

California's Workers' Compensation Surveillance

Rebecca Jackson

California Department of Public Health

Council of State and Territorial Epidemiologists Annual Conference

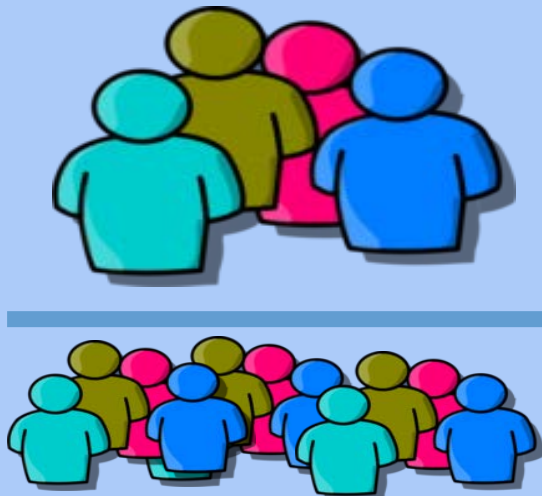
June 5, 2017

Aims

- Collaborate
- Calculate industry-specific injury rates
- Describe the utility and limitations of data
- Publicly available dataset

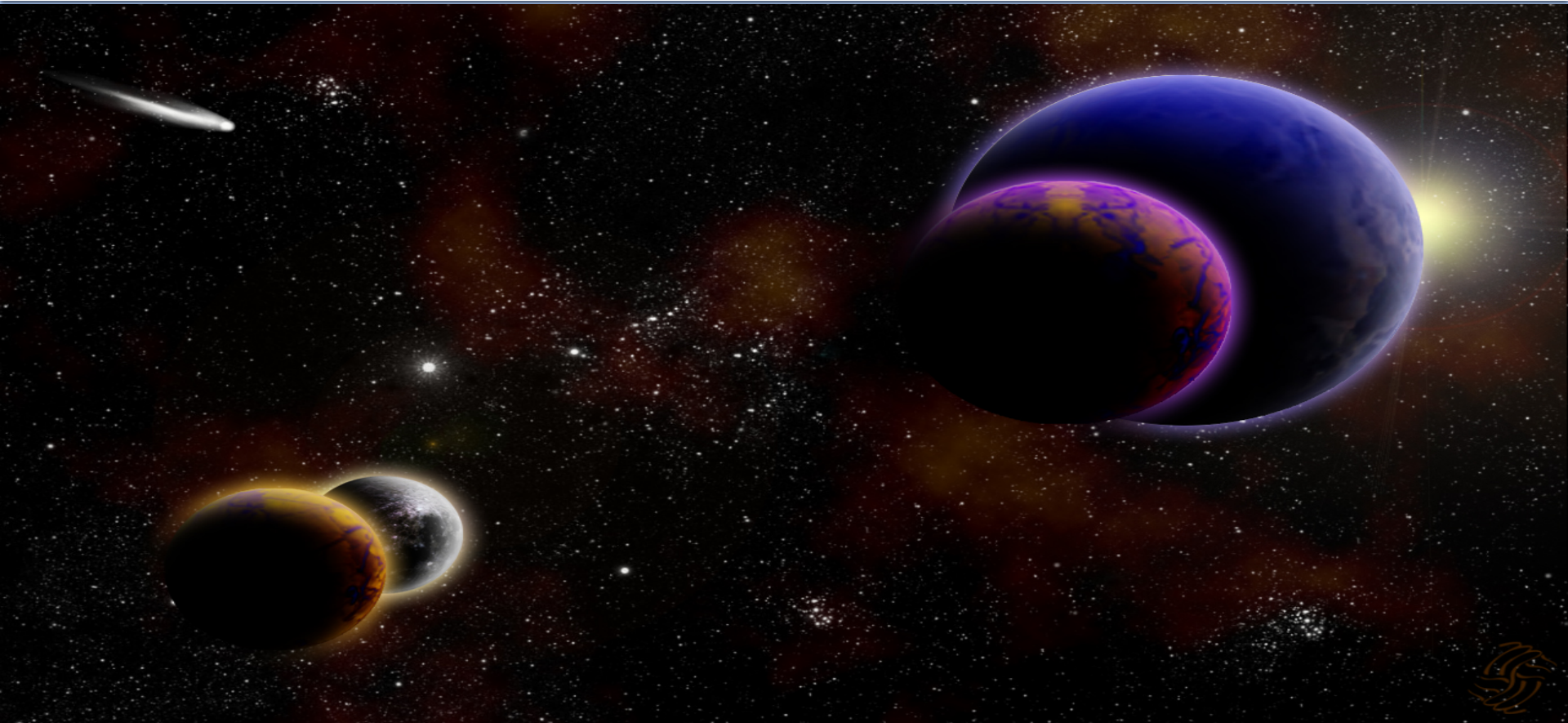
How do we calculate rates in occupational health?

$$Rate_{industry} = \frac{Claims_{industry}}{Full - time\ equivalent_{industry}}$$



Calculating injury rates with four data sources

This might seem like outer space but it isn't rocket science



1. Workers' Compensation Information System (WCIS)

NEW CASES

First Report of Injury (FROI)

F

ICD-Codes

ICD-Codes

Facility codes

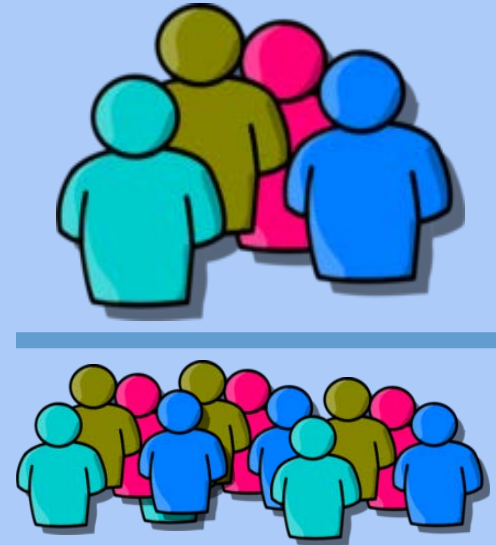
Revenue codes

Subsequent Report of Injury (SROI)



2. Base Wage File (BWF)

- Quarterly employer reporting
- Employee name, SSN, wages
- Employer key



LINK

3. Quarterly Census of Employment and Wages (QCEW)

- Numbers of workers by employer
- Industry code
- Ownership code
- Multi-establishment identifier (MEEI)

POPULATION EXPOSED

Multi Establishment Car Manufacturing



Rules for Multi-establishment Firms

Temp Firms

- 150 employment agencies (NAICS 5613)
- 280K employees

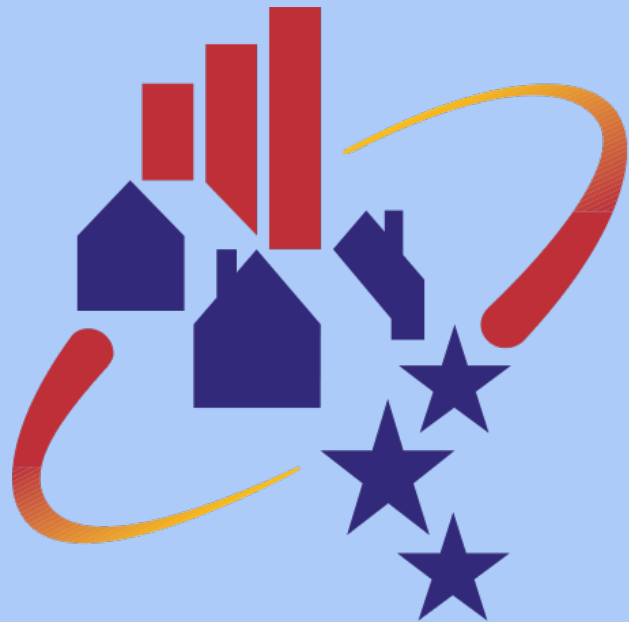
90% Rule

- 90% workers in one industry
- 80% without corporate offices (NAICS 5511)

Remainder

- Assign unique code to both employers and workers for rate calculation

4. American Community Survey (ACS)



AMERICAN
COMMUNITY
SURVEY

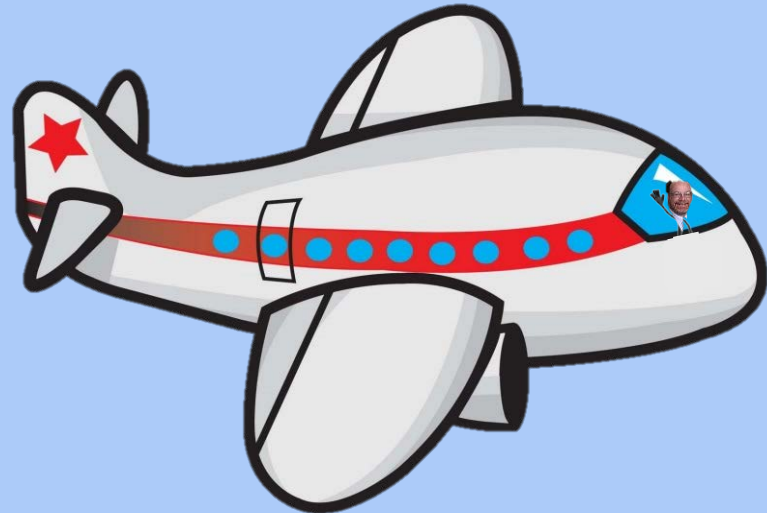
U.S. CENSUS BUREAU

Counts in QCEW multiplied by FTE to EE ratio

TIME ADJUSTMENT

Pilot Project

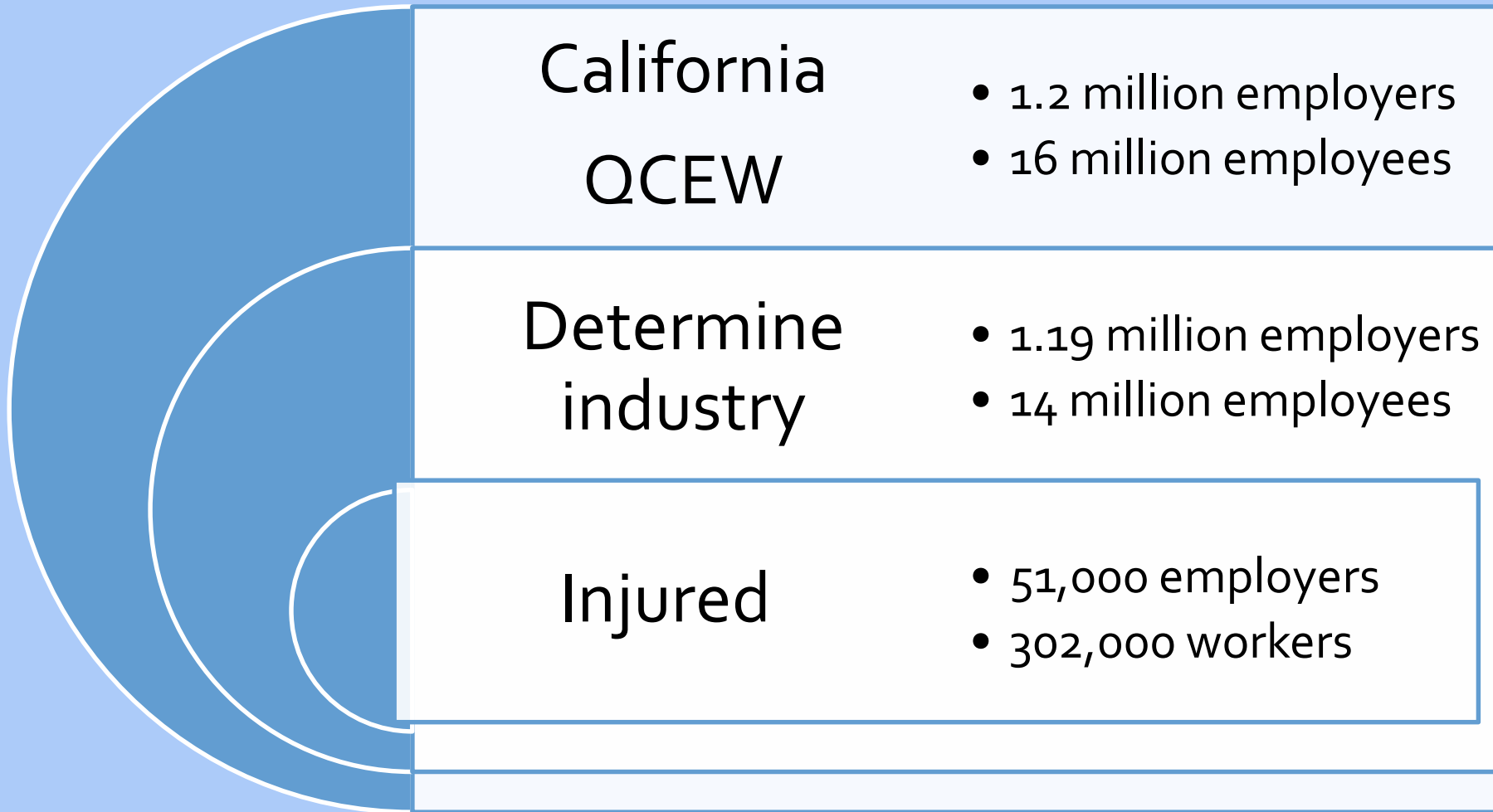
- Six months of 2015 data
 - Develop methods for matching
 - Evaluate match
 - Compare rates
 - Prepare and plan



And now what you've been waiting for...

Rate Results

Employers



Match Results



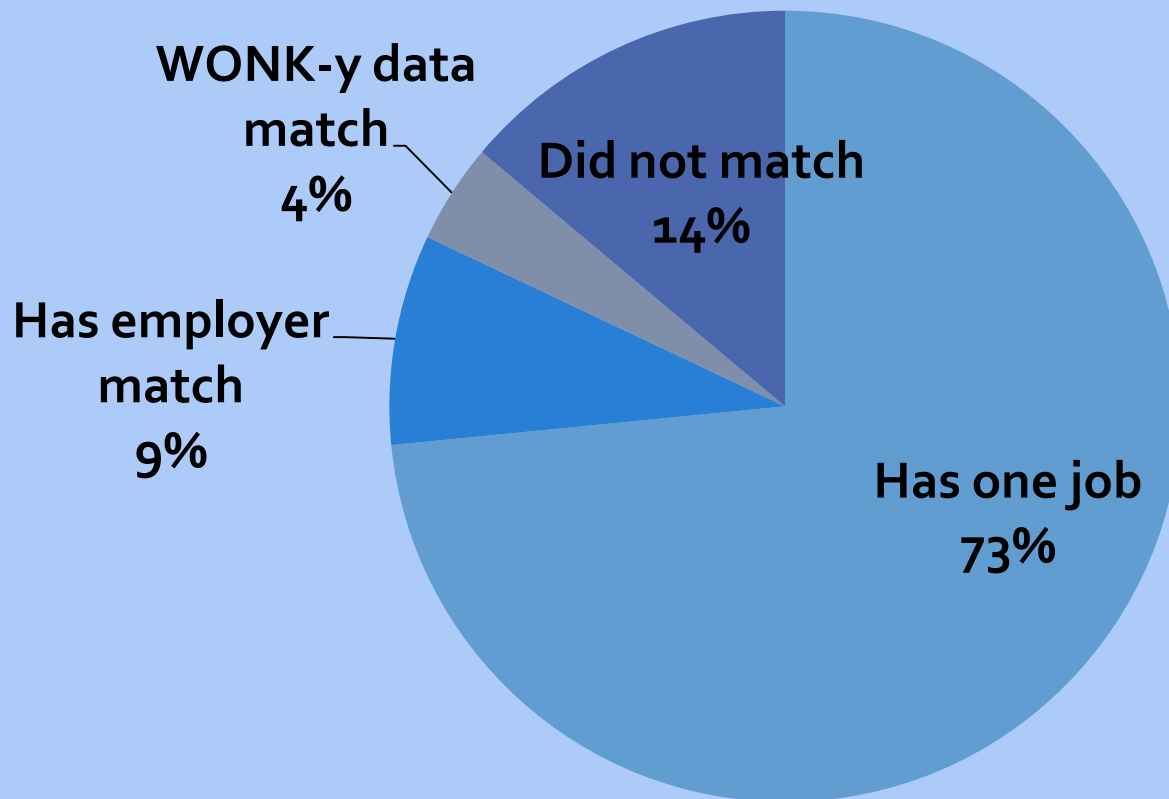
302,000 claims

260,000 employer
match

212,000
private sector


184,000
industry

Match Results



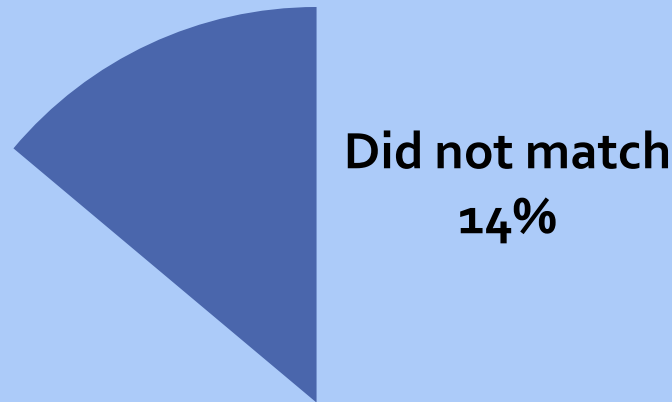
Match Results

WONK-y data
match
4%



- Worker matches multiple employers
 - All employers have the same industry code
 - One employer has the same industry code in WCIS
 - Only one employer is in QCEW

Match Results



- Bad SSN or does not match on SSN
- Matched multiple employers
 - >5 employer
 - No WONK-y data match

Private Sector Rate of Injury January-June 2016



3.1 workers per 100 FTE

Rates of Injury by Industry, Private sector January-June 2016

Number of
Claims

Rate per 100
FTE

Interurban and Rural Bus Transportation	54	15.0
Couriers and Express Delivery Services	3084	10.7
Building Material and Supplies Dealers	4971	10.6
Animal Slaughtering and Processing	555	9.0
Waste Treatment and Disposal	484	9.0
Poultry and Egg Production	99	8.9
Scheduled Air Transportation	1781	8.8
Motor Vehicle Body and Trailer Manufacturing	243	8.5
Cattle Ranching and Farming	989	8.1
Other General Merchandise Stores	2280	8.0
Other Ambulatory Health Care Services	850	8.0
Foundries	250	7.9
Sheep and Goat Farming	19	7.7
Warehousing and Storage	1349	7.7
Waste Collection	706	7.6
Traveler Accommodation	6780	7.6
Other Furniture Related Product Manufacturing	118	7.1
Forging and Stamping	297	7.0
Logging	58	6.9
Sawmills and Wood Preservation	52	6.8

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Rates of Injury by Industry, Private sector

Industry	CA Rate per 100 FTE	National Overall SOII Rate per 100 FTE
Couriers and Express Delivery Services	10.7	7.4
Animal Slaughtering and Processing	9.0	5.4
Poultry and Egg Production	8.9	6.9
Scheduled Air Transportation	8.8	6.6
Cattle Ranching and Farming	8.1	6.4
Foundries	7.9	6.7
Sheep and Goat Farming	7.7	--
Warehousing and Storage	7.7	5.0
Traveler Accommodation	7.6	5.0
Forging and Stamping	7.0	5.3
Sawmills and Wood Preservation	6.8	6.9

Rates of Injury by Industry, Private sector

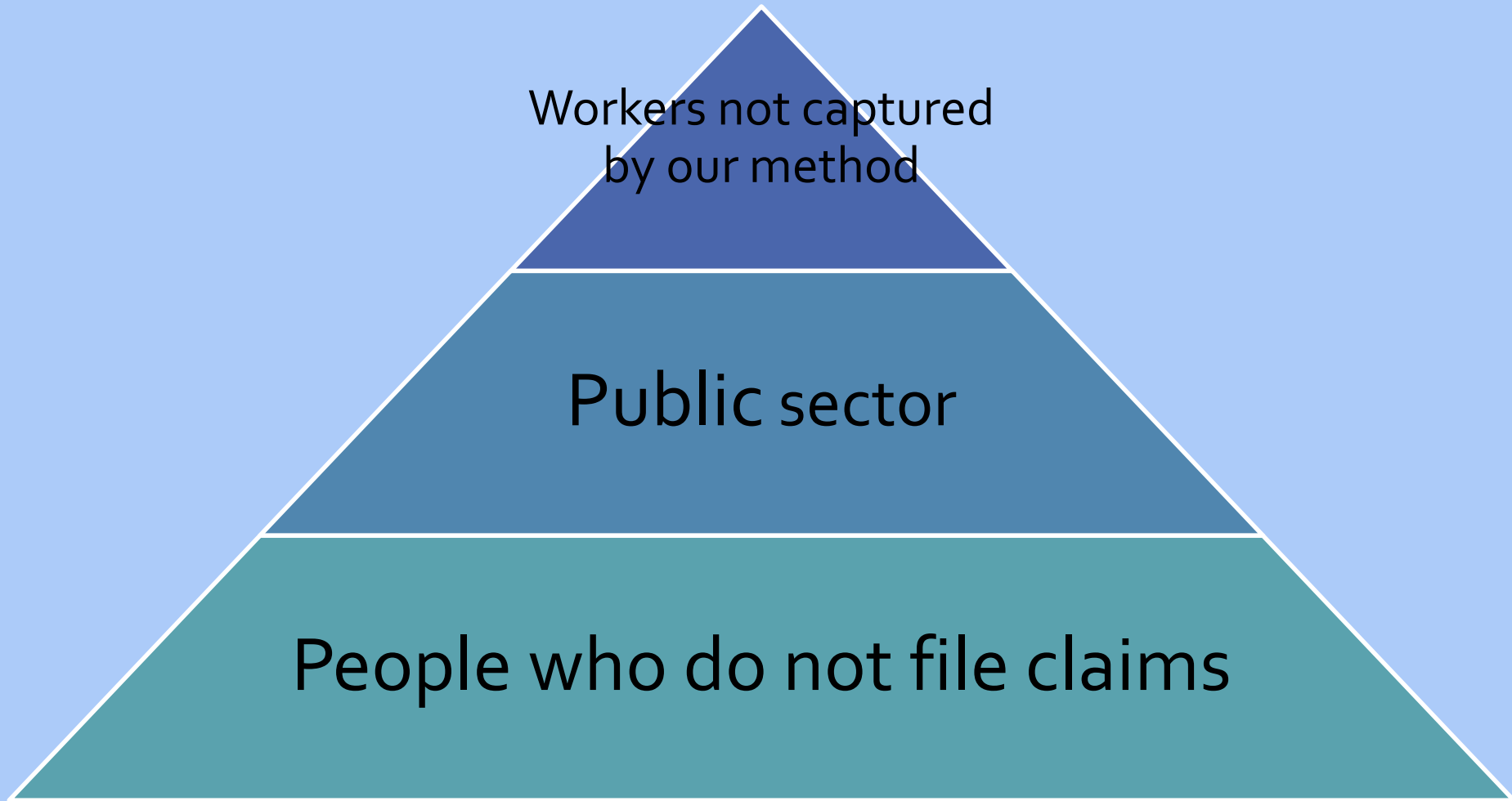
Industry	CA Rate per 100 National Overall SOII	
	FTE	Rate per 100 FTE
Interurban and Rural Bus Transportation	15.0	3.0
Building Material and Supplies Dealers	10.6	4.8
Waste Treatment and Disposal	9.0	3.3
Motor Vehicle Body and Trailer Manufacturing	8.5	7.9
Other General Merchandise Stores	8.0	4.9
Other Ambulatory Health Care Services	8.0	3.0
Waste Collection	7.6	4.6
Other Furniture Related Product Manufacturing	7.1	5.5
Logging	6.9	3.7

How great is this!?!

Milestones

- Collaboration
- Data sharing agreements
- Pilot rates
- Sharable, repeatable methods and code
- Contribution to national discussions about use of WC data

What are we missing?



Next Steps

- Data analysis for 2015-2016
 - Data analysis report
 - Surveillance system evaluation
- Publicly available dataset
- Disseminate findings
- Sustainability



Collaborators

California Department of Public Health

- John Beckman
- Matt Frederick
- Bob Harrison

California Department of Industrial Relations

- Genet Daba
- John Gordon
- Liza Dizon
- Glenn Shor
- Meitong Jin

California Employment Development Department

- Andy Wong
- Spencer Wong

Integration of the Kentucky Occupational Safety and Health Surveillance (KOSHS) Program into State Drug Abuse/Overdose Prevention Efforts

Terry Bunn, PhD

Director, Kentucky Injury Prevention and Research Center, bona fide agent for the Kentucky Department for Public Health

Associate Professor, Departments of Epidemiology and Preventive Medicine and Environmental Health, University of Kentucky, College of Public Health



KOSHS

- Occupational motor vehicle crash investigations a priority focus area since 2005



Case Example

Long Haul Trucker Dies After Striking an Embankment at the End of an Interstate Highway Off-Ramp

Incident Number: 05KY074



Picture of hillside with debris from semi-tractor trailer crash.
(Photo courtesy of private company)



Summary

In the fall of year 2005, at 12:40 AM, a 47-year-old male semi-truck driver began his delivery route hauling a refrigerated trailer loaded with 23,000 pounds of produce. His first delivery was approximately 265 miles away. After two hours and twenty minutes, he exited the interstate 23 miles from the start of his route. At the end of the exit ramp he attempted to turn right onto a 4-lane highway. He missed the turn and drove straight across the highway through a guardrail; the truck became airborne, and crashed into an embankment exploding into flames. An unidentified motorist driving behind the semi called emergency response services. Local police and fire departments arrived at the scene and discovered the cab and trailer burning. The coroner arrived while the firefighters extinguished the blaze. After extinguishing the fire, emergency personnel removed the driver's body and the coroner declared the driver dead at the scene. The death certificate stated the cause of death was multiple blunt force trauma/motor vehicle accident, and that carbon monoxide possibly contributed to death. Toxicology test results showed the driver had a 0.6% blood level of cocaine, a presumptive presence of benzodiazepine, and a carbon monoxide level of 38% at the time of the crash.

Following are recommendations to prevent similar incidents from occurring:

Recommendation No. 1: A "reasonable suspicion" drug testing policy should be implemented and enforced by the company if a trucker is suspected to be under the influence of drugs. The reasonable suspicion testing policy should include drug testing and the suspension of the trucker until the results of the tests are known.

Recommendation No. 2: Comprehensive new-hire prescreening and after-hire random drug testing policies should be implemented and enforced for substance abuse

Recommendation No. 3: A statewide database containing commercial driver positive drug/alcohol test results should be identified.

Case Example

**Semi Owner-Operator
Dies in Rollover After Speeding
Through A Curve
Incident Number: 05KY075**



Photograph of curve in two-lane state highway where semi-truck driver lost control and crashed.



Summary

On a Fall day in 2005 at 3:00 PM, a 46 year-old male semi-tractor trailer owner-operator was hauling logs when he rounded a curve, drove off the right side of a two lane state highway, struck a tree and rolled over. Emergency medical services were called to the scene. When they arrived, they found the driver without vital signs and contacted the local coroner. Kentucky State Police arrived and called Kentucky Vehicle Enforcement to the scene. The driver had not been wearing his seatbelt. Toxicology detected methamphetamine and doxylamine in his system at the time of the crash.

To prevent future occurrences of similar incidents, the following recommendations have been made:

Recommendation No. 1: Owner-Operators should follow Kentucky laws and wear seat belts while operating a commercial vehicle.

Recommendation No. 2: Owner-Operators should comply with mandated participation in a consortium that provides the central coordination of drug screening programs and other services within Federal Motor Carrier Administration guidelines and Department of Transportation regulations.

Hazard Alert

Volume 6, Issue 2

August 2008

FACE THE FACTS HAZ ALERT

To prevent truck crashes due to substance use:

- Employers should implement and enforce a policy that prohibits commercial drivers who are ill or taking over-the-counter medications with potential side effects for impaired driving from operating a commercial vehicle.
- Employers should implement and enforce a "reasonable suspicion" drug testing policy if a driver is suspected to be under the influence of drugs.
- Companies should conduct comprehensive new-hire prescreening and after-hire random drug testing for substance abuse.
- A nationwide database containing a record of all commercial driver positive drug tests in the last two years should be developed.

Truck Drivers in Fatal Crashes After Substance Use

In Kentucky in 2007, preliminary numbers indicate that at least twenty-nine drivers were killed in occupational motor vehicle collisions.

Following are case descriptions for two Kentucky drivers who were killed in crashes after using substances while driving:

Case 1: A 31-year-old male truck driver died when his semi-tractor trailer left the roadway and rolled into a ditch. The driver was on a straight stretch of road. His right tires left the pavement into a grassy area on the side of the road. The driver attempted to correct the vehicle, but was unable to do so, then hit a tree and rolled over. The driver, who was not wearing a seat belt was declared dead at the scene. Toxicology results showed the presence of chemicals found in over the counter cough and flu medications. When used together, these substances have a dramatic depressive effect on the central nervous system.



Case 2: A 47-year-old male truck driver was killed after crashing his tractor and refrigerated trailer. The driver had exited the interstate and attempted to turn right at the end of the ramp. He missed the turn and drove straight across a four-lane highway, going through a guardrail, becoming airborne, and crashing into an embankment, immediately bursting into flames. The truck driver was pronounced dead at the scene by the coroner. Toxicology results showed the presence of cocaine, benzodiazepine (active ingredient in Valium), and a carbon monoxide level of 38% at the time of the crash.

DRIVERS WHO ARE ILL OR UNDER THE INFLUENCE OF SUBSTANCES SHOULD BE PROHIBITED FROM OPERATING A COMMERCIAL VEHICLE.



Reports

Factors Associated with the Increase in Prescriptions for Opioid Analgesic Medications in Kentucky between 2001 to 2007

Yelena Tarasenko, DrPH(c), MPH, MPA
Michael Singleton, MS
Kentucky Injury Prevention and Research Center
Jennifer Havens, PhD, MPH
Alcohol Research

Drug Overdose Morbidity and Mortality in Kentucky, 2000 - 2010

An examination of statewide data, including the rising impact of prescription drug overdose on fatality rates, and the parallel rise in associated medical costs.

**Drug Overdose Deaths,
Hospitalizations,
and Emergency
Department Visits
in Kentucky,
2000 - 2012**



kiprc
KENTUCKY INJURY PREVENTION
AND RESEARCH CENTER

kiprc
KENTUCKY INJURY PREVENTION
AND RESEARCH CENTER



Kentucky Public Health
Prevention. Promise. Progress.

Publications

Journal of Toxicology and Environmental Health, Part A, 71, 283-288, 2008
Copyright © Taylor & Francis Group, LLC
ISSN: 1528-7394 print / 1087-2620 online
DOI: 10.1080/15287390701738459

The Effect of Poison Control Center Consultation on Accidental Poisoning Inpatient Hospitalizations with Preexisting Medical Conditions

Terry L. Bunn¹, Svetla Slavova¹, Henry A. Spiller², Jonathan Arne Bathke⁴, and Valerie J. Nicholson⁵

¹Kentucky Injury Prevention and Research Center, University of Kentucky,
²Kentucky Regional Poison Center, Louisville, Kentucky, ³Drug and Poison
Cincinnati, Ohio, ⁴Department of Statistics, University of Kentucky, Lexington,
⁵Department of Health Services Management, University of Kentucky, Lexington, KY

Traffic Injury Prevention (2013) 14, 680-689
Copyright © Taylor & Francis Group, LLC
ISSN: 1538-9588 print / 1538-957X online
DOI: 10.1080/15389588.2012.757310

Concordance of Motor Vehicle Crash, Emergency Department, and Inpatient Hospitalization Data Sets in the Identification of Drugs in Injured Drivers

T. BUNN, M. SINGLETON, V. NICHOLSON, and S. SLAVOVA

Kentucky Injury Prevention and Research Center, University of Kentucky College of Public Health, Lexington, Kentucky

Received 21 September 2012, Accepted 6 December 2012

 **PDS** Pharmacoepidemiology & Drug Safety
Official Journal of the International Society for Pharmacoepidemiology
Explore this journal >

Original Report

Surveillance of methadone-related poisonings in Kentucky using multiple data sources[†]

Terry L. Bunn PhD , Lei Yu PhD, Henry A. Spiller MS, DABAT, Michael Singleton MS

First published: 14 January 2010 Full publication history
DOI: 10.1002/pds.1901 View/save citation

Cited by (CrossRef): 8 articles  Check for updates  Citation tools

  Funding Information

[†]The authors declare no conflict of interest.

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Extramural Funding

Kentucky Violence and Injury Prevention Program

- Substance abuse a priority focus area
- State injury prevention plan
- Legislation data support (HB1)
 - Pill mills
 - Clinical prescribing regulations
 - Decedent controlled substance testing law
 - Inter-state prescription drug monitoring program (PDMP) data sharing



Kentucky Drug Overdose Prevention Program

- Use of PDMP data for public health surveillance
- Inform community interventions
- Evaluate and perform cost-benefit analysis of drug-related laws
- Establish substance use disorder information and referral service
 - physicians (e.g., prevention of needle sticks when lancing drug abuse-related abscesses)
 - first responders (e.g., handling of fentanyl analogs at drug overdose scenes)
 - law enforcement (e.g., naloxone administration training)
 - general public



Kentucky Enhanced State Surveillance of Opioid-Involved Morbidity and Mortality

- Increase timeliness of public health data sources
- Use syndromic surveillance data for drug overdose and injury surveillance



Multidisciplinary Approaches to Drug Abuse Prevention

- Algorithm development for milligram morphine equivalent calculations in PDMP reports
- Death certificate and PDMP data linkage to identify possible drug diversion
- State advisory group



Drugged Driving Collisions

- Link Ky CRASH and trauma registry data with FARS driver drug testing results from fatal crashes in 2014
- Link 2014 trauma registry toxicology result data with inpatient hospitalization data to assess drug overdose and drug abuse coding



Kentucky Opioid Response Effort (KORE)

Primary populations:

- Opioid overdose victims
- Pregnant and parenting women
- Individuals re-entering society upon criminal justice release
- Adolescents and young adults

Goals:

- Prevent opioid misuse and abuse
- Increase access to OUD treatment services (e.g., MAT)
- Increase availability of recovery support services
- Increase availability of naloxone
- Enhance coordination and evaluation of OUD healthcare and public safety strategies



A collage of medical and pharmaceutical imagery. In the foreground, a pile of white powder sits on a dark surface. Behind it, several syringes and vials are visible, some containing clear or yellow liquids. The background is slightly blurred, showing more medical equipment and papers. The word "Policies" is overlaid in a bold, yellow font with a black outline.

Policies

Laws

- KRS 217.186- A person or agency, including a peace officer, jailer, firefighter, paramedic, or emergency medical technician or a school employee authorized to administer medication under KRS 156.502, may:
 - Receive a prescription for the drug naloxone
 - Possess naloxone pursuant to this subsection and any equipment needed for its administration
 - Administer naloxone to an individual suffering from an apparent opiate-related overdose



Workers' Compensation Legislation

- Reduce prescriber opioid prescribing (physicians, APRNs, etc.) to a 3-day supply for injured workers
- First line treatment based on non-opioid therapy alternatives (physical therapy, acupuncture, etc.)
- Revise drug formularies for treatment of pain associated with occupational injuries



Kentucky Heroin and Fentanyl Strategic Plan

Developing State Strategies for Reducing Overdose and Deaths from
Heroin and Illicit Fentanyl



Goals

Prevention: Decrease likelihood that Kentuckians develop a SUD through strategies to decrease overexposure of opioid medications and illicit opioids

- prescriptions (dosage units); overdose deaths containing fentanyl

Harm Reduction: Improve Access to Harm Reduction Services to Save Lives

- naloxone kits dispensed to first responders and public; people in syringe exchange programs who received naloxone

Treatment and Recovery: Expand access to treatment and recovery supports

- peer recovery coaches; Emergency Departments with peer recovery coaches; people with SUD who interact with peer recovery coaches and enter treatment; Emergency Department peer follow-up; individuals with SUD who receive residential services; calls to SUD treatment locator and portal



Future Research

SouthON

- Louisville Metro Police Department presentation
- Breakout Session
- First Responder Opioid Exposure Survey development
- Focus Groups
- Survey Administration
- Data Analysis
- Use of Data Results



SouthON

- UK ERC first responder overdose response exposure pilot project opportunity
- Multistate or single state applications
 - Use of survey
 - development of other first responder-related pilot project



Conclusions

FACE case investigations

- initiated drug overdose prevention conversations
- enhanced collaborations
- provided evidence of need for enhanced multidisciplinary drug overdose prevention efforts
 1. Interventions
 2. Policies
 3. Research



Ladder rap

<https://www.youtube.com/watch?v=FsW6eb3aO8g&feature=youtu.be>



BLS Survey of Employers vs. Multi-Source Surveillance of Work-Related Injuries?



Kenneth D. Rosenman, M.D.
Professor of Medicine
Michigan State University
www.oem.msu.edu

**NIOSH Expanding Research Partnerships Conference,
Denver, Colorado, June 21-23, 2017**

Funding: NIOSH U60 OH008466



Survey of Occupational Injuries and Illnesses (SOII)

- **Injuries and illnesses (based on OSHA's recordkeeping standards) from 230,000 establishments (sample by state and NAICS code)**
- **Redesigned in 1992 to collect circumstances of injuries and illnesses that lead to days away from work and characteristics of affected workers**
- **Scope limitations: no small farms, private household or self-employed workers (< 2008, no public sector workers)**



NATIONAL ACADEMY OF SCIENCES, 1987

New Jersey

24% Deaths not covered by OSHA

**35% Deaths covered by OSHA but
employer had NOT recorded on OSHA
log or did NOT keep OSHA log**

Texas

**NIOSH Fatal Occupational Trauma
Surveillance**



CENSUS OF FATAL OCCUPATIONAL INJURIES (CFOI) BEGAN IN 1992

- **Multiple death sources**

 - Death certificates

 - Employer reporting

 - State Police

 - Newspaper Clipping Service

 - Medical Examiners

 - Agricultural Extension Service

- **Number of deaths doubled from previous
BLS estimate**



How Much Work-Related Injury and Illness is Missed By the Current National Surveillance System

**Rosenman KD, Kalush A, Reilly MJ,
Gardiner JC, Reeves M, Luo Z. JOEM
2006; 48:357-365.**

Funding: NIOSH 5 R01 OH004276-03



Study Finds That U.S. Undercounts Workplace Injuries, Illnesses

By KRIS MAHER

A new study suggests government statistics undercount the number of illnesses and injuries that occur in U.S. workplaces each year, largely as a result of underreporting by employers.

The study, by researchers at Michigan State University, analyzed data collected by the Bureau of Labor Statistics and found that the statistics failed to count roughly two-thirds of nonfatal work-related injuries and illnesses that occurred in Michigan over a three-year period.

The findings are in line with previous broad estimates of undercounting, but in this study researchers had access to confidential BLS records and used multiple databases to find evidence of injuries and illnesses at companies. Experts say more accurate data could reshape commonly held views of how safe workplaces are and have policy implications for government agencies charged with enforcing workplace safety regulations.

"If it's not accurate, how do you know where to put your resources and if your

interventions are effective?" said Kenneth Rosenman, professor of medicine at Michigan State University and principal author of the study.

Government statistics on work-related injuries and illnesses are compiled by the BLS through an annual survey of about 230,000 employers. Yet many researchers say employers and employees alike have incentives to underreport injuries. In addition, the government survey omits large groups of workers at employers who aren't required by law to report, including government employees, self-employed people and workers at farms with fewer than 11 employees.

In the Michigan State study, which appears in the April issue of the Journal of Occupational and Environmental Medicine, researchers used sources such as state workers' compensation reports to find cases where employers surveyed by the BLS had failed to report injuries and illnesses. Researchers estimated that 869,034 work-related injuries and illnesses occurred on average each year in Michigan from 1999 to 2001, compared with the BLS estimate of 281,567 per year.

Dr. Rosenman estimates that 75% of the injuries and illnesses missed by BLS resulted from employer underreporting.

"There is probably some undercount and we are missing some," said Bill McCarthy, chief of the BLS's division of safety and health statistics. He said another study using a different methodology is under way.

Labor groups have cited the undercounting to question government claims that workplace injury rates are declining. In February, Labor Secretary Elaine Chao cited a 9.4% decline in injury and illness rates at employers be-

tween 2002 and 2004 among department accomplishments.

J. Paul Leigh, a professor of health economics at the University of California, Davis, said he thought overall rates have declined, in part because the economy is creating more service jobs.

In a report last year, insurer Liberty Mutual Group Inc. estimated the total cost of disabling occupational injuries and illnesses that cause workers to miss six or more days of work to be \$50.8 billion to employers in 2003, using BLS injury and illness data. Mr. Leigh puts the figure at about \$170 billion a year.

WALL ST. JOURNAL 5/1/06 PA2

CORRECTIONS & AMPLIFICATIONS

Readers can alert THE WALL STREET JOURNAL to any errors in news articles by e-mailing wsjcontact@wsj.com or by calling 888-410-2667.

A PAGE-ONE promotional item for an interview with George P. Shultz misspelled his last name as Schultz in some editions Saturday.

* * *

JOHN BRADY is a Newport News,

Va., family physician who opened an office using the Ideal Micro Practice model described in the April 19 Informed Patient column. His first name was given incorrectly as James in the column.

Summary of Analysis Comparing BLS and Worker Comp data, Michigan 2009-2001

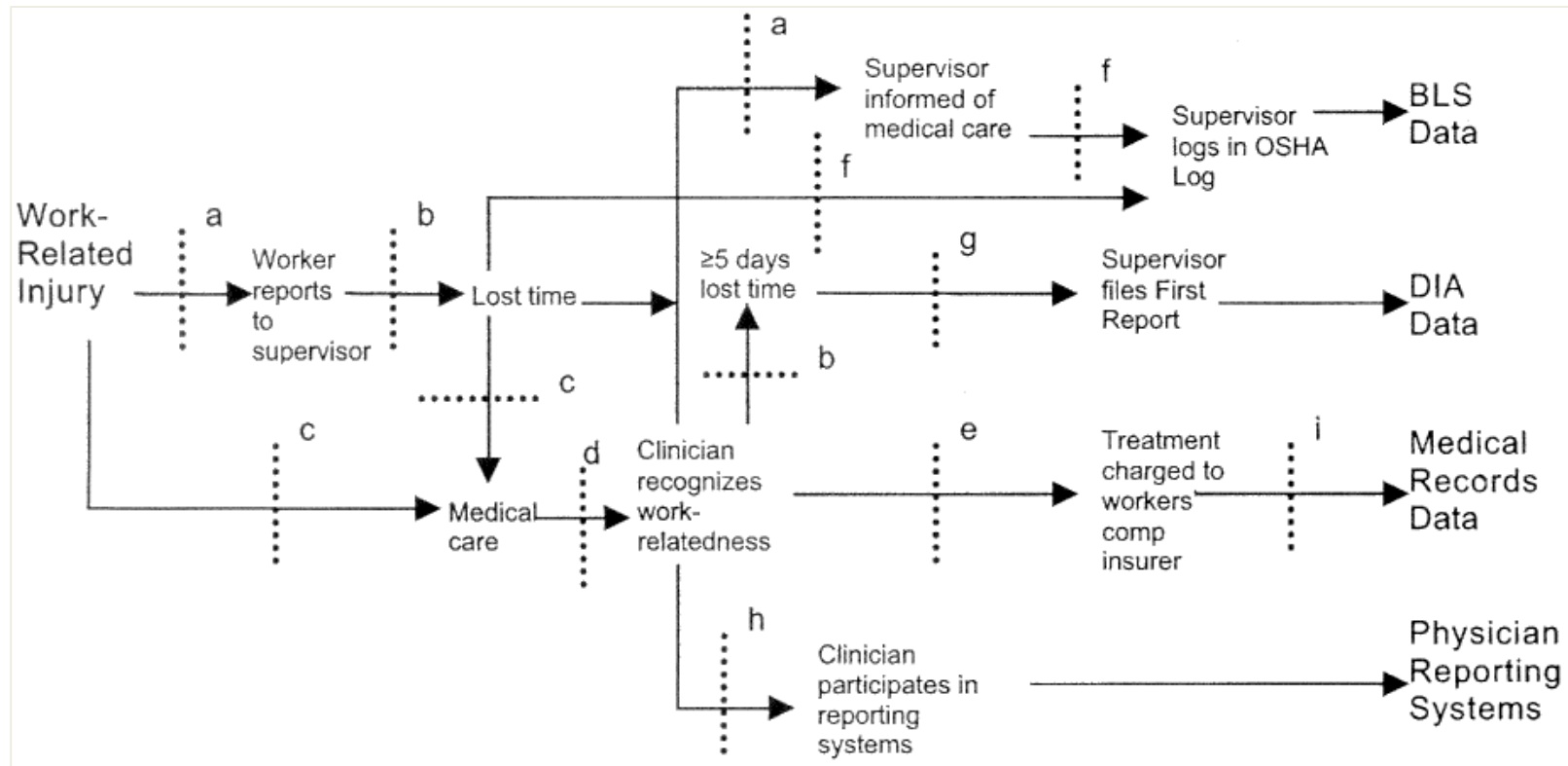
Days away from work

- **BLS estimate:**
 - 37-41% BLS+ WC**
 - 31-34% BLS + WC+ Capture/Recapture**

1999-2001 Estimates - Michigan

- **BLS -281,567 vs. Our Estimate - 868,241**
 - 1 in 15 workers vs. 1 in 5 workers**

Simplified Flowchart of Events Necessary to the Documentation of Work-Related Injuries and Illnesses



(Azaroff et al. AJPH 2002)

Filters to Identifying Work-Related Injuries and Illnesses

- a. Filters To Reporting to Supervisors
- b. Filters To Losing Work Time
- c. Filters to Obtaining Medical Care
- d. Filters to Recognizing Work-Related by Doctor
- e. Filters to Workers' Compensation being the Payer
- f. Filters To Recording on OSHA Log
- g. Filters to Reporting by Employers to Workers' Compensation Agency
- h. Filters to Reporting by Doctors

(Azaroff et al. AJPH 2002)



Capture-Recapture Estimates of Workplace Injury and Illness Reporting by BLS Adjusted for Capture Heterogeneity: Lost-Time Cases, 1998-2001

Percent Reported to:	WA	WV	OR	WI	NM	MN
No Source Dependence	55%	76%	56%	65%	51%	68%
Source Dependence	52%	71%	45%	53%	37%	53%

(Adapted Boden and Ozonoff, Annals Epidemiology 2008)



Workers' Compensation

State Specific Program

Mandatory insurance or if large enough self-insured

Michigan WC Excludes:

- Federal employees
- Interstate railroad workers
- Maritime workers
- Less than 3 employees at any one time
- All employees work less than 35 hours/week or if more hours less than 13 weeks
- Self-employed

Not computerized

- Medical claims only



**Proportion of Work-Injured Adults* for Whom Treatment was paid by
Workers' Compensation, by State-BRFSS, 10 States, 2007**

State	% Injured with Payment by Workers' Compensation
Texas	47% (95% CI 35-59)
New York	50% (95% CI 39-60)
Michigan	56% (95% CI 41-69)
Massachusetts	60% (95% CI 45-75)
California	61% (95% CI 55-66)
Washington	61% (95% CI 55-67)
Oregon	62% (95% CI 50-74)
Connecticut	63% (95% CI 53-74)
New Jersey	64% (95% CI 51-78)
Kentucky	77% (95% CI 65-89)

*Excludes self-employed

Percentage Received Workers' Compensation by Condition, Michigan

	Wage Replacement	Medical Only	No Comp Employed	No Comp Self -Employed
Amputations	64%	22%	17%	6%
Burns	17%	48%	33%	2%
Skull Fractures	36%	32%	29%	3%



Percent Applied for Workers' Comp among 2,016 Cases of Work-Related Asthma, Michigan

Overall	48.4%
Still Exposed/Conditions Unchanged	23.9%
No Longer Exposed	57.5%
Quit on Doctor's Advice	77.8%
Sick Leave	72.7%
Fired	62.1%
New Controls	58.9%
Chemical Substitution	53.6%
Quit on Own	43.1%
Reassigned	36.0%



Reasons Didn't File a Workers' Compensation Claims for a Repetitive Trauma, Michigan

Only 397 (25.1%) of 1598 Filed WC Claim

Injury Not Serious Enough	705 (59.1%)
Did Not Expect to Miss Work	694 (58.3%)
Expect to Receive Sick Leave or Disability	337 (28.3%)
Medical Expenses Covered by Other Insurance	427 (35.9%)
Did Not Think Injury Work Related	242 (20.4%)

Goals of Surveillance

- **Population-Based**
 - **Assess Magnitude of Problem**
 - Numbers/Rates/Trends
 - **Determine Relative Importance vs. Other Health Issues**
 - **Identify High Risk**
 - Industries/Occupations/Worker Populations
 - **Prioritize Interventions**
 - **Evaluate Interventions**
 - **Generate Hypotheses for Research**
 - **Identify Emerging Problems**
 - **Identify Workplaces for Intervention**
- **Case-Based**



Reportable Conditions in Michigan

Local Health Departments

Communicable Diseases (83)

“Unusual occurrence, outbreak or epidemic of any disease or conditions”

MDHHS

Abortions

Birth Defects

Cancer

Chemical Poisonings including Carbon Monoxide*

Injuries *

Nursing Home Abuse

LARA

Occupational Illnesses

County Department of Social Services

Child Abuse

Adult Abuse

Police

Injury from Knife, Gun or Deadly Weapon

Mental Health Patient Abuse

*On Request Only



Laboratory Reporting Regulations, Michigan

- **Arsenic**
- **Cadmium**
- **Carboxyhemoglobin**
- **Cholinesterase**
- **IgE Antibodies**
- **Lead**
- **Mercury**



Occupational Illness Reporting Requirement in Michigan

- **LARA – MIOSHA**

Physician, hospital, clinic or employer having a known or suspected occupational disease or health condition aggravated by workplace exposures shall report within 10 days after discovery.

Misdemeanor punishable by a fine of not more than \$50



Methodology of Multi-Source Surveillance

Amputations, 2006- Date

Hospitals/ED/Outpatient Clinics

Workers' Compensation Wage Replacement

Crushing Injuries, 2013- Date

+ FACE Program

Skull Fractures, 2012-Date

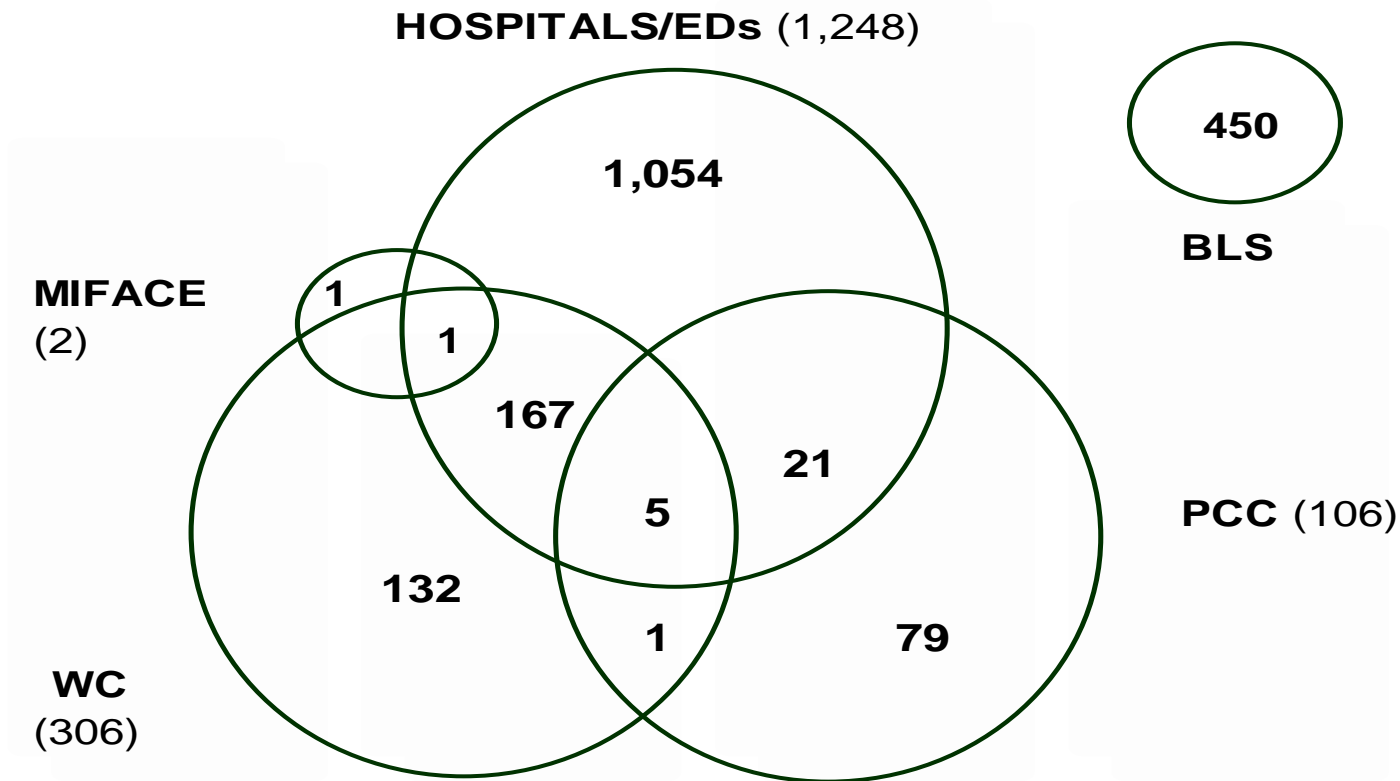
Burns, 2009-Date

+ Poison Control Center

- Quarterly Reporting Specified ICD codes -134 Hospitals
- Quarterly Reporting all Work-related Events – Poison Control Center
- Electronic Data Base All Paid Claims – Workers' Compensation
- FACE – Death Certificates/OSHA Hot Line/Police Reports



Work-Related Burn Reports – By Source. Total 1,461, Michigan 2009

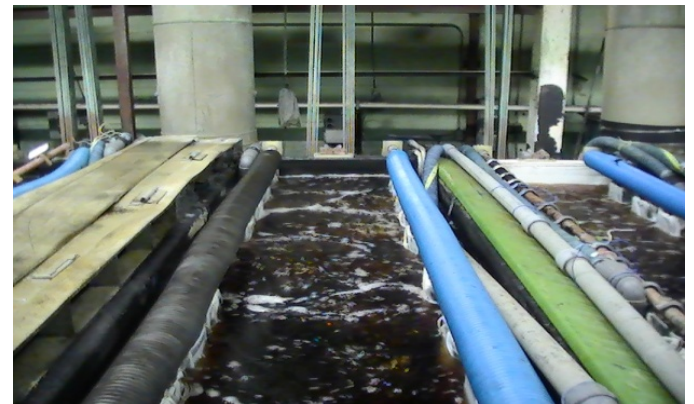


n=1,460 individuals

(Kica and Rosenman, JOEM 2012)

Work-Related Burn – Case History

- **Electroplating industry**
- **39-year-old male**
- **Second degree thermal burns to right foot**
- **Temperature of chemicals: 150°F**
- **Inadequate fall protection**
- **No barrier(s)**
- **# of Violations: 20**
- **Penalty: \$19,200**



Work-Related Crushing Injury– Case History

- **Ice Cream Manufacturer**
- **Woman mid-forties**
- **Crushing injury to her left wrist, laceration that needed sutures and a burn from the heated element used to seal packaging**
- **No Guard**
- **# of Serious Violations: 1**
- **Penalty: \$ 4,000**



Michigan OSHA Inspections, Violations and Penalties by Work-Related Injuries

CONDITION	TIME PERIOD	# ENFORCEMENT INSPECTIONS	# VIOLATIONS	TOTAL PENALTIES ASSESSED
Amputations	2006 - 2013	184	1,575	\$674,255
Crush Injuries	2013 - 2015	77	212	\$276,425
Burns	2009 - 2013	213	539	\$954,590
Skull Fractures	2010 - 2013	28	66	\$78,050
TOTAL		502	2,392	\$1,983,320

Percent Inspections Hazard Causing the Injury is Still Present - 60 - 94%



Severity of Burns within Specific Industries, Michigan 2013

Industry Classification (NAICS)	Degree of Burn				
	1°	2°	3°	Fatal	Total
	# (%)	# (%)	# (%)	# (%)	
Accommodation and Food Svcs (72)	176 (37)	288 (61)	8 (2)	0 (-)	472
Health Care and Social Assist (62)	78 (53)	66 (45)	2 (2)	0 (-)	146
Primary Metal Manufacturing (33)	33 (27)	75 (61)	15 (12)	0 (-)	123
Retail Trade (44)	27 (38)	39 (54)	6 (8)	0 (-)	72
Construction (23)	23 (29)	48 (61)	6 (8)	2 (2%)	79

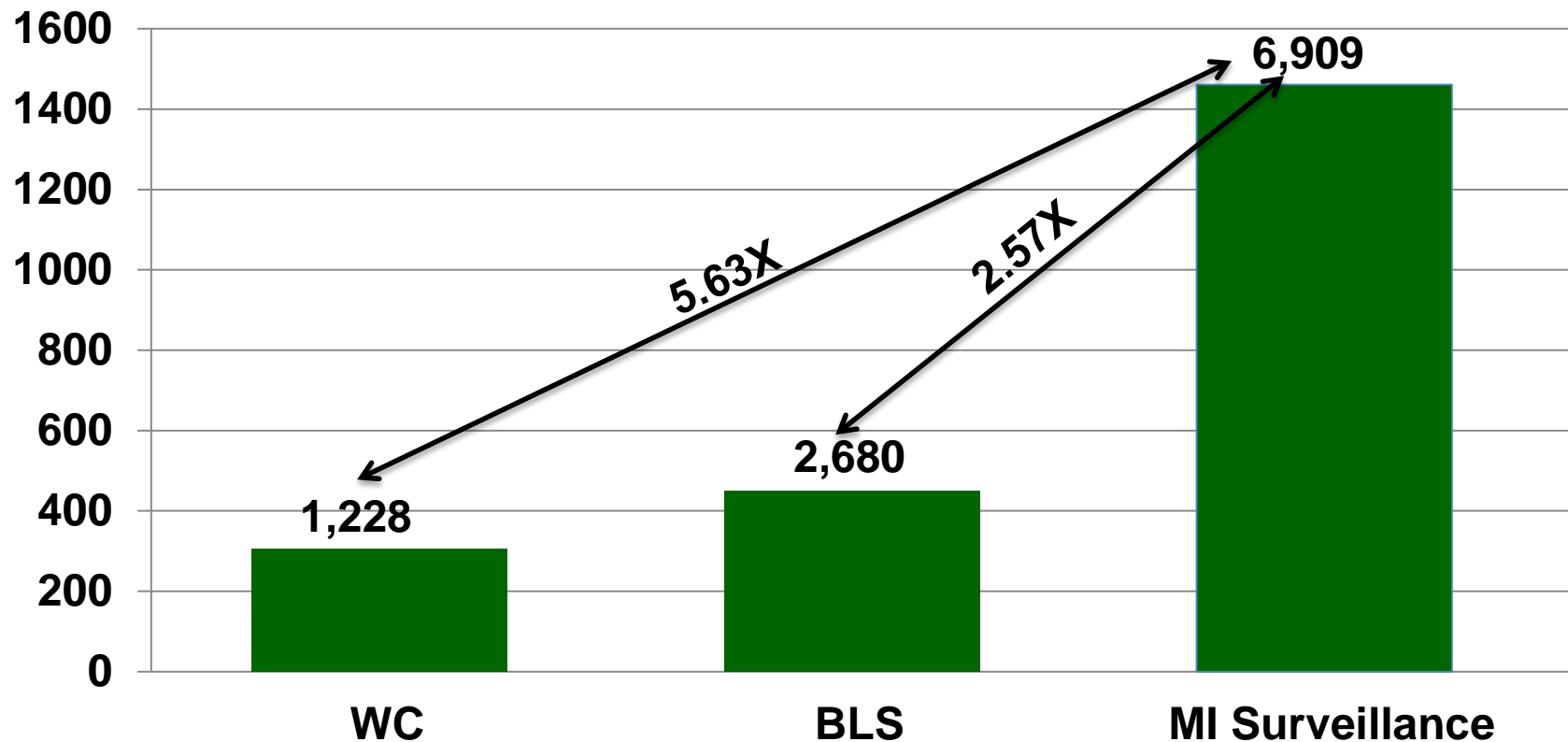


Work-Related Burns Among Young Workers (14-24) by Top 5 Industries, Michigan 2013

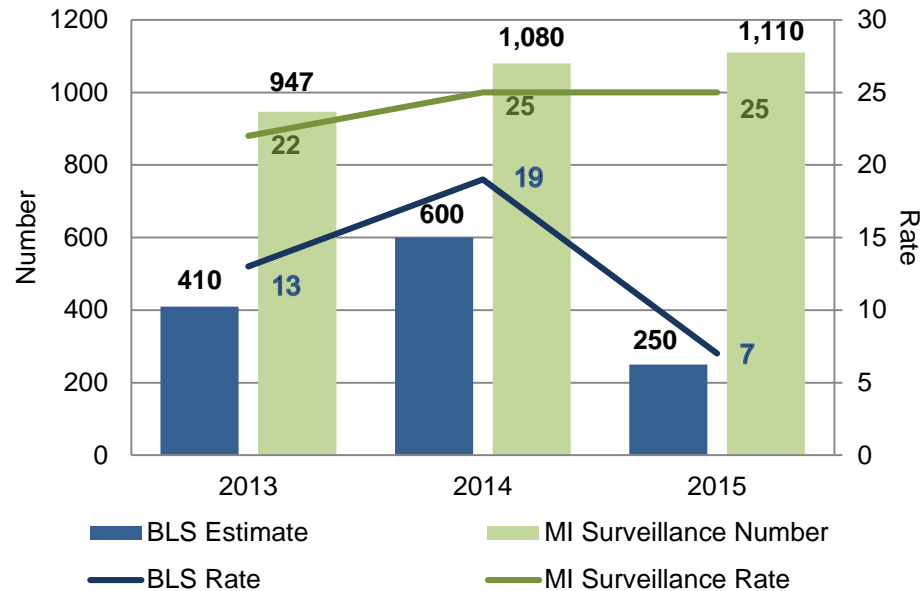
Industry Classification (NAICS)	2013	
	Number	Percent
Accommodation and Food Services (72)	251	53
Health Care and Social Assistance (62)	28	19
Primary Metal Manufacturing (33)	25	20
Retail Trade (44)	25	35
Construction (23)	14	18



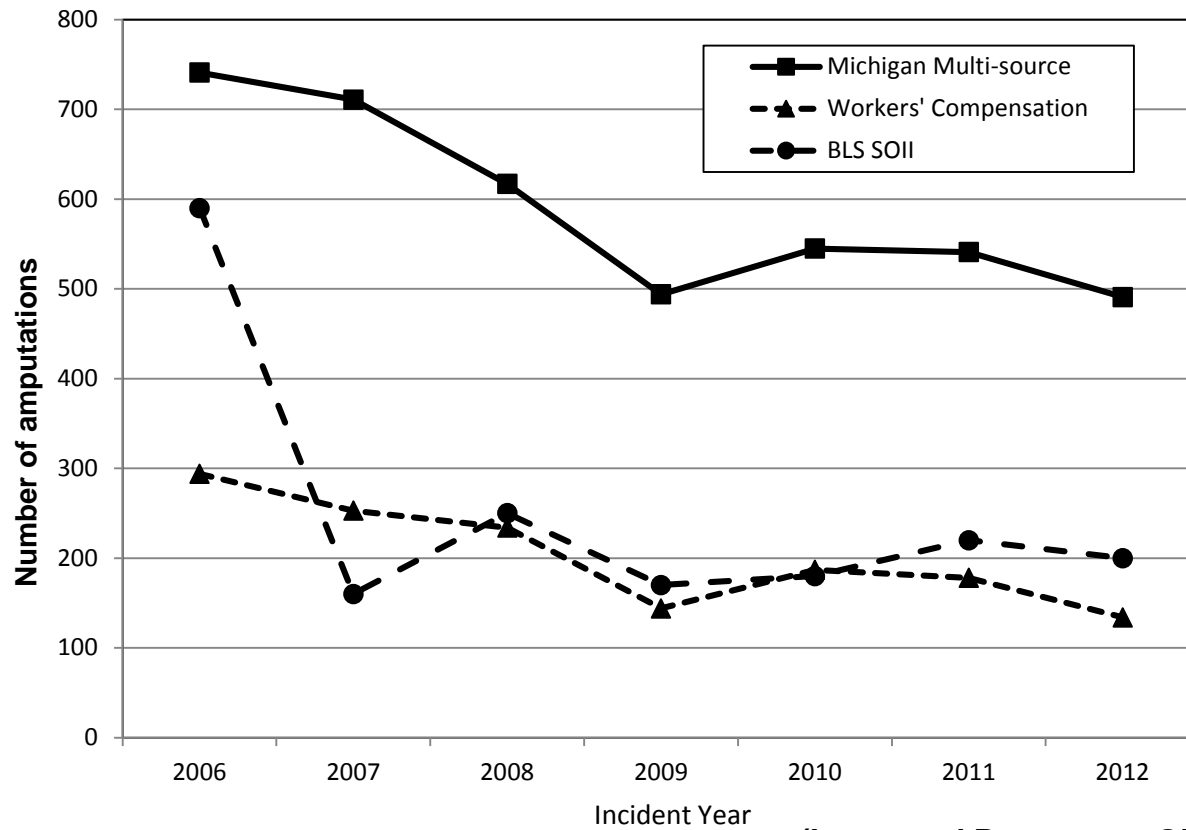
Work-Related Burn Summary, Michigan 2009-2012



Number and Rate of Work-Related Crushing Injuries Comparing BLS and MI Surveillance, Michigan 2013-2015

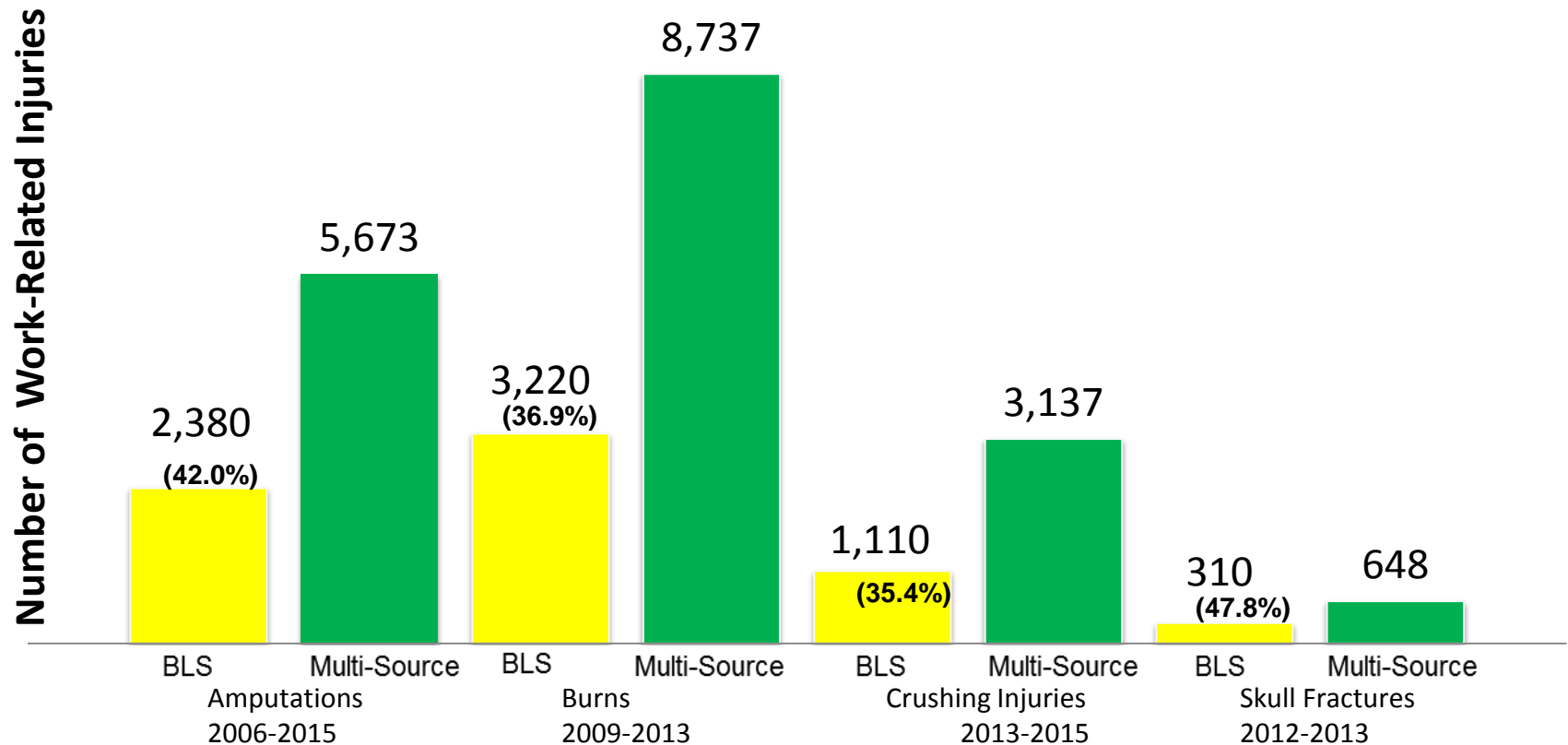


Number of Work-Related Amputations by year, Michigan 2006-2012, by data source



(Largo and Rosenman, OEM 2014)

Comparison of Multi-Source Data Surveillance in Michigan vs. the Bureau of Labor Statistics Employer Based Survey for Work-Related Amputations, Burns, Crushing Injuries and Skull Fractures



Summary Statistics of Work-Related Farm Injuries, Michigan 2015

- **678** work-related farm injuries treated in Michigan's hospitals or Emergency Room departments for work-related farm injuries
- Types of medical encounter:
 - ED visits – 594 (87.6%)
 - Hospitalizations – 70 (10.3%)
 - Outpatient visits – 14 (2.1%)
- 9 individuals were identified as migrant workers
- There were an additional 16 agricultural fatalities and 1,408 non work-related farm injuries



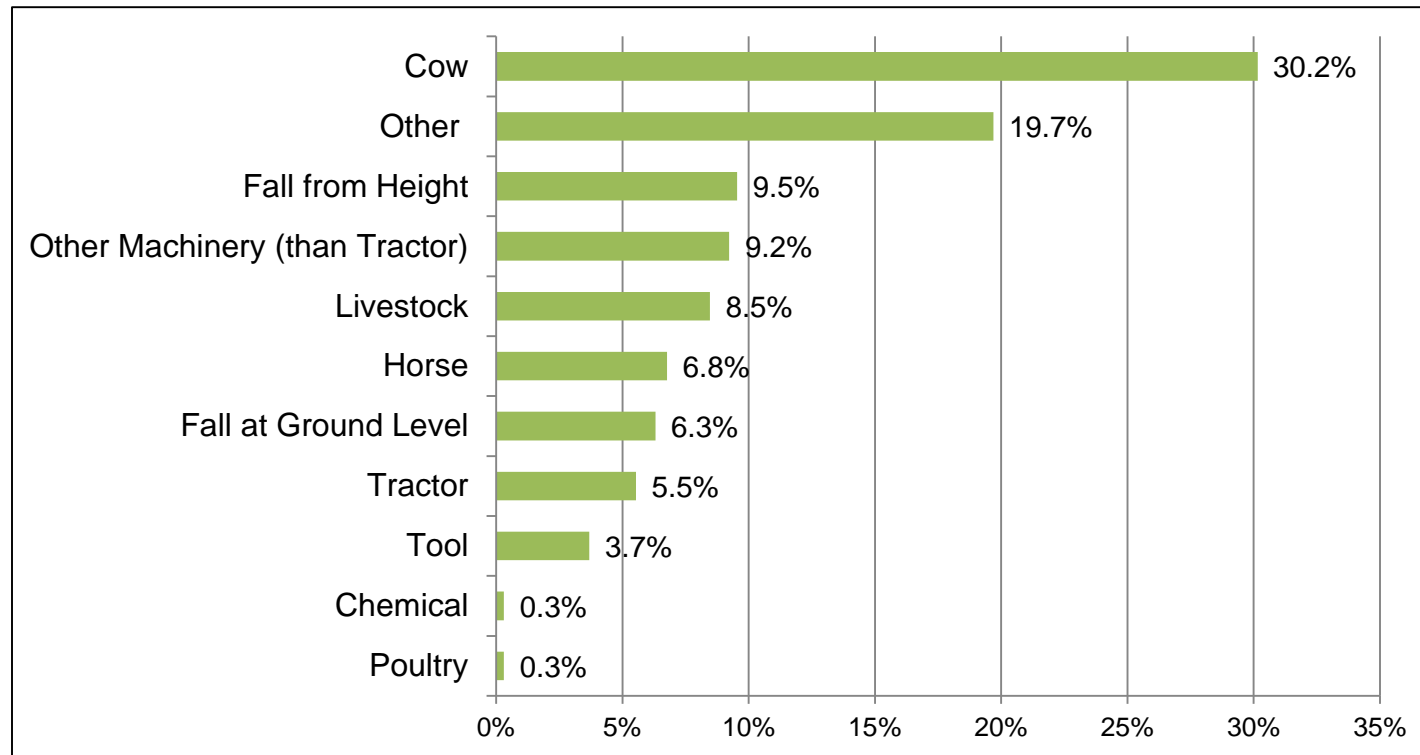
Work-Related Farm Injury Narrative Examples - AgrAbility Letter Follow-up

- **A 68-year-old male farmer was using a tractor on his grain farm, when he exited it while it was still running. He was run over by the tractor when it slipped into gear. He sustained multiple traumatic crush injuries, right multiple rib fractures, pelvic fractures and a left lower extremity injury. He was hospitalized for seven days.**
- **A 26-year-old male was working on a dairy farm when his right lower extremity was caught in an auger attached to a power takeoff unit. He sustained a traumatic above-the-knee amputation of the right lower extremity up to the hip joint. He was hospitalized.**



Injury Source – Work-Related Farm Injuries, Michigan 2015

- Information on injury source available: 650 (95.9%)



BLS Undercount – Possible Explanations (Burn data)

- **Self employed – only 11**
- **Farms – only 5**
- **Includes only one or more days away from work**
- **Employer reporting**
- **Statistical Sampling/extrapolation**
- **Coding/miscoding**



WC Undercount – Possible Explanations (Burn Data)

- **Includes only 7 consecutive days away from work**
- **Self employed – only 11**
- **Coding/miscoding**
- **Handled unofficially directly with company**



Number of Patients with Inpatient Hospitalizations, Primary Diagnosis with Workers' Compensation Expected Payer, Michigan 2014

Infectious	44
Mental Disorders	19
Nervous System	45
Circulatory	94
Respiratory	46
Digestive	46
Urinary	22
Skin	121
Musculoskeletal	617
Backs	405
Injuries	1,235
Fractures	683
Internal	48
Crushing/Contusion	56
Open Wounds	88
Dislocations	16
Sprains & Strains	29
Intracranial Injury	68
Burns	57
Toxic Effects	7
Total	2,391*

*This table does not include another 15 diagnosis with 281 patients

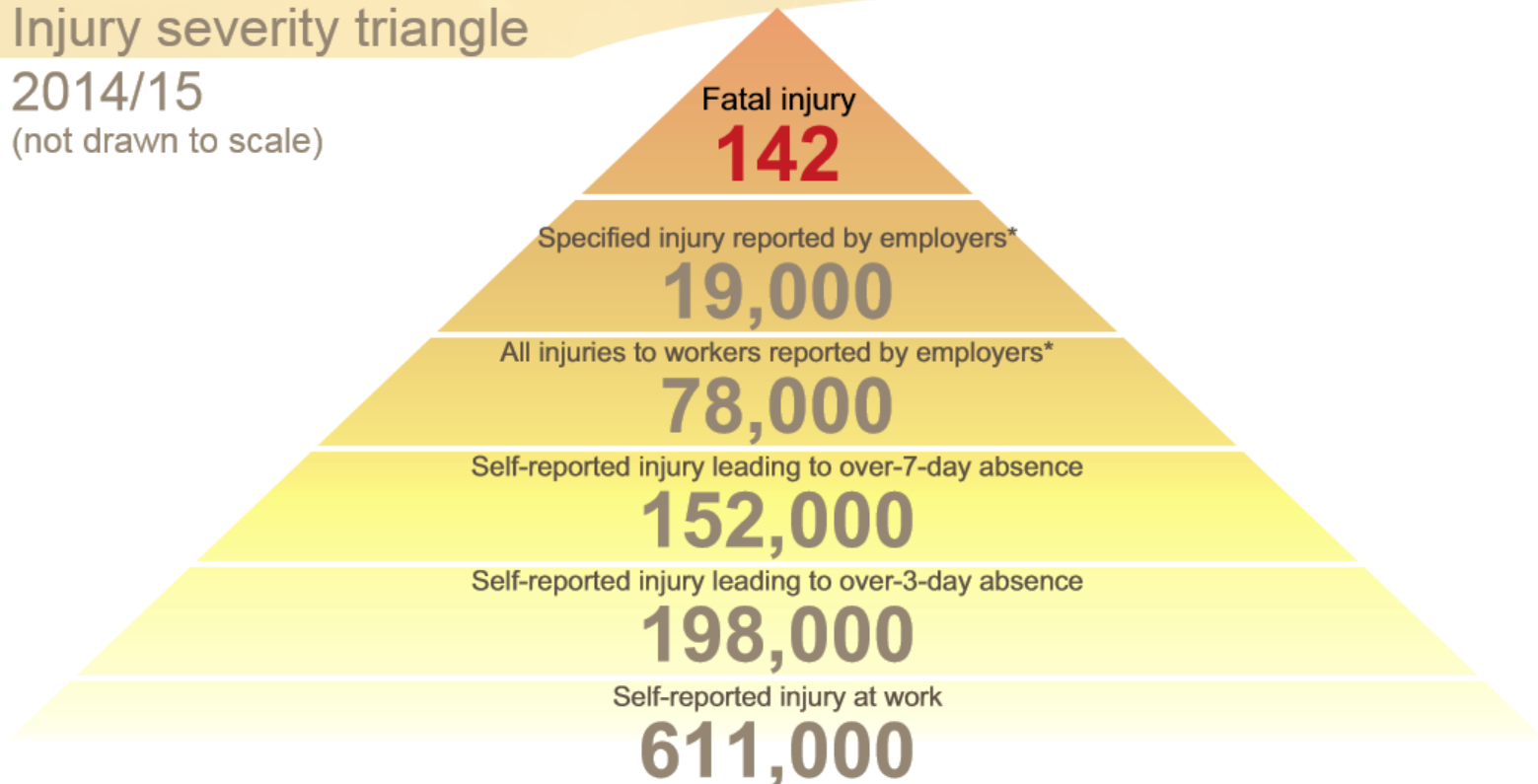




Injury severity triangle

2014/15

(not drawn to scale)



* RIDDOR reporting requirements have changed in recent years (move to over-7-day absences from April 2012 and specified injuries from October 2013)



 **1.3**
million

Workers suffering from a work-related illness (new or long standing) in 2015/16

Source: Estimates based on self-reports from the Labour Force Survey

 **0.5**
million

Workers suffering from work-related musculoskeletal disorders (new or longstanding) in 2015/16

Source: Estimates based on self-reports from the Labour Force Survey

 **0.5**
million

Workers suffering from work-related stress, depression or anxiety (new or longstanding) in 2015/16

Source: Estimates based on self-reports from the Labour Force Survey

 **9.3**
billion

Annual costs of new cases of work-related illness in 2014/15, excluding long latency illness such as cancer

Source: Estimates based on HSE Cost Mod

 **0.6**
million

Non-fatal injuries to workers in 2015/16

Source: Estimates based on self-reports from the Labour Force Survey

 **72,702**

Non-fatal injuries to employees reported by employers in 2015/16

Source: RIDDOR

 **144**

Fatal injuries to workers in 2015/16

Source: RIDDOR

 **4.8**
billion

Annual costs of workplace injury in 2014/15

Source: Estimates based on HSE Cost Mod

 **2515**

Mesothelioma deaths in 2014, with a similar number of lung cancer deaths linked to past exposures to asbestos

Source: Death certificates

 **30.4**
million

Working days lost due to work-related illness and non-fatal workplace injuries in 2015/16

Source: Estimates based on self-reports from the Labour Force Survey

 **11,403**

Notices issued by all enforcing bodies in 2015/16

Source: HSE Enforcement data

 **14.1**
billion

Annual costs of work-related injury and new cases of illness in 2014/15, excluding long latency illness such as cancer

Source: Estimates based on HSE Cost Mod

Summary

Current Employer Based System

- Undercount - Miss 29% - 69% of cases
- Undercount Not Consistent Across Industry/Condition

What is Needed?

- Multi-Source System like CFOI
Cost Prohibitive to do in Every State
- System that Allows Follow Up/Intervention
- System that Extrapolates from Multi-Source Surveillance Systems
- Better Presentation of Data





Occupational & Environmental Medicine

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- Asthma
- Abrasive Blasting
- Resources



Division Chief:
Kenneth D. Rosenman, M.D.
Professor of Medicine

Since 1978, physicians, hospitals, clinics, other health professionals and employers have been required by the Michigan Public Health Code to report known or suspected cases of occupational disease to the Michigan Department of Labor and Economic Growth (MDLEG). Initially, the number of reports received was generally less than one hundred per year. However, following the 1988 implementation of the Sentinal Event Notification System for Occupational Risks (Project SENSOR), a statewide initiative began to actively solicit reports of occupational disease (OD). MDLEG now contracts with MSU's College of Human Medicine, Occupational and Environmental Medicine Division to assist in handling approximately 15,000-20,000 reports a year of occupational disease.