

# Utah Hazardous Substances Emergency Events Surveillance

**Annual Report  
2005**



**Utah Department of Health  
Office of Epidemiology  
Hazardous Substances Emergency Events Surveillance (HSEES)  
Prepared by Louise Saw**



**The Utah HSEES program is supported with funds from the CERCLA trust fund, and the Office of Terrorism Planning and Emergency Response of the CDC, and provided by the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, US Department of Health and Human Services under Cooperative Agreement Number U61/ATU866932**

## *Contents*

	Page
List of Tables.....	2
List of Figures.....	3
Executive Summary.....	4
Introduction.....	5
Methods.....	7
Results.....	8
Industries.....	10
Substances.....	11
Victims.....	12
Nearby populations.....	14
Evacuations.....	15
Decontamination.....	15
Response.....	16
2005 Prevention Outreach Activities.....	16
Summary of Results, 2000–2005.....	18
References.....	20
Appendix – Tables and Figures.....	21

### *List of Tables*

- Table 1. The ten substances most frequently involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 2. Number of events meeting the surveillance definition, by county and type of event— Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 3. Number of substances involved per event, by type of event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 4. Industries involved in hazardous substance events, by category—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 5. Number of substances involved, by substance category and type of event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 6. Number of victims per event, by type of event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 7. Frequency of substance categories in all events and events with victims—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 8. Frequencies of injuries/symptoms, by type of event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 9. Distribution of personnel who responded to the event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Table 10. Cumulative data by year—Utah Hazardous Substances Emergency Events Surveillance, 2000–2005

### *List of Figures*

- Figure 1. Areas of fixed facilities involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 2. Distribution of transportation-related events, by type of transport—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 3a. Primary factors reported as contributing to events—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 3b. Secondary factors reported as contributing to events—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 4. Number of victims, by population group and type of event—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 5a. Distribution of responders injured in fixed-facility events, by type of responder—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 5b. Distribution of responders injured in transportation-related events, by type of responder—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 6. Injury disposition—Utah Hazardous Substances Emergency Events Surveillance, 2005
- Figure 7. Number of victims, by category and year—Utah Hazardous Substances Emergency Events Surveillance, 2000–2005

## **EXECUTIVE SUMMARY**

The Hazardous Substances Emergency Events Surveillance (HSEES) system, maintained by the Agency for Toxic Substances and Disease Registry (ATSDR), actively collects information to describe the public health consequences of acute releases of hazardous substances in participating states. This report summarizes the characteristics of events reported to Utah in 2005. 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 517 events were reported in 2005. In 233 (45.1 %) events, only one substance was released. The most commonly reported categories of substances were other inorganic substances, volatile organic compounds and oxy-organics. During this reporting period, 55 events (10.6 % of all reported events) resulted in a total of 176 victims, of whom one (0.6 %) died. The most frequently reported injuries were respiratory irritation, headache, and eye irritation. Evacuations were ordered for 17 (3.4 %) events.

The findings regarding the percentage of events with victims increased during 2005. The distribution of the types of injuries reported showed a decrease in dizziness/central nervous system symptoms, a decrease in gastrointestinal symptoms but an increase in eye irritation. Respiratory irritation and headaches continued to lead as type of injuries most frequently occurring. Prevention outreach efforts for 2005 focused on outreach for adult care and child care centers on the mixing of cleaning products and the dangers involved, developing a quarterly newsletter to send out to first responders, Local Emergency Planning Committees (LEPCs) and other groups that work with hazardous releases, and on increasing knowledge among Local Health Departments and methamphetamine-related hazardous substance emergency events.

## **INTRODUCTION**

The Centers for Disease Control and Prevention defines surveillance as the

“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 Material 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 several goals:

- to describe the distribution and characteristics of acute hazardous substances releases;
- to describe morbidity and mortality among employees, responders, and the general public that resulted from hazardous substances releases; and
- to develop 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 the data must also be used to protect public health.

In the last few years, the last goal of the HSEES system has been emphasized; i.e., to develop strategies to reduce subsequent morbidity and mortality by having each participating state analyze its data and develop 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 HSEES for 2005 in Utah, 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.

## **METHODS**

In 2005, fifteen state health departments participated in HSEES: Colorado, Florida, Iowa, Louisiana, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Oregon, Texas, Utah, Washington, and Wisconsin.

Beginning in 2002, a newly updated data-collection form, approved by the Office of Management and Budget, went into effect. Information was collected about each event, including substance(s) released, victims, injuries (adverse health effects and symptoms), and evacuations.

Various data sources were used to obtain information about these events. These sources included, but were not limited to, Utah Division of Environmental Response & Remediation, Utah Highway Patrol, National Response Center, Utah Poison Control Center, Department of Transportation Hazardous Materials Information System, Lexis Nexis (media alert system), media (newspaper, radio, television), local health agencies and industry. Census data were used to estimate the number of residents in the vicinity of most of the events. All data were computerized using a Web-based data entry system provided by ATSDR.

HSEES defines hazardous substances emergency events as acute uncontrolled or illegal releases or threatened releases of hazardous substances. Events involving releases of only petroleum are excluded. Events are included if (a) 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 laws or (b) the release of a substance was threatened, but the threat lead to

an action (for example, evacuation) that could have affected the health of employees, emergency responders, or members of the general public. HSEES defines victims as people who experience at least one documented adverse health effect within 24 hours after the event or who die as a consequence of the event. Victims who receive more than one type of injury or symptom are counted once in each applicable injury type or symptom. Events are defined as transportation-related if they occur (a) during surface, air, pipeline, or water transport of hazardous substances, or (b) before being unloaded from a vehicle or vessel. All other events are considered fixed-facility events.

For data analyses, the substances released were categorized into 16 groups. The category “mixture” comprises substances from different categories that were mixed or formed from a reaction before the event; the category “other inorganic substances” comprises all inorganic substances except acids, bases, ammonia, and chlorine; and the category “other” comprises substances that could not be grouped into one of the other existing categories.

## **RESULTS**

For 2005, a total of 517 acute hazardous substances events were captured by Utah HSEES: 10 (1.9%) of these events were threatened releases. There were no events in which substances were both threatened to be released and actually released. A total of 442 (85.5%) events occurred in fixed facilities. The counties with the most frequent number of events were San Juan (271 [52.4%]) and Salt Lake County (143 [27.7%]) (Table 1).

For each fixed-facility event, one or two types of area or equipment involved in the fixed facility where the event occurred could be selected. Of all 442 fixed-facility events, 71 (16.1%) reported

one type of area and two (0.5%) reported a combination of two area types. Type of area was not reported for mining, utilities, and manufacturing based on the industry code, yielding 371 (83.9%) events with no entry. Among events with one type of area reported, the main areas were classified as follows: 51 (71.8%) ancillary process equipment, nine (12.7%) storage areas above ground, three (4.2%) material handling areas (Figure 1). Of the events with two areas, both involved storage areas above ground as one of the areas. They were: One (50.0%) involved material handling area and storage area above ground and one (50.0%) involved piping and storage area above ground.

Of the 75 transportation-related events, 56 (74.7%) occurred during ground transport (e.g., truck, van, or tractor) and 18 (24.0 %) involved transport by rail (Figure 2). Fewer events involved water, air, and pipeline transportation modes. Most (98.2%) ground transportation events involved trucks. The largest proportions of transportation-related events occurred during a release en route that was later discovered at a fixed facility (35 [46.7%]) and from unloading of a stationary vehicle or vessel (14 [18.7 %]). Of the 75 transportation-related events, 14 (18.7 %) involved a moving vehicle or vessel. Of the 75 transportation-related events, 12 (16.0%) occurred from a stationary vehicle or vessel such as ones staged at a transfer station

Factors contributing to the events consisted of primary and secondary entries. Primary factors were reported for 517 (100.0%) events (Figure 3a). Of the reported primary factors, most (76.0%) fixed-facility events involved equipment failure. For transportation-related events, most (77.3%) involved human error. Secondary factors were reported for 363 (70.2%) events (Figure 3b). Of the reported secondary factors, most (42.6%) fixed-facility events involved system

process upset, and most (73.3%) transportation-related events involved improper filling, loading or packing.

More than 45.3% of all events involved the release of only one substance. Two substances were released in approximately 1.5% of the events, and approximately 53.2 % involved the release of more than two substances (Table 2). Fixed-facility events were more likely than transportation events to have two or more substances released in an event (63.1% vs. 5.3%).

The number of events by month ranged from 25 (4.9%) in April to 59 (11.4%) in December, with the largest proportions occurring from September through December. The proportion of events ranged from 15.1% to 17.2% during weekdays, and from 8.7% to 10.8% during weekend days. Of all 517 (100.0%) events for which time of day or time category was reported, 34.8% occurred from 6:00 AM to 11:59 AM, 23.4% from 12:00 PM to 5:59 PM, 17.2% from 6:00 PM to 11:59 PM, and the remainder during the early hours of the day.

### ***Industries***

The largest proportions of HSEES events were associated with the wholesale trade (274 [53.0%]) and warehousing (48 [9.28%]) industries (Table 3). The largest number of events with victims occurred from unknown or not an industry (13 [23.6%]). The total number of victims was greatest in the accommodation and food industry (53 [30.1%]) followed by the number of victims in transportation services (29 [16.5%]) and unknown or not an industry (27 [15.3%]). Although the unknown or not an industry resulted in a large proportion of events with victims and a large number of victims, only 48.2% of all 27 events resulted in victims. Conversely,

100.0% of all events in the information industry resulted in victims, but this industry represents a small proportion (7.3%) of events with victims.

### ***Substances***

A total of 1,347 substances were released or were threatened to be released in all events, of which 10 (0.7%) substances were reported as threatened to be released. The individual substances most frequently released were sulfur dioxide, carbon monoxide, volatile organic compounds and nitrogen oxide (NOX) (Appendix). Substances were grouped into 16 categories. The most commonly released categories of substances were other inorganic substances (594 [44.1%]) volatile organic compounds (310 [23.0%]) and oxy-organics (292 [21.7%]) (Table 4). The substance categories most commonly released in fixed-facility events were other inorganic substances (594 [46.9%]), oxy-organics (288 [22.8%]), and volatile organic compounds (293 [23.1%]) (Table 4). In transportation-related events, the most common substance categories released were volatile organic compounds (17 [21.5%]), paint and dye (16 [20.3%]), and acids (12 [15.2%]) (Table 4).

Two types of releases for each substance (e.g., spill and air) could be reported. Only one type of release was associated with the following: air releases (1,191 [88.4%]), spills (132 [9.8%]), threatened release (10 [0.7%]), fire (1 [0.1%]), explosion (2 [0.1%]), and radiation (0 [0.0%]). Of events with two types of releases, the following combinations were reported: air releases and spills (10 [0.7%]), explosion and spill (1 [0.1%]). The release type was missing for zero substances.

## *Victims*

A total of 176 victims were involved in 55 events (10.6% of all events) (Table 5). Of the 55 events with victims, 30 (54.5%) events involved only one victim, and eight (14.5%) involved two victims. Of all victims, 163 (95.7%) were injured in fixed-facility events. Fixed-facility events were more likely to have three or more victims per event (3.6%) than were transportation-related events (1.3%).

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 resulted in victims. In events that involved one or more substances from the same substance category, substances were counted once in that category. In events that involved two or more substances from different categories, substances were counted once in the multiple substance category. Substances released most often were not necessarily the most likely to result in victims (Table 6). For example, events categorized as multiple substance category constituted 40.2% of all events; however, only 0.5% of these events resulted in injuries. Conversely, events involving pesticides and oxy-organics accounted for 0.8% and 3.7% of all events respectively, but 25.0% of the pesticide events and 52.6% of oxy-organics events resulted in injuries.

The general public (103 [58.5%]) constituted the largest proportion of the population groups injured, followed by employees (73 [41.5 %]) (Figure 4). In fixed-facility events, no emergency response personnel were injured. There were no responders injured during transportation-related events.

Victims were reported to sustain a total of 304 injuries or symptoms (Table 7). Some victims had more than one injury or symptom. Of all reported injuries/symptoms, the most common injuries/symptoms in fixed-facility events were respiratory irritation (120 [41.8%]), headache (95 [33.1%]), and eye irritation (27 [9.5%]). In transportation-related events, trauma (10 [58.8%]), gastrointestinal system problems (2 [11.8%]), skin irritation (2 [11.8%]), and eye irritation (2 [11.8%]) were reported most frequently.

The median age of the 121 (68.8%) victims for whom exact age was reported was 34 years (range: 2-71 years). For the 54 (30.7%) injured persons for whom an age category was reported, one (1.9%) was < 5 years of age, one (1.9%) was 5–14 years of age, zero (0.0%) were 15–19 years of age, 50 (92.6%) were 20–44 years of age, one (1.9%) was 45–64 years of age, and zero (0.0%) were  $\geq$  65 years of age. The one injured person for whom age was not reported was likely  $\geq$  16 years of age because he or she was reported as an employee.

Sex was known for 146 (83.0%) of the victims; of these, 76 (43.2%) were females. Of all employees for whom sex was reported, 51.7% were females.

Of the 176 victims, 106 (60.2%) were treated at a hospital (not-admitted) and 62 (35.2%) were treated on scene (first-aid), six (3.4%) were seen by a private physicians within 24 hours. One (0.6%) death was reported (Figure 6). Severity was unknown for one (0.6%) victim.

The status of personal protective equipment (PPE) use was reported for 73 (100.0%) employee-victims. All of the employee-victims only one (0.1%) had worn any form of PPE. The other 72 (98.6%) had not worn any form of PPE.

The event that consisted of the largest amount of victims was the result of pepper spray being released. An employee cleaning a hotel room found a canister of bear repellent (pepper spray) and sprayed it on the wall. When the employee smelled the noxious fumes he opened a window. The fumes drifted to other parts of the lodge and sent 53 guests to the hospital with symptoms. There were 300 hotel guests evacuated by the facility management. The odor appeared to be concentrated in the area of the indoor swimming pool, which spread to the lobby and dining areas of the main building. The building was decontaminated by hazmat crews.

### *Nearby populations*

The proximity of the event location in relation to selected populations was determined using geographic information systems (GIS) or health department records. Residences were within ¼ mile of 438 (86.9%) events, schools within ¼ mile of 12 (2.4%) events, hospitals within ¼ mile of four (0.8%) events, nursing homes within ¼ mile of four (0.8%) events, licensed daycares within ¼ mile of 14 (2.8%) events, industries or other businesses within ¼ mile of 502 (99.0%) events and recreational areas within ¼ mile of 45 (9.1%) events. Information for proximity of the event location in relation to selected populations was missing for 21 events.

The number of events at which persons were at risk of exposure was determined primarily using GIS. There were 427 (82.6%) events with persons living within ¼ mile of the event; 459 (88.8%) events with persons living within ½ mile; and 479 (92.6%) events with persons living within one mile. Information on the number of people living within ¼, ½, and one mile of the event was missing for 23 events.

### ***Evacuations***

Evacuations were ordered in 17 (3.3%) of 517 events where evacuation status was reported. Of these evacuations, 58.8% were of buildings or affected parts of buildings; 17.6% were of defined circular areas surrounding the event locations; 11.8% were of areas downwind or downstream of the event; and the remainder were of circular and downwind or downstream areas, of no criteria, or not known. The number of people evacuated was known for 13 (76.5%) events and ranged from three to 8000 people, with a median of 25 people. The median length of evacuation was four hours (range: 0.5 to 72). Evacuation length was missing for 0 (0.0%) events. Of all 517 events, 24 (4.6%) had access to the area restricted. There were two (0.4%) events that had in-place sheltering ordered by an official.

### ***Decontamination***

Of the 161 (100.0%) victims for whom decontamination status was known, 150 (93.2%) were not decontaminated, six (3.7%) were decontaminated at the scene, five (3.1%) were decontaminated at a medical facility, and zero (0.0%) were decontaminated at both the scene and a medical facility.

In events where uninjured persons were decontaminated, the median number of uninjured decontaminated individuals was four persons per event (range: 1-8 persons). Decontamination at a medical facility was conducted for zero uninjured employees, zero uninjured responders, zero uninjured members of the general public, and zero uninjured students. Decontamination at the scene was conducted for four uninjured employees, five uninjured responders, four uninjured members of the general public, and zero uninjured students.

### ***Response***

Of the 517 (100%) events with information on who responded to the event, 13.0% reported two or more categories of personnel who responded, 6.8% reported three or more categories, and 2.3% reported four or more categories. The personnel who responded most frequently were the response team of the company where release occurred, 118 (22.8%), followed by certified HazMat, 44 (8.5%), hospital personnel/Poison Control Center, 32 (6.2%), and law enforcement agency, 10 (1.9%) (Table 8).

### **2005 Prevention Outreach Activities**

The outreach activities that were used during 2005 were: 1) to develop relationships with large industries in the state that would enhance our ability to obtain detailed information regarding releases of hazardous substances. 2) Develop a quarterly newsletter to send out to first responders, LEPCs and other groups that work with hazardous releases. 3) Increase knowledge among adult care and child care centers on the potential dangers of mixing of cleaning products. 4) Develop a collaborative relationship with each of the local health departments to improve reporting of methamphetamine-related hazardous substance emergency events.

The first outreach activity was to develop relationships with large industry in the state that would enhance our ability to obtain detailed information regarding releases of hazardous substances. A tri-fold brochure was developed outlining HSEES activities and describing how information collected by HSEES could be used by industry. It included industry specific data from 2002-2003, broken down by fixed-facility and transportation. The brochure was disseminated utilizing a posting on the Utah HSEES website in a PDF version and a mass mailing to 200 large industries and some 60 businesses in Utah. As a result of this outreach activity, there has been an increase in knowledge and awareness of the HSEES program. This has resulted in a more prompt reply to additional information requests with the information contained on a spreadsheet.

For the second outreach activity, the newsletter was sent during the second quarter and contained data for January through March. This newsletter included information about the HSEES program, the number of events occurring during that time period, as well as a break down of the data into fixed facilities and transportation events. The newsletter included information on how to directly contact the HSEES program. It was distributed by mail to 70 Local Emergency Planning Committee members and environmental health agencies throughout Utah. We learned that e-mail delivery was preferred, so they could e-mail it to their e-mail distribution lists. This increased distribution by an estimated 300 people.

For the third outreach activity the Utah HSEES coordinator requested to work with the PHPS fellow supported by ATSDR. The objective of the PHPS prevention specialist was to improve Utah HSEES program outreach activities and the evaluation of these activities. The process began by discussing past outreach activities completed by the Utah HSEES program to identify

an activity that would be qualified to take through the beginning processes to the final evaluation process. An expanded logic model and evaluation planning concepts for the PHPS project were selected to be applied to an outreach activity done in 2004. This activity and participation with the PHPS fellow also provided an opportunity to provide information to and work in collaboration with ATSDR on a paper titled, “Outcome-Based Planning and Evaluation: Challenges for Hazardous Substances Emergency Events Surveillance Programs at the State Level,” that described our state’s activity and participation with the PHPS fellow.

The fourth outreach activity involved creating a collaborative relationship with local health departments. The Utah HSEES program receives most methamphetamine-related reports from monitoring the news media, not from the standard reporting agencies. The Utah legislature passed a bill this year entitled, “Illegal Drug Operations Site Reporting and Decontamination Act.” This bill requires law enforcement agencies in Utah to report clandestine drug labs to the local health department. This would help in getting more detailed information about methamphetamine-related events in a timely manner. Contact has been made with the local health departments regarding receiving information about these types of events. The Utah HSEES program is currently determining the best way to further request this information formally.

## **SUMMARY OF RESULTS, 2000–2005**

During 2000–2005, the largest proportion of events occurred in fixed facilities (Table 9). The number of transportation related-events has decreased in recent years. This could be due to exclusion of events that do not meet the reporting rule of either one gallon or ten pounds being

released. The number of total events has been increasing. This increase could be due to better reporting from participating sources.

The number of substances released has also increased. The number of events with victims has increased over the last five years. This leads to the percentage of events with victims being highest in 2005 (10.6 %) and lowest in years 2002 and 2003 (both at 1.8 %). The average percentage of events with victims during 2000–2005 was 4.6 %.

Respiratory irritation has consistently been the most frequently reported injury. Members of the general public rose above employees as the most commonly reported victims of acute chemical releases. However, employees continue to constitute a large proportion of the victims. (Figure 7). The number of injured responders decreased to zero. This significant decrease from previous years is possibly due to increased awareness of the dangers and increased precautions.

## REFERENCES

1. Centers for Disease Control and Prevention. Comprehensive plan for epidemiologic surveillance. Atlanta: US Department of Health and Human Services; 1986.
2. Binder S. Death, injuries, and evacuations from acute hazardous materials releases. *Am J Public Health* 1989; 70:1042–4.

## Appendix

Table 1. The ten substances most frequently involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2005

Number	Standardized Substance Name	Frequency
1	Sulfur Dioxide	290
2	Carbon Monoxide	276
3	Volatile Organic Compounds	275
4	Nitrogen Oxide (NOX)	245
5	Chlorine	26
6	Paint NOS	20
7	Mixture	18
8	Nitrous Oxide	14
9	Mercury	10
10	Hydrochloric Acid	9
Total		1,183

Table 2. Number of events meeting the surveillance definition, by county and type of event—  
Utah Hazardous Substances Emergency Events Surveillance, 2005

County	Type of event				All events
	Fixed facility		Transportation		
	No. events	%*	No. events	%*	Total no. events (%)
Beaver	0	0.0	1	100.0	1 (0.2)
Box Elder	1	100.0	0	0.0	1 (0.2)
Cache	3	100.0	0	0.0	3 (0.6)
Carbon	1	50.0	1	50.0	2 (0.4)
Daggett	0	0.0	0	0.0	0 (0.0)
Davis	17	85.0	3	15.0	20 (3.9)
Duchesne	0	0.0	0	0.0	0 (0.0)
Emery	0	0.0	0	0.0	0 (0.0)
Garfield	1	50.0	1	50.0	2 (0.4)
Grand	0	0	1	100.0	1 (0.2)
Iron	2	66.7	1	33.3	3 (0.6)
Juab	1	100.0	0	0.0	1 (0.2)
Kane	0	0.0	0	0.0	0 (0.0)
Millard	8	88.9	1	11.1	9 (1.7)
Morgan	1	100.0	0	0.0	1 (0.2)
Piute	0	0.0	0	0.0	0 (0.0)
Rich	0	0.0	0	0.0	0 (0.0)
Salt Lake	85	59.4	58	40.6	143 (27.7)
San Juan	271	100.0	0	0.0	271 (52.4)
San Pete	2	100.0	0	0.0	0 (0.0)
Sevier	1	100.0	0	0.0	1 (0.2)
Summit	3	100.0	0	0.0	3 (0.6)
Tooele	22	88.0	3	12.0	25 (4.8)
Uintah	0	0.0	0	0.0	0 (0.0)
Utah	8	80.0	2	20.0	10 (1.9)
Wasatch	2	100.0	0	0.0	2 (0.4)
Washington	5	100.0	0	0.0	5 (1.0)
Wayne	0	0.0	0	0.0	0 (0.0)
Weber	10	76.9	3	23.1	13 (2.5)
Unknown	0	0.0	0	0.0	0 (0.0)
	<b>442</b>		<b>75</b>		<b>517 (100.0 %)</b>

\* Percentage = (number of events by type of event per county ÷ total number of events in that county) x 100

Figure 1. Area of fixed facilities involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2005.

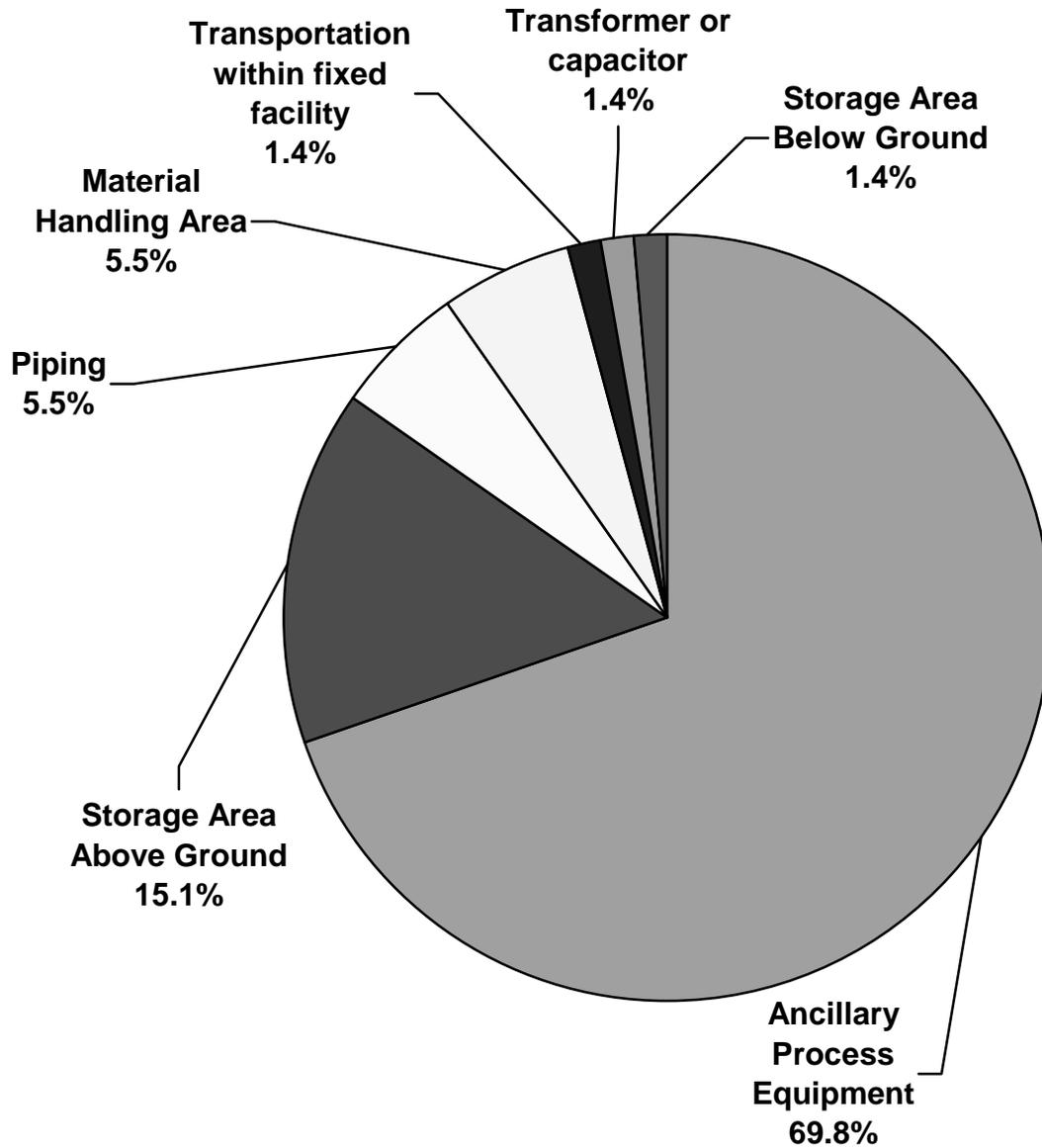


Figure 2. Distribution of transportation-related events, by type of transport—Utah Hazardous Substances Emergency Events Surveillance, 2005.

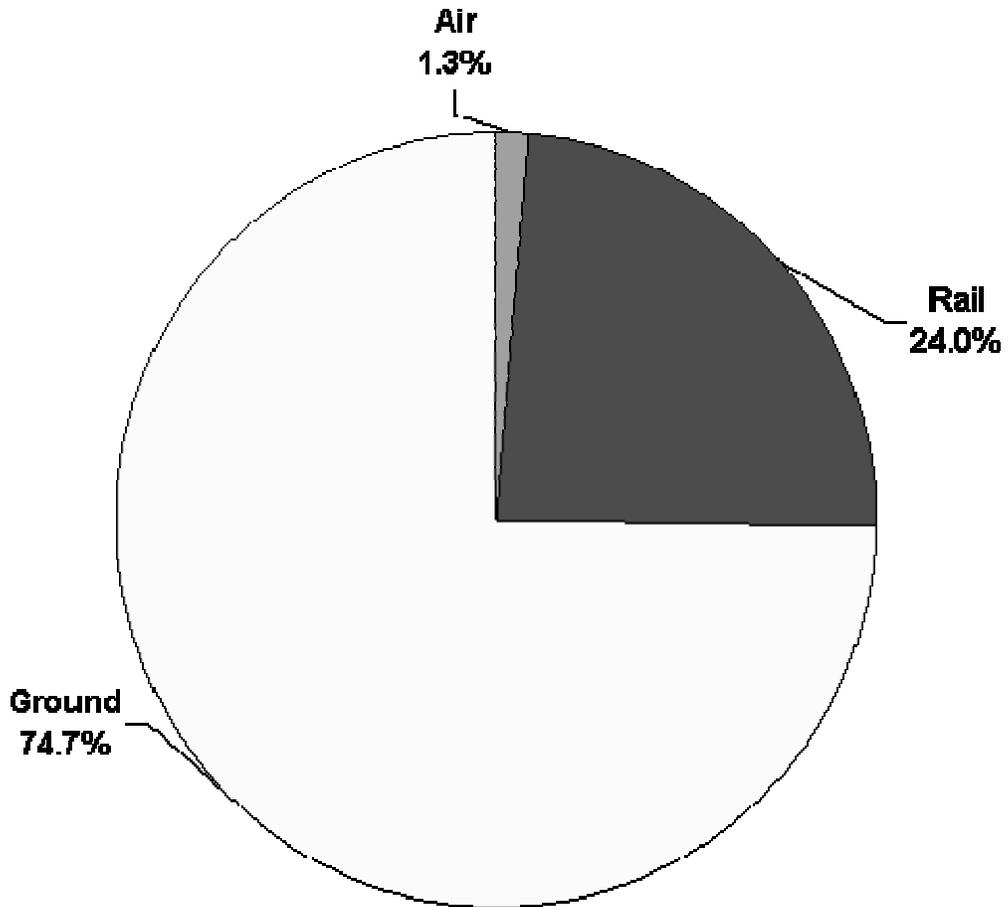


Figure 3a. Primary factors reported as contributing to events— Utah Hazardous Substances Emergency Events Surveillance, 2005

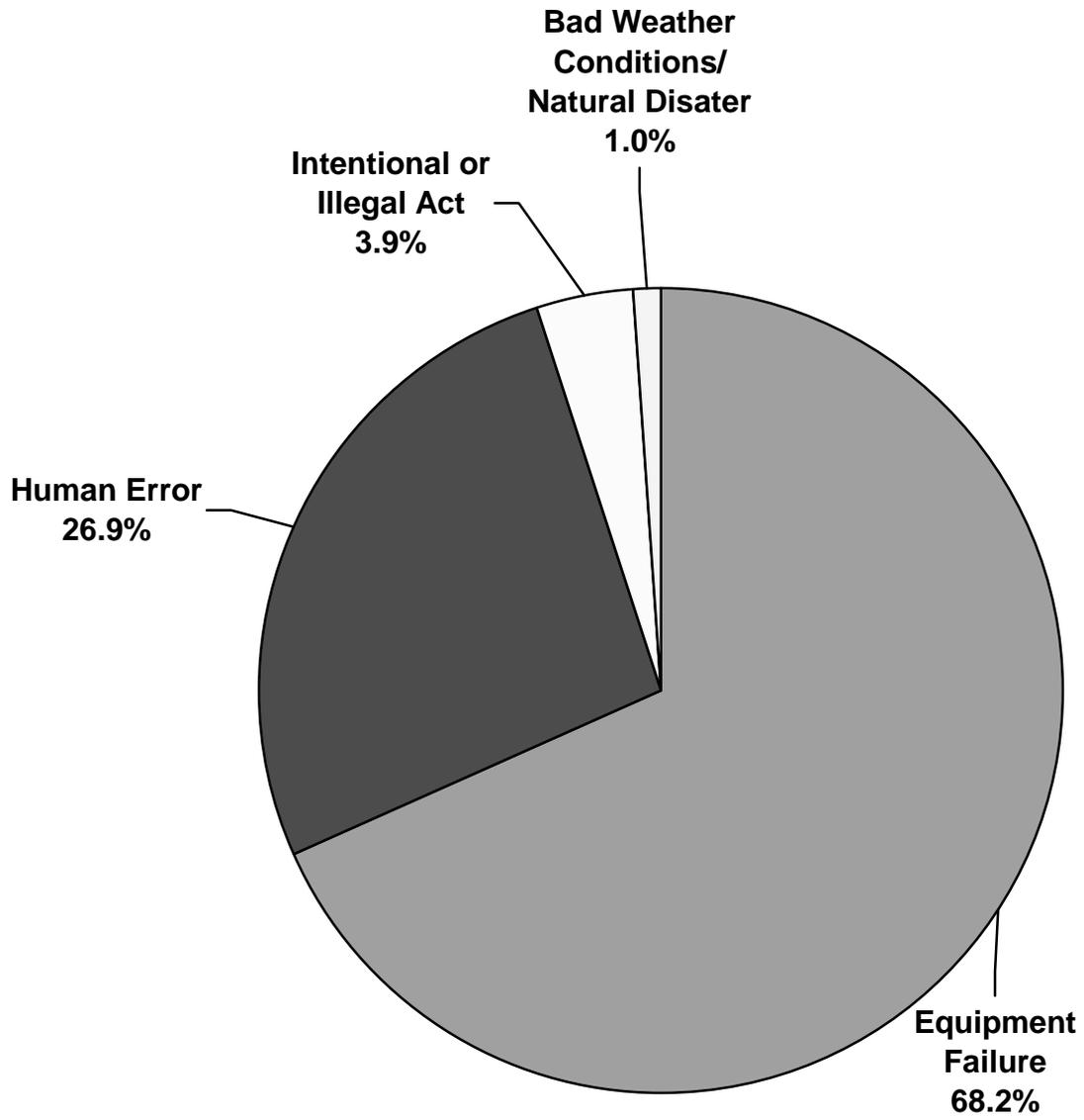


Figure 3b. Secondary factors reported as contributing to events— Utah Hazardous Substances Emergency Events Surveillance, 2005.

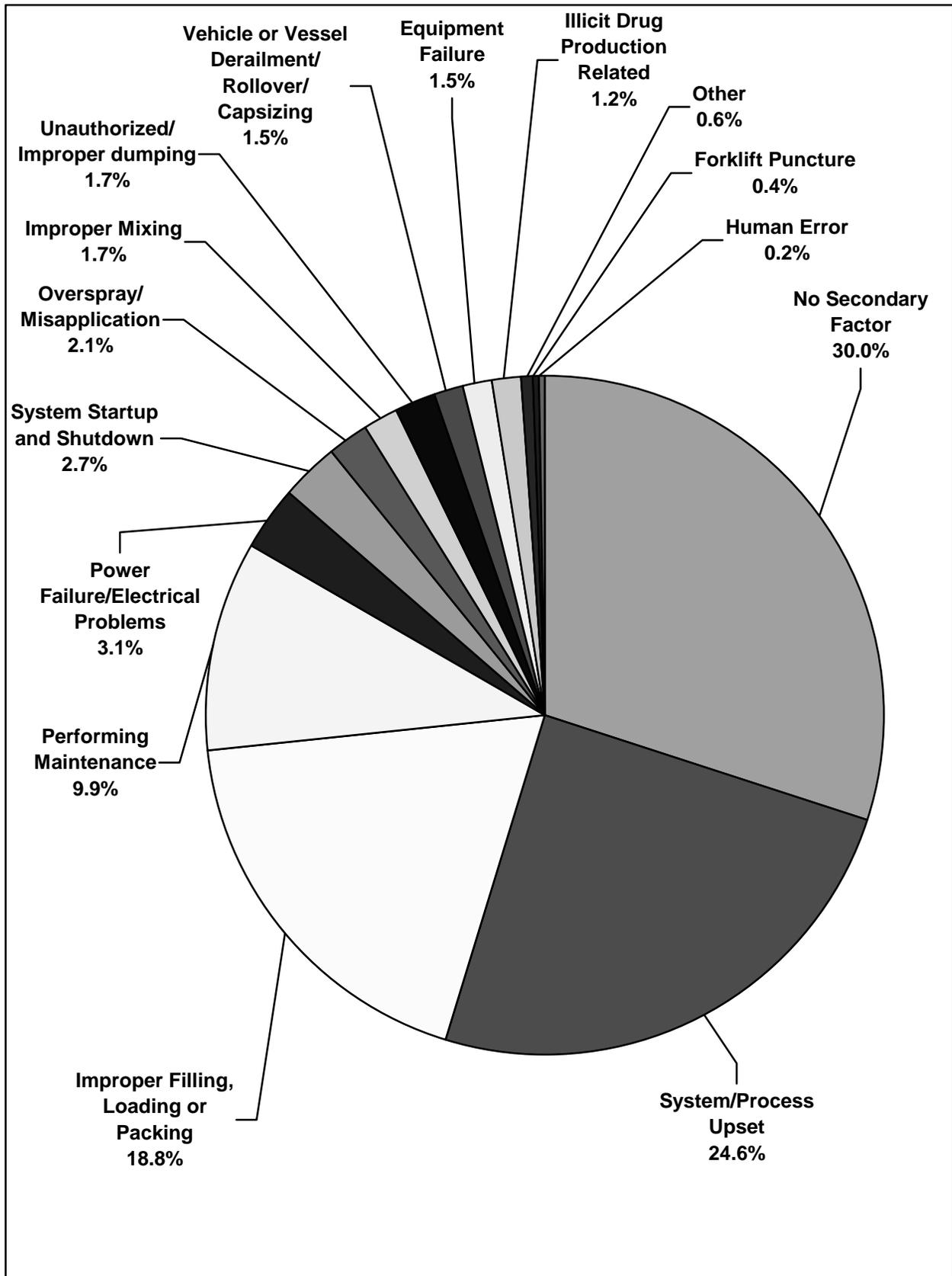


Table 3. Number of substances involved per event, by type of event –Utah Hazardous Substances Emergency Events Surveillance, 2005

	Type of event						All events		
	Fixed facility			Transportation					
No. substances	No. events	%	Total substances	No. events	%	Total substances	No. events	%	Total substances
1	163	36.9	163	71	94.7	71	234	45.3	234
2	4	0.9	8	4	5.3	8	8	1.5	16
3	3	0.7	9	0	0.0	0	3	0.6	9
4	272	61.5	1088	0	0.0	0	272	52.6	1088
≥ 5	0	0.0	0	0	0.0	0	0	0.0	0
<b>Total</b>	<b>442</b>	<b>100 %</b>	<b>1268</b>	<b>75</b>	<b>100 %</b>	<b>79</b>	<b>517</b>	<b>100 %</b>	<b>1347</b>

Table 4. Industries involved in hazardous substance events, by category—Utah Hazardous Substances Emergency Events Surveillance, 2005

Industry category	Total events		Events with victims		Percentage of events with victims	Total no. victims (min no.-max no.) <sup>*</sup>
	No.	%	No.	%		
	Wholesale Trade	274	53.0	1		
Manufacturing	59	11.4	6	10.9	10.2	10 (1-3)
Warehousing	48	9.3	0	0.0	0.0	0
Transportation	42	8.1	3	5.5	7.1	14 (1-10)
Unknown or not an Industry	27	5.2	13	23.6	48.2	27 (1-10)
Other Services	18	3.5	10	18.2	55.6	29 (1-6)
Utilities	12	2.3	1	1.8	8.3	1 (1-1)
Health Care and Social Assistance	9	1.7	5	9.1	55.6	19 (2-6)
Public Administration	7	1.4	3	5.5	42.9	6 (1-4)
Educational Services	3	0.6	1	1.8	33.3	1 (1-1)
Retail Trade	3	0.6	2	3.6	66.7	2 (1-1)
Accommodation and Food Services	3	0.6	3	5.5	100.0	55 (1-53)
Administrative and Support and Waste Management and Remediation Services	2	0.4	0	0.0	0.0	0
Agriculture, Forestry, Fishing and Hunting	2	0.4	2	3.6	100.0	2 (1-1)
Arts, Entertainment, and Recreation	2	0.4	1	1.8	50.0	1 (1-1)
Finance and Insurance	2	0.4	1	1.8	50.0	1 (1-1)
Mining	1	0.2	1	1.8	100.0	2 (2-2)
Construction	1	0.2	0	0.0	0.0	0
Professional, Scientific, and Technical Services	1	0.2	1	1.8	100.0	1 (1-1)
Information	1	0.2	1	1.8	100.0	4 (4-4)
<b>Total<sup>‡</sup></b>	<b>517</b>		<b>55</b>		<b>10.6</b>	<b>176</b>

Percentages do not total 100% due to rounding.

Table 5. Number of substances involved, by substance category and type of event –Utah Hazardous Substances Emergency Events Surveillance, 2005

Substance category	Type of event				All events	
	Fixed facility		Transportation			
	No. substances	%	No. substances	%	No. substances	%
Acids	9	0.7	12	15.2	21	1.6
Ammonia	3	0.2	1	1.3	4	0.3
Bases	2	0.2	11	13.9	13	1.0
Chlorine	29	2.3	1	1.3	30	2.2
Formulations	0	0.0	0	0.0	0	0.0
Hetero-organics	0	0.0	1	1.3	1	0.1
Hydrocarbons	1	0.1	0	0.0	1	0.1
Mixture*	19	1.5	2	2.5	21	1.6
Other <sup>†</sup>	19	1.5	7	8.9	26	1.9
Other inorganic substances <sup>‡</sup>	594	46.9	0	0.0	594	44.2
Oxy-organics	288	22.7	4	5.1	292	21.7
Paints and dyes	5	0.4	16	20.3	21	1.6
Pesticides	1	0.1	3	3.8	4	0.3
Polychlorinated biphenyls	2	0.2	1	1.3	3	0.2
Polymers	1	0.1	3	3.8	4	0.3
Volatile organic compounds	293	23.1	17	21.5	310	23.0
<b>Total<sup>¶</sup></b>	<b>1266</b>	<b>100.0</b>	<b>79</b>	<b>100.0</b>	<b>1345</b>	<b>100.0</b>

\* Substances from different categories that were mixed or formed from a reaction before the event.

<sup>†</sup> Not belonging to one of the existing categories.

<sup>‡</sup> All inorganic substances except for acids, bases, ammonia, and chlorine.

<sup>¶</sup> Of a total of 1347 substances, 2 were excluded because they were not assigned a substance category: 0 occurred in fixed facilities and 0 during transportation. Percentages do not total 100% due to rounding.

Table 6. Number of victims per event, by type of event –Utah Hazardous Substances Emergency Events Surveillance, 2005

No. victims	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total victims	No. events	%	Total victims	No. events	%	Total victims
1	29	55.8	29	1	33.3	1	30	54.5	30
2	7	13.5	14	1	33.3	2	8	14.5	16
3	6	11.5	18	0	0.0	0	6	10.9	18
4	4	7.7	16	0	0.0	0	4	7.3	16
5	1	1.9	5	0	0.0	0	1	1.8	5
≥6	5	9.6	81	1	33.3	10	6	10.9	91
<b>Total</b>	<b>52</b>	<b>100</b>	<b>163</b>	<b>3</b>	<b>100</b>	<b>13</b>	<b>55</b>	<b>100.0</b>	<b>176</b>

Figure 4. Distribution of victims by population group –Utah Hazardous Substances Emergency Events Surveillance, 2005.

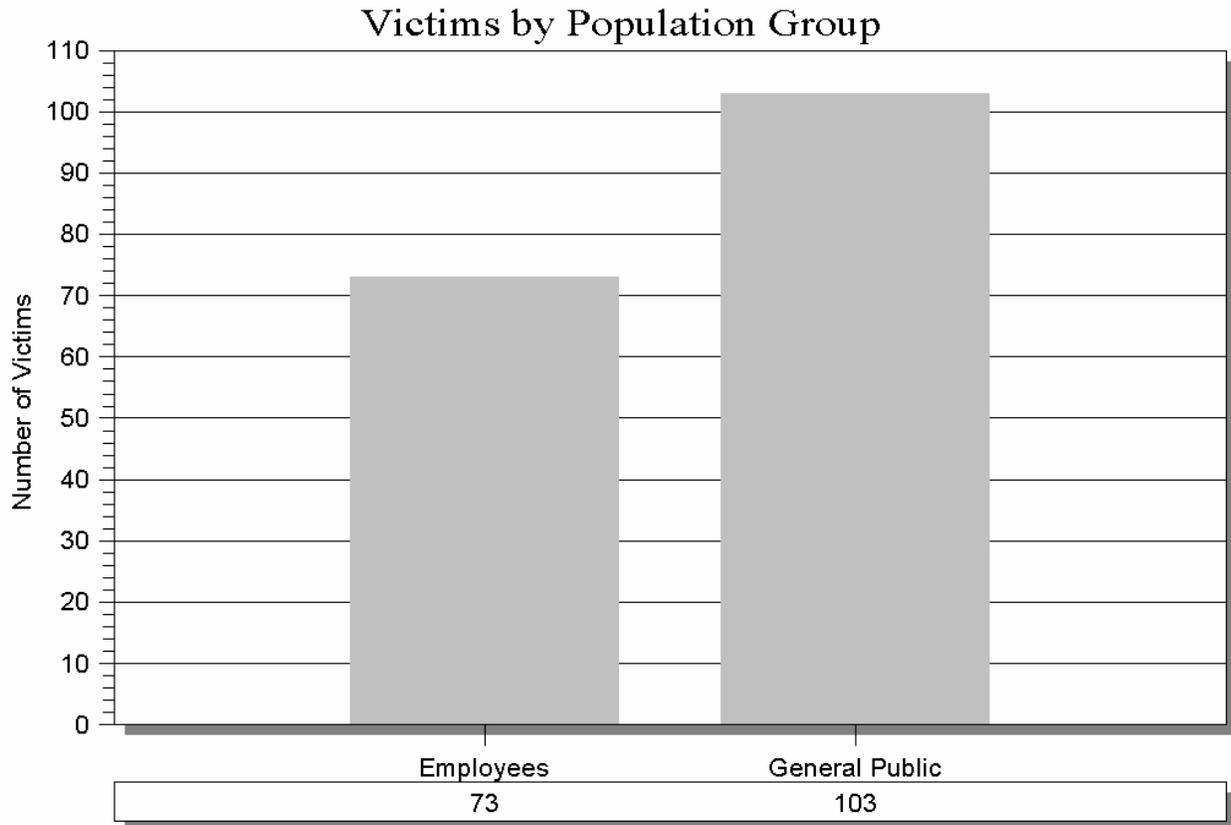


Table 7. Frequency of substance categories in all events and events with victims –Utah Hazardous Substances Emergency Events Surveillance System, 2005\*

Substance category	All events		Events with victims		
	No.	%	No.	Percentage of all releases with victims	Percentage of events with victims in substance category
Acids	20	3.9	4	7.3	20.0
Ammonia	4	0.8	1	1.8	25.0
Bases	12	2.3	0	0.0	0.0
Chlorine	30	5.8	9	16.4	30.0
Formulations	0	0.0	0	0.0	0.0
Hetero-organics	1	0.2	1	1.8	100.0
Hydrocarbons	1	0.2	1	1.8	100.0
Mixture <sup>†</sup>	20	3.9	8	14.5	40.0
Multiple substance category	278	53.8	1	1.8	0.4
Other <sup>‡</sup>	22	4.3	6	10.9	27.3
Other inorganic substances <sup>§</sup>	43	8.3	6	10.9	14.0
Oxy-organics	19	3.7	10	18.2	52.6
Paints and dyes	20	3.9	0	0.0	0.0
Pesticides	4	0.8	1	1.8	25.0
Polychlorinated biphenyls	3	0.6	0	0.0	0.0
Polymers	4	0.8	1	1.8	25.0
Volatile organic compounds	34	6.6	6	10.9	17.6
<b>Total<sup>¶</sup></b>	<b>515</b>	<b>(99.6)</b>	<b>55</b>	<b>(100.0)</b>	<b>10.7</b>

\*Substances in events that involved multiple substances were counted only once in a substance category when all the substances were associated with the same category. If events involved multiple substances from different substance categories, they were counted only once in the multiple substance category.

<sup>†</sup>Substances from different categories that were mixed or formed from a reaction before the event.

<sup>‡</sup>Not classified.

<sup>§</sup>All inorganic substances except for acids, bases, ammonia, and chlorine.

<sup>¶</sup>Percentages do not total 100% due to rounding. Of a total of 515 events, 2 were excluded because they were not assigned a substance category.

Table 8. Frequencies of injuries/symptoms, by type of event\*-Utah Hazardous Substances Emergency Events Surveillance System, 2005

Injury/symptom	Fixed facility		Transportation		All events	
	No. injuries	%	No. injuries	%	Total no.	%
Chemical burns	4	1.4	0	0	4	1.3
Dizziness/central nervous system symptoms	19	6.6	0	0	19	6.2
Eye irritation	27	9.4	2	11.8	29	9.5
Gastrointestinal system problems	10	3.5	2	11.8	12	3.9
Headache	94	32.6	0	0.0	94	30.8
Heart problems	0	0.0	0	0.0	0	0.0
Heat stress	0	0.0	0	0.0	0	0.0
Other	2	0.7	0	0.0	2	0.7
Respiratory irritation	120	41.7	1	5.9	121	39.7
Shortness of breath	4	1.4	0	0.0	4	1.3
Skin irritation	5	1.7	2	11.8	7	2.3
Thermal burns	3	1.0	0	0.0	3	1.0
Trauma	0	0.0	10	58.8	10	3.3
<b>Total<sup>‡</sup></b>	<b>288</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>	<b>305</b>	<b>100</b>

\*The number of injuries is greater than the number of victims (176) because a victim could have had more than one injury.

<sup>‡</sup> Percentages do not total 100% due to rounding.

Figure 6. Injury disposition –Utah Hazardous Substances Emergency Events Surveillance, 2005.

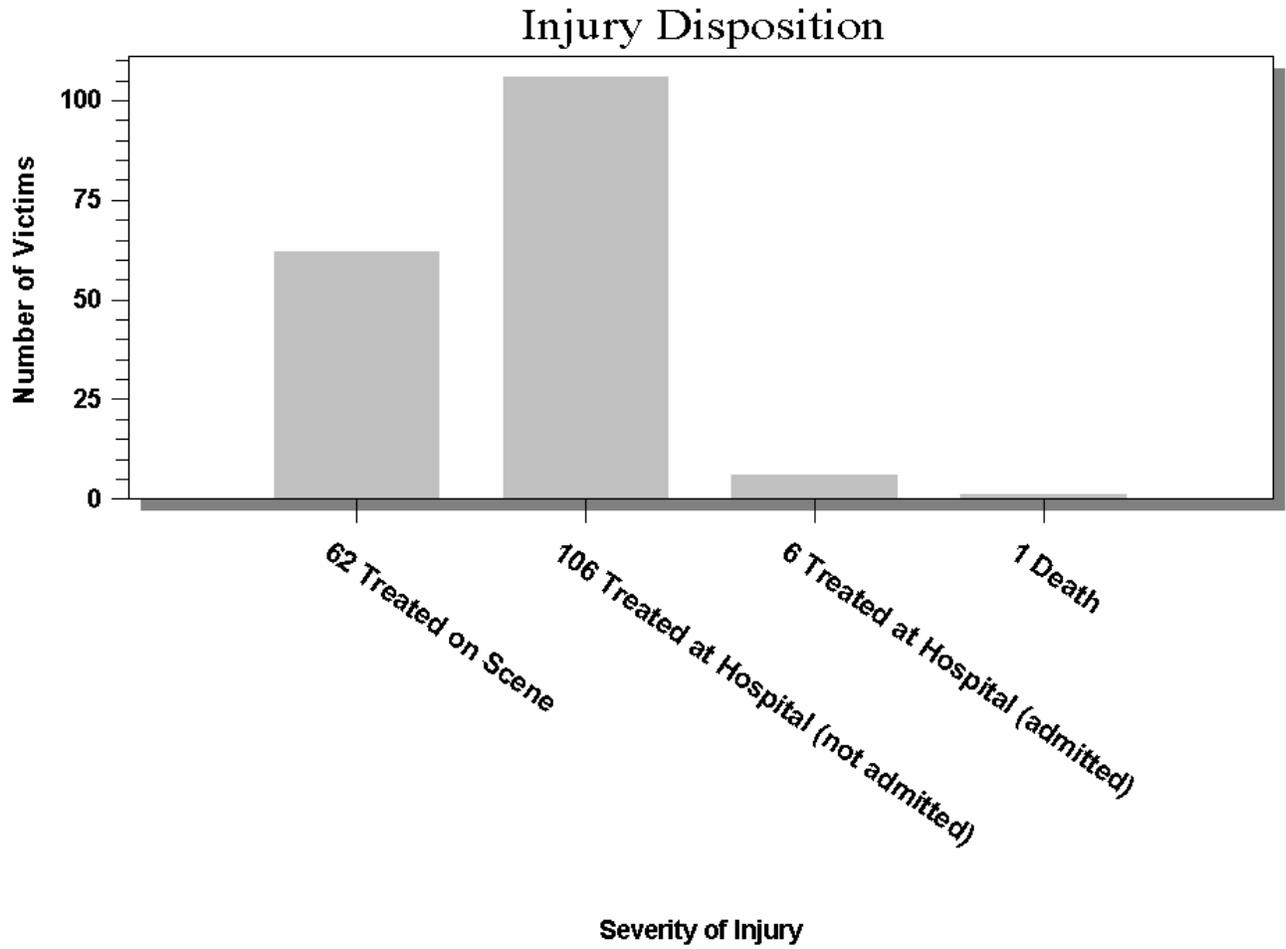


Table 9. Distribution of personnel who responded to the event–Utah Hazardous Substances Emergency Events Surveillance System, 2005

<b>Responder category</b>	<b>No.</b>	<b>%*</b>
3 <sup>rd</sup> Party Clean-up Contractor	16	3.1
Certified HazMat team	44	8.5
Department of works/ utilities/ transportation	3	0.6
Emergency medical technicians	8	1.5
Environmental agency/ EPA <sup>†</sup> response team	7	1.4
Fire department	36	7.0
Health department/health agency	24	4.6
Hospital personnel	44	8.5
Law enforcement agency	26	5.0
No Response	300	58.0
Other	2	0.4
Response team of company where release occurred	133	25.7
Specialized multi-agency team	4	0.8
State, county, or local emergency managers/coordinators/planning committees	2	0.4

\*Percentages total greater than 100% because multiple responder categories could be reported per event.

<sup>†</sup>Environmental Protection Agency.

Table 10. Cumulative data by year–Utah Hazardous Substances Emergency Events Surveillance, 2000-2005\*

Year	Type of event			No. substances released	No. victims	No. deaths	Events with victims	
	Fixed facility	Transportation	Total				No.	% <sup>†</sup>
2000	140	163	303	375	46	0	11	3.6
2001	408	126	534	1104	94	0	13	2.4
2002	329	117	446	939	76	0	8	1.8
2003	364	110	474	1000	32	0	8	1.8
2004	397	107	504	1138	93	0	38	7.5
2005	442	75	517	1347	176	1	55	10.6
<b>Total</b>	2080	698	2778	5903	517	1	133	25.7

\* Numbers in the table may differ from those reported in previous years due to adjustments in HSEES qualification requirements for events.

† Percentage of events with victims.