

Louisiana Hazardous Substances Emergency Events Surveillance (HSEES) System

2009: A Summary Report

Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology & Toxicology



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Contents

	Page
List of Tables	iv
List of Figures	v
Executive Summary	vi
Introduction	1
Methods	3
Results	4
Industries	10
Substances	12
Victims	13
Nearby populations	19
Evacuations	19
Decontamination	20
Response	20
Prevention Activities	21
Summary of Results, 2001–2009	21
References	24
Appendix	25
Glossary	26

List of Tables

- Table 1. Number of events meeting the surveillance definition, by parish and type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 2. Number of substances involved per event, by type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 3. Industries involved in hazardous substance events, by category— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 4. Number of substances involved, by substance category and type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 5. Number of victims per event, by type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 6. Frequency of substance categories in all events and events with victims— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 7. Frequencies of injuries/symptoms, by type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 8. Distribution of personnel who responded to the event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Table 9. Cumulative data by year—Louisiana Hazardous Substances Emergency Events Surveillance, 2001–2009

List of Figures

- Figure 1. Primary areas or equipment of fixed facilities involved in mining, manufacturing, or utility events—Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 2. Distribution of transportation-related events, by type of transport— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 3a. Primary factors reported as contributing to events— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 4. Monthly breakdown of HSEES events for calendar year 2009—Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 5. Number of victims, by population group and type of event— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 6. Injury disposition— Louisiana Hazardous Substances Emergency Events Surveillance, 2009
- Figure 7. Number of victims, by category and year— Louisiana Hazardous Substances Emergency Events Surveillance, 2001–2009

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. The Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services, Section of Environmental Epidemiology and Toxicology has participated in this surveillance system since 2001. This report summarizes the characteristics of events reported to Louisiana in 2009. 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.

In 2009, 819 events met the HSEES surveillance definition. In 625 (76.3%) events, only one substance was released. The most commonly reported categories of substances were volatile organic compounds, other inorganic substances, and acids. During this reporting period, 44 events (5.4% of all reported events) resulted in a total of 86 victims. The most frequently reported injuries were respiratory irritation and eye irritation. Evacuations were ordered for 19 (2.3%) 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 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 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.

The Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services, Section of Environmental Epidemiology and Toxicology has participated in this surveillance system since 2001. In 2009, fourteen state health departments participated in HSEES: Colorado, Florida, Iowa, Louisiana, Michigan, Minnesota, New Jersey, New York, North Carolina, Oregon, Texas, Utah, Washington, and Wisconsin.

This report provides an overview of HSEES for 2009 in Louisiana, 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 an updated data-collection form was approved by the Office of Management and Budget. 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, the Louisiana Department of Public Safety and Corrections, Office of State Police, the Louisiana Department of Environmental Quality (LDEQ), the U.S. Coast Guard National Response Center, and the U.S. Department of Transportation, Hazardous Materials Information System (HMIS). 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.

A HSEES event is defined as an uncontrolled or illegal acute release of any hazardous substance (except petroleum when petroleum is the only substance released), in any amount for substances listed on the HSEES Mandatory Chemical Reporting List, or, if not on the list, in an amount greater than or equal to 10 lbs or 1 gallon. Threatened releases of qualifying amounts will be included if the threat led to an action (e.g., evacuation) to protect the public health. Petroleum-only releases are not included because of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). [Note: The Petroleum Exclusion clause of

CERCLA excludes any form of petroleum that has not been refined to the point of becoming a single-chemical product]. 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 15 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

In 2009, a total of 819 acute hazardous substances events met the HSEES surveillance definition. A total of 693 (84.6%) events occurred in fixed facilities. The parishes with the most events (Table 1) were East Baton Rouge (150 [18.3%]), Calcasieu (122 [14.9%]), Ascension (91 [11.1%]) and St. Charles (78 [9.5%]).

Table 1.—Number of events meeting the surveillance definition, by parish and type of event—
Louisiana Hazardous Substances Emergency Events Surveillance, 2009

Parish	Type of Event				All Events	
	Fixed Facility		Transportation		No. Events	%*
	No. Events	%*	No. Events	%*		
Acadia	0	0	1	0.8	1	0.1
Allen	No HSEES Events					
Ascension	80	11.5	11	8.7	91	11.1
Assumption	0	0	1	0.8	1	0.1
Avoyelles	2	0.3	0	0	2	0.2
Beauregard	0	0	1	0.8	1	0.1
Bienville	No HSEES Events					
Bossier	3	0.4	4	3.2	7	0.9
Caddo	18	2.6	17	13.5	35	4.3
Calcasieu	115	16.6	7	5.6	122	14.9
Caldwell	No HSEES Events					
Cameron	No HSEES Events					
Catahoula	No HSEES Events					
Claiborne	0	0	2	1.6	2	0.2
Concordia	No HSEES Events					
De Soto	1	0.1	3	2.4	4	0.5
E. Baton Rouge	139	20.1	11	8.7	150	18.3
E. Carroll	No HSEES Events					
E. Feliciana	No HSEES Events					
Evangeline	No HSEES Events					
Franklin	No HSEES Events					
Grant	3	0.4	0	0	3	0.4
Iberia	1	0.1	2	1.6	3	0.4
Iberville	69	10	5	4	74	9
Jackson	1	0.1	1	0.8	2	0.2
Jefferson	18	2.6	14	11.1	32	3.9
Jefferson Davis	0	0	1	0.8	1	0.1
Lafayette	5	0.7	10	7.9	15	1.8
La Fourche	2	0.3	1	0.8	3	0.4
La Salle	1	0.1	0	0	1	0.1
Lincoln	1	0.1	1	0.8	2	0.2
Livingston	3	0.4	0	0	3	0.4
Madison	0	0	1	0.8	1	0.1
Morehouse	1	0.1	0	0	1	0.1
Natchitoches	1	0.1	1	0.8	2	0.2
Orleans	7	1	2	1.6	9	1.1

Ouachita	9	1.3	0	0	9	1.1
Plaquemines	16	2.3	0	0	16	2
Pointe Coupee	0	0	3	2.4	3	0.4
Rapides	1	0.1	1	0.8	2	0.2
Red River	No HSEES Events					
Richland	No HSEES Events					
Sabine	1	0.1	0	0	1	0.1
St. Bernard	39	5.6	1	0.8	40	4.9
St. Charles	74	10.7	4	3.2	78	9.5
St. Helena	No HSEES Events					
St. James	24	3.5	2	1.6	26	3.2
St. John	12	1.7	2	1.6	14	1.7
St. Landry	6	0.9	1	0.8	7	0.9
St. Martin	0	0	1	0.8	1	0.1
St. Mary	0	0	1	0.8	1	0.1
St. Tammany	No HSEES Events					
Tangipahoa	0	0	2	1.6	2	0.2
Tensas	0	0	0	0	0	0
Terrebonne	3	0.4	2	1.6	5	0.6
Union	1	0.1	0	0	1	0.1
Vermilion	1	0.1	2	1.6	3	0.4
Vernon	No HSEES Events					
Washington	1	0.1	0	0	1	0.1
Webster	3	0.4	2	1.6	5	0.6
W. Baton Rouge	31	4.5	5	4	36	4.4
W. Carroll	No HSEES Events					
W. Feliciana	No HSEES Events					
Winn	No HSEES Events					
Total[‡]	693	99.4	126	100.3	819	99.7

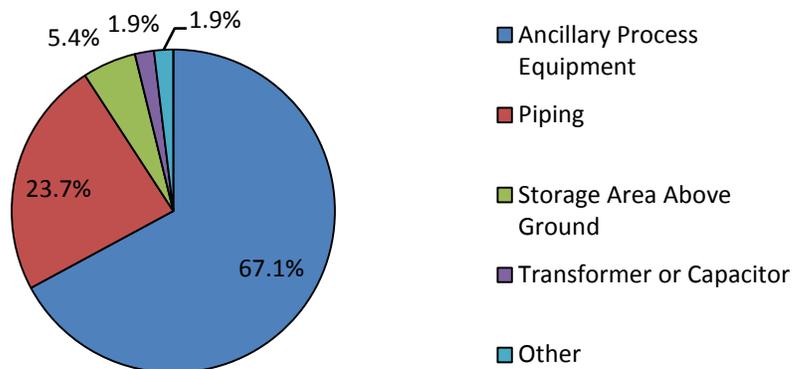
* Percentage = (number of events by type of event per parish ÷ total number of events) x 100

‡ Percentages do not total 100% because of rounding.

For each fixed-facility event occurring in mining, manufacturing, or utilities, one or two choices can be selected to describe the type of area where the event occurred or the equipment involved with the event. Only one type of area was reported for 523 (92.9%) of fixed facility events and a combination of two area types were reported for 40 (7.1%). Among events with one type of area

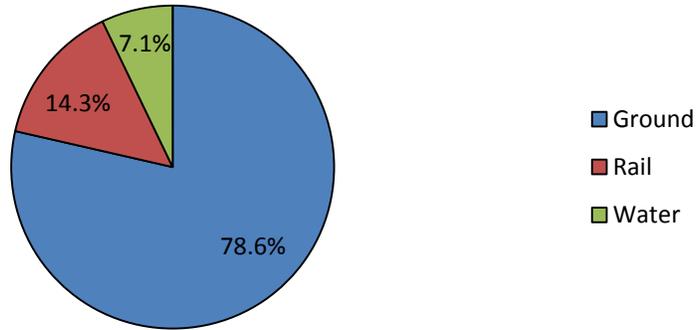
reported, the main areas were classified as follows: 351 (67.1%) ancillary process equipment, 124 (23.7%) piping, and 28 (5.4%) storage area above ground (Figure 1).

Figure 1.—Primary areas or equipment of fixed facilities involved in mining, manufacturing, or utility events where only one type of area was reported—Louisiana Hazardous Substances Emergency Events Surveillance, 2009



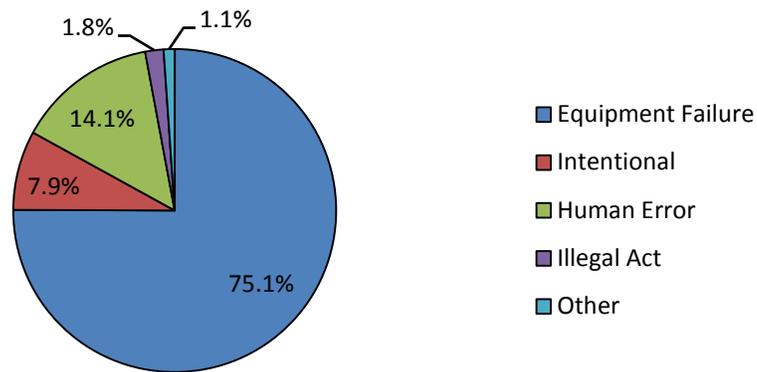
Of the 126 transportation-related events, 99 (78.6%) occurred during ground transport (e.g., truck, van, or tractor), 18 (14.3%) involved transport by rail, and 9 (7.1%) involved transport by water (Figure 2). The largest proportions of transportation-related events occurred from a moving vehicle or vessel (56 [44.4%]) or occurred en route and was later discovered at a fixed facility (31 [24.6%]).

Figure 2.—Distribution of transportation-related events, by type of transport—Louisiana Hazardous Substances Emergency Events Surveillance, 2009



Primary and secondary factors contributing to the events were reported. Primary factors were reported for 818 (99.9%) events (Figure 3). Most (81.6%) fixed-facility events reported equipment failure as the primary factor, and most (58.7%) transportation-related events reported human error as the primary factor. Secondary factors were reported for 1.0% of all events.

Figure 3.—Primary factors reported as contributing to events—Louisiana Hazardous Substances Emergency Events Surveillance, 2009*



*Primary factor was unknown for 1 event.

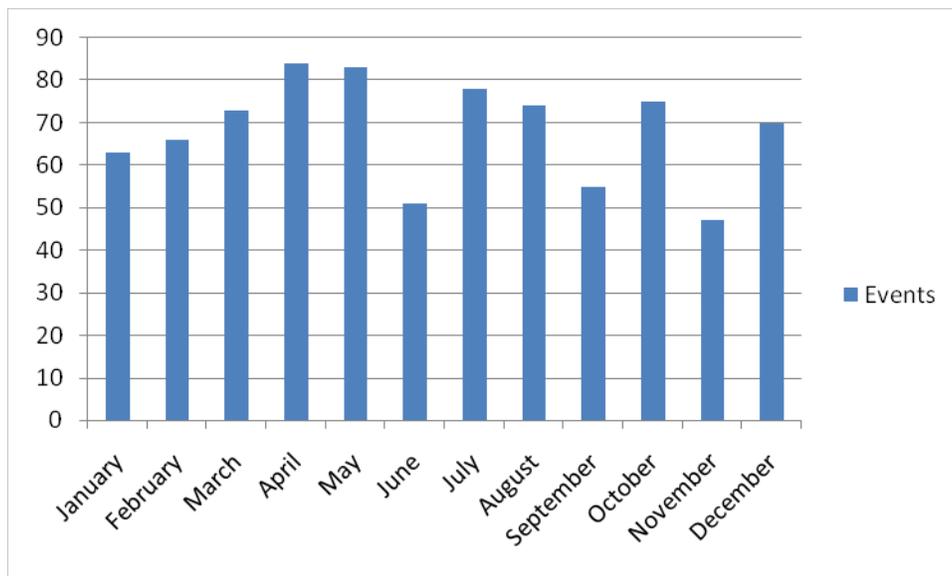
Over 76% of all events involved the release of only one substance. Two substances were released in 11% of the events, and approximately 13% involved the release of more than two substances (Table 2). Fixed-facility events were more likely than transportation events to have two or more substances released in an event (28% vs. 2%).

Table 2.—Number of substances involved per event, by type of event—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

No. Substances	Type of Event						All Events		
	Fixed Facility			Transportation					
	No. Events	%	Total Substances	No. Events	%	Total Substances	No. Events	%	Total Substances
1	502	72.4	502	123	97.6	123	625	76.3	625
2	88	12.7	176	2	1.6	4	90	11.0	180
3	52	7.5	156	0	0.0	0	52	6.3	156
4	25	3.6	100	0	0.0	0	25	3.1	100
≥ 5	26	3.8	183	1	0.8	5	27	3.3	188
Total	693	100.0	1117	126	100.0	132	819	100.0	1249

HSEES events were more likely to occur in industrial areas as opposed to commercial, residential or agricultural areas. In addition, HSEES events were more likely to occur in the 6 hours before noon (39.6%) and the 6 hours after and including noon (28.8%), compared with the 6 hours before midnight (16.2%) and the 6 hours after and including midnight (15.4%). Three events did not have a time specified. Additionally, 13-17% of events occurred on each weekday as compared with 9-10% on a weekend day. The highest number of events occurred in April (84 [10.3%]) (Figure 4).

Figure 4.— Monthly breakdown of HSEES events for calendar year 2009—Louisiana Hazardous Substances Emergency Events Surveillance, 2009



Industries

The largest proportions of HSEES events were associated with the manufacturing (561 [68.5%]) and transportation / warehousing (161 [19.7%]) industries (Table 3). Within manufacturing, petroleum manufacturing (224 [39.9%]) accounted for most of the events. The largest number of events with victims occurred in the manufacturing industry (22 [50.0%]). The total number of victims was greatest in the manufacturing industry (44 [51.2%]) followed by the number of victims in the Transportation / Warehousing Industries (13 [15.1%]). Although the manufacturing industry resulted in a large proportion of events with victims and a large number of victims, only 3.9% of all 561 events in that category resulted in victims. Conversely, 100% of events in the “*Arts, Entertainment and Recreation*” and “*Educational Services*” categories resulted in victims, but these industries represent a small proportion (4.5%) of events with victims. The incident with the largest number of injuries was in the manufacturing industry. Approximately 20 nearby residents experienced breathing problems as a result of a spillage of aqueous ammonia.

Table 3.—Industries involved in hazardous substance events and events with victims, by category— Louisiana Hazardous Substances Emergency Events Surveillance, 2009

Industry Category	Total Events		Events with Victims		Percentage of Events with Victims	Total Number of Victims (Maximum)*
	Number	Percent	Number	Percent		
Accommodation and Food Services	NO HSEES Events					
Administrative and Support and Waste Management and Remediation Services	2	0.2	0	0	0	0
Agriculture, Forestry, Fishing and Hunting	1	0.1	0	0	0	0
Arts, Entertainment, and Recreation	1	0.1	1	2.3	100	8 (8)
Construction	5	0.6	0	0	0	0
Educational Services	1	0.1	1	2.3	100	3 (3)
Finance and Insurance	NO HSEES Events					
Health Care and Social Assistance	NO HSEES Events					
Information	NO HSEES Events					
Management of Companies and Enterprises	NO HSEES Events					
Manufacturing (Food, Textile, Apparel)	2	0.2	0	0	0	0
Manufacturing (Metal, Electrical, Transport, Professional)	2	0.2	0	0	0	0
Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)	557	68	22	50	3.9	44 (20)
Mining	11	1.3	1	2.3	9.1	1 (1)
Not an Industry / Not Identified / Unknown	17	2.1	5	11.4	29.4	6 (2)
Other Services (except Public Administration)	3	0.4	1	2.3	33.3	1 (1)
Professional, Scientific, and Technical Services	3	0.4	0	0	0	0
Public Administration	5	0.6	1	2.3	20	1 (1)

Real Estate and Rental and Leasing	2	0.2	0	0	0	0
Retail Trade I	3	0.4	0	0	0	0
Retail Trade II	5	0.6	0	0	0	0
Transportation and Warehousing I	159	19.4	7	15.9	4.4	9 (2)
Transportation and Warehousing II	2	0.2	1	2.3	50	4 (4)
Utilities	9	1.1	1	2.3	11.1	1 (1)
Wholesale Trade	29	3.5	3	6.8	10.3	8 (5)
Total†	819	99.7	44	100.2	-	86 (20)

*Minimum number of victims per event = 1.

† Percentages do not total 100% because of rounding.

Substances

A total of 1249 substances were released in all events, of which 44 (3.5%) substances were reported as threatened to be released. The individual substances most frequently released were sulfur dioxide, ethylene, benzene, hydrogen sulfide, and propylene (Appendix). Substances were grouped into 16 categories. The substance categories most commonly released in fixed-facility events were volatile organic compounds (487 [43.6%]), other inorganic substances (264 [23.6%]), and acids (70 [6.3%]) (Table 4). In transportation-related events, the most common substance categories released were acids (32 [24.2%]).

Two types of releases for each substance (e.g., spill and air) could be reported. Only two substances involved more than one release type. In both releases, substances were both spilled as a liquid and a gas.

Table 4.—Number of substances involved, by substance category and type of event—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

Substance Category	Type of Event				All Events	
	Fixed facility		Transportation			
	No. Substances	%	No. Substances	%	No. Substances	%
Acids	70	6.3	32	24.2	102	8.2
Ammonia	47	4.2	4	3.0	51	4.1
Bases	25	2.2	21	15.9	46	3.7
Chlorine	34	3.0	4	3.0	38	3.0
Hetero-organics	11	1.0	2	1.5	13	1.0
Hydrocarbons	39	3.5	3	2.3	42	3.4
Mixture Across Chemical Category	7	0.6	1	0.8	8	0.6
Other	29	2.6	4	3.0	33	2.6
Other Inorganic Substances	264	23.6	16	12.1	280	22.4
Oxy-organics	38	3.4	6	4.5	44	3.5
Paints and Dyes	2	0.2	7	5.3	9	0.7
PCB's	1	0.1	0	0.0	1	0.1
Pesticides	20	1.8	2	1.5	22	1.8
Polymers	39	3.5	9	6.8	48	3.8
Unknown	4	0.4	1	0.8	5	0.4
Volatile Organic Compounds	487	43.6	20	15.2	507	40.6
Total[‡]	1117	100.0	132	99.9	1249	99.9

[‡] Percentages do not total 100% because of rounding.

Victims

A total of 86 victims were involved in 44 events (5.4% of all events) (Table 5). Of the 44 events with victims, 34 (77.3%) events involved only one victim, and 4 (9.1%) involved two victims. One incident had approximately 20 victims. The victims were nearby residents with breathing problems as a result of a spillage of aqueous ammonia.

Table 5.—Number of victims per event, by type of event—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

No. Victims	Type of Event						All Events		
	Fixed facility			Transportation					
	No. Events	%	Total Victims	No. Events	%	Total Victims	No. Events	%	Total Victims
1	23	74.2	23	11	84.6	11	34	77.3	34
2	3	9.7	6	1	7.7	2	4	9.1	8
3	1	3.2	3	0	0	0	1	2.3	3
4	2	6.5	8	0	0	0	2	4.5	8
≥5	2	6.5	13	1	7.7	20	3	6.8	33
Total[‡]	31	100.1	53	13	100	33	44	100	86

[‡] Percentages do not total 100% because of rounding.

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 volatile organic compounds constituted 26.6% of all events; however, only 1.4% of these events resulted in injuries. Conversely, events involving bases accounted for 5.1% of all events respectively, but 19.0% of these events resulted in injuries.

Table 6.—Frequency of substance categories in all events and events with victims—Louisiana Hazardous Substances Emergency Events Surveillance System, 2009

Substance Category	All Events		Events with Victims		
	No.	%	No.	Percentage of all Releases with Victims	Percentage of Events with Victims in Substance Category
Acids	75	9.2	6	13.6	8.0
Ammonia	45	5.5	4	9.1	8.9
Bases	42	5.1	8	18.2	19.0
Chlorine	34	4.2	2	4.5	5.9
Hetero-organics	11	1.3	1	2.3	9.1
Hydrocarbons	16	2.0	0	0.0	0.0
Mixture Across Chemical Category [†]	8	1.0	2	4.5	25.0
Multiple Substance Category*	137	16.7	1	2.3	0.7
Other [‡]	26	3.2	6	13.6	23.1
Other Inorganic Substances [§]	125	15.3	7	15.9	5.6
Oxy-organics	26	3.2	3	6.8	11.5
Paints and Dyes	9	1.1	0	0.0	0.0
PCB's	1	0.1	0	0.0	0.0
Pesticides	14	1.7	1	2.3	7.1
Polymers	30	3.7	0	0.0	0.0
Indeterminate/Unknown	2	0.2	0	0.0	0.0
Volatile Organic Compounds	218	26.6	3	6.8	1.4
Total[¶]	819	100.0	44	99.9	5.4

*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.

[†]Substances from different categories that were mixed or formed from a reaction before the event.

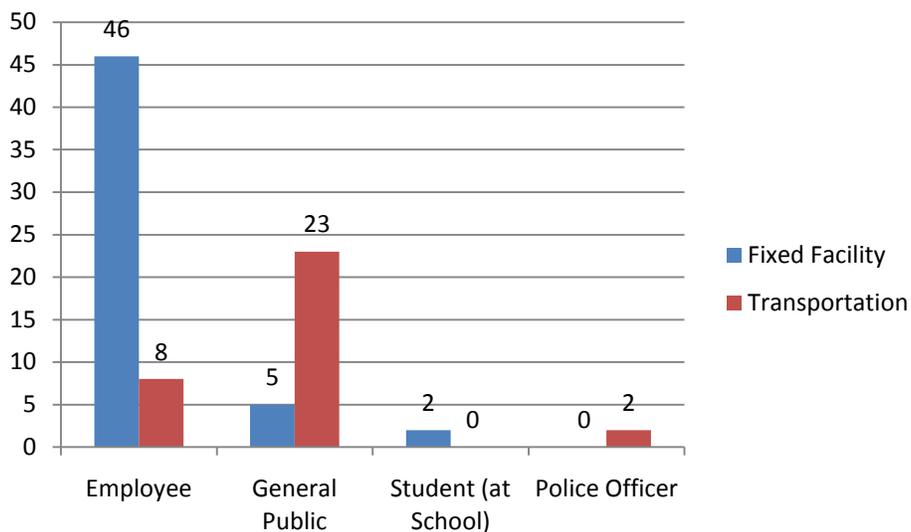
[‡]Not classified.

[§]All inorganic substances except for acids, bases, ammonia, and chlorine.

[¶]Percentages do not total 100% because of rounding.

Employees (54 [62.8%]) constituted the largest proportion of the population groups injured, followed by members or the general public (28 [32.6%]) (Figure 5).

Figure 5.—Number of victims, by population group and type of event—Louisiana Hazardous Substances Emergency Events Surveillance, 2009.



Victims were reported to have sustained a total of 108 injuries or symptoms (Table 7). Some victims had more than one injury or symptom. Of all reported injuries/symptoms, the most common in fixed-facility events were eye irritation (14 [19.2%]) and chemical burns (10 [13.7%]). In transportation-related events, respiratory irritation (21 [60.0%]) and trauma (not specified) (4 [11.4%]) were reported most frequently.

Table 7.—Frequencies of injuries/symptoms, by type of event*—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

Injury/Symptom	Fixed Facility		Transportation		All Events	
	No. injuries	%	No. injuries	%	Total no.	%
Chemical Burns	10	13.7	2	5.7	12	11.1
Dizziness/Central Nervous System Symptoms	1	1.4	0	0.0	1	0.9
Eye Irritation	14	19.2	1	2.9	15	13.9
Gastrointestinal System Problems	0	0.0	1	2.9	1	0.9
Headache	9	12.3	0	0.0	9	8.3
Other	16	21.9	1	2.9	17	15.7
Respiratory Irritation	5	6.8	21	60.0	26	24.1
Skin Irritation	3	4.1	1	2.9	4	3.7
Thermal Burns	1	1.4	0	0.0	1	0.9
Trauma (Chemical-related)	4	5.5	1	2.9	5	4.6
Trauma (Not Chemical-related)	0	0.0	2	5.7	2	1.9
Trauma (Not Specified)	0	0.0	4	11.4	4	3.7
Unknown	10	13.7	1	2.9	11	10.2
Total ‡	73	100.0	35	100.2	108	99.9

*The number of injuries is greater than the number of victims (86) because a victim could have had more than one injury.

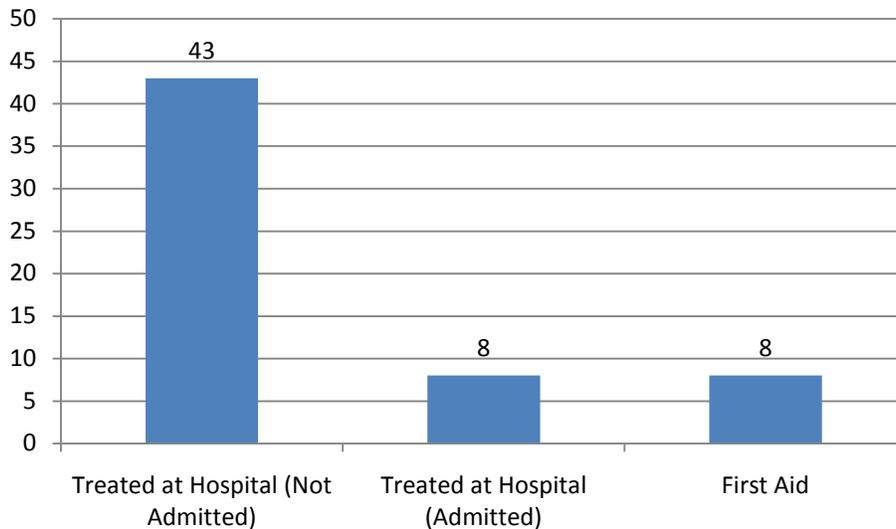
‡ Percentages do not total 100% because of rounding.

For the 34 (39.5%) injured persons for whom an age category was reported, 31 (91.2%) were under 18, and 3 were 18 years of age or older. Of the 52 injured persons for whom age was not reported, 28 (53.8%) were presumably adults (because their population group was reported as employees), and 24 (46.2%) could have been adults or children (because their population group was reported as members of the general public).

Sex was known for 31 (36.0%) of the victims; of these, 29 (93.5%) were males. Of all employees and responders for whom sex was reported, 100% were males.

For the 59 (68.6%) injured persons for whom treatment was reported, 43 (72.9%) were treated at a hospital and not admitted, and 8 (13.6%) were treated at a hospital and admitted (Figure 6).

Figure 6.—Injury disposition—Louisiana Hazardous Substances Emergency Events Surveillance, 2009.



The status of personal protective equipment (PPE) use was reported for 20 (23.3%) victims. All of the victims whose PPE status was known had not worn any form of PPE.

One event resulted in 20 victims. In this event, ammonia overflowed from a stationary tanker truck at an industrial facility. The release occurred at approximately 4:30 PM on a Friday. All twenty general public-victims reported respiratory irritation. The primary contributing factor in this event was human error.

Nearby Populations

The proximity of the event location in relation to selected populations was determined using geographic information systems (GIS), a computer mapping program, or state health department records. Residences were within ¼ mile of 653 (79.7%) events, schools were within ¼ mile of 49 (6.0%) events, hospitals were within ¼ mile of 6 (0.7%) events, nursing homes were within ¼ mile of 6 (0.7%) events, licensed daycares were within ¼ mile of 84 (10.3%) events, industries or other businesses were within ¼ mile of 775 (94.6%) events, and recreational areas were within ¼ mile of 19 (2.3%) events.

The number of events at which persons were at risk of exposure was determined primarily using GIS. There were 665 (81.2%) events with persons living within ¼ mile of the event; 737 (90.0%) events with persons living within ½ mile; and 795 (97.1%) events with persons living within 1 mile.

Evacuations

Evacuations were ordered in 19 (2.3%) events. Of these evacuations, 78.9% were of buildings or affected parts of buildings and no criteria was defined for 21.1% of events. The number of people evacuated was unknown for most (94.7%) events. One (5.3%) event resulted in the evacuation of 1 to 5 people. The length of evacuation was reported for 1 (5.3%) event (4 hours). Of all 19 events, 14 (68.4%) had access to the area restricted (normal access availability was altered). Thirteen (1.6%) events had in-place sheltering ordered by an official.

Decontamination

Of the 63 (73.3%) victims for whom decontamination status was known, 47 (75.8%) were decontaminated at the hospital, 11 (17.7%) were decontaminated at the scene, and 4 (6.5%) were not decontaminated.

Response

All events had information on who responded to the event; 7.0% reported 2 or more categories of personnel who responded, 2.1% reported 3 or more categories, and 0.4% reported 4 or more categories. Company response teams (82.9%) responded most frequently to events, followed by law enforcement agencies (6.9%), fire departments (3.3%) and third party clean-up contractors (2.9) (Table 8).

Table 8.—Distribution of personnel who responded to the event—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

Responder Category	No.	%
Certified HazMat Team	10	1.1
EMS	3	0.3
Environmental Agency	21	2.3
Fire Department	30	3.3
Law Enforcement Agency	62	6.9
Response Team of Company where Release Occurred	743	82.9
Third Party Clean-up Contractor	26	2.9
Other	1	0.1
Total[†]	896	99.8

[†]The number of responders is greater than the number of events (819) because an event could have had more than one category of responder

PREVENTION ACTIVITIES

For the 2009 Louisiana HSEES Program performed various prevention activities. These activities included:

- Email Notification System
- HSEES Parish Profiles
- Annual Report
- Cumulative Report on HSEES events (2001-2009)

SUMMARY OF RESULTS, 2001–2009

During 2001–2009, the largest proportion of events occurred in fixed facilities (Table 9). The total number of events decreased from 2008 to 2009. The percentage of events with victims increased from 2008 to 2009. The percentage of events with victims was highest in 2005 (5.5%) and lowest in 2003 (1.2%). The average percentage of events with victims during 2001–2009 was 3.7%.

Table 9.— Cumulative data by year—Louisiana Hazardous Substances Emergency Events Surveillance, 2001-2009*

Year	Type of Event			No. Substances Released	No. Victims	No. Deaths	Events with Victims	
	Fixed Facility	Transportation	Total				No.	% [†]
2001	684	131	815	1163	63	2	20	2.5
2002	630	122	752	1205	30	1	20	2.7
2003	587	87	674	1113	42	1	8	1.2
2004	474	90	564	1053	176	0	25	4.4
2005	704	163	867	1514	95	3	48	5.5
2006	515	145	660	1086	63	4	31	4.7
2007	646	172	818	1459	51	3	30	3.7
2008	843	174	1019	1752	47	0	33	3.3
2009	693	126	819	1249	86	0	44	5.4
Total	5776	1210	6988	11594	653	14	259	3.7

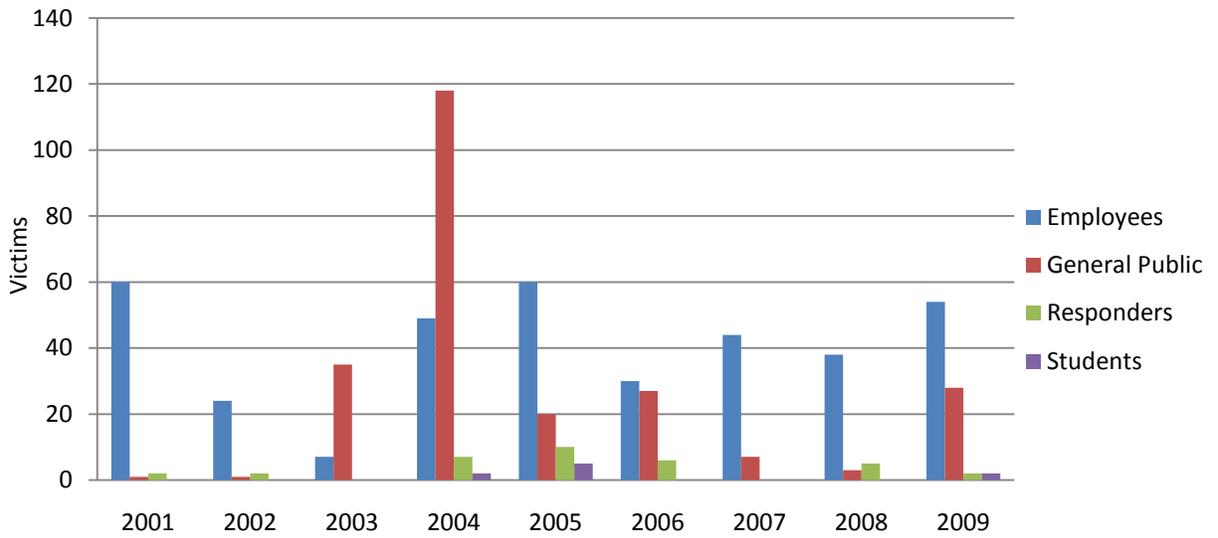
* Numbers in the table may differ from those reported in previous years because of adjustments in HSEES qualification requirements for events.

[†] Percentage of events with victims.

Respiratory irritation has consistently been one of the most frequently reported injuries. In 2009, respiratory irritation was reported as the most frequent injury and accounted for 24.1% of injuries.

In 2009 employees were the most commonly reported victim type as well as with previous years (Figure 7). As with previous years, most employee-victims and responder-victims had not worn any form of PPE.

Figure 7.—Number of victims, by category and year—Louisiana Hazardous Substances Emergency Events Surveillance, 2001–2009



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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

The 10 substances most frequently involved in events—Louisiana Hazardous Substances Emergency Events Surveillance, 2009

	Chemical Substance	Number of Releases
1	Sulfur Dioxide	83
2	Ethylene	79
3	Benzene	75
4	Hydrogen Sulfide	67
5	Propylene	53
6	Ammonia	49
7	Volatile Organic Compounds	47
8	NO _x	38
9	Hydrochloric Acid	32
10	Vinyl Chloride	31

Note: NO_x includes Nitrogen Oxide, Nitrogen Oxides, and Nitrogen Oxides NOS

Glossary

Ancillary Process Equipment – Equipment used in the processing of chemicals, but excluding the process vessel.

Cooperative Agreement - An award similar to a grant, but in which the sponsor's staff may be actively involved in proposal preparation as well as research activities once the award has been made.

Fixed Facility Events - Events involving hazardous materials that occur in a non-moving facility such as an oil refinery or manufacturing plant.

Hazardous Substance Releases - Discharge of any hazardous substance such as, chemical (except petroleum products), biological, radiological, or medical material that may reasonable be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutations or malformations.

In-Place Sheltering - Protecting yourself where you are (home, workplace) and remaining there until given further instructions. This includes closing all windows, doors and vents as well as turning off all cooling, heating or ventilating systems.

Petroleum Only - Events in which only a petroleum product (i.e. gasoline, diesel fuel, etc.) is released.

Process Vessel - Chemical reaction chamber where chemicals are processed such as a tank, reactor or distillation column.

Responders - Individuals such as police officers, sheriff deputies, firefighters, and paramedics that respond to the scene of an emergency situation.

Transportation Events – Events involving hazardous materials transported by ground transportation, railroad, aircraft, boats, ships and pipelines outside the boundaries of a fixed facility property.