develop training for University of Illinois Agricultural Extension Service employees and Master Gardener volunteers. These volunteers teach and recommend the use of pesticides and other related chemicals used in gardening and plants to various members of the community. It is important that these volunteers know how to protect themselves as well as advise their students on safe use of hazardous substances.

- New courses outlined in the plan will be developed using a variety of delivery models including classroom and on-line media. Another component to meeting current contemporary needs is to provide online training for portions of the courses. With help from UIC Center for the Advancement of Distance Education (CADE), we propose to pursue this effort. Another goal for development is to provide classes via telnet offered through the UIUC. Both of the methods would be highly beneficial to our participants to decrease time away from the office and costs related to travel. An on-line course would be designed to allow the participant to take a course in sections and thus the participant might not need to

miss an important meeting or event. We find that a difficulty with recruiting participants for class is related to scheduling. Our goal is to adapt two courses by identifying course components that may be presented on-line in concert with hands-on demonstration so that hybrid events may be created. Participants may utilize the on-line course component to save travel time and money or to refer to after the event to refresh or continue to develop competencies. We have successfully developed these hybrid courses in our radon program. To accomplish this goal we will convene a planning committee in 2008-2009 to identify the target population and outline two courses. In 2009-2010 we will work with CADE to develop and offer the courses.

A Program Title: Continuing Education Agricultural Health and Safety

B Program Director: Leslie Nickels, MEd

Program leadership is the combined effort on the part of Robert Aherin, PhD, Robert Petrea, PhD, and Leslie Nickels, PhD - C. The working partnership has existed since 1991 and resulted in the establishment of a state wide network on agricultural safety and health in Illinois (INASH); establishment of training and research partnerships between academia, business, and workers (through advocacy groups); increased interdisciplinary teaching and research in industrial hygiene, occupational medicine, safety, and occupational health nursing; and leadership on bringing the public health occupational and environmental health community together with the agricultural community.

C Program Description

The Agricultural Safety and Health Program (AGCEO) was established in the Illinois ERC in 1991. The AGCEO Project is administratively housed in the Illinois ERC Continuing Education Program. The target audience for the AGCEO continuing education program are practitioners and workers in the agricultural community. This includes health care providers, emergency response personnel, health and safety specialists, health educators, public health workers, cooperative extension workers, migrant farm workers, advocacy groups and farm owners. In addition, while the academic portion of the program goal is to increase the number of people with agricultural health and safety skills, AGCEO seeks to support through continuing education and outreach those currently in secondary agricultural teaching secondary agricultural science teachers, and university teacher educators. Our previous record, current and past needs assessments, collaborations and course development and offerings are all developed with these audiences in mind. Our success in reaching and addressing some of the needs of this diverse audience is the cooperative relationships we have developed between local and regional groups such as UIC School of Public Health, UIUC College of ACES, partners who comprise INASH, Agricultural Extension Offices, Marshfield Clinic (Wisconsin), Community Health Partnership of Illinois, Migrant Health Promotion (Michigan), Illinois Department of Public Health, Illinois Rural Health Care Association, Carle Foundation Hospital and Carle Clinic, Southern Illinois University, Illinois State University, and ASH-NET.

The AgCEO program goals are 1) to identify the training needs of health and safety professionals, health care providers, public health workers, cooperative extension workers, farm owners, secondary agricultural science teachers, university teacher educators, and migrant farm workers on the issues of agricultural safety and health, 2) establish cooperative arrangements with agencies and organizations whose mission includes to addressing the agricultural safety and health needs and 3) to develop and conduct continuing education and outreach programs increase awareness and reduce the incidence of agricultural injuries and illnesses.

D Program Activities and Accomplishments

Continuing education training continues basic program planning based on assessed needs using state and regional information. Needs assessment sources include in addition to national statistics: 1) strategic planning and priority setting within the reconstituted Illinois Network for Agricultural Safety and Health (INASH); 2) UI Extension Vital Statistics analysis; 3) Great Plains Center for Agricultural Health's Regional Farm and Ag Injury Press Clippings; 4) Survey of secondary agriculture education programs in Illinois, 6) key informant surveys with representatives from target and partner organizations, 7) findings from the *Aging Farm Community* initiative, 8) periodic meetings with the established Amish safety committee determine what program needs of the Amish can best be met with Center resources, and 9) meetings with administrative staff members of the Community Health Partnership of Illinois to determine program needs of migrant workers and what Center resources can best be utilized to assist with meeting

those needs. As there are several needs assessment resources, a partial listing of the direct connection between sources and programming seems warranted.

An incomplete list of organizations that AgCEO has partnered and collaborated with in the past funding period include: Illinois Network for Agricultural Safety and Health, National Farm Medicine Center, North American Agromedicine Consortium, National Institute for Farm Safety , University of Illinois at Urbana-Champaign College of Medicine RMED program, Southern Illinois University College of Medicine, UIUC Information and Computing Technology, Illinois Facilitating Coordination of Agricultural Education, University of Iowa School of Public Health, Livestock and Poultry Environmental Stewardship Program, Black Beauty Coal Company, Knight Hawk Coal Company, Illinois Association of Aggregate Producers, Great Lakes Center for Agricultural Safety and Health (Ohio State University) Fellows Program, Great Plains Center for Agricultural Health (NIOSH Ag. Research Center, University of Iowa), State Public Policy Group and Agriwellness, Inc (both in Iowa), and Carle's Center for Rural Health and Farm Safety.

AgCEO continued the associations developed by Dr. Petrea with southern Illinois based strip-coal mine companies and the Illinois Association of Aggregate Producers. Opportunities for presentations on both general agricultural as well as occupational specific safety and health concerns to company personnel, especially maintenance and equipment operators, of aggregate producers in western and north-western continued. These presentations augmented the required OSHA/MSHA training and retraining and touch on topics not commonly included due to time constraints.

AgCEO continued to pursue the establishment of a Secondary Advisory Committee (ASH SAC) with secondary agriculture teachers and pertinent state agency and organizational personnel. However, as noted above in the description of the secondary agriculture teacher's survey, there was little desire for a separate entity to provide direction for future content specific training modules. Findings indicated that provision of specific content, such as the agricultural respiratory module directed at both greenhouse as well as other agricultural production areas, would be more useful in the long term than a general set of awareness and knowledge modules. The continued interaction of Dr. Petrea with Dave Wilson, Media Specialist, UIUC Information and Computing Technology and the five individual FCAE Field Directors was deemed the most fruitful mechanism for interaction with the FFA secondary instructors.

AgCEO program continued to identify and address health and safety training needs in agriculture through its partnerships, interdisciplinary activities, and outreach to the agricultural community. A classroom and on-line version of the Confined Space for Agriculture course was offered. The target audience for the course was cooperative extension personnel, health and safety professionals, and small business owners. The classroom course was successfully offered to 260 participants. This year the course is currently offered in a classroom version, on-line version and CDROM and is undergoing modification based upon evaluations and changes in confined space entry requirements.

Drs. Petrea and Aherin and Ms. Nickels continued taking the lead in facilitating a North American conference and proceedings document on the Aging Farm Community. The established Ad Hoc Advisory Committee, 13 individuals from nine institutions including two from Canada, continued to advise Dr. Petrea, who is serving as PI of the project. A two and one-half day agenda was presented with 16 speakers from 13 institutions, including three from Canada, presenting on a wide range of issues as they apply to aging farmers. A proceedings document is to be produced, once all White Papers are provided from authors making presentations, and made available on the WWW along with the currently posted program, powerpoint presentations and presentation audio files that can be found at: http://www.age.uiuc.edu/ash-net/Speakers%20and%20Presentations.htm.

The Center was a co-sponsor and organizer for four Midwest Agricultural Safety and Health Forums with the Great Plains Center for Agricultural Health at the University of Iowa. Dr. Aherin served on the planning committee for each program. Dr. Aherin and Dr. Petrea made presentations at the conferences on various topics. The primary purpose of the Forum is to provide technical training on current issues to rural health and agricultural safety professionals in the states of Illinois, Iowa, Nebraska, Missouri, Wisconsin and Indiana. This two day forum was attended by a total of approximately 600 professionals or 150 participants each year. Attendees were professional rural health care providers,

agricultural safety professionals, agricultural media, farm leaders, agricultural business leaders and students. Over 85 percent of the combined written survey evaluations rated the programs as good or excellent. Additionally, over 80 percent of the participants rated the program sessions as highly useful in their professional activities. Each year participants are asked to identify topics that they would like to have addressed at the next year's forum. The results are one of the primary factors that influence the program for the next year.

Dr. Aherin organized and assisted with the instruction for 6 one day instructor training short courses on a new program developed through USDA that introduced a new set of training materials for a 24 hour farm machinery safety training program. This program is focused on enhancing the machinery safety training of older youth and others who work on farms. Also, the program meets the U.S. Department of Labor requirements for 14 and 15 year old youth who want to operate farm machinery for persons other than their parents or legal guardian and need to be trained and certified. Outcomes included the training of 65 community instructors in Illinois and Nebraska. Since 2005 approximately 700 youth in Illinois and Nebraska have successfully completed this 24 hour training program and have been certified. Ninety-five percent of those youth and adults who have completed the training passed the required national exams.

A proposal written by Dr. Aherin was funded by the Great Planes Agricultural Safety and Health Center at the University of Iowa assisted in the cost of amending and offering a one day confined space training program for agricultural employers and supervisors in 3 states. Dr. Aherin and Mr. Cali, collaborated in the development and offering of this program. The program was conducted in Illinois, Nebraska, and Iowa. The program was attended by 115 individuals who were primarily managers from grain elevators, swine production farms and grain farms. A series of Power Point presentations were developed on various confined space related topics. Additionally, a set of written resource materials resulting in more than 150 pages was developed as a resource to use in the instruction and for a take home resource for participants. The program received very high ratings in the written evaluations that were completed by the participants. Two of the participants from the same company stated "This is without exception the best investment of my time in an educational seminar since the spring of 1993. We say that in absolute sincerity. Thank You. H.H. Deever & Hansen Mueller". The participants also indicated in their evaluations that there was a need on a program that focused on the management of agricultural safety and health risk.

Dr. Aherin was contacted by lawyers representing a large agricultural company in Florida. The company had been ordered by a Federal court, as part of a sentencing plea agreement, to seek the services of a national expert on grain handling safety. An employee in 2003 had entered a large steel grain bin to break up bridged grain while the unloading augers were operating. They had approximately 3 months to develop and implement a new training program that included policies that met the OSHA Grain Standard. The company had employees that worked in four grain mills in Florida and Georgia. They also operated one of the largest poultry production operations in the South. Dr. Aherin evaluated their current training program and policies, outlined a significantly more comprehensive program and safety policies, assembled a fairly comprehensive set of training materials and conducted a one day training program for 17 of their management level personnel who were to be responsible for conducting training of their workers and implementing new company safety policies. Additionally, at the time of the entrapment the local rescue squads that were called to the scene had not received any training in grain bin rescue. Part of the plea agreement called for Dr. Aherin to collaborate with the University of Florida in the development of grain bin rescue training materials for use by the fire/rescue service in Florida. Dr. Aherin provided technical information to assist the University of Florida in providing this training. The primary evaluation consisted of Dr. Aherin writing a report that outlined the training program and recommended revised policies that was submitted for review to the regional OSHA office and the federal judge involved in the case. The program he developed was accepted without modification by OSHA and the federal court. This was a primary factor that fines and civil penalty cost were reduced by over one million dollars.

Dr Aherin wrote a proposal in 2004 that was funded by the National Center for the Prevention of

Childhood Injuries on Farms located at Marshfield, Wisconsin to develope a specialized rural youth safety program for children with a special emphasis on Amish children. The grant of $15,000 partially funded the cost of the development and implementation of this program. Formed a collaborative partnership with the Amish safety committee in Illinois counties of Douglas and Moultrie and the farm safety specialist at Carle Foundation Hospital Center for Rural Health and Farm Safety. The Carle Foundation also provided both financial assistance and in kind support for the program. The progroam involved training local instructors on the content of 9 different modules that were developed on various safety topics. All but one of the modules had and interactive demonstration that accompanies it. The topics of the modules include: Risk Taking, Tractor Safety, PTO Safety, Grain Suffocation Prevention, Safe Handling of Animals, All Terrain Vehicle Safety, Skid Steer Loader Safety, Lawn Mower Safety, and Bicycle Safety. Each module contains an instructor guide, visual aids, test questions, and how to conduct demonstrations related to the respective topics. The modules and demonstration kits were stored and transported to program sites in a van donated by the Carle Foundation. The van was designated as the Farm Safety Mobile. This allowed for the training materials to be more readily accessible. These modules were used to conduct 1 to 3 hour training sessions in communities and schools. The Amish agreed to allow us to train three members of their safety committee in use of the modules in their Amish schools. They allowed us to conduct the program at three schools so the Amish trainers could observe how to conduct programs. A few of the modules were developed particularily for an Amish audience and topics were selected by the Amish safety committee. The program has also been presented at 10 other locations. Approximately 30 FFA students were trained as community instructors and they in turn conducted programs for over 700 youth. Evaluations were developed to assess knowledge transfer and behavioral practice changes.

Dr. Aherin also provided technical support in the development of a program by Carle Foundation Hospital's Center for Rural Health and Farm Safety and the Farm Safety for Just Kids national organization in the development of an Amish farm child safety program in 2005 and 2006 that involved the development of farm safety story boards that utlizes magnets on a board that depicts various farm safety hazards that youth need to be aware. Community instructors have been trained on how to utilize it and programs have been presented to over 400 youth to date by the community instructors. Over 80% of the participants showed significant knowledge gain on post testing regarding the safety principals presented.

Dr. Aherin was involved in the training of approximately 3,500 rural professionals and farm operators on various farm safety topics. Normally, these were one to two hour sessions that were presented as part of larger farm educational program. Examples of topics included machinery safety, safe animal handling, safe grain storage procedures, ag chemical safety, safe movement of farm equipment on public roadways, age appropriate farm tasks, aging farm worker safety issues etc. It was not feasable because of the training situation to conduct formal evaluations of the programs.

Dr. Aheirn was directly involved in 18 one and two day training programs of approximately 1,400 rural rescue personnel. These programs inlcuded both classroom instruction and either or both hands on skill training or observation of demonstrations by participants. This training was conducted in collaboration with the University Fire Training Institute, regional hospital trauma centers and local fire/rescue districts. Dr. Aherin was involved in providing materials and assisted in program development for another approximately 30 programs involving more than 2,000 participants. Participants completed writted test and skill evaluations for the two day programs. Over 90 percent of the participants successfully passed these evaluations.

As Dr. Petrea reported earlier on specifics of the Secondary Ag. Teacher Survey, only a summary of pertinent finds will be provided. The survey was conducted at IAVAT convention attended by a majority of secondary Illinois agriculture teaches. The survey elicited a 51% response rate with 50% of respondents (25% of total) interested in some form of lesson plans related to agricultural safety and health topics. The findings included that the top interests for use in specific courses were: Ag. Power/Machinery (safety), Basic Ag. Science (health and safety), Ag. Business operations (safety and health). The Illinois agricultural teachers belonging to the Illinois Association of Vocational Agriculture

Teachers, approximately 95% of all Illinois secondary agriculture teachers, were resurveyed via e-mail in April, 04 (the spring following the IAVAT conference in June, 03). This e-mail survey had an overall response rate of 67%, with 79% of those responding with data that was not significantly different than the preceding survey.

Dr. Petrea conducted a survey with UI Extension unit leaders and extension educations planned for 2005 was delayed until late Spring 2006 upon advice of the UI Extension evaluation specialist due to broad scale changes in personnel and office locations. The survey instrument was an amended version of that used by the Aging Farm Community Advisory Council prior to Spring 2006 to guide the general selection of topics for presentation at the corresponding conference held in March 2007 and described above. The population was all Extension Unit Leaders and Extension Educators, N = 278. Findings were available too late to be requested to be included in the 2007 Extension Conference agenda. The Total Response Rate for the survey was 69% (192 responses) with 72% (140 of those responding, 50.3% of total population) providing similar response. A summary of the topics of interest included: Effects of Aging on Personal Activities, Physiological Aging and its Impacts on Personal Wellbeing, Impact of Lack of Sleep on Daily Activities, Mental Health Implications of Aging on Individuals and Caregivers, Impacts of Medications and Non-Compliance with Medical Prescriptions.

Given the fluidity of funding priorities of prominent funding agencies as well as the verities of specific of programming within collaborating organizations it is difficult to be exceedingly positive of programming efforts in the out years of the this proposal. It is expected at this point that all the collaborations mentioned below will continue. It is hoped that one constant is vigilance in evaluation of current programming that will contribute, in addition to all the other Illinois ERC needs assessment sources, to forward looking action in current programming and future activities. Given the breadth of continuing inputs: Ag Academic, AgCEO and the other Illinois ERC academic and continuing education programming; as well as input from those collaborating agencies and organizations; the past practice of basing programmatic activities on the solid foundation of needs assessment will continue to lead to activities deemed both useful and necessary for the target population that are addressed.

E Program Products

Referenced in activities and accomplishments.

F Future Plans

The Objectives for the AgCEO are to:

1. provide continuing education to agricultural occupational and environmental health and safety professionals and outreach to workers, as well as to other occupational professional and outreach workers, and communities to improve their knowledge, skills, and awareness of key issues in agricultural occupational safety and environmental health, devoting special attention to the problems and needs of at risk and underserved workers and communities;
2. contribute to the knowledge base in agricultural occupational and environmental safety and health by performing research and consulting with other professionals on problems of regional agricultural occupational significance, and disseminating the results of research; and
3. serve as a regional information resource on agricultural occupational safety and environmental health as well as to work with other occupational environments found in rural and agricultural settings.

These three objectives represent the way AgCEO currently implements the programs offered. Therefore, while more objectives may be addressed, each specific program item will have a Primary Objective Addressed stated prior to its specifics for 2008-2010 program years.

- Maintain partnership with the Illinois Association of Aggregate Producers.
- Maintain partnership with the Illinois Association of Vocational Agriculture Teachers.
- Increase membership and participation in the Illinois Network for Agricultural Safety and Health.

- Continue collaboration with University of Illinois Extension through participation in state and locally sponsored activities and responding to requests for information.
- Conduct in service training of extension professionals. Dr's Aherin & Petrea will conduct training of extension professionals who serve the farming population on agricultural safety and health issues. Topics will be selected based on needs assessment of these professionals and known current issues.
- Continue with partnership with Community Health Partnership of Illinois on migrant worker health and safety.
- Continue to offer Confined Space Training (classroom and on-line).
- Continue to offer Farm Accident/incident extrication training of rural rescue personnel.
- AgCEO will continue to collaborate with ASH-NET to secure placement of electronic proceedings of the March, 2007 *Aging Farm Community* conference on the WWW.
- Conduct outreach activities with the National Farm Medicine Center, Marshfield, Wisconsin. At the invitation of Dr. Barb Lee, Director, National Farm Medicine Center,
- Continue presentations with students in the University of Illinois College of Medicine Rural Medicine Program, including lecture to R1 students and conducting farm site visit with R2 students.
- AgCEO will continue to collaborate with the Great Plains Center for Agricultural Health (GCPAH)– a NIOSH Ag Research Center - located in the College of Public Health at the University of Iowa.
- Continue collaboration with the Western Illinois Area Health Education Center.
- Continue collaboration with the Livestock and Environmental Learning Center through responding to Ask the Expert questions, contribute questions to a FAQ database, and updating posted materials and links to other available resources as needed.

IV. Report on Specific Improvements in OS&H Resulting from ERC Programs

There is limited national or regional data and therefore it is difficult to assess intermediate and long-term outcomes from programs such as ours. However, we graduate trainees who continue to be employed in occupational safety and health. Many employers have hired several trainees from our programs indicated that the program is provided the appropriate training needed to address OSH in US workplaces. We have a number of examples where our program has had an impact on OSH. As described earlier in this report, the results of an outreach project of the ERC related to lead-safe work practices were incorporated into state-wide legislation. Other projects have resulted in a "culture change" in workplaces where we have partnered. One example is a research project to measure the effectiveness of bloodborne pathogen training of home care workers in reducing their risk of blood exposures. Researchers at UIC partnered with a large homecare agency in Chicago. The agency did have a joint labor-management safety committee prior to the intervention, but following the intervention, the committee is taking a much larger role in designing health and safety training for other topics.

As described in the Pilot Projects section of this report, a pilot project to study "Immunologic Risk Factors for Laboratory Animal Allergen" was initially funded in July, 2001 and received further funding in 2003. Since that time, the project has developed from a relatively small project involving a single investigator to a series of projects involving several other departments and investigators. Two veterinarians at UIC have become interested in allergen and irritant levels in the animal research facility studied in the original project. Investigations have been conducted in which mouse and rabbit allergen concentrations, as well as total dust and airborne endotoxin have been measured. One of these projects was the basis of a research study by a veterinary medicine trainee, and another was the basis for a masters degree thesis by an industrial hygiene trainee. An intervention study that employed a relatively low-cost engineering control of allergen level exposure to workers at the facility has also been performed. In addition, a PhD student in immunology and another masters degree student participated in a study of in vitro responses of lymphocytes of workers in the same facility. Furthermore, in 2004, an occupational medicine resident participated in the laboratory animal allergy surveillance of workers at the facility and two other UIC departments. Since the launch of the original project, 193 research subjects have participated. Data from the research has been presented at regional and national meetings. Data analysis is ongoing, and it is anticipated that manuscripts will be submitted for publication by researchers in a variety of disciplines, including epidemiology/biostatistics, environmental and occupational health sciences, immunology/microbiology, and veterinary medicine. The intervention study showed that a relatively low cost change in cage design could reduce allergen concentrations in the mouse rooms by approximately 80%.