

Utah Hazardous Substances Emergency Events Surveillance

**Cumulative Report
2002-2003**



**Utah Department of Health
Office of Epidemiology
Hazardous Substances Emergency Events Surveillance (HSEES)**



The Utah HSEES program is supported by cooperative agreement U61/ATU874146-01 from the Agency for Toxic Substances and Disease Registry, Public Health Services, U. Department of Health and Human Services.

Table of Contents

	Page
Table of Contents.....	ii
List of Tables	iii
List of Figures.....	iv
List of Appendices	iv
Executive Summary.....	1
Introduction.....	2
Methods.....	4
Results.....	5
Industries.....	7
Substances.....	8
Victims.....	8
Evacuations.....	11
Response.....	11
Prevention Activities.....	12
Methamphetamine Laboratories in Utah During 2002-2003.....	13
Summary of Results, 2002-2003.....	14
Reference.....	15
Appendices.....	16

List of Tables

	Page
Table 1. Number of substances involved per event, by type of event, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	21
Table 2. Industries involved in hazardous substances events, by category, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	22
Table 3. Number of substances involved by substances category and type of event, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	23
Table 4. Frequency of the number of victims by type of event, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	24
Table 5. Frequency of substance categories in all events and events with victims, Utah Hazardous Substances Emergency Events Surveillance.....	25
Table 6. Frequencies of injuries/symptoms, by type of event, Utah Hazardous Substances Emergency Events Surveillance, 202-2003.....	27
Table 7. Cumulative data by year, Utah Hazardous Substances Emergency Events Surveillance, 2000-2003.....	29

List of Figures

	Page
Figure 1. Area of fixed facilities involved in events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	18
Figure 2. Distribution of transportation-related events, by type of transport, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	19
Figure 3. Factors reported as contributing to events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	20
Figure 4. Distribution of victims by population group, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	26
Figure 6. Injury disposition, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	28
Figure 7. Cumulative data for Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	30
Figure 8. Number of victims by category and year, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	31

List of Appendices

Appendix 1. The 10 most frequent substances involved in events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.....	17
---	----

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 releases of hazardous substances in 15 states. This report summarizes the characteristics of events reported to the Utah Department of Health in 2002 and 2003. 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 920 events were reported. In 563 (61.1 %) events, only one substance was released. The most commonly reported categories of substances were other inorganic substances, volatile organic compounds, oxy-organics and other. During this reporting period, 16 events (1.7% of all reported events) resulted in a total of 108 victims, of whom 0 (0.0 %) died. The most frequently reported injuries were gastrointestinal system, respiratory, headache, and other (all of which were throat irritation). Evacuation reportedly was ordered for 14 (1.5 %) events.

The findings regarding the percentages of events with victims and events with evacuations has been decreasing from the previous years and the distributions of the numbers and types of injuries reported except for gastrointestinal system, which increased, have been decreasing from the previous years.

HAZARDOUS SUBSTANCES EMERGENCY EVENTS SURVEILLANCE SYSTEM – 2002-2003 SUMMARY

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 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 four 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;
- To identify risk factors associated with the 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; 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 2002-2003 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

Beginning in 2002, a newly updated data-collection form, approved by the Office of Management and Budget, went into effect. For each event, information was collected about the event, substance(s) released, victims, injuries, 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, 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 the events. All data were computerized using Web-based data entry system provided by ATSDR.

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) that could have affected the health of employees, emergency responders, or members of the general public. HSEES defines victims as people who suffer at least one adverse health effect within 24 hours of the event or who die as a consequence of the

event. Victims who receive more than one type of injury are counted once in each applicable injury type. 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.

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.

RESULTS

For 2002-2003, 920 hazardous substances emergency events were reported to HSEES: (1.2 %) of these events were threatened releases. A total of 693 (75.3 %) occurred in fixed facilities.

For each fixed-facility event, one or two types of area involved in the release can be selected. Of all 693 fixed-facility events, 693 (100.0 %) had one type of area; 0 (0.0 %), a combination of two area types, and 0 (0.0 %), no type of area reported. Among events with one type of area reported, the main area was classified as follows: 425 (61.3 %) ancillary processing equipment, 147 (21.0%) material handling, 25 (3.6 %) piping, and 21 (3.0 %) storage areas above ground (i.e., tank, storage shed, and warehouse) (Figure 1). Of the 227 transportation-related events, 187 (82.4 %) occurred during ground transport (e.g., truck, van, or tractor), and 36 (16.9 %) involved transport by rail (Figure 2). Fewer events involved water, air, and pipeline transportation modes.

The largest proportion of transportation-related events occurred during unloading of a stationary vehicle or vessel 132 (58.1 %) and from a moving vehicle or vessel 33 (14.5 %).

Factors contributing to the events consisted of primary and secondary entries and were reported for 918 (99.8 %) events (Figure 3). Of reported factors, more than 470 (67.9 %), of fixed-facility events and 41 (18.1 %) of transportation-related events involved equipment failure as the primary factor; 206 (29.7 %) of fixed-facility and 186 (81.9 %) of transportation-related events involved human error as the primary factor.

More than 61.5 % of all events involved the release of only one substance. Two substances were released in 17 (1.9 %) events, and approximately 337 (36.6 %) involved the release of more than two substances (Table 1). Fixed-facility events were more likely than transportation events to have two or more substances involved in an event (50.1 % vs. 3.1 %).

A total of 1939 substances were either released or threatened to be released during the events. Two types of releases for each chemical (e.g., spill and air) could be reported. Of a total of 1939 substances having type of release reported, only one type of release was associated with the following: air releases (1424, 73.4 %), spills (499, 25.7 %), fires (2, 0.1 %), and explosions (0, 0.0%). Two types of releases were reported for the following combinations: spill and air releases (0, 0.0%), and fires and explosions (0, 0.0%); the remainder involved other combinations of release types, or unknown release types.

The number of events by month ranged from 67 (7.3 %) in December to 88 (9.6 %) in February, with the largest proportions occurring from January to April. The proportion of events ranged from 14.6 % to 18.6 % during weekdays, and from 8.9% to 9.6% during weekend days. Of all 920 (100.0 %) events for which time of day or time category was reported, 42.6 % occurred from 6:00 a.m. to 11:59 a.m., 36.8 % from 12:00 p.m. to 5:59 p.m., 9.3 % from 6:00 p.m. to 11:59 p.m., and the remainder during the early hours of the day.

Industries

The largest proportions of HSEES events were associated with the transportation type of industry 355 (38.6 %) and the wholesale trade type of industry 345 (37.5 %) industries (Table 2).

However, the largest proportion of events with injuries occurred in the professional services industry (37.4 %). The number of victims in the professional services industry (35, 32.4 %) was second highest following the number of victims in the manufacturing industry (41, 38.0 %).

Wholesale trade and the transportation industry categories have the highest percentage of events with 37.5 % and 38.6 % respectively. The reason that wholesale trade is so high in the number of events is due to one particular facility that is located in San Juan County. The facility is a petroleum bulk station and terminal. The most common releases at this facility are comprised of carbon monoxide, sulfur dioxide, volatile organic compounds and nitrogen oxide. The facility is located in a remote portion of the state, and is in a sparsely populated area. The Department of Transportation (DOT) most often reports transportation events and they often times involve the same companies.

Substances

A total of 1939 substances were involved in all events, of which 18 (0.9 %) were reported as threatened releases. The substances most frequently released were sulfur dioxide, volatile organic compounds, nitrogen oxide (NOX), and carbon monoxide (Appendix A). These substances were grouped into 16 categories. The categories most commonly involved in fixed-facility events were other inorganic substances (755, 44.3 %), volatile organic compounds (398, 23.4 %), and oxy organics (323, 19.0 %). In transportation-related events, the most common releases were volatile organic compounds (64, 27.0 %), acids (46, 19.3 %), and other (40, 6.8%) (Table 3).

Victims

A total of 108 victims were involved in 16 events (1.7 % of all events) (Table 4). Of the 16 events with victims, 10 (62.5 %) events involved only one victim, and 6 (37.5 %) involved two victims or more. Of all victims, 108 (100.0 %) were injured in fixed-facility events. Fixed-facility events were more likely to have more than one victim per event (37.5 %) than were transportation events (0.0 %).

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 in events that involved one or more substances from the same substance category were counted once in that category. Substances in events that involved two or

more substances from different categories were counted once in the multiple-substance categories. Substances released most often were not necessarily the most likely to result in victims (Table 5). For example, events involving the substance category “multiple substance category” constituted 37.4 % of all events. However, only 0.6 % of these events resulted in injuries. Conversely, events involving ammonia and oxy-organics exclusively comprised 1.1 % and 2.8 % of all events respectively, but 20.0 % of these ammonia events and 15.4 % of oxy-organic events resulted in injuries.

Employees (82, 76.0 %) constituted the largest proportion of the population groups injured followed by responders (20, 18.5 %), members of the general public (5, 4.6 %), and students (1, 0.9 %)(Figure 4). Twenty emergency response personnel were injured in fixed-facility events. All of the emergency personnel that were injured were injured in the same event and all 20 were career firefighters. There were no victims involved in transportation-related events.

Victims were reported to sustain a total of 173 injuries (Table 6). Some victims had more than one injury. Of all reported injuries, the most common injuries in fixed-facility events were gastrointestinal system (62, 35.8%), respiratory (49, 28.3 %), headache (32, 18.5 %), other (20, 11.6%), eye (3, 1.7%) and skin (3, 1.7 %). In transportation-related events, there were no injuries reported from chemicals released due to a transportation-related event. 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 by the exposure to the substance itself.

Sex was known for 108 (100.0 %) of the victims; of these 71 (66.0 %) were males. Males constituted 66.0 % of all employees and responders for whom sex was reported. The median age of the 37 (34.0 %) victims for whom age was reported was 23 years (range: 0–50, where 0 includes victims <1 year old). Of these, 0 were children aged <10 years, and 1 were children aged 10–18 years. For the 71 (66.0 %) injured persons for whom the age was not reported, 70 (98.6 %) were presumably adults (first responders and employees), 0 (0.0 %) were students, and 1 (1.4 %) could have been adults or children (members of the general public or the category of victims was not known). The largest proportions of victims (severity/disposition) 39 (36.1%) were treated on the scene; 38 (35.2 %) were treated at the hospital but not admitted, and 29 (26.9%) had seen at a hospital for observation, but received no treatment. None of the victims died (Figure 6).

The status of personal protective equipment (PPE) use was reported for 81 (98.8 %) employees and for 20 (100.0 %) first-responder victims. All of the employees that reported use of PPE, 81 (100.0 %) and 0.0 % of first responders had not worn any form of PPE. Employees who wore PPE most often used gloves and eye protection (0, 0.0 %). Among first responders who wore PPE, all wore firefighter equipment with respiratory protection.^a

Three events involved more than 20 injured people per event. The first event resulted from the release of carbon monoxide from a generator not venting properly, due to a planned power outage. This event resulted in 1200 employees being evacuated. Of those 29 experienced nausea and headaches, all 29 were transported to a hospital to be treated and released. A second

^a Note: Firefighter turnout gear is protective clothing normally worn by firefighters during structural fire-fighting operations and is similar to level “D” protection. Level “D” as defined by the Occupational Safety and Health Administration is coveralls, boots/shoes (leather or chemical resistant, steel toe and shank), safety glasses or chemical splash goggles, and hardhat. Level “D” provides limited protection against chemical hazards.

event occurred in a speedometer manufacturing plant and resulted when a machine jammed causing resin to spill onto the floor and filling the building with hot resin fumes causing an evacuation of 230 employees. This event affected 29 employees all of who complained of respiratory problems and gastrointestinal problems. One of the employees was treated at the hospital (admitted), 13 were treated at the hospital (not admitted), and 15 were treated on scene (first aid). A third event occurred at a city fire station where sodium bromide was released. This event affected 20 firefighters. All complained of throat irritation and were treated on scene (first aid). They were decontaminated at the scene.

EVACUATIONS

Evacuations were ordered in 14 (1.5 %) events where evacuation status was reported. Of these evacuations, 71.4 % were of a building or the affected part of a building; 21.4 % were of a defined circular area surrounding the event locations; and the remainder were of a downwind or downstream area, a circular and downwind or downstream area, of no criteria, or not known. The number of people evacuated was known for 13 events and ranged from 5 to 1200 people, with a median of 151.7. However, one of the ordered evacuations was reported as having no evacuees. The median length of evacuation was 3.3 hours. In 92.9 % of events for which evacuation was ordered, access to the area was restricted. One event had in-place sheltering ordered by an official.

RESPONSE

States could report up to 10 categories of “who responded” to the event. At least one response category was reported for 918 of events. Of these events, 40 had two or more categories reported, 16 had three or more categories reported, and 2 had four or more categories reported.

The distribution of the 10 response categories is as follows:

Company's response team	91.7%
Fire Department	3.2%
Certified HazMat team	2.9%
Law enforcement agency	2.6%
Health Department	2.5%
Hospital personnel	0.4%
Environmental agency	0.3%
EMT	0.1%
EPA response team	0.1%
'Other'	0.0%

* Percentages sum to greater than 100% because an event can report multiple categories.

PREVENTION ACTIVITIES

During 2002-2003 the Utah HSEES program performed various prevention activities. These activities included:

- Presentation of an overview of the Utah HSEES program to attendees at the Intermountain Hazardous Waste Conference held in Richfield, Utah, in May of 2002. The conference was well attended, with approximately 250-300 first responders.
- Presentation of an overview of the HSEES program to the Wasatch Front Local Emergency Planning Committee meetings and the distribution of ATSDR's annual reports, and the Utah Cumulative 2000-2001 report to the committees.
- In collaboration with the Utah Poison Control, a local grocery chain and the Salt Lake Valley Health Department to replace mercury thermometers with digital thermometers for the public and schools.

- In an effort to increase the number of events reported to the Utah HSEES Program, and the number of events reported within 48 hours. To accomplish this task, the Utah Poison Control center was contacted in order to receive this data.

The Utah HSEES Internet website page is available at

<http://health.utah.gov/els/epidmiology/envepi/activities/hsees.htm>.

At this site, annual reports, fact sheets and other information can be downloaded.

Methamphetamine Laboratories in Utah During 2002-2003

Methamphetamine labs are a rising concern for public health and those that work in responding to these events. The concern is the exposure of first responders, social workers and the general public to chemicals released from methamphetamine production. These laboratories can produce toxic fumes and large amounts of toxic wastes, which can permeate the area where the methamphetamine is manufactured, creating serious risks to public health. The property and buildings where methamphetamine labs are operated become severely contaminated and pose a risk to the police, health department employees, human services employees and others who are exposed to these sites.

In Utah from 2002-2003 there were 198 methamphetamine lab seizures. The Utah HSEES database has five events (2.5% of methamphetamine labs) that are associated directly to methamphetamine materials. The Utah HSEES program only receives information regarding a methamphetamine lab when it is reported in the news and is seen by the HSEES coordinator. The news source, which includes radio, television and newspaper, are also where most of the information about a methamphetamine lab event is collected. It is often difficult to collect all of

the information about the event because of various reasons. It is difficult to contact the proper source, usually multiple phone calls are made multiple phone calls, and often times calls go unreturned. Not all methamphetamine labs are considered a reportable event. Each event varies. It is possible that many didn't require any action to be taken. There was no decontamination or evacuation involved. But it appears that more lab seizures could be collected as events and entered into the HSEES database than have been. Efforts will be made to increase the reporting of methamphetamine labs in the state of Utah.

SUMMARY OF RESULTS, 2000-2003

During 2000—2003, the largest proportion of events occurred in fixed facilities (Table 7).

However, the number of reported transportation-related events decreased. The decrease could be partially due to the Utah HSEES program becoming more developed, and are excluding events that were previously counted in surveillance=yes, that did not meet all of the requirements it could also be that there was a decrease in transportation related events. In addition, the total number of events decreased from years 2001 to 2002 and then begins to rise again in 2003. This could be in part to the exclusion of events that were previously included into the database, and do not meet the requirements due to small quantities (Figure 7).

In events involving victims, respiratory symptoms were the highest for years 2000-2001, but in 2002-2003 gastrointestinal symptoms increased surpassing respiratory as the most frequently reported. The number of deaths continues to stay at zero. Employees continued to rise as being the most commonly reported victims of emergency events. However, in 2003 they decreased

significantly and responders rose to be the highest category involved as victims. The general public as victims decreased significantly from the year 2001 to 2002, but then stays consistent the next year as does the student category (Figure 8).

The findings from the HSEES data analyses regarding the proportions of the number of events with victims and events with evacuations has been decreasing from the previous years and the distributions of the numbers and types of injuries reported except for gastrointestinal system, which increased, have been decreasing from the previous years.

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

Appendix A. — The 10 most frequent substances involved in events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003

Number	Standardized Substance Name	Frequency
1.	Sulfur Dioxide	347
2.	Volatile Organic Compounds	332
3.	Nitrogen Oxide (NOX)	314
4.	Carbon Monoxide	302
5.	Chlorine	38
6.	Corrosive Liquid NOS	33
7.	Flammable Liquid NOS	33
8.	Nitric Oxide	24
9.	Adhesive	18
10.	Sulfuric Acid	18
Total		1459

Figure 1. —Area of fixed facilities involved in events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

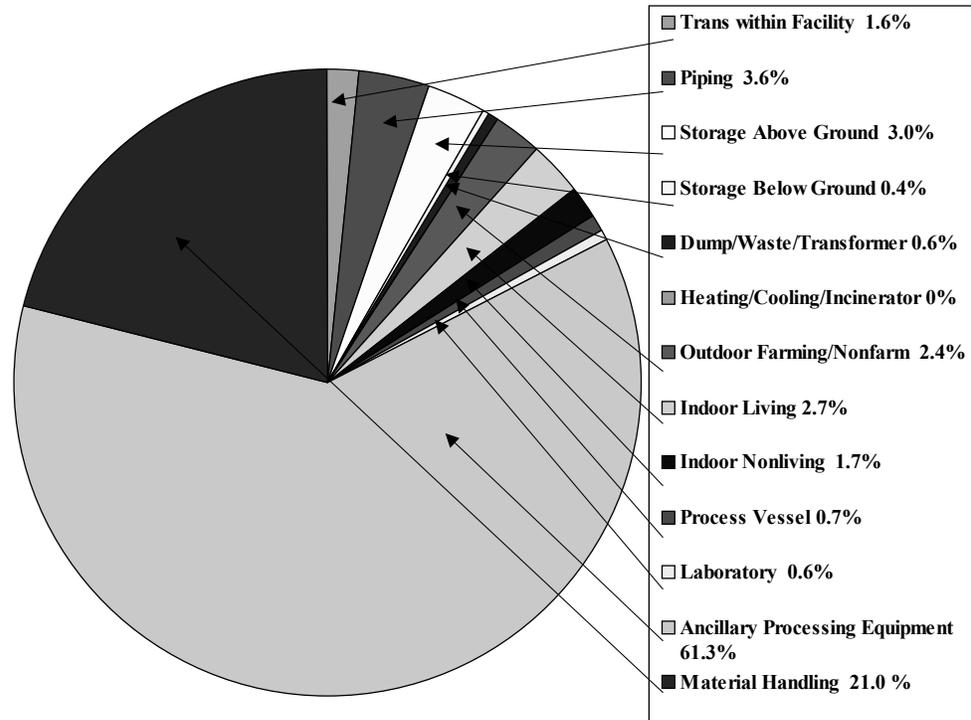


Figure 2. —Distribution of transportation-related events, by type of transport, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

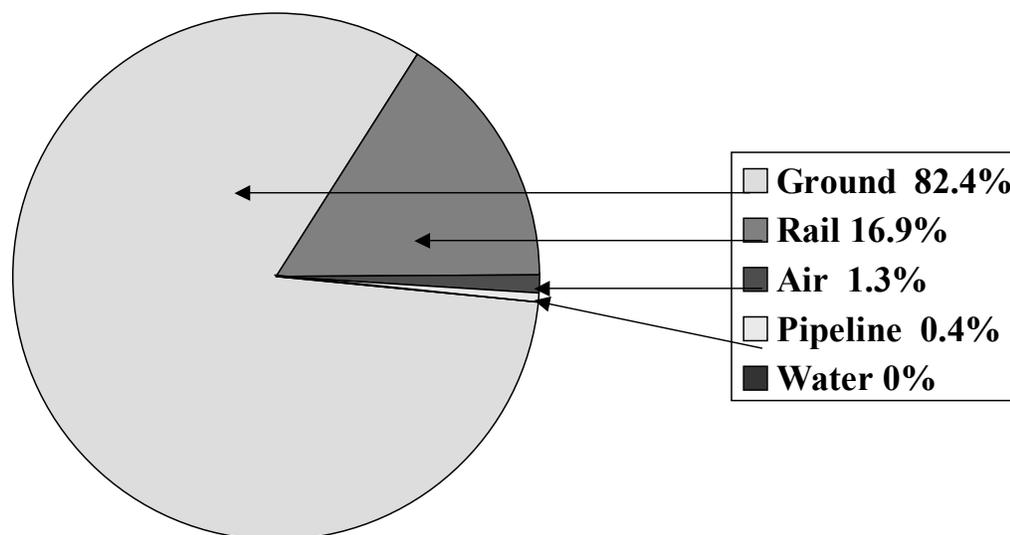
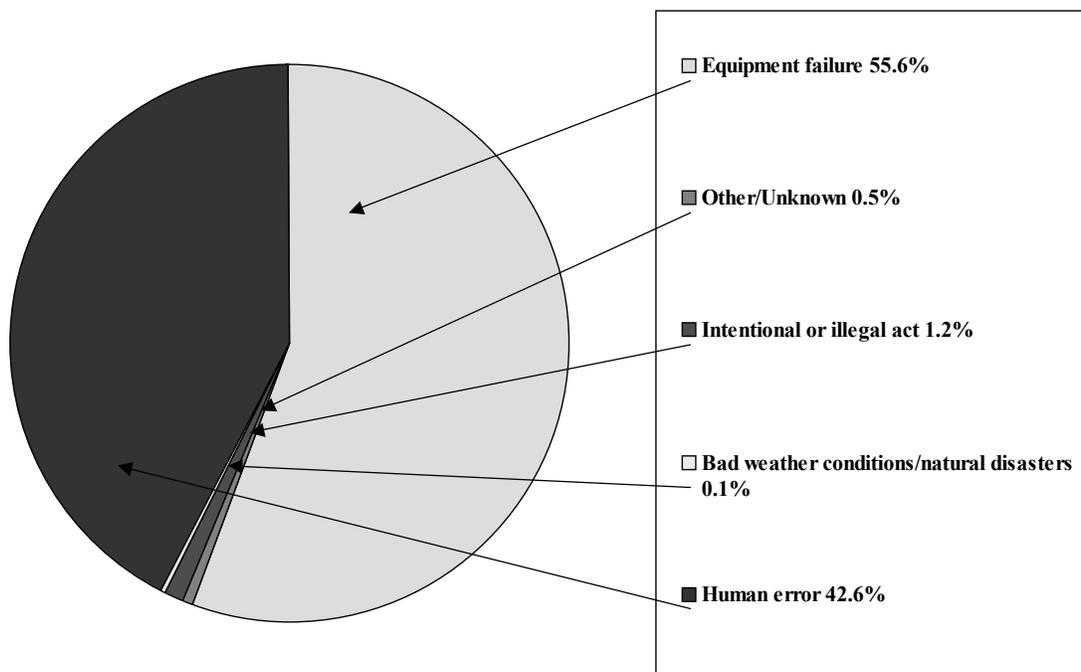


Figure 3. —Factors reported as contributing to events, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.



Of 511 equipment failures the following were involved: no secondary factor (442), improper filling, loading or packing (32), power failure/electrical problems (18), system process/upset (6), system start up and shutdown (5), and the remainder with other factors.

Of 392 human error primary factors the following were involved: involved improper filling, loading or packing (277), no secondary factor (43), forklift puncture (19), load shift (19), unauthorized/improper dumping (7), equipment failure (6), performing maintenance (5), and the remainder with other factors.

Of the 11 intentional or illegal act primary factors (5) involved illicit drug production, and (2) human error.

There were five other or unknown primary factors with emergency shutdown and gas surge being involved. There was one event that the primary factor involved bad weather conditions /natural disasters.

Table 1. —Number of substances involved per event, by type of event, Utah Hazardous Substances Emergency Events Surveillance, 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	346	49.9	346	220	96.9	220	566	61.5	566
2	13	1.9	26	4	1.8	8	17	1.9	34
3	8	1.2	24	2	0.9	6	10	1.1	30
4	325	46.9	1300	1	0.4	4	326	35.4	1304
≥ 5	1	0.1	5	0	0	0	1	0.1	5
Total	693	100	1701	227	100	238	920	100	1939

Table 2. —Industries involved in hazardous substances events, by category, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

Industry category	Total events		Events with victims		Percentage all events with victims	Total no. victims # (range)*
	No.	%	No.	%		
Agriculture	2	0.2	0	0	0.0	0 (0)
Mining	32	3.5	0	0	0.0	0 (0)
Construction	8	0.9	0	0	0.0	0 (0)
Manufacturing	90	9.8	2	12.5	2.2	41 (1-29)
Transportation	355	38.6	2	12.5	0.6	2 (2)
Communications	0	0	0	0	0.0	0 (0)
Utilities	25	2.7	0	0	0.0	0 (0)
Wholesale trade	345	37.5	0	0	0.0	0 (0)
Retail trade	6	0.6	1	6.3	16.7	2 (2)
Finance	0	0	0	0	0.0	0 (0)
Business and repair services	7	0.7	0	0	0.0	0 (0)
Personal services	13	1.4	0	0	0.0	0 (0)
Entertainment	5	0.5	1	6.3	20.0	6 (6)
Professional services	12	1.3	6	37.4	50.0	35 (1-29)
Public administration	10	1.1	2	12.5	20.0	21 (1-20)
Unspecified and unknown	11	1.2	2	12.5	18.2	1 (1)
Total	920	100	16	100	1.7	108

*Range of number of victims per event with victims.

Table 3. —Number of substances involved by substance category and type of event, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

Substance category	Type of event				All events	
	Fixed facility		Transportation			
	No. substances	%	No. substances	%	No. substances	%
Acids	38	2.2	46	19.3	84	4.3
Other*	75	4.4	40	16.8	445	5.9
Mixture†	3	0.2	2	0.8	5	0.3
Ammonia	10	0.6	0	0.0	10	0.5
Bases	18	1.1	15	6.3	33	1.7
Chlorine	37	2.2	4	1.6	41	2.1
Other inorganic substances‡	755	44.3	19	8.0	774	39.9
Paints & dyes	11	0.6	10	4.2	21	1.1
Pesticides	12	0.7	12	5.0	24	1.2
Polychlorinated biphenyls	3	0.2	0	0.0	3	0.2
Volatile organic compounds	398	23.4	64	27.0	462	23.8
Formulations	0	0.0	0	0.0	0	0.0
Hetero-Organics	5	0.3	6	2.5	11	0.6
Hydrocarbons	8	0.5	7	3.0	15	0.8
Oxy-Organics	323	19.0	7	3.0	330	17
Polymers	5	0.3	6	2.5	11	0.6
Total	1701	100	238	100	1939	100

* Not classified.

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

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

Table 4. —Frequency of the number of victims by type of event, Utah Hazardous Substances Emergency Events Surveillance, 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	10	62.5	10	0	0.0	0	10	62.5	10
2	1	6.2	2	0	0.0	0	1	6.2	2
3	0	0.0	0	0	0.0	0	0	0.0	0
4	0	0.0	0	0	0.0	0	0	0.0	0
5	0	0.0	0	0	0.0	0	0	0.0	0
≥6	5	31.3	96	0	0.0	0	5	31.3	96
Total	16	100	108	0	0.0	0		100	108

Table 5. —Frequency of substance categories in all events and events with victims, Utah Hazardous Substances Emergency Events Surveillance, 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	79	8.6	1	6.3	1.3
Other†	82	8.9	3	18.7	3.7
Mixture‡	5	0.5	0	0.0	0.0
Ammonia	10	1.1	2	12.4	20.0
Bases	32	3.5	1	6.3	3.1
Chlorine	39	4.2	1	6.3	2.6
Other inorganic substances¶	91	9.9	1	6.3	1.1
Paints & dyes	21	2.3	0	0.0	0.0
Pesticides	19	2.1	0	0.0	0.0
Polychlorinated biphenyls	3	0.3	0	0.0	0.0
Volatile organic compounds	134	14.6	0	0.0	0.0
Multiple substance categories	344	37.4	2	12.4	0.6
Formulations	0	0.0	0	0.0	0.0
Hetero organics	11	1.2	0	0.0	0.0
Hydrocarbons	13	1.4	0	0.0	0.0
Oxy-organics	26	2.8	4	25.0	15.4
Polymers	11	1.2	1	6.3	9.0
Total	920	100	16	100	1.7

*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 that involved multiple substances from different substance categories they were counted only once in the multiple substance categories.

†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. —Distribution of victims by population group, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

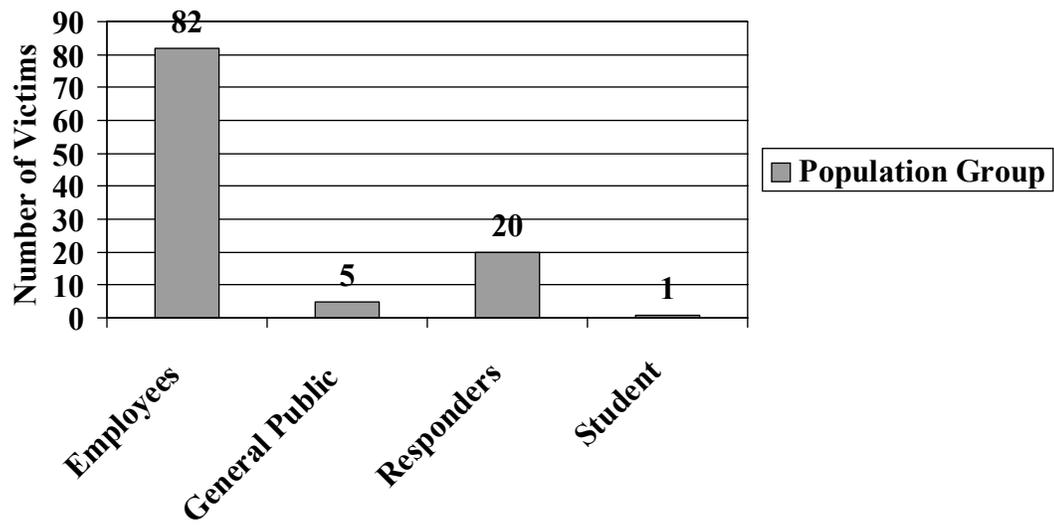


Table 6. —Frequencies of injuries/symptoms, by type of event, *Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

Injury/symptom	Fixed facility		Transportation		All events	
	No. injuries	%	No. injuries	%	Total no.	%
Trauma	1	0.6	0	0	1	0.6
Respiratory	49	28.3	0	0	49	28.3
Eye	3	1.7	0	0	3	1.7
Gastrointestinal system	62	35.8	0	0	62	35.8
Chemical burns	1	0.6	0	0	1	0.6
Other	20	11.6	0	0	20	11.6
Skin	3	1.7	0	0	3	1.7
Headache	32	18.5	0	0	32	18.5
Shortness of breath	2	1.2	0	0	2	1.2
Total	173	100	0	0	173	100

*The number of injuries is greater than the number of victims (108) because a victim could have had more than one injury.

*****Please note that not all injury categories are here, if there were few in a category, they were combined in other*****

Figure 6. —Injury disposition, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

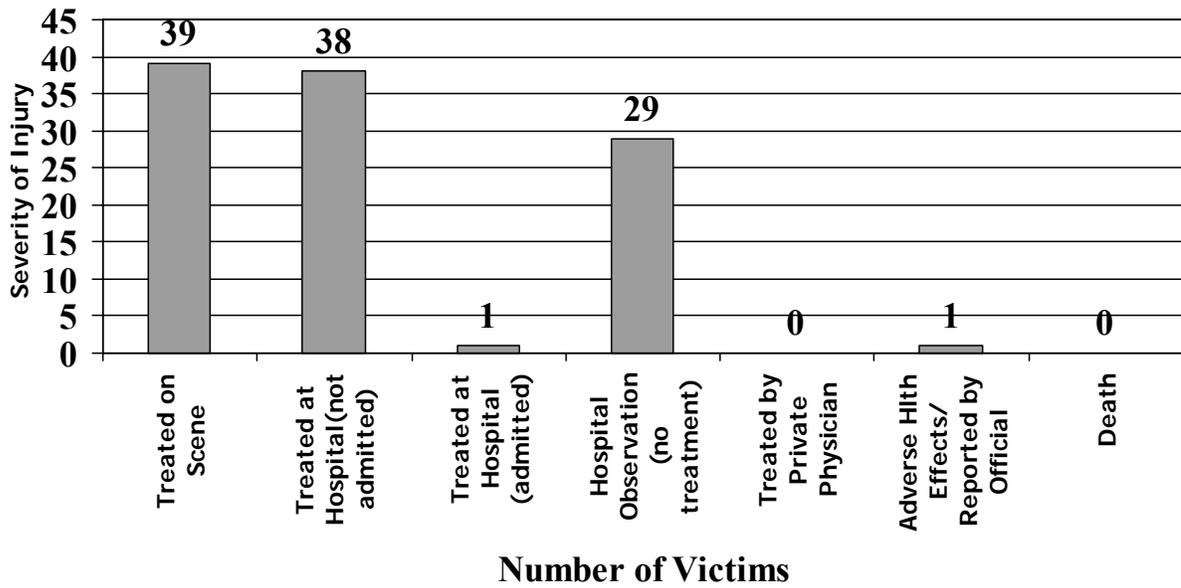


Table 7.— Cumulative data by year, Utah Hazardous Substances Emergency Events Surveillance, 2000-2003.*

Year	Type of event			No. substances Involved	No. victims	No. deaths	Events with victims	
	Fixed facility	Transportation	Total				No.	%†
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
Total‡	1241	516	1757	3418	248	0	40	2.3

* 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

Figure 7.—Cumulative data for Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

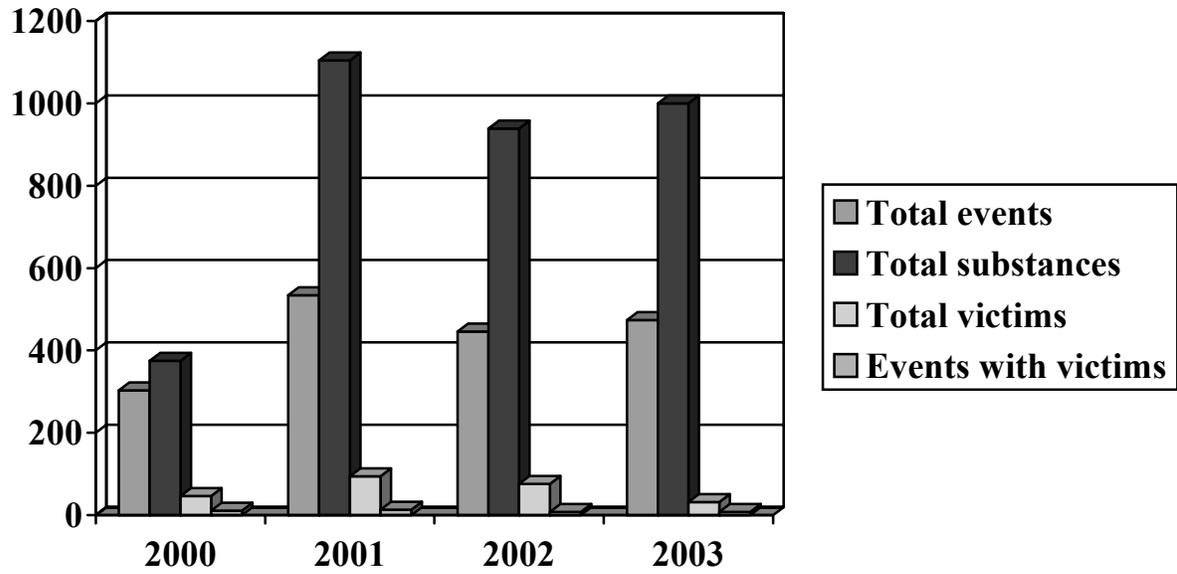


Figure 8.—Number of victims by category and year, Utah Hazardous Substances Emergency Events Surveillance, 2002-2003.

