

Risk of Injuries among responders to hazardous materials releases in Oregon, 1993-2005

Theodora Tsongas & Laura Boswell
Hazardous Substances Emergency
Events Surveillance System (HSEES)
Oregon Public Health Division

“... one of the attributes of a good safety culture that is a ‘must’ is ‘learning from incidents’.”

M. Sam Mannan, Director, Mary Kay O’Conner
Process Safety Center, Texas A&M University

**What Does Safety Culture
have to do with HSEES?**

Safety culture and HSEES

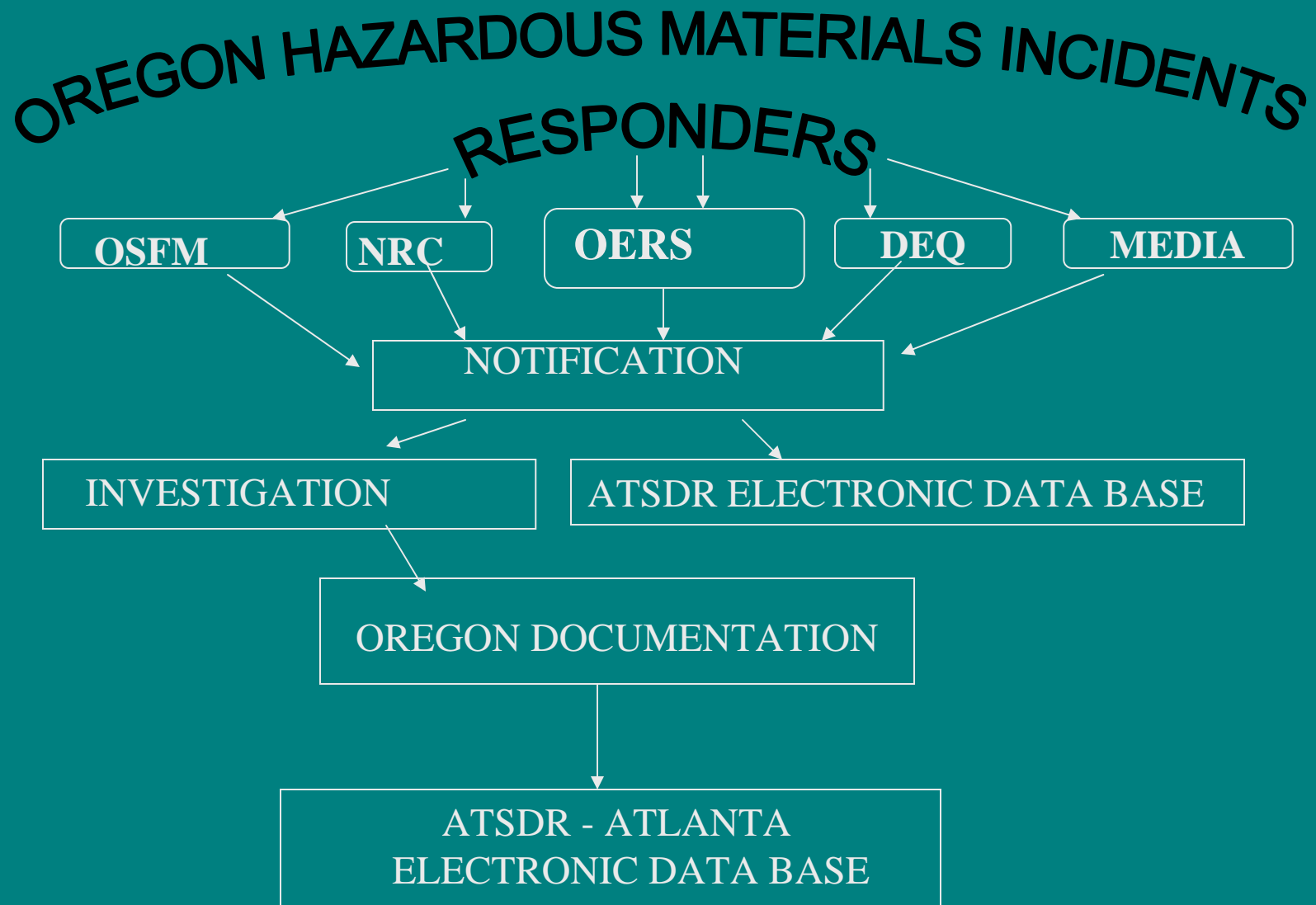
- ◆ Learning from incidents is basic to both.
- ◆ How did the incident happen?
- ◆ What processes, chemicals and people were involved?
- ◆ Systematic records of incidents are necessary.
- ◆ Analysis of collected records on incidents can help us plan to avoid incidents and injuries

HSEES is a federally sponsored surveillance program in 14 states to follow and evaluate emergency releases of hazardous materials and associated human adverse effects

HSEES Objectives

- ◆ 1. To characterize hazardous substance emergency release incidents in Oregon.
- ◆ 2. To describe morbidity and mortality associated with releases.
- ◆ 3. To identify risk factors associated with incidents and adverse effects.
- ◆ 4. To propose strategies to reduce morbidity and mortality when comparable incidents occur in the future.

Oregon HSEES Flow of Information



On-Scene Reporting Sources

- ◆ Fire Fighters
- ◆ HazMat Teams
- ◆ Law Enforcement Officers
- ◆ Company Safety & Health
- ◆ Dept Of Transportation
- ◆ Dept Of Environmental Quality
- ◆ Public Works
- ◆ Media

Timing of Incident Reports to OR HSEES:

- ◆ OERS - real time
- ◆ NRC – real time
- ◆ OSFM – 1-3 months
- ◆ USDOT/HMIS – 1 week unless injury
- ◆ News clippings – 1-6 weeks

Information needed on incidents:

- ◆ Date, time, exact location
- ◆ Identity of substance
- ◆ Amount released
- ◆ Who decontaminated
- ◆ Decontamination at scene
- ◆ Decontamination at med facility
- ◆ Evacuation? Who? How many? How long?
- ◆ Shelter-in-place ordered?
- ◆ Injuries/Symptoms reported

Information needed on injuries and victims:

treated at scene, transported, treated and released, hospitalization;
symptoms reported, age, sex;
distance from release;
if responder, type, and whether wearing personal protective equipment.

Value and Purpose of HSEES

- ◆ HSEES is not a regulatory system.
- ◆ HSEES is the only reporting system for emergency events that focuses on public health.

Value and Purpose of HSEES

- ◆ Unique ability to provide feedback on incidents to:
 - Increase safety among responders, employees, and the public.
 - Decrease the number and severity of release incidents.
 - Reduce morbidity and mortality due to incidents.

General Oregon findings: 1993-2005

- ◆ 15% of Oregon events involved injuries or illnesses.
- ◆ Employees were the most frequently injured (57%), the general public made up 34% of victims, and responders accounted for 9% of victims.
- ◆ 71% of events occurred at fixed facilities; 29% during transportation

General Oregon Findings - 2

- ◆ 48% of victims were transported to the hospital for treatment but not admitted; 31% were treated at the scene.
- ◆ Respiratory problems were the most frequently reported injuries, accounting for 39% of all injuries reported
- ◆ 67% of injured responders experienced respiratory irritation.

General Oregon Findings - 3

- ◆ 33% of injured responders and 80% of injured employees were wearing no personal protective equipment. 12% of injured firefighters were wearing "turnouts".
- ◆ 73% of employees experiencing respiratory irritation were not wearing respiratory protective equipment.

Injuries to Responders - HSEES incidents – 1993-2005 - Oregon

Type of Responder	Number	Percent
Career Firefighter (ff)	25	22%
Volunteer ff	2	2%
Unspecified ff	20	17%
Police officer	33	28%
EMS personnel	6	5%
Unspecified responder	30	26%
Total	116	100%

Injuries to Responders - HSEES incidents – 1993-2005 - Oregon

Severity of Injury	Number	Percent
Treated on scene	48	41%
Trt@hospital, NoAdmit	35	30%
Trt@hospital, Admit	2	2%
Obs@hospital, Notrt	1	1%
See private doc w/in24 hrs	2	2%
Symptoms24hrs rpt by official	24	21%
Death	3	3%
Unknown	1	1%
Total	116	100%

Frequently reported Symptoms by responders

- ◆ Respiratory problems 67 (58%)
- ◆ Gastrointestinal problems 24 (21%)
- ◆ Eye irritation 17 (15%)
- ◆ CNS symptoms 16 (14%)

* Each victim may report multiple symptoms

Most frequent chemicals released during responder injury incidents

1. Carbon monoxide
2. Chlorine
3. Ammonia
4. Sulfuric acid (battery acid)

Conclusions & Recommendations

- ◆ Responders only 9% of injured during HSEES incidents
- ◆ Many injuries can be prevented.
- ◆ Many symptoms experienced could be prevented by effective use of personal protective equipment (ppe)
- ◆ Effective PPE use requires training.

Prevention of responder injuries

- ◆ Prevent exposure to hazardous substances through use of ppe;
- ◆ Periodically
 - Revisit types of ppe being used
 - Revisit how, when, and where ppe is being used
 - Train all responders in appropriate choice, use, care and maintenance of personal protective equipment

Limitations of HSEES in Oregon

- ◆ The system is only as good as the completeness of reporting to OERS, NRC, OSFM, and other sources of incident reports & information
- ◆ The system counts acute injuries but not all exposures
- ◆ The system cannot follow victims for long-term effects

Acknowledgements

This report is supported by funds from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) trust fund and the Office of Terrorism Preparedness and Emergency Response of the Centers for Disease Control and Prevention (CDC), provided to the Oregon Department of Human Services under Cooperative Agreement #U61/TS074151 from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

For further information contact
Theodora Tsongas 971-673-0438
theodora.a.tsongas@state.or.us

or

Laura Boswell 971-673-0443
laura.e.boswell@state.or.us