

FINAL PROGRESS REPORT

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Research and Training and Education in OHS

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TABLE OF CONTENTS

Title Page	i
Table of Contents	ii
List of Terms and Abbreviations	iii
Abstract	iv
Section 1	
Highlights/Significant Findings Translation of Findings	1
Outcomes/Relevance/Impact	2
Section 2	
Scientific Report	3
Statement Regarding Inclusion	14
Financial Status Report	15
Final Invention Statement and Certification Form	16
Appendices	17
Attachment 1 MCN Evaluation	
Attachment 2 AOEC E-News	
Attachment 3 Clinic List	
Attachment 4 Asthmagen Reviews	

LIST OF TERMS AND ABBREVIATIONS

ACPM	American College of Preventive Medicine
AAFP	American Association of Family Physicians
AAOHN	American Association of Occupational Health Nurses
AAFP	American Academy of Family Physicians
ABPM	American Board of Medical Specialties
ACOEM	American College of Occupational and Environmental Medicine
AMSA	American Medical Students Association
AOEC	Association of Occupational and Environmental Clinics
AOHC	American Occupational Health Conference
APHA	American Public Health Association
ARC	American Red Cross
CDC	Centers for Disease Control and Prevention, US Public Health Service
COCA	Clinician Outreach and Communications Activity
CPWR	CPWR the Center for Construction Research and Training
DHHS	US Department of Health and Human Services
DOL	US Department of Labor
DRDS	Divisions of Respiratory Disease Studies
DSHEFS	Division of Surveillance, Hazard Evaluations and Field Studies
EIS	Epidemic Intelligence Service
HHE	Health Hazard Evaluations
MCN	Migrant Clinicians Network
MMWR	Morbidity and Mortality Weekly Report
NACCT	North American Congress of Clinical Toxicology
NIOSH	National Institute for Occupational Safety and Health
NSNA	National Student Nurses Association
OEM-List	Occupational and Environmental Medicine List-serve
OHIP	Occupational Health Internship Program
OSHA	Occupational Safety and Health Administration
US EPA	United States Environmental Protection Agency
WTC	World Trade Center

ABSTRACT

AOEC provided the following activities which improved education, expertise and awareness of the field of occupational health and safety.

A. Educational Outreach

1. Developed OHS educational programs based on needs assessments conducted by AOEC members and others with an emphasis on National Occupational Research Agenda (NORA) objectives and health promotion activities.
2. Provided OHS educational outreach by disseminating information and conducting educational activities to both OHS professionals and to primary care practitioners, with emphasis on those providing medical care and OHS services to medically under-served populations.
3. Increased awareness of OHS among professionals in early training (medical students, nurses, industrial hygienists and others) and subsequently fostering recruitment into the field.
4. Acted as liaison between NIOSH personnel and the OHS community to increase participation and collaboration in health hazard evaluations and other activities of interest to both parties.

B. Occupational Health and Safety Information Sharing

1. Fostered rapid communication and dissemination of information in a world wide OHS community by supporting and enhancing the OEM List, an internet mail list server that has over 4,000 direct subscribers in over 60 countries.

2. Expanded a network of occupational health clinics with the capacity to respond to requests for assistance from individuals, state, local and federal agencies and others.
3. Enhanced and maintained a web site with information regarding OHS resources, with the capacity to provide access to the products developed in this work, including downloadable educational materials, surveillance data and related projects, and information resources relevant to the broader community of occupational health practice.

C. Surveillance

1. Increased surveillance capacity for occupational illnesses and injuries by collecting, analyzing, and sharing data from AOEC member clinics.
2. Improved the quality of occupational disease surveillance by AOEC and other systems by maintaining and updating a clinically usable exposure coding system.

Section

Highlights/Significant Findings

The primary foci of this agreement were: educational outreach, occupational health and safety information sharing, and surveillance. During the four years of the grant, AOEC provided education to over 1,200 participants of the Migrant Stream Forums, provided over 8,000 educational modules from its web site, distributed over 3,000 CDs containing modules and participated in over electronic newsletter, AOEC F-News, which is posted on the AOEC web site and disseminated to all members and relevant federal agencies. The OEM-List continues to provide daily communication among over 4,000 direct subscribers. AOEC staff worked with NIOSH personnel to inform all the U.S. based occupational medicine residency directors and others of tag-along programs with the Health Hazard Evaluation (HHE) program. During the course of this grant, AOEC also served as liaison and provided support for the NIOSH funded World Trade Center Medical Monitoring Program. AOEC member clinics contributed to the AOEC Database of Occupational and Environmental Illnesses and Injuries (Database). The AOEC Exposure Code System, developed to complement that program, has been updated, expanded, and made available as a downloadable program with interactive search capacity on the AOEC web site.

Translation of Findings

The grant is not focused on research findings but instead on best methods for achieving education, communication and increasing knowledge of OHS issues. The outcomes demonstrate the need for continued communication both web based and personal, the need to outreach to students beginning to concentrate on careers, and the need for a uniform coding system for

exposures suitable for use by clinicians.

Outcome/Relevance/Impact

The number of downloads of educational materials added to the number of hard copies disseminated speaks to the need for continued education and outreach. The number of subscribers on the OEM-List continues to increase which indicates the ongoing need for such communications. While the program is now funded under a NIOSH training program grant, the number of interns interested in the Occupational Health Internship Program (OHIP) and the percentage (30%) who have completed the program and gone on to careers in OHS or OHS related fields demonstrates both the interest in and need for an ongoing pipeline of trained OHS workers. The capacity of AOEC to respond to requests for assistance was aptly demonstrated by the response to the WTC disaster and subsequent assistance to NIOSH in coordinating the American Red Cross treatment program and the NIOSH funded medical monitoring program.

Section 2: Scientific Report

A. Educational Outreach

A1. Develop OHS educational programs based on needs assessments conducted by AOEC members and others with an emphasis on National Occupational Research Agenda objectives and health promotion activities.

During the course of this agreement nine peer-reviewed programs were added to the AOEC library. These include: *Agriculture Respiratory Hazards, Audiometric Testing and Occupational Hearing Conservation, Carbon Monoxide Health Effects, Drinking Water Contamination, Heavy Metal Toxicity, Indoor Mold Exposure Health Effects, Influenza Prevention 2009, Inorganic Dusts, and Particulate Matter Toxicology*. An additional program, *Occupational Medicine Whazzat*, was donated to help introduce medical students to occupational medicine.

A2. Provide OHS educational outreach by disseminating information and conducting educational activities to both OHS professionals and to primary care practitioners, with emphasis on those providing care to medically under-served populations.

Between October 1, 2006 and September 30, 2009, the online modules were downloaded over 8,000 times. The five most downloaded modules were *Pesticide Illness* (2,889 downloads) followed by *Health Hazards of Solvents* (1,530 downloads), *Heart Disease and Occupational Health* (885 downloads), *Worker Preparedness and Response to Bioterrorism* (709 downloads) and *Audiometric Testing and Occupational Hearing Conservation* (469 downloads). The document, *Medical Management of Lead Exposed Adults*, prepared by AOEC under a prior NIOSH grant on was updated in 2007. During the course of this agreement, that document was

viewed and/or downloaded 5,872 times.

In addition to the NIOSH funded activities, AOEC continues its collaboration with the Migrant Clinicians Network (MCN) on a US EPA grant, *Saving Lives by Changing Practice*, a five-year cooperative agreement with the Office of Pesticide Programs, to address pesticides and other EOH issues in practice setting. AOEC members Matthew Keifer, MD, MPH, Daniel Sudakin, MD, MPH and Executive Director, Katherine Kirkland, MPH, serve as members of the Expert Advisory Committee for the initiative. Integral to this program are MCN's partnerships with AOEC and the American College of Occupational and Environmental Medicine (ACOEM).

AOEC has provided direct assistance to that project by participating in advisory sessions, providing referrals to AOEC members for assistance, and working to establish formal partnerships with AOEC member clinics and MCN member clinics. AOEC worked with MCN, the occupational medicine residency directors and the American College of Occupational and Environmental Medicine (ACOEM) Section on Underserved Occupational Populations to create a priority list of occupational history questions for MCN clinics. The questions developed and results of the first evaluation are documents (Attachment 1).

AOEC has continued working with MCN, the occupational medicine residency directors and the ACOEM Section on Underserved Occupational Populations to recruit residents and other occupational physicians for projects within MCN and to assist the Migrant and Community Health Clinics. AOEC members provided information and education at Migrant Stream Forums from 2006 through 2009 reaching approximately 1,400 people.

AOEC participated in a number of other conferences including the American Occupational Health Conference, the annual meetings of the American Association of Occupational Health Nurses (AAOHN), the American Academy of Family Physicians (AAFP) and the American Public Health Association (APHA). Goals of participation in all of these conferences were to hand out educational materials related to OHS, provide participants with contact information for consultation and referral, promote NIOSH and CDC programs such as the Health Hazard Evaluations (HHE), Epidemic Intelligence Service (EIS), the *NIOSH Pocket Guide to Chemical Hazards* and others.

AOEC published the AOEC E-News which is posted on the AOEC web site and disseminated to all AOEC members and relevant federal agencies. The AOEC E-News reports on member activities, government announcements and other information pertinent to OHS professionals. It also contains listings of upcoming conferences, educational seminars and an ongoing list of web based educational opportunities. The AOEC E-News is posted on the AOEC web site at <http://www.aoc.org/about.htm> and an example is included in this report (Attachment 2).

A3. Increase awareness of OHS among professionals in early training (medical students, nurses, industrial hygienists and others). and subsequently increase recruitment into the field

Increasing the awareness of OHS among professionals in early training was a second focus of this grant. Each year AOEC has sponsored the presenter of two sessions at the National Student Nurses Association (NSNA) meeting. These presentations have focused on introducing nursing

students to OHS by teaching them how to take an occupational and environmental history. The Occupational Health Internship Program (OHIP) began in 2004 with outreach funding from a prior NIOSH grant and continued under this grant until 2007. In FY05, the OHIP program received 40 applications. In FY09 that had increased to over 140 applications. A total of 83 students have completed OHIP since 2004; of these, 25 (30%) were self-identified as members of underserved minorities. Follow-up with the students has indicated that at least 30 of the OHIP students have enrolled in a graduate OSH program or have been employed by an OSH related field in a union, non-profit organization, or government jobs with diverse agencies such as state health departments, NIOSH, the Food and Drug Administration, and the US Environmental Protection Agency.

A4. Provide liaison between NIOSH personnel and the OHS community to increase participation and collaboration in health hazard evaluations and other activities of interest to both parties.

AOEC has advertised opportunities for participation and collaboration in NIOSH HHEs at least twice a month for most of the time of this *grant*. These opportunities are primarily advertised by the Division of Surveillance, Hazard Evaluations and Field Studies in Cincinnati but also from the Division of Respiratory Disease Studies in Morgantown. Ms. Kirkland continues to work closely with Bruce Bernard of NIOSH to identify the obstacles to participation and devise ways to increase the number of participants. Information regarding how to request a Health Hazard Evaluation was provided to participants at five Migrant Stream Forums as well as at other meetings.

Ms. Kirkland is now enrolled in Epi-X due to this activity. This allows Ms. Kirkland to see notification of an upcoming HHE as soon as it is posted and contact the relevant NIOSH offices to determine if the proposed HHE is appropriate for the tag-along program. Notices have been directed primarily towards

the occupational medicine residency programs. Participation in Epi-X also allows Ms. Kirkland to be notified in case of public health emergency and contact AOEC members if necessary.

AOEC forwards information for the Epidemic Intelligence *Service* (EIS) on the OEM-List, all AOEC members and to all residency programs. AOEC displayed information regarding these opportunities (HHE and EIS) at the annual meetings of the American Association of Occupational Health Nurses annual conference, the American Occupational Health Conference, the North American Congress of Clinical Toxicology, and the American Public Health Association (APHA) meeting.

In addition to participating in the Epi-X system, Ms. Kirkland is the point person for the CDC Clinician Outreach and Communications Activity (COCA). COCA announcements are sent to AOEC for dissemination as appropriate.

B. Occupational Health and Safety Information Sharing

BI. Foster rapid communication and dissemination of information in a world-wide OHS community by supporting and enhancing the OEM-List, an internet mail list server that has over 3,000 subscribers.

Funding through the low cost extension for the last year of this grant did not include funding for the OEM-List. However, AOEC continued to support it through a smaller donation provided through membership dues revenue. The OEM-List continues to provide rapid communication and dissemination of information in a world-wide OSH community. The OEM-List virtual community is the largest and oldest (16+ years) mail list on occupational and environmental health and as of September 2009 has immediate reach to over 4,000 addresses in 60+ countries.

The OEM-List is located at the North Carolina Occupational Safety and Health Education and Research Center at the University of North Carolina. In addition, the list has approximately 300 subscribers to the "Announce list" which is limited to items such as conference announcements, NIOSH alerts, educational opportunities, etc. The list generates approximately 300 messages per month. Messages on NIOSH activities, CDC activities, OSHA issues and MMWR reports accounted for approximately 15% of all OEM-List messages between October 1, 2006 and September 30, 2009. The OEM-List now includes dissemination of the *NIOSH eNews* links.

B2. Expand a network of occupational health clinics with the capacity to respond to requests for assistance from individuals, state, local and federal agencies and others.

AOEC continues to provide clinical and consultation referrals to AOEC member clinics for the general public, governmental and public health agencies and others in need of OEM expertise. Inquiries are received primarily by telephone and e-mail. The AOEC clinic network remains strong with over 60 clinics throughout North America and Europe (Attachment 3).

All AOEC clinics and many individual members are well equipped to assist state and local health officials in case of natural disaster, terrorism and/or bioterrorism attack. All AOEC members including the PEHSU staff have been given two peer reviewed modules on bioterrorism developed by AOEC member (with NIOSH funding). CDC has developed several methods for contacting clinicians regarding emergency response and AOEC is an integral part of three of these communications systems including; 1) Epi-X, the Epidemic Information Exchange, 2) the

Clinician Outreach and Communications Activity (COCA), and 3) the CDC Health Alert Network. These are overlapping CDC programs that alert clinicians and health departments about potential public health emergencies.

B3. Enhance and maintain a web site with access to OHS resources, with the capacity to provide access to the products developed in this work, including downloadable educational materials, surveillance data and related projects, and information resources relevant to the broader community of occupational health practice.

All AOEC peer reviewed educational materials are posted on the web site for download. In addition, a few other educational modules such as the introduction to occupational medicine are posted. The listing of occupational medicine residency programs is maintained on the site. This listing is updated quarterly and used to access the latest contact information for all occupational medicine residencies. The ACOEM web site has linked to the AOEC OM residency listing because of its consistent level of accuracy and timeliness.

Statistics from the web site show that educational materials funded by NIOSH, under this and previous agreements, are among the most popular items on the AOEC web site. As noted above in section A2, while downloadable modules are an integral part of the AOEC web site, other AOEC documents are also available. The AOEC web page includes the document *Medical Management of Lead Exposed Adults* (downloaded 5,872 times since October 1, 2006) and the *Criteria for Designating Substances as Occupational Asthmagens on the AOEC List of Exposure Codes* (downloaded 1,851 times since October 1, 2006).

C. Surveillance

CI. Increase surveillance capacity for occupational illnesses and injuries by collecting, analyzing, and sharing data from AOEC member clinics.

AOEC continues to work with NIOSH and the AOEC member clinics to provide a general overview of occupational and environmental illnesses and injuries seen at AOEC clinics. Data collection has fallen off due to various obstacles including older software, overly stringent interpretation of HIPAA regulations by various universities, and lack of time at clinic sites. To address these issues a new simplified data collection form was developed and is currently being pilot tested. One formal analysis was conducted under this agreement. Due to the complexity of the tables, this report is submitted as a bound hard copy and not as an electronic attachment.

C2. Improve the quality of occupational disease surveillance by AOEC and other systems by maintaining and updating a clinically usable exposure coding system.

The project has remained very active in updating and revising the AOEC exposure coding system. AOEC has played an integral role in working with the NIOSH work-related asthma surveillance activity in both Morgantown, WV and at the funded states conducting various aspects of occupational surveillance since 1993. Staff currently work primarily with Margaret Filios, RN, ScD of the Division of Respiratory Disease Studies. This collaboration includes a number of factors but focuses on the AOEC exposure code system. One key need for

occupational surveillance is standardized coding systems for varying data elements such as occupation, industry and exposure. While the CAS, RTECS, and ANSI systems of exposure are superb for identifying and classifying specific chemical substances, they are impractical for most clinical settings and the exposures to which individuals are exposed. In recognition of this fact, in 1994, AOEC funded the development of a hierarchical exposure coding system for clinic based occupational and environmental illness and injury.

The AOEC Exposure Coding System on line look-up capacity was enhanced this past year. The look-up is now on <http://www.aoecdata.org/ExpCodeLookup.aspx>. A new web site was required to support the look-up program. In addition, this new web site will allow for easy updating of the exposure codes by AOEC staff. There were over 3,000 visits to access the epidemiology tools page in FY09. Since the announcement of the new program on November 30, 2009 in the *AOEC E-News* there have been over 600 visits to access the epidemiology tools.

AOEC has been officially notified that the AOEC Exposure Coding System is currently used by the New York State Occupational Health Clinic Network, the Occupational Health Clinics for Ontario Workers, and the SENSOR Asthma program.

The asthmagen designation was added to supplement the coding system as a tool to help AOEC member clinicians. The asthmagen list was begun in the late 1990's using lists published by academic experts and researchers in occupational asthma such as the lists of Moira Chen-Yeung and Jean Luc Malo. It also listed substances that were deemed as asthmagens by AOEC members based upon their reports to the surveillance database. In response to a perceived need

to codify this effort, the AOEC developed the *Criteria for Designating Substances as Occupational Asthmagens on the AOEC List of Exposure Codes* (AOEC Asthmagen Criteria). The initial AOEC Asthmagen Criteria was developed and approved by the AOEC members in 2002. The AOEC Asthmagen Criteria has since been updated twice.

Not all substances designated as asthmagens on the AOEC List of Exposure Codes have been evaluated against the AOEC Asthmagen Criteria. The exposures that have been evaluated are clearly notated. Exposures designated with an "A" for asthmagen are further classified by which criteria they meet. Exposures reviewed and meeting criteria for sensitizer-induced asthma are designated "Rs"; those reviewed and meeting criteria for RADS are designated "Rr"; those reviewed and not meeting either set of criteria are designated "R". Substances that are generally accepted as asthmagens are designated "G".

Comments have been received from trade organizations, the U.S. Navy, the Massachusetts Department of Health and others. In addition, in 2008, the AOEC asthmagen list was cited for use by *Green Seal's Standard for Industrial and Institutional Cleaners (GS-37)*, 4th Edition. The GS-37 includes the following statement: *2.2 Asthmagens. Substances designated as asthma causing agents by the AOEC, which after review by AOEC have met the AOEC sensitization criteria.*

From 2002 through 2007, the AOEC asthmagen reviews were conducted under the leadership of William Beckett, MD, MPH at the University of Rochester. A pilot test of the usefulness of the protocol was conducted in 2006. OM residents were requested to use the protocol to determine

the asthmagen status of six substances. These reports were reviewed by senior faculty prior to submission to AOEC. In 2008, Ken Rosenman, MD at the AOEC member clinic at Michigan State University was awarded the new contract to review asthmagens in accordance with the AOEC Asthmagen Criteria and to provide updates as requested to the exposure code listing. All reports were approved by the AOEC Board of Directors (Attachment 4).

The Inclusion of Gender and Minority Study Subjects and Inclusion of Children forms are not applicable to this grant.

Questions regarding data collected may be submitted to the AOEC Offices ATTN: Katherine Kirkland, MPH kkirkland@daocc.org or 202-347-4976.