Personal Protective Equipment

Only 1 of 133 employee victims and 4 of 12 responder-victims were reported to have worn PPE. Whether PPE was worn was unknown for 21 employee-victims. The employee-victims wore level D type of protection. All four injured firefighters, wore fire fighter turn-out gear with respiratory protection. None of the injured police officers wore any type of protection.

Nearby Populations

Residences were within ¼ mile of 1,137 events, industries or other businesses within ¼ mile of 1,116 events, schools were within ¼ mile of 159 events, licensed daycare centers were within ¼ mile of 175 events, recreational areas were within ¼ mile of 130 events, nursing homes were within ¼ mile of 58 events, and hospitals were within ¼ mile of 19 events. For 77 events, information about nearby population areas was not collected.

Evacuations and Sheltering

From July 1 to December 31, 2009, evacuations were ordered in 121 events. Of these evacuations, 83.2% were from the building or affected areas of the building, 10.1% evacuations were from a circular area surrounding the event generated by computer or defined by investigator, 2.5% evacuations were from areas downwind or downstream, 3.4% from a circular and downwind or downstream area, and 0.8% had no defined criteria. The number of persons evacuated was known for 52 (42.9%) of the events and ranged from 2 to 15,000 persons, with a median of 18. The median duration of evacuation was 2 hours (range: 0.5 hours to 58 days). For 16 (13.2%) events, the duration of evacuation was missing. Sheltering-in-place was ordered in 6 incidents (0.4%).

Decontamination

In 1,352 events decontamination status was known for 112 exposed uninjured people; 69 of them were decontaminated at the scene and 43 at a medical facility.

Of the 293 injured for whom decontamination status was known, 209 were not decontaminated, 33 were decontaminated at the scene, 43 were decontaminated at a medical facility, and 8 were decontaminated both at the scene and at a medical facility.

No injured firefighters were decontaminated. Three of 8 injured police officers were decontaminated at a medical facility, one was decontaminated at both the scene and medical facility and 4 were not decontaminated. Of the non-responder victims, 57 (38.3%) employees, 20 (15.6%) members of the public and 3 (75%) students received decontamination.

Response

No responder types were reported for 22 events. A single responder category was reported for 768 events and multiple responder categories for 562. The most frequently reported responder group was the company response team, followed by fire departments, law enforcement agencies, certified HazMat teams, EMT and EPA response team (Table 9b)**.**

Table 9b. Distribution of HSEES Responder Categories, July 1 - December 31, 2009

Responder Category	Number of events
Company's response team	1093
Fire department	242
Law enforcement agency	160
Certified Haz Mat team	114
EMT	109
Environmental agency/EPA response team	109
Third Party clean-up contractors	89
Other	142

*Total (2,058) is greater than the total number of events with information on responder categories because multiple responder categories could be reported per event.

Reporting Timeliness

Of the 942 events that occurred in fixed facilities, 73.3% were reported to HSEES within 48 hours of the event; only 34.4% of the 410 transportation events were reported within 48 hours. The Department of Transportation is a primary reporting source for transportation events for many states. Transportation companies have to report incidents to the US Department of Transportation, but reports are not required within 48 hours, thereby delaying HSEES reporting.

CUMULATIVE RESULTS, 1993-2009

HSEES was supported by a series of 5-year competitive, cooperative agreements funded by ATSDR with additional support in recent years from the Centers for Disease Control and Prevention's Coordinating Office for Terrorism Preparedness and Emergency Response. States receiving funds changed over the years (Table 10). Due to the funding changes in July 2009, only 6 states continued collecting data from July1 to December 31, 2009.

Table 10. Years of HSEES Participation, by State, 1993–2009*

State	Years Participated
Alabama	1993-2003
Colorado	1993-June 30, 2009
Florida	2005-June 30, 2009
Iowa	1993-June 30, 2009
Louisiana	2001-December 31, 2009
Michigan	2005-June 30, 2009
Minnesota	1995-June 30, 2009
Mississippi	1995-2003
Missouri	1994-2005
New Hampshire	1993-1996
New Jersey	2000-2008**
New York	1993-December 31, 2009
North Carolina	1993- December 31, 2009
Oregon	1993-December 31, 2009
Rhode Island	1993-2001
Texas	1993-December 31, 2009
Utah	2000-July 30, 2009
Washington	1993-July 30, 2009
Wisconsin	1993-December 31, 2009

*1993-2008 annual reports may be found at the HSEES Website: http://www.atsdr.cdc.gov/HS/HSEES/index.html.

**NJ was unable to collect complete data in 2006, 2008 and 2009.

Year 2009 was the turning point for the HSEES program. Thirteen states collected data from January 1 to June 30, 2009. Due to the funding changes related to the transformation of the HSEES program to NTSIP in mid-2009, only six states continued collecting data from July 1 to December 31, 2009.

From January 1 to June 30, 2009 a total of 3,458 acute hazardous substances events met the criteria for HSEES inclusion in 13 states. From July 1 to December 31, 2009 a total of 1,352 acute hazardous substances events met the criteria for HSEES inclusion in 6 states.

During 2009, the largest proportion of events occurred in fixed facilities (Table 11). The percentage of fixed-facilities events decreased from 83.5% in 1993 to 69.7% at the end of 2009. The percentage of transportation related events increased from 16.5% in 1993 to 30.3% at the end of 2009.

Table 11. Cumulative HSEES Data by Year

Source: Hazardous Substances Emergency Events Surveillance, 1993–2009*

Year	Number of States Participating				Number of substances released	Number of victims	Number of deaths	Events with victims	
		Fixed Facility (%)	Transportation Events (%)	Total number				Number	%
1993	11	83.5	16.5	3,833	4,361	2,230	16	464	12.1
1994	12	78.5	21.5	4,233	5,072	2,181	21	414	9.8
1995	14	80.5	19.5	5,310	6,027	1,688	14	402	7.6
1996	13	78.9	21.1	5,488	5,861	1,622	33	390	7.1
1997	13	79.5	20.5	5,513	6,089	1,896	28	372	6.7
1998	13	79.1	20.9	5,981	6,486	1,533	36	405	6.8
1999	15	74.1	25.9	6,260	6,974	1,912	30	504	8.1
2000	16	72.9	27.1	7,548	8,342	2,513	44	752	10.0
2001	15	75.0	25.0	8,978	11,764	2,168	22	710	7.9
2002	15	72.1	27.9	†9,013	11,009	2,150	47	739	8.2
2003	15	74.5	25.5	9,105	12,018	1,835	51	720	7.9
2004	13	73.4	26.6	7,744	10,323	1,838	41	620	8.0
2005	15	74.2	25.8	†8,603	11,506	2,034	69	778	9.0
2006	13	68.1	31.9	7,268	9,462	2,190	69	683	9.4
2007	14	68.5	31.5	7,947	9,873	2,337	69	778	9.0
2008	13	69.1	30.9	7,559	9,227	2,206	56	948	12.5
2009 Jan-June	13	68.3	31.7	3,458	4,074	1,050	44	439	12.7
2009 July-Dec	6	69.7	30.3	1,352	1,673	319	8	129	9.5

*Numbers in the table may differ from those reported in previous years because of edits.

†The total number of events does not include one event in 2002 and one in 2005 for which the type of event was unknown.

Employees and members of the public remained the groups most often injured (Table 12).

Table 12. Percent of Cumulative HSEES Victims, by Population Group and Year

Source: Hazardous Substances Emergency Events Surveillance, 1993-2009

Year	Employees		Public		Responders		Students		Unknown		Total
	N	%	N	%	N	%	N	%	N	%	N
1993	1,285	57.6	788	35.3	143	6.4	n/a	n/a	14	0.6	2,230
1994	977	44.8	963	44.2	235	10.8	n/a	n/a	6	0.3	2,181
1995	907	53.7	482	28.6	218	12.9	81	4.8	0	0.0	1,688
1996	830	51.2	480	29.6	164	10.1	145	8.9	3	0.2	1,622
1997	1,102	58.1	580	30.6	121	6.4	79	4.2	14	0.7	1,896
1998	1,008	65.4	253	16.5	107	7.0	157	10.2	8	0.5	1,533
1999	1,125	58.8	330	17.3	159	8.3	297	15.5	1	0.1	1,912
2000	1,199	47.7	593	23.6	338	13.5	365	14.5	17	0.7	2,512
2001	1,085	50.0	613	28.3	291	13.4	178	8.2	1	0.1	2,168
2002	1,008	46.9	650	30.2	274	12.7	211	9.8	7	0.3	2,150
2003	943	51.4	500	27.2	260	14.2	132	7.2	0	0.0	1,835
2004	837	45.5	640	34.8	219	11.9	142	7.7	0	0.0	1,838
2005	795	39.1	955	47.0	185	9.1	99	4.9	0	0.0	2,034
2006	1,003	45.6	774	35.3	159	7.3	237	10.8	17	0.8	2,190
2007	1,126	43.0	855	36.6	139	5.9	209	8.9	8	0.3	2,337
2008	1,006	45.6	887	40.2	132	6.0	180	8.2	1	0.1	2,206
2009 Jan-June	522	49.7	422	40.2	78	7.4	28	2.7	0	0.0	1,050
2009 July-Dec	154	48.3	149	46.7	12	3.8	4	1.3	0	0.0	319

*The student category was not available before 1995.

USES OF HSEES DATA

During 2009, ATSDR continued responding to requests for HSEES information from local, state, and federal agencies and organizations. ATSDR and state health department staff presented HSEES data at many local, state, national, and international conferences. The ATSDR HSEES Web site (http://www.atsdr.cdc.gov/HS/HSEES/) contains annual reports, published journal articles, public use datasets, and other information.

Public Use Dataset

ATSDR has created a public use HSEES dataset to enable public health professionals and other interested parties to analyze the data. A data dictionary provides users with detailed instructions for working with the dataset. This dataset resides on the HSEES public Web site. Data contained in the file are related to events that occurred in the 17 states participating in HSEES from 1996–2007. The dataset for 2008-2009 will also be placed on the website shortly. To date, 1356 requests for this data have been received.

PREVENTION/OUTREACH ACTIVITIES

The goal of HSEES was to develop strategies that might reduce future morbidity and mortality resulting from the release of hazardous substances. To accomplish this goal, the HSEES program made an important contribution to building capacity within each participating state health department to target prevention activities related to acute spills and their associated public health consequences. The HSEES system also built capacity to alert the proper authorities when a public health action needed immediate implementation.

State HSEES coordinators often conducted activities in collaboration with other local and state agencies. The HSEES program has worked over the years with several CDC Public Health Prevention Specialists trying to build capacity to develop sound prevention activities that can be evaluated for their effectiveness. In 2006, a CDC Public Health Prevention Service fellow developed the "HSEES Prevention Outreach and Evaluation Activity Planning Guide" for use by states. During January 1 to June 30, 2009, HSEES states sponsored 12 prevention/outreach activities that targeted over 48,011 persons. During the period from July 1 to December 31, 2009, HSEES states sponsored 43 prevention/outreach activities that targeted more than 75,503 persons. The HSEES Web page contains links to state HSEES Web pages where many of the prevention/outreach materials are posted.

Examples of prevention activities for 2009 include:

Awareness-Promoting Activities

Raising awareness of the public health significance of acute chemical releases and their impacts is important. This occurred mainly through presentations at meetings and distribution of HSEES materials. Increased awareness might result in reduction in hazardous substance releases and public health impact. Increased awareness also may produce better reporting leading to higher number of HSEES events collected. Thus, for these activities, states measured the effects of their activities mainly by the number of people they reached and whether that outreach resulted in changed knowledge or attitudes.

- The New York State HSEES program published an article entitled "New York Hazardous Substances Emergency Events Surveillance (HSEES) data support emergency response, promote safety and protect public health" in the Journal of Loss Prevention in the Process Industries.
- The North Carolina HSEES program presented the NC HSEES data at the 2009 Business and Environmental Safety Training conference, the 2009 All Hazards conference, the 2009 NC State Fireman's Association Annual Conference, and the Guilford County LEPC & ASSE Safety & Environmental Conference.
- The Utah State HSEES program together with Utah's Environmental Public Health Tracking Program (EPHT), developed HSEES indicators to track environmental conditions and query modules for the Utah Indicator-Based Information System for Public Health (IBIS-PH). The indicators were published on a public portal of the IBIS-PH and may be found at http://ibis.health.utah.gov/.
- The Washington State HSEES program prepared a 2009 HSEES calendar including messages promoting hazardous substances awareness and forwarded it to law

enforcement and fire department officials and others interested in emergency management.
- The Washington State HSEES program also developed and distributed a publication entitled "HSEES Highlights" to promote awareness of the program.

Targeted Activities

Identifying high-risk groups and their preferred channels for receiving information is important for effectively targeting prevention messages. Examples of targeted activities during 2009 included:

- Using HSEES data, the New York HSEES program made several presentations to firefighters and published an article entitled, "Expect the Unexpected and Prevent Firefighter Injuries in HAZMAT events."
- North Carolina HSEES program distributed a fact sheet designed to show factors associated with the most releases and prevention measures to decrease the number of events at trucking terminals throughout the state.
- The Texas HSEES program incorporated the county data into a query and mapping system maintained by the Texas Department of State Health Services Center for Health Statistics. Texas HSEES staff made three presentations to the Governor's Division of Emergency Management training workshop for the county emergency managers and responded to data requests generated from presentations.
- The Utah HSEES program developed a presentation that targeted the Hazardous Material Emergency Responders. This presentation, along with an interactive game section where key concepts were reviewed, was presented during two breakout sections of the Intermountain Hazardous Material Conference in August, 2009. It was also presented at five Local Emergency Planning Committees throughout state of Utah

Substance-Specific Prevention Activities by HSEES States

Participating states targeted common and dangerous substances including mercury, carbon monoxide, chlorine, sulfuric acid, sulfur dioxide, ammonia, pesticides, and other agricultural substances for prevention activities in 2009. States measured immediate effects (e.g., audience numbers) and mid-term effects (e.g., continued interest, requests for information, changes in behavior). Examples of 2009 state activities include:

- The Michigan HSEES program prepared a manuscript entitled, "Compliance with a law banning mercury in Michigan schools" for publication at one of the public health journals. The Michigan HSEES program also collaborated with other HSEES states and ATSDR on a publication entitled, "State programs for surveillance of carbon monoxide releases using the HSEES system."
- The Minnesota, New York, Michigan, and ATSDR HSEES staff prepared a publication entitled, "Hazards of Illicit Methamphetamine Production and Efforts at Reduction" that was accepted for publication in the Healthy People/Healthy Homes supplement of Public Health Reports.
- Upon request from University of Minnesota Extension Office, the Minnesota HSEES program wrote two reports entitled, "Summary of pesticide incidents reported to

Minnesota HSEES, 1995-2008" and "Summary of antimicrobial incidents reported to Minnesota HSEES, 1995-2008". The first report was posted on Minnesota's HSEES Web page at http://www.health.state.mn.us/divs/eh/hazardous/surv/index.html. The second report was provided to the Extension Office.

- The New York HSEES program supporting New York State's response to clandestine drug laboratories made several presentations to educate law enforcement and public health professionals on the recognition of clandestine drug labs, hazards associated with these labs, and the health department's role in responding to identified labs.
- The New York HSEES program worked closely with the Bureau of Community Environmental Health and Food Protection (BCEH&FP) targeting operation of public pools and water parks in New York State and promoting principles of green chemistry in the pool environment.
- The Wisconsin HSEES program joined a State Agency Dialogue Pertaining to Implementation of Inherently Safer Technology and Green Chemistry Outreach Precepts and other related workgroups such as Green Tier Program, promoting Green technology.

The Future of Hazardous Substance Surveillance

An external peer review of the HSEES program in 2005 recommended the development of a national approach to chemical events surveillance. In addition to these recommendations, a series of meetings with interested parties including academia, other federal agencies, and chemical organizations has elicited gaps, overlaps, and needs. This process resulted in the development of the National Toxic Substance Incidents Program (NTSIP). The goal of NTSIP is to reduce the morbidity and mortality from toxic substance incidents. NTSIP employs three components: 1) national level surveillance, 2) state programs, and 3) incident investigations. Funding for HSEES ended in 2009 and NTSIP's implementation began in fiscal year 2010. For more information on NTSIP, please visit http://www.atsdr.cdc.gov/ntsip/.

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4 ATSDR HSEES Web site: http://www.atsdr.cdc.gov/HS/HSEES/.

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Appendix A. *2009 Publications*

Welles, W. L., Wilburn, R. E., Ehrlich, J. K. and J. M. Kamara. New York Hazardous Substances Emergency Events Surveillance (HSEES) Data Support Emergency Response, Promote Safety and Protect Public Health. Journal of Loss Prevention in the Process Industries, 22(6), 728-734. 2009.

Welles, W. L. and R. E. Wilburn. EXPECT THE UNEXPECTED and Prevent Firefighter Injuries in Hazmat Events. NYS Association of Fire Chiefs. SIZE UP Issue 1: 44-49. 2009.

Wattigney, W, Rice, N, Cooper, D. Drew, J, Orr, M. State Programs to Reduce Uncontrolled Ammonia Releases and Associated Injury Using the Hazardous Substances Emergency Events Surveillance System. Journal of Occupational and Environmental Medicine, Vol. 51, Number 3:356-363. March, 2009.

Hughes N, Stanbury M. "Hazardous Substances Emergency Events Surveillance in Michigan", Michigan Department of Community Health. October, 2009.

Submitted Publications

Melnikova N, Lizak W.W, Wilburn, R,E, Rice N, Wu J, Stanbury M. Hazards of Illicit Methamphetamine Production and Efforts at Reduction: Data from the Hazardous Substances Emergency Events Surveillance System. Accepted for publication at Public Health Reports, Special Supplement on Healthy People in a Healthy Environment, spring 2011. Abstract published at Public Health report, July 2010.
Available at http://www.publichealthreports.org/EOH-abstracts/Exposures.cfm#26

Stanbury M, Huges N, "Compliance with a law banning mercury in Michigan schools," submitted for publication.