

NIOSH Surveillance Program: Data To Improve Worker Safety and Health

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Inner workings - NIOSH Surveillance Program

- Computerized Autocoders
 - Key role in Surveillance Plan
- Occupational Health and Safety Surveillance Data
 - Examples of uses and value added
- EHRs
 - Accomplishments
- Communicating Results of Surveillance Actions
 - Today and in the future

Build and Improve Autocoders

NIOSH Surveillance Program

Plan for NIOSH Surveillance Program

1. Leverage data from existing surveys and data systems
2. Incorporate industry and occupation into existing surveys and data systems
- 3. Improve autocoders to expand available data**
4. Build capacity in states
5. Accelerate communication

Surveillance into the Future

- If we are to:
 - Close information gaps
 - Use more data systems with work information
 - Must have better tools

Why Build and Improve Autocoders?

- Work information recorded as text
- 20th century method – code by hand
- 21st century method – code by machine
 - More efficient than manual coding: cost and time
 - More reproducible & less random error

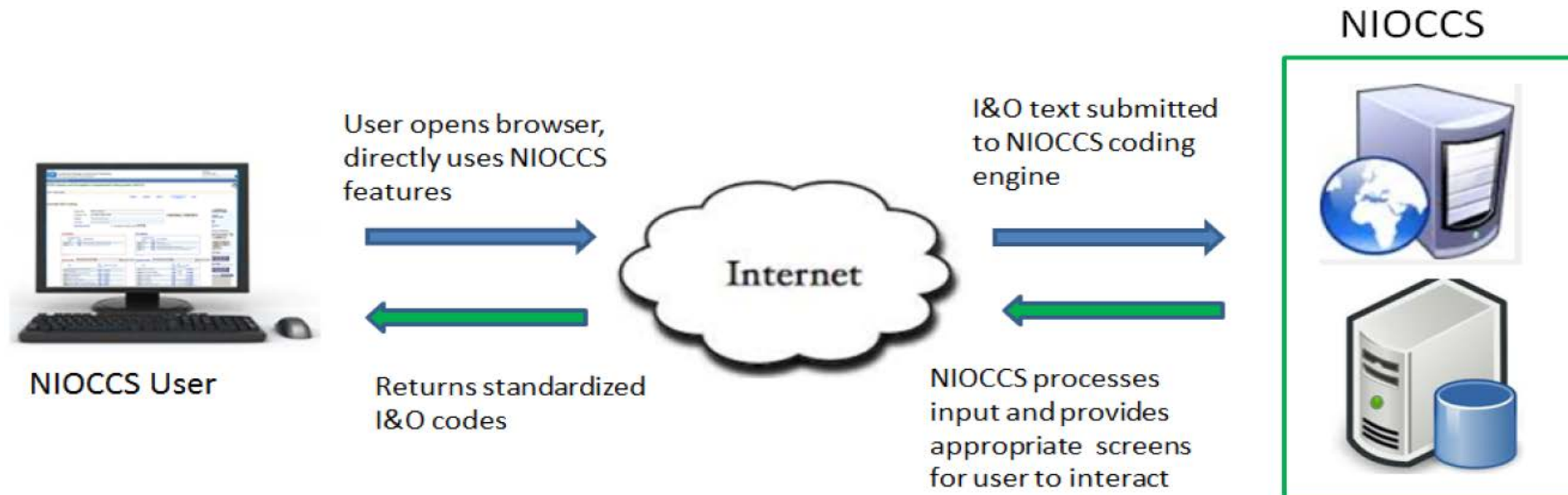
NIOSH Autocoding Systems

- SOIC (progenitor)
- NIOSH Industry and Occupation Computerized Coding System (NIOCCS)
- Cause of Injury Coder



NIOSH Industry and Occupation Computerized Coding System (NIOCCS)

- A web-based system
- Codes industry and occupation text
- Launched in 2012 & >12 Million records coded
- Users = states, universities, private businesses



NIOSH Computerized Autocoders Systems

■ NIOSH Industry and Occupation Coding System (NIOCCS)

- Codes industry and occupation text
- Codes to Census Industry & Occupation
- Cross-walks to NAICS and SOC
- Birth/Death certificates, surveys, cancer registries
- Human coders: computer assisted coding



■ Cause of Injury Coder

- Codes causation of injury from free text
- Codes to BLS OIICS event/exposure category
- Workers' Compensation claim narratives

Continuous Improvement: NIOSH Computerized Autocoding Systems

- **Improve coding success rate for all types of data**
 - Improve coding accuracy
- **Improve quality of incoming data**
 - Training courses for data collection (BRFSS & Cancer Registries)
- **Improve ability of users to analyze coded I&O or work data**
 - Training courses
 - Informational material

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Surveillance Data

NIOSH Surveillance Program

Background: Data Sources for Surveillance

NIOSH Surveillance mandate is broad – all work-related illnesses & injuries

- Generate little *de novo* data
- Use publicly available data
 - Contain the outcome(s) of interest – injury, illness, or health status
 - Contain indicator of work in the data or add it
- Cannot use one-size-fits-all approach

Traumatic Injury Data

NIOSH Surveillance Program

Injury Data– Analyses of Existing Data

Examples

- BLS Census of Fatal Occupational Injuries
- BLS Survey of Occupational Injuries and Illnesses (SOII)
- BJS National Crime Victimization Survey
- NHTSA Fatality Analysis Reporting System
- Mine Safety and Health Administration data (fatal and nonfatal)
- Workers' compensation data
- Teens/Young Worker- MA
- TIRES (Trucking) - WA

Value

- Costs limited to staff time
- Provide interpretation– implications for research and prevention
- Bridge for use in national health goals

Example Finding

Upward trend in suicides in the workplace, with the highest rates in protective services and farming.

Tiesman et al, *Am J Prev Med* 2015, 48(6): 674-682

Injury Data– Addition of Work Variables

Example

- National Electronic Injury Surveillance System- Work Supplement (NEISS-Work)
 - Fund Consumer Product Safety Commission to collect work-related injuries, industry and occupation

Example Finding

Upward trend in work-related traumatic brain injuries.

Konda et al, *Inj Prev* 2015, 21(2): 115-120

Value

- Partially fills gaps in nonfatal injury surveillance
 - Includes populations excluded in SOII (e.g. self-employed)
 - Include details on injuries with less than a day away from work
 - Based on worker report of injury vs. employer report

Case-based Surveillance

Examples

- **Fatality Assessment and Control Evaluation (FACE)**
 - NIOSH and state cooperative agreements
- **Fire Fighter Fatality Investigation and Prevention Program**
- **Law Enforcement Officer Fatality Investigation Program (pilot)**
- **Teens/Young Worker- MA**

Value

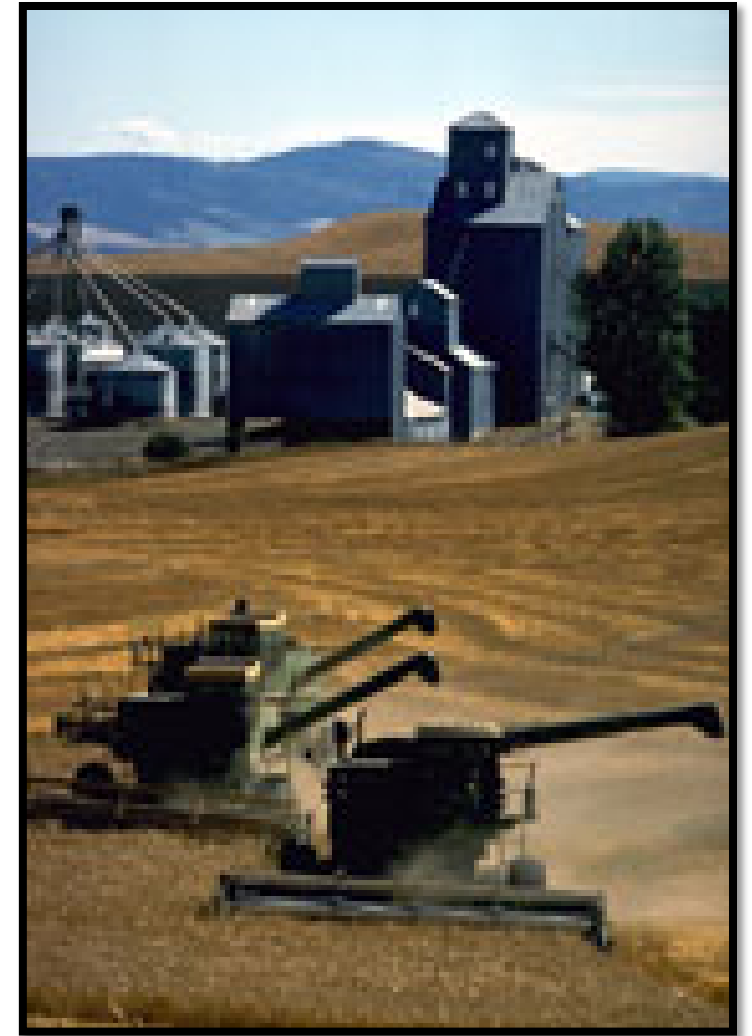
- **Rich contextual data not available from population-based surveillance, e.g.**
 - Task
 - Training
 - Hazard controls, e.g. personal protective equipment
 - Machinery and equipment specifics

Example Impact

Fire fighter fatality investigation findings used in standard for safety officer qualifications **NFPA 1521**

Agricultural Injury Surveillance- Case Study

- Funded USDA and Department of Labor to conduct surveys/add questions, 1990s to 2015
- Survey costs increased, in part due to reductions in injuries which impacts the sample size required
- President's budget over several years has proposed elimination of NIOSH agricultural program
- Deliberating on future directions based on:
 - Stakeholder input
 - RAND assessment of feasibility of recommendations made in 2012 program review



Health Data

NIOSH Surveillance Program

Health Data – Analyses of Existing Data

Examples

- National Health Interview Survey (NHIS)
- Death Certificates
- Audiometric Service Providers
- National Birth Defects Prevention Study
- SOII
- OSHA Administration Information System

Value

- Provide basis of worker health data
- Assess outcomes & exposures not previously examined
- Provide interpretation– implications for research and prevention

Example Finding

Prevalence of short sleep duration highest among night shift workers in transportation and warehousing and healthcare and social assistance.

MMWR, April 27, 2012/61(16): 281-285



NHIS



Health Data – Addition of Work Variables

Example

- Behavioral Risk Factor Surveillance Survey (BRFSS)
 - Survey core asks only of employment status
- Pregnancy Risk Assessment Monitoring System (PRAMS)

Value

- Gives states ability to examine state-specific prevalence of the impact of work on health risk factors
 - Large respondent population (BRFSS)
 - Addition of I&O temporary until CDC & states add questions to core survey

Example Finding

Highest prevalence of obesity among workers in the occupation group of Installation, Repair & Maintenance & Transportation & Material Moving

Massachusetts Department of Public Health: Putting Data to Work: 23 Health Indicators by I&O: Findings from the Massachusetts BRFSS, 2012-2013 (2016)



Health Data – Add or Improve Work Variables

Examples

- Cancer Registries



- National Notifiable Disease Surveillance System (NNDSS)
- EHRs

Value

- Standardize work/I&O questions in national data collection systems
- Improve data quality and completeness
- Improve clinical care

Example findings

Significant elevations in melanoma, multiple myeloma, AML, & cancers of the prostate, esophagus & kidney among California firefighters.

Tsai R, et al. Am J Ind Med 2015 Jul; 58(7):715-729

Case-based Health Data

Examples

- Adult Blood Lead Epidemiology and Surveillance (ABLES)
- SENSOR Pesticides
- Asthma and Silicosis



Value

- Build/enhance state OSH surveillance capacity
- Aggregated data from states provide insight into worker health in nation
- Data motivate guidance and regulation to improve worker health nationally

Example Finding

Isocyanate-induced asthma was found in a wide variety of industries, suggesting continued need for more effective controls and interventions. Lefkowitz, D et al. Am J Ind Med 2015 Nov; 58(11):1138-1149

Electronic Health Records

NIOSH Surveillance Program

EHRs and Surveillance

- EHRs hold great promise for surveillance
- Combined with other health data, EHRs may:
 - Fill gaps left by unreported workplace injuries
 - Give more complete picture of work-related diseases
 - Identify new or emerging work-related conditions
- Requirements & Challenge:
 - Work information must be universally included in EHRs

NIOSH and EHRs

- Convened NAS Study Panel
 - Carrying out recommendations
- Convinced ONC-HIT of value work information in EHRs
 - provided NIOSH opportunity to provide evidence of feasibility
- Interact with standard setting organizations, CDC & vendors



NIOSH and EHRs

- NIOSH is illustrating purpose and need for I&O in EHRs
- **Examples**
 - Inform vendors of **critical data by developing information model** specific to occupational health data
 - Demonstrate **ability to capture usable I&O** by intake personnel
 - Demonstrate **utility of work information in informing clinical decisions**
 - Include work case definitions in electronic case reporting, HL7, MMG and much more

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Communicating Surveillance

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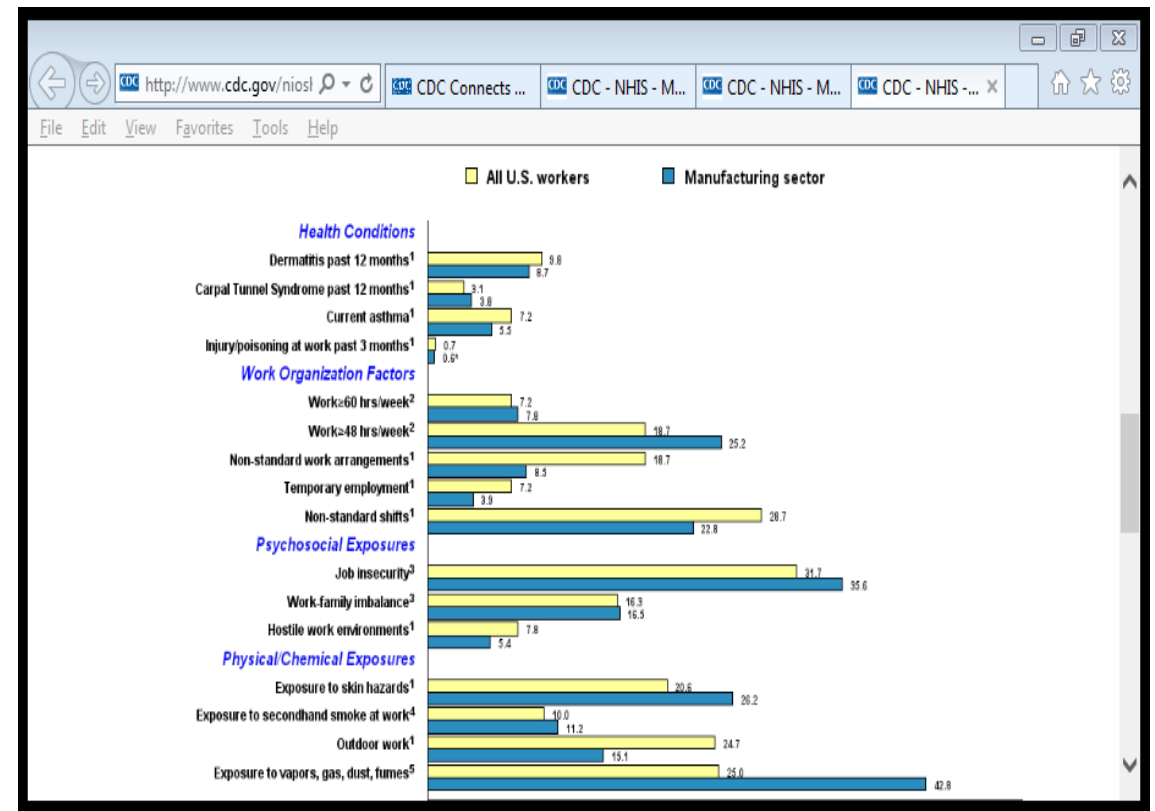
Communicating Surveillance

- Publications, presentations and presence on the internet & social media, e.g. infographics, blogs



- Current efforts:
 - Find methods to increase utilization of data
 - Creating 'On Demand' data visualization tools
 - Speed up data availability without sacrificing information

NHIS Occupational Health Supplement 2010: Work Organization Factors in the Manufacturing Industry



Summary

- Accomplish Occupational Health and Safety Surveillance
 - Leverage, incorporate I&O/work information
 - Build infrastructure
 - Add value
 - Communicate results
- Motivate inclusion of I&O in EHRs
 - Demonstrate work can be technically added to EHR systems
 - Demonstrate utility of work in clinical care

Summary - Needs

- Advances in information technology and methods that could advance surveillance in a cost-effective manner
- New data sources – to fill gaps
- Simplify path to ensure inclusion of work in EHRs
- Communication methods – to reach more audiences more effectively