

Fig.15 Poisons/deleterious substances of health hazard-associated leakage and spill accidents (1999~2008, 197 accidents) (Data provided by the MHLW)

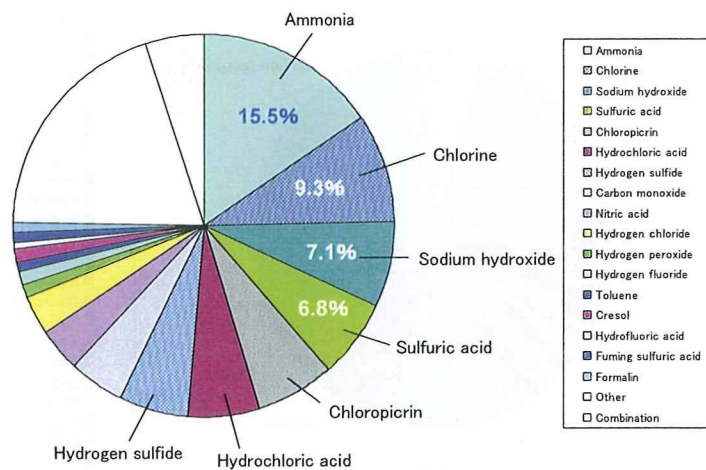


Fig.16 Poisons/deleterious substances of accidents (1997~2008, 891 accidents) (Data provided by the Fire and Disaster Management Agency)

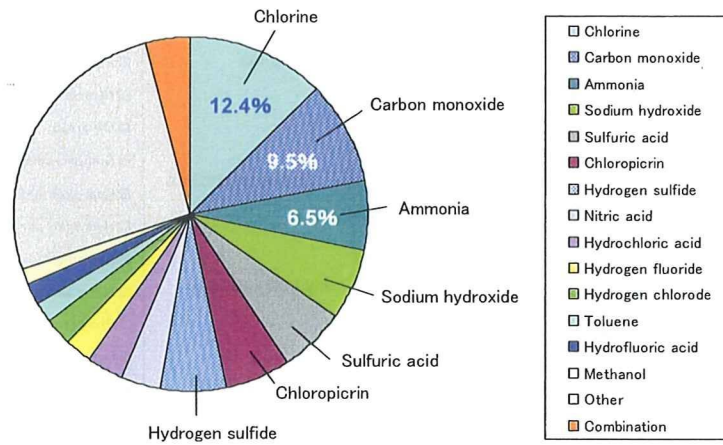


Fig.17 Poisons/deleterious substances of health hazard accidents (1997~2008, 370 accidents)  
(Data provided by the Fire and Disaster Management Agency)

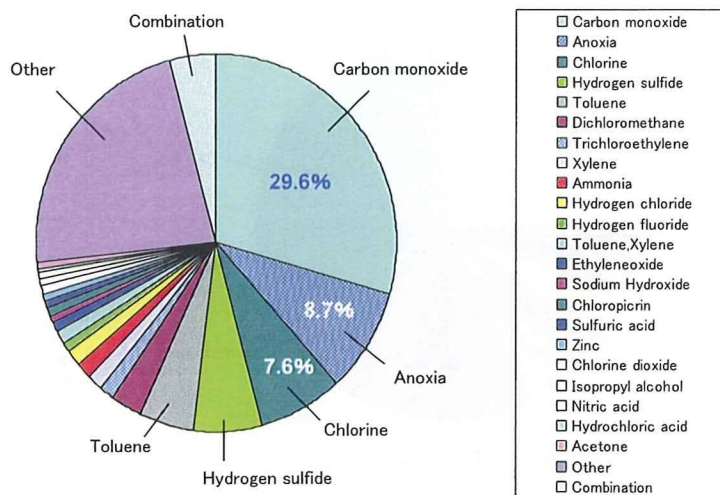


Fig.18 Substance of occupation-related accidents (1995~2008, 1,651 accidents)  
(Based on Guide for Industrial Health)

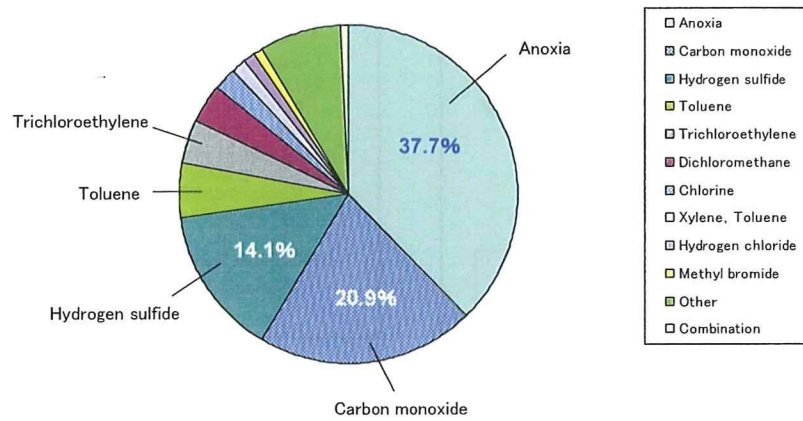


Fig.19 Substance of occupational-related accidents causing fatalities (1995~2008, 220 accidents)  
(Based on Guide for Industrial Health)

### The Current Status of Chemical Hazards and Poisonings caused by Toxic Industrial Chemicals in Japan

- Chemical Incident (Accidental)
- Accident during Transportation (Accidental)
- Food Contamination of Chemicals (Accidental, Intentional)
- Chemical Terrorism (Intentional)



Japan poison Information Center  
Yumiko Kuroki, Ph.D., Kaoru Iida,  
Toshiharu Yoshioka, M.D. Ph.D.

### The Current Status of Chemical Hazards and Poisonings caused by Toxic Industrial Chemicals in Japan

(1) Statistical Analysis

- 1) Japan Poison Information Center (2006)
- 2) Leakage and spill accidents of poisonous and deleterious substances (1999~2006) (Data provided by the MHLW)
- 3) Accidents involving poisonous and deleterious substance (1997~2006) (Data provided by the Fire and Disaster Management Agency)
- 4) Occupation-related accidents (1995~2004) (Based on Guide for Industrial Health)

(2) Recent Topics in Japan

Hydrogen Sulfide

### Japan Poison Information Center



### Where is the Japan Poison Information Center ?

Population of Japan : ~127 million  
Poisoning patients : 500,000/year (visited medical institutions)  
Death by poisoning : 5,000/year

Acute Poison Inquiries : ~30,000/year



### Japan Poison Information Center

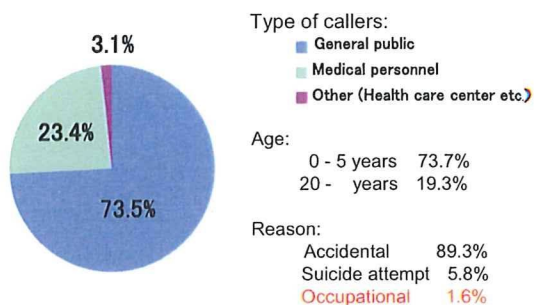


Osaka Office

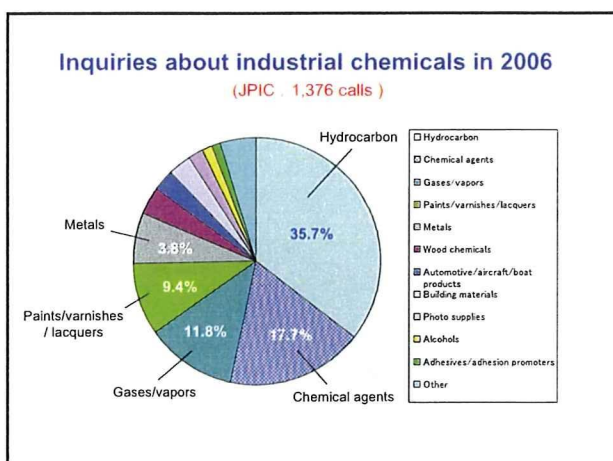
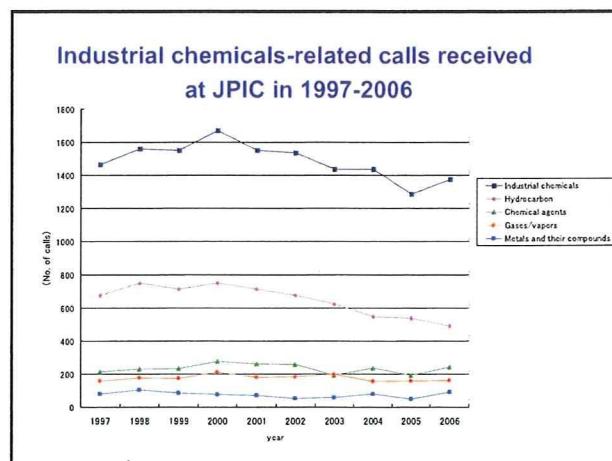
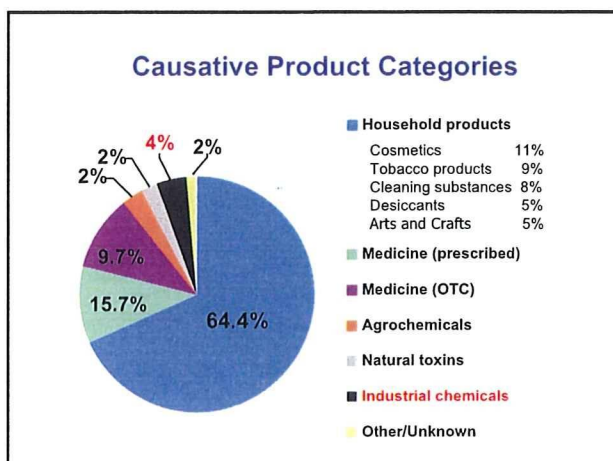
Tsukuba Office

### Acute Poisoning Related Inquires

(29,789 inquiries in 2006)







### Types of industrial chemicals by callers in 2006

	General public			Medical personnel			Other		
	No. of calls	(%)		No. of calls	(%)		No. of calls	(%)	
Hydrocarbon (n=491)	314	(64.0)		164	(33.4)		13	(2.6)	
Chemical agents (n=244)	57	(23.4)		159	(65.2)		28	(11.5)	
Gases/vapors (n=163)	79	(48.5)		78	(47.9)		6	(3.7)	
Paints/varnishes/lacquers (n=130)	84	(64.6)		38	(29.2)		8	(6.2)	
Metals (n=91)	37	(40.7)		45	(49.5)		9	(9.9)	
Wood chemicals (n=52)	23	(44.2)		23	(44.2)		6	(11.5)	
Building materials (n=45)	22	(48.9)		21	(46.7)		2	(4.4)	
Automotive/aircraft/boat products (n=35)	19	(54.3)		16	(45.7)		0	(0.0)	
Photo supplies (n=27)	22	(81.5)		4	(14.8)		1	(3.7)	
Alcohols (n=19)	5	(26.3)		13	(68.4)		1	(5.3)	
Adhesives/adhesion promoters (n=13)	5	(38.5)		7	(53.8)		1	(7.7)	
Other industrial chemicals (n=66)	23	(34.8)		38	(57.6)		5	(7.6)	
<b>All industrial chemicals (n=1,376)</b>	<b>690</b>	<b>(50.1)</b>		<b>606</b>	<b>(44.0)</b>		<b>80</b>	<b>(5.8)</b>	

### Types of industrial chemicals by age in 2006

	Under 6		6 - 19		20 - 64		Over 64		Unknown	
	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)
Hydrocarbon (n=491)	278	(56.6)	21	(4.3)	132	(26.9)	39	(7.9)	21	(4.3)
Chemical agents (n=244)	23	(9.4)	41	(16.8)	130	(53.3)	13	(5.3)	37	(15.2)
Gases/vapors (n=163)	37	(22.7)	14	(8.6)	79	(48.5)	10	(6.1)	23	(14.1)
Paints/varnishes/lacquers (n=130)	70	(53.8)	11	(8.5)	31	(23.8)	7	(5.4)	11	(8.5)
Metals (n=91)	37	(40.7)	13	(14.3)	26	(28.6)	3	(3.3)	12	(13.2)
Wood chemicals (n=52)	2	(3.8)	1	(1.9)	37	(71.2)	7	(13.5)	5	(9.6)
Building materials (n=45)	21	(46.7)	1	(2.2)	19	(42.2)	2	(4.4)	2	(4.4)
Automotive/aircraft/boat products (n=35)	13	(37.1)	4	(11.4)	10	(28.6)	4	(11.4)	4	(11.4)
Photo supplies (n=27)	24	(88.9)	1	(3.7)	2	(7.4)	0	(0.0)	0	(0.0)
Alcohols (n=19)	3	(15.8)	0	(0.0)	13	(68.4)	1	(5.3)	2	(10.5)
Adhesives/adhesion promoters (n=13)	2	(15.4)	0	(0.0)	7	(53.8)	2	(15.4)	2	(15.4)
Other industrial chemicals (n=66)	11	(16.7)	4	(6.1)	36	(54.5)	7	(10.6)	8	(12.1)
<b>All industrial chemicals (n=1,376)</b>	<b>521</b>	<b>(37.9)</b>	<b>111</b>	<b>(8.1)</b>	<b>522</b>	<b>(37.9)</b>	<b>95</b>	<b>(6.9)</b>	<b>127</b>	<b>(9.2)</b>

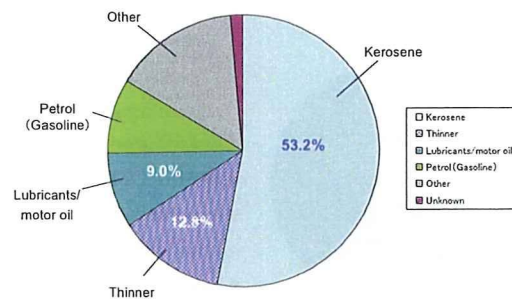
### Types of industrial chemicals by reason for exposure in 2006

	Accidental ingestion		Occupational accident		Unknown accident		Attempts of suicide		Other intentional		Unknown intentional		Unknown	
	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)	No. of calls	(%)
Hydrocarbon (n=491)	406	(82.7)	39	(7.9)	9	(1.8)	21	(4.3)	2	(0.4)	4	(0.8)	10	(2.0)
Chemical agents (n=244)	103	(42.2)	118	(47.5)	5	(2.0)	7	(2.8)	1	(0.4)	0	(0.0)	12	(4.9)
Gases/vapors (n=163)	104	(63.8)	37	(22.7)	1	(0.6)	11	(6.7)	4	(2.5)	1	(0.6)	5	(3.1)
Paints/varnishes/lacquers (n=130)	109	(83.8)	16	(12.3)	3	(2.3)	1	(0.8)	0	(0.0)	0	(0.0)	1	(0.8)
Metals (n=91)	55	(60.4)	23	(25.3)	2	(2.2)	2	(2.2)	3	(3.3)	1	(1.1)	5	(5.5)
Wood chemicals (n=52)	21	(40.4)	27	(51.9)	3	(5.8)	0	(0.0)	0	(0.0)	0	(0.0)	1	(1.9)
Building materials (n=45)	30	(66.7)	14	(31.1)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	1	(2.2)
Automotive/aircraft/boat products (n=35)	30	(85.7)	1	(2.9)	1	(2.9)	2	(5.7)	0	(0.0)	0	(0.0)	1	(2.9)
Photo supplies (n=27)	25	(92.6)	2	(7.4)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Alcohols (n=19)	10	(52.6)	8	(31.8)	0	(0.0)	1	(5.3)	1	(5.3)	0	(0.0)	1	(5.3)
Adhesives/adhesion promoters (n=13)	6	(46.2)	5	(38.5)	2	(15.4)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Other industrial chemicals (n=66)	39	(59.1)	22	(33.3)	0	(0.0)	3	(4.5)	1	(1.5)	0	(0.0)	1	(1.5)
<b>All industrial chemicals (n=1,376)</b>	<b>935</b>	<b>(68.2)</b>	<b>308</b>	<b>(22.4)</b>	<b>26</b>	<b>(1.9)</b>	<b>46</b>	<b>(3.5)</b>	<b>12</b>	<b>(0.9)</b>	<b>6</b>	<b>(0.4)</b>	<b>38</b>	<b>(2.8)</b>

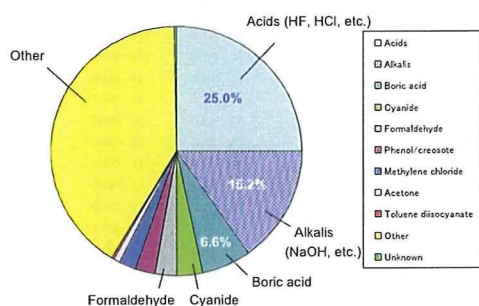
### Types of industrial chemicals by the presence/absence of symptoms in 2006

	Symptoms present		Symptoms absent		Unknown	
	No. of calls (%)	No. of calls (%)	No. of calls (%)	No. of calls (%)	No. of calls (%)	No. of calls (%)
Hydrocarbon (n=491)	186 (37.9)	292 (59.5)	13 (2.6)			
Chemical agents (n=244)	181 (74.2)	55 (22.5)	8 (3.3)			
Gases/vapors (n=163)	112 (68.7)	46 (28.2)	5 (3.1)			
Paints/varnishes/lacquers (n=130)	46 (35.4)	78 (60.0)	6 (4.6)			
Metals (n=91)	38 (41.8)	48 (52.7)	5 (5.5)			
Wood chemicals (n=52)	48 (92.3)	3 (5.8)	1 (1.9)			
Building materials (n=45)	21 (46.7)	23 (51.1)	1 (2.2)			
Automotive/aircraft/boat products (n=35)	17 (48.6)	17 (48.6)	1 (2.9)			
Photo supplies (n=27)	2 (7.4)	25 (92.6)	0 (0.0)			
Alcohols (n=19)	8 (42.1)	10 (52.6)	1 (5.3)			
Adhesives/adhesion promoters (n=13)	9 (69.2)	4 (30.8)	0 (0.0)			
Other industrial chemicals (n=86)	52 (78.8)	13 (19.7)	1 (1.5)			
All industrial chemicals (n=1,376)	720 (52.3)	614 (44.6)	42 (3.1)			

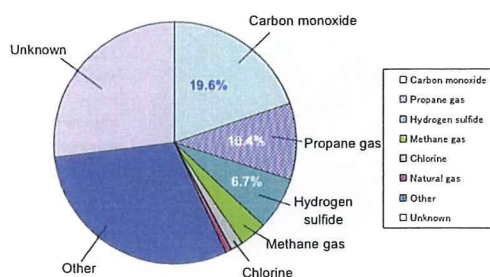
### Inquiries about hydrocarbons, industrial chemicals in 2006 (JPIC, 491 calls)



### Inquiries about chemical agents, industrial chemicals in 2006 (JPIC, 244 calls)



### Inquiries about gases/vapors, industrial chemicals in 2006 (JPIC, 163 calls)



### Leakage and spill accidents of poisonous and deleterious substances (1999~2006)

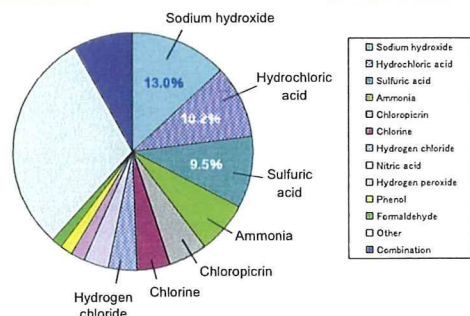
(Data provided by the MHLW)

### Number of Leakage and spill accidents of poisonous and deleterious substances

(1999~2006, 462 accidents) (Data provided by the MHLW)

Year	No. of accidents
1999	33
2000	62
2001	56
2002	54
2003	68
2004	74
2005	59
2006	56
<b>Total</b>	<b>462</b>

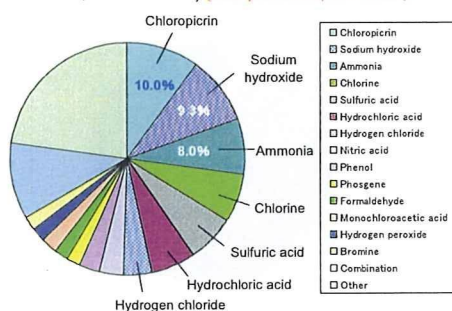
**Poisonous & deleterious substances of leakage and spill accidents** (1999~2006, 462 accidents) (Data provided by the MHLW)



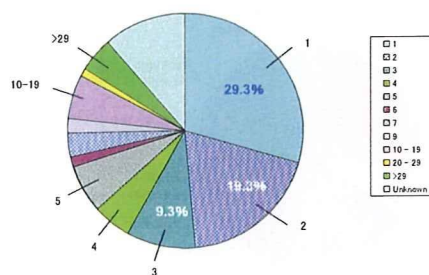
**Poisonous and deleterious substances involved in leakage and spill accidents** (1999~2006, 462 accidents) (Data provided by the MHLW)

Substance	No. of accidents
Sodium hydroxide	60
Hydrochloric acid	47
Sulfuric acid	44
Ammonia	33
Chloropicrin	24
Chlorine	20
Hydrogen chloride	18
Nitric acid	16
Hydrogen peroxide	9
Phenol	7
Formaldehyde	7
Other	140
Combination	37
<b>Total</b>	<b>462</b>

**Poisonous & deleterious substances of health hazard-associated leakage and spill accidents** (1999~2006, 150 accidents) (Data provided by the MHLW)



**Number of victims of health hazard-associated leakage and spill accidents** (1999~2006, 150 accidents) (Data provided by the MHLW)



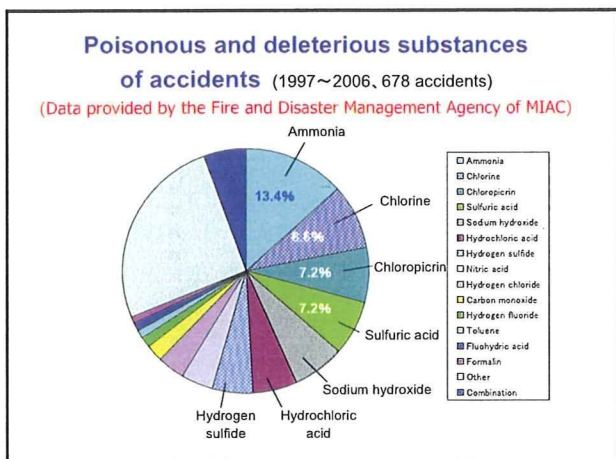
**Accidents involving poisonous and deleterious substance** (1997~2006)

(Data provided by the Fire and Disaster Management Agency)

**Number of accidents involving poisonous and deleterious substances** (1997~2006, 678 accidents) (Data provided by the Fire and Disaster Management Agency)

Year	No. of accidents
1997	59
1998	50
1999	64
2000	61
2001	68
2002	86
2003	81
2004	67
2005	78
2006	64
<b>Total</b>	<b>678</b>

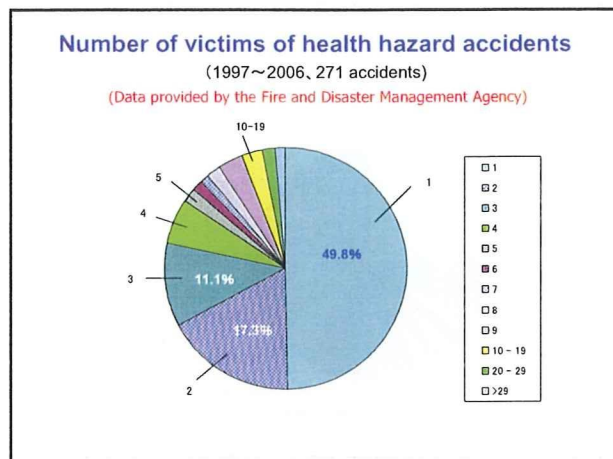
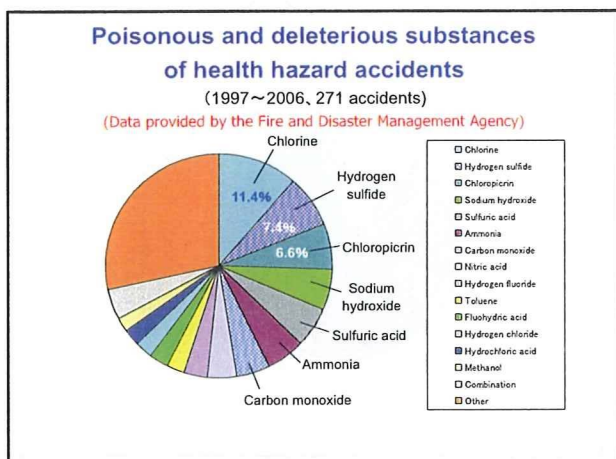




### Poisonous and deleterious substances involved in accidents (1997~2006)

(Data provided by the Fire and Disaster Management Agency)

Substance	No. of accidents
Ammonia	91
Chlorine	58
Chloropicrin	49
Sulfuric acid	49
Sodium hydroxide	47
Hydrochloric acid	40
Hydrogen sulfide	36
Nitric acid	27
Hydrogen chloride	24
Carbon monoxide	15
Hydrogen fluoride	10
Toluene	8
Hydrofluoric acid	7
Formalin	7
Other/Combination	210
<b>Total</b>	<b>678</b>



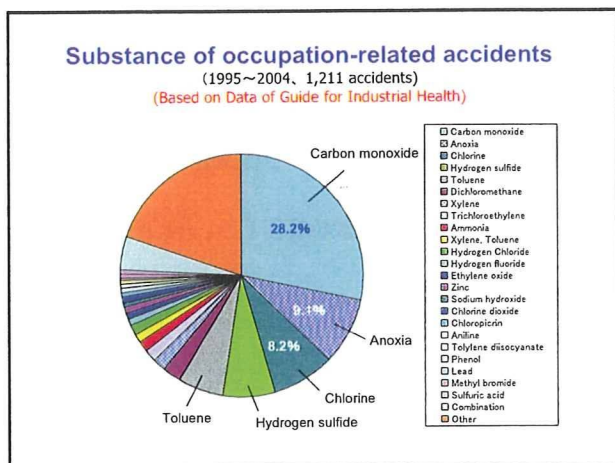
### Occupation-related accidents (1995~2004)

(Based on Guide for Industrial Health)

### Occupation-related accidents (1995~2004)

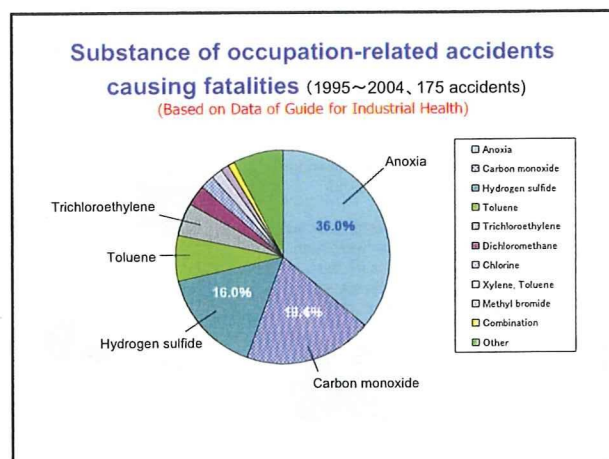
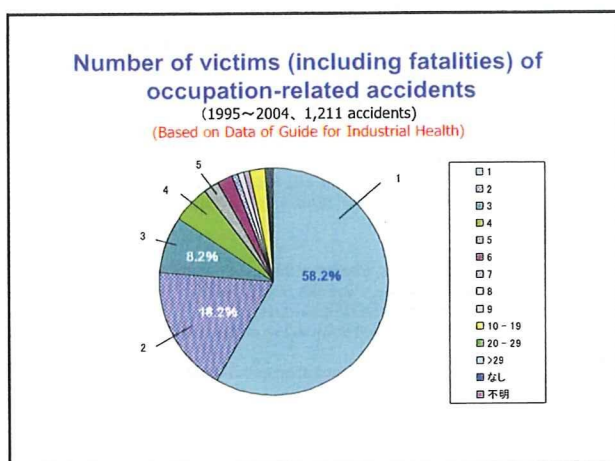
(Based on Data of Guide for Industrial Health)

Year	No. of accidents
1995	118
1996	126
1997	136
1998	108
1999	112
2000	158
2001	89
2002	122
2003	135
2004	107
<b>Total</b>	<b>1211</b>



### Substances involved in occupation-related accidents (1995~2004, 1,211 accidents) (Based on Data of Guide for Industrial Health)

Substance	No. of accidents	Substance	No. of accidents
Carbon monoxide	342	Zinc	10
Anoxia	110	Sodium hydroxide	9
Chlorine	99	Chlorine dioxide	9
Hydrogen sulfide	84	Chloropicrin	7
Toluene	74	Aniline	6
Dichloromethane	31	Tolylene diisocyanate	6
Xylene	21	Phenol	6
Trichloroethylene	20	Lead	6
Ammonia	16	Methyl bromide	6
Xylene, Toluene	15	Sulfuric acid	6
Hydrogen Chloride	14	Combination	53
Hydrogen fluoride	11	Other	240
Ethylene oxide	10	Total	1211



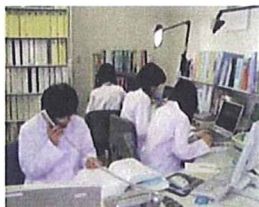
- ### Priority Top 10 Poison Information Data Files including response for chemical incidents
- Acid (Hydrogen chloride, Sulfuric acid)
  - Alkali (Sodium hydroxide, Ammonia)
  - Chlorine
  - Hydrogen Sulfide
  - Chloropicrin
  - Hydrogen Fluoride
  - Cyanide
  - Arsenic
- 

- ### Poison Information Database Format - Product Data Sheet and Poison Information Data Files by JPIC - including response for chemical incidents
- |   |   |
|---|---|
| 1. Names of Substance                     | 9. Mechanism of Toxicological Action            |
| 2. JPIC Code Number                       | 10. Kinetics                                    |
| 3. Ingredients / Formula                  | Absorption, Distribution, Metabolism, Excretion |
| 4. Manufacturing Company                  | 11. Clinical Effects                            |
| 5. Physical and Chemical Characteristics  | 12. Treatment                                   |
| 6. Use                                    | 13. Case Reports                                |
| 7. Legal Regulations                      | 14. Analytical Procedure                        |
| 8. Toxicity (LD <sub>50</sub> , MLD etc.) | 15. Others                                      |
- Protection Required  
Decontamination etc.**



Poison Information Data Files including response for chemical incidents

- Acid (**Hydrogen chloride**, Sulfuric acid )
- Alkali (**Sodium hydroxide**, Ammonia)
- **Chlorine**
- **Hydrogen Sulfide**
- **Chloropicrin**
- Hydrogen Fluoride
- Cyanide
- Arsenic



## Recent Topics in Japan

### Hydrogen Sulfide



### Four deaths caused by Hydrogen Sulfide near the hot spring

Natural Disaster

- A family (4 victims) fell down to a snow cavity near the hot spring, and all died.
- **Hydrogen sulfide** were detected, which concentration were high to have an influence on the human body from the cavity inside and the near outside.



2005. Dem. 31st, Yomiuri News

### Two worker deaths caused by Hydrogen Sulfide in manhole

Chemical Accident/Incident

Case :

One worker entered in the manhole for rescue of another worker who fell down in it, and he inhaled to **hydrogen sulfide**.

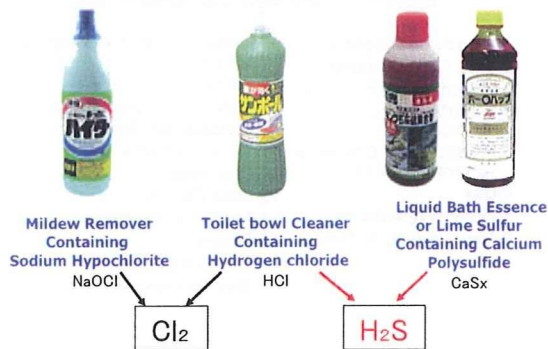
Signs & Symptoms:

Unconsciousness, Edema of the lungs, Acute respiratory distress syndrome, Cyanosis, Hypotension. Fell into a coma and died six days later. (The worker who fell down in the manhole also died.)

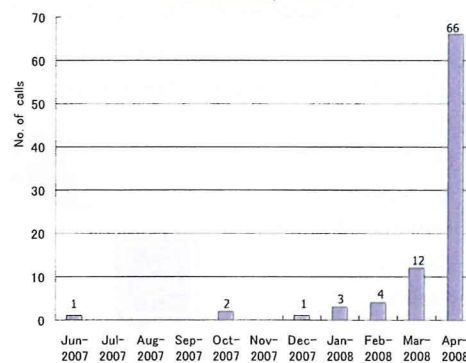
Hydrogen sulfide concentration in the manhole were more than 150ppm.

### Mix A & B ! → Poisonous Gas ↑↑

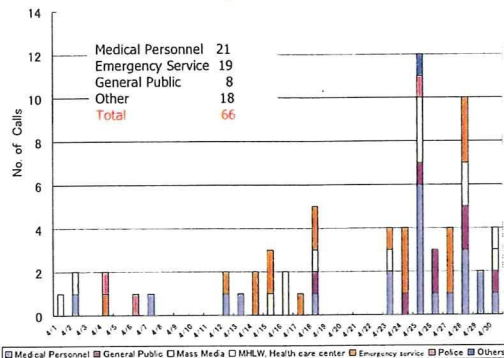
Informed of "How to carry out a suicide" on the Internet "suicide site" in Japan (2007?~)



### Number of Inquiries about Hydrogen Sulfide in JPIC (Jun2007~Apr.2008)



### Number of Inquiries about Hydrogen Sulfide in JPIC (Apr.2008)



### Case Report Suicidal Poisoning Due to Hydrogen Sulfide Produced by Mixing a Liquid Bath Essence Containing Sulfur and a Toilet bowl Cleaner Containing Hydrochloric Acid

- A 21-year-old man was found dead in a car.
- There were 9 empty bottles of 610HAP® (a 440g bottle of a liquid bath essence containing 160-195g sulfur/kg) and 10 empty bottles of Sunpoie® (a 500mL bottle of a toilet bowl cleaner containing 9.5% HCl) in the car. The car doors were sealed with tape, and there was a strong smell of sulfur in and around the car.
- GC/MS analysis showed 0.66 μg sulfide/mL and 0.14 μmol thiosulfate/mL in the blood sample. The concentration of thiosulfate in the urine sample was normal.
- Police investigation concluded that the man killed himself by aspirating hydrogen sulfide that had been produced by mixing 610HAP® and Sunpoie®.
- To examine the amount of hydrogen sulfide produced, small portions of these liquids were mixed in a 560-mL volume flask. The results showed that 0.1mL of each liquid produced 4,950 ppm of hydrogen sulfide, and 0.2mL of each produced 10,800ppm.
- According to these results, if the cabin volume is assumed to be 3,300L, mixing 120mL of each liquid produces a lethal level of hydrogen sulfide, i.e., 1,000 ppm.
- This was a rare suicide case, and it revealed the hazards of mixing of liquid bath essences containing sulfur and toilet bowl cleaners containing hydrochloric acid.

Kanya Kobayashi et al., The Japanese Journal of Toxicology, 21, 183-188, 2008.

### Hydrogen sulfide suicides putting family members, neighbors at risk (Mainichi Daily News, 2008 Apr. 24<sup>th</sup>)

- A spate of suicides by people mixing chemicals to create deadly hydrogen sulfide gas has occurred across Japan this April, while family members and residents have also fallen victim by inadvertently inhaling the gas.
- Explanations of how to mix commercially available detergents to create the gas have been posted on Internet suicide sites inciting the dangerous behavior.
- Inhaling hydrogen sulfide several times at a concentration of between 800 and 1,000 parts per million causes instant death. The chemical smells like rotten eggs, but in high concentrations it becomes odorless.
- In one incident in Hadano, Kanagawa Prefecture, last July, two family members of a man who committed suicide also died. In a separate incident in Nishinomiya, Hyogo Prefecture this month, residents in the apartment of a man who committed suicide were affected by the gas and were rushed to hospital.
- Following the spate of suicides, Kyoto Prefecture Police have asked Internet providers with offices located in the prefecture to delete Web pages that contain information on how to create hydrogen sulfide.

### Teenage girl gasses self to death with hydrogen sulfide, 14 local residents hospitalized (Mainichi Daily News, 2008 Apr. 24<sup>th</sup>)

- KONAN, Kochi -- A teenage girl fatally gassed herself by generating deadly hydrogen sulfide at her home here, forcing dozens of residents in the neighborhood to flee their homes, police said.
- Following the incident, 14 local residents including the girl's mother were hospitalized apparently after inhaling the toxic gas. Her death follows a spate of incidents in which people mixed detergent to produce hydrogen sulfide to kill themselves.
- At around 8 p.m. on Wednesday, a 14-year-old, third-year girl at a public junior high school was found dead after apparently inhaling hydrogen sulfide in the bathroom of her apartment inside a municipal housing complex in Konan, local police said.
- Three bottles containing commercially available detergent were found in the bathroom, leading investigators to suspect that she committed suicide by producing hydrogen sulfide.
- A total of 21 local residents were transported to four hospitals, and 14 of them were hospitalized. Sixty-eight other residents went to hospitals on their own.
- Due to fears of hydrogen sulfide poisoning, 75 residents of the housing complex were evacuated and spent the night at a nearby gymnasium.



Rescue workers question evacuees at a gymnasium in Konan where they took shelter.

### Hydrogen sulfide gas from an apartment hedge Mischief? Aim at a resident?

(Mainichi Daily News, 2008 May. 5<sup>th</sup>)

- There was a report in Saitama prefecture police Omiya station, "I smelled an egg having been corrupt" from a resident of the apartment, at about 5:15 a.m. on May 4th.
- A staff member of a police station who rushed discovered the bag which three plastic containers were in with the hedge of the apartment south side, and a member of fire department detected hydrogen sulfide.
- Omiya station considers that there is a possibility that aimed at a resident indiscriminately and it is classify the attempted murder charge into the field of vision as well as the house invasion charge and investigate it.
- In the investigation, about 2 meters hedges were separated from an apartment, and the bottle one that two empty bottles and liquid were in the bag entered. 7 houses of 18 people who were in the apartment sheltered to the outdoors for about 2 hours and a half, but there was not the injured person in those days. A housewife (40) who lives in the first floor said "it seems to be a sarin case to roll up to a person irrelevant with poisonous gas".

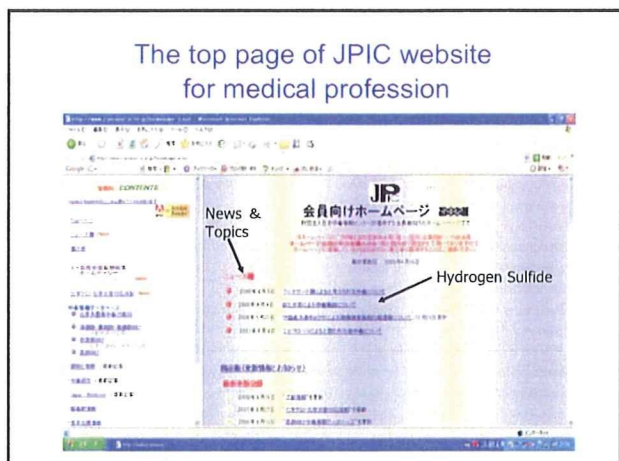
### If indiscriminate terrorism using Hydrogen Sulfide were occurred in office/tube !!



Taking alarm for upcoming G8 summit in Japan !! 2008.5.9 Weekly Post



The top page of JPIC website for medical profession

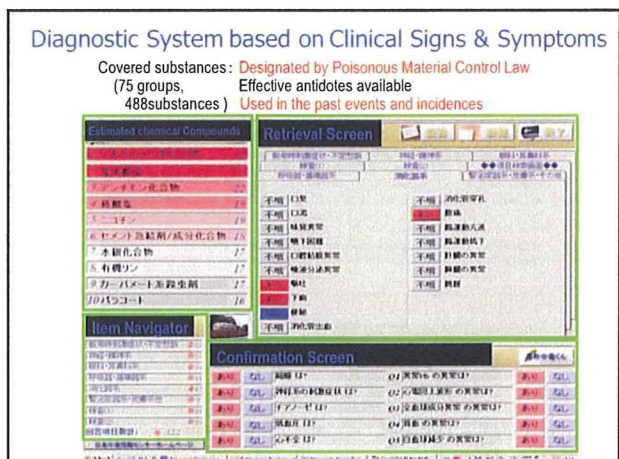


Main contents of JPIC website for medical profession

- News
  - Topics of current chemical incidents
- Poison Information Database
  - For response to **chemical terrorism**
  - For public health nurse, pharmacist or nurse to respond to inquiries from general public
  - For emergency and rescue team to respond to **chemical incident** on site
  - For clinician to provide medical care to poisoning patients
- Information on biological sample analyzing facilities

Diagnostic System based on Clinical Signs & Symptoms

Covered substances: Designated by Poisonous Material Control Law (75 groups, Effective antidotes available 488 substances) Used in the past events and incidences

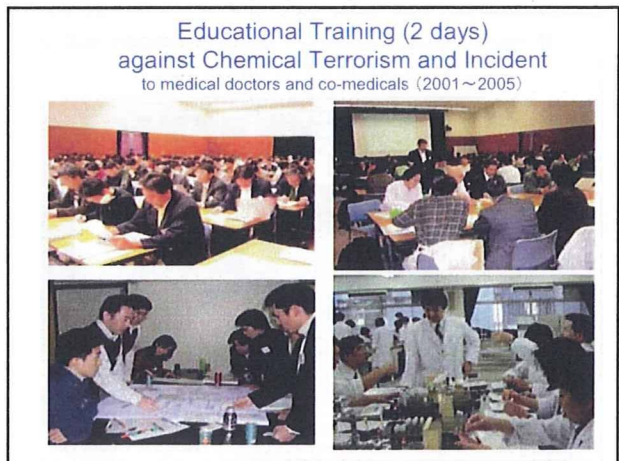


Poisoning Specialists Registration System by Each Toxic Substance

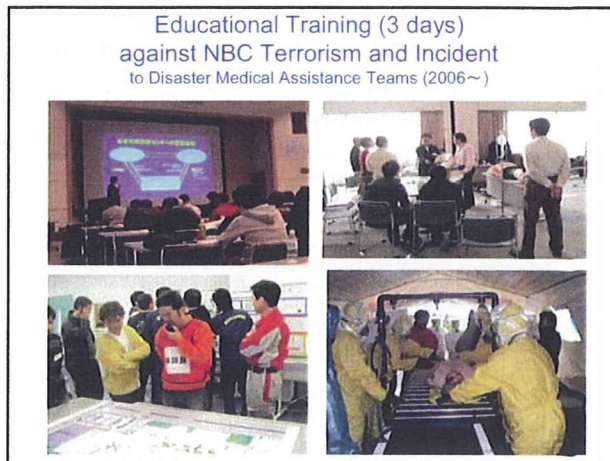
Including TICs

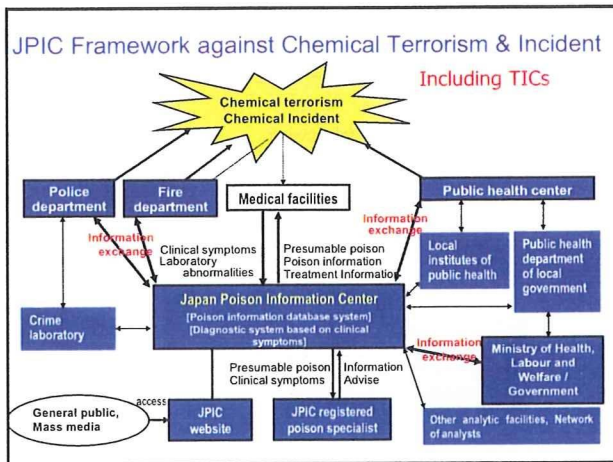
- Registration items
  - Affiliation, Address
  - Communication method
  - Professional field
  - Poison or poisoning
  - Representative relevant articles
- Registered specialists
  - Basic researcher: 75 persons
  - Clinical researcher: 35 persons

Educational Training (2 days) against Chemical Terrorism and Incident to medical doctors and co-medicals (2001~2005)



Educational Training (3 days) against NBC Terrorism and Incident to Disaster Medical Assistance Teams (2006~)





*Thank you very much indeed  
for your attention*

See you again !!

Case report of chemical events by familiar chemicals

Lesson to learned from Japanese Incident by **Hydrogen Sulfide** generated from household products



Japan poison Information Center  
 Yumiko Kuroki, Ph.D., Kaoru Iida,  
 Toshiharu Yoshioka, M.D. Ph.D,  
 Noriyoshi Ohashi, M.D.,  
 Yayoi Hatano, Fujiko Iizuka, Yoko Endo,  
 Hiroyuki Araki, Hironori Takano

Natural Disaster

Four deaths caused by Hydrogen Sulfide near the hot spring

- A family (4 victims) fell down to a snow cavity near the hot spring, and all died.
- **Hydrogen sulfide** were detected, which concentration were high to have an influence on the human body from the cavity inside and the near outside.



2005. Dem. 31st, Yomiuri News

Chemical Accident/Incident

Two worker deaths caused by Hydrogen Sulfide in manhole

Case :

One worker entered in the manhole for rescue of another worker who fell down in it, and he inhaled to **hydrogen sulfide**.



Signs & Symptoms:

Unconsciousness, Edema of the lungs, Acute respiratory distress syndrome, Cyanosis, Hypotension.  
 Fell into a coma and died six days later.  
 (The worker who fell down in the manhole also died.)

Hydrogen sulfide concentration in the manhole were more than 150ppm.

Japan Poison Information Center

JPC receives about  
 Acute Poison Inquiries : ~30,000/year

Population of Japan : ~127 million  
 Poisoning patients : 500,000/year  
 (visited medical institutions)  
 Death by poisoning : 5,000/year

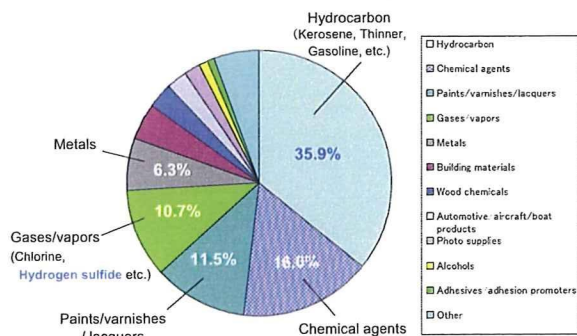


Osaka Information Service Branch (24hrs)

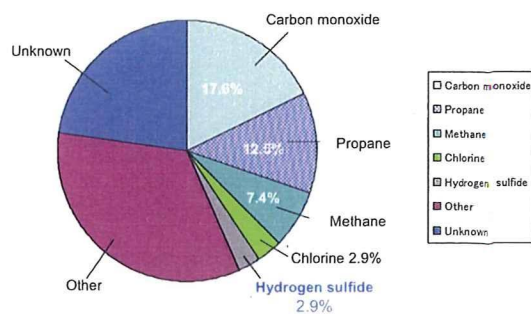
Head Office & Tsukuba Information Service Branch (9:00-21:00)



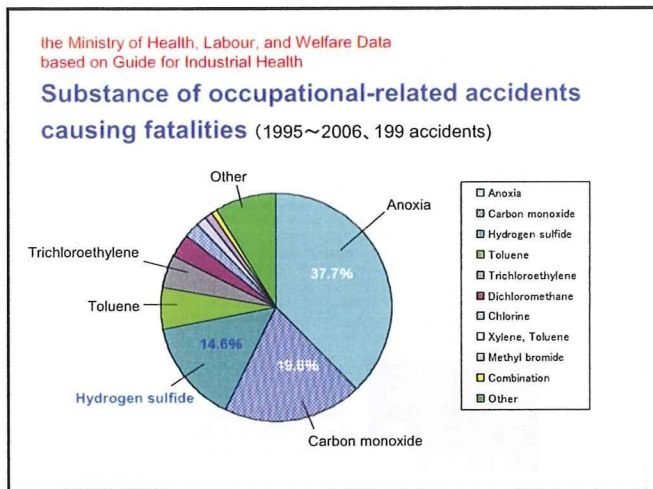
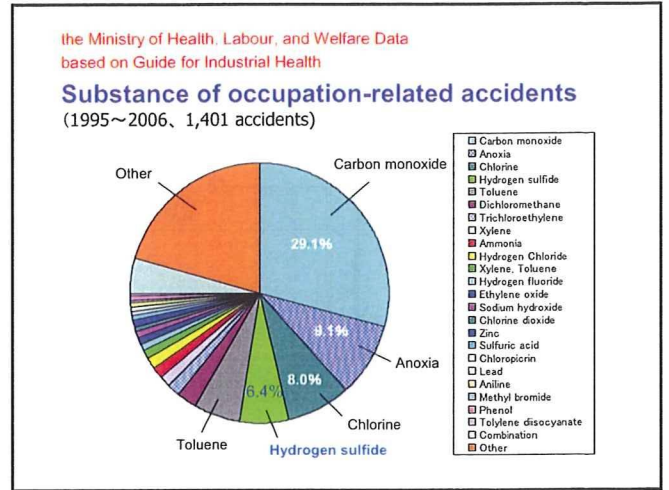
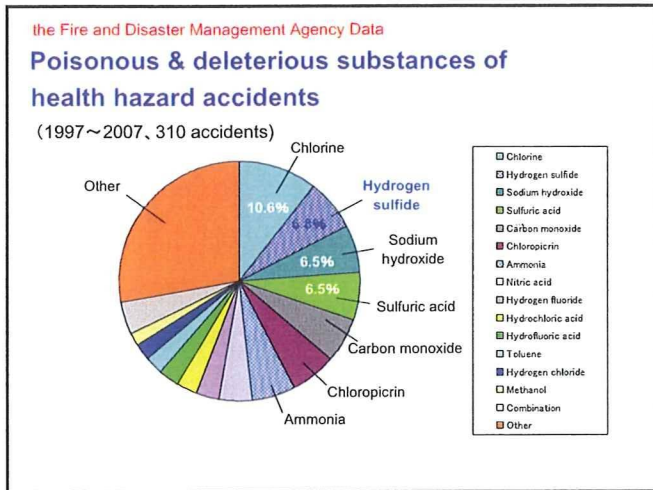
Industrial chemicals-related inquiries received at JPIC in 2007 (1,268 calls)



Industrial chemicals gases/vapors-related inquiries received at JPIC in 2007 (136 calls)



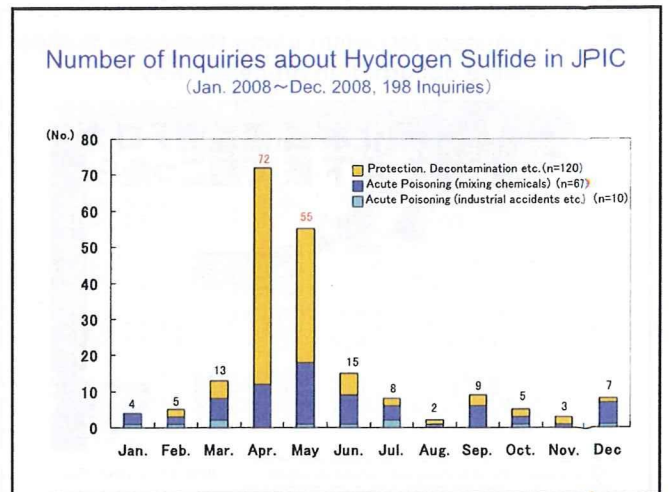
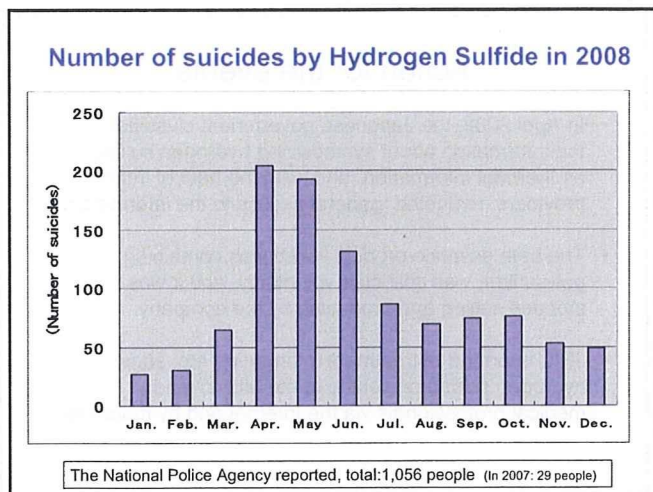


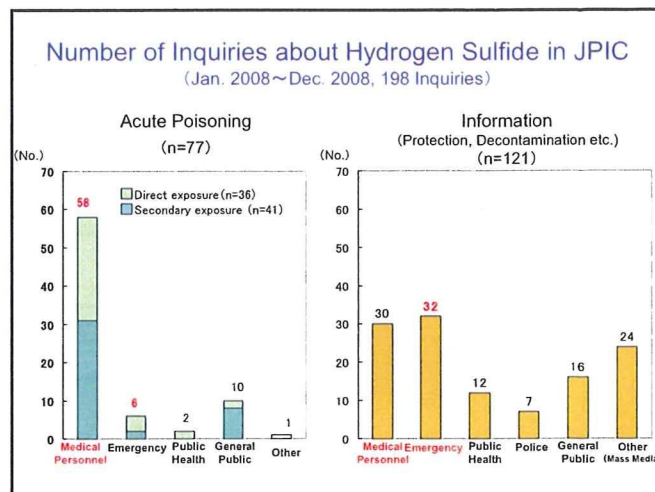
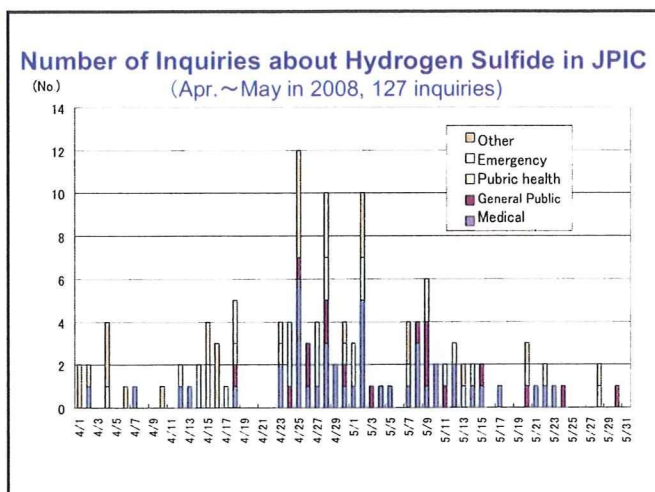


How to generated Hydrogen Sulfide

It was informed of "How to carry out a suicide" on the Internet "suicide site" in Japan from 2007

Toilet bowl Cleaner Containing Hydrogen chloride (HCl) + Liquid Bath Essence or Lime Sulfur Containing Calcium Polysulfide (CaS<sub>x</sub>) → H<sub>2</sub>S





### Hydrogen sulfide suicides putting family members, neighbors at risk (Mainichi Daily News, 2008 Apr. 24<sup>th</sup>)

- A spate of suicides by people mixing chemicals to create deadly hydrogen sulfide gas has occurred across Japan this April, while family members and residents have also fallen victim by inadvertently inhaling the gas.
- Inhaling hydrogen sulfide several times at a concentration of between 800 and 1,000 parts per million causes instant death. The chemical smells like rotten eggs, but in high concentrations it becomes odorless.
- In one incident in Hadano, Kanagawa Prefecture, last July, two family members of a man who committed suicide also died.
- In a separate incident in Nishinomiya, Hyogo Prefecture this April, residents in the apartment of a man who committed suicide were affected by the gas and were rushed to hospital.
- Following the spate of suicides, Kyoto Prefecture Police have asked Internet providers with offices located in the prefecture to delete Web pages that contain information on how to create hydrogen sulfide.

### Teenage girl gasses self to death with Hydrogen Sulfide, 14 local residents hospitalized (Mainichi Daily News, 2008 Apr. 24<sup>th</sup>)

- KONAN, Kochi -- A teenage girl fatally gassed herself by generating deadly hydrogen sulfide at her home here, forcing dozens of residents in the neighborhood to flee their homes, police said.
- Following the incident, 14 local residents including the girl's mother were hospitalized apparently after inhaling the toxic gas. Her death follows a spate of incidents in which people mixed detergent to produce hydrogen sulfide to kill themselves.
- At around 8 p.m. on Wednesday, a 14-year-old, third-year girl at a public junior high school was found dead after apparently inhaling hydrogen sulfide in the bathroom of her apartment inside a municipal housing complex in Konan, local police said.
- Three bottles containing commercially available detergent were found in the bathroom, leading investigators to suspect that she committed suicide by producing hydrogen sulfide.
- A total of 21 local residents were transported to four hospitals, and 14 of them were hospitalized. Sixty-eight other residents went to hospitals on their own.
- Due to fears of hydrogen sulfide poisoning, 75 residents of the housing complex were evacuated and spent the night at a nearby gymnasium.

Rescue workers question evacuees at a gymnasium in Konan where they took shelter.

JPIC received this case

### If indiscriminate terrorism using Hydrogen Sulfide were occurred in office/subway !!

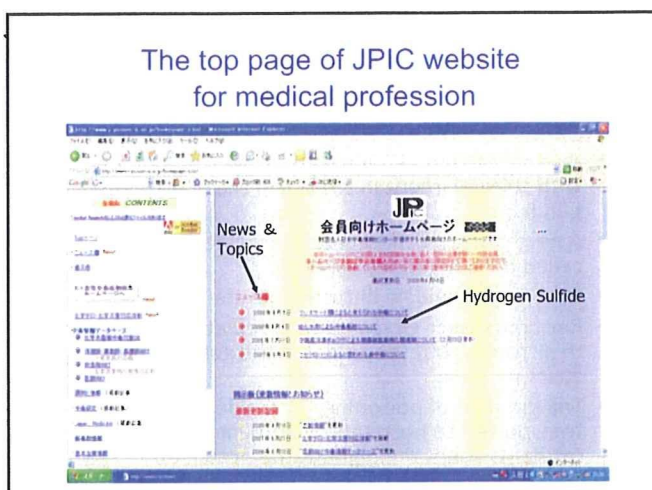
Taking alarm for upcoming G8 summit in Japan !! 2008.5.9 Weekly Post

### Action for the events

- In April 2008, the Japanese government classified the information about synthesizing hydrogen sulfide as "harmful information" and, with the help of internet providers, restricted general access to the information.
- The bath essence product which was containing polysulfide, was collected voluntarily, and it was stopped selling and producing by the company.
- JPIC informed of treatment information etc. about hydrogen sulfide poisoning to the MLHW and medical professionals via the Internet and by materials.



The top page of JPIC website for medical profession



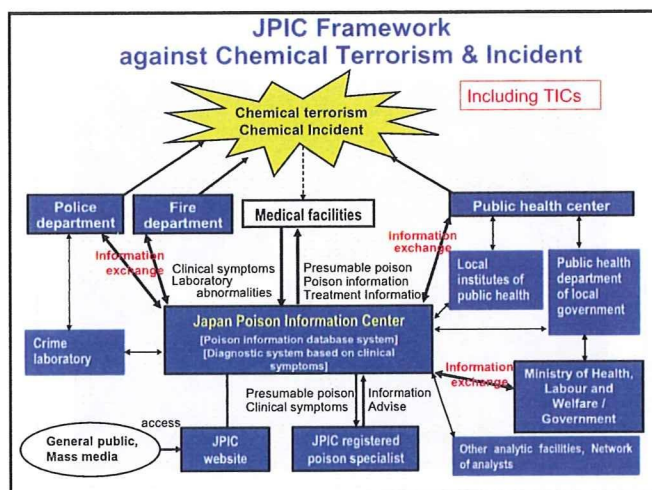
Many countermeasures for the event have been done. But, it has still continued...

- There was a bad smell from a hotel "Toyoko in Sapporo Station north exit" in the ninth floor guest room at about 9:50 a.m. on May 22nd 2009.
- There was a poster written during "hydrogen sulfide generation" at the bathroom door of the guest room, and a man died alone in it. Police considers that a man (26) committed suicide.
- About 20 women who work in the opposite building appeal to nausea, and 18 people were transported to the hospital. the hotel guest and employees about 60 people took refuge outdoors.
- The spot is near to JR Sapporo Station. About 100 meters nearby roads were closed to traffic and were thrown into a commotion with the visitors who took refuge at one time.

(2009 May 22nd, Hokkaido Shimbun)

JPIC received this case

JPIC Framework against Chemical Terrorism & Incident



Thank you very much for your attention !!

## Response of Emergency Hospital for Mass Causality

The Incident by Hydrogen Sulfide generated from household products

Noriyuki Ihara  
Chikamori Hospital  
Kochi, Japan



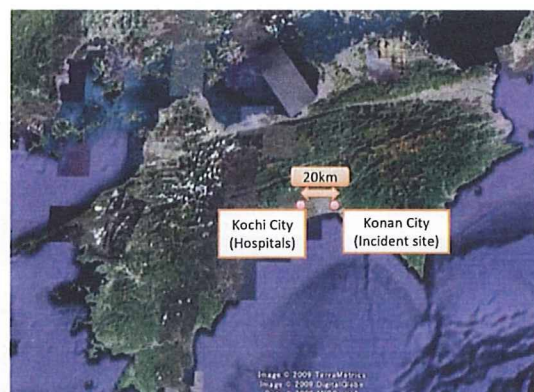
## Overview

- A underage girl generated Hydrogen Sulfide gas with suicidal intent in a room in the apartment building.
- A neighborhood detected the incident, and called for emergency services.
- The gas was widely diffused into the building.
- Residents were evacuated immediately from their rooms, but they inhaled the gas on the stairs.
- The girl died of poisoning, 21 residents were transported to hospitals by ambulance, 150 residents spent the night at the evacuation center.

## Location



## Location



## Incident Site : Apartment Building



5-story buildings  
Wednesday night  
April 2008  
Rainy weather

A 14-year-old girl in the 3rd-story generated Hydrogen Sulfide gas with suicidal intent in the bathroom.

(サンポール:toilet-bowl cleaner

+ 六-Oハップ:sulfurous bath agent)

## Incident Site : Apartment Building



Warning Posted on the door by the girl




Toxic gas has just been generated.  
Don't open this door.  
High levels of Hydrogen Sulfide gas is filled in this room.  
If you open this door, you will die immediately.  
Call for emergency services.


### 8:00pm Emergency Call 119

A total of 25 Rescue squads, firefighters, EMTs

- Established a Forward Control  
(In Japan, the Fire Service are in control at major incidents.)
- Evacuated all residents of the apartment building.
- Approached the gas room.
- Controlled the inner cordon.
- Determined the receiving hospitals.
- Set up the evacuation center.




### Hospital



**9:20pm** Initial report from the Fire Service  
“The incident by Hydrogen Sulfide in the apartment building!”  
“Number of casualties estimated figures 30~100!”  
“How many casualties can you receive?”  
  
→Emergency Staff Call

### Hospital



**9:40pm** 6 Doctors and 6 nurses got into the hospital.

- Checked an information on a treatment about Hydrogen Sulfide gas (from JPIC).
- Checked the personal protective equipments and medical equipments.
- Checked ventilation in Emergency Room.
- Checked the decontamination area.  
– undressing, flushing


### Hospital

**11:45pm** Patients arrived  
4 patients by ambulance  
5 patients by their cars.

All the patients had mild irritation in the mucosal membrane in the larynx, and no smell of the gas(rotten eggs)

### Approach for each patient

- Undressing and changing the clothes before entry of ER.
- Advised them to wash their hands and gargle.
- Check patients.
  - respiratory discomfort
  - sore throat, wheezing
  - Dacryorrhoea(tearing), eye-ache
- Wait-and-see approach until the next morning.

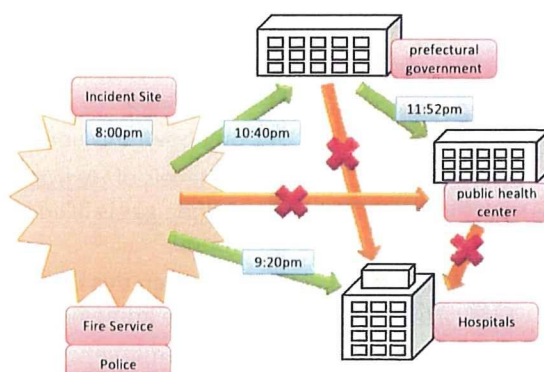




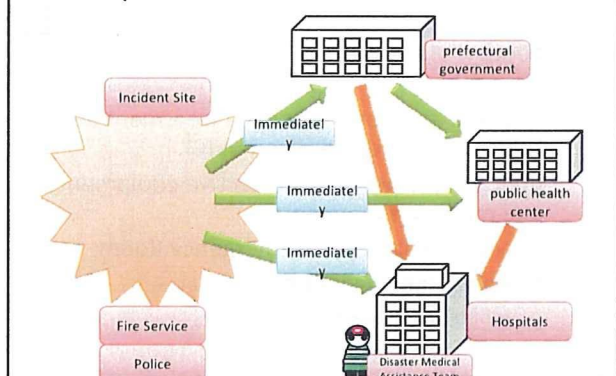
### Discussion(Hospital)

- Insufficiencies
  - Personal protective equipments
  - Decontamination kit
  - Clerical staff
    - Spokesperson
    - Note-taker
    - Collecting information
    - Patient counselor
  - Exact Information from the incident site
    - Exact place, Hazards, number of severities

### Informative function



### Improved Informative function



### Now

- As soon as the fire service goes into action for a major incident, they call the hospital and the prefectural government, immediately .

Failure is a stepping stone to success.