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## FUNDAMENTAL (CORE) SURVEILLANCE AND PROGRAMMING

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The mission of the Iowa OHSSP is to promote and protect the health and safety of Iowans in the workplace. The fundamental or core program provides administrative coordination and continuity across all IDPH OHSSP projects, explores options to improve the surveillance and data translation capacity of the entire program, and provides outreach, dissemination, and evaluation functions to support each project. The core program is also responsible for the Occupational Health Indicators project and Adult Blood Lead Epidemiology and Surveillance (ABLES), as well as working with external partner projects and reports.

### Iowa ABLES

Blood lead levels (BLLs) previously considered harmless are now understood to have harmful effects in adults, such as decreased renal function and increased risk for hypertension and essential tremor at BLLs <10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ). The CDC has designated 10  $\mu\text{g}/\text{dL}$  as the reference BLL for adults with levels  $\geq 10 \mu\text{g}/\text{dL}$  considered elevated.

**Outputs:** Iowa has consistently been one of the top 7 states by prevalence rates, with rates about double the US rate for BLLs of 10 or greater (US 2010 rate 24.8\*) as calculated for the Occupational Health Indicators.

IDPH OHSSP Surveillance Data	# Iowa Adults with BLLs 10 $\mu\text{g}/\text{dL}$ or higher	Prevalence rate* of adults with blood lead levels of 10 $\mu\text{g}/\text{dL}$ or higher	Prevalence rate* of adults with blood lead levels of 25 $\mu\text{g}/\text{dL}$ or higher	Prevalence rate* of adults with blood lead levels of 40 $\mu\text{g}/\text{dL}$ or higher
2010	731	46.5	10.9	0.9
2011	832	53.0	15.3	2.4
2012	818	52.4	12.5	1.4
2013	856	53.5	12.6	1.2

\*rate per 100,000 employed adults 16 years of age or old

IDPH OHSSP surveillance also documented an increase in the number of women of childbearing age (16-44 years of age) with elevated BLLs, rising from 28 women in 2012 to 43 women in 2013. For women 35 years of age or younger, the numbers also doubled from 11 in 2012 to 24 in 2013. A total of 111 women with elevated BLLs were reported in 2013 and 96% worked in battery manufacturing. This information was disseminated through the OHSSP mail list and

other communication networks, including correspondence with workers, medical providers, and employers.

**Outcomes:** ABLES data is being used by the State's childhood lead poisoning program to target areas of highest risk in the state and by the Maternal Child Health programming in their Title V funding application.

### **Battery Plant Project - Data Analysis and Outreach to Employers**

Iowa worked with Missouri, Ohio, and NIOSH on a project to reach out to lead-acid battery manufacturing plants in our states. The goal was to secure an agreement allowing NIOSH to conduct a Health Hazard Evaluation at a plant in each state to help identify ways workers and employers could decrease lead exposure for the workers and take-home exposure to their families. While none of the states were able to obtain permission for a HHE prior to October, 2013, this project led to a more in-depth analysis of Iowa ABLES data, increased dialogue with the Iowa battery manufacturing employers, and laid the foundation for additional dissemination and outreach to the Iowa battery plant workers and area medical providers in 2014-2015.

**Outputs:** Key findings shared with the battery plants in 2013:

- Over 1,000 Iowa battery plant workers were tested 2008-2012, with 37% having at least one blood lead level of 25  $\mu\text{g}/\text{dL}$  or higher during that time, and 80% having at least one blood lead level of 10  $\mu\text{g}/\text{dL}$  or higher.
- From 1998 through 2012, 1,269 Iowa battery manufacturing workers had blood lead levels of 20  $\mu\text{g}/\text{dL}$  or greater, many for multiple years.
- In 2012, 196 battery manufacturing workers had elevated BLLs of 25  $\mu\text{g}/\text{dL}$  or greater.
- County-level testing data for 2012 of counties where battery plant workers live:
  - County Group 1: Of adults tested with county residence, non-battery plant workers had 4% elevated blood lead levels compared to 77% of battery plant workers.
  - County Group 2: Of adults tested with county residence, non-battery plant workers had 18% elevated blood lead levels compared to 83% of battery plant workers. The counties in this group also have other manufacturing businesses where workers are known to have an increased risk of lead exposure.

**Outcome:** Data from the project was used in discussions between NIOSH and an international trade association representing lead-acid battery manufacturing plants across the U.S. regarding the development of voluntary intervention options to reduce the lead exposure of workers and the risk of take-home lead exposure.

### **Grain Related Fatalities in Iowa – Data Analysis and Translation**

**Outputs:** The OHSSP core program reviewed 17 years of Iowa Fatality Assessment and Control Evaluation data (FACE, 1998-2012) in response to a request for state data regarding grain-related fatalities in Iowa. The initial analysis was presented at a regional conference late in 2012, followed by written articles disseminated through partnering program newsletters throughout 2013, with updates displayed at the Midwest Regional Agricultural Safety and Health conference, November 2013.

**Outcomes:** Data was referenced in multiple radio and print media reports in 2013 and Iowa FACE data was included in the 2013 annual report from Purdue's Agricultural Confined Space Incident Database (Purdue University).

### **Program Capacity Expansion for Dissemination**

The OHSSP dissemination plan included major components that were activated during the 2013-2014 fiscal year and continue to be updated with new reports and materials.

**Outputs:** The OHSSP launched a website ([www.idph.state.ia.us/LPP/OHSSP.aspx](http://www.idph.state.ia.us/LPP/OHSSP.aspx)) dedicated to the core program with links to expanded program discrete pages (ABLES, Pesticides, FACE). An outgoing mail list was also established to aid in disseminating program surveillance findings and news or resources from NIOSH and other partners. A program email account was established for use on print materials and social marketing.

**Outcome:** Public and external partner usage continues to increase, with surveillance materials and data being utilized across a variety of programs and topics. Website analytics are newly available and will be utilized for evaluation in the coming year.

### **Miscellaneous Output Highlights**

- OHSSP arranged for industry and occupation questions to be included in the 2014 Iowa Behavioral Risk Factor Surveillance System (BRFSS) survey.
- OHSSP took an active role in the development of the CSTE Adult Blood Lead Guidelines, and the 2014 update to the Occupational Health Indicator (OHI) guidance manual, and a flier for state promotion of the NIOSH State-based Occupational Health Clearinghouse.
- OHSSP hosted in-state training on the NIOSH Industry & Occupation Computerized Coding System (NIOCCS) in May 2014.
- OHSSP helped author the MMWR article *Very High Blood Lead Levels Among Adults – US 2002-2011*, MMWR Vol. 62/No. 47, as well as two other journal articles that are still unpublished.
- OHSSP is working with state partners on the Zero Fatalities project (roadway deaths), the national Stop Construction Falls Campaign (construction fall fatalities), and the Healthy Iowans plan, mainly by providing Iowa data, pursuing collaborative projects for intervention, and the dissemination of materials. Iowa OHI and FACE data are utilized.
- OHSSP presented at the May 2014 Region 7 (IA, KS, MO, NE) Voluntary Protection Program Participants' Association (VPPPA) conference in La Vista Nebraska. Occupational Health Indicator data regarding state and regional indicators of interest was presented ([www.idph.state.ia.us/LPP/OHSSP.aspx](http://www.idph.state.ia.us/LPP/OHSSP.aspx))

## PESTICIDE POISONING SURVEILLANCE PROJECT (PPSP)

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The Iowa PPSP is an expanded program component of the Occupational Health and Safety Surveillance Program, and operates as part of the NIOSH Pesticide Illness and Injury Sentinel Event Notification System for Occupational Risk (SENSOR) surveillance program. The goal of the Iowa PPSP is to prevent pesticide illness and injury in Iowa through exposure surveillance, case investigation, and public health actions.

### SURVEILLANCE

Iowa receives a weekly TOXICALL<sup>®</sup> file from the Iowa Statewide Poison Control Center (ISPPC). This file includes the ISPPC contact report sheets for various types of calls, including chemical and pesticide exposure reports. The contact reports also include call notes and follow-up reports. Over 1800 contact reports have been reported to IDPH since July 1, 2013. Each contact report is reviewed manually to pull out possible cases related to occupational pesticide exposures. Additional follow up is needed for some reports to determine case details. PPSP collaborates with the Iowa Department of Agriculture and Land Stewardship (IDALS) to consult or share investigative findings for a limited number of cases of public health importance.

Case details are entered into the Iowa PPSP database utilized by the Pesticide SENSOR programs. 2013 confirmed case data entry is progressing, with plans to report de-identified data to NIOSH when complete.

While the majority of pesticide exposure cases are currently identified from ISPPC reports, the Iowa PPSP also utilizes media reports, reports from the public, mandatory reporting by medical providers and laboratories, and notifications from partnering agencies to supplement case identification of pesticide exposures. PPSP evaluated the completeness of the Iowa Statewide Poison Control Center's data and the reporting frequency of providers through a process called capture-recapture sampling. De-identified Iowa inpatient hospitalization data, outpatient (Emergency Department) discharge data, and mortality data is utilized for this ongoing quality control process.

### DATA ANALYSIS

Iowa PPSP developed a standard report for yearly data on a multiple year format. This will facilitate comparative data reporting over time to demonstrate trends. A five year report of Iowa PPSP data was completed and released in November 2013. Prior to its release, members of the OHSSP stakeholders group (advisory committee) were surveyed regarding what data would be most useful for them in the report. *Work-Related Exposures to Pesticide in Iowa 2008-2012* is available online at [www.idph.state.ia.us/LPP/Pesticide.aspx](http://www.idph.state.ia.us/LPP/Pesticide.aspx).

### **PROJECT CAPACITY DEVELOPMENT**

The Iowa PPSP developed an updated Standard Operating Procedure Manual utilizing SENSOR guidelines and IDPH Environmental Health Services Bureau protocols for case ascertainment and follow-up of required environmental reportable conditions in the State of Iowa. The PPSP SOP update was completed in response to ongoing PPSP process evaluation and reorganization within the bureau, division, and department.

### **TECHNICAL CAPACITY DEVELOPMENT**

The Iowa PPSP assisted the TOXICALL® developer in beta testing a new data query tool that will allow advanced evaluation and analyzing of data.

In addition to quality control and evaluation measures already mentioned, the Iowa PPSP personnel participated in coding exercises, teleconferences, webinars, and training events coordinated by NIOSH pesticide surveillance program. The Iowa OHSSP hosted in-state training on the NIOSH Industry & Occupation Computerized Coding System (NIOCCS) in May 2014. PPSP personnel participated in the training.

Iowa OHSSP/PPSP personnel participated in the development of a department-wide integrated data elements list for use in traumatic injury surveillance in the department. The goal of the project was to promote standardized key data element inclusion in all data sets and databases utilized by the Health Department to meet the needs of multiple areas of surveillance, including occupational injury and illness, traumatic injury tracking (Trauma Registry), emergency response tracking (EMS responders), agricultural injury tracking, pesticide surveillance, traumatic brain and spinal cord injury tracking, and ATV injury tracking. It is anticipated that this will increase the ability of various projects to utilize common datasets for specific surveillance needs and improve the quality of the data. The workgroup included members of the Iowa Injury Prevention and Research Center. The project was completed in February 2014.

### **COLLABORATION WITH STATE REGULATORY PARTNERS AND TRAINING PARTNERS**

The Iowa PPSP collaborates with the Iowa Department of Agriculture and Land Stewardship (IDALS) on any cases of label violations, over-spraying, or other cases of public health concern.

The PPSP communicates regularly with the Iowa State Extension Service about new or innovative pesticide safety information that can be utilized in their pesticide applicator training. Pesticide information is also disseminated to additional stakeholders, including the AgriSafe Network and the National Educational Center for Agricultural Safety, which provide worker training across the U.S.

### **COLLABORATION AND DISSEMINATION**

It is a priority of the Iowa PPSP to collaborate with NIOSH and the other state-based pesticide surveillance organizations, and to represent not only the concerns of Iowa workers, but the needs of other states with numerous owner/operator or family agricultural operations and businesses. Iowa contributed to numerous requests for data assistance. We participate on

various national workgroups and assist the NIOSH pesticide program whenever requested. Personnel of the Iowa OHSSP/PPSP are members of the Agriculture Health Study (AHS) Iowa advisory group which meets periodically.

A new discrete pesticide surveillance website ([www.idph.state.ia.us/LPP/Pesticide.aspx](http://www.idph.state.ia.us/LPP/Pesticide.aspx)) was developed and launched late in 2013, as well as an OHSSP outgoing mail list and program email (January 2014) for use with print and posted materials. Local and national pesticide information and findings are routinely shared with key stakeholders across the state, including the Iowa Environmental Health Association, the Iowa Rural Health Association, Iowa's Center for Agricultural Safety and Health, the Great Plains Center for Agricultural Health, and various other organizations. Pesticide articles of interest were also submitted to the IDPH EpiUpdate – a weekly email newsletter targeted to medical and public health providers with a current subscription of over 1,300.

#### **PUBLISHED ARTICLES AND REPORTS:**

- American Journal of Industrial Medicine 57:15–30 (2014): *Characteristics and Magnitude of Acute Pesticide-Related Illnesses and Injuries Associated With Pyrethrin and Pyrethroid Exposures—11 States, 2000–2008*. Naomi L. Hudson, Dr.P.H., MPH Edward J. Kasner, MPH John Beckman, BS, Louise Mehler, PhD, MD Abby Schwartz, MPH Sheila Higgins, RN, MPH, Joanne Bonnar-Prado, MPH Michelle Lackovic, MPH Prakash Mulay, MPH, Yvette Mitchell, MS Leo Larios, BA, Rob Walker, MS, Justin Waltz, MPH, Stephanie Moraga-McHaley, MS, Rachel Roisman, MD, MPH, and Geoffrey M. Calvert, MD, MPH
- November 2013. *Work-Related Exposures to Pesticide in Iowa 2008-2012 Report*. Rob Walker. Available online at [www.idph.state.ia.us/LPP/Pesticide.aspx](http://www.idph.state.ia.us/LPP/Pesticide.aspx).

#### **PRESENTATIONS/EXHIBITS**

- 7/25/13: John Deere Manufacturing Plant Employee Health Fair Exhibit, display materials for IDPH PPSP
- 9/1/13: Exhibit with brief oral presentation at Pests, IPM, and Local Policies for Public Health Workshop, including display materials for IDPH PPSP
- 9/18/13: PowerPoint and text developed by request for use with departmental training regarding inter-program partnerships. The narrated slideshow documented the success of the OHSSP coordination of the 2012 Farm Progress Show Health & Safety Tent, including PPSP messaging.
- 11/7-8/13 - Exhibit at Iowa Governor's Safety Conference, including display materials for IDPH PPSP
- 11/19-20/13 - Exhibit at Midwest Regional Agricultural Safety & Health Conference, including display materials for IDPH PPSP

## IOWA FATALITY ASSESSMENT & CONTROL EVALUATION (FACE) PROGRAM

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The aims of the Iowa FACE Program are to:

- 1) conduct surveillance to identify all traumatic occupational fatalities
- 2) conduct investigations of occupational fatalities to determine root cause and contributing factors of fatal injuries
- 3) disseminate recommendations for prevention to employers, workers, and safety and health professionals
- 4) involve occupational safety and health graduate students in Iowa FACE Program investigation and dissemination activities

### MAJOR OUTPUTS

#### Surveillance

- Surveillance activities identified 81 cases (preliminary information) occurring during FY 2014 using data obtained through media sources, state and county medical examiners, a press clip service, Iowa State Patrol crash reports, and the Iowa Division of Labor Services (IOSHA).
- FY 2014 cases included 78 males and 3 females, aged 16 to 81. Industries with highest numbers of fatalities were agriculture (26), construction (20), and transportation (8); this ranking is consistent with prior years. The most common event/exposures were transportation incidents (27), contact with objects and equipment (24), and falls (21).

#### Completed In-depth Investigation Case Reports

FACE investigations targeted young workers, agricultural workers, and a foreign-born Hispanic worker:

**2013 IA 026: *Farmer was struck by a round hay bale that fell backward from a raised front end loader*** was completed with assistance from a local county Sheriff's Department and the victim's family. Iowa State University Agricultural and Biosystems Engineering faculty collaborated on its review.

**2011 IA 039: *A 17-year-old (minor) farm worker was caught between the raised bucket of a wheel loader and the door header of a cattle shed*** was completed with assistance from the Iowa Division of Labor Services (IOSHA).

**2008 IA 074: *Farm worker electrocuted while pressure-washing interior of swine barn***, a case involving a foreign-born Hispanic worker, was completed with assistance from the Iowa Department of Public Safety/Division of Criminal Investigation and IOSHA.

**2005 IA 024 & 025: *Farmer and his employee died after collapse and attempted rescue in manure storage pit*** was completed with assistance of the victim's family and the local Sheriff's Department, and in collaboration with the National Education Center for Agricultural Safety (NECAS). Information and recommendations from this report will be used in NECAS teaching and demonstration projects for manure pit entry and rescue procedures provided to livestock producers and first responders.

## Dissemination

- Iowa FACE contributed to The Iowa Center for Public Affairs Journalism series of articles entitled [Matter of Seconds: Injury and Death on America's Farms](#); the series was published online at [IowaWatch.org](#) and the [Midwest Center for Investigative Reporting](#).
- FACE personnel participated in dissemination activities via conferences, professional meetings, and graduate and undergraduate classroom presentations as guest lecturers. Professional groups, including those interacting with FACE surveillance and investigation activities, requested FACE presentations at their continuing education seminars and professional conferences. Other conference audiences included employers, workers, health and safety professionals, and students.
- FACE personnel delivered lectures in UI OEH graduate level course *Rural Health & Agricultural Medicine*, which incorporates FACE surveillance data and completed case investigations to illustrate hazard recognition and injury prevention.
- Please refer to Table 1 for a listing of presentations provided by Iowa FACE personnel.

## Graduate student activities

- NIOSH and state FACE cases were regularly reviewed throughout the OEH *Occupational Safety* course providing training in investigation techniques and injury prevention. Students conducted mock investigations based on actual injury scenarios documented in FACE surveillance cases and used cases and recommendations to communicate risk of injury to local businesses in their class projects.

## MAJOR OUTCOMES

### Publications

- Iowa FACE case investigation reports and hazard alerts were featured in National Safety Council's [Safety+Health](#) magazine FACEValue series:
  - [Truck driver entangled in drive train of semi-truck tractor](#) (February 2014)
  - [Driver dies after being pinned under truck](#) (December 2013)
- A new [eXtension publication](#) (September 2013) describing the FACE Program highlighted Iowa's hazard alert [Prevent Fatalities from Grain Entrapments](#).
- Iowa FACE Injury prevention messages were incorporated into the Great Plains Center for Agricultural Health (GPCAH, a NIOSH-funded Ag Center) "[Resources for Farmers and Agricultural Workers](#)" safety topics on [tractor overturns](#) and [grain engulfment](#).
- The Iowa Center for Public Affairs Journalism [Matter of Seconds: Injury and Death on America's Farms](#) series of in-depth articles on farm safety and farm fatalities was republished in **The Des Moines Register**, **The Gazette** (Cedar Rapids), **The Telegraph Herald** (Dubuque), **The Courier** (Waterloo-Cedar Falls), [InvestigateMidwest.org](#), [AltoonaHerald.com](#), **Morning Ag Clips**, **Iowa Falls Times-Citizen**, **Tipton Conservative**, **Corridor Business Journal**, **The N'west Iowa Review** and **Iowa Farmer Today**. Iowa Face surveillance data and fatality cases were cited in the articles [Matter of Seconds: Tougher Farm Safety Regulation Hard To Come By In Iowa](#) and [Database: Iowa Farm Fatalities](#) of this series.
- A case-series study of toxicology testing on Iowa FACE cases occurring 2005-2009 indicated that one in five workers killed while working tested positive for alcohol or other drugs. Ramirez, et al. [Toxicology Testing in Fatally Injured Workers: A Review of Five Years of Iowa FACE Cases](#). *Int. J Environ Res Public Health*. Nov 2013; 10(11):6154-6168.

## Training

- UI Department of Emergency Medicine and the Rural Health and Safety Clinic of Greater Johnson County initiated a GPCAH-funded pilot program: [Piloting an Occupational ATV/UTV Safety Workshop for Iowa Farmers](#) to develop and evaluate training on safe use of all-terrain-vehicles (ATVs) and utility task vehicles (UTVs). Materials for this program utilize data from Iowa FACE cases occurring 1996-2012. Results will be used for future dissemination of training to reduce ATV-related deaths and injuries.
- Prevention recommendations from Iowa FACE data and investigations were incorporated into new curriculum for graduate, professional, and community college courses.
  - UI OEH professional education course [Occupational and Environmental Health for Rural Health Professionals – The Core Course](#) and OEH graduate course *Rural Health and Agricultural Medicine*.
  - Kirkwood Community College farm management course *Agricultural Procedures and Safety*.

## Research to Practice

- UI OEH graduate students in *Occupational Safety* used report **2011 IA 035: [Convenience store cook died from smoke inhalation](#)** as a case study model to develop emergency escape plans for a university college. The students also individually developed emergency action plans for 12 local businesses as part of a course project focused on implementing recommendations from this FACE investigation.
- Google Analytics recorded that the Iowa FACE website was visited 1,822 times by 1,452 unique visitors, generating 3,787 total page views in FY 2014. (Statistics exclude visits by UI network users.)

**Table 1. Presentations at conferences, seminars, and workshops**

### Oral presentations

- Lessons Learned in the FACE Program. 42<sup>nd</sup> Annual Iowa Governor’s Safety & Health Conference. November 7, 2013. Cedar Rapids, IA.
- The Iowa FACE Program. 2013 Iowa Association of County Medical Examiners Fall Meeting and Education Expo. November 15, 2013. West Des Moines, IA.
- Agricultural Fatality Case Studies: An Update from Iowa FACE. 2013 Midwest Rural Agricultural Safety & Health (MRASH) Conference. November 20, 2013. Ames, IA.
- Occupational Deaths Due to ATV and UTV Use in Iowa. 2013 MRASH Conference. November 20, 2013. Ames, IA.
- An Overview of the Iowa FACE Program. 2013 Iowa State Sheriffs’ and Deputies’ Association Winter School. December 9, 2013. Des Moines, IA.
- Public Health in Rural and Ag Health and Safety, in *Rural Health and Agricultural Medicine*. UI OEH. February 3, 2014. Iowa City, IA.
- Transportation Hazards in Agriculture; Agricultural Fatality Case Studies; ATV Safety for Workers and Families in Agriculture, all in *Rural Health and Agricultural Medicine*. UI OEH. February 10, 2014. Iowa City, IA.
- Principals of Safety and Injury Prevention in Agriculture, in *Agricultural Procedures and Safety*. Kirkwood Community College. February 20, 2014. Cedar Rapids, IA.
- Trauma, Injury Cases, Machinery, and Falls, in *Agricultural Procedures and Safety*. Kirkwood Community College. March 4, 2014. Cedar Rapids, IA.
- Occupational Safety and Health in Agriculture; Transportation Hazards in Agriculture, in *Occupational and Environmental Health for Rural Health Professionals – The Core Course*. UI OEH. June 9-13, 2014. Iowa City, IA.

### Posters and workshops

- Distracted Driving. John Deere Employee Health Fair. July 25, 2013. Ankeny, IA
- Occupational Deaths Due to ATV and UTV Use in Iowa. ACEP Research Forum. October 15, 2013. Seattle, WA.