

# Utah Hazardous Substances Emergency Events Surveillance

Annual Report  
2008



Utah Department of Health  
Office of Epidemiology  
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**ATSDR**  
AGENCY FOR TOXIC SUBSTANCES  
AND DISEASE REGISTRY

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## **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 2008. 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 209 events were reported in 2008. In 194 (92.8%) events, only one substance was released. The most commonly reported categories of substances were chemicals, specifically paints and dyes not otherwise specified (NOS). During this reporting period, 20 events (9.6% of all reported events) resulted in a total of 67 victims, none of whom died. The most frequently reported injuries were gastrointestinal problems, dizziness, and headache. Evacuations were ordered for 10 (4.8%) events.

The findings regarding the percentage of events with victims during 2008 were equal to the previous year. The distribution of the types of injuries reported showed a decrease in eye irritation but an increase in gastrointestinal symptoms. Headache continued to be among the most frequently occurring types of injuries.

Prevention outreach efforts for 2008 focused on outreach for HazMat Responders and other community partners in Utah. These outreach activities shared indicator data, risk factors and prevention strategies for hazardous substance emergency events. These activities also involved requests for agencies to report potential events to the Utah HSEES program.

## **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.

The HSEES program has several goals:

- to describe the distribution and characteristics of acute hazardous substance releases;
- to describe morbidity and mortality among employees, responders, and the general public that result 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 recent 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 the data and develop appropriate prevention outreach activities to educate the public. 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 activities for 2008 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 2008, fifteen state health departments participated in the HSEES program: Colorado, Florida, Iowa, Louisiana, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Oregon, Texas, Utah, Washington, and Wisconsin.

Since 2005, an updated data-collection form, approved by the Office of Management and Budget (OMB) at ATSDR, was used for the collection of HSEES reported data. 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, Google News (media alert system), media (newspaper, radio, and television), local health agencies and industry. Census data were used to estimate the number of residents in the vicinity for a majority of the events. All data were computerized using a Web-based data entry system provided by ATSDR.

HSEES defines hazardous substance emergency events as acute, uncontrolled or illegal releases or threatened releases of hazardous substances. Events involving releases of petroleum only continued to be excluded. A release is considered an event if it meets the following criteria (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 prior to 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 grouped into one of the other existing categories.

## **RESULTS**

For 2008, a total of 209 acute hazardous substances events were captured by Utah HSEES. Of these events, ten (4.8%) were considered threatened releases. There were 18 (8.6%) events in

which substances were both threatened to be released and actually released. A total of 91 (43.5%) events occurred in fixed facilities. The counties with the most frequent number of events were Salt Lake County (117 [56.0%]) and Davis County (21 [10%]) (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 91 fixed-facility events, 71 (78%) reported one type of area and 20 (22.0%) reported a combination of two area types. Type of area was only reported for mining, utilities, and manufacturing based on the industry code, yielding 49 (23.4%) events with no entry. Among events with one type of area reported, following other areas, 27 (55%) of the main areas were classified as follows: 8 (5.0%) storage area above ground, 5 (3.1%) piping, 3 (1.9%) material handling area, and 3 (1.9%) dump/waste area (Figure 1).

Of the 118 transportation-related events, 106 (90%) occurred during ground transport (e.g., truck, van, or tractor) and 7 (6%) involved transport by rail (Figure 2). Fewer events involved air, and pipeline modes. The largest proportion of transportation-related events occurred from unloading of a stationary vehicle or vessel (50 [42.4%]) and during a release en route that was later discovered at a fixed facility (46 [39%]). Of the 118 transportation-related events, 16 (13.6%) involved a moving vehicle or vessel and 6 (5.1%) involved a stationary vehicle or vessel such as ones staged at a transfer station.

Factors contributing to the events consisted of entries for primary factors and secondary factors. Primary factors relate to the factor that caused the actual release, where secondary factors relate

to why the release occurred. Primary factors were reported for 195 (95.6%) events (Figure 3a). Of the reported primary factors, nearly half (48.4%) fixed-facility events involved equipment failure. For transportation-related events, nearly three-quarters (72.4%) involved human error. Secondary factors were reported for 67 (32.0%) events (Figure 3b). Of the reported secondary factors, nearly half (45.1%) fixed-facility events reported no secondary factors involved, and a half (50%) of transportation-related events involved improper filling, loading or packing.

A small amount (4.3%) of all events involved the release of three or more substances. Two substances were released in 11.5% of the events, and 84.2% involved the release of one substance (Table 3). 15.3% of transportation-related events had one substance released.

The number of events by month ranged from 7 (3.3%) in March to 33 (15.8%) in December, with the largest proportions occurring from October through December (41.6%). The proportion of events occurring during weekdays ranged from 14.8% to 17.7%, and during weekend days from 7.2% to 13.4%. Time categories were reported for all 209 (100%) events. Of all events 20.6% occurred between 12:00 a.m. and 5:59 a.m., 29.2% occurred from 6:00 a.m. to 11:59 a.m., 25.8% from 12:00 p.m. to 5:59 p.m., and 24.4% occurred from 6:00 p.m. until 11:59 p.m.

### ***Industries***

The largest proportion of HSEES events were associated with the transportation and warehousing (102 [48.8%]) industries and manufacturing (30 [14.4%]) industries (Table 3). The largest number of events with victims occurred from health care and social assistance industries

(3 [15.0%]), other services (2 [10.0%]), Manufacturing (2 [10.0%]), Mining (2 [10.0%]) and unknown or not an industry (4 [20.0%]). The total number of victims was greatest in the unknown or not an industry categories (22 [32.8]), followed by manufacturing industries (12 [17.9%]) then administrative/support/waste management and remediation services (7 [10.4%]). Although the largest proportion of HSEES events were associated with transportation and warehousing (102 [48.8%]), only 1 (0.9%) of these events reported victims.

### *Substances*

A total of 276 substances were released or were threatened to be released in all events, of which 10 (4.8%) substances were reported as threatened to be released. The individual substances most frequently released were paint and dyes not otherwise specified (NOS) (44[16.9%]), mixture (15[5.8%]), carbon monoxide (10[3.8%]), and hydrochloric acid (10[3.8%]) (Table 5).

Substances were grouped into 16 categories. The most commonly released categories of substances were paints and dyes (41 [18.9%]), acids (41 [15.8%]), and volatile organic compounds (36 [13.9%]) (Table 6). The substance categories most commonly released in fixed-facility events were other inorganic substances (30 [24.8%]), acids (20 [16.5%]), and other substances (19[15.7%]) (Table 6). In transportation-related events, the most common substance categories released were paints and dyes (47 [33.8%]), volatile organic compounds (26 [18.7%]), and acids (21 [15.1%]) (Table 6).

Five types of releases (e.g., air releases, spills) were reported. Air releases (54 [20.8%]), spills (166 [63.9%]), threatened release (34 [13.1%]), fire (3 [1.2%]), and explosion (3 [1.2%]). There were no events with two types of releases listed.

### ***Victims***

A total of 67 victims were involved in 20 events (% of all events) (Table 7). Of the 20 events with victims, 11 (55.0%) events involved only one victim, one (5.0%) involved two victims, and nine (45%) involved three or more victims. All 67 (100%) victims were injured in fixed-facility events.

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 7). For example, events categorized as multiple substance category constituted 5.0% of all events; however, only 7.7% of these events resulted in injuries. Conversely, events involving pesticides and oxy-organics accounted for 2.3% and 5.8% of all events respectively, but 16.7% of the pesticide events and 33.3% of oxy-organics events resulted in injuries.

Employees (32 [47.8%]) constituted the largest proportion of the population groups injured, followed by general public (29 [43.3%]), and unknown (6 [9.0%]) (Figure 4). There were no reported responders, police, EMT, hospital personnel, or students injured.

Victims were reported to sustain a total of 149 injuries or symptoms (Table 9). Some victims had more than one injury or symptom. Of all reported injuries/symptoms, the most common injuries/symptoms in fixed-facility events were headache (40 [26.8%]), and dizziness/central nervous system symptoms (36 [24.2%]). There were no injuries in transportation-related events.

The median age of the 59 (86.8%) victims for whom exact age was reported was 25.9 years (range: 1 – 60 years). For the 64 (95.5%) injured persons for whom an age category was reported, 13 (20.3%) were < 15 years of age, five (7.8%) were 15–19 years of age, 41 (64.1%) were 20–44 years of age, five (7.8%) were 45–64 years of age, and there were no victims 65 years of age or above.

Sex was known for 56 (83.6%) of the victims; of these, 40 (71.4%) were males and 16 (28.6%) were females. Of all employees for whom sex was reported, 88.9% were males.

Of the 67 victims, 13 (19.4%) were treated on scene (administered first-aid), 31 (46.3%) were treated at a hospital (not-admitted), and 21 (31.3%) were treated at a hospital (admitted) (Figure 5). Severity of injury was unknown for 67 (100%) of victims. There were no deaths.

The status of personal protective equipment (PPE) use during event was reported for only 15 (45.5%) of 33 employee-victims. All of these employee-victims reported PPE usage such as gloves, eye protection, hard hat, and/or steel-toed shoes.

The event that consisted of the largest amount of victims (16 [23.9%]) occurred when a family used a barbecue cooker inside a garage during a holiday party at a private residence. Forty-nine people were in the garage and throughout the house, but only 16 showed symptoms of carbon monoxide poisoning. Levels of carbon monoxide were detected at 175 ppm by local fire department.

### *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 108 (51.7%) events in which 125 events reported, schools within ¼ mile of five (2.4%) events in which 43 events reported, hospitals within ¼ mile of one (0.5%) events in which 40 events reported, nursing homes within ¼ mile of three (1.4%) event in which 41 events reported, licensed daycare facilities within ¼ mile of 11 (5.5%) events in which 47 events reported, industries or other businesses within ¼ mile of 151 (72.2%) events in which 152 events reported, and recreational areas within ¼ mile of 36 (17.2%) events in which 69 events reported.

The number of events at which persons were at risk of exposure was determined primarily using GIS. Information was collected on the number of persons living in proximity of the event and on

the number of persons at home within a specific time frame of the event. Approximately 72.5% of the persons living in proximity of the events were home when the events occurred. There were 100 (47.8%) events with persons living within ¼ mile of the event; 122 (58.4%) events with persons living within ½ mile, and 93 (44.5%) events with persons living within one mile of the event. Information on the number of persons living within ¼, ½, and one mile of the event was not reported for 52 events. There were 98 (46.9%) events with persons at home within ¼ mile of the event; 119 (56.9%) events with persons at home within ½ mile; and 149 (71.3%) events with persons at home within one mile. Information on the number of persons at home when the events occurred was not reported for 54 events.

### ***Evacuations***

Evacuations were ordered in 10 (4.8%) of 208 events where evacuation status was reported. There was 1 event that had in-place sheltering ordered by an official.

### ***Decontamination***

Of the 63 (94.0%) victims for whom decontamination status was known, 49 (77.8%) were not decontaminated, four (6.3%) was decontaminated at the scene, seven (11.1%) were decontaminated at a medical facility, and three (4.8%) was decontaminated at both the scene and a medical facility.

Six events occurred where uninjured persons were decontaminated. In these events, decontamination at the scene was conducted for 20 uninjured employees. Decontamination at a medical facility was conducted for three uninjured employees.

### ***Response***

Of the 189 (90.4%) events with information detailing who responded to the event, six (3.2%) reported two or more categories of personnel who responded, five (2.6%) reported three or more categories, and four (2.1%) reported four or more categories. The personnel who responded most frequently were the company's response team where release occurred, 128 (67.7%), followed by certified hazmat team, 16 (8.5%), hospital personnel/poison control center, 12 (6.3%), and fire department, five (2.6%) (Table 9).

### **2008 Prevention Outreach Activities**

The first awareness prevention/outreach activity targeted hazardous material emergency responders and LEPC members in the state of Utah, to increase awareness of and reporting to the HSEES program. This involved preparation of a presentation of the HSEES program that included a trivia game that reviewed key concepts within the presentation. This was presented during two breakout sessions at the Intermountain Hazardous Material Conference in May 2008. In addition, the HSEES coordinator presented at 10 LEPCs sharing county or area specific data, increasing awareness and allowing for discussion of county specific concerns. Presentations were also given at the Pesticide Applicators Application Renewal Workshop in December of 2008. This presentation outreach activity provided crucial networking for obtaining additional information on events and increase overall reporting of releases to the HSEES program.

The first data-driven activity focused on pesticide exposure outreach due to a death that occurred in 2007 from pesticide exposure. A fact sheet was developed and included release data and risks of exposure to pesticide. Consultation with the Utah agricultural department determined the licensed applicators to target. Additionally the fact sheet was posted to the website for the general public to view. The Utah HSEES coordinator presented and provided the pesticides fact sheet at two pesticide applicator trainings in 2008.

The second data-driven prevention activity was collaboration between the Utah HSEES coordinator, the National Response Center (NRC), and the Utah Department of Transportation (DOT) to combine reports by matching fields and creating a merged format to directly input their data into the HSEES database. The Utah HSEES coordinator participated in the roadmap conference in Washington D.C.

### **SUMMARY OF RESULTS, 2000–2008**

During the period 2000–2008, the largest proportion of events occurred in 2001 (Table 10). The number of transportation related-events shows an increase. This is likely due to decreased reporting of events by the National Response Center as they were no longer required to report events occurring in San Juan County. The number of total events reported in Utah has dropped consistently since 2005. There has been a 59.57% decrease in the reported number of cases. This decrease could be due to a variety of reasons, including a decrease in the number of events actually occurring or a decrease in the reporting/capturing of these events.

The number of substances released has also decreased. The number of events with victims increased from 2006-2008, but decreased substantially from 2005. The average percentage of events with victims during 2000–2008 was 4.9%, although the percentage of victims in 2007 was 9.6%, which had increased considerably from 2006.

Previously respiratory irritation has been the most frequently reported injury. In 2008 headache was reported most frequently. Employees as victims decreased substantially between 2007 and 2008 and members of the general public were most commonly reported victims of acute chemical releases (Figure 4). The number of injured responders remained consistent at zero.

## 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.

Appendices

Table 1. The ten substances most frequently involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2008

<b>Number</b>	<b>Standardized Substance Name</b>	<b>Frequency</b>	<b>Percentage</b>
1	Paint or Coating NOS	44	16.9
2	Mixture	15	5.8
3	Carbon Monoxide	10	3.8
4	Hydrochloric Acid	10	3.8
5	Sulfuric Acid	9	3.5
6	Particulate Matter NOS	8	3.1
7	Acetone	7	2.7
8	Sodium Hydroxide	7	2.7
9	Sulfur Dioxide	6	2.3
10	Volatile Organic Compounds NOS	6	2.3

Table 2. Number of events meeting the surveillance definition, by county and type of event—  
Utah Hazardous Substances Emergency Events Surveillance, 2008

County	Type of event				All events Total no. events (%)
	Fixed facility		Transportation		
	No. events	%*	No. events	%*	
Beaver	0	0	0	0	0 (0.00)
Box Elder	3	60	2	40	5 (2.42)
Cache	2	100	0	0	2 (0.97)
Carbon	0	0	1	100	1 (0.48)
Daggett	0	0	0	0	0 (0.0)
Davis	11	52.38	10	47.62	21 (10.14)
Duchesne	5	83.33	1	16.67	6 (2.90)
Emery	2	100	0	0	2 (0.97)
Garfield	0	0	0	0	0 (0.0)
Grand	0	0	1	100	1 (0.48)
Iron	1	100	0	0	1 (0.48)
Juab	0	0	0	0	0 (0.00)
Kane	0	0	0	0	0 (0.0)
Millard	8	100	0	0	8 (3.86)
Morgan	0	0	0	0	0 (0.0)
Piute	0	0	0	0	0 (0.0)
Rich	0	0	0	0	0 (0.0)
Salt Lake	29	23.08	90	76.92	119 (56.94)
San Juan	0	0	0	0	0 (0.00)
Sanpete	1	100	0	0	1 (0.48)
Sevier	2	66.67	1	33.33	3 (1.45)
Summit	1	50	1	50	2 (0.97)
Tooele	4	50	4	50	8 (3.86)
Uintah	6	85.71	1	14.29	7 (3.38)
Utah	6	54.55	5	45.45	11 (5.31)
Wasatch	0	0	0	0	0 (0.00)
Washington	0	0	0	0	0 (0.00)
Wayne	0	0	0	0	0 (0.0)
Weber	10	90.91	1	9.09	11 (5.31)
	91	44	118	56	209 (100.00)

\* 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 for Mining, Utilities or Manufacturing (NAICS 21, 22, 31, 32, 33)—Utah Hazardous Substances Emergency Events Surveillance, 2008

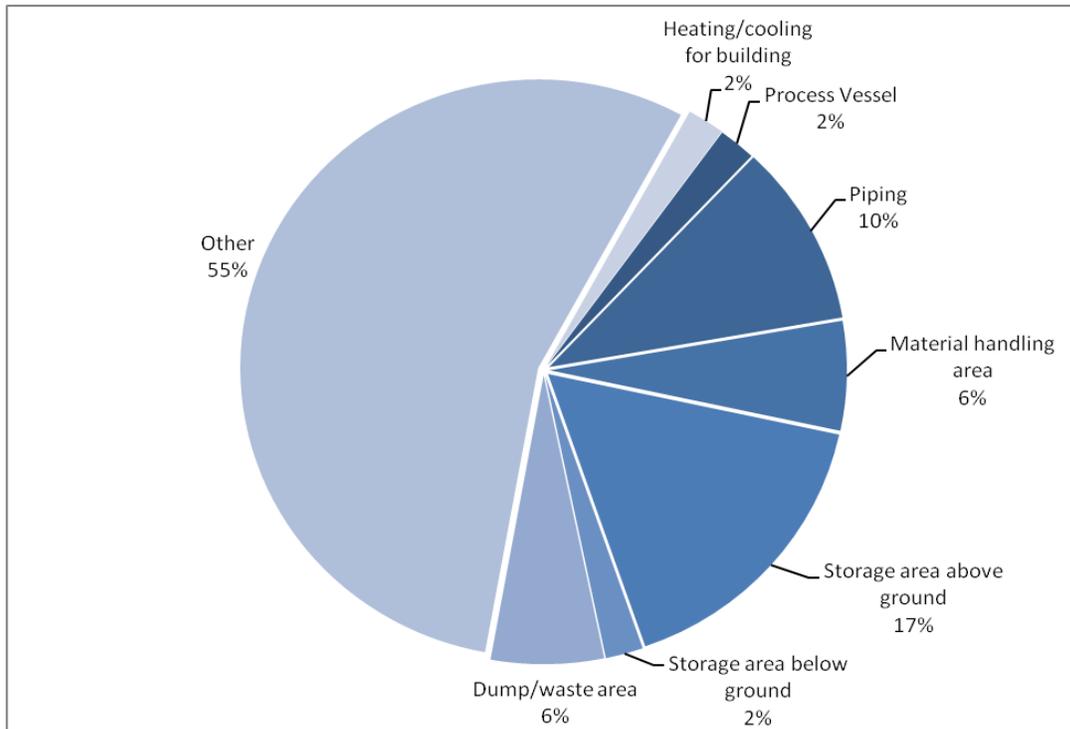


Figure 2. Distribution of transportation-related events, by type of transport—Utah Hazardous Substances Emergency Events Surveillance, 2008

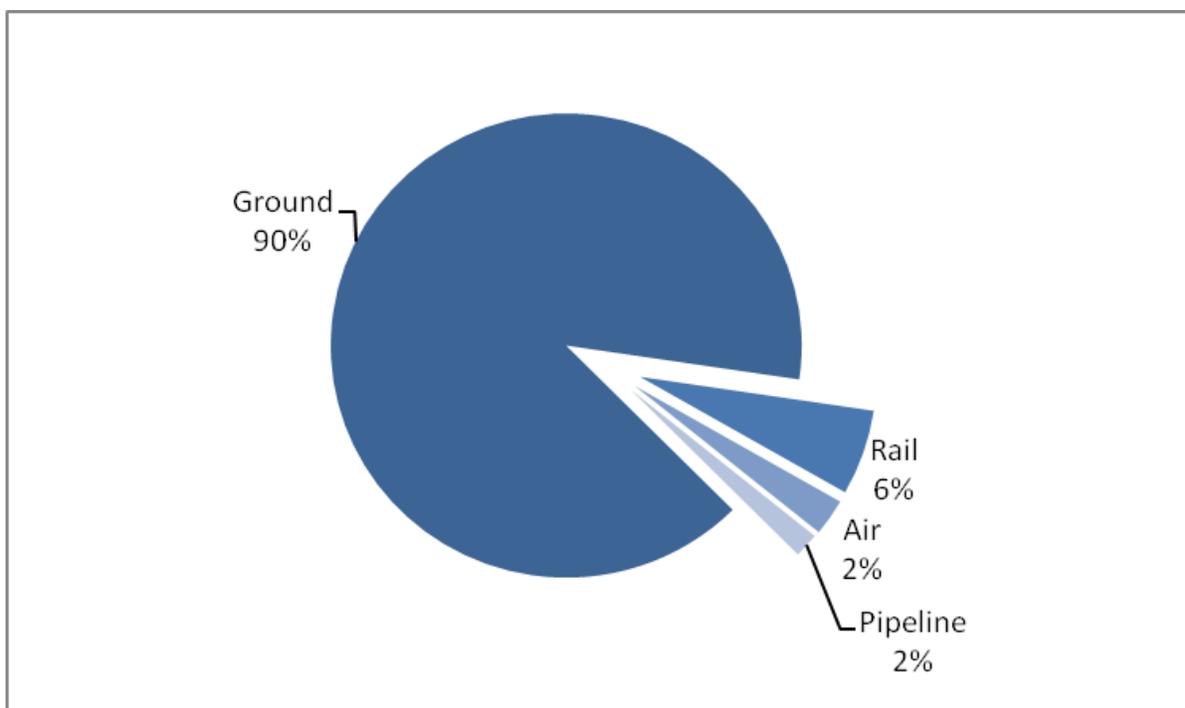


Figure 3a. Primary factors reported as contributing to events— Utah Hazardous Substances Emergency Events Surveillance, 2008

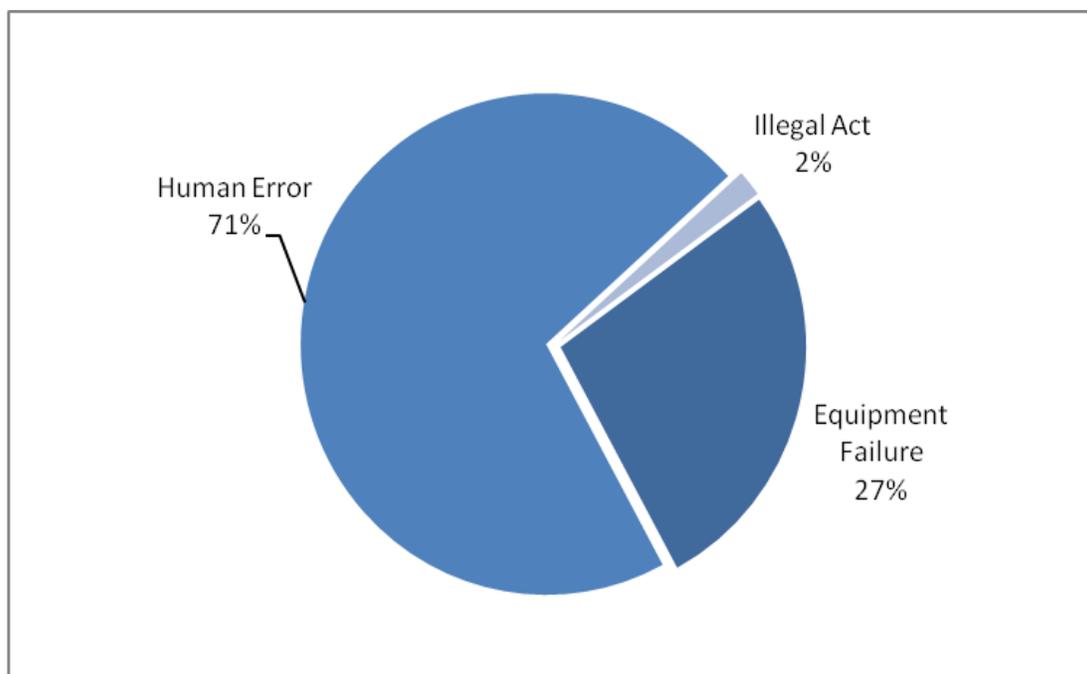


Figure 3b. Secondary factors reported as contributing to events— Utah Hazardous Substances Emergency Events Surveillance, 2008

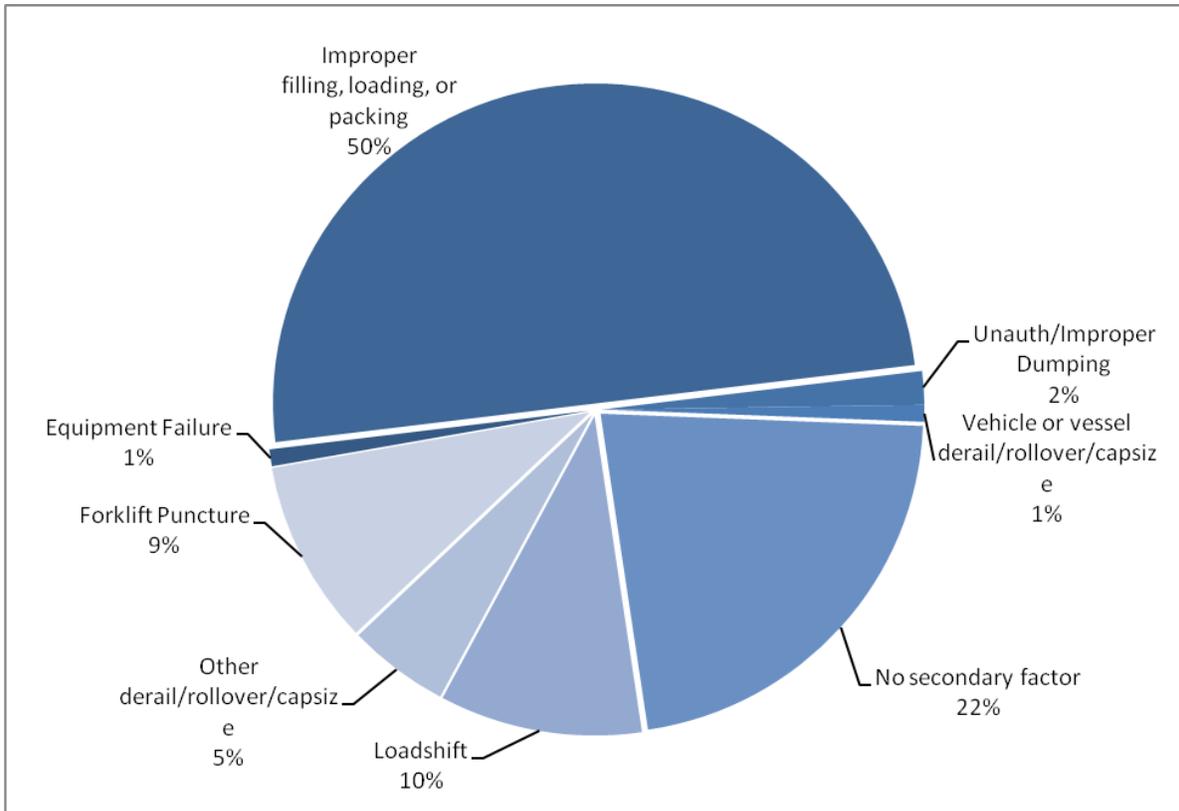


Table 3. Number of substances involved per event, by type of event –Utah Hazardous Substances Emergency Events Surveillance, 2008

No. substances	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total substances	No. events	%	Total substances	No. events	%	Total substances
1	77	44%	77	99	56%	99	176	100%	176
2	6	25%	12	18	75%	36	24	100%	48
3	2	100%	6	0	0%	0	2	100%	6
4	5	83%	20	1	17%	20	6	100%	40
≥ 5	1	100%	6	0	0%	0	1	100%	6
<b>Total</b>	<b>91</b>	<b>44%</b>	<b>121</b>	<b>118</b>	<b>56%</b>	<b>155</b>	<b>209</b>	<b>100%</b>	<b>276</b>

Table 4. Industries involved in hazardous substance events, by category—Utah Hazardous Substances Emergency Events Surveillance, 2008

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	7	3.3	1	14.3	5.0	4
Manufacturing	30	14.4	2	6.7	10.0	12
Transportation and Warehousing	102	48.8	1	0.9	5.0	5
Unknown or not an Industry	22	10.5	4	18.2	20.0	22
Other Services	7	3.3	2	28.6	10.0	2
Utilities	16	7.7	1	6.3	5.0	1
Health Care and Social Assistance	4	1.9	3	75.0	15.0	5
Public Administration	3	1.4	0	0.0	0.0	0
Educational Services	0	0.0	0	0.0	0.0	0
Retail Trade	1	0.5	1	100.0	5.0	2
Accommodation and Food Services	2	1.0	1	50.0	5.0	4
Administrative and Support and Waste Management and Remediation Services	6	2.9	1	16.7	5.0	7
Agriculture, Forestry, Fishing and Hunting	1	0.5	0	0.0	0.0	0
Arts, Entertainment, and Recreation	1	0.5	1	100.0	5.0	1
Finance and Insurance	0	0.0	0	0.0	0.0	0
Mining	5	2.4	2	40.0	10.0	2
Construction	1	0.5	0	0.0	0.0	0
Professional, Scientific, and Technical Services	1	0.5	0	0.0	0.0	0
Information	0	0.0	0	0.0	0.0	0
<b>Total<sup>‡</sup></b>	<b>209</b>	<b>100.0</b>	<b>20</b>		<b>100.0</b>	<b>67</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, 2008

Substance category	Type of event				All events	
	Fixed facility		Transportation			
	No. substances	%	No. substances	%	No. substances	%
Acids	20	16.5	21	15.1	41	15.8
Ammonia	2	1.7	1	0.7	3	1.2
Bases	4	3.3	10	7.2	14	5.4
Chlorine	5	4.1	1	0.7	6	2.3
Formulations	0	0.0	0	0.0	0	0.0
Hetero-organics	0	0.0	2	1.4	2	0.8
Hydrocarbons	1	0.8	2	1.4	3	1.2
Mixture*	8	6.6	5	3.6	13	5.0
Other <sup>†</sup>	19	15.7	10	7.2	29	11.2
Other inorganic substances <sup>‡</sup>	30	24.8	7	5.0	37	14.2
Oxy-organics	14	11.6	1	0.7	15	5.8
Paints and dyes	2	1.7	47	33.8	49	18.9
Pesticides	3	2.5	3	2.2	6	2.3
Polychlorinated biphenyls	2	1.7	1	0.7	3	1.2
Polymers	1	0.8	2	1.4	3	1.2
Volatile organic compounds	10	8.3	26	18.7	36	13.9
<b>Total<sup>¶</sup></b>	<b>121</b>	<b>46.5</b>	<b>139</b>	<b>53.5</b>	<b>260</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> 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, 2008.

No. victims	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total victims	No. events	%	Total victims	No. events	%	Total victims
1	11	55.0	11	0	0.0	0	11	55.0	11
2	1	5.0	2	0	0.0	0	1	5.0	2
3	1	5.0	3	0	0.0	0	1	5.0	3
4	3	15.0	12	0	0.0	0	3	15.0	12
5	1	5.0	5	0	0.0	0	1	5.0	5
7	1	5.0	7	0	0.0	0	1	5.0	7
11	1	5.0	11	0	0.0	0	1	5.0	11
16	1	5.0	16	0	0.0	0	1	5.0	16
<b>Total</b>	<b>20</b>	<b>100.0</b>	<b>67</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>20</b>	<b>100.0</b>	<b>67</b>

Figure 4. Distribution of victims by population group –Utah Hazardous Substances Emergency Events Surveillance, 2008.

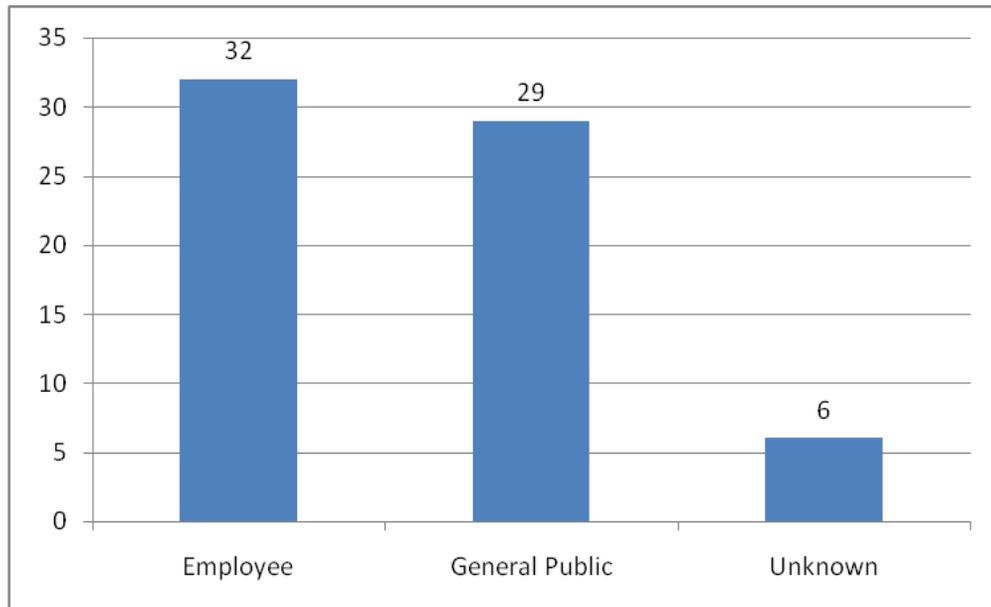


Table 7. Frequency of substance categories in all events and events with victims –Utah Hazardous Substances Emergency Events Surveillance System, 2008\*

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	15.8	5	25.0	12.2
Ammonia	3	1.2	1	5.0	33.3
Bases	14	5.4	1	5.0	7.1
Chlorine	6	2.3	2	10.0	33.3
Formulations	0	0.0	0	0.0	0.0
Hetero-organics	2	0.8	0	0.0	0.0
Hydrocarbons	3	1.2	0	0.0	0.0
Mixture <sup>†</sup>	13	5.0	1	5.0	7.7
Other <sup>‡</sup>	29	11.2	0	0.0	0.0
Other inorganic substances <sup>§</sup>	37	14.2	4	20.0	10.8
Oxy-organics	15	5.8	5	25.0	33.3
Paints and dyes	49	18.9	0	0.0	0.0
Pesticides	6	2.3	1	5.0	16.7
Polychlorinated biphenyls	3	1.2	0	0.0	0.0
Polymers	3	1.2	0	0.0	0.0
Volatile organic compounds	36	13.9	0	0.0	0.0
<b>Total</b>	<b>260</b>	<b>100.0</b>	<b>20</b>	<b>100.0</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.

Table 8. Frequencies of injuries/symptoms, by type of event\*-Utah Hazardous Substances Emergency Events Surveillance System, 2008

Injury/symptom	Fixed facility		Transportation		All events	
	No. injuries	%	No. injuries	%	Total no.	%
Burns	5	3.4	0	0.0	5	3.4
Dizziness/central nervous system symptoms	36	24.2	0	0.0	36	24.2
Eye irritation	2	1.3	0	0.0	2	1.3
Gastrointestinal system problems	34	22.8	0	0.0	34	22.8
Headache	40	26.8	0	0.0	40	26.8
Other	5	3.4	0	0.0	5	3.4
Respiratory irritation	19	12.8	0	0.0	19	12.8
Shortness of breath	2	1.3	0	0.0	2	1.3
Skin irritation	6	4.0	0	0.0	6	4.0
<b>Total<sup>†</sup></b>	<b>149</b>	<b>100.0</b>	<b>0</b>	<b>0.0</b>	<b>149</b>	<b>100.0</b>

\*The number of injuries is greater than the number of victims (68) because a victim could have had more than one injury.

Figure 5. Frequency of Injury Disposition—Utah Hazardous Substances Emergency Events Surveillance, 2008.

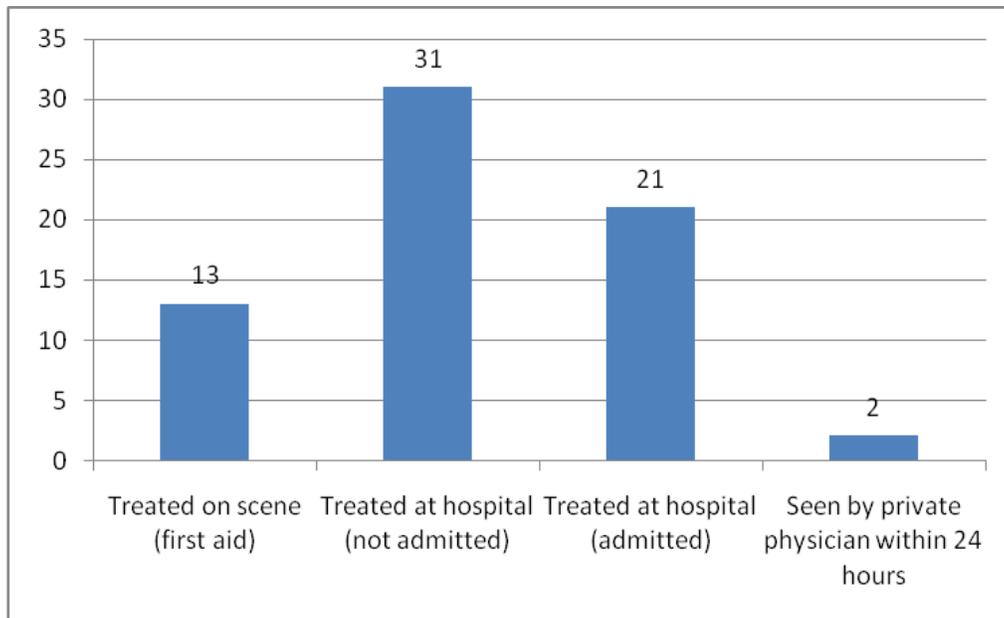


Table 9. Distribution of personnel who responded to the event–Utah Hazardous Substances Emergency Events Surveillance System, 2008

<b>Responder category</b>	<b>No.</b>	<b>%*</b>
3 <sup>rd</sup> Party Clean-up Contractor	1	0.53
Certified HazMat team	16	8.46
Department of works/ utilities/ transportation	1	0.53
Emergency medical technicians	1	0.53
Environmental agency/ EPA <sup>†</sup> response team	2	1.06
Fire department	5	2.65
Health department/health agency	11	5.82
Hospital or Poison Control personnel	12	6.35
Law enforcement agency	4	2.12
No Response	22	11.64
Other	0	0.00
Response team of company where release occurred	129	68.25
Specialized multi-agency team	0	0.00
State, county, or local emergency managers/coordinators/planning	1	0.53

\*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, 2000-2008

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
2006	375	56	431	1243	31	0	15	3.4
2007	308	84	392	970	63	1	20	5.1
2008	91	118	209	276	67	0	20	9.6
<b>Total</b>	2854	956	3810	8392	678	2	188	4.9

† Percentage of events with victims.