Hazardous Substances Emergency Events Surveillance in Michigan: 2010

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SUMMARY

This report summarizes the characteristics of hazardous substances emergency events reported to the Michigan Department of Community Health (MDCH) for 2010. The Hazardous Substances Emergency Events Surveillance system (HSEES) was established in Michigan in 2004 with funding from the Agency for Toxic Substances and Disease Registry (ATSDR). This multi-state program followed standardized protocols and definitions for collection and compilation of hazardous substances release events. In late 2009, ATSDR funded a new surveillance program for hazardous substances releases modeled on HSEES, titled the National Toxic Substance Incidents Program (NTSIP), and funded 7 states, not including Michigan. As an unfunded state, Michigan currently uses the NTSIP database for tracking releases in Michigan, but does not follow all of the NTSIP protocols.

Releases tracked by states in the HSEES/NTSIP system include uncontrolled or illegal acute releases of any hazardous substance (except petroleum when petroleum is the only substance released). Some substances require a threshold minimum amount released in order to be included. Information collected about these events includes the substance(s) released, number of victims, number and types of injuries, and number of evacuations. Reports of releases come from a variety of sources, primarily other state and federal agencies that are mandated to receive reports from industry and the public.

Because of resource constraints, in 2010, the Michigan HSEES program limited the types of events included in its system to include for the most part only those that involved an agency response (e.g. hazmat, public health) and an injury, exposure, or evacuation.

A total of 127 reported events met criteria for inclusion in 2010. One hundred nine of the events occurred at fixed facilities and the remainder were associated with transportation. More than one substance was released in 14 (11.0%) of these 127 events. The most commonly reported substances were mercury and methamphetamine chemicals from illegal laboratories. One event, a spill of over 800,000 gallons of crude oil into several Michigan waterways, resulted in 145 injuries reported by health care providers, 320 self-reported injuries noted during community surveys and many voluntary evacuations, although the precise number is not known. Forty-five of the other events resulted in an injury, involving a total of 76 victims, 14 of whom died; the most frequently reported injuries were trauma and respiratory irritation. Eight events involved a mandatory evacuation.

INTRODUCTION

Since 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) has supported and maintained a state-based surveillance system through cooperative agreements with state health departments to describe the public health consequences of releases of hazardous substances. The system was titled "Hazardous Substances Emergency Events Surveillance" or HSEES until 2009, and then ATSDR funded a new surveillance program for hazardous substances releases modeled on HSEES, titled the National Toxic Substance Incidents Program (NTSIP), which involved collection of national data and data from seven participating states.

In October, 2004 the Michigan Department of Community Health (MDCH) was funded to establish HSEES in Michigan, joining 13 other states. It was not funded for NTSIP. However, as an unfunded state, Michigan currently uses the NTSIP database for tracking releases in Michigan, but does not follow all of the NTSIP protocols. The name of the Michigan system did not change with the change in the national program; it is still MI-HSEES.

The purpose of the national HSEES/NTSIP system has been to describe the public health consequences of releases of hazardous substances, with the goal being to reduce injury and illness from acute hazardous substance releases by linking the data to prevention programs. The objectives of the surveillance systems in Michigan and nationally are:

- To describe the distribution of hazardous substances emergencies within the participating states, and nationally.
- To describe the types and causes of morbidity and mortality experienced by employees, responders, and the general public as a result of hazardous substances emergencies.
- To analyze and describe risk factors associated with morbidity and mortality.
- To develop strategies to reduce subsequent morbidity and mortality when comparable events occur in the future.

This report summarizes the characteristics of hazardous substance releases and their associated public health consequences of events that occurred in 2010 in Michigan. The appendices include additional details about the data, and a brief narrative of each of the events that involved an injury, evacuation, or shelter-in-place.

Annual reports for MI-HSEES for 2005-2008 can be found at http://www.michigan.gov/mdch/0,1607,7-132-2945_5105-110654--,00.html. (A report for 2009 was not done because of the mid-year change in funding and event definitions.)

METHODS

The general definition of a HSEES event in Michigan, which is shared with the national NTSIP program is “an uncontrolled or illegal acute release of a toxic substance”.

Beginning in 2010, MI-HSEES altered the specific definition of a release from the definition used in the earlier MI-HSEES system and the current definition used by ATSDR funded states for NTSIP in several ways, because of resource constraints. First, in order to be included as an event in Michigan the released chemical must have resulted in some kind of agency response (e.g. hazmat, fire, public health). In addition, it must have resulted in a human exposure, a human injury, or an evacuation. These events are included regardless of the amount of the chemical released. Second, contrary to the NTSIP definition, all carbon monoxide releases/injuries are excluded, regardless of agency response, because they are being tracked in a new public health surveillance system. Finally, unlike the NTSIP system, in 2010 MI-HSEES collects information about natural gas releases/explosions that result in injuries.

Various sources are used to identify and obtain information about HSEES-eligible events in Michigan. These include reports to the National Response Center (NRC),[*] the Federal Department of Transportation, the Michigan Department of Environmental Quality (DEQ), the Michigan Department of Agriculture, the Michigan State Police, the Michigan Poison Control Center, the media, and others.

Information collected on Michigan HSEES events includes the following, when available:

- Type of event: Events are classified according to whether they occur at fixed facilities or during transportation. Fixed-facility events involve hazardous substances released at industrial sites, schools, farms, or other permanent facilities. Transportation-related events involve hazardous materials released during transport by surface, air, or water. The type of area or equipment within fixed facilities involved in the release is also recorded (e.g., piping, storage tank, laboratory).
- Event location: The location of the event is identified by longitude and latitude coordinates where possible, and an ATSDR-maintained Geographic Information System (GIS) uses this information to identify nearby population groups and institutions (e.g. schools). If the exact location is not available, nearby population groups are estimated based on incident information.
- Date and time of the release, and current weather conditions if known and a factor in the incident.

[*] The NRC is the single portal for mandatory reporting of hazardous spills and releases to 16 federal agencies. See: www.nrc.uscg.mil

- Responsible party: If the responsible party for the release is a business, it is classified using the North American Industry Classification System (NAICS).
- Response: Response actions are categorized including what activities were taken to protect public health (e.g., issuance of health advisories, health investigations, and environmental sampling), and the groups responding to the incident (e.g., fire department, HazMat, public health agency).
- Substance(s) released: Released substances are identified by chemical name or chemical category, including “mixture.” Chemical constituents of brand name products are ascertained. The quantity released, type of release (e.g., spill, fire, volatilization), and whether the substance was actually released or a threatened release are also recorded.
- Causes: A primary or root cause of the release is assigned (e.g., human error, equipment failure, bad weather) and, when appropriate, a secondary or immediate cause of the release (e.g., improper mixing, vehicle collision, explosion).
- Victim(s): The number of individuals injured in the event is noted and which population group(s) were involved (e.g., the public, emergency responders, school children). Also recorded are the type(s) of injuries, severity of medical outcome, and demographics (age, gender) of injured individuals.
- Evacuation, sheltering-in-place, and decontamination: The numbers of individuals evacuated, sheltered in place, and decontaminated are recorded.

Because of loss of funding, Michigan HSEES is no longer conducting follow-up interviews to complete data fields where information was missing in the initial report.

All information is entered into a web-based application used by the NTSIP-participating states and maintained by ATSDR.

RESULTS

For 2010, 127 hazardous substance emergency events in Michigan were included in the Michigan MI-HSEES data set. The counties with the most frequent number of events were Wayne with 17 (13.4%) events, Oakland with 15 (11.8%) events and Kent with 11 (8.6%) events. A complete list of counties and event frequencies can be found in Appendix 1.

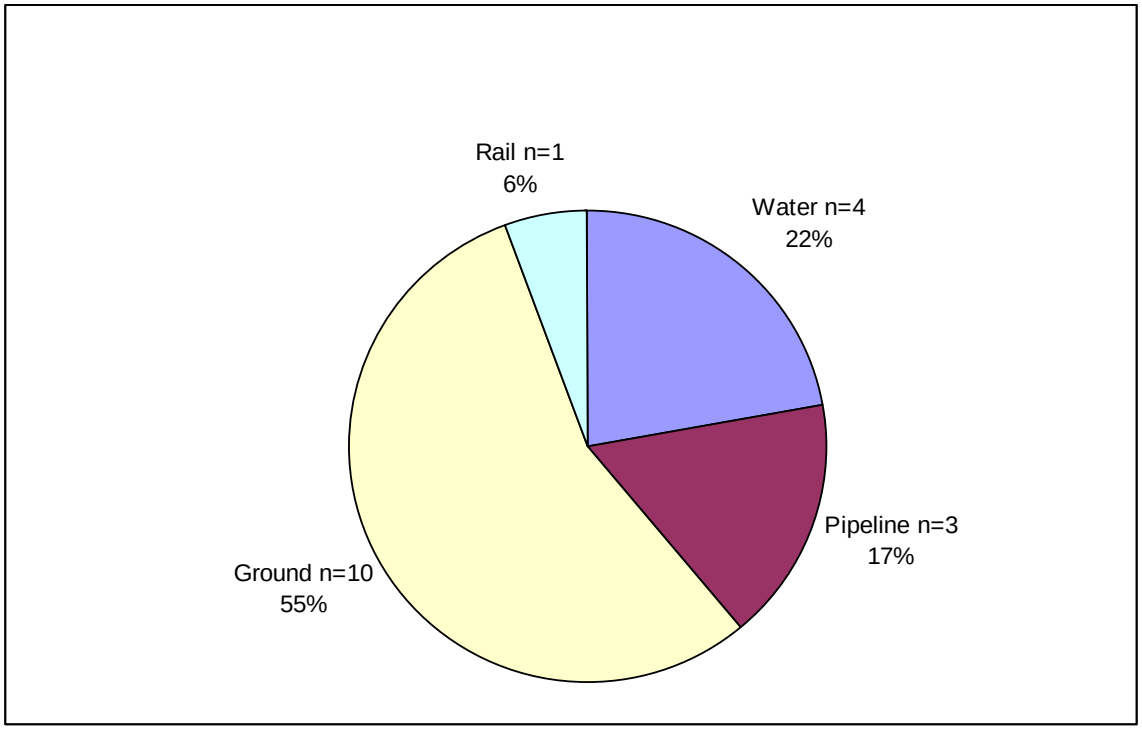
Facility type

A total of 109 (85.8%) events occurred in fixed facilities.

Ninety-five (74.8%) of the 109 fixed facility events did not identify an area in the facility where the release occurred. The locations for the 14 events where an area was identified included process vessels 5 (37%), piping 3 (21%), and others (one each).

Of the 18 transportation events, 10 (55.6%) occurred during ground transport, 4 (22.2%) by water, 3 (16.7%) by pipeline, and 1 (5.6%) by rail. (Figure 1)

Figure 1 – Distribution of transportation related events - Michigan HSEES 2010



Causes of events

Primary or root cause factors were reported in 125 of the 127 events. Of the reported primary factors, human error 60 (47%) and equipment failure 43 (34%) accounted for most of the factors. A greater percent of events at fixed facilities

than transportation-related events were related to human error, whereas in transportation, a greater percent was due to equipment failure. (Figure 2 and Table 1)

Figure 2 - Primary Causes of Events - Michigan HSEES 2010 (N=125)

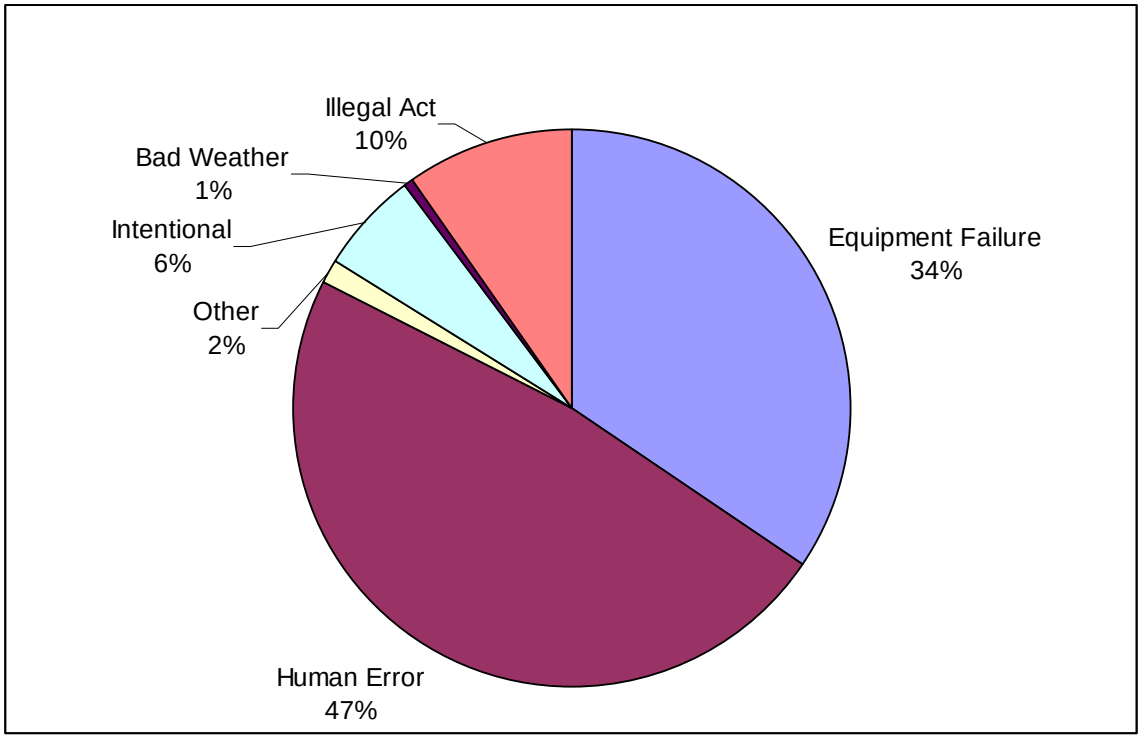


Table 1 – Primary factors associated with events by event type – Michigan HSEES 2010

Primary Factor	Event Type					
	Fixed Facility*		Transportation		All Events	
	Number of Events	%	Number of Events	%	Number of Events	%
Human Error	55	51.4	5	27.8	60	48
Intentional	7	6.5	0	0	7	5.6
Equipment Failure	33	30.8	10	55.6	43	34.4
Illegal Act	10	9.3	2	11.1	12	9.6
Bad Weather	0	0	1	0.9	1	0.8
Other	2	1.9	0	0	2	1.6
Total	107		18		125	

*Primary factor was unknown for 2 fixed facility events.

Substances

A single substance was released in 112 (88.2%) of the 127 events. A mixture of methamphetamine chemicals were reported in 10 (7.9%) events. Other events involving multiple chemicals included one event each of crude oil, a school chemistry experiment, a lead acid battery accident, a truck carrying multiple chemicals that overturned, and a natural gas explosion at a hardware store resulting in a fire of fertilizer, paints, solvents and other chemicals.

A total of 34 substances/mixtures were associated with the 127 events. The 12 substances/mixtures that were released in more than one event and the numbers of events for each of these are listed in Table 2. The list of all 34 substances/mixtures released are in Appendix 2.

Table 2 - Twelve substances/mixtures involved released in more than one event - Michigan HSEES 2010

Substance	Number of times released
Mercury	52
Methamphetamine Chemicals NOS	10
Gasoline	9
Natural Gas	9
Ammonia	7
Diesel Fuel	3
Explosives NOS	3
Propane	3
Flammable Liquid NOS	2
Hydrochloric Acid	2
Oil NOS	2
Sufuric acid	2

Mercury Spills

Mercury spills can have significant clean-up costs and frequently involve public health and other public agency responses to ensure safety. Many of these spills are in public facilities (e.g. schools) or private residences where there is no cost recovery. Michigan has passed laws prohibiting the sale of mercury thermometers, mercury containing blood pressure monitors, mercury thermostats and other mercury containing devices; and the use of mercury devices and elemental mercury in schools. Nevertheless, MI-HSEES continues to document mercury spills necessitating clean-up response.

In 2010 51 (40%) of the 127 MI-HSEES events were mercury spills. Of the 51 spills, 35 (69%) were broken mercury fever thermometers in the home. The non-thermometer spills were from mercury furnace flame sensors, mercury containing thermostats, mercury switches, blood pressure monitors, medical devices and free mercury. (Table 3) 100% resulted in an evacuation or other disruption to allow clean-up.

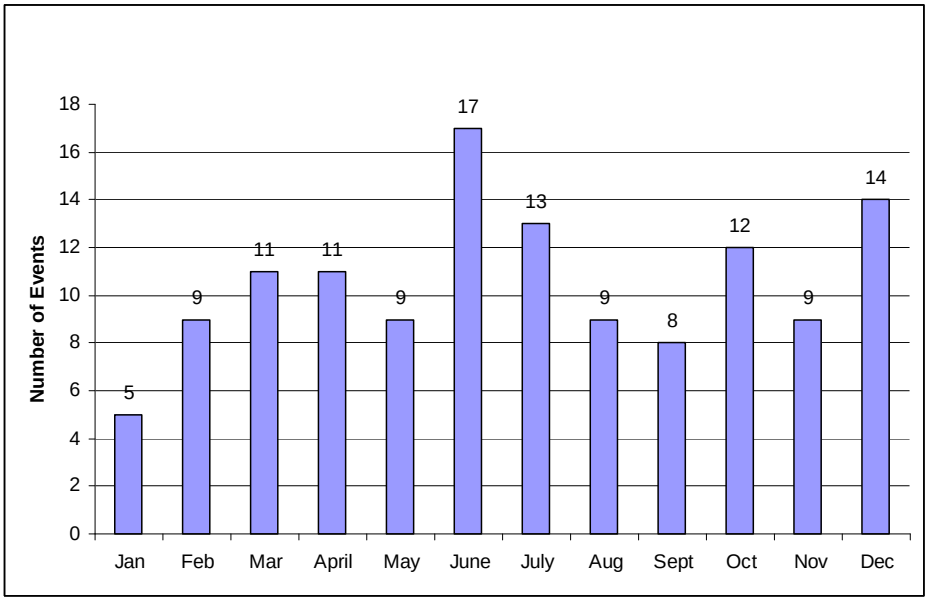
Table 3 - Frequency of mercury releases by spill type

Type of mercury spill	Number of times released
Broken thermometer in home	35 (69%)
Furnace flame sensors	1 (2.0)
Thermostats	3 (5.9)
Mercury switches	2 (3.9)
Blood pressure monitors	4 (7.8)
Free mercury	5 (9.8)
Mercury medical devices	1 (2.0)
Total	**51 (100%)**

Time of release

The number of events by month ranged from 17(13.4%) in June to 5 (3.9%) in January. (Figure 3)

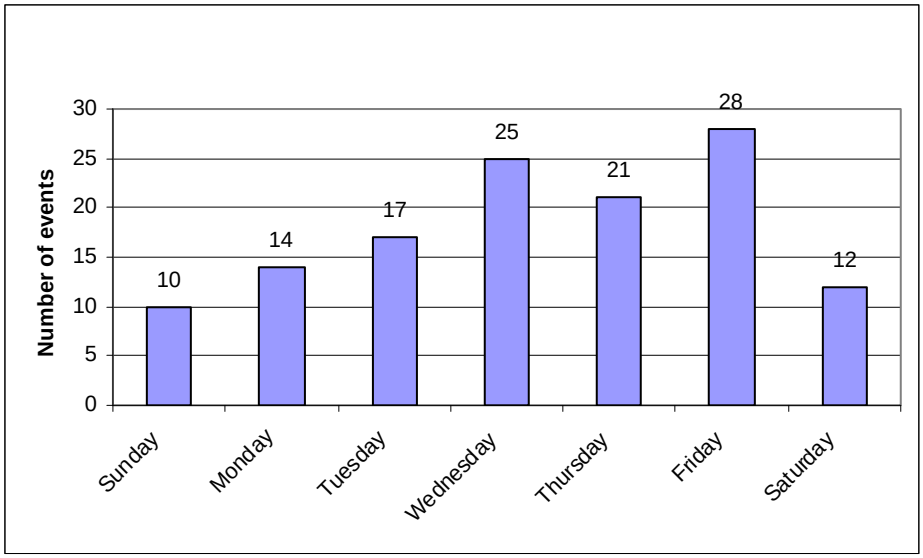
Figure 3 – Month distribution of events - Michigan HSEES 2010



Day of week of releases

Events were more likely to occur during the week than on weekends (Figure 4).

Figure 4 – Event day of the week distribution - Michigan HSEES 2010



Business/industry

Fifty-six (44.1%) of the 127 events were the responsibility of an industry or business. The largest proportion of the industry/business-associated events involved metal manufacturing, education, and health care, with 7 (12.5%) events each. (Table 4)

Table 4 – Industries involved in events by 2-digit NAICS codes - Michigan HSEES 2010

NAICS Code	Industry Category	No. Events	%
11	Agriculture	5	8.9
22	Utilities	4	7.1
23	Construction	1	1.8
31	Manufacturing - Food/Textiles/Apparel	6	10.7
32	Manufacturing - Paper/Petroleum/Chemicals/Plastics (N=21)	2	3.6
33	Manufacturing - Metal/Transportation	7	12.5
42	Wholesale Trade	1	1.8
44	Retail Trade - Motor Vehicle/Building Materials/Gas Stations	4	7.1
48	Transportation - Ground/Air Rail (N=51)	6	10.7
56	Administrative Support/Waste Management and Remediation	1	1.8
61	Education	7	12.5
62	Health Care	7	12.5
72	Accommodations/Food Services	1	1.8
81	Other Services	2	3.6
92	Public Administration	2	3.6
		56	

Response

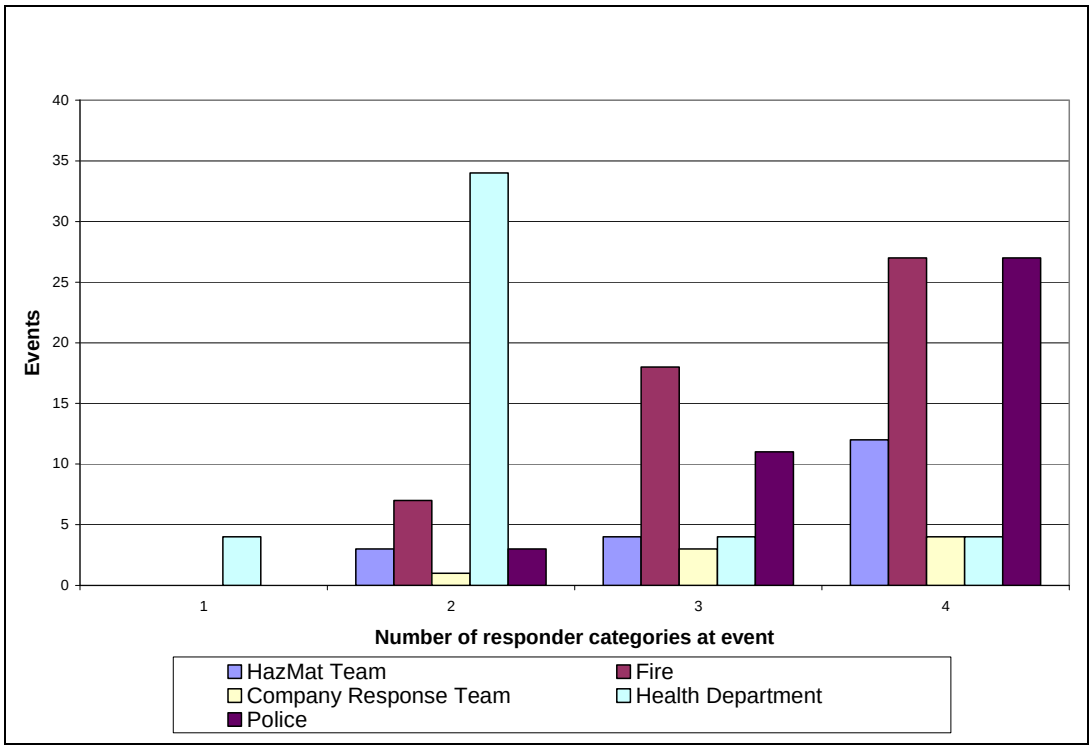
Responders: There were five categories of responders to the 127 events; Hazmat, fire, company response team, health department, and police. Table 5 shows the frequency of responses by responder categories.

Table 5 - Frequency of responses by responder category- Michigan HSEES 2010

Responder category	Number of events responded	%
Hazmat	38	29.9
Fire	71	55.9
Company Response Teams	15	11.8
Public Health	51	40.2
Police	68	53.5

Seven events (5.5%) reported only one category of responders, 44 (34.6%) reported two categories of responders, 27 (21.3%) reported three and 49 (38.6%) reported four or five categories of responders. The frequencies of events by types of categories of responders are in Figure 5. Note that public health was more frequently involved in events with only one or two responders (i.e., smaller events), and Hazmat and Fire were more likely to be involved in events with multiple responders.

Figure 5- Number of responder categories at event - Michigan HSEES 2010



Public health actions

Seventy-one (55.9%) of the 127 events resulted in one or more public health responses, including one very large event with multiple public health actions including sampling, a health investigation, and health advisory (see sidebar on page 11). Of the others, 56 (44.1%) had environmental sampling only; 4 (3.1%) had environmental sampling and a health investigation; 2 (1.6%) had a health investigation only; and 6 (4.7%) had other public health responses.

Enbridge Oil Spill

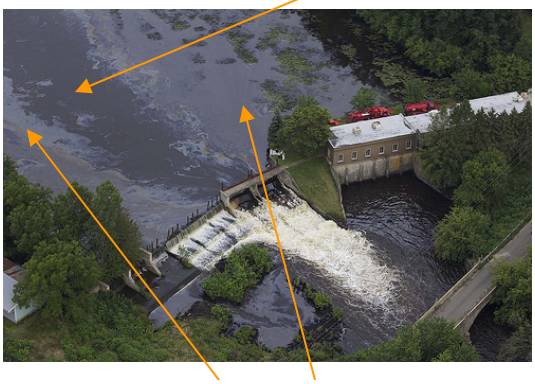
Enbridge Energy Partners LLP reported a 30-inch pipeline containing crude oil ruptured on Monday, July 26, 2010, near Marshall, Michigan. The release was estimated at greater than 800,000 gallons. The oil entered Talmadge Creek and flowed into the Kalamazoo River, a Lake Michigan tributary. Heavy rains caused the river to overtop existing dams and carried oil 30 miles downstream on the Kalamazoo River.

Air monitoring was performed and it was found that the levels of benzene near the pipeline release exceeded the Minimum Risk Levels (MRLs) for a public exposure of 1 year. A voluntary evacuation order was given for 60 homes for 21 days based on the levels of benzene in the air. The actual number of families complying with the order is unknown.

Many areas contained strong odors of oil, even though MRLs were not exceeded for any chemicals. Based on anecdotal reports and calls to the Enbridge hotline, many individuals apparently temporarily relocated from their homes because of these noxious odors, although the exact number is not known.

MDCH conducted surveillance for acute health impacts of exposure to the oil. Health care providers reported 145 patients who had been seen because of one or more symptoms related to the oil spill and its odors, including nausea, vomiting, and respiratory irritation. Door-to-door surveys of 550 household members in four communities adjacent to the contaminated waterways identified 320 residents with similar symptoms. (Table 6) The massive clean-up effort is still underway over a year later.

Pipeline break site



Oil sheen on water

Table 6 – Prevalence of oil-spill related symptoms

Symptom/clinical effect	Prevalence among 145 individuals reported by health care providers	Self-reported prevalence among 320 symptomatic individuals in four communities
Headache/other neurologic effect	64.8%	63.4%
Respiratory (breathing difficulty, cough, sore throat)	46.9%	42.2%
Gastrointestinal (nausea, vomiting, stomach ache)	59.3%	31.9%
Skin/eye irritation	22.1%	15.9%
Anxiety	0	8.1%
Other (e.g. cardiovascular, fatigue).	36.6%	29.1%

Victims, evacuations, and sheltering-in-place
excluding data from Enbridge oil spill

This section excludes data from the Enbridge oil spill, because that single event involved such large numbers of victims and because the actual number of individuals who voluntarily evacuated is unknown. Details of the oil spill event, including information about victims are provided in the sidebar on p. 12, with additional details available by accessing the MDCH website on the spill http://www.michigan.gov/mdch/0,1607,7-132-54783_54784-241680--,00.html.

Excluding the Enbridge oil spill, 70 (55.1%) of the 126 events involved an injury or evacuation. (No decontamination events were identified in 2010). A brief synopsis of each of the 70 events that included one or more of these public health impacts measures is included in Appendix 3.

Victims

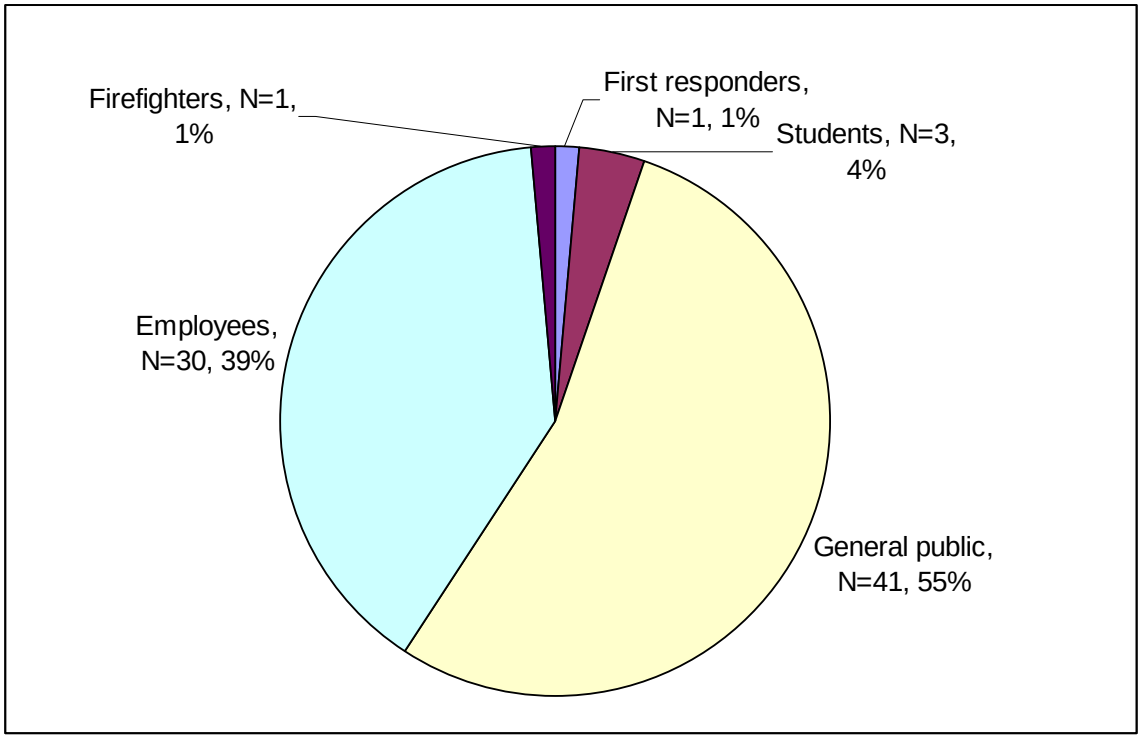
Seventy-six victims were reported in 45 events (35.7% of the 126 events) (Table 7). Of the 45 events with victims, 29 (64.4%) involved only one victim, 7 (15.5%) involved two victims, 5 (11.4%) had three victims, and 4 (8.9%) had four or more victims. Of all victims, 73 (96.1%) were injured in fixed facility events (Table 7).

Table 7 - Number of victims per event, by type of events - Michigan HSEES 2010

Number of Victims	Type of event								
	Fixed Facility			Transportation			All Events		
	No. of Events	%	Total Victims	No. of Events	%	Total Victims	No. of Events	%	Total Victims
1	29	65.9	29	0	0	0	29	64.4	29
2	7	15.9	14	0	0	0	7	15.5	14
3	4	9.1	12	1	100	3	5	11.4	15
≥4	4	9.1	18	0	0	0	4	8.9	18
Total	44		73	1		3	45		76

The majority (55%) of the injured were among the general public; 32 (41%) were injured while in work status. (Figure 7)

Figure 7 – Victims by population group - Michigan HSEES 2010 (N=76)

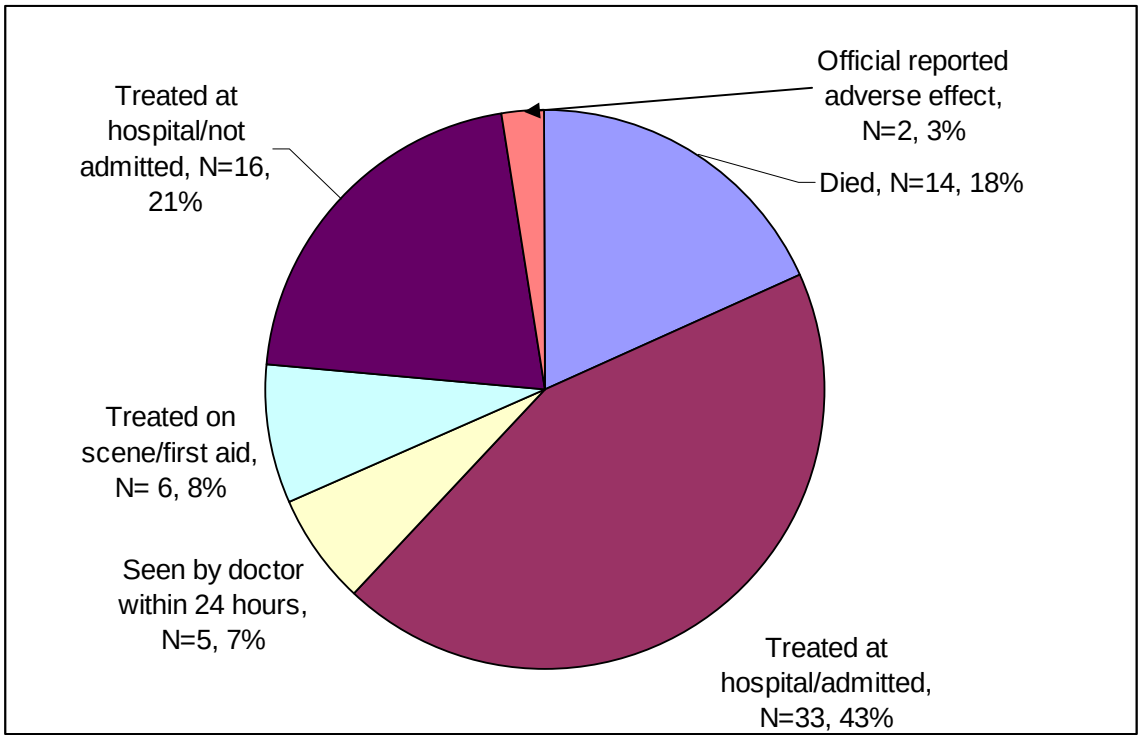


The age group was determined for 24 (31.6%) of the 76 victims: Five (20.8%) were five to 14 years old, 5 (20.8%) were 15 - 20 years old, 8 (33.3%) were 20 – 44 years old, 4 (16.7%) were 45 – 64 years old and 1 (4.2%) was older than 65 years.

Sex was known for 34 (44.7%) of the victims; of these, 26 (76.5%) were male.

Severity of injuries was known for all victims: 16 (21.1%) were treated and released from the hospital, 6 (7.9%) were treated on scene, 33 (43.4%) were admitted to the hospital, 5 (6.6%) were seen by a doctor within 24 hours and 14(18.4%) died (Figure 8).

Figure 8 - Injury outcomes - Michigan HSEES 2010



Of the 76 victims, 73 (96.1%) were reported to have sustained a total of 83 injuries or symptoms (Table 8). (The remaining three were known to have been injured, but the types of injuries were unknown.) Of all the reported injuries/symptoms the most common were burns with 31 (37.3%), followed by trauma with 26 (31.3%).

Table 8 – Number of Injuries/Symptoms - Michigan HSEES 2010

Injury/Symptom	No. of injuries	%
Burns	31	37.3
Trauma	26	31.3
Respiratory Irritation	12	14.5
Other	7	8.4
Skin Irritation	3	3.6
Eye Irritation	1	1.2
Gastrointestinal Problems	1	1.2
Dizziness/other CNS* symptoms	1	1.2
Heat Stress	1	1.2
Total	83	100

*Central Nervous System

Fatalities

Among the 76 victims there were 14 (18.4%) fatalities. Of the fatalities 5 (35.7%) were from natural gas/propane explosions, 3 (21.4%) were from illegal

methamphetamine laboratory explosions, 3 (21.4%) were from fires caused by transportation accidents, 2 (14.3%) were confined space accidents; 1 resulting from an explosive atmosphere and the other from hydrogen sulfide released from molasses in a silo, and 1 (7.1%) was from the improper use of a cutting torch.

Evacuations and sheltering-in-place

Evacuations were ordered in 40 (32.3%) of the 126 events (which excludes the large oil spill). Of these evacuations 24 (60%) were of buildings or the affected parts of the building, 8 (20%) were within a circle or radius of the event, 1 (2.5%) had no defined criteria, 2 (5%) were downwind of the event, 1 (2.5%) was within a circle and downwind of the event, and for 4 (10%) the area of evacuation was unknown.

The number of people evacuated was known for 8 (20%) of the 40 events. Four of the eight events involved less than 20 people each. The four others each involved more than 100 people and all involved evacuations of schools – two because of gas leaks (see case numbers MI20100015 and MI20100019 in Appendix 3), one because of vapors from cleaning fluids (MI20100016), and the largest, involving an evacuation of 2,300 students, involved improper mixing of pool chemicals (MI2010095).

The length of the evacuation, which was reported for 9 (22.5%) of the 40 events, ranged from 0.75 hour to 21 days.

Two (5%) of the events with evacuation orders had shelter-in-place orders along with the evacuation orders.

There was one reported event that had only shelter-in-place orders.

Appendix 1 – Events by county – Michigan HSEES 2010

County	Event Type				Total	
	Fixed Facility		Transportation		All Events	
	Number	%	Number	%	Number	%
Baraga	1	0.8	0	0	1	0.8
Barry	1	0.8	0	0	1	0.8
Bay	1	0.8	1	0.8	2	1.6
Berrien	2	1.6	0	0	2	1.6
Calhoun	1	0.8	1	0.8	2	1.6
Cheboygan	0	0	1	0.8	1	0.8
Clinton	1	0.8	0	0	1	0.8
Eaton	1	0.8	0	0	1	0.8
Genesee	4	3.1	1	0.8	5	3.9
Grand Traverse	1	0.8	0	0	1	0.8
Gratiot	1	0.8	0	0	1	0.8
Ingham	5	3.9	1	0.8	6	4.7
Ionia	0	0	1	0.8	1	0.8
Jackson	5	3.9	0	0	5	3.9
Kalamazoo	3	2.3	1	0.8	4	3.1
Kent	11	8.7	0	0	11	8.7
Livingston	3	2.3	2	1.6	5	3.9
Macomb	6	4.7	0	0	6	4.7
Marquette	1	0.8	1	0.8	2	1.6
Mecosta	2	1.6	0	0	2	1.6
Midland	2	1.6	0	0	2	1.6
Monroe	1	0.8	0	0	1	0.8
Montcalm	2	1.6	0	0	2	1.6
Muskegon	4	3.1	0	0	4	3.1
Newaygo	1	0.8	0	0	1	0.8
Oakland	15	11.8	0	0	15	11.8
Oceana	1	0.8	0	0	1	0.8
Osceola	1	0.8	0	0	1	0.8
Otsego	1	0.8	0	0	1	0.8
Saginaw	3	2.3	0	0	3	2.3
Sanilac	2	1.6	0	0	2	1.6
St. Joseph	6	4.7	2	1.6	8	6.3
Tuscola	1	0.8	0	0	1	0.8
Van Buren	2	1.6	1	0.8	3	2.3
Washtenaw	4	3.2	1	0.8	5	3.9
Wayne	13	10.2	4	3.1	17	21.3
Total	**109**	**85.8**	**18**	**14.2**	**127**	**100**

Appendix 2 – Complete list of substances released and frequencies – Michigan HSEES 2010

Chemical Name	Number of Events	Percent
Mercury	52	41.7
Methamphetamine Chemicals NOS	10	7.9
Gasoline	9	7.1
Natural Gas	9	7.1
Ammonia	7	5.5
Diesel Fuel	3	3.1
Explosives NOS	3	3.1
Propane	3	3.1
Flammable Liquid NOS	2	1.6
Hydrochloric Acid	2	1.6
Oil NOS	2	1.6
Sulfuric Acid	2	1.6
Acetic Acid	1	0.8
Calcium Silicate	1	0.8
Chlorine NOS	1	0.8
Cleaning Agent NOS	1	0.8
Crude Oil NOS	1	0.8
Fibrous Material NOS	1	0.8
Flammable Gas NOS	1	0.8
Hazardous Waste NOS	1	0.8
Hydrogen Sulfide	1	0.8
Lubricant NOS	1	0.8
Methane NOS	1	0.8
Mineral Spirits	1	0.8
MIX: Crude Oil NOS	1	0.8
MIX: Ferrous Sulfate/Hydrogen Peroxide/Sodium Sulfide NOS	1	0.8
MIX: Fertilizer NOS/Natural Gas/Paint or Coating NOS	1	0.8
MIX: Hydrochloric Acid/Lead/Plastic NOS	1	0.8
MIX: Potassium Chlorate/Sucrose/Sulfuric Acid	1	0.8
Oxygen	1	0.8
Paint NOS	1	0.8
Pesticide NOS	1	0.8
Radioactive Material NOS	1	0.8
Silicon Tetrachloride	1	0.8
	127	**100**

The five events having more than one chemical are listed above as mixtures (MIX).

Appendix 3- Events resulting in an evacuation, injury or exposure – Michigan HSEES 2010

MI20100003 - Mercury switch in commercial popcorn popper in movie theater broke into popcorn. Local health department and third party contractor cleaned up spill.

MI20100004 - During surgery a mercury containing bougie tube was nicked with a scalpel releasing mercury into the patient. Health department screened hospital.

MI20100010 - Mercury fever thermometer broken in home, house evacuated by fire department.

MI20100012 - Mercury blood pressure cuff was brought to school by a teacher to demonstrate its use. Mercury was spilled and not reported for 3 days. Third party contractor called in for cleanup.

MI20100015 - Natural gas leak at elementary school, 365 students evacuated. No injuries were reported.

MI20100016 - Student created an explosion using cleaning fluids in the school hallway, students were evacuated and sent home due to the chemical vapor in the hallway.

MI20100017 - Equipment failure on a rail car released hydrochloric acid. Two people were injured and admitted to the hospital.

MI20100018 - Homeowner disposed of explosives in the trash, possibly from manufacturing fireworks. The garbage collector was burned when he picked up the trash.

MI20100019 - Truck backed into a natural gas meter causing evacuation of a school and preschool while repairs were being made. No injuries were reported.

MI20100021 - Two people were operating a methamphetamine lab, when it exploded causing severe burns to both.

MI20100022 - Silicon tetrachloride released, plant workers and area residents asked to shelter in place for an hour, one worker was injured and treated at the scene.

MI20100023 - Calcium Silicon Barium was reacting with moisture in the air, building and adjacent buildings were evacuated.

MI20100025 - Employee received burns over 40% of his body from a propane explosion when lighting a torch.

MI20100026 - Two people injured from a gasoline explosion while working on a generator.

MI20100027 - Man killed in a home explosion and fire due to natural gas.

MI20100029 - Leak in underground gasoline pipeline creating a 3 foot high fountain, 89 barrels released. Homes in immediate area evacuated for 48 hours.

MI20100030 - Employee was using a cutting torch on an oil barrel when it exploded, killing employee.

MI20100031 – During a chemistry experiment a student broke test, tube spilling dilute acid on two students. A student who was a distance away said she was exposed and was treated by her doctor.

MI20100032 - Truck overturned spilling drums of Mono-lube 3004, a tire mold release compound on the freeway, creating an extremely slick road surface. Freeway closed for 12 hours to remove and clean up spill.

MI20100033 - Natural gas explosion destroying a four unit apartment complex, four people hospitalized.

MI20100035 - Mercury found in pot pie purchased from grocery store. Four occupants of home were tested for mercury, all levels were acceptable.

MI20100036 - Mercury blood pressure monitor was broken in a nursing home. Clean-up contactor called in, health department helped with screening. Area evacuated until clean up was completed

MI20100038 - Welding shop caught fire from flammable liquids, no injuries, thick smoke from fire. Adjoining businesses were evacuated.

MI20100040 - Truck fire outside of day care, Day care evacuation due to smoke and fumes from leaking diesel.

MI20100041 - Two people burned from methamphetamine chemical explosion in a home.

MI20100042 - Methamphetamine lab in apartment building caught on fire, building evacuated.

MI20100043 - Mercury spill in dentist's office discovered by cleaning service. Office closed until clean- up finished.

MI20100045 - Farmer splashed ammonia on his chest and arms, resulting in second degree burns.

MI20100046 - Plant released hydrochloric acid, no injuries reported, plant evacuated and roads closed.

MI20100047 - Thermostat broken in home, splashed mercury on child.

MI20100051 - House destroyed by natural gas explosion from leaking appliance, no one home at time of explosion.

MI20100055 - Child burned by gasoline from parent starting a bonfire.

MI20100056 - Ammonia tank overturned spilling contents, public was gathering near tank while it was off-gassing. Public removed, roads closed, no reports of adverse exposures.

MI20100057 - Mercury thermometer broken into container with water used to heat up a dental device, found after device was placed in patient's mouth.

MI20100059 - Explosion at a hardware store, destroyed store and adjacent dollar store. Utility dug up pavement to stop leaking natural gas.

MI20100060 - Apartment explosion in apartment building. One person treated and released, 20 apartments damaged.

MI20100062 - Resident returned home and turned on the lights, house exploded due to natural gas. House was knocked off foundation resident was blown 10 feet into a wall but was uninjured.

MI20100063 - Gasoline tanker exploded after a motorcyclist ran into and broke off the fill valve. Motorcyclist was killed, freeway closed down in both directions.

MI20100067 - Gasoline overfilled on a pleasure boat. Gasoline exploded, 5 people were thrown from craft, 1 child hospitalized.

MI20100068 - Machine at a battery plant caught on fire spread to piles of batteries that were being recycled created large smoke cloud containing particles from burning plastics, HCL and possibly lead.

MI20100069 - Two workers were killed from hydrogen sulfide in a silo.

MI20100070 - Man was killed by an explosion resulting from a natural gas leak on a stove that had been converted from propane.

MI20100071 - Ammonia leak from agricultural process, 1 person admitted to hospital.

MI20100072 – Crude oil leak from a pipeline, more than 840,000 gallons. Multiple homes recommended for voluntary evacuation; 145 individuals reported by health care providers with oil-spill related injuries/illnesses; 320 individuals with self-reported oil-spill related symptoms during community door-to-door surveys.

MI20100074 - Oxygen tank explosion and fire in apartment complex; 16 people evacuated.

MI20100076 - Ammonia release from refrigeration. 100 people at plant and 50 area residents evacuated for 4 hours

MI20100077 - When loading a tanker 7,000 gallons of mineral spirits exploded, 1 person sent to hospital with hearing problems.

MI20100078 - Gasoline spill at gasoline station, gasoline drained into storm sewers under the station, station evacuated due to explosion hazard.

MI20100079 - Semi-truck overturned on I-275 spilling chemicals on freeway, freeway closed for over 12 hours, 1 first responder treated for heat exhaustion.

MI20100080 - Boat exploded after filling up with gasoline, hospitalizing one person.

MI20100081 - Ammonia mixed with other chemicals releasing ammonia vapors in a commercial laundry, building evacuated. HazMat was called to clean up, no injuries.

MI20100087 - Methamphetamine lab exploded, severely burning woman who later died.

MI20100088 - Man threw accelerant on fire severely burning 6 year old daughter.

MI20100089 - Truck dumping waste into waste stream which caught fire, injuring worker.

MI20100090 - 2 inch natural gas pipeline leaked causing an explosion, 12 homes evacuated, school sheltered in place

MI20100091 - Refrigeration leak at winery, six employees treated and released from hospital.

MI20100095 - Pool chemicals mixed improperly, one person taken to hospital, school closed for the day.

MI20100097 - One person severely burned using gasoline to burn leaves.

MI20100100 - Oil was released from a boat offshore. The 5,000 gallons of oil caused the beach and state park area to be evacuated and closed.

MI20100102 - Propane gas explosion destroyed home killing occupant.

MI20100105 - Methamphetamine lab caught on fire burning two individuals.

MI20100109 - Semi-truck hit bridge abutment, diesel fuel caught on fire killing driver and passenger.

MI20100113 - Car was on fire from methamphetamine lab. Three people severely burned.

MI20100119 - Three workers burned, one severely, from a propane explosion in an excavation.

MI20100120 - One worker was severely burned from an explosion during a welding process.

MI20100121 - One man was killed when a methamphetamine lab exploded in a garage.

MI20100122 - One man was burned on his hands and face from a methamphetamine lab explosion

MI20100123 - One man was killed from a methamphetamine lab explosion.

MI20100124 - Paper dust exploded no injuries, building evacuated.

MI20100125 - Natural gas explosion killed three, severely injured one, destroyed furniture store.

MI20100127 - Methamphetamine lab explosion and fire in apartment building, two were injured.