FINAL PROGRESS REPORT
Project Title: Occupational Safety and Health Surveillance in Iowa

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Abstract

In this project, the Iowa Department of Public Health (IDPH) addressed the development of a fundamental surveillance system to monitor occupational illnesses and injuries in Iowa, surveillance of occupational pesticide poisoning, and surveillance of work-related fatal injuries.

Fundamental surveillance
IDPH collaborated with key stakeholders in academia, business, agriculture, and healthcare to establish a surveillance system comprised of 15 indicators. Thirteen indicators were those required by the National Institute for Occupational Safety and Health (NIOSH) and were consistent with past recipients of NIOSH funding to allow for comparison of Iowa to other states. IDPH also included occupational exposure to anhydrous ammonia and commodity-production related agricultural injuries because they relate to the prominence of the agricultural industry in Iowa.

Surveillance of occupational pesticide poisoning
In the pesticide poisoning surveillance program, IDPH built on existing efforts to monitor pesticide poisoning in Iowa and developed methods to prevent pesticide poisoning.

Work-related fatal injuries
In the work-related fatal injuries program, IDPH collaborated with the University of Iowa to determine the circumstances of work-related fatal injuries and disseminate information regarding prevention.

Key Findings
Preliminary data analysis of the 2007 data indicates that many state-specific trends continue for Iowa including higher rates per 100,000 employed persons for the rate of work-related fatal injuries and higher prevalence and incidence rates among adults with elevated blood lead levels blood of 25 micrograms per deciliter (μg/dL) or higher compared to national data.
*Some data still incomplete due to data delays from national sources.

In 2007, Iowa also had a non-fatal occupational injury and illness incidence rate, based on total recordable cases (TRC) of 5.5 per 100 full-time workers, while the USA rate was 4.2 and the average rate of 9 Midwest states was 4.8.

IDPH investigated 10 airplane crashes in the summer of 2009, with 8 being crop dusters. With the increase in use of aerial application of pyraclostrobin, and other pesticides, Iowa is seeing a larger number of reports each year. IDPH works with the Iowa Department of Agriculture and Land Stewardship (IDALS) on many pesticide cases as they investigate possible label violations. Disinfectants continue to be the most common pesticide exposure and are most frequently associated with cases of occupational pesticide poisoning.

How the Results Can Be Utilized in the Workplace
IDPH has publicized its findings and is targeting information to pesticide applicators, people who use disinfectants on the job, and people who work under circumstances that have resulted in work-related fatal injuries.

SECTION 1

Highlights/Significant Findings.
Occupational Health Indicators were finalized for 2006* and data were collected or requested for preliminary calculation of the 2007 indicators in compliance with the updated guidelines issued by CSTE in June 2010. Preliminary data analysis of the 2007 data indicates that many state-specific trends continue for Iowa including higher rates per 100,000 employed persons for the rate of work-related fatal injuries and higher prevalence and incidence rates among adults with elevated blood lead levels blood of 25 micrograms per deciliter (μg/dL) or higher compared to national data.
*Some data still incomplete due to data delays from national sources.

In 2007, Iowa also had a non-fatal occupational injury and illness incidence rate, based on total recordable cases (TRC) of 5.5 per 100 full-time workers, while the USA rate was 4.2 and the average rate of 9 Midwest states was 4.8 (U.S. DoL, BLS, Survey of Occupational Injuries and Illnesses 2007 data).

The top two general areas of work-related traumatic fatalities can be grouped as farm or agricultural incidents and motor vehicle fatalities. These are also the two areas that include the majority of the older worker fatalities in Iowa. Iowa's 2007 work-related fatality percentages exceeded the national and Midwest average percentages for both transportation (IA 58%, US 41%, Midwest average 43%) and contact with an object or equipment (IA 20%, US 17%, Midwest average 19%).

Further analysis of the 2007 CFOI data shows that older workers in Iowa continue to have more traumatic work-related deaths than those across the US. For workers in Iowa, 85% of all work-related fatalities occurred in those workers 35 years of age or older, compared to 72% of all US workers in that age range in 2007. Of these, 63% of the Iowa worker fatalities were 45 years of age or older compared to 52% of all USA workers. The data spread was slightly closer in 2008 for Iowa workers 35 years or older at 83% compared to 75% USA workers, but the discrepancy increased to a 16% difference for workers 45 years of age or older in Iowa (69%) compared to the USA worker data (53%).

IDPH investigated five events of pyraclostrobin exposure in the summer of 2007 that sickened 33 persons, including 27 migrant workers who were exposed in a single incident during crop dusting. The report of this investigation was published in the January 4, 2008, *Morbidity and Mortality Weekly Report* as "Pesticide Poisoning Associated with Pyraclostrobin Fungicide — Iowa, 2007." In 2009, IDPH investigated several high profile cases of pesticide poisoning, such as a child giving rodenticide to fellow students, a large chemical gas exposure at a milk processing plant due to mixing of incompatible chemicals, and an occupational death that included the release of an industrial chemical. Iowa also investigated 10 airplane crashes in the summer of 2009, with 8 being crop dusters. With the increase in use of aerial application of pyraclostrobin, and other pesticides, Iowa is seeing a larger number of reports each year. IDPH works with the Iowa Department of Agriculture and Land Stewardship (IDALS) on many pesticide cases as they investigate possible label violations.

The data for calendar year 2008 cases of occupational pesticide poisoning include 99 known occupational cases. Of these cases, 30 are classified as definitive cases, 3 are probable cases, and 24 possible cases. An additional 5 cases were suspicious, and 35 have not been classified due to insufficient information. Disinfectants continue to be the most common pesticide exposure and are most frequently associated with cases of occupational pesticide poisoning.

Translation of Findings and Outcomes/Relevance/Impact

The outcomes of this project are in the category of potential outcomes, which are findings, results, or recommendations that could influence workplace risk if used. IDPH has publicized some of its findings. However, IDPH needs to better publicize these findings by targeting information to the following groups:

- People who work with lead on the job. Employers and employees need to adopt practices that will reduce exposure to lead.
- Aerial pesticide applicators. Employers and employees need to be aware of the weight of the plane and obstacles that could cause a plane to crash on takeoff and landing. In addition, they need to be aware of people who are working in fields and people who live in the area to reduce the possibility of exposing these people to pesticides by overspraying or drift.
- People who use disinfectants on the job. These people need to be aware of the risk of using disinfectants. They need to wear appropriate protective clothing and be very cautious of mixing chemicals.
- People who work under circumstances that have resulted in work-related fatal injuries. IDPH needs to work with existing programs that address farm/agricultural safety to communicate with these workers. In addition, IDPH needs to use its existing authority under Iowa law to conduct surveillance of production agriculture-related injuries to gain additional information that can be used to education agricultural workers in the prevention of injuries. IDPH needs to work with employers to adopt practices to reduce work-related motor vehicle fatalities. Older workers are more likely to die in farm/agricultural accidents and work-related motor vehicle accidents. IDPH needs to target older workers in these areas to prevent work-related fatal injuries.

SECTION 2
Scientific Report.
Background for the Project
The mission of the Iowa Department of Public Health (IDPH) is to promote and protect the health of Iowans. By developing a fundamental surveillance system to monitor occupational illnesses and injuries in Iowa, IDPH has been able to deliver effective prevention and education programs to Iowa's workforce. IDPH has collaborated with key stakeholders in academia, business, agriculture, and healthcare to establish the surveillance system. Initially, the system was comprised of 15 indicators. Thirteen indicators are those required by the National Institute for Occupational Safety and Health (NIOSH) and consistent with past recipients of NIOSH funding to allow for comparison of Iowa to other states. The other two indicators included in the system are occupational exposure to anhydrous ammonia and commodity-production related agricultural injuries. Both relate to the prominence of the agricultural industry in Iowa.

In the pesticide poisoning surveillance program, IDPH has built on efforts to monitor pesticide poisoning in Iowa and developed methods to prevent pesticide poisoning.

In the work-related fatal injuries program, IDPH has collaborated with the University of Iowa to continue efforts to determine the circumstances of work-related fatal injuries and disseminate information regarding prevention.

Specific Aims
Fundamental Surveillance
1. Establish and maintain a scientific advisory committee that includes appropriate state partners, local public health agencies, and other stakeholders to identify relevant Iowa-specific issues and priorities for occupational surveillance.

2. Establish and maintain contacts with appropriate organizations, groups, and individuals who may provide or use appropriate surveillance data.

3. Collect and analyze surveillance data for the 13 occupational health indicators that have been identified by the National Institute for Occupational Safety and Health (NIOSH) and Council of State and Territorial Epidemiologists (CSTE) and for 2 indicators that have been identified by IDPH.

4. Annually, publish surveillance results, interpretations, and conclusions.

5. Conduct an annual evaluation of the accomplishments and impact of the surveillance program.

6. Participate in all meetings of the Consortium of Occupational State-based Surveillance (COSS) and the Coordinating Committee (CC).

7. Determine potential future indicators that will enhance knowledge of occupational illness and injury in Iowa.

Although not listed as a specific aim, an important activity during this project has to been to grow the capacity for occupational health and safety surveillance within the Iowa Department of Public Health and the state of Iowa.

Pesticides Poisoning Surveillance Program
1. Establish and maintain a scientific advisory committee that includes appropriate state partners, local public health agencies, and other stakeholders to identify relevant Iowa-specific issues and priorities for pesticide poisoning surveillance.

2. Collect and investigate reports of pesticide poisoning.

3. Analyze pesticide poisoning surveillance data.

4. Publish pesticide poisoning surveillance results, interpretations, and conclusions.

5. Conduct an annual evaluation of the accomplishments and impact of the pesticide poisoning surveillance program.

FACE

1. To conduct timely and comprehensive surveillance to identify all traumatic occupational fatalities occurring within the State of Iowa.

2. To conduct on-site investigations of specific traumatic occupational fatalities using the NIOSH FACE investigative mode.

3. To develop and disseminate prevention strategies to reduce the risk of fatal occupational injuries.

PROCEDURES

Project Design and Methods

Rita Gergely served as the Principal Investigator. She is Chief of the Iowa Department of Public Health Bureau of Lead Poisoning Prevention, which includes the Occupational Health and Safety Surveillance (OHSS) Program. She provided oversight and guidance to IDPH staff and to the FACE program, which was contracted to the University of Iowa.

Fundamental Occupational Health and Safety Surveillance Program

IDPH monitored the 13 fundamental indicators identified by NIOSH and the Council of State and Territorial Epidemiologists (CSTE/NIOSH 2004) and 2 Iowa-specific indicators and carried out other Iowa-specific Fundamental OHSS Program activities.

Pesticide Poisoning Surveillance Program

Pesticide poisoning has been required to be reported to IDPH since 1987. IDPH gathers reports from health care providers and also receives weekly extracts of Toxicall data from the Iowa State Poison Control Center. All data are entered into a spreadsheet and classified according to NIOSH guidelines for pesticide poisoning. Iowa law requires IDPH to provide a report to the Iowa Department of Agriculture and Land Stewardships. This report must include the EPA registration number of the pesticide. Occupational data are entered into SPIDER. Data are reported to NIOSH each year and are analyzed by NIOSH.

Work-Related Fatal Injuries (FACE) Program

IDPH contracts with the University of Iowa to carry out the FACE program. The goal of the FACE Program is to "prevent occupational fatalities across the nation by identifying and investigating work situations at high risk for injury and illness and then formulating and disseminating prevention strategies to those who can intervene in the workplace." It further states that "Expanded Programs are expected to fill gaps in existing national surveillance systems." The Iowa FACE Program has, and will continue to address these goals through a comprehensive and efficient surveillance system, thorough investigations and insightful prevention recommendations, and a multi-faceted and robust dissemination system. The goal of the Iowa FACE Program is to reduce the number of traumatic occupational fatalities in Iowa and the nation by establishing a fatal occupational injury surveillance system, conducting on-site investigations of the fatal incidents, identifying risk factors for such injuries, developing prevention strategies, and disseminating the results of these efforts.

Results and Discussion

Fundamental

SPECIFIC AIM 1: Establish and maintain a scientific advisory committee that includes appropriate state partners, local public health agencies, and other stakeholders to identify relevant Iowa-specific issues and priorities for occupational surveillance.

The first meeting of the advisory committee was held on November 19, 2007, via the Iowa Communications Network (ICN). The meeting originated from IDPH, and 29 people participated from 5 remote ICN sites around Iowa. Follow-up on issues from this meeting continued throughout the project period.

SPECIFIC AIM 2: Establish and maintain contacts with appropriate organizations, groups, and individuals who may provide or use appropriate surveillance data.

IDPH staff conducted the following activities:

- Worked with the IDPH Bureau of Emergency Medical Services (EMS) to gain access to the raw data from the Farm Injury Registry currently housed in their program.

- Performed data clean-up, analysis, graphing, and reported the preliminary findings to members of the advisory group.
- Attended weekly meetings of the IDPH Center for Acute Disease Epidemiology (CADE).
- Monitors the CDC Epi-Ex for occupational related events, participated in numerous work-related infectious disease outbreaks in the past year, drafted interview forms, conducted interviews, gathered and summarized data, and writing reports. Participated in investigation of a histoplasmosis outbreak involving workers from 18 different employers.
- Requested a NIOSH HHE site visit for one of the outbreak events.
- Drafted an update to the Iowa Administrative Code to include agriculturally-related injuries in the same part of the IAC as other mandatory requirements for reporting disease, illness, and environmental exposure requirements to IDPH.
- Established a working relationship with the Iowa Workforce Development program, which includes the Division of Labor, Iowa Occupational Safety and Health (I-OSH), and Workers Compensation program, to determine guidelines for data sharing, mutual reporting, and inter-office collaboration. Met with I-OSH to discuss adult blood lead exposures in the state.
- Partnered with the University Hygienic Laboratory (UHL) to conduct site follow-up at laboratories where workers were identified as potentially exposed to infectious materials.
- Participated in board meetings and teleconferences of Iowa's Center for Agricultural Safety and Health (I-CASH). Appointed by IDPH director to serve on the governing board for this group and had a display at annual conference.
- Developed display, presentation, and hard copy materials for the fundamental surveillance program, pesticide surveillance program, and ABLES, as well as informational materials for workers, employers, and the community during outbreak and injury investigations.
- Developed fliers for the pesticide surveillance program and occupational safety and health surveillance program and display materials for the OSHSP.
- IDPH Disability and Injury Prevention Bureau: participated in the development and writing of a report regarding injury in Iowa called "The Burden of Injury in Iowa: 2002-2006" which can be viewed at www.idph.state.ia.us/bh/common/pdf/injury_prevention/burden_of_injury_full_report.pdf
- IDPH Disability and Injury Prevention Bureau – is serving on a new injury prevention committee.
- Work-related fatal injuries -- participates in monthly calls and analyzes data for trends.
- Iowa Asthma Coalition: Member on the data surveillance committee, promoting the need to monitor work-related asthma, which led to the inclusion of work-related asthma as part of the IAC goals and inclusion in a IDPH Health Statistics grant application.

SPECIFIC AIM 3: Collect and analyze surveillance data for the 13 occupational health indicators that have been identified by the National Institute for Occupational Safety and Health (NIOSH) and Council of State and Territorial Epidemiologists (CSTE) and for 2 indicators that have been identified by IDPH.

IDPH submitted indicator data through 2008. IDPH also obtained raw data for ammonia exposures in Iowa, which is an Iowa-specific indicator, and is analyzing and graphing these data.

Table 1
Fundamental Indicators Identified by NIOSH and CSTE

Non-fatal work related injuries and illnesses reported by employers.
Work-related hospitalization.
Work-related fatal injuries.
Work-related amputations with days away from work reported by employers.
Amputations filed with the state workers' compensation system.
Hospitalization for work-related burns.
Work-related musculoskeletal disorders with days away from work reported by employers.
Carpal tunnel syndrome cases filed with the state workers' compensation system.
Hospitalization from or with pneumoconiosis.
Mortality from or with pneumoconiosis.
Acute work-related pesticide-associated illness and injury reported to poison control centers.
Incidence of malignant mesothelioma.
Elevated blood lead levels among adults.

In addition, the Fundamental OHSS program has collected data on two Iowa-specific indicators: commodity production centered agricultural injuries and work-related injuries from anhydrous ammonia exposure. These indicators are also calculated using existing data sources. Commodity-production centered agricultural injuries was chosen as an Iowa-specific indicator because Iowa is a farming state, and farming is its most hazardous occupation in Iowa, with a death rate nearly 10 times the average for all workers (*Healthy Iowans 2010*). Data needed to monitor agricultural trauma are available through the Trauma Registry and the Sentinel Project Researching Agricultural Injuries (SPRAINS) farm injury reporting system at IDPH.

Because farming is the most hazardous occupation in Iowa and a major economic force, it is critical to monitor agricultural conditions. IDPH also chose to monitor occupational injuries from anhydrous ammonia exposure. Anhydrous ammonia is a hazardous substance used both as a farm chemical and as an ingredient in the production of methamphetamine. Ammonia exposure was chosen based on the relatively substantial presence of both agriculture and methamphetamine production in Iowa and because it is the most commonly released hazardous substance in Iowa.

SPECIFIC AIM 4: Annually, publish surveillance results, interpretations, and conclusions.

- IDPH will publish the first report containing the surveillance results, interpretations, and conclusions by August 1, 2011.

SPECIFIC AIM 5: Conduct an annual evaluation of the accomplishments and impact of the surveillance program.

- IDPH is developing the methods to be used for this evaluation and will begin the first evaluation on May 1, 2011.

SPECIFIC AIM 6: Participate in all meetings of the Consortium of Occupational State-based Surveillance (COSS) and the Coordinating Committee (CC).

- IDPH staff attended the COSS meeting that were held in 2007 through 2010.

SPECIFIC AIM 7: Determine potential future indicators that will enhance knowledge of occupational illness and injury in Iowa.

- IDPH is working with the members of the scientific advisory committee through June 30, 2010, to determine if additional indicators should be added and whether data are available to calculate these indicators.

- Although not listed as a specific aim, an important activity during this project has to been to grow the capacity for occupational health and safety surveillance within the Iowa Department of Public Health and the state of Iowa. Progress in this area has included:

    1. Developed a resource library of OHS materials and shared information with other programs as appropriate.
    2. Increased capacity of local public health to address OHS needs identified through CHNA-HIP.
    3. Healthy Iowans 2010 by providing resources and consultation
    4. Consulted with Scott County Public Health for the development of a public health employee safety policy.

Pesticides Poisoning Surveillance Program

SPECIFIC AIM 1: Establish and maintain a scientific advisory committee that includes appropriate state partners, local public health agencies, and other stakeholders to identify relevant Iowa-specific issues and priorities for pesticide poisoning surveillance.

- The first meeting of the advisory committee was held on November 19, 2007, via the Iowa Communications Network (ICN). The meeting originated from IDPH, and 29 people participated from 5 remote ICN sites around Iowa. Follow-up on issues from this meeting continued throughout the project period.

SPECIFIC AIM 2: Collect and investigate reports of pesticide poisoning.

- Reports of pesticide poisoning are received weekly. These are received primarily through electronic extracts of the Toxicall program from the Iowa State Poison Center. IDPH receives the complete poison center case reports of pesticide poisoning, including all narrative notes. IDPH received 2,465 reports from January through October of 2008. IDPH has collaborated with the Iowa Department of Agriculture and Land Stewardship to investigate selected cases, beginning in June 2007. IDPH investigated five events of pyraclostrobin exposure in the summer of 2007 that sickened 33 persons, including 27 migrant workers who were exposed in a single incident during crop dusting. The report of this investigation was published in the January 4, 2008, *Morbidity and Mortality Weekly Report* as "Pesticide Poisoning Associated with Pyraclostrobin Fungicide — Iowa, 2007."
- IDPH entered all reports of occupational pesticide poisoning from 2006 through 2008 into the SPIDER program and exported this information to NIOSH.
- In addition to obtaining summary of medical information from hospital emergency room for all cases of Headline exposure in summer of 2007, former IDPH staff obtained medical records and interviewed people in the four cases from 2008 that have been classified as "definite" or "probable." Current IDPH staff is working on a plan to start this activity again.

SPECIFIC AIM 3: Analyze pesticide poisoning surveillance data.

SPECIFIC AIM 4: Publish pesticide poisoning surveillance results, interpretations, and conclusions.

IDPH has analyzed data and published yearly pesticide poisoning surveillance reports for 2005 through 2008. These are posted on the IDPH web site.

SPECIFIC AIM 5: Conduct an annual evaluation of the accomplishments and impact of the pesticide poisoning surveillance program.

- IDPH staff are working on an evaluation of the pesticide poisoning surveillance program.

Work-Related Fatal Injuries (FACE)

SPECIFIC AIM 1: To conduct timely and comprehensive surveillance to identify all traumatic occupational fatalities occurring within the State of Iowa. The Iowa FACE Program continues to maintain a comprehensive, multi-faceted surveillance system for identifying traumatic deaths in the workplace. IDPH staff participate in the monthly FACE Program meetings with the University of Iowa investigators to review cases. The Iowa FACE Program continues to use media reports, first responder reports, and other injury surveillance programs to identify traumatic workplace deaths. A newspaper clipping service of all Iowa newspapers is also used to identify traumatic occupational fatalities in Iowa.

- During calendar year 2008, 88 fatal incidents resulted in a total of 90 traumatic deaths to persons while at work (compared to 80 deaths in calendar year 2007). From January 1, 2009 through April 19, 2009, a total of 16 traumatic deaths have been identified. All but four of the occupational deaths in Iowa during 2008 were males. The victims tend to be older with 30.0% being 60+ years of age. Four of the victims were less than 21 years old (7, 19, 20, 20 yrs.).
- The Iowa FACE Program staff has cultivated mutually helpful relationships with the Iowa Workforce Development / IOSH staff and the Iowa CFOI (Census of Fatal Occupational Injuries) Coordinator. First-alert notifications are distributed internally, to these offices, and to NIOSH staff when a fatal workplace incident is identified. At least once per year the Iowa FACE and CFOI staffs compare their lists of fatal occupational traumatic incidents to identify any missed cases. After a preliminary review of calendar year 2008, the CFOI list did not contain five incidents that FACE had identified. This is down dramatically from 2007 when CFOI was missing 38 FACE incidents. The FACE list was missing one fatal incident on the CFOI list, which was the result of a work-related motor vehicle crash.

SPECIFIC AIM 2: To conduct on-site investigations of specific traumatic occupational fatalities using the NIOSH FACE investigative mode. During the calendar year 2008 and year-to-date 2009 through on-site investigations and collection of substantial information (photos, witness/co-worker statements, etc.) from law enforcement and first responder agencies, employer phone interviews, etc. of traumatic fatal injury incidents, the Iowa FACE Program has submitted eleven investigative new and re-drafted reports to NIOSH.

- Through close collaboration between the University of Iowa FACE staff and the State Medical Examiner's Office, ME-1 reports are now available in 84% of the FACE cases and autopsies in 71%. ME-1 and autopsies provided valuable medical-related information on the worker killed on the job by traumatic injuries.

SPECIFIC AIM 3: To develop and disseminate prevention strategies to reduce the risk of fatal occupational injuries. The Iowa FACE Program continues to emphasize the dissemination of its investigations and recommendations. The Program's dissemination efforts include a combination of oral presentations, written publications, and a completely redesigned Iowa FACE Program website that was rolled out in 2008. The Iowa FACE Program's useful website averages over 45,000 "hits" and more than 98,000 "page views" per month. Additional FACE-related presentations/publications have included:

- The Iowa FACE Program distributed several news releases during 2008. Titles of the releases were:
  - Farmers account for one-third of Iowa worker deaths in 2007.
  - Caution urged for farmers making repairs under equipment.
  - Attention needed to prevent Hispanic worker deaths.

- *Successful Farming* magazine, March 2008. Three articles mentioning the Iowa FACE Program (Circulation 442,000). An additional Iowa FACE – *Successful Farming* collaboration is underway on the topic of ATV injuries.
- Reports on farm and agricultural incidents from press clippings are regularly included in the Iowa Center for Agricultural and Safety *Alive & Well* Newsletter. An article on fatalities caused by cattle appeared in the March, 2009 issue.
- Lehtola MM, Rautiainen RH, Day LM, Schonstein E, Suutarinen J. Salminen S, Verbeek JH. Effectiveness of interventions in preventing injuries in agriculture – a systematic review and meta-analysis. Scand J Work Environ Health. 2008 Oct; 34(5):327-36.
- Kline A, Leedom-Larson K, Donham K, Schneiders S, Rautiainen R. Farmer Assessment of the Iowa Certified Safe Farm program. J Agromed 12(3):33-43, June 2008.
- Rautiainen RH, Lehtola MM, Day LM, Schonstein E, Suutarinen J, Salminen S, Verbeek J. Interventions for preventing injuries in the agricultural industry. *Cochrane Database of Systematic Reviews* 2008, Issue 1. Art. No.: CD006398. DOI:10.1002/14651858.CD006398.pub2.
- A MMWR written by IDPH staff on "Cattle-caused Deaths" has been submitted.
- Iowa FACE investigation was featured in the February, 2009 issue of the National Safety Council's **Safety and Health** magazine.
- Various class and departmental seminars.

Conclusions

Preliminary data analysis of the 2007 data indicates that many state-specific trends continue for Iowa including higher rates per 100,000 employed persons for the rate of work-related fatal injuries and higher prevalence and incidence rates among adults with elevated blood lead levels blood of 25 micrograms per deciliter (µg/dL) or higher compared to national data.
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In 2007, Iowa also had a non-fatal occupational injury and illness incidence rate, based on total recordable cases (TRC) of 5.5 per 100 full-time workers, while the USA rate was 4.2 and the average rate of 9 Midwest states.

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IDPH has publicized its findings and is targeting information to pesticide applicators, people who use disinfectants on the job, and people who work under circumstances that have resulted in work-related fatal injuries.

Publications.

PEER-REVIEWED JOURNAL ARTICLES

2006

Choi SW, Peek-Asa C, Sprince NL, Rautiainen RH, Flamme GA, Whitten PS, Zwerling C. Sleep quantity and quality as a predictor of injuries in a rural population. Am J. Emerg Med. 24(2):189-96, Mar 2006.

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Tiesman, HM, Peek-Asa C, Whitten P, Sprince NL, Stromquist AM, Zwerling C. Depressive symptoms as a risk factor for unintentional injury: A cohort study in a rural county. Inj Prev. 12(3):172-7, 2006.

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Kaustell KO, Mattila TEA, Rautiainen RH. Safety performance of animal confinement floors – slip, trip and fall injuries in Finland. J Agric Saf Health 13(4):395-406. November 2007.

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Tiesman H, Peek-Asa C, Zwerling C, Sprince N, Amoroso P. Occupational and non-occupational injuries in the United States Army. Am J Prev Med. 33(6):464-470. 2007.

Tiesman H, Zwerling C, Peek-Asa C, Sprince N, Cavanaugh JE. Non-fatal Injuries among urban and rural residents: The National Health Interview Survey, 1997-2001. Inj. Prev. 13:115-119, 2007.

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2008

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Gergely R, Hokel B, Calvert G, Luckhaupt. Acute Pesticide Poisoning Associated with Pyraclostrobin Fungicide --- Iowa, 2007. MMWR Weekly. January 4, 2008 / 56(51);1343-1345.

Kline A, Leedom-Larson K, Donham K, Schneiders S, Rautiainen R. Farmer assessment of the Iowa Certified Safe Farm Program. J Agromed 12(3):33-43, June 2008.

Lehtola MM, Rautiainen RH, Day LM, Schonstein E, Suutarinen J. Salminen S, Verbeek JH. Effectiveness of interventions in preventing injuries in agriculture – a systematic review and meta-analysis. Scand J Work Environ Health. 2008 Oct; 34(5):327-36.

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Sprince NL, Zwerling C, Whitten PS, Lynch CF, Burmeister LF, Gillette PP, Thu K, Alavanja MC. Farm activities associated with eye injuries in the Agricultural Health Study. J Agromedicine 13(1), 2008.

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OTHER PUBLICATIONS

Outreach Publications

A unique strength of the Iowa FACE Program is broad-based dissemination of information, including newsletters and an innovative focus on publishing investigations and prevention recommendations in trade-specific publications. Both the management and employees of specific trades frequently read these types of publications, and it is common to find these magazines in waiting areas and on employee break room tables. Reading about an on-the-job death of a peer makes a lasting impression on an employee.

During this project period, articles have been published in a variety of trade publications, including *Wallace's Farmer*, *American Towman*, *Arbor Age*, *Professional Safety*, and *Successful Farming*. In addition, Iowa FACE Program-related stories are a regular feature in *Farm Families Alive and Well***,** a quarterly newsletter produced jointly by the Great Plains Center for Agricultural Health and Iowa's Center for Agricultural Safety and Health. *Farm Families Alive and Well* is distributed electronically to 1117 email addresses and in hard copy to 621 postal addresses across the 9-state upper Midwest region, 30 U.S. states, Canada, and Australia. A companion "list serve" supports the sharing of published works on a monthly basis among 58 subscribers. The Iowa FACE Program has also been featured in the newsletter published by the State Medical Examiner's Office. An Iowa FACE investigation was featured in the February, 2009 issue of the National Safety Council's *Safety and Health* magazine.

Media Releases:

The Iowa Work-Related Fatal Injuries (FACE) Program is continually seeking opportunities to use the state and local media to draw attention to worker safety issues. For example, titles of recent media releases have included:

- Midwest leaders working to improve safety on rural roadways (03/11/2009)
- Farmers, motor vehicle operators top Iowa worker deaths (01/22/2009)
- Attention needed to prevent Hispanic worker deaths (12/09/2008)
- Caution urged for farmers making repairs under equipment (09/18/2008)
- Farmers account for one third of Iowa worker deaths in 2007 (01/16/2008)

Iowa FACE publications often generate media inquiries. For instance the July 31, 2009 MMWR article "Fatalities Caused by Cattle- Four States, 2003-2008" resulted in contacts from media across the country.

Iowa FACE Program Website:

The Iowa FACE Program maintains one of the most comprehensive, useful, and innovative FACE Program websites (www.public-health.uiowa.edu/FACE). Helpful and unique aspects of the website include:

- Listing by year from 1995 to the present of every traumatic injury occupational fatality identified by the Iowa FACE Program. Each of the 1,120 fatality listings contains the FACE ID#, date, industry codes, ECode, job title, and a brief description of the event.*
- All Iowa FACE Program full investigation reports with prevention recommendations completed since 1995. These reports are listed both chronologically and by "key pictures" similar to a keyword type listing.*
- An interactive Google map of all Iowa traumatic occupational deaths in 2006 (79 fatalities) and 2007 (89 fatalities). This useful feature allows site visitors to scan down a list of brief incident descriptions, click on the case of interest, and identifies the incident's approximate location. Alternatively, the user can click on any of the "thumbtacks" on the map to see additional information. This information is useful to see the geographic dispersion/clustering of fatal incidents and is particularly useful for regional agencies to see incidents that occurred in their jurisdiction.*
- General information on topics such as the aims of the FACE Program, definition of what is an occupational fatality, Program FAQs, information on how FACE differs from OSHA, and issues of confidentiality.
- Biographies including photos of all Iowa FACE Program staff.
- A listing of links to NIOSH and the other FACE state websites.

* The Iowa FACE Program delays displaying the fatality listings, investigative reports, and Google maps on our website for one year in order to help ensure the confidentiality of the victims.

A listing by title of investigations submitted to NIOSH from 2006 through 2010 is as follows:

1. Farmer Crushed Under Falling Dump Trailer Box while Repairing Lift Cylinder
2. Farmer Pitched from Cart that Tipped while Being Unloaded by Grain Vacuum
3. Part-time Metal Salvager Died when Crushed in Tractor Overturn with Loader
4. Man, 29, Died when Tractor with Front-end Loader Full of Rocks Overturned
5. Farmer Killed When Raised Front-end Loader Bucket Attachment Falls
6. Farmer Crushed Against Tractor Tire by Gravity Flow Wagon Box while Unhitching
7. Two Sewer Pipe Relining Workers Killed by Toxic Sewer Gas
8. Farmer Pitched from Operator Position Run Over by Tractor and Rotary Cutter
9. Tractor Moving Large Round Bale on Loader Forks Overturned onto Farmer
10. Handyman Plumber Asphyxiated in Entry into Water Service Manhole Vault
11. Farmer Fatally Injured in Tractor Posthole Auger Entanglement

12. Farmer Attacked and Killed by Dairy Bull
13. Hispanic Laborer Entangled in Auger at Pork Processing Plant
14. Driver Pinned Under Haul Truck that Went Off Quarry Road and Tipped Over
15. Farmer Asphyxiated Entangled in Drives of Box-type Manure Spreader
16. Exit Pit Worker Entangled in Horizontal Directional Drill Back Reamer
17. Farmer Engulfed and Suffocated in Soybeans during Unloading of Steel Grain Bin
18. Farmer Killed when Large Round Bale Tumbled from Forks in Loader Bucket
19. Tractor with Cable Hitched High to Tow Brush Overturned Rearward on Farmer