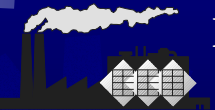


Hazardous Substances Emergency Events Surveillance (HSEES)

Julie Borders, M.S.

Epidemiologist

Texas Department of Health



Maureen F. Orr, M.S.

Epidemiologist



Agency for Toxic Substances And Disease Registry

ATSDR

Agency for Toxic Substances and Disease Registry (ATSDR)

- **A federal public health agency within the Department of Health and Human Services**
- **Hazardous substances come from waste sites, unplanned releases, and other sources of pollution in the environment**

ATSDR

The slide has a dark blue background with faint gear patterns. On the left side, there is a vertical decorative strip with a colorful, abstract pattern of gears and shapes in shades of orange, yellow, and brown. The title is centered in a gold, italicized serif font.

ATSDR Mission

To prevent exposure and adverse human health outcomes and diminished quality of life from exposure to hazardous substances

ATSDR

The slide has a dark blue background with faint gear patterns. On the left side, there is a vertical decorative strip with a colorful, abstract pattern of gears and shapes in shades of orange, yellow, and brown. The title is centered in a gold, italicized serif font.

HSEES versus Other Hazardous Substance Release Databases

- **Purpose of ATSDR-HSEES database is protecting public health**
- **Purpose of other agencies' databases are for response or enforcement**
- **Other agencies maintaining databases include the EPA, National Response Center, and the Department of Transportation**

ATSDR

HSEES versus Other Hazardous Substance Release Databases

- Each agency has its own mission and therefore collects different information on a select set of releases (e.g. DOT collects only transportation-related releases and EPA has a set of criteria for ERNS reports)

ATSDR

HSEES versus Other Hazardous Substance Release Databases

- There is only one unique record for each release in the HSEES database since it is an active system that verifies information
- The other databases are passive and not consistently verified and updated, so information may be incomplete, duplicative or erroneous

ATSDR

HSEES is designed specifically to capture the public health impact of releases like decontamination, evacuation, injury or death



ATSDR

HSEES Case Definition

- **Sudden uncontrolled or illegal releases or threatened releases of at least one hazardous substance**
- **A substance is considered hazardous if it might reasonably be expected to cause adverse human health outcomes**
- **Events involving only petroleum products are excluded**

ATSDR

Texas HSEES Case Definition

- Includes all of the previous qualifications plus the released material must be greater than 1 gallon or 10 pounds or exceed the CERCLA reportable quantity (RQ).
- This is due to the large volume of events that occur in Texas.

ATSDR

HSEES Criteria for Inclusion:

- Substance released had to be removed, cleaned up, or neutralized according to federal, state, or local law
- A threatened release that would have had to be removed, cleaned up, or neutralized according to federal, state, or local law and the threat led to an action to protect the public health

ATSDR

HSEES Objectives

- Describe the distribution and characteristics of emergency events
- Describe the morbidity and mortality resulting from the events
- Identify the risk factors associated with the morbidity and mortality
- Identify strategies aimed at reducing future morbidity and mortality

ATSDR

HSEES Surveillance System Activities

- Data collection
- Data management
- Data analysis
- Report generation
- Prevention outreach activities

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HSEES Data Collection Form

- **Type of Event**
- **Chemical(s)**
 - **Identity**
 - **Chemical Form**
 - **Type of Release**
 - **Quantity**

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HSEES Data Collection Form (continued)

- **Victims**
 - **Population Group**
 - **Type of Injury**
 - **Medical Treatment**
 - **Demographics**
 - **Personnel Protective Equipment**
 - **Distance From Event**

ATSDR

HSEES Data Collection Form (continued)

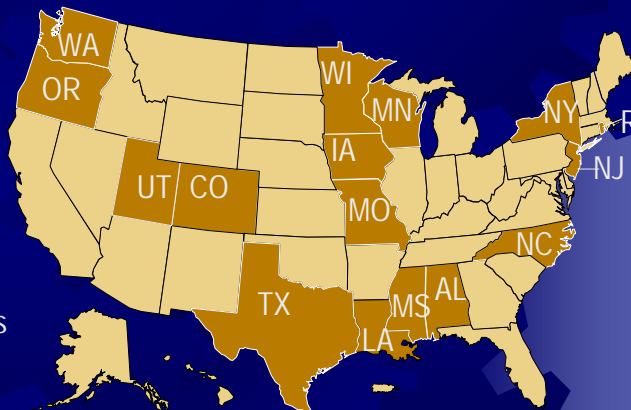
- **Other Information**

- Area
- Response Plan
- Time
- Environmental Sampling
- Evacuations
- Causal Factors
- Affected Population

ATSDR

States Participating in HSEES

- Sixteen states
- Wide geographic distribution
- Array of industries



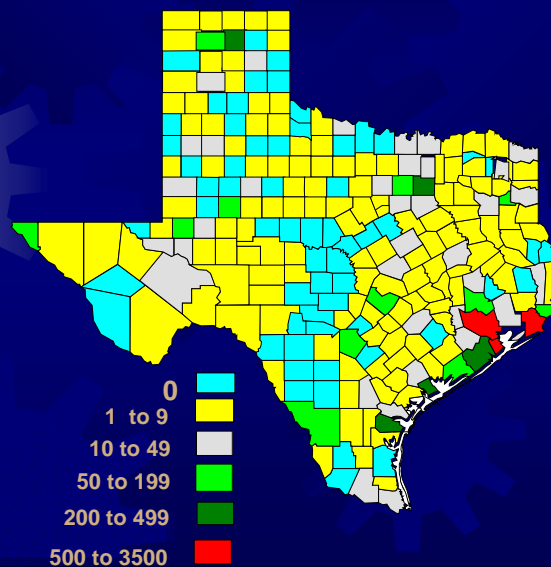
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HSEES Participating States

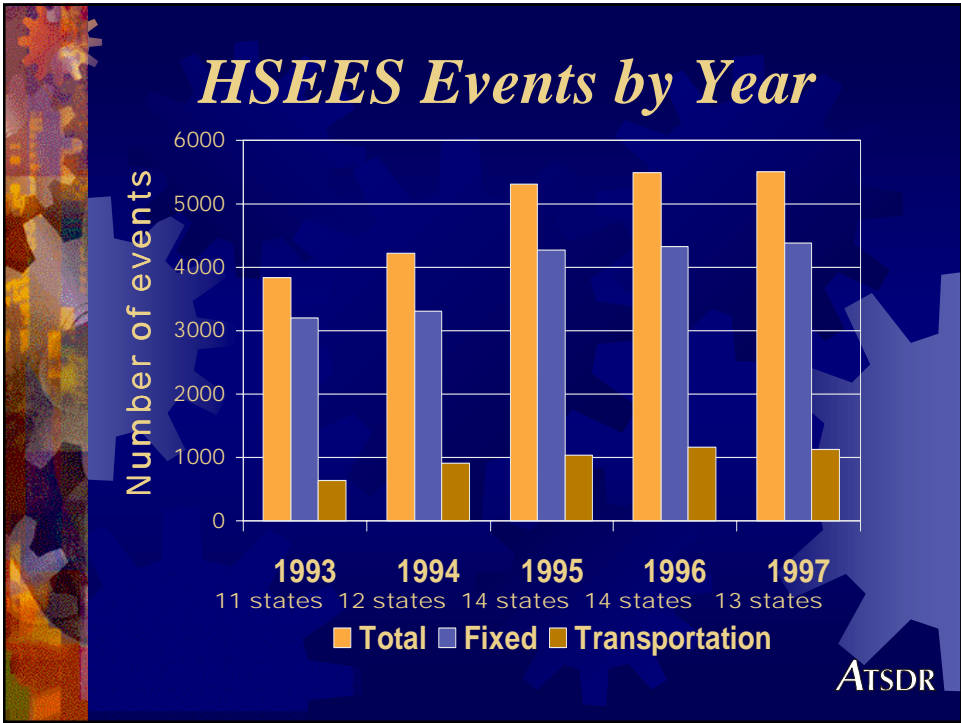
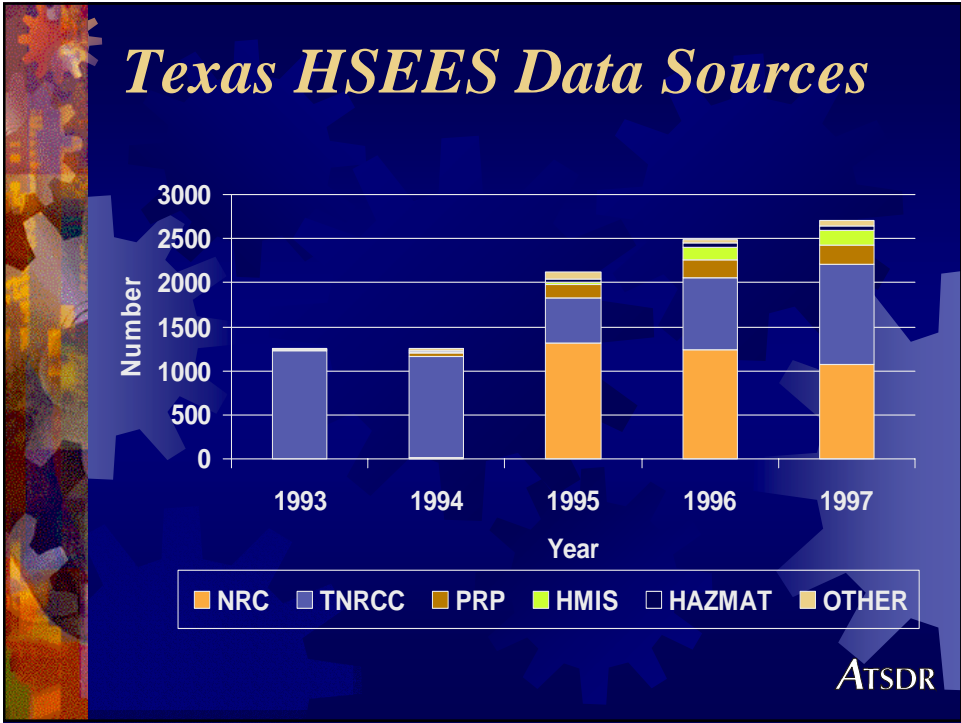
- 1993 - Alabama, Colorado, Iowa, New Hampshire, New York, North Carolina, Oregon, Rhode Island, Texas, Washington, Wisconsin
- 1994 - Missouri added
- 1995 - Minnesota and Mississippi added
- 1996 - last year for New Hampshire
- 2000 - Utah and New Jersey added
- 2001 - Louisiana will be added

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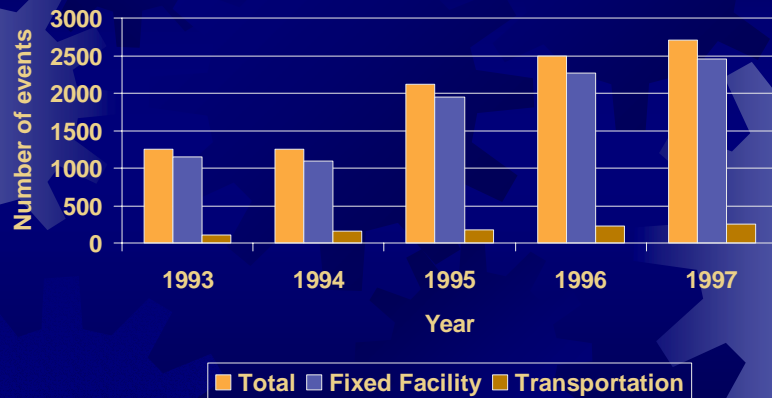
Events by county, Texas HSEES 1993 - 1997



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Texas HSEES Events by Year



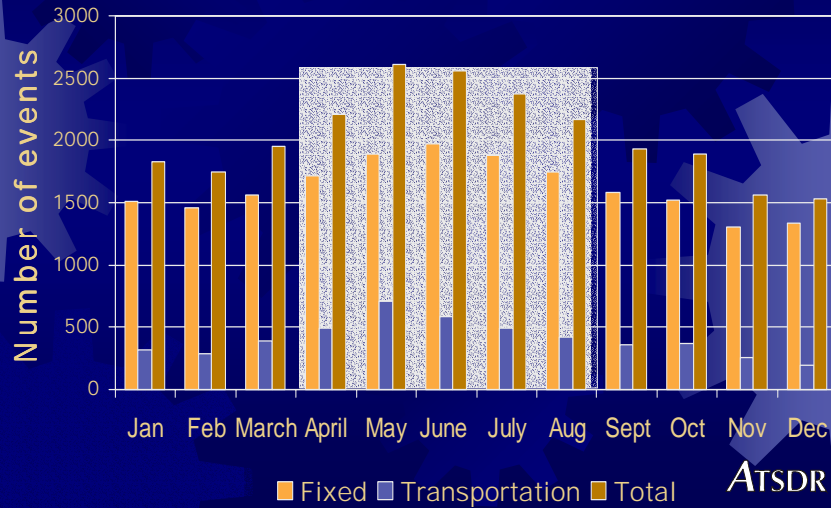
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HSEES Events by State

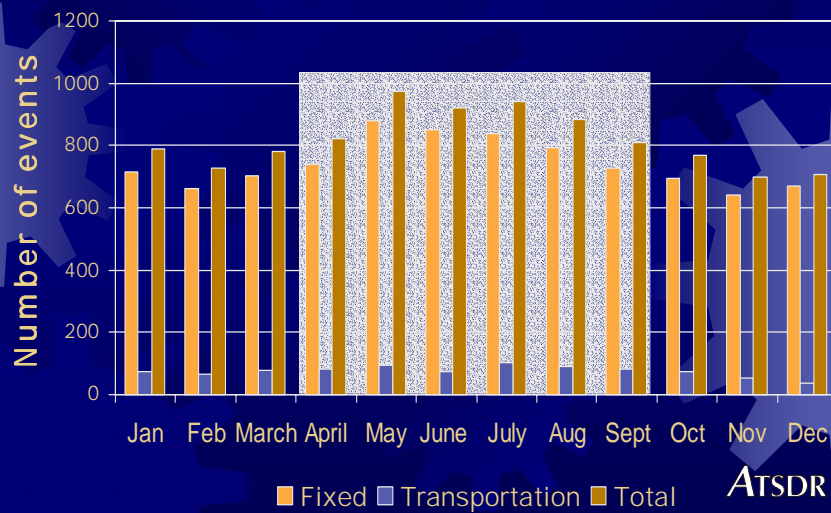
State	% Fixed facility	% Transportation	% of Total
Texas	91	9	40
Washington	75	25	8
New York	83	17	8
Colorado	69	31	8
Wisconsin	67	33	8
Iowa	66	34	6
N. Carolina	74	26	4
Oregon	72	28	4
Missouri	60	40	4
Alabama	81	19	3
Minnesota	77	23	3
Mississippi	68	32	1
Rhode Island	87	13	1
New Hampshire	84	16	1
Total	80 (n=19,490)	20 (n=4,869)	99

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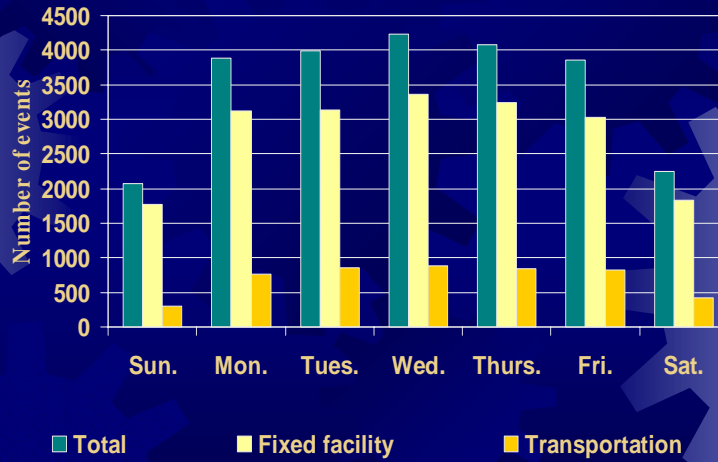
HSEES Events by Type and Month



Texas HSEES Events by Type and Month

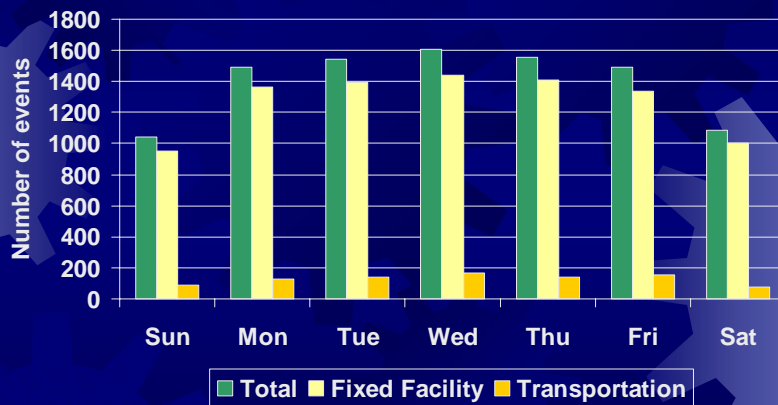


HSEES Events by Type and Day of Week



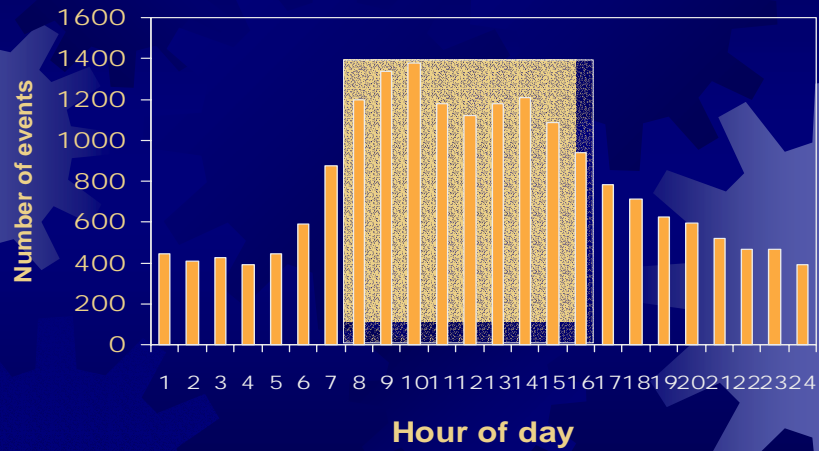
ATSDR

Texas HSEES Events by Type and Day of Week



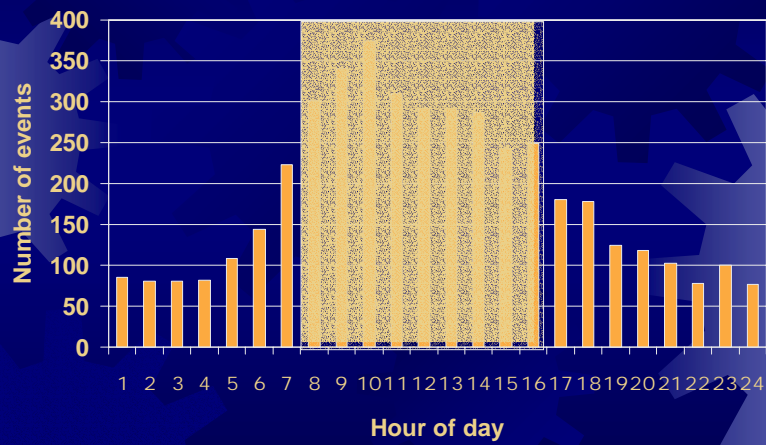
ATSDR

Hourly Distribution of Events at Fixed Facilities



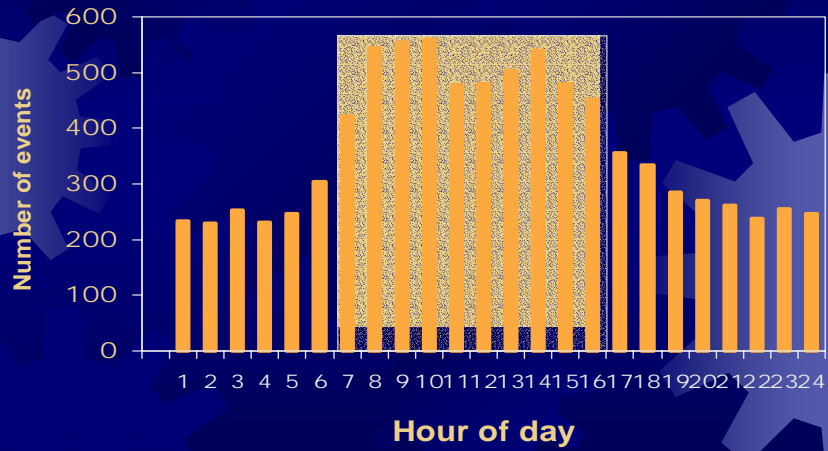
ATSDR

Hourly Distribution of Transportation Events



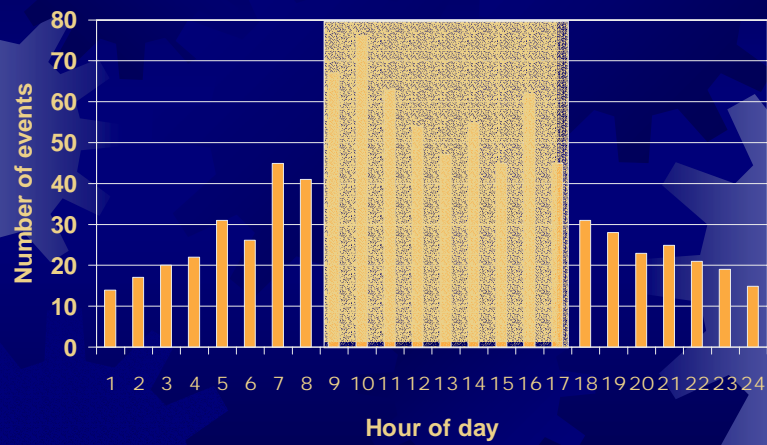
ATSDR

Hourly Distribution of Events at Texas Fixed Facilities



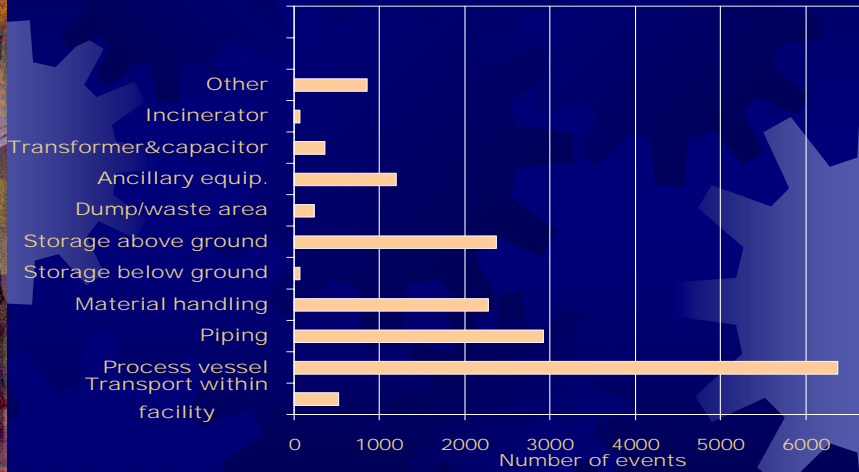
ATSDR

Hourly Distribution of Texas Transportation Events



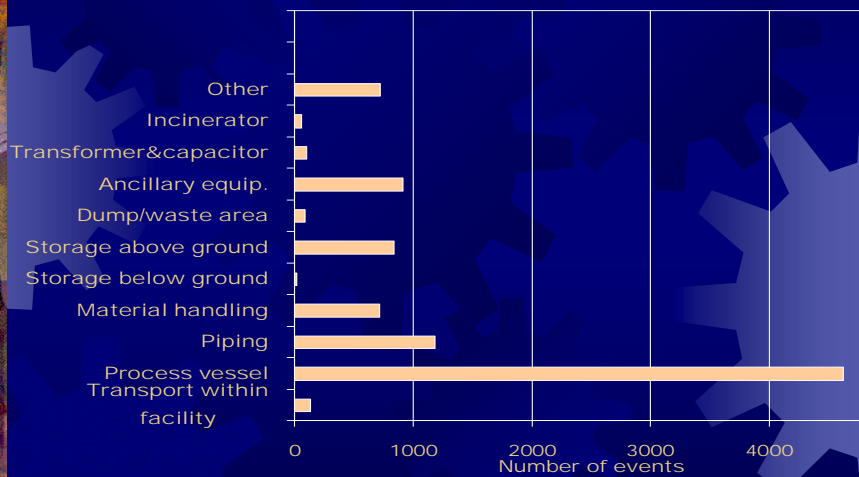
ATSDR

Area of Release for Selected Fixed-facility Events



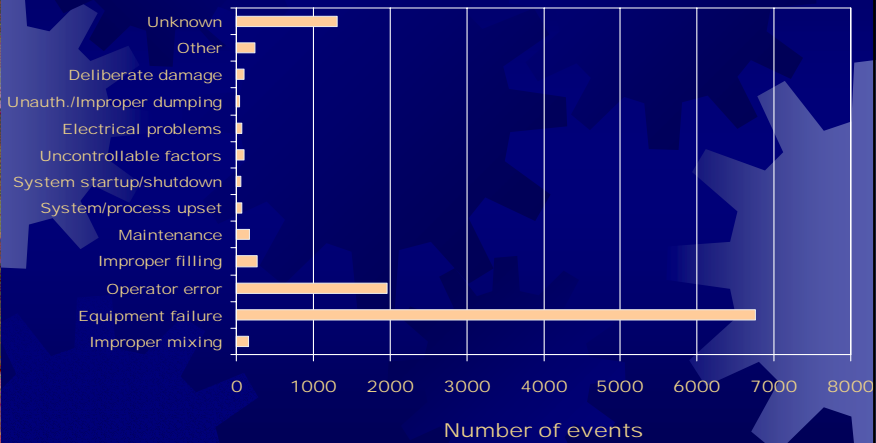
ATSDR

Area of Release for Texas Fixed-facility Events



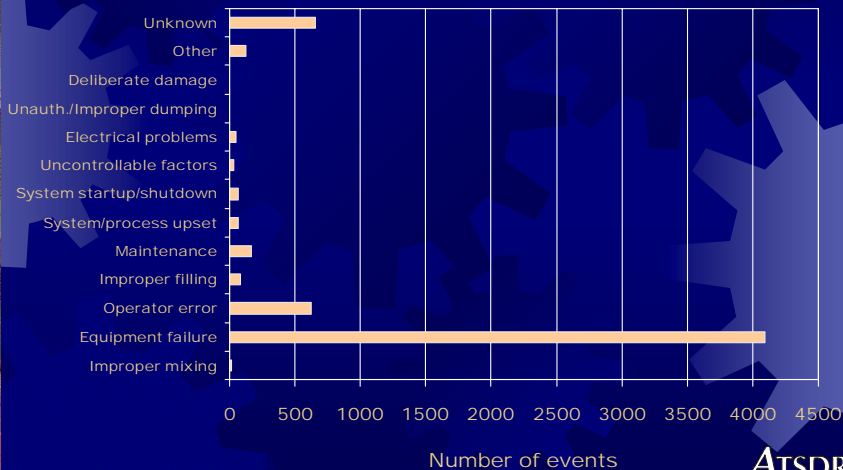
ATSDR

Causes for Releases in Fixed Facilities



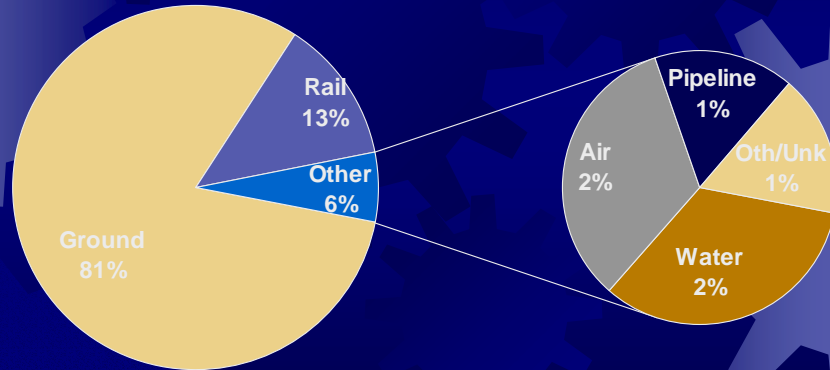
ATSDR

Causes for Releases in Texas Fixed Facilities



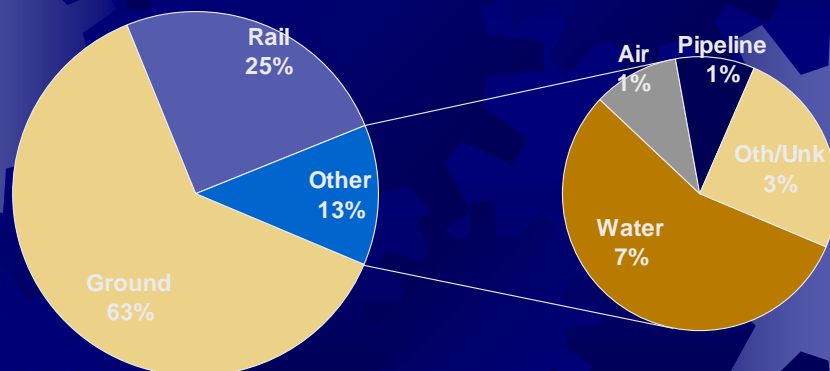
ATSDR

Transportation Events by Mode of Transport



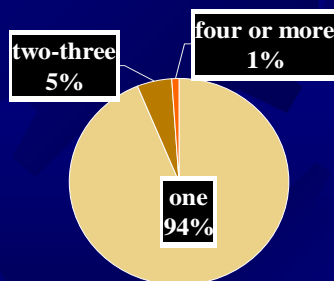
ATSDR

Texas Transportation Events by Mode of Transport



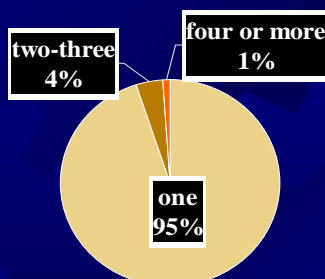
ATSDR

Number of Chemicals Released Per Event

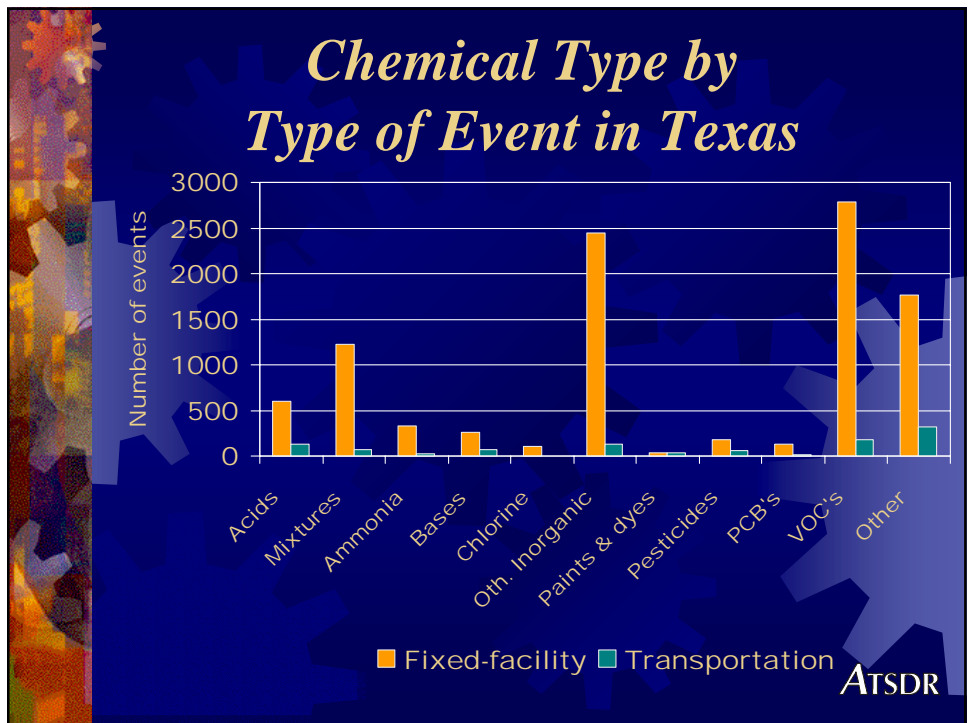
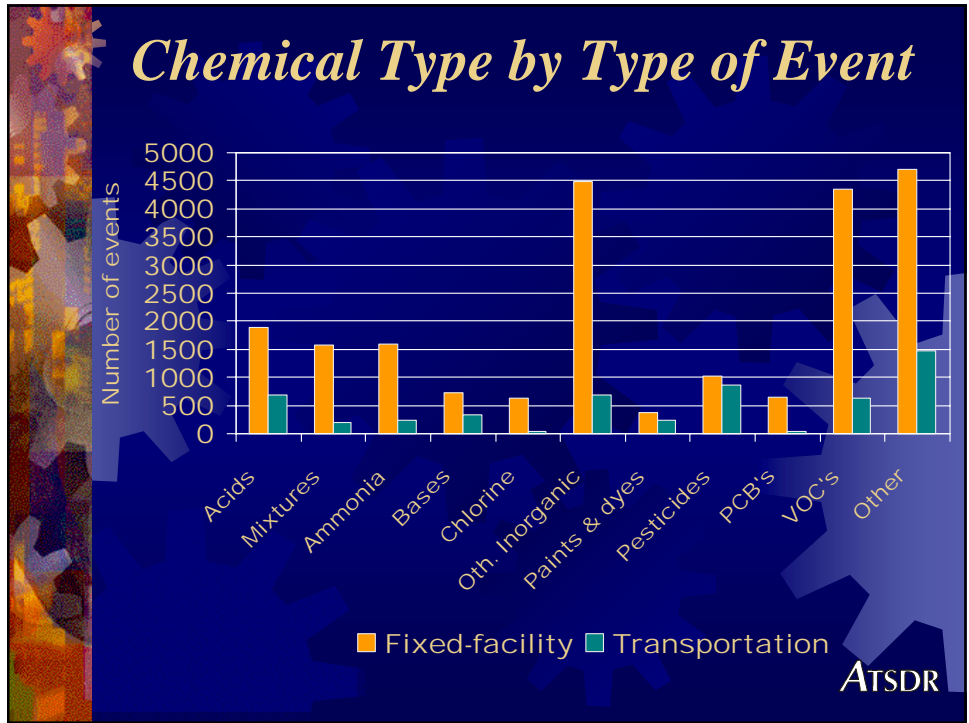


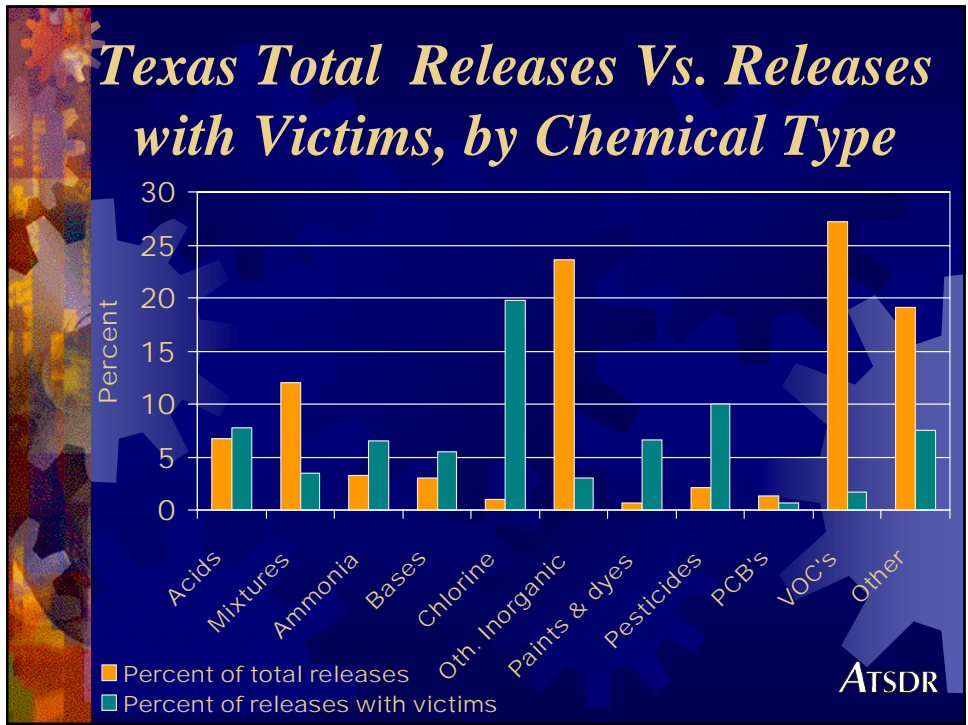
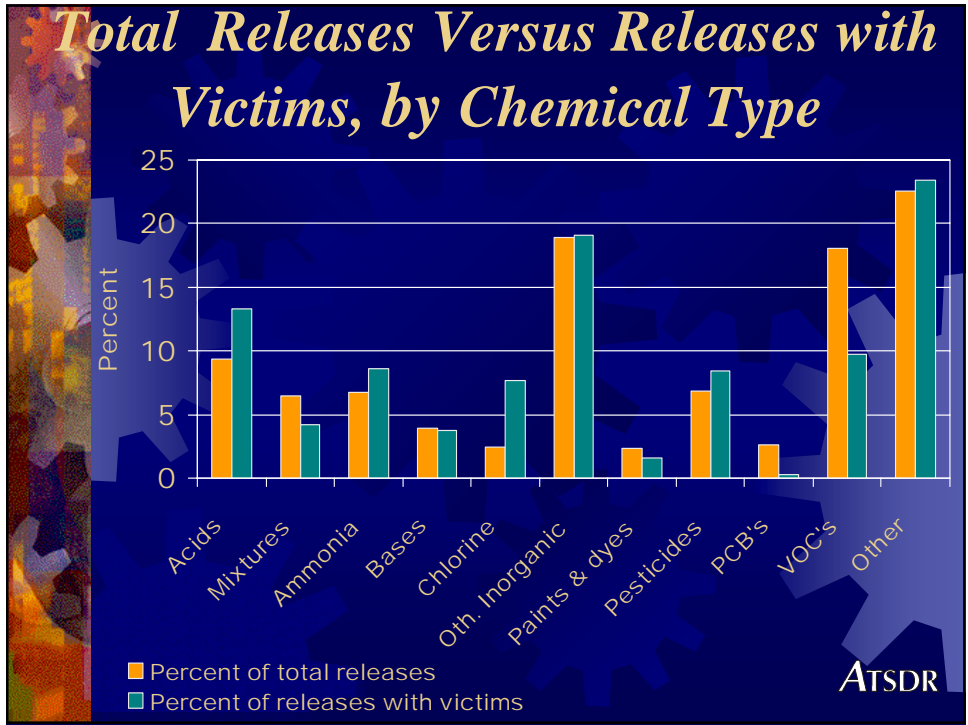
ATSDR

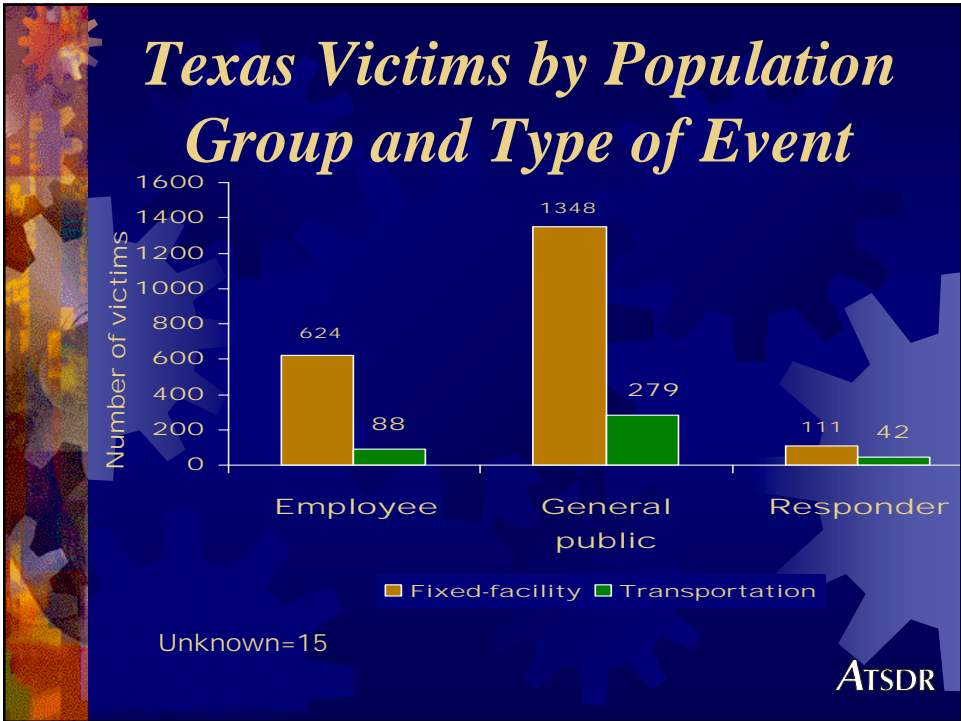
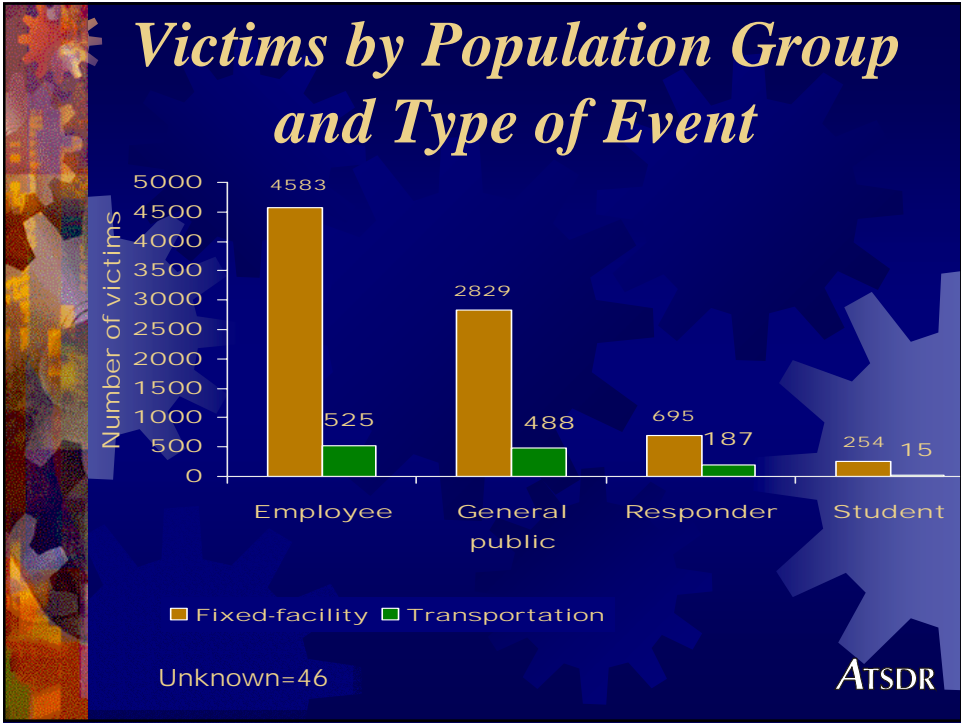
Number of Chemicals Released Per Event in Texas



ATSDR







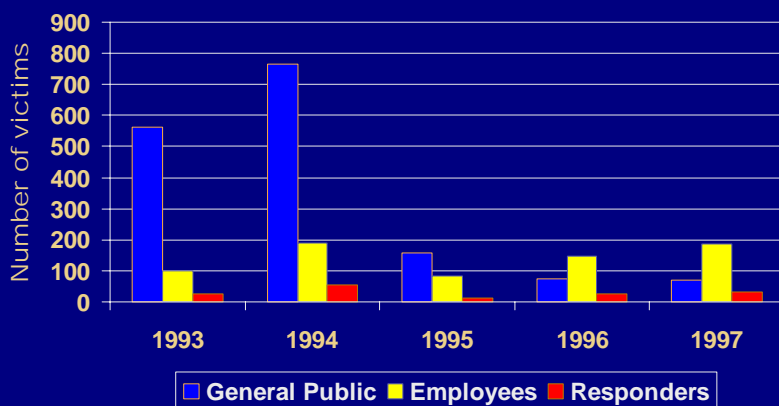
Texas Victims and Chemicals

- The general public was most frequently injured in events involving ammonia (n=632, 39%).
- Employees were most frequently injured in events involving other chemicals (n=126, 18%), other inorganic substances (n=124, 17%), and the multi-chemical category (n=123, 17%).
- Responders were most frequently injured in events involving other chemicals (n=36, 24%), followed by acids (n=33, 22%), and pesticides (n=27, 18%).

n = number of victims

ATSDR

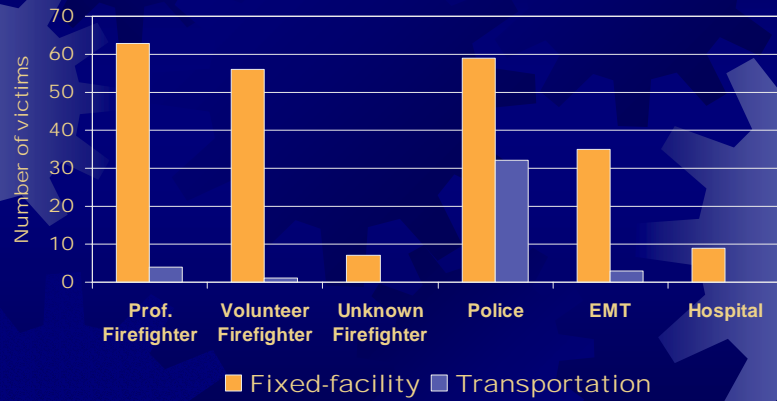
Texas Victims* by Year



*15 victims were of unknown category.

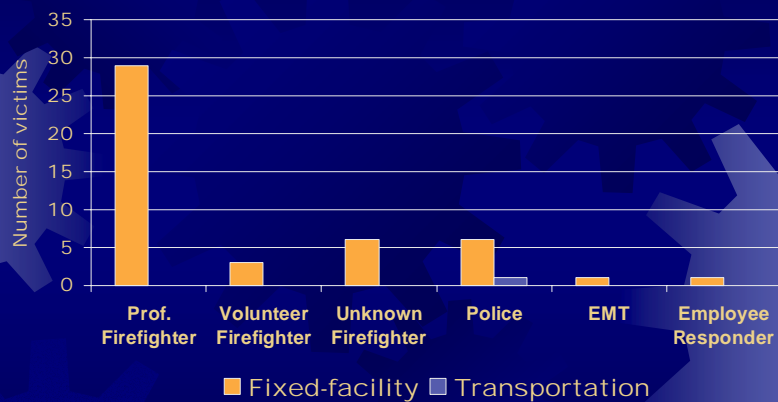
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Injured Responders of Known Type



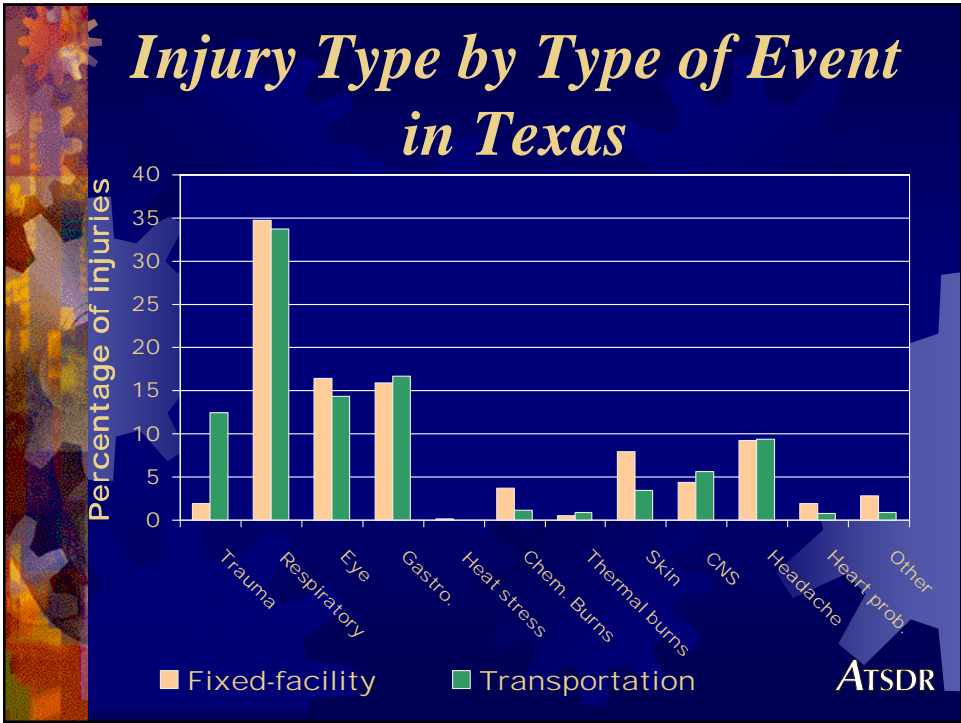
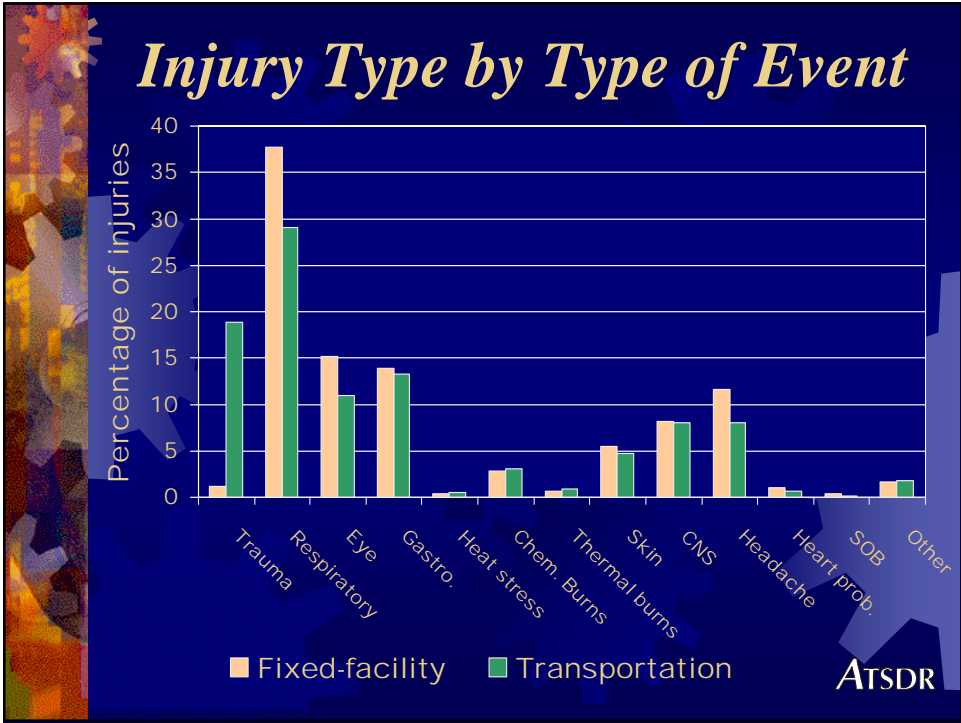
ATSDR

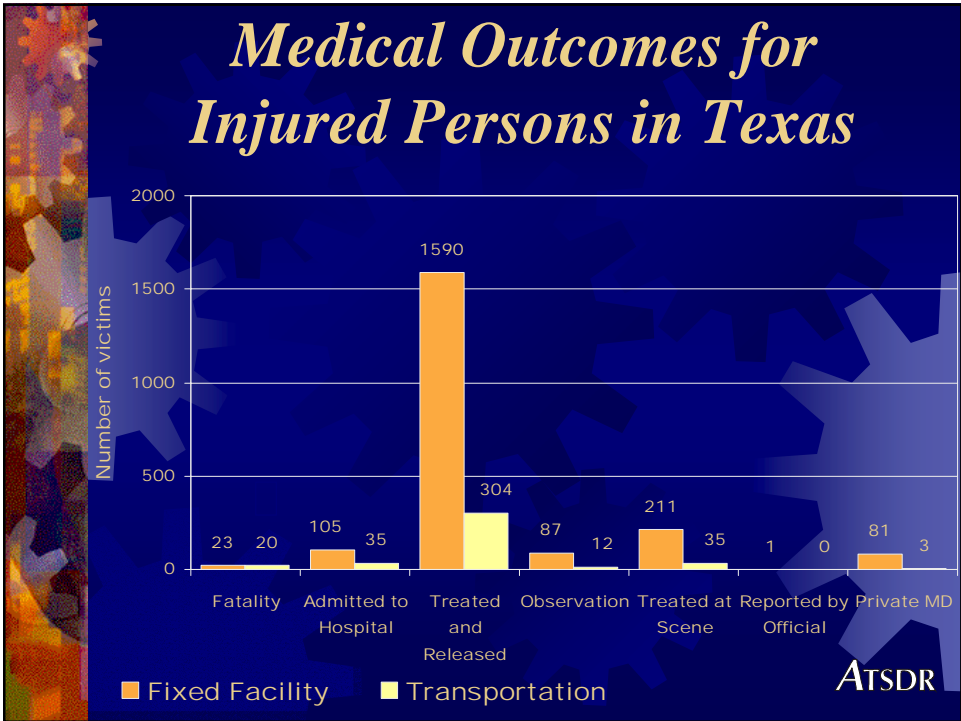
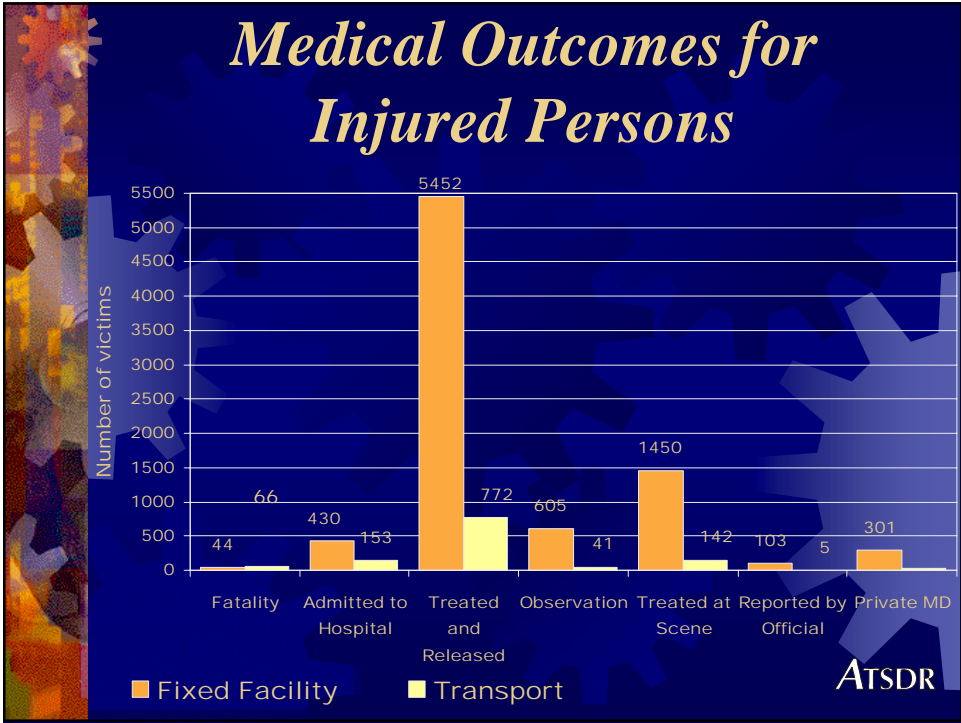
*Texas Injured Responders**



*There were 96 unidentified responders; 55 in fixed-facility and 41 in transportation-related events.

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Medical Outcomes by Victim Category in Texas

	Death	Treated and admitted to hosp.	Treated at hosp. (not admitted)	Observed in hosp.	First Aid	Seen by private phys.	Injuries reported by an official
Employees	34	93	316	61	147	62	0
Responders	0	9	122	4	13	3	1
General Public	9	37	1455	34	73	19	0

ATSDR

Decontamination by Population Category

Victim Category	Location of Decontamination		Total Persons
	Scene	Medical Facility	
Employee	2,162	406	2,568
Responder	5,637	259	5,896
General Public	992	413	1,405
Total	8,791	1,078	9,869

ATSDR

Texas Decontaminations by Victim Group

Victim Category	Location of Decontamination			
	Scene		Medical Facility	
	# Events	# People	# Events	# People
Employees	93	294	21	39
Responders	42	249	5	21
General Public	20	816	5	229
Total	155	1359	31	289

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Evacuations, HSEES 1993 through 1997

- **Eleven percent (n=2,676) of events had an official evacuation order**

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Evacuations, HSEES 1993 through 1997

- **Persons evacuated ranged from one to more than 10,000**
 - **Fifty percent of the evacuations involved 20 or less persons**
 - **Seventy-five percent involved 68 or less persons**
 - **Only 2% involved 1,000 or more persons**

ATSDR

Evacuations, Texas HSEES 1993 through 1997

- **Four percent (n=421) of events had an official evacuation order**

ATSDR

Evacuations, Texas HSEES 1993 through 1997

- Persons evacuated ranged from one to more than 5000
 - Fifty percent of the evacuations involved 21 or less persons
 - Seventy-five percent involved 80 or less persons
 - Only 3.6% involved 1,000 or more persons

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PPE worn by firefighters, Texas HSEES 1993 - 1997

- Firefighter Turnout Gear worn by:
 - 26 professional firefighters
 - 1 volunteer firefighter
 - 5 firefighters, unknown type
- Level D worn by:
 - 3 professional firefighters

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*PPE worn by responders,
unknown type
Texas HSEES 1993 - 1997*

- None, 60
- Level A, 3
- Level B, 4
- Level D, 1
- Firefighter Turnout Gear, 35
- Gloves, 2
- Eye protection, 2
- Hard hat, 1

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*Injuries and Level A, Level B,
and Firefighter Turnout Gear
(FFTG) PPE among all Victims,
Texas HSEES 1993-1997*

18 wore Level A
14 wore Level B
83 wore FFTG
115 total

Most Frequently Reported
Injuries:
59 Respiratory irritation
22 Skin irritation
18 Trauma

ATSDR

Hydrofluoric Acid Event, Texas HSEES 1993 - 1997

- 21 firefighters in firefighter turnout gear
- All men, ranging in age from 26 - 49
- 21 reports of respiratory irritation
 - 5 Admitted to the hospital
 - 16 Treated and released

ATSDR

Texas Recommendations:

- ✦ **Keep up the training, good work and process safety practices.**
- ✦ **Before responding, if possible, find out what chemical(s) are involved.**
- ✦ **Be especially aware of situations involving acid, chlorine, ammonia, pesticide, or bases.**
- ✦ **Be careful during decontamination procedures.**
- ✦ **People wearing FFTOG* are experiencing respiratory irritation. Carefully consider wearing respiratory protection.**

*Firefighter turnout gear.

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HSEES Current Activities

- Enhance training for first responders
- Strategically locate Hazmat teams
- Data for state and local emergency planning committees

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HSEES Current Activities

- Fact sheets on specific chemicals or industries
- Information for labor & industry safety training
- Planning for EPA well head protection areas
- Emerging hazards identification

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HSEES Future Directions

- Further refine the chemical database
- Perform more industry and chemical-specific data analyses
- Expand coverage to ensure representativeness
- Web site for dissemination of information

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HSEES Future Directions

- Expand the Web-based data entry system, (outside U.S. and/or terrorism incidents)
- Develop and document the efficacy of additional prevention outreach activities

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HSEES Future Directions

- **Foster more collaboration among partners (EPA, CSB, DOT, local /state health departments, industry, public, etc.)**

ATSDR

For more information, contact:

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