

**Fundamental Project Update
Annual Performance Review
July 1, 2007 – June 30, 2008**

State: Michigan

Name of Project: Fundamental Program (Part 1)

- Program Type: Fundamental Program
- Principal Investigator: *Kenneth D. Rosenman, MD* Contact Number: (517) 353-1846
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- Program Personnel (with their primary role):

At Michigan State University:

- Kenneth D. Rosenman, MD: Principal Investigator
- Mary Jo Reilly, MS: Epidemiologist, Project Coordinator

At the Michigan Department of Community Health:

- Thomas Largo, MPH
- Martha Stanbury, MSPH: Co-Investigator

At the Michigan Department of Labor and Economic Growth (MIOSHA):

- Douglas J. Kalinowski, MS, CIH: Co-Investigator
- Byron Panasuk, CIH: Industrial Hygienist, Workplace Intervention Coordinator

- Brief Overview of Project and Accomplishments in the Past Year: Michigan State University (MSU), the MIOSHA Program at the Michigan Department of Labor and Economic Growth (MDLEG), and the Michigan Department of Community Health (MDCH) have been collaborating in the conduct of state-based occupational health surveillance since 1988, when Michigan received a NIOSH grant for the NIOSH SENSOR Program. Building on these 20 years of experience, the Fundamental Program has undertaken a number of projects to maintain and enhance occupational health surveillance activity in Michigan. Specifically in the last year, the project has
 - Maintained the surveillance reporting infrastructure and data systems for occupational disease reports submitted under the Michigan Public Health Code, and published annual reports with data summaries.
 - Collected and submitted the 2004 and 2005 occupational health indicator (OHI) data to the Council of State and Territorial Epidemiologists (CSTE); continued to utilize the Michigan evaluation report of OHIs; provided significant assistance (e.g., quality assurance, revising online text) to CSTE to ensure that 2000-2003 multi-state/national OHI data were uploaded to the CSTE website; co-lead regular conference calls among OHI staff in funded states; revised three sections of the OHI How To Guide; participated in multi-state analysis and discussion of proposal to add two new OHIs; and convened national group to develop methods for analyzing multi-state, multi-year OHI data and presented findings at Cincinnati meeting.

- Improved surveillance data by the implementation of surveillance systems based on rules that (1) require health care providers and laboratories to report all cases of injury or illness due to exposure to mercury, arsenic, cadmium and pesticides, and (2) promulgated rules requiring health care providers and institutions to report non-medicinal, non-suicidal chemical poisonings.
- Provided epidemiologic support to “outbreak” investigations that involved possible chemical exposure at work, including a number of carbon monoxide exposures, chemical pneumonitis associated with a spray waterproofing agent, and others. Collaborated in the development of a set of guidelines for doing epidemiologic “outbreak” investigations of chemical poisonings.
- Maintained web-based tools for identifying resources and information about toxic substances.
- Developed surveillance systems for heavy metals, amputations, noise induce hearing loss, and cholinesterase lab reports for pesticide surveillance (reported separately).
- Performed initial analysis of MI responses to questions about work-related injury incidence and workers’ compensation coverage/utilization in the 2007 BRFSS. Continued to work with other funded states to formulate an analysis plan for the multi-state BRFSS data.
- Led the effort to revise the 10-year-old document: “Guidelines: Minimum and Comprehensive State-based Activities in Occupational Safety and Health” and submitted to NIOSH for review following approval of the CSTE Executive Committee.

➤ Reports/Publications Included

- Largo T, Scarpetta L. Injury Mortality in Michigan 2002-2006. MDCH Report April 2008. (Includes a section on work-related injuries)
- Reilly MJ, Rosenman KD. *2006 Annual Summary of Occupational Disease Reports to the Michigan Department of Labor and Economic Growth*. Michigan State University. September 2007.
- Stanbury M, Anderson H, Rogers P, Bonauto D, Davis L, Materna B, Rosenman K. *Guidelines for Minimum and Comprehensive State-Based Public Health Activities in Occupational Safety and Health*. Approved by NIOSH and in preparation for printing..
- Rosenman KD. The Impact of Regulations on Occupational Injuries in the U.S. *Occup Environ Med (Commentary)* 2007; 64:429-430.
- Rosenman KD, Kalush A, Reilly MJ. Variations in Worker Compensation Claims by Company. The Potential for Achieving a Significant Reduction in Claims. *Am J Ind Med* 2007; 50:415-420.
- Thomsen C, McClain J, Rosenman K, Davis L. Indicators for Occupational Health Surveillance. *MMWR* 2007; 56(No. RR-1):1-7.

➤ Materials Developed Included

- Four issues each of two newsletters “Project Sensor News” and “Now Hear This” (www.oem.msu.edu)

- A copy of the rules: “Reporting of non-suicidal, non-medicinal chemical poisonings” is now part of a new MDCH web page that links to all reporting requirements for occupational and environmental diseases and injuries in the state. Go to:
http://www.michigan.gov/mdch/0,1607,7-132-2945_5105-127047--,00.html
 - The updated *Toxic Substances Information Directory*:
http://www.michigan.gov/mdch/0,1607,7-132-2945_5105-80557--,00.html.)
- Plans for Next Year: Indicator development and publication on the CSTE website will continue, with Michigan leading in the coordination and data compilation. Annual reports and newsletters will continue to be published. On-going investigations, outreach to healthcare providers and all other occupational disease surveillance activities will continue.

**Pesticides Surveillance Project Update
Annual Performance Review
July 1, 2007-June 30, 2008**

State: Michigan

Name of Project: Pesticides

➤ Program Type: Enhanced Program in Occupational Injury and Illness Surveillance: Pesticides

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➤ Program Personnel (with their primary role):

At the Michigan Department of Community Health:

- Abby Schwartz, Pesticides Epidemiologist.
- Martha Stanbury, MSPH: Co-Investigator

At Michigan State University:

- Kenneth D. Rosenman, MD: Principal Investigator

➤ Brief Overview of Project and Accomplishments in the Past Year: This program is a continuation and expansion of occupational health surveillance activities in Michigan funded by NIOSH under its “Core State-based Occupational Health Surveillance” that began in 2000. Pesticide surveillance has continued with approximately 80 confirmed occupational cases annually (512 confirmed occupational cases since 2001). Cases are reported under the mandatory occupational disease reporting law. Employers identified by case reports are referred to the Michigan Department of Agriculture (MDA) for enforcement of violations of pesticide use and labeling laws or the Michigan Occupational Safety and Health Administration (MIOSHA) for enforcement of MIOSHA standards. Pesticide poisoning events that meet certain reporting criteria are referred to the NIOSH pesticides coordinator for further referral to EPA. De-identified data are submitted to NIOSH annually. Specifically in the last year:

- The 2006 Annual Report that includes Michigan surveillance data and case summaries was printed and distributed to stakeholders in late 2007: Schwartz A, Stanbury M, Rosenman KD. *Pesticide Illness and Injury Surveillance in Michigan: 2006*. available at www.michigan.gov/documents/mdch/Pesticides_Annual_Report2006_222912_7.pdf
- Expansion to include environmental pesticide surveillance began in 2006 and the first year of data was summarized in the 2006 Annual Report.
- Data through 2007 were submitted to NIOSH on May 1, 2007.
- New laboratory rules that went into effect in September 2005 mandated laboratory reporting of cholinesterase; most reports are being received electronically; a computer algorithm to identify cases needing follow-up was developed. From October 1, 2005 through April 30, 2008 there were 2,278 test results reported, representing 811 individuals. Of these 60 had low test results and 21 had a > 20% change from the first reported test

and required follow-up. Results were presented at the June 2008 annual meeting of the Council of State and Territorial Epidemiologists.

- Rules were promulgated in September 2007 mandating reporting of non-medicinal, non-suicidal chemical poisonings by health care providers and health care institutions; these have improved surveillance both for work-related and non-work related pesticide poisonings.
 - Staff participates in ongoing improvement of the pesticide surveillance program through participation at the annual SENSOR-Pesticides “Winterfest” meeting and through working with NIOSH and other states on the coding committee to improve case coding.
 - Information about “bug bomb” cases was submitted to NIOSH for inclusion in a MMWR article.
 - Several significant worker exposure events took place in the past year, resulting in referral to MDA. These included a case where a person treated a pond without proper training or PPE, another where a worker in a restaurant was prepping food and an applicator sprayed around her and the food, and a third involving an applicator for a lawn care company who sprayed on a windy day. Two cases were referred to MDA because the workers were not certified applicators, their employers were not licensed, yet they routinely applied pesticides. One of these workers was treating utility poles with a fungicide and the other was a high-rise window washer, who also applied an insecticide to control spiders as part of his duties. One case, where a worker in a bottle recycling center was exposed to repeated spraying, was referred to both MDA and to the asthma surveillance program.
 - Staff continue to represent MDCH on the state-wide Pesticide Advisory Committee. Staff provides quarterly reports about pesticide cases in Michigan. In addition, staff developed a report for one of the Committee members on effects of quaternary ammonium compounds and a report on children with pesticide exposure in our database to another member.
 - The program has collaborated with the Michigan Primary Care Association, the Michigan Migrant Legal Assistance Project, the Michigan Farm Bureau and the Michigan Birth Defects Steering Committee.
 - Clinics that provide services to migrants received a letter about occupational disease reporting requirements and pesticide surveillance.
 - MDCH data are being used in a publication on pesticide poisoning in agriculture: Calvert G, Karnik J, Mehler L, Beckman J, Morrissey B, Sievert J, Barrett R, Lackovic M, Mabee L, Schwartz A, Mitchell Y, Moraga-McHaley S, MS. Acute Pesticide Poisoning Among Agricultural Workers in the United States, 1998-2005(in draft).
 - Improving the sensitivity of the surveillance system is an ongoing challenge, because of lack of recognition of pesticide illness and poor compliance with reporting by health care providers.
 - Case follow-up to confirm non-occupational cases is not possible with existing resources.
- Plans for Next Year: The surveillance system will continue, along with annual reporting to NIOSH and in an MDCH annual report format. In addition, a special outreach program is being planned to address hazards of disinfectant cleaners.

**Work-Related Asthma Surveillance
Annual Performance Review
July 2007 – June 2008**

State: Michigan

Name of Project: Work-Related Asthma

- Program Type: Enhanced Program in Occupational Injury and Illness Surveillance: Work-Related Asthma (WRA)
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- Program Personnel (with their primary role):

At Michigan State University:

- Kenneth D. Rosenman, MD: Principal Investigator
- Mary Jo Reilly, MS: Epidemiologist, Project Coordinator
- Amy Sims: Research Assistant, Interviewer Coordinator (left June, 2008)

At the Michigan Department of Labor and Economic Growth (MIOSHA):

- Douglas J. Kalinowski, MS, CIH: Co-Investigator
- Byron Panasuk, CIH: Industrial Hygienist, Workplace Intervention Coordinator

At the Michigan Department of Community Health:

- Martha Stanbury, MSPH: Co-Investigator

- Brief Overview of Project: New potential WRA cases are identified through state-mandated occupational disease reporting. Main reporting sources are: hospitals, physicians, workers' compensation, and poison control centers. An emerging source of WRA reports in the past three years is death certificates (through links with our MI FACE Program). We also are now prospectively reviewing all asthma death certificates for work-related cases. Telephone-administered medical and work history questionnaires are completed. Medical records are obtained for the most recent H & P, and pulmonary function testing. Questionnaire and medical information is reviewed by a board-certified occupational medicine physician (KDR) to determine disease status. If status confirmed as WRA, an enforcement MIOSHA inspection may be conducted. MIOSHA inspections include: assessing sensitizer exposures including air monitoring, reviewing Injury and Illness Logs, conducting brief medical questionnaire interviews with co-workers in the same exposure zone, and assessing compliance with applicable standards. A report of the MIOSHA inspection findings is generated. For companies out of MIOSHA jurisdiction, referrals are made to the appropriate agency (ex. DEQ). The physician who initially reported the case to the state is sent a copy of the inspection report.
- Major Accomplishments: Approximately 200 potential case interviews were conducted, yielding over 120 new WRA cases. Over 80 new workplaces were identified and over 20 MIOSHA enforcement workplace inspections were conducted as a result of the WRA case interviews. At the workplace inspections, approximately 100 co-workers were interviewed about their work and breathing health. The 2006 Annual Report on WRA was completed (www.oem.msu.edu). Other

outreach included our 4 quarterly newsletters to approximately 3,000 health professionals (www.oem.msu.edu), exhibiting information on WRA at seven annual medical and safety & health conferences, and Dr. Rosenman speaking with labor and management safety and health professionals at conferences and other meetings including:

- “Reducing Asthma Deaths,” at the 34th MI Emergency Medicine Assembly, 7-15-2007.
 - “Fatal Work-Related Asthma from Second Hand Smoke,” at the CDC/NIOSH Work Life 2007 Symposium, 9-11-2007.
 - “Work-Related Deaths in MI,” at the MOEMA Annual Scientific Meeting, 9-27-2007.
 - “Asthma Mortality: The Use of Individual Tragedies to Facilitate Policy Change,” at the MDCH, 11-15-2007.
 - “Asthma Mortality: The Use of Individual Tragedies to Facilitate Policy Change,” at the University of MI School of Public Health, 2-1-2008.
 -
- Collaboration Opportunities/Projects with Other States:
- Within our state, we continue to work with the State’s Asthma Initiative (AIM) to ensure the inclusion of WRA in its programs and outreach efforts. Both Dr. Rosenman and Ms. Reilly participate in the State’s Asthma Initiative Steering Committee.
 - With other WRA surveillance states, we continue to work on collaborative efforts to analyze and share our combined findings including data on Cidex OPA-related investigations.
 - Dr. Rosenman shared MI’s experience and protocol for using workers’ compensation data to identify new WRA cases with the other WRA surveillance states, at the annual WRA meeting, April 2008.
- List of Reports/Publications:
- Evaluating the Michigan SENSOR Surveillance Program for Work-Related Asthma. *Am J Ind Med*. 2007 Sep;50(9):646-656.
 - Work Related Asthma in the *Educational Services* Industry – California, Massachusetts, Michigan, and New Jersey, 1993-2000. *Am J Ind Med* 2008;51:47-59.
 - How Many Deaths Will It Take? A Death From Asthma Associated With Work-Related Environmental Tobacco Smoke. *Am J Ind Med* 2008;51:111-116.
 - Clean As A Whistle, But What About That Wheeze? (Editorial). *Am J Resp Crit Care Med* 2007; 176:731-732.
- Challenges and Lessons Learned: Identify new sources of reports of potential WRA cases, encourage better reporting of WRA cases among health professionals, identify new or emerging sources of exposure among industries. One way Michigan is working to encourage better reporting is through enforcement of its Occupational Disease Reporting Law, which is still under review by the State. Plans are in place to formally inspect select occupational medicine clinics that are noncompliant with the occupational disease reporting law. New sources of case reports are being explored, including: hospital discharge data where there is a ICD-9 diagnosis of 493 (asthma) and select E codes, death certificates, and NEMSIS (emergency medical services) electronic reports of asthma encounters. Repeated outreach through publications has been critical to ensure awareness about the continuing hazards of exposure to allergens in the workplace.

➤ Plans for Next Year:

- Use of Emergency Medical Services data from ambulance runs to identify new WRA cases.
- Workshop on WRA for Asthma Educators and Case Managers, arranged through the Michigan Department of Community Health (tentatively scheduled for August 2008).
- On-site visits to Occupational Health Clinics that are not in compliance with the MI Occupational Disease Reporting Law, to enforce the law (tentatively scheduled for Fall 2008).

**Silicosis Surveillance
Annual Performance Review
July 2007 – June 2008**

State: Michigan

Name of Project: Silicosis

- Program Type: Enhanced Program in Occupational Injury and Illness Surveillance: Silicosis
- Principal Investigator: *Kenneth D. Rosenman, MD* Contact Number: (517) 353-1846
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- Program Personnel (with their primary role):
 - At Michigan State University:**
 - Kenneth D. Rosenman, MD: Principal Investigator
 - Mary Jo Reilly, MS: Epidemiologist, Project Coordinator
 - Amy Sims: Research Assistant, Interviewer Coordinator (left June, 2008)
 - At the Michigan Department of Labor and Economic Growth (MIOSHA):**
 - Douglas J. Kalinowski, MS, CIH: Co-Investigator
 - Byron Panasuk, CIH: Industrial Hygienist, Workplace Intervention Coordinator
 - At the Michigan Department of Community Health:**
 - Martha Stanbury, MSPH: Co-Investigator
- Brief Overview of Project: New potential silicosis cases are identified through state-mandated occupational disease reporting. Main reporting sources are: hospitals, physicians, workers' compensation, and death certificates. Telephone-administered medical and work history questionnaires are completed. Medical records are obtained for most recent H & P, chest x-ray, pulmonary function testing, and lung biopsy (if performed). Questionnaire and medical information is reviewed by a board-certified occupational medicine physician (KDR) to determine disease status. If status confirmed as silicosis, an enforcement MIOSHA inspection may be conducted. MIOSHA inspections include: assessing current silica exposure including air monitoring, reviewing Injury and Illness Logs, reviewing co-worker chest x-rays if available, and assessing compliance with applicable standards. A report of the MIOSHA inspection findings is generated. For companies out of MIOSHA jurisdiction, referrals are made to the appropriate agency (ex. MSHA). The physician who initially reported the case to the state is sent a copy of the inspection report.
- Major Accomplishments: Approximately 50 potential silicosis case interviews were conducted, yielding over 20 new silicosis cases. Over 10 new workplaces were identified and three enforcement inspections were conducted. Other outreach included exhibiting information on silicosis at seven annual medical and safety and health conferences, articles in our quarterly newsletter to approximately 3,000 health professionals (www.oem.msu.edu), and speaking with labor and management safety and health professionals at conferences where we exhibited our display booth.

- In the fall of 2007, a listing of 94 potential silica-using foundries was developed and distributed to the MIOSHA District offices in the state. The state's MIOSHA industrial hygienists are in the process of inspecting each of the foundries on the list. Key information collected during these enforcement inspections includes silica air monitoring and information on any medical surveillance programs (especially the regular collection of chest x-rays) used by the establishment. The results of these inspections will be compiled and written up once all companies have been inspected. It is anticipated that this work will be completed within the next two years.
- Collaboration Opportunities/Projects with Other States: There is a draft article currently being updated to include the years 2000-2005 (original draft is called--Silicosis Still Occurs: 12 Years of Surveillance Data-Michigan, New Jersey, and Ohio, 1988–1999). Michigan is also collaborating with the New Jersey program in developing a national estimate of silicosis using hospital discharge data.
- List of Reports/Publications:
 - Silicosis Still Occurs: 12 Years of Surveillance Data-Michigan, New Jersey, and Ohio, 1988–1999 (currently being updated)
 - Update on Connective Tissue Disease and Silicosis (in progress)
- Challenges and Lessons Learned: Identify new sources of reports of silicosis cases, encourage better reporting of silicosis cases among health professionals, identify new or emerging sources of silica exposure among industries. One way Michigan is working to encourage better reporting is through enforcement of its Occupational Disease Reporting Law, which is still under review by the State. Plans are in place to formally inspect select occupational medicine clinics that are noncompliant with the occupational disease reporting law. Repeated outreach through publications has been critical to ensure awareness about the continuing hazards of silica exposure.

FACE Project Update
Annual Performance Review
July 1 2007 – June 30 2008

State: Michigan

Name of Project: FACE

➤ Program Type: Enhanced Program in Occupational injury and Illness Surveillance: Fatality Assessment and Control Evaluation (FACE)

➤ Principal Investigator: *Kenneth Rosenman, MD* Contact Number: (517) 353-1846

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➤ Program Personnel (with their primary role):

At Michigan State University:

- Kenneth Rosenman, MD : Principal Investigator
- Debra Chester, MS: Program Coordinator and Field Investigator
- Mary Jo Reilly, MS: Epidemiologist

➤ Brief Overview of Project: All notifications of possible work-related deaths are evaluated and then confirmed as being work-related. Source documents (death certificate, medical examiner report/death scene investigation, and police report) are requested for all possible work-related deaths to determine if a death is work-related. Data collection forms are completed for all confirmed work-related deaths. Source documents only are obtained for homicides, suicides and most transportation-related fatalities. For the rest of the work-related deaths, MIFACE attempts to contact the employer/family members via letter and phone call(s) to inquire about their interest in participating in the MIFACE research program and if they would permit a MIFACE site visit. At the site visit, interviews are held to gather facts about pre-, during-, and post-event activities. Based on information gathered during the site visit and from source documents, MIFACE writes a report that contains a summary of the fatal incident, a detailed narrative, the cause of death, pictures/drawings, and prevention recommendations.

➤ Key Collaboration/Intervention/Outreach/Evaluation Activities:

- Michigan Occupational Safety and Health Administration (MIOSHA): (1) Work-related death notification, (2) Discuss case with investigating compliance officers, (3) Compliance officer review of MIFACE Investigation Report/MIOSHA summary, (4) MIFACE investigative reports used in upcoming MIOSHA training classes, (5) MIFACE accompanies MIOSHA on second or third site visit to company under investigation. Companies asked at that time for their participation in the MIFACE program.
- Census of Fatal Occupational Injuries: Collaboration in confirmation of work-related deaths.
- MIFACE Advisory Board: All Advisory Board members are prominent members of their industry and promote, review and distribute MIFACE reports to their constituents.
- Michigan State Police: Collaboration in identification and confirmation of work-related deaths.

- Michigan Farm Bureau: (1) Safety education and training seminars around state for agricultural community.
- Health Care: (1) Informational/educational work-related asthma seminar at CDC/NIOSH Symposion-Work Life 2007: Protecting and Promoting Work Health. (2) Seminar at Michigan Occupational & Environmental Medicine Association discussing work-related asthma deaths.
- Industry Outreach: AFL-CIO Union industries show. America at Work: 2008. MIFACE program introduced and case discussion at health and safety seminar.

➤ Challenges (ongoing or overcome):

- Continuing to get the reports and other educational material to the “man in the street” and past the front desk.
- Gaining site access – employers “lawyer up” or do not want to relive event and therefore do not participate. Strategy to Overcome: MIFACE is accompanying MIOSHA compliance officers in a 15 county area on the MIOSHA second or third visit.

➤ Collaboration Opportunities/Projects with Other States:

- Morbidity and Mortality Weekly Report (MMWR) –Work-Related Injury Deaths of Hispanic Workers – United States, 1992-2006 2008; 57: 597-600.

➤ List of Materials Developed:

- MIFACE Forty-Six Summaries of MIOSHA inspections
- MIFACE Twenty-Five Investigation Reports
- MIFACE Hazard Alert: Carbon Monoxide-What you cannot smell can kill you
- MIFACE Annual Reports (2001-2006)

➤ List of Reports/Publications:

- Stanbury M, Chester D, Hanna EA, Rosenman KD. How Many Deaths Will It Take? A Death From Asthma Associated With Work-Related Environmental Tobacco Smoke. Am J Ind Med 2008; 51:111-116.
- Work-Related Injury Deaths of Hispanic Workers – United States, 1992-2006 2008; 57: 597-600.

**Heavy Metals Surveillance Project Update
Annual Performance Review
July 1, 2007- June 30, 2008**

State: Michigan

Name of Project: Heavy Metals

- Program Type: Fundamental Program: (Part 2 - Heavy Metals)
- Principal Investigator: *Kenneth D. Rosenman, MD* Contact Number: (517) 353-1846
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 - Jay Fiedler, MS: Epidemiologist
 - Martha Stanbury, MSPH: Co-Investigator
 - At Michigan State University:**
 - Kenneth D. Rosenman, MD: Principal Investigator
 - Amy Sims: Research Assistant, Interviewer Coordinator
- Brief Overview of Project: Michigan State University (MSU), the MIOSHA Program at the Michigan Department of Labor and Economic Growth (MDLEG), and the Michigan Department of Community Health (MDCH) have been collaborating in the conduct of state-based occupational health surveillance since 1988, when Michigan received a NIOSH grant for the NIOSH SENSOR Program. Building on these 20 years of experience, the Fundamental Program has undertaken a number of projects to maintain and enhance occupational health surveillance activity in Michigan, including the development of a surveillance system based on clinical laboratory reports of mercury, arsenic and cadmium. Reporting of these tests has been mandated by state regulations since September 2005. Protocols for data management, case follow-up and referral were developed. MDCH conducts interviews and other follow-up of children and MSU conducts interviews of the adults whose clinical test results are above the established action threshold. The first annual report summarizing the data from September 2005 through December 2006 was printed and distributed. Over 15,000 reports were received in that time frame. Very few children were reported. Elevated levels were determined to be the result of dietary, occupational, and environmental exposures.
- Key Collaboration/Intervention/Outreach/Evaluation Activities:
 - The heavy metals surveillance system identified a cluster of workers with elevated blood mercury and MIOSHA conducted an inspection resulting in fines. This worksite had been of concern to the state Department of Environmental Quality (DEQ) because of environmental mercury issues, but DEQ hadn't had sufficient data to take enforcement actions.
 - Efforts to obtain lab reports electronically has required collaboration between MDCH staff working on this project and other programs in the MDCH that are working on electronic reporting. Some laboratories are now reporting electronically in HL7 and a variety of other formats. .

- MDCH worked with the DEQ Water Bureau to update a brochure about arsenic in well water, which is mailed to individuals with elevated arsenic levels possibly due to ingestion of well water.
- Individuals for whom mercury exposure is determined to be related to fish receive an MDCH brochure about how to make better choices about which species of fish to eat.
- MDCH has an ongoing collaboration with an interagency workgroup on mercury in Michigan that is hosted by the DEQ. Surveillance data were provided to DEQ to include in their recent strategic policy document on mercury in the environment.
- The EPA contacted the program because of their interest in mercury, especially in fish. A teleconference was held and data were provided.
- A Preventive Medicine resident from the University of Michigan used this surveillance system to perform the surveillance system evaluation exercise that is required of physicians in the residency program.
- An abstract on the metals surveillance system was presented at the annual CSTE meeting in Denver, June 2008.
- Case Ascertainment Status of Reports Received: All Ages
- Patient Interviews July 2007 through June 2008, metals:

Month/Year Reported	Arsenic Lab Reports	Cadmium Lab Reports	Mercury Lab Reports
July 2007	498	217	443
August 2007	684	367	626
September 2007	664	304	622
October 2007	666	214	668
November 2007	567	226	534
December 2007	476	194	433
January 2008	584	209	533
February 2008	581	222	528
March 2008	669	256	622
April 2008	98	28	78
May 2008	n/a	n/a	n/a

June 2008	n/a	n/a	n/a
Total	5,100	1,948	5,333

Table Notes: Each report represents one test. Most individuals receive more than one test and would be represented multiple times in the above table.

	Elevated Arsenic	Elevated Cadmium	Elevated Mercury
MDCH	Completed = 2 Pending = 4 Total = 6	Completed = 0 Pending = 0 Total = 0	Completed = 2 Pending = 1 Total = 3
MSU	Completed = 268 Pending = 102 Total = 370	Completed = 60 Pending = 35 Total = 95	Completed = 70 Pending = 22 Total = 92

- Challenges (ongoing or overcome):
 - Data processing and management of the laboratory reporting system has been very challenging, partly because of the unexpectedly large volume of reports and partly because of electronic laboratory reporting issues. As a result of efforts to ensure electronic reporting from the laboratories with a large number of reports, all, but one large lab, now report electronically.
 - The indications for ordering these tests by physicians is being reviewed, given that the vast majority of test results are non-detects or within normal range. We will be exploring this issue through additional data analysis.
- Collaboration Opportunities/Projects with Other States: The project utilized materials and tools from New Jersey and New York, which have previously conducted this type of surveillance.
- List of Materials Developed:
 - A Standards Operating Procedure manual, questionnaires, supporting materials such as contact letters were developed.
- List of Reports/Publications:
 - Fiedler J, Stanbury M, Sims A, Rosenman K. Heavy Metals Surveillance in Michigan Residents: First Annual Report (October 2005-December 2006). Lansing, Michigan: Michigan Department of Community Health and Michigan State University, October 2007.

**Work-Related Noise-Induced Hearing Loss Surveillance Project Update
Annual Performance Review
July 1, 2007- June 30, 2008**

State: Michigan

Name of Project: Work-Related Noise-Induced Hearing Loss

➤ Program Type: Fundamental Program: (Part 4 - Work-Related Noise-Induced Hearing Loss)

➤ Principal Investigator: *Kenneth D. Rosenman, MD* Contact Number: (517) 353-1846
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➤ Program Personnel (with their primary role):

At Michigan State University:

- Kenneth D. Rosenman, MD: Principal Investigator
- Amy Sims: Research Assistant, Project Coordinator

At the Michigan Department of Labor and Economic Growth (MIOSHA):

- Douglas J. Kalinowski, MS, CIH: Co-Investigator

At the Michigan Department of Community Health:

- Martha Stanbury, MSPH: Co-Investigator

➤ Brief Overview of Project: New potential Work-Related Noise-Induced Hearing Loss (NIHL) cases are identified through state-mandated occupational disease reporting. Main reporting sources are: (1) reports from audiologists, otolaryngologists and other health care providers and (2) reports from companies or health care professionals providing services to companies. Telephone-administered medical and work history questionnaires are completed. Audiograms are obtained for the most recent audiometric testing. Questionnaire and medical information is reviewed by a board-certified occupational medicine physician (KDR) to determine disease status. If status confirmed as work-related NIHL, an enforcement MIOSHA inspection may be conducted. MIOSHA inspections include: reviewing Injury and Illness Logs and assessing compliance with applicable standards. A report of the MIOSHA inspection findings is generated.

➤ Key Collaboration/Intervention/Outreach/Evaluation Activities: Case interview data is analyzed at least annually and an annual report is generated (www.oem.msu.edu). Other outreach includes scientific journal articles, articles in our quarterly newsletter (www.oem.msu.edu) to approximately 900 audiologists, otolaryngologists and other health care providers, and speaking with labor and management safety and health professionals at conferences.

- Reporting Source and Disease Status of Reports Received 7/1/2007 through 6/30/2008:

Reporting Source	Disease Status				Total
	NIHL	Standard Threshold Shift	Disease Related	Unconfirmed	
	#	#	#	#	
Facility Physician Reports	404	1	0	101	506
Physician Reports	100	0	1	34	135
Workers' Compensation	0	0	0	2	2
TOTAL	504	1	1	137	643

During this time period, telephone interviews were conducted with 507 of 643 (79%) cases; audiograms were received on 530 of 643 (82%) cases; and no industrial hygiene referrals were made.

- Challenges (ongoing or overcome): Identify new sources of reports of potential NIHL cases, encourage better reporting of NIHL cases among health professionals, identify new or emerging sources of exposure among industries. One way Michigan is working to encourage better reporting is through enforcement of its Occupational Disease Reporting Law. In 2006, select occupational medicine clinics will be formally inspected and fined for failure to report cases to the state.
- Collaboration Opportunities/Projects with Other States: none
- List of Materials Developed:
 - Worker Health Surveillance in Michigan brochure contains information on Michigan's Occupational Disease Reporting Law and Registry (www.oem.msu.edu).
 - Work-Related Hearing Loss Q & A brochure for providers (www.oem.msu.edu).
 - Work-Related Hearing Loss Q & A brochure for patients (www.oem.msu.edu).
 - Farmers and Hearing Loss brochure (www.oem.msu.edu).
 - Auto Repair Workers and Hearing Loss brochure (www.oem.msu.edu).
 - Lawncare Workers and Hearing Loss brochure (www.oem.msu.edu).
 - The Summer 2007 issue of our newsletter, *Now Hear This...* was distributed to approximately 933 health professionals. The theme of this issue was "Excerpts from the 2006 Annual Report on Work-Related Noise-Induced Hearing Loss." The newsletter is available on line at: www.oem.msu.edu.
 - The Fall 2007 issue of our newsletter, *Now Hear This...* was distributed to approximately 921 health professionals. The theme of this issue was "Noisy Work But No Workplace Hearing Conservation Program." The newsletter is available on line at: www.oem.msu.edu.
 - The Winter-Spring 2007-2008 issue of our newsletter, *Now Hear This...* was distributed to approximately 915 health professionals. The theme of this issue was "New

Recommendations for Preventing Hearing Loss in Construction Workers.” The newsletter is available on line at: www.oem.msu.edu.

➤ Outreach to Case Ascertainment Sources:

- The Work-Related Injury and Illness educational display booth was exhibited at the American College of Physicians Conference in Kalamazoo on September 7-8, 2007.
- The Work-Related Injury and Illness educational display booth was exhibited at the University of Michigan Pulmonary and Critical Care Medicine Conference in Ann Arbor on September 24-25, 2007.
- The Work-Related Injury and Illness educational display booth was exhibited at the Michigan Occupational and Environmental Medicine Association 2007 Conference in East Lansing on September 27-28, 2007.
- The Work-Related Injury and Illness educational display booth was exhibited at the Second Annual Michigan Audiology Coalition Conference in East Lansing, MI on October 18 and 19, 2007. It will be exhibited at the Third Annual Michigan Audiology Coalition Conference in East Lansing, MI on October 23 and 24, 2008.
- The Work-Related Injury and Illness educational display booth was exhibited at the 2007 Michigan State Medical Society Annual Conference on October 24-26, 2007.
- The Work-Related Injury and Illness educational display booth was exhibited at the 2008 Michigan Safety Conference in Lansing, MI on April 15 and 16, 2008.

➤ List of Reports/Publications:

- Smith SW, Rosenman K, Kotowski MR, Glazer E, McFeters C, Keesecker N, Law A. Using the EPPM to Create and Evaluate the Effectiveness of Brochures to Increase the Use of Hearing Protection in Farmers and Landscape Workers. *Journal of Applied Communication Research* 2008; 36:200-218.
- Stanbury M, Rafferty AP, Rosenman K. Prevalence of Hearing Loss and Work-related Noise Induced Hearing Loss in Michigan. *J Occup Env Med* 2008;50:72-79.
- Rosenman KD, Sims A, Reilly MJ, Kalinowski DJ. 2006 Annual Report on Work-Related Noise-Induced Hearing Loss in Michigan. Lansing, Michigan: Michigan State University and the Michigan Department of Labor and Economic Growth, 12/05/2007.

**Work-Related Amputations Surveillance
Annual Performance Review
July 1, 2007 – June 30, 2008**

State: Michigan

Name of Project: Fundamental Program (Part 3 - Work-Related Amputations)

- Program Type: Fundamental Program
- Principal Investigator: *Kenneth D. Rosenman, MD* Contact Number: (517) 353-1846
117 West Fee East Lansing, Michigan 48824 Email: Rosenman@msu.edu
- Program Personnel (with their primary role):

At Michigan State University:

- Kenneth D. Rosenman, MD: Principal Investigator
- Mary Jo Reilly, MS: Epidemiologist, Project Coordinator

At the Michigan Department of Labor and Economic Growth (MIOSHA):

- Douglas J. Kalinowski, MS, CIH: Co-Investigator
- Byron Panasuk, CIH: Industrial Hygienist, Workplace Intervention Coordinator

At the Michigan Department of Community Health:

- Thomas Largo, MPH
- Martha Stanbury, MSPH: Co-Investigator

- Brief Overview of Project and Accomplishments in the Past Year: Michigan State University (MSU) has been receiving medical records of hospitalized or Emergency Department patients sustaining work-related amputations since 1997, reported under the Public Health Code. In 2004, MSU began referring a subset of these cases to the Michigan Occupational Safety and Health Administration (MIOSHA) within the Michigan Department of Labor and Economic Growth (MDLEG), based on referral criteria requested by MIOSHA. MIOSHA reviews each case to determine if an inspection is warranted. The impetus for this referral system was MIOSHA's 2004 strategic plan which contained an objective to reduce the incidence of work-related amputations.

The database used to track cases was modified in 2007. Originally, information on referred cases only was entered into the database. In mid-2007, the database expanded to include data on all work-related amputations (regardless of whether the incident was referred to MIOSHA). The database contains information on all work-related amputations receiving hospital medical care from January 1, 2006 onward.

The following summarizes the amputations data for 2006. (Data for 2007 are incomplete due to the long lag time between hospitalization and case reporting):

- Approximately 2,000 medical records were reviewed (about 95% of the state's acute care hospitals submitted records).
- Five hundred thirty nine (539) Michigan residents sustained a work-related amputation requiring hospital medical attention. The amputation rate for males was six times the rate for females and rates were highest for males aged 20-29. (Rates by specific industry are currently being developed.)
- Of these 539 cases, 143 were referred to MIOSHA for potential workplace inspection.
- The referrals were responsible for 22 inspections. These inspections had a median fine of \$3,200. (Note: as of this writing, 21 referred cases have yet to be resolved.)

Results of the evaluation of referrals, which were presented at the June 2007 annual meeting of the Council of State and Territorial epidemiologists, were used in a July 2007 meeting with MIOSHA to improve system efficiency. A May 2008 meeting with the new point of contact at MIOSHA resulted in even more informative and timely information from MIOSHA on the status of referred cases.

- Plans for Next Year: The amputations surveillance system and MIOSHA referrals will continue next year. The first annual report will be prepared and distributed.