



**HAZARDOUS SUBSTANCES EMERGENCY EVENTS SURVEILLANCE SYSTEM
CUMULATIVE REPORT
2002-2003**

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**STATE OF OREGON
DEPARTMENT OF HUMAN SERVICES
PUBLIC HEALTH SERVICES
ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY**

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EXECUTIVE SUMMARY

The Hazardous Substances Emergency Events Surveillance (HSEES) system, supported by the Agency for Toxic Substances and Disease Registry (ATSDR), collects information by a common protocol and on a common set of variables, to describe the public health consequences of releases of hazardous substances in 15 states. This report summarizes the characteristics of events reported to the Oregon HSEES program during 2002 and 2003. Oregon HSEES is part of the Oregon Department of Human Services, Public Health Services, Environmental and Occupational Epidemiology Section. Information about acute events involving hazardous substances was collected, including the substance(s) released, number of victims, number and types of injuries, and number of evacuations. The data were computerized using an ATSDR-provided Web-based data entry system.

A total of 538 events were reported for 2002 and 2003. There were 362 (67%) events at fixed facilities and 176 (33%) were transportation-related events. In 487 (91%) events, only one substance was released. The most commonly reported categories of substances were: "Other," "Other Inorganic," and "Volatile Organic Compounds." Of the 186 substances classified in the "Other" category, 114 (61%) were methamphetamine related chemicals. The top three primary causal factors for HSEES events were: "human error" [204 (38%)], "equipment failure" [168 (31%)], and "intentional or illegal act" [155 (29%)].

During this reporting period, 70 events (13%) involved human health impacts that resulted in a total of 305 victims, of whom 10 (3%) died. The most frequently reported symptoms were: respiratory irritation (142 victims), gastrointestinal problems (119 victims), and headache (117 victims). Most of the victims [169 (55%)] were treated at the hospital but not admitted.

Evacuation was ordered for 32 (6 %) events. Shelter-in-place was ordered for 5 events.

The five counties with the most HSEES events were: Multnomah, Umatilla, Clackamas, Washington, and Lane. When adjusted per 10,000 persons in the county population, the top five counties were: Gilliam, Umatilla, Grant, Columbia, and Linn.

Of the 538 events, 511 (95%) involved spills of liquids or solids, and 279 (52%) involved release of a vapor. Fire was involved in 32 events, and explosion was involved in nine events. 30 events involved a threatened release.

The most common responder to the HSEES events was a company response team [201 (24%)] followed by fire departments [174 (21%)], law enforcement [158 (19%)], and HazMat teams [130 (16%)].

The increased prevalence of illegal methamphetamine drug labs in Oregon over the past five years has continued to have a significant impact on the distribution of hazardous substances emergency events and on emergency response resources in the state.

INTRODUCTION

The Centers for Disease Control and Prevention defines surveillance as:

“...ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link of the surveillance chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs”[1].

Since 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) has maintained an active, state-based Hazardous Substances Emergency Events Surveillance (HSEES) system to describe the public health consequences of releases of hazardous substances. The decision to initiate a surveillance system of this type was based on a study published in 1989 about the reporting of hazardous substances releases to three national databases: the National Response Center Database, the Hazardous Materials Information System (HMIS), and the Acute Hazardous Events Database [2]. A review of these databases indicated limitations. Many events were missed because of specific reporting requirements (for example, the HMIS did not record events involving intrastate carriers or fixed-facility events). Other important information was not recorded, such as the demographic characteristics of victims, the types of injuries sustained, and the number of persons evacuated. As a result of this review, ATSDR implemented the HSEES system to more fully describe the public health consequences of releases of hazardous substances.

HSEES has four goals:

- To describe the distribution and characteristics of acute hazardous substances releases;
- To describe the morbidity and mortality among employees, responders, and the general public that result from hazardous substances releases;
- To identify risk factors associated with morbidity and mortality; and
- To identify strategies that might reduce future morbidity and mortality resulting from the release of hazardous substances.

For a surveillance system to be useful, it must not only be a repository for data, but also useful to protect public health. In the last few years, the fourth goal of the HSEES system has been emphasized, to develop strategies to reduce subsequent morbidity and mortality. Each participating state analyzes its data and develops appropriate prevention outreach activities. These activities are intended to provide industry, responders, and the general public with information that can help prevent chemical releases and reduce morbidity and mortality if a release occurs.

This report provides an overview of Oregon’s HSEES for 2002-2003, summarizes the characteristics of acute releases of hazardous substances and their associated public health consequences, and demonstrates how data from the system are translated into prevention activities to protect public health.

HSEES defines hazardous substances emergency events as uncontrolled or illegal releases or threatened releases of hazardous substances. Events involving releases of only petroleum are

not included. Events are included if (1) the amount of substance released (or that might have been released) needed (or would have needed) to be removed, cleaned up, or neutralized according to federal, state, or local law; or (2) release of a substance was threatened, but the threat led to an action (for example, evacuation) to protect the health of employees, emergency responders, or members of the general public.

METHODS

Beginning in 2002, a newly updated data-collection form, approved by the federal Office of Management and Budget, went into effect. For each qualifying event, information was collected about the event, substance(s) released, victims, symptoms reported, and evacuations.

Various data sources were used to obtain information about these events in Oregon. These sources included, but were not limited to: the Oregon Emergency Response System (OERS), the National Response Center (NRC), the Office of State Fire Marshal (OSFM), emergency responders, and the media. Census data were used to estimate the number of residents in the vicinity of the events. All data were computerized using a secure web-based data entry system located at ATSDR in Atlanta.

Events are defined as transportation-related if they occur during surface, air, pipeline, or water transport of hazardous substances, or before being unloaded from a vehicle or vessel. All other events are considered fixed-facility events.

HSEES defines victims as people who exhibit at least one symptom of an adverse health effect within 24 hours of the event or who die as a consequence of the event. Victims who experience more than one type of symptom are counted once in each applicable symptom type.

For the data analyses in this report, the substances released were categorized into 16 groups. The category “mixture” comprises substances from different categories that were mixed before the event, and the category “other inorganic substances” comprises all inorganic substances, except acids, bases, ammonia, and chlorine.

Analyses for this report were conducted using Microsoft Access 2000®, Microsoft Excel 2000®, and SAS 8e for Windows®.

RESULTS

For 2002-2003, 538 hazardous substances emergency events were reported to Oregon's HSEES: 362 events (67%) occurred at fixed facilities; 176 (33%) were transportation related events. 30 (6 %) events involved threatened releases.

The number of events in each county and the rate per 10,000 persons in each county is presented in Table 1 (p. 9). The three counties with the highest number of events were: Multnomah, Umatilla, and Clackamas. However, the three counties with the highest number per 10,000 persons were: Gilliam, Umatilla, and Grant. The high rate in Gilliam County may be due to the presence of a hazardous waste facility.

The three counties with the most fixed facility events were: Multnomah, Umatilla, and Lane. The three counties with the highest fixed facility event rate per 10,000 persons were: Gilliam, Umatilla, and Columbia.

The counties with the highest number of transportation incidents were: Multnomah, Clackamas, and Washington tied with Umatilla. The counties with the highest rate of transportation incidents per 10,000 persons were: Grant, Union and Umatilla (Table 1).

Table 1. Frequency of Events by County for Fixed Facility and Transportation Events, Oregon HSEES, 2002-2003

COUNTY	Total	Fixed	Trans	Population*	Rate/10000#	FixedRate	TransRate
Baker	3	2	1	16741	1.8	1.2	0.6
Benton	3	3	0	78153	0.4	0.4	0.0
Clackamas	41	26	15	338391	1.2	0.8	0.4
Clatsop	7	4	3	35630	2.0	1.1	0.8
Columbia	17	11	6	43560	3.9	2.5	1.4
Coos	7	7	0	62779	1.1	1.1	0.0
Crook	3	2	1	19182	1.6	1.0	0.5
Curry	5	4	1	21137	2.4	1.9	0.5
Deschutes	10	7	3	115367	0.9	0.6	0.3
Douglas	17	9	8	100399	1.7	0.9	0.8
Gilliam	2	2	0	1915	10.4	10.4	0.0
Grant	4	2	2	7935	5.0	2.5	2.5
Hood River	5	2	3	20411	2.5	1.0	1.5
Jackson	22	15	7	181269	1.2	0.8	0.4
Jefferson	2	0	2	19009	1.1	0.0	1.1
Josephine	3	3	0	75726	0.4	0.4	0.0
Klamath	13	10	3	63775	2.0	1.6	0.5
Lake	1	1	0	7422	1.4	1.4	0.0
Lane	35	27	8	322959	1.1	0.8	0.3
Lincoln	7	6	1	44479	1.6	1.4	0.2
Linn	30	24	6	103069	2.9	2.3	0.6
Malheur	4	3	1	31615	1.3	1.0	0.3
Marion	29	22	7	284834	1.0	0.8	0.3
Multnomah	159	95	64	660486	2.4	1.4	1.0
Polk	7	4	3	62380	1.1	0.6	0.5
Tillamook	2	2	0	24262	0.8	0.8	0.0
Umatilla	48	37	11	70548	6.8	5.2	1.6
Union	5	0	5	24530	2.0	0.0	2.0
Wasco	2	0	2	23791	0.8	0.0	0.8
Washington	37	26	11	445342	0.8	0.6	0.3
Yamhill	8	6	2	84992	0.9	0.7	0.2

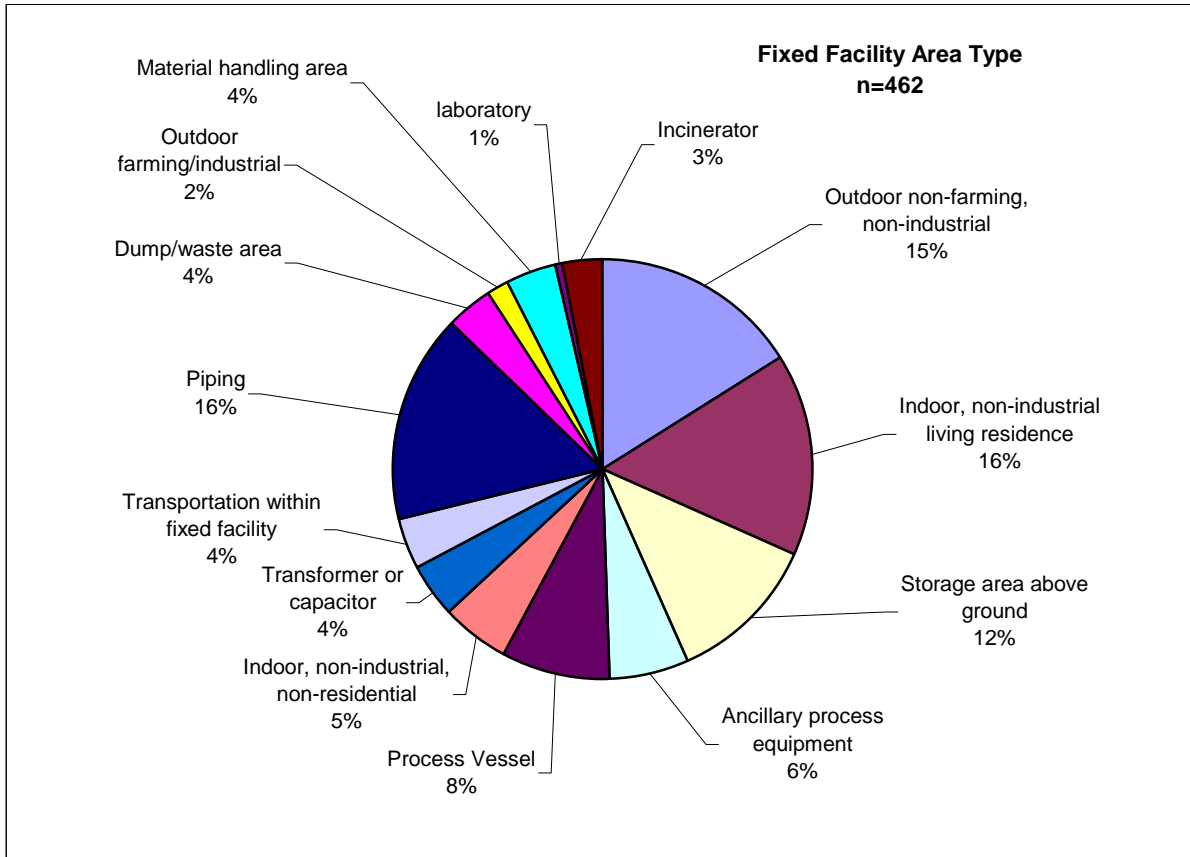
*County population, 2000 Census

Rate per 10,000 persons

Fixed Facility Events

At fixed facilities, events occurred most frequently in indoor, non-industrial (living) residence areas (16 %) and in piping areas (16 %), followed by outdoor, non-farming, non-industrial areas (15 %), and in storage areas above ground such as tanks, storage sheds, or warehouses (12 %) (Figure 1).

Figure 1. Location of Events at Fixed Facilities, Oregon HSEES, 2002-2003

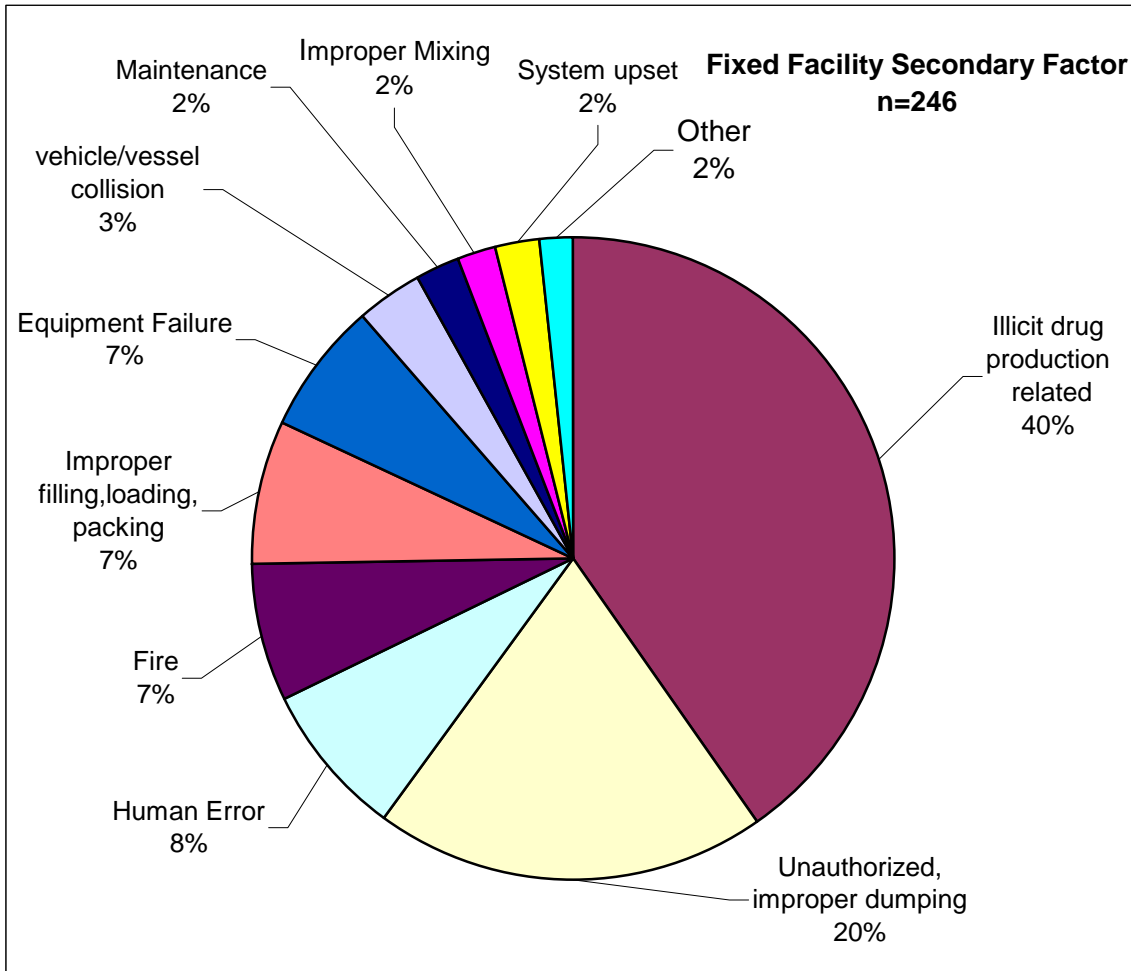


For the 362 fixed-facility events, the top three primary contributing factors were: intentional/illegal act [138 (38%)], equipment failure [111 (31%)], and human error [102 (28%)] (Table 2). The top three secondary contributing factors were: illicit drug production [97 (27%)], unauthorized/improper dumping [47 (13%)], and human error [18 (5%)] (Figure 2).

Table 2. Primary contributing factors for Fixed Facility and Transportation events, Oregon HSEES, 2002-2003

Primary Factor	Fixed Facility # (%)	Transportation # (%)
Equipment Failure	111 (31%)	57 (32%)
Human Error	102 (28%)	102 (58%)
Intentional/Illegal Act	138 (38%)	17 (10%)
Weather/Natural Disaster	6 (2%)	0 (0%)
Other	5 (1%)	0 (0%)

Figure 2. Secondary Factors at Fixed Facility Events, Oregon HSEES, 2002-2003



A total of 435 substances were released in the fixed facility events. In 326 (90%) of the fixed facility events, only one substance was released. The three most commonly released substances were: methamphetamine chemicals [94 (22%)], ammonia [30 (7%)], and transformer oil [15 (3%)].

There were 261 victims affected during fixed facility events. Employees [138 (58%)] were the most common victim followed by the general public [57 (24%)], students [47 (20%)], and responders [19 (8%)]. The three most common victim injuries were: gastrointestinal problems (includes nausea and vomiting), respiratory problems, and headaches. Most of the victims were treated at the hospital but not admitted (61%). There were five deaths reported for fixed facility events during this two-year period.

Transportation events

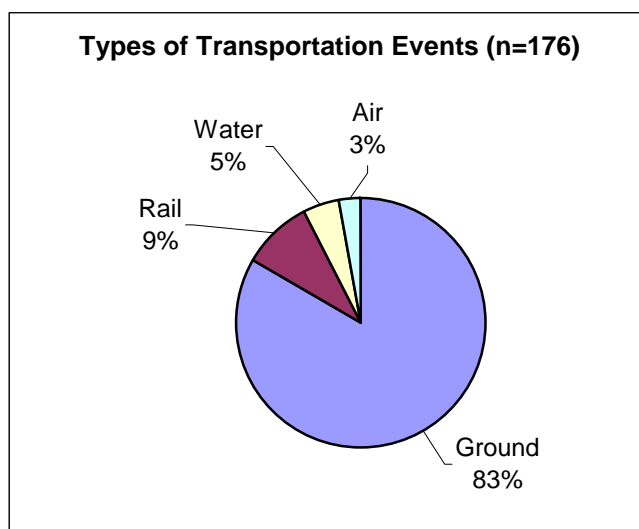
For the 176 transportation events, the most common primary contributing factor was human error [102 (58%)] followed by equipment failure [57 (32%)], and intentional/illegal acts [17 (10%)]. The most common secondary contributing factor was improper filling/loading followed by vehicle collision, and illicit drug production.

Ground transportation (truck, van, or tractor) was the dominant mode involved in the transportation events [146 (83%)], whereas, only 16 events (9 %) involved transport by rail (Figure 3). Of the ground transportation releases, 70 (48%) involved tanker trucks, and 23 (16%) involved non-tanker trucks. Most of the transportation releases occurred while the vehicles were in motion [75 (43%)], with fewer during loading/unloading [60 (34%)]. (For consistency, a release of a hazardous substance during a vehicle collision or motor vehicle accident was considered to have occurred while the vehicle was in motion.)

A total of 202 substances were released in the 176 transportation events. In 161 (91%) of these events only one substance was released. The three most commonly released substances in transportation events were: hydraulic fluid/oil, methamphetamine related chemicals, and ammonia.

There were 44 victims in 23 (13%) of the transportation incidents. Of the 44 victims, employees (47%) made up the largest category, followed by the general public (41%), and responders/hospital personnel (11%). The most common injuries in transportation events were: respiratory problems, trauma, and eye irritation. 25% of the victims were treated at the hospital but not admitted. 18 % were observed at the hospital without treatment, and 18% were treated at the hospital and admitted. There were five deaths in the transportation events.

Figure 3. Types of transportation events, Oregon HSEES, 2002-2003



Substances

The 637 substances released in the 538 HSEES events were divided into 16 categories. The most common substance category was the “other” (29%) category followed by “other inorganic” (10%) and “volatile organic compounds” (9%). Of the 186 substances classified in the “other” category, 114 (61%) were methamphetamine related chemicals.

Methamphetamine chemicals were involved in 109 (20%) of the Oregon HSEES events. The three counties with the greatest number of methamphetamine related HSEES events were: Multnomah, Umatilla, and Linn. In terms of methamphetamine events as a percentage of their HSEES events, the top three counties were: Baker, Lincoln, and Malheur.

In 487 (91%) events only one substance was released. Two substances were released in 27(5%) events, and approximately 5 % of events involved the release of more than two substances (Table 1), p. 9. Fixed-facility events were only slightly more likely than transportation events to have two or more substances involved in an event (10 % vs. 9 %).

Table 3. Number of substances per event by type of event, Oregon HSEES, 2002-2003

No. substances	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total substances	No. events	%	Total substances	No. events	%	Total substances
1	326	90%	326	161	91%	161	487	91%	487
2	18	5%	36	9	5%	18	27	5%	54
3	6	2%	18	3	2%	9	9	2%	27
4	8	2%	32	2	1%	8	10	2%	40
≥ 5	4	1%	29	1	1%	6	5	1%	35
Total	362	100	441	176	100	202	538	100	643

The individual substances most frequently released were: methamphetamine related chemicals, ammonia, hydraulic fluid/oil, and paint and coatings (Table 4).

The substance categories most commonly released at fixed-facilities were: “Other” [149 substances (34 %)], “Other inorganic substances” [43 (10 %)], and “Volatile organic compounds” [37 (9 %)]. In transportation events, the most commonly released categories were: “Other” [37 (19 %)], “pesticides” [25 (13 %)], and “volatile organic compounds” [23 (12 %)] (Table 5).

Table 4. Ten Substances most frequently released or threatened, Oregon HSEES, 2002-2003

Substance	# of times involved
1. methamphetamine related chemicals	114
2. ammonia	38
3. hydraulic fluid/hydraulic oil	34
4. paint or coating	28
5. transformer oil/PCBs	23
6. antifreeze/ethylene glycol	15
7. hydrochloric acid	14
8. chlorine	10
9. phosphorus	10
10. sodium hydroxide	9

Table 5. Number of substances involved by substance category and type of event, Oregon HSEES, 2002-2003

Substance category	Type of event				All events	
	Fixed facility		Transportation			
	No. substances	%	No. substances	%	No. substances	%
Acids	22	5%	19	10%	41	7%
Other*	149	34%	37	19%	186	30%
Mixture†	10	2%	2	1%	12	2%
Ammonia	32	7%	10	5%	42	7%
Bases	5	1%	14	7%	19	3%
Chlorine	14	3%	2	1%	16	3%
Other inorganic substances‡	43	10%	21	11%	64	10%
Paints & dyes	26	6%	11	6%	37	6%
Pesticides	20	5%	25	13%	45	7%
Polychlorinated biphenyls	7	2%	0	0%	7	1%
Volatile organic compounds	37	9%	23	12%	60	10%
Formulations	1	<1%	1	1%	2	<1%
Hetero-Organics	7	2%	1	1%	8	1%
Hydrocarbons	24	6%	12	6%	36	6%
Oxy-Organics	31	7%	14	7%	45	7%
Polymers	4	1%	6	3%	10	2%
Total¶	432	100	198	100	630	100

* Not classified

† Substances from different categories that were mixed prior to the event

‡ All inorganic substances except for acids, bases, ammonia and chlorine

¶ Seven substances were excluded because they were not assigned a substance category

Industries

Industry sectors with the most frequent HSEES events were the transportation industry [124(32%)] and the manufacturing industry [69(18 %)] (Table 6). The industries reporting the most frequent events with injuries were retail trade, followed by professional services, and business and repair services. The greatest number of victims reported for one incident occurred in the agricultural sector with 85 persons affected.

Table 6. Industry sectors** involved in hazardous substance events by category, Oregon HSEES, 2002-2003

Industry category	Total events		Events with victims		Percentage all events with victims	Total no. victims (range)*
	No.	%	No.	%		
Agriculture	12	3	3	25	6	97 (3-85)
Mining	1	<1	0	0	0	0
Construction	14	4	3	21	6	6 (1-3)
Manufacturing	69	18	7	10	14	13 (1-3)
Transportation	124	32	11	9	22	17 (1-3)
Communications	0	0	0	0	0	0
Utilities	40	10	2	5	4	3(1-2)
Wholesale trade	12	3	3	25	6	4 (1-2)
Retail trade	11	3	5	45	10	26 (1-15)
Finance	3	1	0	0	0	0
Business and repair svcs	11	3	3	27	6	5 (1-3)
Entertainment	1	<1	0	0	0	0
Professional services	16	4	6	38	12	54 (1-44)
Public administration	37	9	3	8	6	21 (3-15)
Unspecified and unknown	41	10	5	12	10	13 (1-8)
Total	392	100	51	13	100	259 (1-85)

** Only major categories of industry are included (146 non-industry events missing)

* Range of number of victims per event with victims

Victims

A total of 305 victims experienced symptoms in 70 events (Table 7). Of these events, 32 (46%) had only one victim, 18 (26%) events had two victims, and 20 (28%) events had three or more victims. Gender and age were not known for the majority of victims.

Employees of affected industries [159 (52%)] were the most common victims, followed by the general public [75 (25%)], students [47 (15%)], and responders [24 (8 %)] (Figures 4 & 5). Nineteen emergency response personnel were injured in fixed-facility events. Of those, 2 were police officers, 1 was a career firefighter, and 2 were volunteer firefighters (Figure 4). Five emergency responders were injured in transportation-related events (Figure 5). All but three of the student victims were injured in a single event involving a carbon monoxide release.

Table 7. Frequency of victims by type of event, Oregon HSEES, 2002-2003

No. victims	Type of event						All events		
	Fixed facility			Transportation					
	No. of events	%	Total victims	No. events	%	Total victims	No. events	%	Total victims
1	20	43	20	12	52	12	32	46	32
2	11	23	22	7	30	14	18	26	36
3	8	17	24	2	9	6	10	14	30
4	1	2	4	1	4	4	2	3	8
5	0	0	0	0	0	0	0	0	0
≥6	6	13	191	1	4	8	7	11	199
Total	47	100	261	23	100	44	70	100	305

For the 305 victims, carbon monoxide was the most common substance released [140 (46%)]. Two carbon monoxide releases were responsible for 137 victims.

The three most frequent symptoms reported were: respiratory problems, gastrointestinal problems (includes nausea and vomiting), and headaches. Most of the victims [169 (55%)] were treated at the hospital but not admitted.

A total of 10 deaths occurred in six events. Of the ten deaths associated with HSEES events during this time period, two are attributed indirectly to the substance that ignited, causing an explosion of a process vessel. The eight remaining deaths were not due to the release of a hazardous substance, but occurred at incidents where hazardous substances were released. Three were firefighters who died when a roof collapsed during a fire. Five occurred during transportation events, where the deaths were due to vehicle collision.

For the 142 respiratory symptoms, none of the victims were reportedly wearing respiratory protection that could have prevented these injuries. Of the 159 employee victims, only one reported wearing any personal protective equipment (PPE). Of the 22 responder victims, 9 used some other type of PPE not categorized, 6 wore firefighter turnout gear without respiratory protection, 3 wore no PPE, and 3 wore turn-out gear with respiratory protection.

To represent the magnitude of the effects of substances involved in injuries, the number of events in a specific substance category was compared with the number of events in the same category that had victims. Substances released most often were not necessarily the most likely to result in victims (Table 8). For example, events involving the substance category “oxy-organics” constituted 7 % of all events. However, 22 % of these events resulted in injuries. Conversely, events involving “Other” substances comprised 30 % of all events, but only 8 % of these resulted in injuries.

The 305 victims reported a total of 649 symptoms (Figure 6). Some victims reported more than one symptom. Of all reported symptoms, the most common in fixed-facility events were: gastrointestinal symptoms [119 (21 %)], respiratory problems [117 (21 %)], headache [114 (20 %)], and eye irritation [55 (10 %)] (Table 9). In transportation-related events, respiratory problems [25 (35 %)], trauma [15 (21 %)], and eye irritation [9 (13 %)] were reported most frequently (Table 8). There were no reports of gastrointestinal symptoms in transportation events. In a large proportion of the instances, trauma might have resulted from a chain of events, such as a motor vehicle accident, leading to the release of a hazardous substance, and not necessarily from exposure to the substance itself.

Victims were most often treated at the hospital and not admitted (Figure 7). This is a variation from previous years where victims were most often treated on scene and not transported [3].

Table 8. Frequency of substance categories in all events and events with victims, Oregon HSEES, 2002-2003

Substance category	All events		Events with victims		
	No.	%	No.	Percentage of all releases with victims	Percentage of events with victims in substance category
Acids	41	7	9	11	22
Other†	186	30	15	18	8
Mixture‡	12	2	2	2	17
Ammonia	42	7	6	7	14
Bases	19	3	1	1	5
Chlorine	16	3	2	2	13
Other inorganic substances¶	64	10	11	13	17
Paints & dyes	37	6	4	5	11
Pesticides	45	7	11	13	24
Polychlorinated biphenyls	7	1	0	0	0
Volatile organic compounds	60	10	7	8	12
Multiple substance categories	0	0	0	0	0
Formulations	2	<1	0	0	0
Hetero organics	8	1	2	2	25
Hydrocarbons	36	6	1	1	3
Oxy-organics	45	7	10	12	22
Polymers	10	2	2	2	20
Total	630	100	83	100	13

†Not classified

‡Substances from different categories that were mixed prior to the event
 All inorganic substances except for acids, bases, ammonia, and chlorine

Figure 4. Victim Categories, Fixed Facility Events, Oregon HSEES, 2002-2003

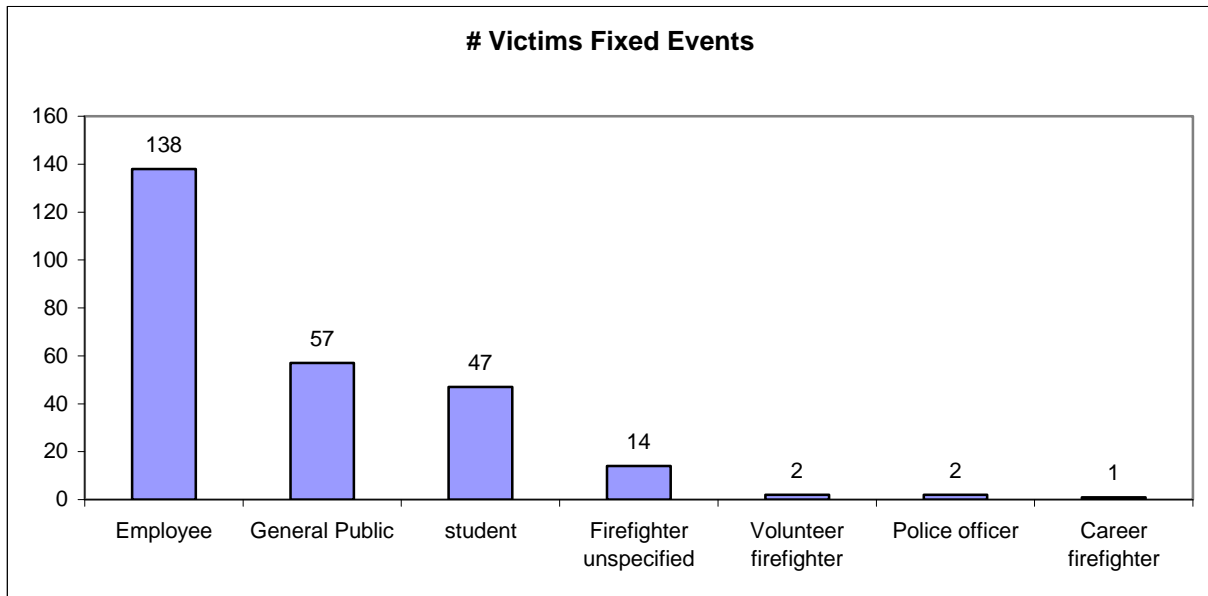


Figure 5. Victim Categories, Transportation events, Oregon HSEES, 2002-2003

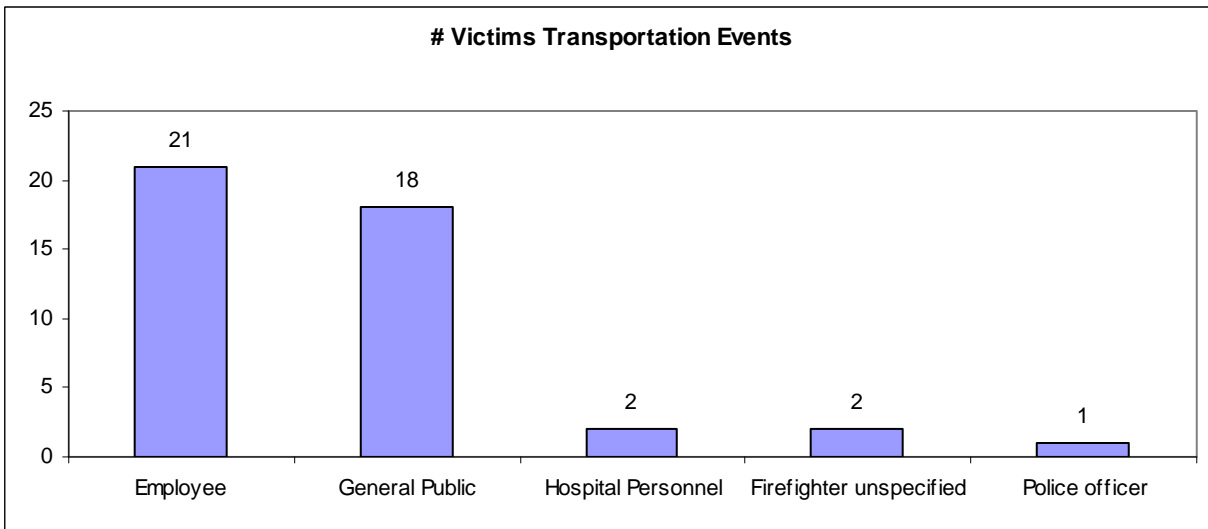


Figure 6. Symptoms reported, Oregon HSEES, 2002-2003

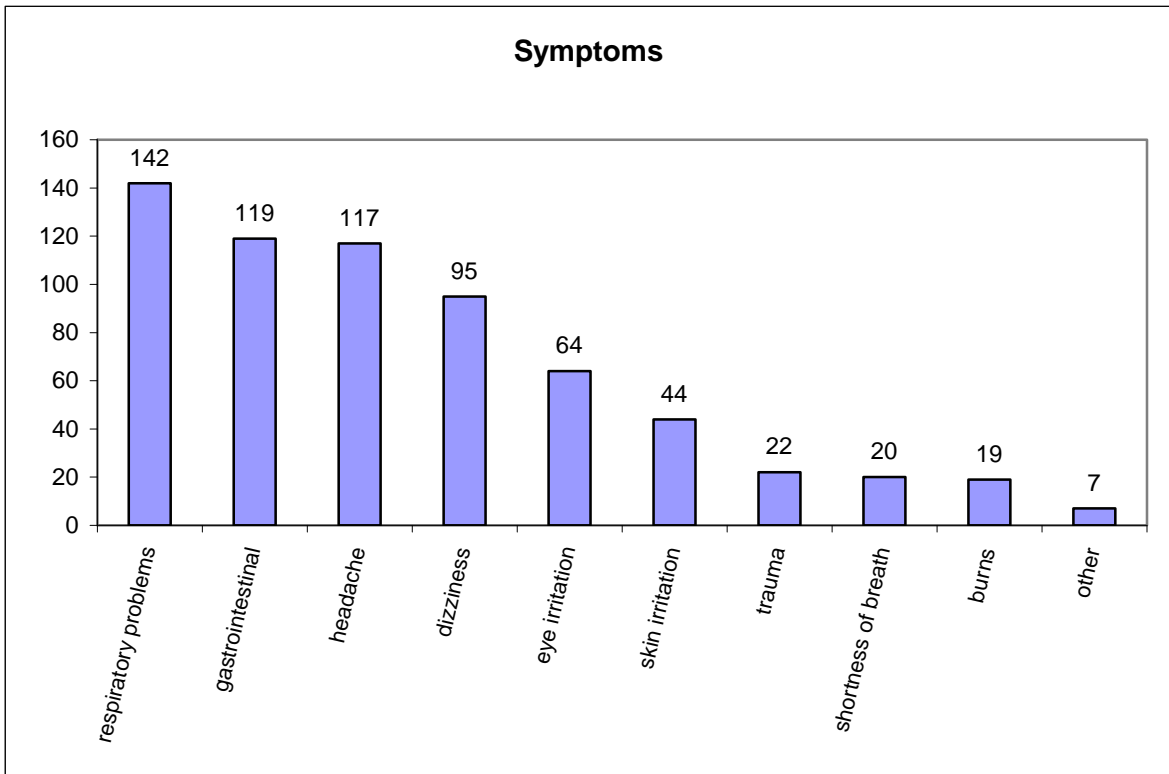
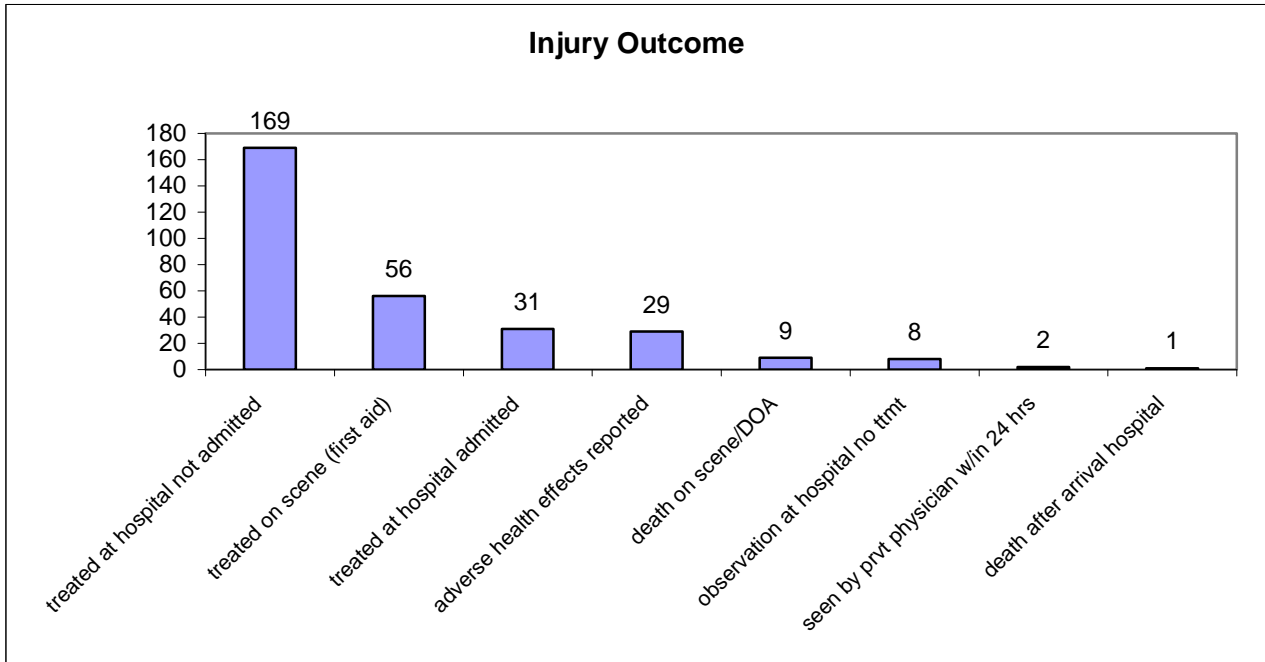


Table 9. Frequencies of injuries/symptoms by type of event, Oregon HSEES, 2002-2003

Injury/symptom	Fixed facility		Transportation		All events	
	No. injuries	%	No. injuries	%	Total no.	%
Trauma	7	1%	15	21%	22	3%
Respiratory	117	21%	25	35%	142	22%
Eye	55	10%	9	13%	64	10%
Gastrointestinal system	119	21%	0	0%	119	19%
Heat stress	0	0%	0	0%	0	0%
Chemical burns	6	1%	5	7%	11	2%
Other	1	0%	6	8%	7	1%
Skin	38	7%	6	8%	44	7%
Dizziness/ central nervous system	94	16%	1	1%	95	15%
Headache	114	20%	3	4%	117	18%
Heart problems	0	0%	0	0%	0	0%
Shortness of breath	19	3%	1	1%	20	3%
Total*	570	100	71	100	641	100

* victims could have experienced more than one symptom

Figure 7. Injury Outcome, Oregon HSEES, 2002-2003



Evacuations

Official evacuations were ordered in 32 (6%) events. Self-evacuations occurred in 23 events. In the events with official evacuations, 27 (84%) involved evacuation of the affected building or part of a building. The number of people evacuated was known for 14 events and ranged from 1 to 950 people, with a median of 40 people. Evacuation times ranged from a half hour to 132 hours; the median length of evacuation was 2 hours. Only five events had in-place sheltering ordered by an official; two of these events were illegal methamphetamine lab related.

Response

The distribution of the responders to HSEES events during 2002-2003 is as follows:

Company's response team	201	24%
Certified HazMat team	130	16%
Fire Department	174	21%
Law enforcement agency	158	19%
Environmental agency	45	5%
EMT	27	3%
Hospital personnel	4	<1%
Health Department	5	<1%
EPA Response team	2	<1%
No response	42	5%
Other	40	5%

A total of 828 responses were reported by various agencies for the 538 HSEES events that occurred in Oregon during this time period. Response to many events was made by more than one category of responder.

ILLEGAL METHAMPHETAMINE LABORATORIES IN OREGON

The rising prevalence of illegal methamphetamine drug labs in Oregon during the past five years has had a significant impact on the distribution of hazardous substance emergency events as well as putting a strain on emergency response resources in the state.

The impact is seen in HSEES statistics in changes in the frequency of events by county, where previously the presence of a large thoroughfare explained higher numbers of transportation events. Rural counties are seeing an increase in meth labs due to meth addicts trying to escape detection; at the same time, the real numbers of labs are not known because of the lack of law enforcement capability in small jurisdictions or large remote areas. Funding of HazMat teams, firefighters and law enforcement continues to be an issue in the state.

Other indicators of the extent of this problem from HSEES data are the following:

The most commonly reported substances released during 2002-2003 were methamphetamine related chemicals; this is in spite of the fact that meth labs that have not been “cooking” within the past 72 hours are not included in the HSEES database, nor are meth wastes or dumps of unknown age. In the past (1993-1998), ammonia and chlorine were the most frequently released chemicals, and chlorine was most often associated with injuries, ammonia ranked fourth in victim events. During 2002-2003, chlorine ranked eighth in number of releases, and ninth in victim events; ammonia ranked second in prevalence of releases and eighth in victim events. The “Other” category of substances was the most commonly reported category; 61% of the substances in this category are methamphetamine related chemicals. Of factors involved in the releases, deliberate damage/illegal activity increased from 13% to 29% of events.

Oregon HSEES will continue to track these changes in HSEES events in future reports.

DISCUSSION & CONCLUSIONS

The data on which these findings are based have the following major limitations. First, we conclude that there is underreporting from all sources. Secondly, information on some variables such as age and gender of victims is often unavailable. Thus we cannot calculate reliable estimates of the impact of spills and releases on certain segments of the population. Furthermore, this surveillance system does not include petroleum spills, which make up a large proportion of the hazardous materials releases in the state. As a result, the relative number of fixed facility to transportation events may not reflect the true ratio of these events in the state. More petroleum releases are associated with transportation events than fixed facilities, and these would be excluded from analysis.

The impact of illicit methamphetamine use and manufacture in Oregon has increased drastically through 2002-2003, and this impact is reflected in our findings from the HSEES system. Even though the methamphetamine and associated chemical releases reported here are a small portion

of those identified (only “cooking” labs) they have caused a rapid change in the character of usual hazardous spill events in Oregon and elsewhere. The methamphetamine ‘epidemic’ is changing where and how people are exposed to hazardous materials.

PREVENTION ACTIVITIES

In order to provide information on its findings, during 2002-2003 the Oregon HSEES program performed various prevention-outreach activities. These activities included distributing general information on the HSEES system, working with community emergency planning groups, and presenting specific information from analysis of data obtained by this program.

- Developed and distributed a fact sheet on Oregon HSEES*
- Published and distributed report on hazardous chemical releases in schools and other settings where children are present*
- Participated as member of Oregon’s Local Emergency Planning Committee
- Presented HSEES findings to Community Awareness Emergency Response (CAER) groups
- Prepared, published and distributed 1998-2001 Cumulative Report on Oregon HSEES findings*

*available on web site

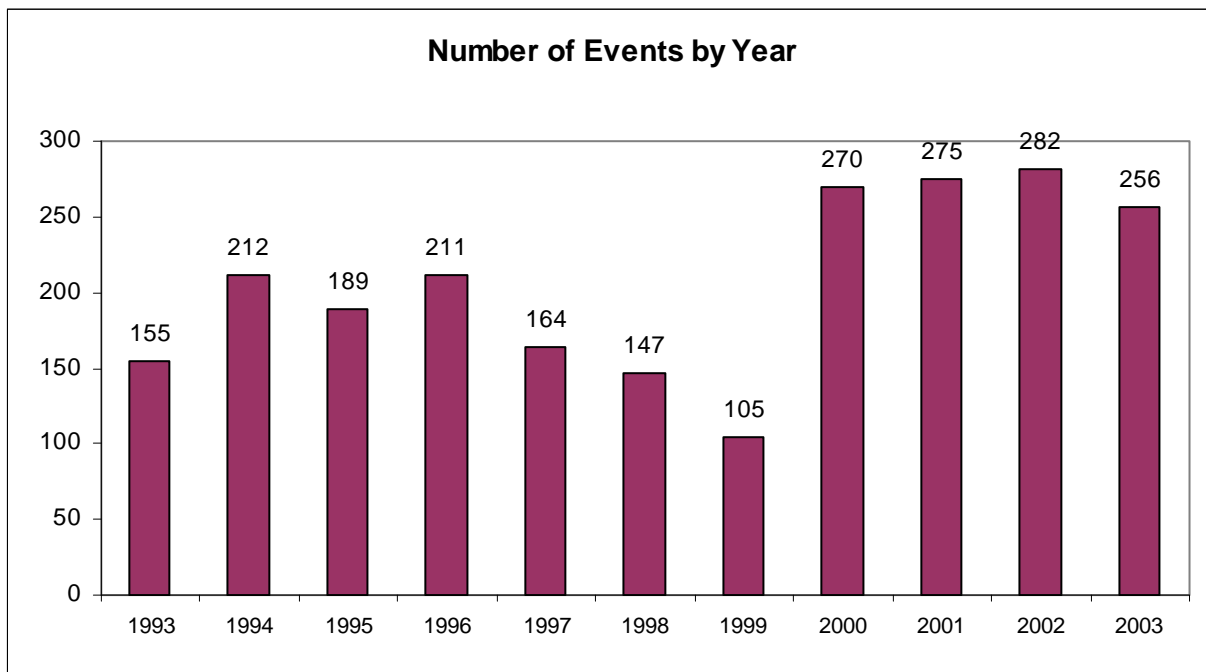
Reports and other information on Oregon HSEES can be found at:

<http://egov.oregon.gov/DHS/ph/hsees/>

SUMMARY OF RESULTS, 1993-2003

During 1993–2003, the largest proportion of events has occurred in fixed facilities (Table 10). The number of reported transportation-related events varies by year. The total number of events reported to Oregon HSEES has increased over time (Figure 8). The increase in the number of events may have been due to the expansion of reporting sources and to the improvements made by reporting agencies.

Figure 8. Number of events by year, Oregon HSEES, 1993-2003.



Findings from the Oregon HSEES data analyses indicate that the number of victims has gradually increased over time (Figure 9). However, the proportion of events with victims has slightly decreased over the years to a little less than the average of 15.8% (Table 10).

The distribution of the types of injuries reported has changed gradually from a preponderance of respiratory irritation to an increase in the number of gastrointestinal symptoms reported, at least at fixed facilities. However, previous to 1999, nausea and vomiting were a separate category from gastrointestinal problems, thus diluting the numbers in these categories.

For transportation events, however, there were no gastrointestinal symptoms reported, so respiratory symptoms are still the most prevalent overall.

The severity of incidents seems to have changed: in the past, victims were most frequently treated on scene. For the 2002-2003 time-period, the victims have been most frequently treated at hospital and released. It is not known whether this is due to changes in policies for responders or related to the type or severity of incidents occurring. The number of deaths associated with events continues to suggest the need to evaluate, not only the danger posed by exposure to hazardous substances, but also the circumstances surrounding the events (e.g., a

crash resulting from high-speed travel of a truck pulling an ammonia tank). Employees continue to be the most commonly reported victims of emergency events, followed by members of the general public, students, and responders, with slight increases in the proportion of the general public and students affected, over previous years.

Figure 9. Number of victims by year, Oregon HSEES, 1993-2003

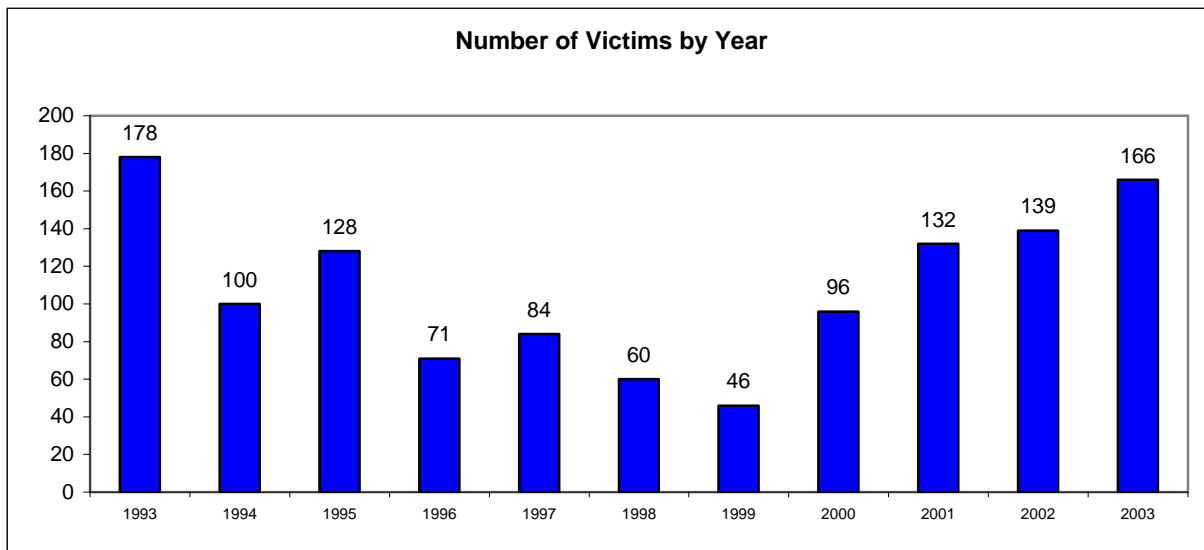


Table 10. Cumulative data by year, Oregon HSEES, 1993-2003*

Year	Type of event			No. substances Involved	No. victims	No. deaths	Events with victims	
	Fixed facility	Transportation	Total				No.	%†
1993	120	35	155	165	178	0	35	22.6
1994	167	45	212	255	100	0	42	19.8
1995	148	41	189	230	128	0	29	15.3
1996	135	76	211	237	71	0	32	15.2
1997	103	61	164	234	84	2	35	21.3
1998	100	47	147	180	60	3	26	17.7
1999	80	25	105	158	46	1	18	17.1
2000	178	92	270	322	96	2	34	12.6
2001	213	62	275	361	132	1	36	13.1
2002	173	109	282	319	139	5	31	11.0
2003	189	67	256	318	166	5	39	15.2
Total	1606	660	2266	2779	1200	19	357	15.8

* Numbers in the table may differ from those reported in previous years because of adjustments in HSEES qualification requirements for events

† Percentage of events with victims among total events

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3. *Oregon HSEES, Hazardous Substances Emergency Events Surveillance (HSEES) System Cumulative Report, 1998-2001. January 2003*