

Louisiana Toxic Substance Incidents Program (LaTSIP)

2012: A Summary Report

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



**Prepared by William C. Trachtman, MS, Allison N. Koehler, MPH, and
Syed Atif Ahsan, MSPH**

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EXECUTIVE SUMMARY

The National Toxic Substance Incidents Program (NTSIP) system, funded by the Agency for Toxic Substances and Disease Registry (ATSDR), actively collects information to describe the public health consequences of acute releases of toxic 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 its creation in 2010 and with this program's predecessor since 2001. This report summarizes the characteristics of events reported in Louisiana during 2012. Information about acute events involving toxic 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 2012, 679 events met the NTSIP surveillance definition. In 610 (89.8%) events, only one substance was released. The most commonly reported categories of substances were volatile organic compounds, acids, and other (not belonging to one of the existing categories). During this reporting period, 50 events (7.4%) resulted in a total of 77 victims. The most frequently reported injuries were respiratory irritation and chemical burns. Evacuations were ordered for 46 (6.8%) events.

INTRODUCTION

The National Toxic Substance Incidents Program (NTSIP) is designed to protect people from harm caused by spills and leaks of toxic substances. The program is funded by the Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) and modeled partially after the Hazardous Substance Emergency Events Surveillance Program (HSEES, 1990-2009), the program that NTSIP was designed to replace. The Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services, Section of Environmental Epidemiology and Toxicology participated in HSEES from 2001-2009 and in NTSIP since its creation in 2010. The Louisiana Toxic Substance Incidents Program (LaTSIP) collects information about chemical spills and maintains it in a centralized database. Trends in data can then be analyzed to develop approaches to minimize risk to public health.

From 1990 - 2009, the Agency for Toxic Substances and Disease Registry (ATSDR) maintained an active, state-based 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 Database¹.

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. In 2010, NTSIP was formed to replace HSEES as a more comprehensive program by incorporating stakeholder suggestions. NTSIP has three components: National Database, State Partners, and Response Teams. In 2012, seven state health departments collected data for NTSIP: Louisiana, New York, North Carolina, Oregon, Tennessee, Utah, and Wisconsin.

LaTSIP has three goals: to describe toxic substance releases and the public health impact associated with such releases, to identify vulnerabilities in industry, transportation, and communities as they relate to toxic releases, and to promote the use of inherently safer technologies that could prevent exposures to toxic releases and subsequent health effects. These goals 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 LaTSIP for 2012, summarizes the characteristics of acute releases of toxic substances and their associated public health consequences, and demonstrates how data from the system are translated into prevention activities to protect public health.

METHODS

Detailed information was collected about each toxic substance incident, 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 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 NTSIP event is defined as **an uncontrolled or illegal acute release of any toxic substance**, in any amount for substances listed on the NTSIP Mandatory Chemical Reporting List, or, if not on the list, in an amount greater than or equal to 10 lbs or 1 gallon. Petroleum only incidents, as well as stack or flare incidents are included only when there is a public health action or an injury caused by the chemical. NTSIP 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 totally 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 2012, a total of 679 acute toxic substances events met the LaTSIP surveillance definition; 457 (67.3%) events occurred in fixed facilities. The parishes with the most events (Table 1) were East Baton Rouge (118 [17.4%]), Calcasieu (65 [9.6%]), and Ascension (58 [8.5%]). The parishes with 0 events were generally small in population and have agricultural based economies.

Table 1: Number of events meeting the surveillance definition, by parish and type of event - Louisiana Toxic Substances Emergency Events Surveillance, 2012

Parish	Type of Event				All Events	
	Fixed Facility		Transportation		No. Events	%*
	No. Events	%*	No. Events	%*		
Acadia	9	2.0	2	0.9	11	1.6
Allen	0	0.0	1	0.5	1	0.1
Ascension	46	10.1	12	5.4	58	8.5
Assumption	1	0.2	0	0.0	1	0.1
Avoyelles	1	0.2	0	0.0	1	0.1
Beauregard	2	0.4	1	0.5	3	0.4
Bienville	No NTSIP Events					
Bossier	2	0.4	14	6.3	16	2.4
Caddo	9	2.0	42	18.9	51	7.5
Calcasieu	52	11.4	13	5.9	65	9.6
Caldwell	No NTSIP Events					
Cameron	1	0.2	0	0.0	1	0.1
Catahoula	No NTSIP Events					
Claiborne	0	0.0	1	0.5	1	0.1
Concordia	No NTSIP Events					
De Soto	5	1.1	4	1.8	9	1.3
E. Baton Rouge	96	21.0	22	9.9	118	17.4
E. Carroll	No NTSIP Events					
E. Feliciana	2	0.4	0	0.0	2	0.3
Evangeline	2	0.4	0	0.0	2	0.3
Franklin	No NTSIP Events					
Grant	No NTSIP Events					
Iberia	3	0.7	0	0.0	3	0.4
Iberville	28	6.1	9	4.1	37	5.4
Jackson	No NTSIP Events					
Jefferson	26	5.7	7	3.2	33	4.9
Jefferson Davis	2	0.4	0	0.0	2	0.3
Lafayette	6	1.3	11	5.0	17	2.5
LaFourche	5	1.1	8	3.6	13	1.9
La Salle	0	0.0	1	0.5	1	0.1
Lincoln	0	0.0	2	0.9	2	0.3
Livingston	3	0.7	1	0.5	4	0.6
Madison	No NTSIP Events					
Morehouse	2	0.4	1	0.5	3	0.4
Natchitoches	2	0.4	0	0.0	2	0.3

Parish	Type of Event				All Events	
	Fixed Facility		Transportation			
	No. Events	%*	No. Events	%*	No. Events	%*
Orleans	12	2.6	22	9.9	34	5.0
Ouachita	7	1.5	5	2.3	12	1.8
Plaquemines	10	2.2	1	0.5	11	1.6
Pointe Coupee	0	0.0	2	0.9	2	0.3
Rapides	10	2.2	4	1.8	14	2.1
Red River	2	0.4	0	0.0	2	0.3
Richland	1	0.2	2	0.9	3	0.4
Sabine	1	0.2	1	0.5	2	0.3
St. Bernard	13	2.8	0	0.0	13	1.9
St. Charles	23	5.0	7	3.2	30	4.4
St. Helena	No NTSIP Events					
St. James	19	4.2	2	0.9	21	3.1
St. John	12	2.6	2	0.9	14	2.1
St. Landry	2	0.4	1	0.5	3	0.4
St. Martin	4	0.9	1	0.5	5	0.7
St. Mary	0	0.0	2	0.9	2	0.3
St. Tammany	7	1.5	2	0.9	9	1.3
Tangipahoa	5	1.1	1	0.5	6	0.9
Tensas	No NTSIP Events					
Terrebonne	3	0.7	1	0.5	4	0.6
Union	1	0.2	0	0.0	1	0.1
Vermilion	6	1.3	1	0.5	7	1.0
Vernon	1	0.2	2	0.9	3	0.4
Washington	No NTSIP Events					
Webster	0	0.0	3	1.4	3	0.4
W. Baton Rouge	10	2.2	8	3.6	18	2.7
W. Carroll	1	0.2	0	0.0	1	0.1
W. Feliciana	No NTSIP Events					
Winn	2	0.4	0	0.0	2	0.3
Total	457	99.6	222	100.9	679	99.4

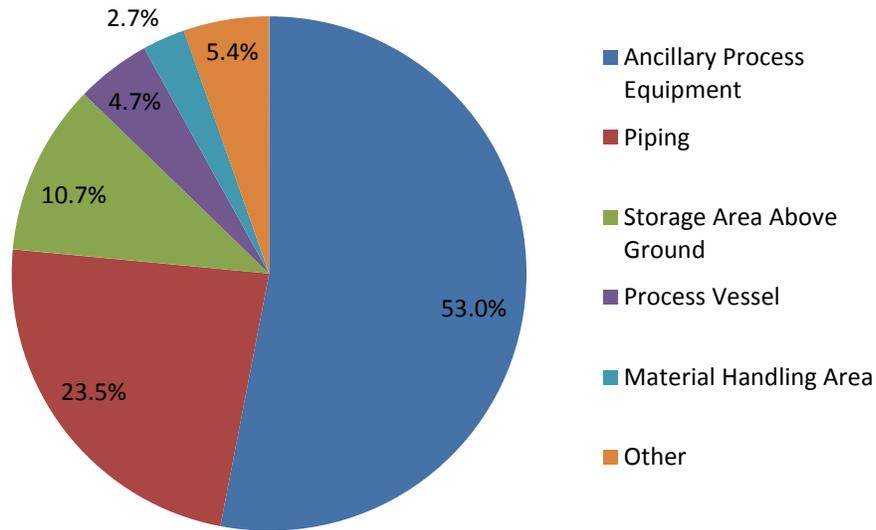
* Percentage = (number of events by type of event per parish ÷ total number of events) x 100

† Percentages do not total 100% because of rounding.

§ Parish was unknown for 1 fixed facility event.

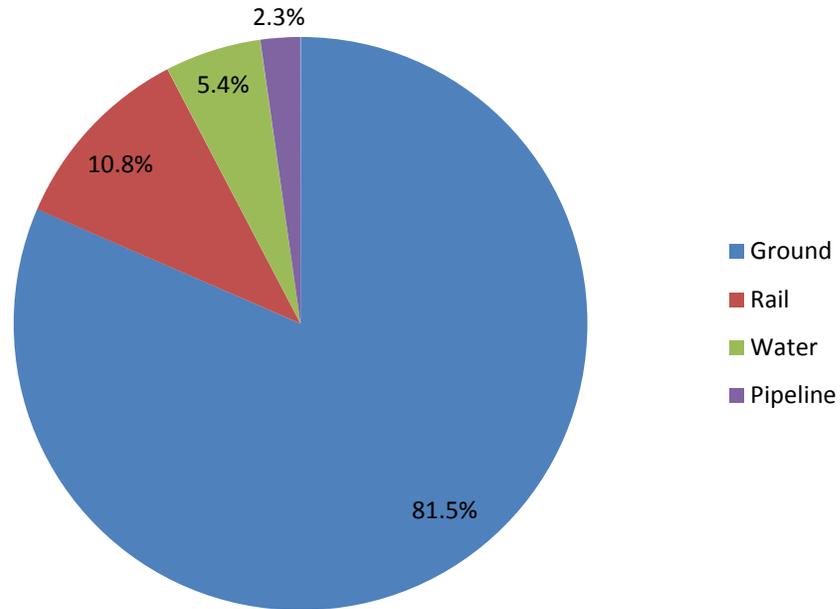
For each of the 284 fixed-facility event occurring in mining, manufacturing, or utilities, one or two choices can be selected to describe the type of area where the event occurred or the equipment involved with the event. Only one type of area was reported for 149 (52.5%) fixed facility events, a combination of two area types were reported for 135 (47.5%). Among events with one type of area reported, the main areas were classified as follows: 79 (53.0%) ancillary process equipment, 35 (23.5%) piping, and 16 (10.7%) 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 Toxic Substance Incidents Program, 2012



Of the 222 transportation-related events, most (181 [81.5%]) occurred during ground transport (e.g., truck, van, or tractor (Figure 2). The largest proportions of transportation-related events occurred during unloading of a stationary vehicle or vessel (75 [33.8%]) or from a moving vehicle or vessel (57 [25.7%]).

Figure 2: Distribution of transportation-related events, by type of transport - Louisiana Toxic Substance Incidents Program, 2012



Primary and secondary factors contributing to the events were reported for all events (Figure 3). Most (67.0%) fixed-facility events reported equipment failure as the primary factor, and most (64.9%) transportation-related events reported human error as the primary factor. Secondary factors were reported for 62 (9.1%) events (Figure 3b). Of the reported secondary factors, most (84.6%) fixed-facility events involved equipment failure and most (91.7%) transportation-related events involved equipment failure.

Figure 3a: Primary factors reported as contributing to events - Louisiana Toxic Substance Incidents Program, 2012

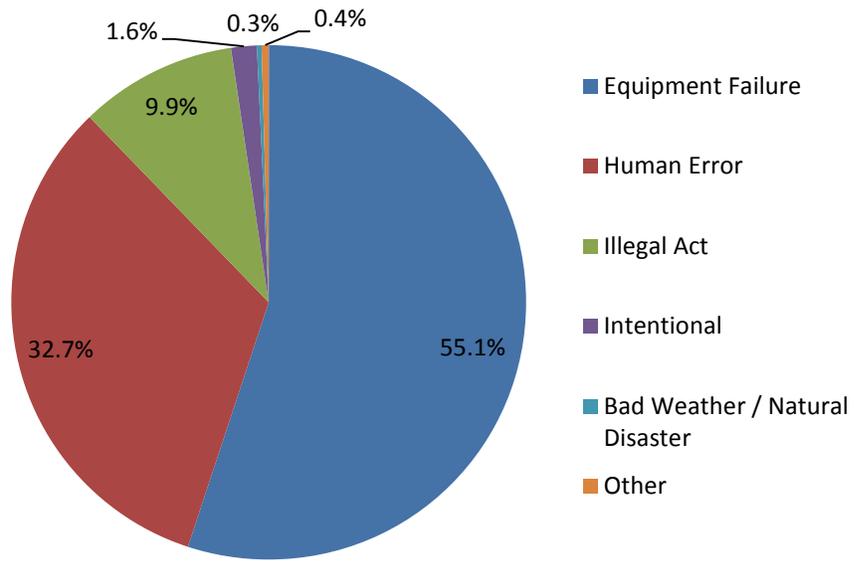
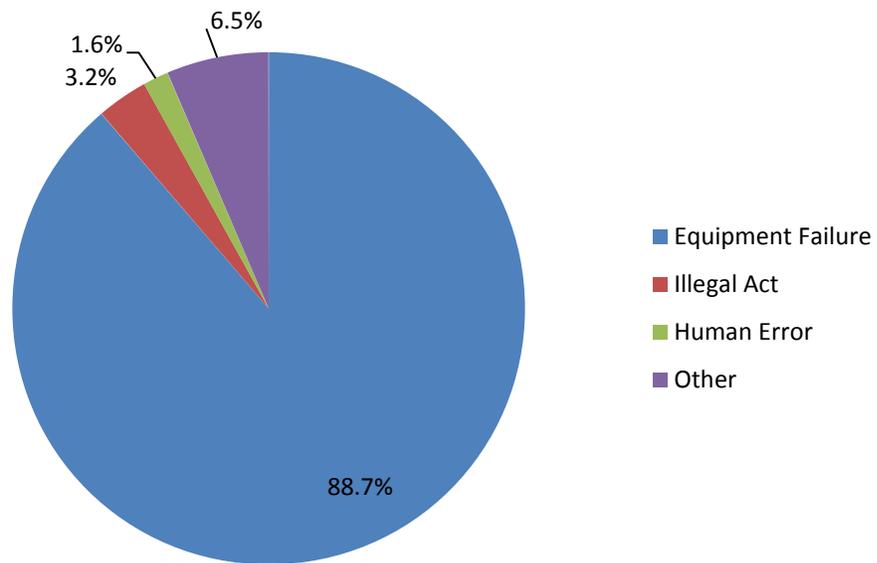


Figure 3b: Secondary factors reported as contributing to events – Louisiana Toxic Substance Incidents Program, 2012



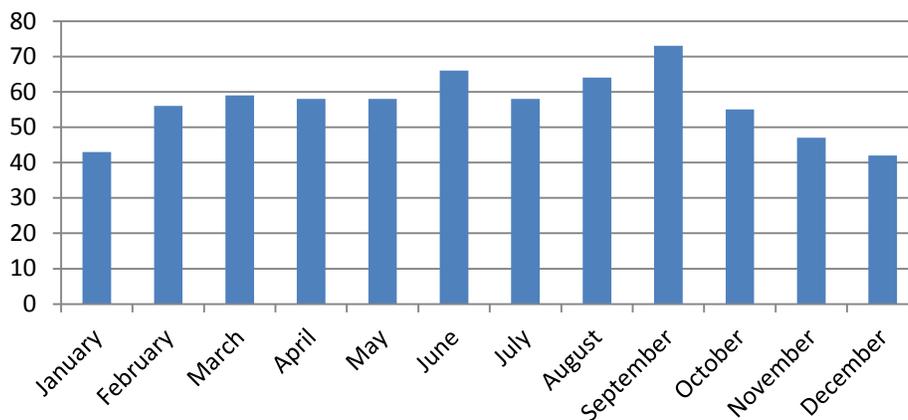
Over 89% of all events involved the release of only one substance. Two substances were released in 5.9% of the events, and 4.3% involved the release of more than two substances (Table 2). Fixed-facility events were more likely than transportation events to have two or more substances released in an event (13.3% vs. 3.7%).

Table 2: Number of substances involved per event, by type of event - Louisiana Toxic Substance Incidents Program, 2012

No. Substances	Type of Event						All Events		
	Fixed Facility			Transportation					
	No. Events	%	Total Substances	No. Events	%	Total Substances	No. Events	%	Total Substances
1	396	86.7	396	214	96.4	214	610	89.8	610
2	33	7.2	66	7	3.2	14	40	5.9	80
3	16	3.5	48	1	0.5	3	17	2.5	51
4	6	1.3	24	0	0.0	0	6	0.9	24
≥ 5	6	1.3	33	0	0.0	0	6	0.9	33
Total	457	100.0	567	222	100.1	231	679	100.0	798

LaTSIP events were more likely to occur in industrial areas as opposed to commercial, residential or agricultural areas. In addition, for LaTSIP events where the time was known, LaTSIP events were more likely to occur in the 6 hours before noon (35.3%) and the 6 hours after and including noon (28.3%), compared with the 6 hours after and including midnight (18.70%) and the 6 hours before midnight (17.7%). Additionally, 13-20% of events occurred on each weekday as compared with 7-10% on a weekend day. The highest number of events occurred in September (73 [10.8%]) (Figure 4).

Figure 4: Monthly breakdown of LaTSIP events for calendar year 2012 - Louisiana Toxic Substance Incidents Program, 2012



Industries

The largest proportions of LaTSIP events were associated with the manufacturing (268 [39.5%]) and transportation / warehousing (197 [29.0%]) industries (Table 3). Within manufacturing, chemical manufacturing (175 [67.3%]) and petroleum manufacturing (85 [32.7%]) accounted for most of the events. The industry with largest number of events with victims was the manufacturing industry (22 [44.0%]). Additionally, there were 9 (18.0%) events with victims where an industry was not involved (ex. methamphetamine manufacturing) or the industry was not identified.

The total number of victims was greatest in the manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone) industry (38 [49.4%]) followed by the number of victims in the transportation and warehousing I industry (16 [20.8%]). Of the events where the industry was identified, the manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone) industry resulted in a large proportion of events with victims and the largest number of victims; however, only 8.3% of all 263 events in that category resulted in victims. Conversely, 66.7% of events in the “*Retail Trade II*” industry resulted in victims, but this industry represents a small proportion (4.0%) of events with victims. Two events within the manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone) industry, each resulted in four employee injuries. In one event, four employees were exposed to chlorine and nitrogen from a rail car as it was being off loaded. In a second event, four employees were exposed to vinyl chloride, chloroform, ethylene, and other volatile organic compounds when a loss of power resulted in the bypass of control devices in the unit.

Table 3: Industries involved in toxic substance events and events with victims, by category - Louisiana Toxic Substance Incidents Program, 2012

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	1	0.1	0	0.0	0.0	0
Administrative and Support and Waste Management and Remediation Services	8	1.2	0	0.0	0.0	0
Agriculture, Forestry, Fishing and Hunting	2	0.3	0	0.0	0.0	0
Arts, Entertainment, and Recreation	NO LaTSIP Events					
Construction	18	2.7	0	0.0	0.0	0
Educational Services	6	0.9	1	2.0	16.7	1 (1)
Finance and Insurance	NO LaTSIP Events					
Health Care and Social Assistance	1	0.1	0	0.0	0.0	0
Information	1	0.1	0	0.0	0.0	0
Management of Companies and Enterprises	NO LaTSIP Events					
Manufacturing (Food, Textile, Apparel)	1	0.1	0	0.0	0.0	0
Manufacturing (Metal, Electrical, Transport, Professional)	4	0.6	0	0.0	0.0	0
Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)	263	38.7	22	44.0	8.4	38 (4)
Mining	18	2.7	3	6.0	16.7	3 (1)
Not an Industry / Not Identified / Unknown	94	13.8	9	18.0	9.6	10 (2)
Other Services (except Public Administration)	1	0.1	0	0.0	0.0	0
Professional, Scientific, and Technical Services	5	0.7	0	0.0	0.0	0
Public Administration	6	0.9	0	0.0	0.0	0
Real Estate and Rental and Leasing	2	0.3	0	0.0	0.0	0
Retail Trade I	1	0.1	0	0.0	0.0	0
Retail Trade II	3	0.4	2	4.0	66.7	4 (3)
Transportation and Warehousing I	190	28.0	9	18.0	4.7	16 (3)
Transportation and Warehousing II	7	1.0	0	0.0	0.0	0
Utilities	13	1.9	0	0.0	0.0	0
Wholesale Trade	34	5.0	4	8.0	11.8	5 (2)
Total‡	679	99.7	50	100.0	-	77 (4)

*Minimum number of victims per event = 1.

‡ Percentages do not total 100% because of rounding.

Substances

A total of 798 substances were released in all events. The individual substances most frequently released were Methamphetamine Chemicals NOS, Hydrochloric Acid, and Sodium Hydroxide (Appendix). Substances were grouped into 15 categories. The substance category most commonly released in fixed-facility events was volatile organic compounds (207 [36.5%]), other (77 [13.6%]), and other inorganic substances (77 [13.6%]) (Table 4). In transportation-related events, the most common substance categories released were acids (53 [22.9%]), volatile organic compounds (53 [22.9%]), and bases (34 [14.7%]).

Two types of releases for each substance (e.g., spill and air) could be reported. Of the 798 substances released, 81 (10.2%) substances involved more than one release type. Of the substances with more than one release type, 49.4% involved the release as a liquid and a gas.

Table 4: Number of substances involved, by substance category and type of event - Louisiana Toxic Substance Incidents Program, 2012

Substance Category	Type of Event				All Events	
	Fixed facility		Transportation			
	No. Substances	%	No. Substances	%	No. Substances	%
Acids	46	8.1	53	22.9	99	12.4
Agricultural Chemicals and Pesticides	31	5.5	6	2.6	37	4.6
Ammonia	16	2.8	3	1.3	19	2.4
Bases	23	4.1	34	14.7	57	7.1
Chlorine	16	2.8	4	1.7	20	2.5
Formulations	0	0.0	1	0.4	1	0.1
Hetero-organics	13	2.3	7	3.0	20	2.5
Hydrocarbons	25	4.4	7	3.0	32	4.0
Mixture Across Chemical Category *	9	1.6	1	0.4	10	1.3
Other †	77	13.6	19	8.2	96	12.0
Other Inorganic Substances ‡	77	13.6	18	7.8	95	11.9
Oxy-organics	11	1.9	5	2.2	16	2.0
Paints and Dyes	1	0.2	2	0.9	3	0.4
PCB's	0	0.0	0	0.0	0	0.0
Polymers	15	2.6	14	6.1	29	3.6
Category not assigned	0	0.0	4	1.7	4	0.5
Volatile Organic Compounds	207	36.5	53	22.9	260	32.6
Total§	567	100.0	231	99.8	798	99.9

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

†Not belonging to one of the existing categories.

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

§ Total percentage doesn't equal 100 due to rounding

Victims

A total of 77 victims were involved in 50 events (7.4% of all events) (Table 5). Of the 50 events with victims, 33 (66%) events involved only one victim, and 9 (18%) involved two victims. Of all victims, 34 (68%) were injured in fixed-facility events.

Table 5.—Number of victims per event, by type of event—Louisiana Toxic Substance Incidents Program, 2012

No. Victims	Type of Event						All Events		
	Fixed facility			Transportation					
	No. Events	%	Total Victims	No. Events	%	Total Victims	No. Events	%	Total Victims
1	23	67.6	23	10	62.5	10	33	66.0	33
2	6	17.6	12	3	18.8	6	9	18.0	18
3	3	8.8	9	3	18.8	9	6	12.0	18
4	2	5.9	8	0	0.0	0	2	4.0	8
Total[†]	34	99.9	52	16	100.1	25	50	100.0	77

[†] 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 26.1% of all events; however, only 5.6% of these events resulted in injuries. Conversely, events involving chlorine accounted for 2.8% of all events respectively, but 21.1% of these events resulted in injuries. Employees (62 [80.5%]) constituted the largest proportion of the population groups injured, followed by members of the general public (13 [16.9%]) (Figure 5).

Table 6: Frequency of substance categories in all events and events with victims - Louisiana Toxic Substance Incidents Program, 2012

Substance Category	All Events		Events with Victims		
	No.	%	No.	Percentage of all Releases with Victims	Percentage of Events with Victims in Substance Category
Acids	89	13.1	4	8.0	4.5
Agricultural Chemicals and Pesticides	23	3.4	0	0.0	0.0
Ammonia	18	2.7	2	4.0	11.1
Bases	52	7.7	8	16.0	15.4
Chlorine	19	2.8	4	8.0	21.1
Formulations	1	0.1	0	0.0	0.0
Hetero-organics	15	2.2	1	2.0	6.7
Hydrocarbons	30	4.4	2	4.0	6.7
Mixture Across Chemical Category [†]	10	1.5	1	2.0	10.0
Multiple Substance Category*	37	5.4	4	8.0	10.8
Other [‡]	91	13.4	10	20.0	11.0
Other Inorganic Substances [§]	80	11.8	3	6.0	3.8
Oxy-organics	11	1.6	1	2.0	9.1
Paints and Dyes	1	0.1	0	0.0	0.0
PCB's	0	0.0	0	0.0	0.0
Polymers	21	3.1	0	0.0	0.0
Indeterminate/Unknown	4	0.6	0	0.0	0.0
Volatile Organic Compounds	177	26.1	10	20.0	5.6
Total	679	100.0	50	100.0	7.4

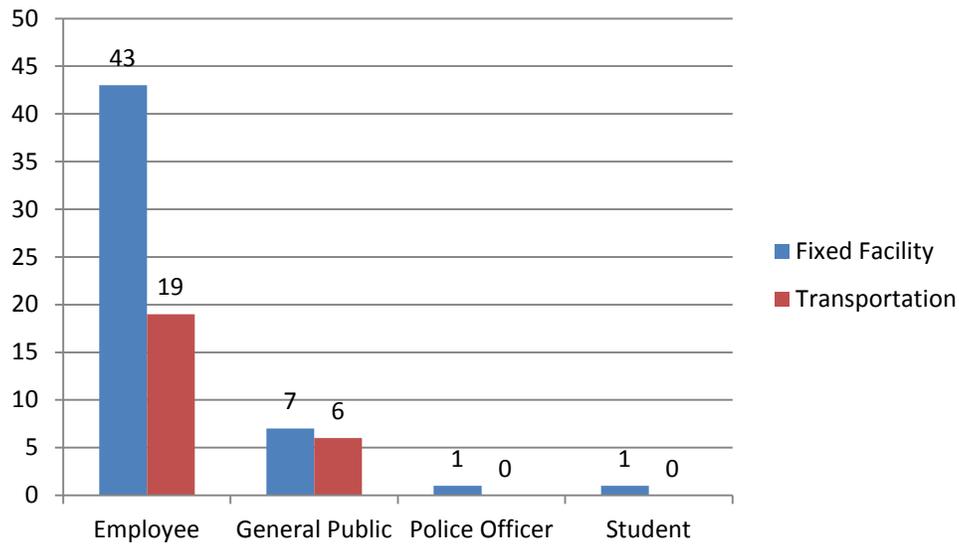
*Substances in events that involved multiple substances were counted only once in a substance category when all the substances were associated with the same category. If events involved multiple substances from different substance categories, they were counted only once in the multiple substance category.

[†]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.

Figure 5: Number of victims, by population group and type of event - Louisiana Toxic Substance Incidents Program, 2012



Victims were reported to have sustained a total of 89 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 respiratory irritation (23 [35.9%]), chemical burns (9 [14.1%]) and eye irritation (8 [12.5%]). In transportation-related events, trauma (not chemical-related) (12 [48.0%]) chemical burns (4 [16.0%]) and respiratory irritation (4 [16.0%]) were reported most frequently.

Table 7: Frequencies of injuries/symptoms, by type of event* - Louisiana Toxic Substance Incidents Program, 2012

Injury/Symptom	Fixed Facility		Transportation		All Events	
	No. injuries	%	No. injuries	%	Total no.	%
Burns (Chemical)	9	14.1	4	16.0	13	14.6
Burns (Thermal)	6	9.4	1	4.0	7	7.9
Burns (Both Chemical and Thermal)	4	6.3	0	0.0	4	4.5
Burns (Unknown)	1	1.6	0	0.0	1	1.1
Dizziness/Central Nervous System Symptoms	3	4.7	0	0.0	3	3.4
Eye Irritation	8	12.5	0	0.0	8	9.0
Gastrointestinal System Problems	1	1.6	0	0.0	1	1.1
Headache	4	6.3	0	0.0	4	4.5
Heart Problems	1	1.6	0	0.0	1	1.1
Other/Unknown	1	1.6	0	0.0	1	1.1
Respiratory Irritation	23	35.9	4	16.0	27	30.3
Shortness of Breath	2	3.1	0	0.0	2	2.2
Skin Irritation	1	1.6	1	4.0	2	2.2
Trauma (Chemical-Related)	0	0.0	3	12.0	3	3.4
Trauma (Not Chemical-Related)	0	0.0	12	48.0	12	13.5
Total ‡	64	100.3	25	100.0	89	99.9

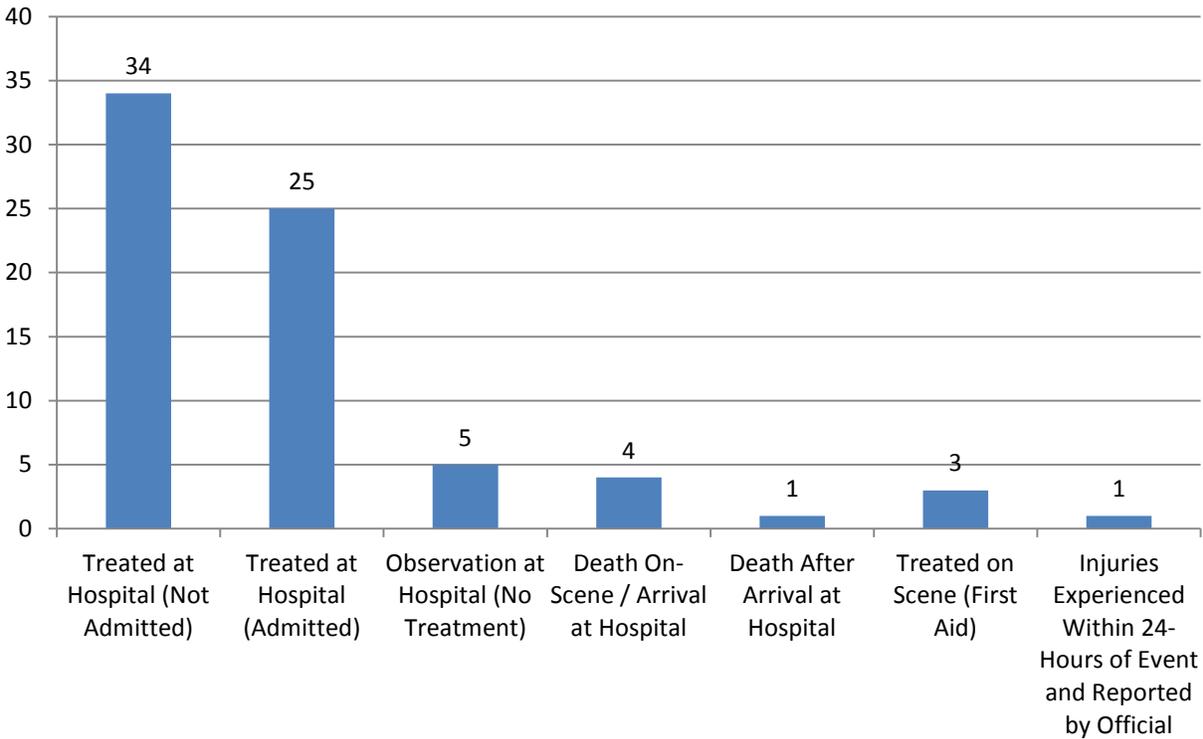
*The number of injuries is greater than the number of victims (77) because a victim could have had more than one injury.

‡ Percentages do not total 100% because of rounding.

The age category was reported for all 77 injured persons; all 77 injured persons were reported as adults (18 years of age or older). Sex was also known for all 76 victims; of these, 73 (96.1%) were males. Of all employees and responders for whom sex was reported, 61 (98.4%) were males.

Of the 77 victims, 34 (44.2%) were treated at a hospital but not admitted, and 25 (32.5%) were admitted to a hospital (Figure 6). Five (6.5%) deaths were reported (Figure 6). Three of the five deaths resulted from exposure to the released substance(s); the remaining two deaths resulted from physical trauma received during a motor vehicle accident.

Figure 6: Injury disposition - Louisiana Toxic Substance Incidents Program, 2012



Personal protective equipment (PPE) use was reported for all employee-victims and responder-victims. Most (87.3%) had not worn any form of PPE. Four (6.3%) employee-victims wore Level “A” PPE, three (4.8%) employee-victims wore Level “D” PPE, and one employee-victim wore gloves, eye protection, and a hardhat. Level “A” is the most protective form of PPE and used when the greatest level of skin, respiratory, and eye protection is necessary. Level “D” provides limited protection against chemical hazards but includes protection as coveralls, boots/shoes (chemical-resistant leather, steel toe and shank), safety glasses or chemical splash goggles, and hard hat.

One event resulted in 4 victims. Four employees experienced respiratory irritation after vinyl chloride, chloroform, ethylene, and other volatile organic compounds were released due to a loss of power. Three of the victims were transported to the hospital and the fourth was seen by a private physician. The release occurred at approximately 3:00 PM on a Wednesday. The primary contributing factor in this event was equipment failure.

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 516 (76.0%) events, schools were within ¼ mile of 40 (5.9%) events, hospitals were within ¼ mile of 4 (0.6%) events, nursing homes were within ¼ mile of 18 (2.7%) events, licensed daycares were within ¼ mile of 54 (8.0%) events, industries or other businesses were within ¼ mile of 417 (61.4%) events, and recreational areas were within ¼ mile of 14 (2.1%) events.

The number of events at which persons were at risk of exposure was determined primarily using GIS. There were 516 (76.0%) events with persons living within ¼ mile of the event; 588 (86.6%) events with persons living within ½ mile; and 655 (96.5%) events with persons living within 1 mile.

Evacuations

Evacuations were ordered in 46 (6.8%) events. Of these evacuations, 60.9% were of buildings or affected parts of buildings; 15.2 % were of defined circular areas surrounding the event locations; 8.7% were of downwind / downstream; 6.5% were of downwind/downstream and circle radius surrounding event; and 8.7% used no criteria. The estimated number of people evacuated was reported for all 46 events and ranged from under 5 to over 100 people. The median length of evacuation was 2 hours (range: less than one hour to 8.5 hours). Of all 46 events, 44 (95.7%) also had access to the area restricted (normal access availability was altered). An additional 11 (23.9%) events had in-place sheltering ordered by an official.

Decontamination

A total of 45 people were decontaminated in 29 events. Of the 45 people who were decontaminated, 32 (71.1%) were decontaminated at the hospital and 5 (11.1%) were decontaminated at the scene, and 8 (17.8%) were decontaminated both on scene and at the hospital.

Response

Of the 679 events, 13.5% reported 2 or more categories of personnel who responded, 5.2% reported 3 or more categories, and 3.0% reported 4 or more categories. Company response teams (60.2%) responded most frequently to events, followed by law enforcement agencies (17.4%), fire departments (6.9%), and certified Hazmat teams (6.0%) (Table 8).

Table 8: Distribution of personnel who responded to the event - Louisiana Toxic Substance Incidents Program, 2012

Responder Category	No.	%
Certified HazMat Team	53	6.0
Company's Response Team	532	60.2
EMT	6	0.7
Environmental Agency	15	1.7
Fire Department	61	6.9
Health Department	6	0.7
Law Enforcement Agency	154	17.4
Other	14	1.6
Third Party Clean-Up Contractor	43	4.9
Total[‡]	884	100.1

[‡]The number of responders is greater than the number of events (679) because an event could have had more than one category of responder

SUMMARY OF RESULTS, 2012

The numbers of toxic substance events, number of substances released, events with victims, and deaths for the year 2012 in Louisiana are shown in Table 9. In the year 2012, 679 events qualified for LaTSIP surveillance. Among them, 457 were fixed facility events and 222 were associated with transportation. There were 798 substances released, and the most frequent releases involved Methamphetamine Chemicals NOS (63 releases or 7.9%) and Hydrochloric Acid (32 releases or 4.0%).

There were a total of 77 victims resulting from 50 events; these victims included 5 (6.5%) fatalities. Respiratory irritation was the most frequently reported injury and accounted for 30.3% of injuries. Employees were the most commonly reported victim type. Of employee and responder victims, most (84.5%) had not worn any form of PPE.

Table 9: Cumulative data for 2010 through 2012 - Louisiana Toxic Substance Incidents Program, 2012

Year	Type of Event			No. Substances Released	No. Victims	No. Deaths	Events with Victims	
	Fixed Facility	Transportation	Total				No.	% [†]
2010	531	209	740	937	91	1	62	8.4
2011	528	267	795	971	71	5	47	5.9
2012	457	222	679	798	77	5	50	7.4
Total	1516	698	2214	2706	239	11	159	7.2

[†] Percentage of events with victims.

REFERENCES

1. 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 Toxic Substance Incidents Program, 2012

	Chemical Substance	Number of Releases
1	Methamphetamine Chemicals NOS	63
2	Hydrochloric Acid	32
3	Sodium Hydroxide	30
4	Ethylene	29
5	Sulfur Dioxide	28
6	Benzene	25
7	Natural Gas	24
8	Flammable Gas NOS	22
9	Ammonia	18
10	Propane	16

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 toxic materials that occur in a non-moving facility such as an oil refinery or manufacturing plant.

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.

Toxic Substance Releases - Discharge of any toxic substance such as, chemical, biological, radiological, or medical material that may reasonable be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutations or malformations.

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