

# Oregon Fatality Assessment and Control Evaluation (OR-FACE)

Analysis of Oregon occupational fatalities from surveillance, investigation, and assessment findings

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**Session A1: Topics in Safety** 



### **Overview**

- What is OR-FACE
  - Mission
  - History
- Surveillance data (occupational fatalities, 2003-2015)
- Investigations
- Outreach
- Research projects



## Mission (background)

- Workplace fatalities: preventable, yet unacceptably common events
  - Each day traumatic injuries kill ~13 workers on the job
  - Each year ~ 350,000 workers killed on the job globally, with nearly 5,000 deaths in US
  - -Current Oregon occupational fatality rate
    - = 2.6 deaths per 100,000 workers

(national average = 3.5)



# OR-FACE Mission (goal / objectives)

- Prevent traumatic work-related deaths in Oregon through
  - Surveillance
  - Targeted investigation
  - Assessment
  - Outreach



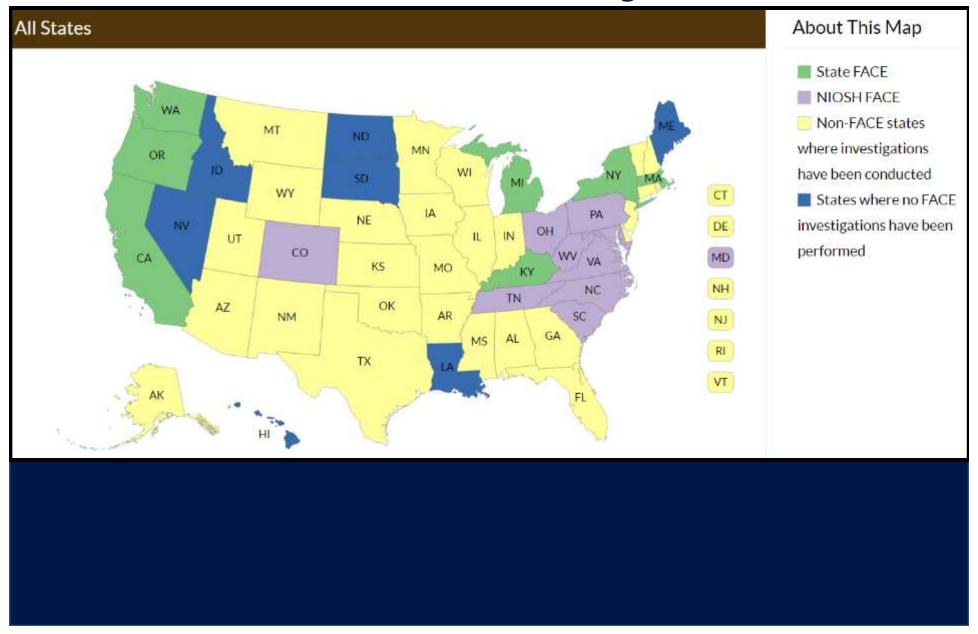
### **FACE History**

- NIOSH surveillance research program
  - -Began in 1982
  - -Expanded to states in 1992
- OR-FACE
  - –Joined 14 other state programs in 2002
  - -2010 only 9 states
  - -Currently only 7 states



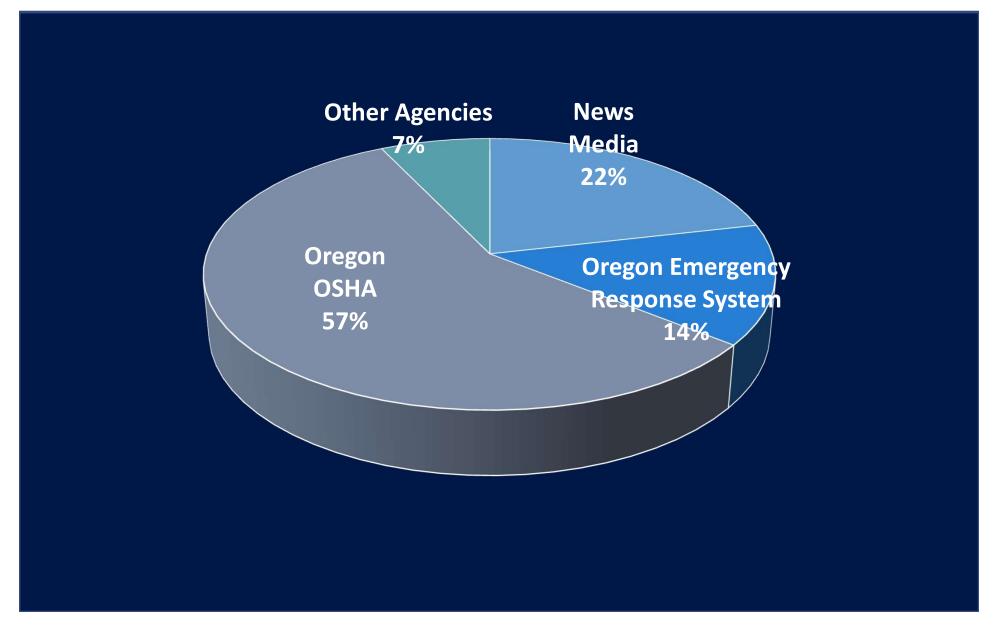


# NIOSH Fatality Assessment and Control Evaluation (FACE) Program





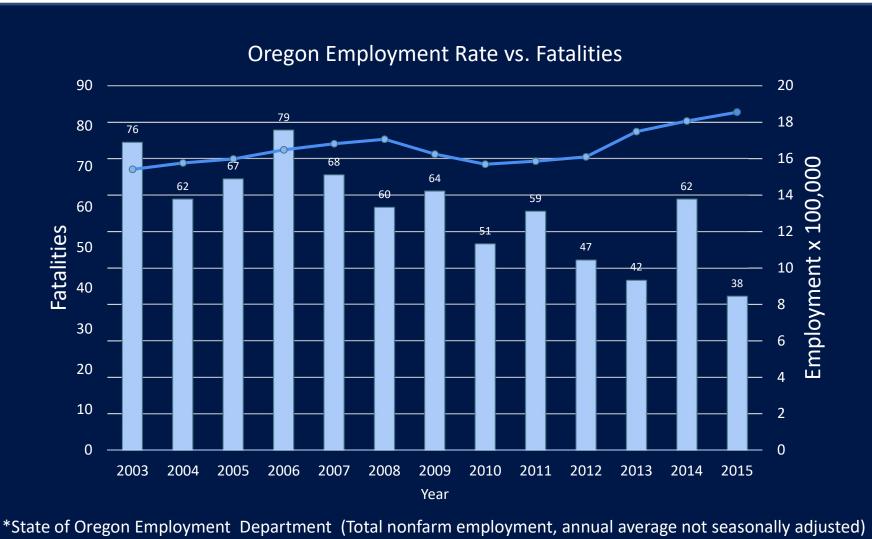
### **Surveillance 2015 Sources**





### **OR-FACE** Worker fatalities in Oregon (2003-2015) by year

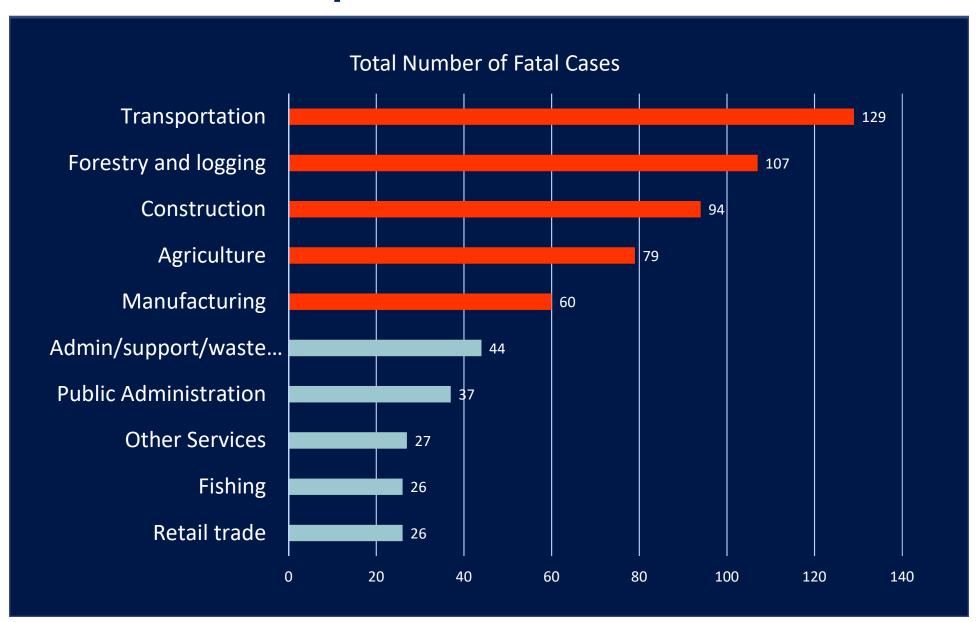
Employment x 100,000



Oregon total fatalities

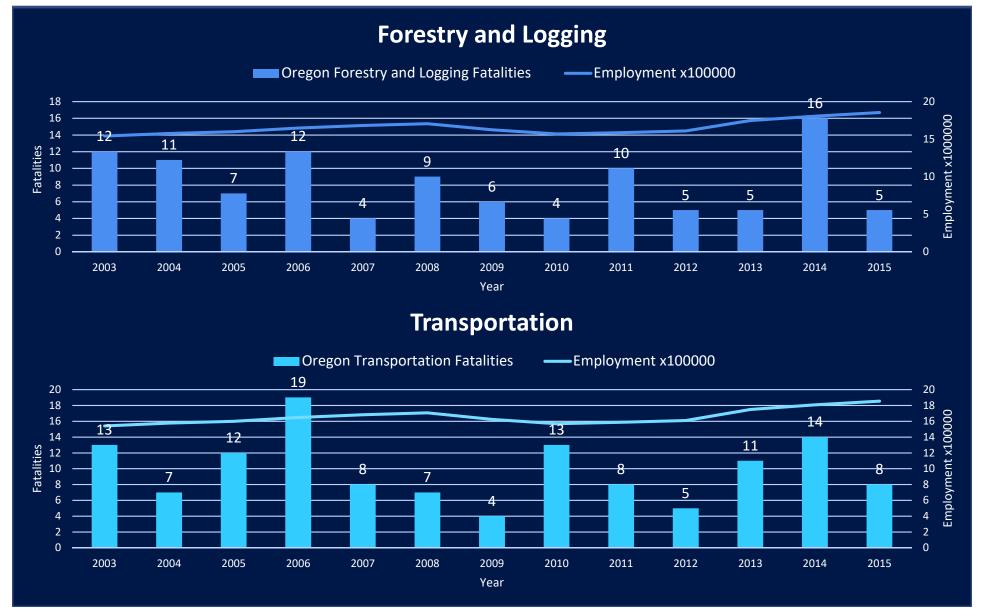


# Worker fatalities in Oregon (2003-2015): top 10 industries in total number



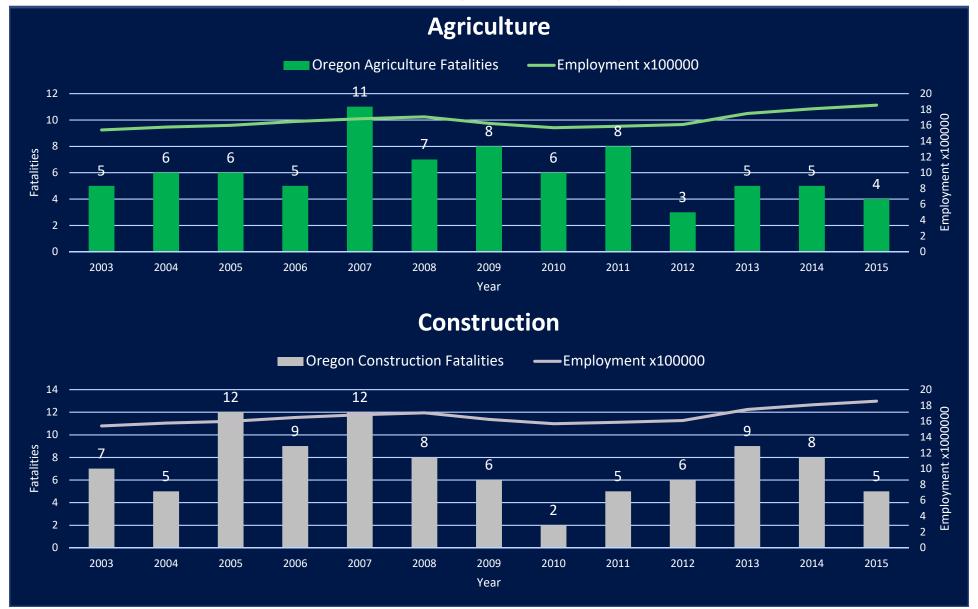


### **OR-FACE** Worker fatalities in Oregon (2003-2015) by industry



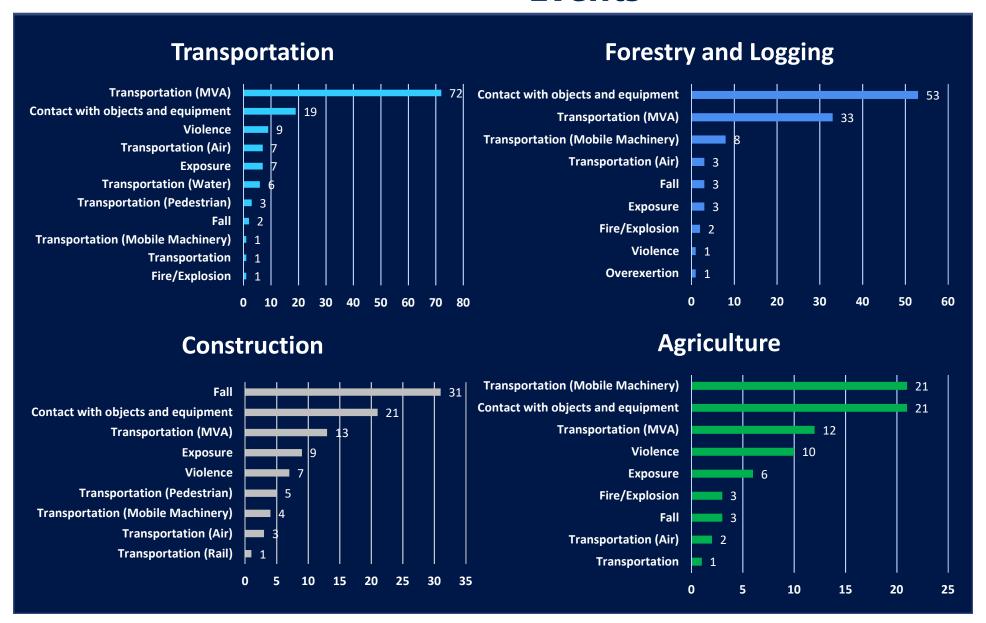


### **OR-FACE** Worker fatalities in Oregon (2003-2015) by industry (cont'd)





### **OR-FACE** Worker fatalities in Oregon (2003-2015): **Events**

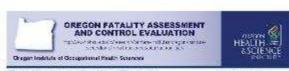




# Investigations

### **Guiding Principles**

- Maintain confidentiality
- Provide facts
- Provide best practice recommendations
  - Beyond regulatory requirements
  - Hierarchy of controls



#### **Fatality Investigation Report**

DR 2014-42-1

#### Forestry worker in vehicle killed from timber falling activity

#### SUMMARY

On November 4, 2014 / 55-years olding quality specialist employed by a timber lessing. organization was alled when her vehicle was struct by a tree that was cit, by a faller." This occurred within an active logging area that included cable yarding at the southeast enclof the unit, and active timper tailing at the northwest and or the unit. The faller was working at the northwest end and up vill from the road (see it estration at right). A single cable flagger associated. with the cable yarding at the southeast end allowed the key quality specialist to drive under the capite and proceed proflowed Short viater she passed under the cable she was met by the owner. of the logging company who was crying from the nonthwest and toward the southeast embolities



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unit. During this step, the log quality specialist and logoling company dwher had a brieft conversation. The owner was the pink without a procure extern, and his report of what he sale was initial and ambiguous. The logging company dwher then lief to perform some work at the cost and of the site. A witness and cated the log quality specialist wasted at the loggical fine specialist wasted at the loggical fine specialists. A window of this encounter for an east 20 minutes before accessing to the positives, a riving

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## **Targeted Investigations**

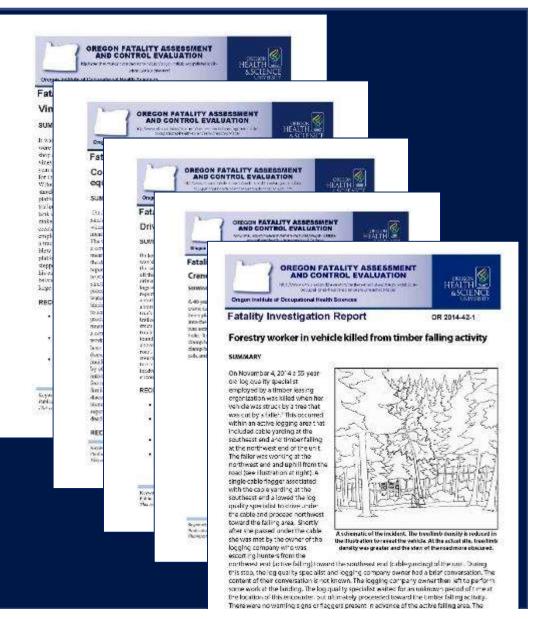
### Goals

- Prevent fatal work-related injuries
- Study work environment, workers, tasks, tools...
   and management role in controlling how these factors interact
- OR-FACE priorities
  - Portland metro (broad) & surrounding
  - Fall in construction
  - Transportation / mobile machinery
  - Temporary / contingent workers
  - Others, per collaborative partnerships
  - Multiple factors beyond OSHA scope



# Recent Investigative Reports (2015-2017)

- Vineyard worker killed in fall from trailer
- Contract sanitation worker killed cleaning meat blending equipment
- Driver killed when ejected from logging truck
- Crane operator killed by falling steel beam
- Forestry worked killed in vehicle from timber falling activity

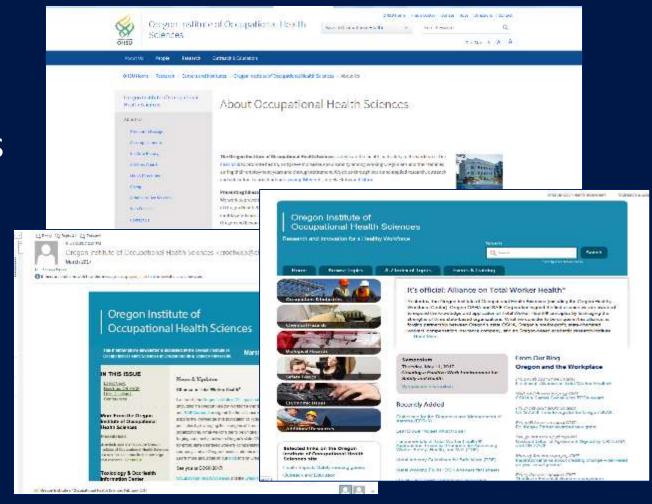




### **Outreach / Resources**

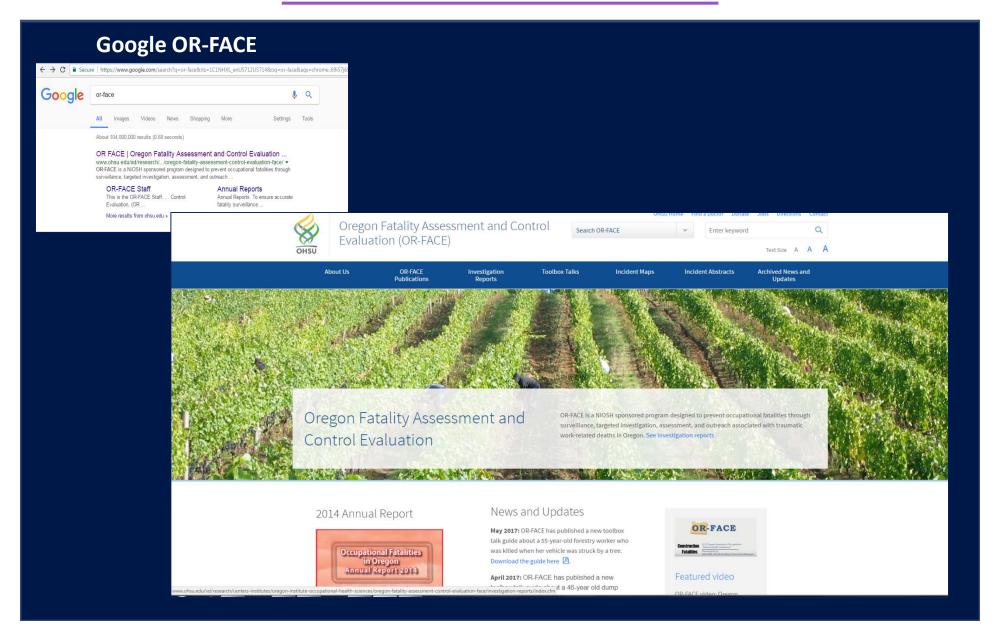
Oregon Institute of Occupational Health Sciences

- Education
- Outreach
- Publications
- Newsletter
- Blog
- Symposia
- Online videos





# **OR-FACE Website**



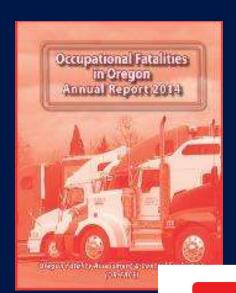


# **OR-FACE** Outreach / Publications

- Annual reports
- Interactive maps
- Safety booklets
- Toolbox talks
- Hazard alerts
- Blogs



# OR-FACE Annual Reports (since 2003)



Worker Fatalities

Season County of Incident

OR-2014-04-1

OR-2014-05-1

Contact with objects and equipment

Abstracts of fatal occupational incidents in Oregon by type of event

> 2014 Contact - Explosion - Exposure - Falls

A 27-year-old logger died from severe head trauma after being struck in the head by a branch of a falling tree. The logger was working alone and no now witnessed the event. The logger was felling a tree that appeared to be approximately 50 feet high and about 12-14 finches in diameter. It is believed that the logger did not see a lower branch coming from the trunk of the tree. The branch estimated at eight feet long and two to these inches on diameters struck him as the tree fell. He was toracted the scene and then

A 65-year-old worker died from a traumatic head injury after being struck by is a system to worker taken from a traumatic freed injury after being struck by an inadequately secured dump truck tailgate. He normally operated a street sweeper, but on this day he was operating a dump truck hauling debris. He climbed into the bed of the truck to release the pins that secure the tailgate, o the bed could be easily off-loaded. After releasing the pins, he read over the tailgate and the gate unexpectedly opened, causing him to fall to the ground. The tailgate detached from the truck and fell, resulting in the

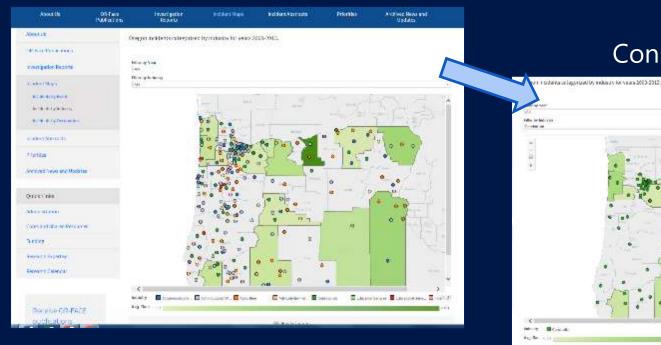
- Published 18 months
- Case abstracts, based on document review
  - OSHA investigation
  - Police investigation
  - Medical examiner reports
  - **National Transportation** Safety Board
  - **US Coast Guard**
  - **Others**



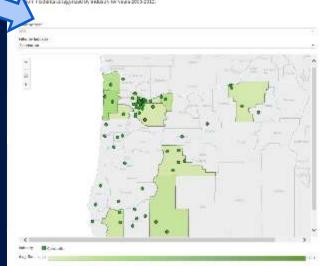
# **Interactive maps**

(2003-2013) by industry

### Industry



### Construction





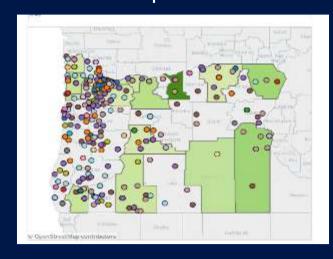
### **Interactive maps**

(2003-2013) by event, occupation

### **Event**



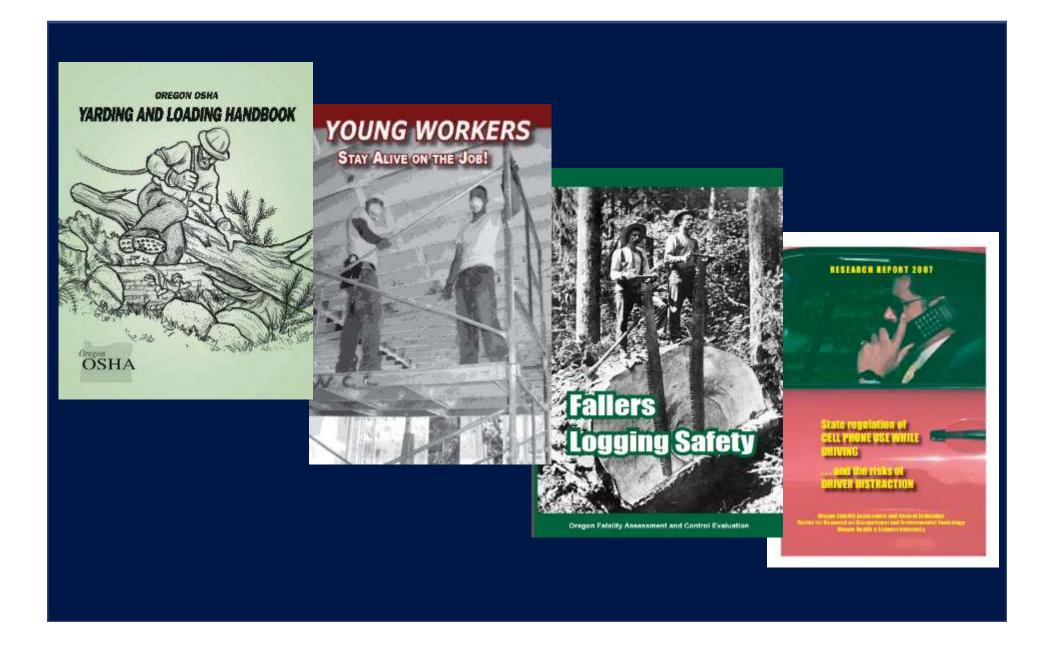
### Occupation





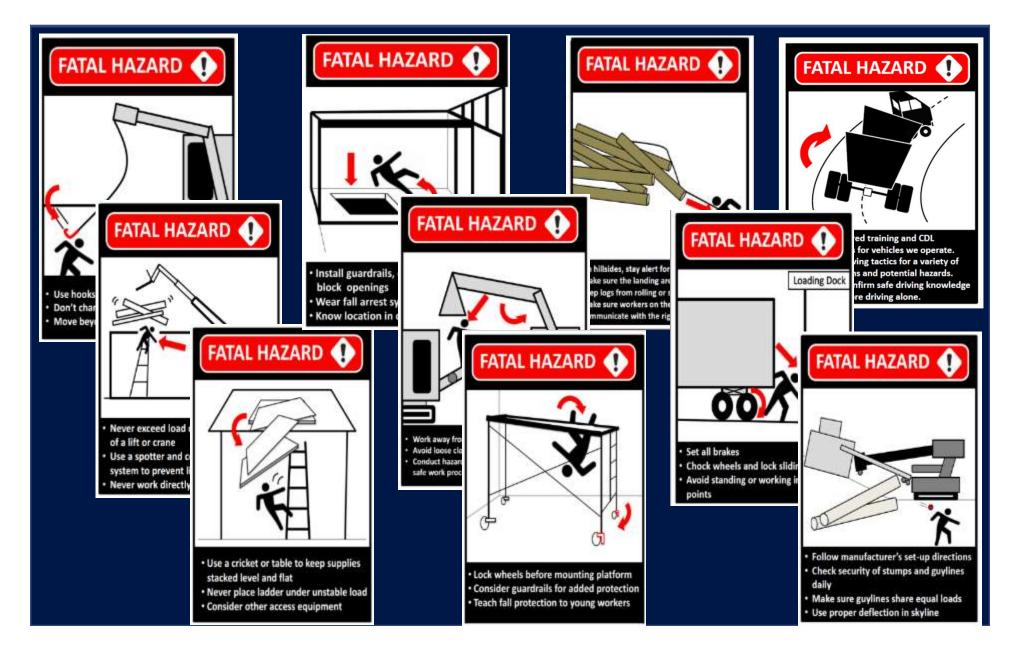


# Safety booklets





### **Toolbox Talks**





## Keep it simple...



- Never exceed load or extension limits of a lift or crane
- Use a spotter and communication system to prevent lifts over workers
- · Never work directly under a load

#### **Toolbox Talk Guide**



Load of Lumber Shifts and Falls on Construction Worker

INSTRUCTIONS: Hold the guide with this side facing you and the other side facing your crew. Then read the story.

Our safety talk today is about a 32-year-old framer from another company who died when a load of lumber fell on him. He was on a ladder to access a stairwell hole to the second level of a house while a rough terrain forklift was lifting a bundle of lumber to the same level. The lumber weighed at least 600-800 lbs more than the maximum possible for the lift arc, and the forklift tipped over. The lumber shifted and dropped on the victim's head and upper body, pinning him against the ladder. The lumber shifted again and he fell to the first floor deck. The worker probably died from being crushed before the fall.



### So here are some ways we can prevent something like this from happening where we work.

- Never exceed the load or extension limits of a lift or crane. You should be trained before you operate a lift or crane, and I can make sure you get the training.
- Never work directly under a load, or under the swing radius of a lift or crane, unless you
  are required to be there as a rigger or guide.
- Use a spotter and communication system to make sure everyone knows about lifts in advance, and to prevent material from passing over workers.

ASK: "Does anyone have more ideas or comments to share?"

Pause for discussion. Then see if there are ways to take action.

#### END WITH ACTION PLAN (ideas for what to ask or say).

- "Are there any operations we do that might cause us to push forklifts too close to their limits?"
- "Does anyone have ideas for improving our communication systems?"
- "What do you all do to make sure people are not under loads being moved?"
- · Discuss a similar situation at your current site.
- Express your commitment to training people for each machine they operate.
- Commit to follow-up at the next safety talk.



# Peer-reviewed publication

Safety Science v.86 (2016) pp.122-131

Safety Science 86 (2016) 127-131



Contents lists available at ScienceDirect

#### Safety Science





Toolbox talks to prevent construction fatalities: Empirical development and evaluation



Ryan Olson a,b,c,\*, Alexandra Varga d,l, Annie Cannon a,c, Jamie Jones a, Illa Gilbert-Jones a, Erika Zoller a,2

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#### ARTICLE INFO

Article history: Received 10 September 2015 Received in revised form 19 November 2015 Accepted 16 February 2016

#### ABSTRACT

Three studies were conducted to develop and evaluate safety toolbox talks about fatal construction inci-Increditation were conducted to developed, and establish pre-shift meetings. About state construction increditations considered to developed, and study 2 evaluated surprising pre-shift meetings. An evidence-based structure for toolbox talks was developed, and study 2 evaluated our selected line trooking illustration format with workers (n = 20, Study 3 evaluated supervisors' calls using: (1) where the toolbox galaxy surprising the surprising structure of the surprising stru investigation reports with workers from eight construction crews.

In study 1, 25% of the sample reported never conducted safety meetings. In study 2, compared to In study 1, 25% or the sample reportion never conducted safety interrugist. In study 2, compared to photos, line drawings increased the distance workers could converted identify study 3, the new format was preferred by 82% of supervisions, saved them 15 min preparation/presen-tation times, and produced (accordable impacts with workers.

Brief scripted toolbox talks made it easier for supervisors to share fatal stories and prevention recom mendations with their crews. When the format includes scripted text for the supervisors, prompts for discussion and action items, and line drawings worker understanding can be enhanced.

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#### 1. Introduction

Construction is a high risk industry with dynamic occupational hazards. The work is typically performed at dispersed locations, including multiple job sites or multiple locations within a single job site (Bureau of Labor Statistics, 2014). Industry specializations include, but are not limited to, commercial and residential construction, bridge erection, excavation, demolition, and roadway paving. Common hazards vary by trade, project, and project stage, but include falls from heights, mobile machinery, electrical exposures, falling objects, inclement weather, equipment failure, and structural collapse. The mix of contractors, trades, and workers changes as projects progress and employers must continually adapt to recruit, staff, and communicate with workers at each

http://dx.doi.org/10.1016/j.ssci.2016.02.009 0925-7535/iii 2016 Elsevier ltd. All rights reserved.

building stage (Lockver and Scholarios, 2007), These exposures contribute to elevated occupational fatality rates in construction. Globally it is estimated that 350,000 workers die each year (International Labor Organization, 2014), with 60,000 of these deaths occurring in the construction industry (The National Examination Roard in Occupational Safety and Health 2014) In the US, the current construction industry fatality rate is 9.9 per 100,000 full time workers compared to the average 3.4 rate for all US industries (Bureau of Labor Statistics, 2012). In 2012, the lar gest proportion (36%) of construction fatalities were due to falls reau of Labor Statistics, 2011).

Controlling hazards and preventing fatal injuries in construction is a multi-faceted challenge. The first priority and best safety control is to completely remove hazards from construction environments. However, when complete hazard removal or control is not possible, training and administrative controls should be applied to promote best safety practices that limit workers' exposures to hazards. In this regard, safety training and communication can set expectations, increase hazard awareness, develop knowledge and skills, and reinforce safe building practices. A traditional communication channel in construction is the safety tailgate o toolbox talk, These brief talks typically address a focused safety

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### **Hazard Alerts**

Fatal Fall Alert

### **Gravity Kills**



In 3 years, 22 Oregon workers deed in falls. Risk

increases greatly over age 35, a Fall hazards are everywhere. Fi

Please observe the following a

#### Recommendations

- Make sure ladder is in good com and tooks are secure. Set base 1 length from wall, supported at to rails extending 3-4 ft above dism
- Three-point rule: Get a firm grip of of four limbs, especially in key or
- Beware losing your balance from unexpected release of a weight y carrying or pulling, or from even

#### Fatal Stories, 2003-2005

#### ACCURA

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OR -FACE

### Snag Hazard Alert

From 2010 to 2013, 10 Gregon workers in the Logging and Forestry industries filed after being struck by frees. Hung limbs and snags in trees are a recurring contributing factor to occupational fatalities among tree fallers in Oregon.

#### Please observe the following safety tips:

- Scan for hung or snagged trees and limbs in your own and ofti communicate with each other about these hazards.
- When faced with a hazardous situation, stop work and seek as a cutting partner, or a more experienced worker.
- If a strag or frang-up is identified, after senting assistance, wo identify the best method for all evisiting the frung limb, time or sr working under a lodged tree or the cutting of a tree where and
- Employers should ensure that workers are trained and undersito snagged or fung limbs and other hazardous logging condition.

#### **Fatal Stories**

Case 1: A 28 year-old self-exployed tree culties was littler gifter in was struck by a disologed protop and created indexen pre-condy helide logs, and underform? The victoria had not a small second growth less that if had have go in another tree as if lot, if to was alwaying to fall a sortion target from when the begind has been been self-less the less when the begind has been been self-less the less than the proton that the proton that the proton is a sortion to the proton that the proton that the proton is a sortion to the proton that the proton is a sortion to the proton that the proton is a sortion to be proton to be a sortion to the proton that the proton is a sortion to be a sortion to the proton to be a sortion to be

when the lodged two bride from and fail on two Cape, 25: AS1 your old logger was silled after the was struck by a safety smap that may caught in the few the was carting. He was exchang on a shoop failude, and the partner was 255-231 yards away the partner sparched for the water after the had not hayoff the witter's saw in 40 minutes. He found the yetter dated with a two on top of fain. The yetter failude and had been as the safety of the partner of the partner of the logging opportune of.

Case 3: A 45-year-old tree faller man falled after a energed tree tell on top of farm. The vector was working as an independent contractor calling book the had just falled a large farm ma hillinite, which upmated a retire free on its way down. The rotain tree hit the eleters for understarts. He was ecident. The voters of equips.

Case 4: A 41-year-divisor for the back was excised in the back was excised as port curified alder traces or member where waste, was to intend for their part performed for a seekly gurrow's sale. He will have for the back and her taken down local large backet pack for a clien and dies it down it mostly tree, which as to be man again and far was consuctous when on the way is due to be the part of the her way to the her and the way to be the second to t

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### **Crab Fishing Hazard Alert**

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#### Please observe the following safety tips:

- Wear personal flotation device whenever on deck and every time the i crossed
- . Train crew on man-overboard procedures and practice at least month
- Use the most current weather forecasts and bar information
   Use personal locator beacons that are water activated for visibility
- Get vessel stability evaluations to aid in loading properly
- Utilize Coast Guard vessel inspections

#### **Fatal Stories**

Case 1. The 42 year of the roat foot against survived when the vested he was confirm packaged out was gashed up on the galary. We creak members (44 and 16 years eith respectively) shart of the foot (45 and 67 years eith respectively) shart of the foot package of the package o

Case 2: A 69 wor old crab tool capitals was filled when the vesces he was operating capitales. The writin was part of a fishing crew of those people truit

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Case 5. A 39 year of contraryout them has seen the histographic operation. Without had considered in after an unique, bitters. Without see consider for high many properties of the product of the product had been been been seen on the boat. Inside regional and aside to books the man. The search was supported histographic productions. One of the leave votines backed construct 5 days laber the use of personal floodium devices described in the reports.

#### PLEASE POST

Oregon Fatality Assessment and Control Evaluation (503)494-22

### OR FACE ALERT

#### -Fellow manufacturer's instructions

Multiple Oregon construction deaths have been linked to not following manufacturer's instructions for equipment or building materials. Three example cases are described below. Using manufacturer's instructions in training, and consulting them before operations, can save lives.

For complete fatality investigation reports vise the OR-FACE website.

#### **Construction Fatal Stories**



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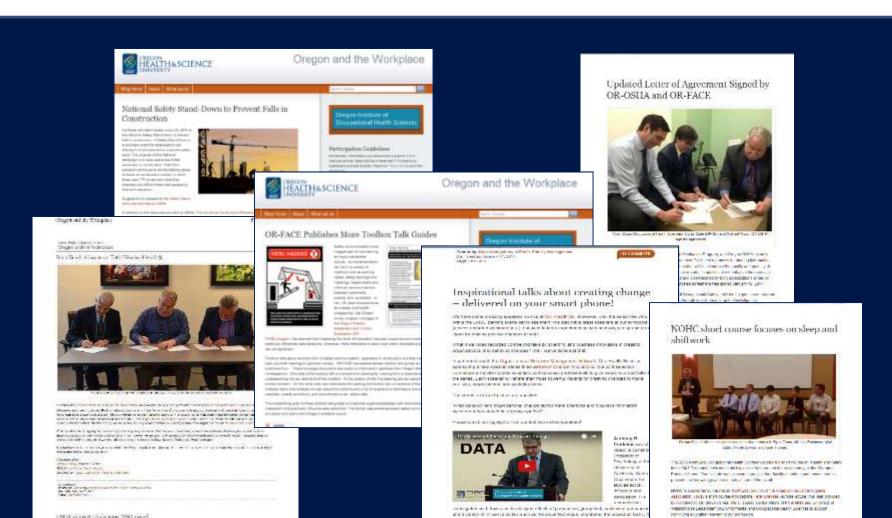
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# **Blogs**



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## **Targeted Research**

- Use knowledge gained through surveillance and investigation, e.g. identify high hazard industries, prevalent injuries, needs for prevention
- Develop and conduct field studies
- Ultimate aim: from lessons learned, produce evidence-based, practical intervention tools & methods



### **Current Research Projects**

- Social network analysis
  - Identify info pathways and opinion leaders to better target communications in high risk industries



- Preventing falls in residential construction
  - Test "trigger event" hypothesis
- Mobile toolbox talks
  - Establish & evaluate mobile marketing system to promote fatality prevention toolbox talks in residential construction







### FACE's "Bottom Line..."

- Targeted investigations
  - Identify contributing factors
  - Develop comprehensive, best-practice recommendations for preventing similar deaths
- Targeted research
  - Surveillance → investigation → identify high hazard industries, prevalent injuries, prevention needs
  - Develop and conduct field studies
- Outreach
  - Produce evidence-based, practical prevention tools & methods



# Thank you!

