Health Report

The occupational health situation in Singapore continues to be satisfactory, with 602 cases of occupational disease confirmed in 2007, a reduction from 657 cases in 2006. The success of the measures to ensure the health of our employees has been possible because of the strong support from employers, unions and other partners for our various enforcement and promotional programmes.

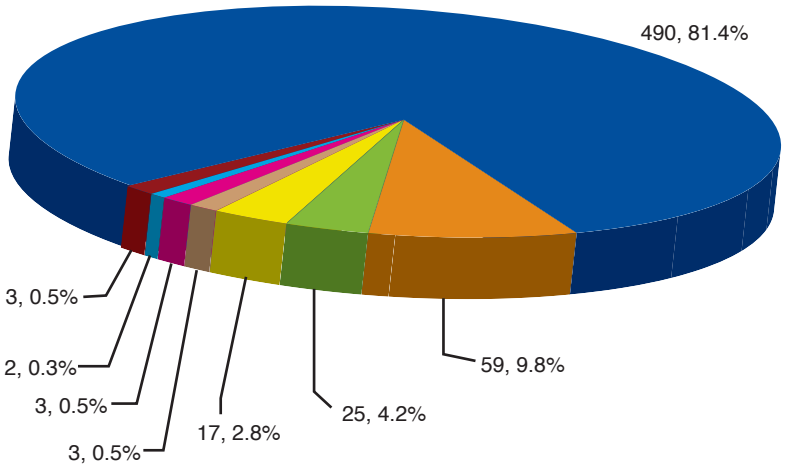
Occupational diseases

Notification of occupational diseases by doctors and employers is required under the Workplace Safety and Health (Incident Reporting) Regulations. There are 31 notifiable diseases (Annex D Table 1). To facilitate such notifications, OSHD partnered the National Healthcare Group and SingHealth to provide joint specialist clinics in various hospitals and polyclinics. All notifications are investigated to confirm the work-relatedness of the cases, as well as to identify any other employees who may be similarly affected. Appropriate control measures are then recommended to the industry, company and employees concerned.

The occupational disease incidence in 2007 was 27.7 per 100,000 employed persons, a reduction from 33.3 in 2006. The highest incidence was from the Manufacturing sector, with 82.4 cases per 100,000 employed persons. This was followed by the Shipbuilding and Ship Repair (25.2 cases per 100,000 employed persons), and the Construction sectors (15.2 cases per 100,000 employed persons).

OCCUPATIONAL DISEASES BY INDUSTRY, 2007

Industry	No of Cases	OD Incidence
Total	602	27.7
Construction	45	15.2
Shipbuilding & Ship Repair (SSR)	33	25.2
Manufacturing (excluding SSR)	359	82.4
6 New Sectors Under WSHA	39	15.7
Other Sectors	126	11.8

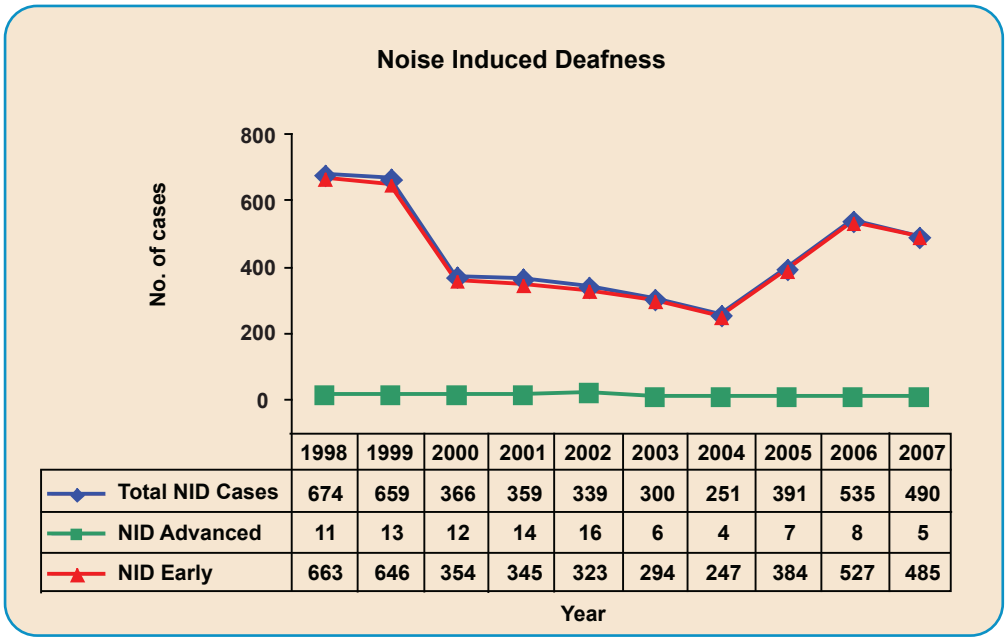


OCCUPATIONAL DISEASES, 2007

- Noise Induced Deafness
- Occupational Skin Diseases
- Work-related Muscubskeletal Disorder
- Barotrauma
- Excessive Absorption of Chemicals
- Occupational Lung Diseases
- Compressed Air Illness
- Others

Noise Induced Deafness

Noise-induced deafness (NID) continued to be the leading occupational disease in 2007, with 490 cases, or 81.4% of all confirmed occupational disease cases. Most of the NID cases were in the early stages of the disease. Only five employees (1.0%) had severe hearing loss requiring compensation under the Workmen's Compensation Act. The majority of the NID cases (64%) were from the manufacturing sector.

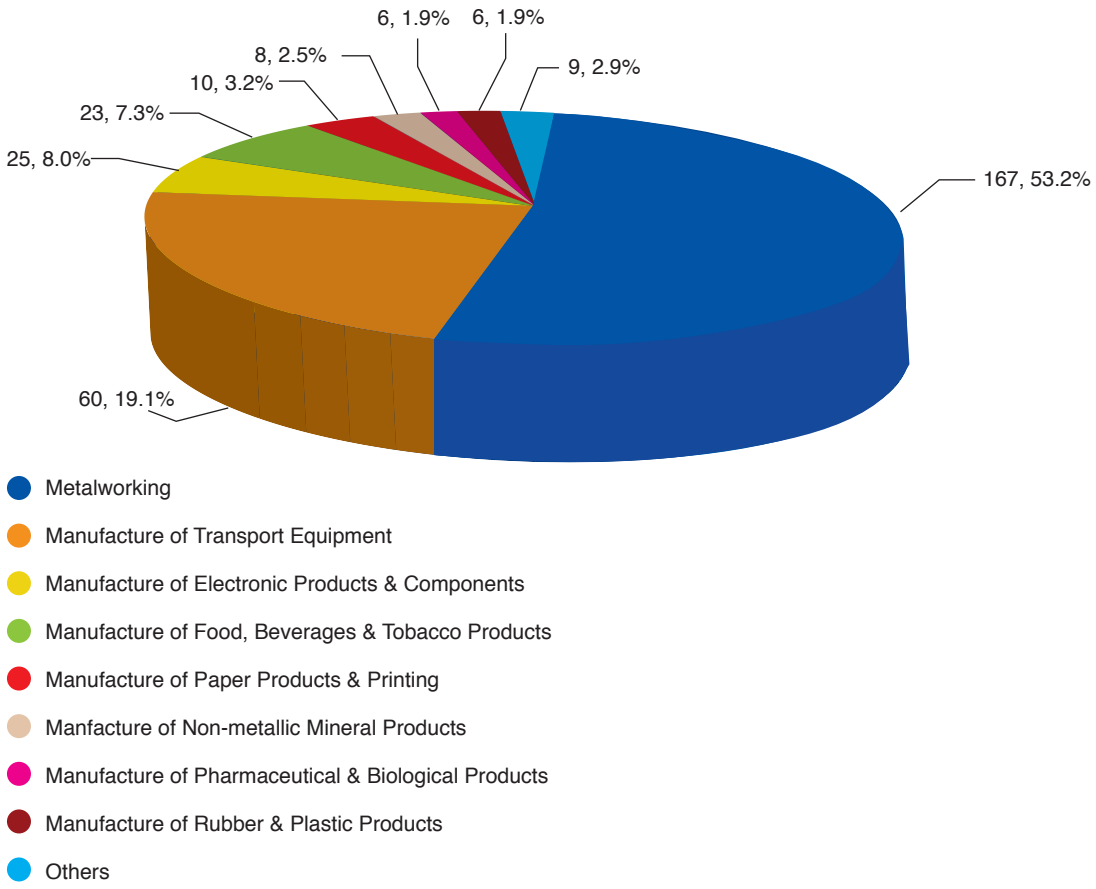


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total NID Cases	674	659	366	359	339	300	251	391	535	490
NID Advanced	11	13	12	14	16	6	4	7	8	5
NID Early	663	646	354	345	323	294	247	384	527	485

NOISE INDUCED DEAFNESS BY INDUSTRY, 2007

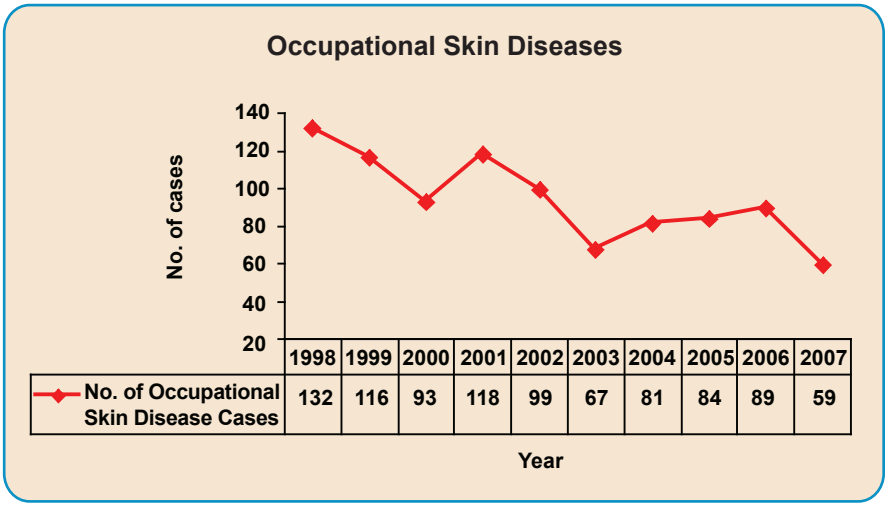
Industry	No of Cases Confirmed
All Sectors	490
Construction	17
Shipbuilding & Ship Repair (SSR)	30
Manufacturing (excluding SSR)	314
6 New Sectors Under WSHA	25
• Water Supply, Sewerage & Water Management	16
• Hotels and Restaurants	-
• Services Allied to Transport of Goods	9
• Health Activities	-
• Landscape Care & Maintenance Service Activites	-
• Veterinary Activities	-
Other Sectors	104
• Transport and Storage (excludes services allied to transport of goods)	70
• Repair and Maintenance of Vehicles	21
• Others	13

NOISE INDUCED DEAFNESS IN MANUFACTURING SECTOR, 2007

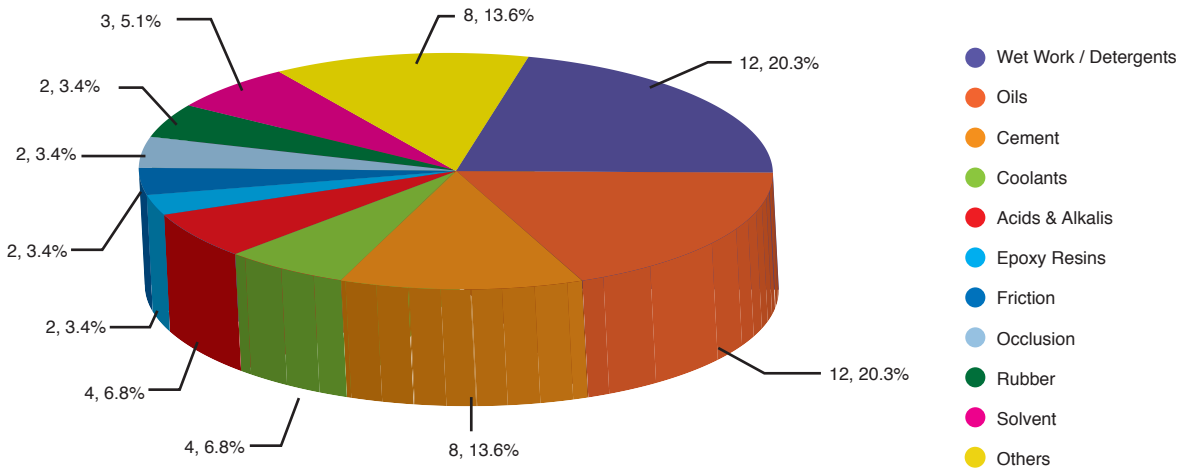


Occupational Skin Diseases

Occupational Skin Diseases continued to be the second most common occupational disease, with 59 cases in 2007. The most common causative agents were wet work/detergents, oils and cement. The manufacturing sector contributed the most number of cases (35.6%).



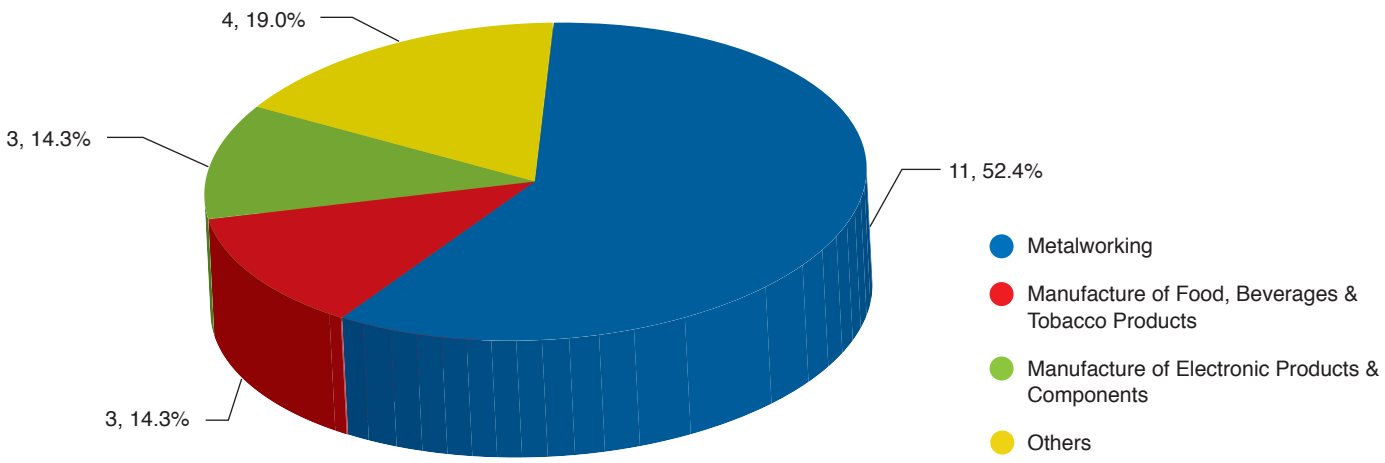
OCCUPATIONAL SKIN DISEASES BY CAUSATIVE AGENT, 2007



OCCUPATIONAL SKIN DISEASES BY INDUSTRY, 2007

Industry	No of Cases Confirmed
All Sectors	59
Construction	11
Shipbuilding & Ship Repair (SSR)	1
Manufacturing (excluding SSR)	21
6 New Sectors Under WSHA	8
• Water Supply, Sewerage & Water Management	-
• Hotels and Restaurants	4
• Services Allied to Transport of Goods	-
• Health Activities	4
• Landscape Care & Maintenance Service Activites	-
• Veterinary Activities	-
Other Sectors	18
• Hairdressing, Other Beauty Treatment and Other Service Activites	4
• Transport & Storage	2
• Others	12

OCCUPATIONAL SKIN DISEASES IN MANUFACTURING SECTOR, 2007

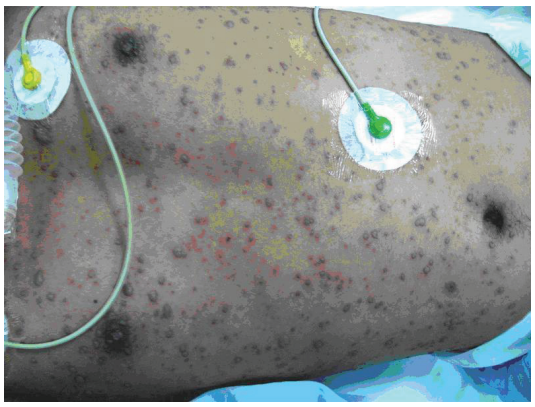


A Case of severe allergic reaction from turpentine contaminated with trichloroethylene (TCE)

The first case in Singapore of Steven Johnson Syndrome / Toxic Epidermal Necrolysis (SJS/TEN) secondary to contamination of turpentine by TCE was diagnosed in a 23 year-old welder who presented with a 3-day history of fever with worsening eye pain and eye redness. On the 4th day, he developed a generalized maculo-papular rash, which later progressed to widespread blisters and erosions on the eyelids and lips.

The worker had worked for 2 years in an engineering firm which manufactures large metal parts. Open trays of turpentine were used for degreasing metal pieces on the workbench. TCE was not used in the work processes. Batch sampling of turpentine revealed that it was contaminated with TCE, containing 0.74% TCE. TCE-in-air levels were detectable at the workbench where he worked (TCE-in-air levels = 0.1mg/m ^{3} or 0.02ppm) and at the nearby machining section (personal TCE exposure=0.4mg/m^3 or 0.07ppm).

This rare severe allergic reaction following very low exposures to TCE demonstrates that there should be a high index of suspicion for anyone presenting with SJS and/or TEN. The worker was advised to exercise extreme care to avoid any future exposure to TCE.



Widespread hemorrhagic blisters

Erosions on the eyelids and lips

Work-related Musculoskeletal Disorders

WORK-RELATED MUSCULOSKELETAL DISORDERS BY INDUSTRY, 2007

Industry	No of Cases	Distribution (%)
Manufacture of Medical Precision and Optical Instruments, Watches and Clocks	19	76.0
Manufacture of Transport Equipment	1	4.0
Manufacture of Furniture	1	4.0
Building & Repair of Pleasure Crafts, Lighters & Boats	1	4.0
Restaurant	2	8.0
Other Service Activities	1	4.0
Total	**25**	100.0

A Cluster of work-related musculoskeletal disorder cases from a factory manufacturing medical implants

Seventeen employees were diagnosed to have work-related musculoskeletal disorder from a single factory. Of these, 5 employees were diagnosed with de Quervain's tendinitis, while the rest had work-related musculoskeletal complaints in the neck, upper back, forearm, wrist and hands. The risk factors identified included prolonged, awkward, static neck flexion; wrist twist with ulnar deviation and forceful pinch grip from holding of scissors and needles during sewing. The company has since scheduled workers to take micro-rest breaks, trained workers to adopt good postures and implemented a surveillance programme for early recognition, reporting and management of employees with such condition.

A case of bilateral ulnar neuropathy in a carpenter

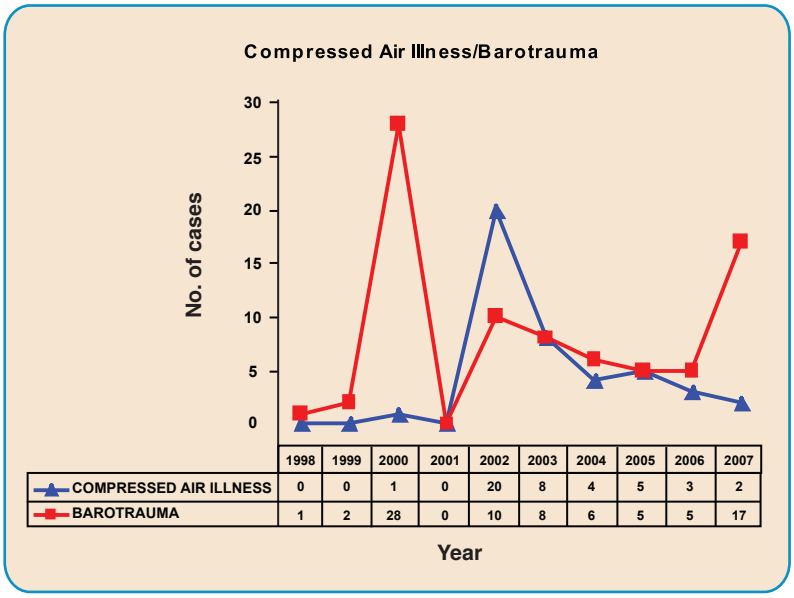
A 63-year-old carpenter with more than 10 years of experience in a company which manufactures luxury yachts developed progressive right hand numbness and weakness which affected his activities of daily living. Neurophysiological studies confirmed a diagnosis of ulnar neuropathy at the level of the elbow. The worker's main task was wood shearing to make door frames and modules. Based on the Rapid Upper Limb Assessment tool, wood shearing is a high-risk activity as it involves repetitive flexion/extension at the elbow joint, causing compression of the ulnar nerves. An evaluation of his hand-held tools revealed that he was not excessively exposed to vibration.

The company has since encouraged the carpenters to rotate job tasks, take regular rest breaks after each cycle of shearing and to don anti-vibration gloves when handling vibratory tools. An in-house monitoring programme for the early notification of symptoms (pain, numbness or weakness) was also implemented.

Wasting of the small muscles of his hands

Wood Shearing

Barotrauma

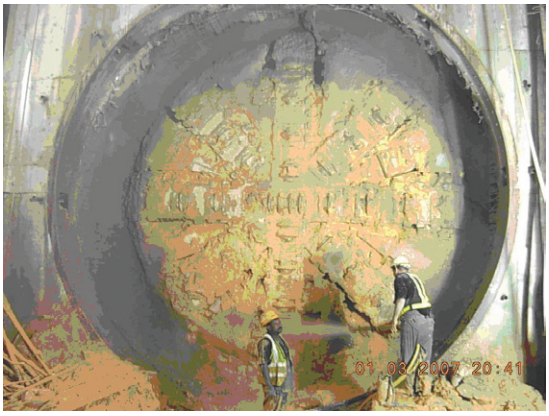


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
COMPRESSED AIR ILLNESS	0	0	1	0	20	8	4	5	3	2
BAROTRAUMA	1	2	28	0	10	8	6	5	5	17

There were 17 cases of barotrauma in 2007. 16 were workers from a tunneling project where compressed air was used to prevent ground water from entering the working chamber and one was a scientific officer.

The 16 workers had to enter the compressed air environment to change the cutter heads. The risk factors identified in some cases were the presence of upper respiratory tract infection and the failure to report promptly to the man-lock attendant when they developed symptoms during compression and de-compression. Refresher training on the procedures to follow for compressed air works was conducted, emphasizing the importance of reporting if they feel unwell.

The scientific officer developed aural barotrauma when she continued to dive even though she was unable to clear her ears. She was advised on the importance of following dive protocol.

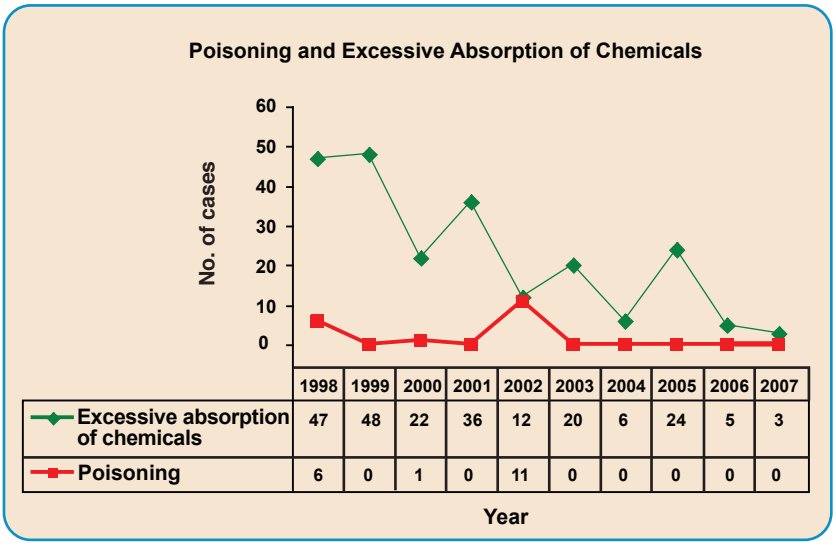


TBM cutter head

Working in cutter head chamber

Briefing workers before compressed air work

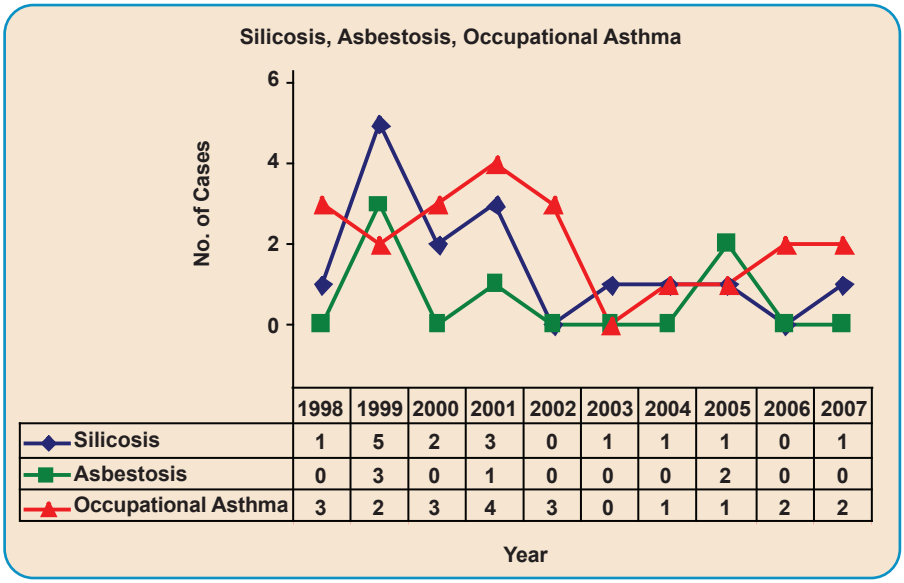
Excessive Absorption Of Chemicals



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Excessive absorption of chemicals	47	48	22	36	12	20	6	24	5	3
Poisoning	6	0	1	0	11	0	0	0	0	0

Agent	No of Cases	Distribution (%)
Toluene	1	33.3
Cadmium	1	33.3
Trichloroethylene (TCE)	1	33.3
Total	3	100.0

Occupational Lung Diseases



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Silicosis	1	5	2	3	0	1	1	1	0	1
Asbestosis	0	3	0	1	0	0	0	2	0	0
Occupational Asthma	3	2	3	4	3	0	1	1	2	2

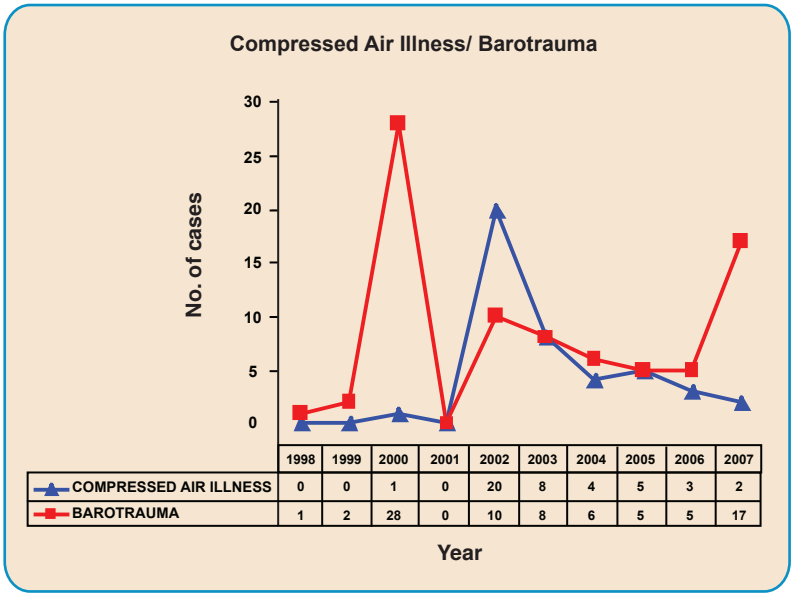
A case of latex-induced occupational asthma

A nurse presented with rhinitis, hand itch and shortness of breath during gowning and de-gowning for operative procedures. Powdered latex gloves were worn during operative procedures. Prick testing showed she was allergic to latex.

She has since changed to an administrative job with no exposure to latex. The management provided staff with reduced protein or powder-free gloves and they were advised to use them as far as possible. They were also informed of the hazards of latex allergy and to report to management if they have suspected symptoms of allergy.

Compressed Air Illness

There were two incidents of compressed air illness in 2007, both involving the same worker. He developed two episodes of skin bends on separate occasions after compressed air work while working in a tunneling project. He was suspended from further exposure to compressed air in view of his increased susceptibility to develop bends.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
COMPRESSED AIR ILLNESS	0	0	1	0	20	8	4	5	3	2
BAROTRAUMA	1	2	28	0	10	8	6	5	5	17

Others

A construction worker who died from heat stroke

A 38 year-old worker employed to work as a carpenter in a construction site developed heat stroke on the second day of starting work. He was tasked to dismantle the timber formwork at the mid-basement level, about 4m below ground level. At lunchtime, he complained of dizziness but resumed work after lunch at 1pm. His work was to loosen the wedges of the tie-rod (formwork accessories) with a chisel and hammer. By 3.25pm, he was found unconscious on the hot concrete ground and was admitted to hospital. He had a body temperature of 43ºC (normal = 36.9 ºC). Despite aggressive resuscitation, he died from circulatory collapse. Investigations revealed that the average Wet Bulb Globe Temperature (WBGT) where the deceased had worked was 32 ºC, exceeding the ACGIH permissible level of 25ºC.

The construction industry was informed of this potential hazard for workers who are working in a hot and humid environment. The industry was advised to implement an acclimatization programme for all new workers and to put in place emergency measures for first aid treatment of heat disorders.

Monitoring Conditions At Work

Workplaces with hazards listed in the First Schedule of the WSH (General Provisions) Regulations are required to have regular industrial hygiene monitoring. Workplaces with specific hazards require medical monitoring for exposed workers. Data from this medical and industrial hygiene monitoring activities indicate that noise and chemical exposure levels in workplaces remain satisfactory in 2007.

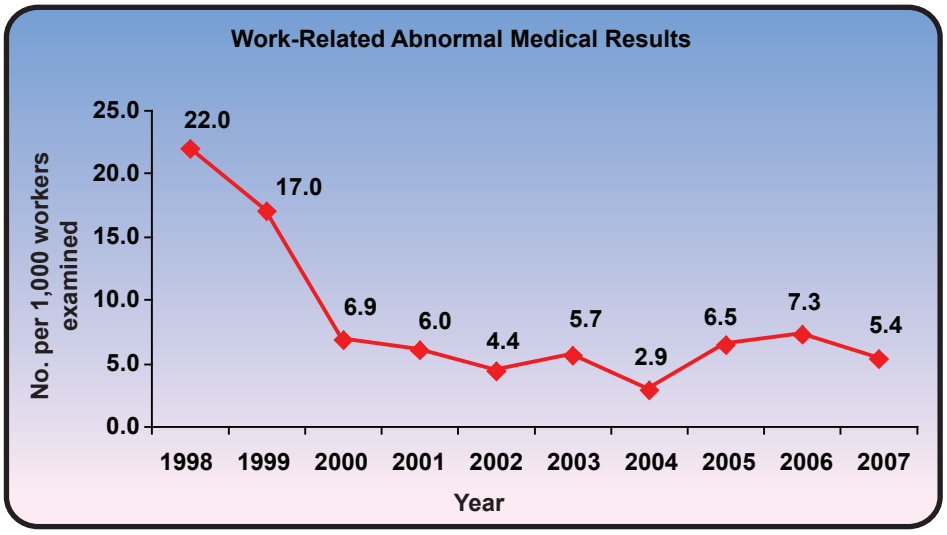
Exposure levels of specific workplace hazards provide a good indicator of the conditions in the work environment. Hygiene monitoring is usually conducted once every three years for noise and annually for chemicals. Medical monitoring is conducted once every six months for lead and organophosphate, and annually for all other hazards. The results of both industrial hygiene and medical monitoring are submitted to OSHD. The division also conducts detailed industrial hygiene assessments on a selective basis in high-risk workplaces.

Industrial hygiene data from our selective assessments, as well as from companies with in-plant monitoring, is maintained within a National Database for Noise and Chemical Exposure. This enables us to identify high-risk workplaces, evaluate trends in exposure levels and advise employers regarding control measures and appropriate monitoring programmes.

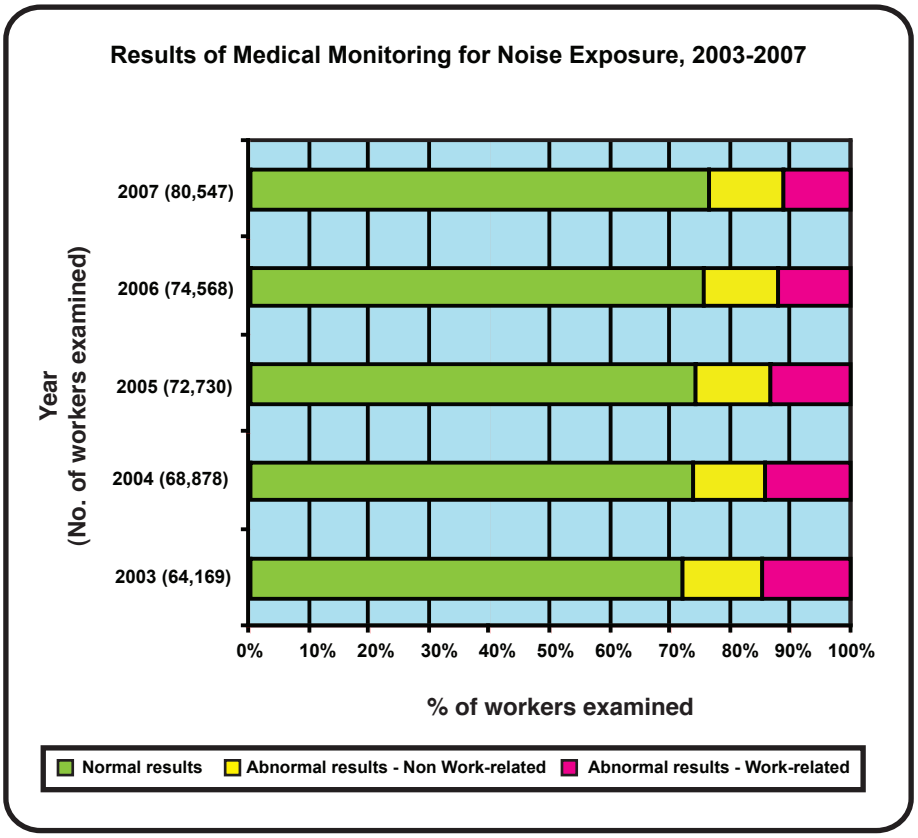
Workers' health status

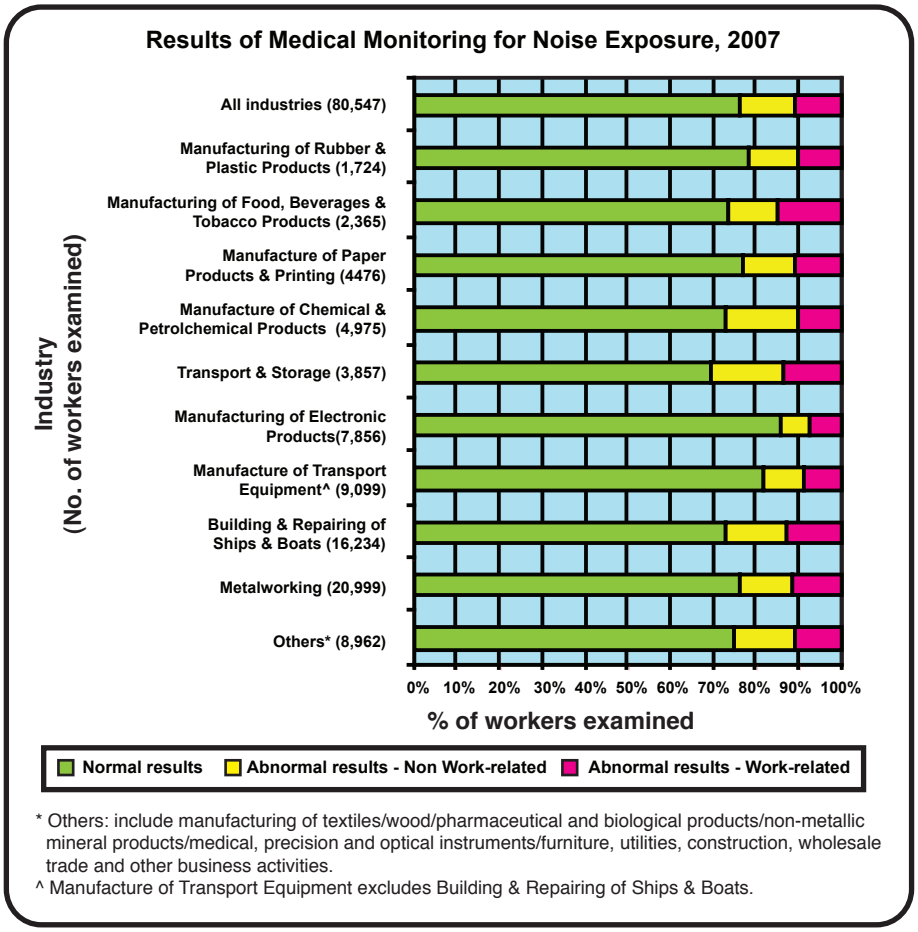
In terms of new work-related abnormal medical results, there was a decrease from 7.3 per 1,000 workers examined in 2006 to 5.4 in 2007.

Detection of work-related abnormal results among workers examined for exposure to noise came mainly from the metal working industries, and shipbuilding and ship repair industries. For exposure to chemicals, a total of 17 workers had biological levels exceeding 80% of the recommended biological threshold limit values (BTLV). This included six workers who were exposed to arsenic in a factory handling industrial waste and five who were exposed to inorganic lead in a lead stabilizer manufacturing factory.



EXPOSURE TO NOISE



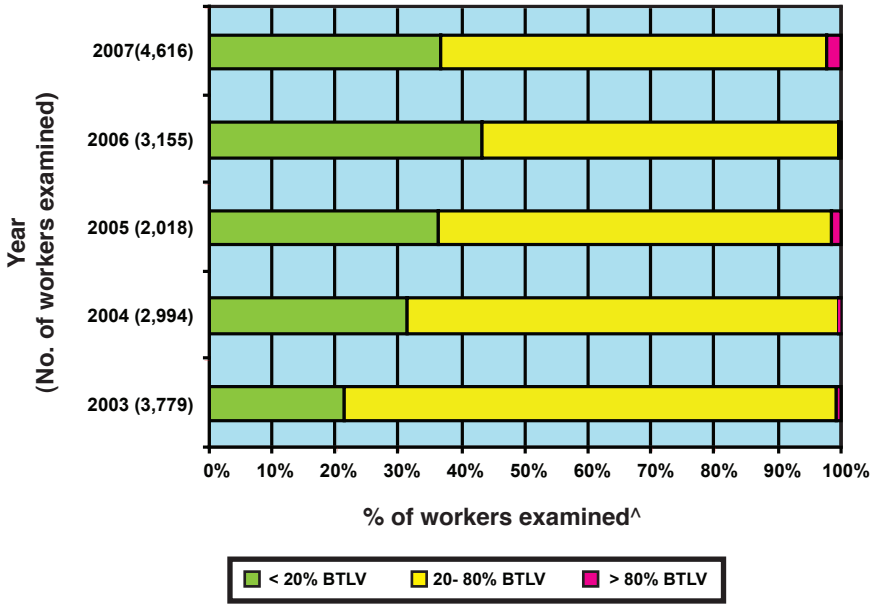


* Others: include manufacturing of textiles/wood/pharmaceutical and biological products/non-metallic mineral products/medical, precision and optical instruments/furniture, utilities, construction, wholesale trade and other business activities.

^ Manufacture of Transport Equipment excludes Building & Repairing of Ships & Boats.

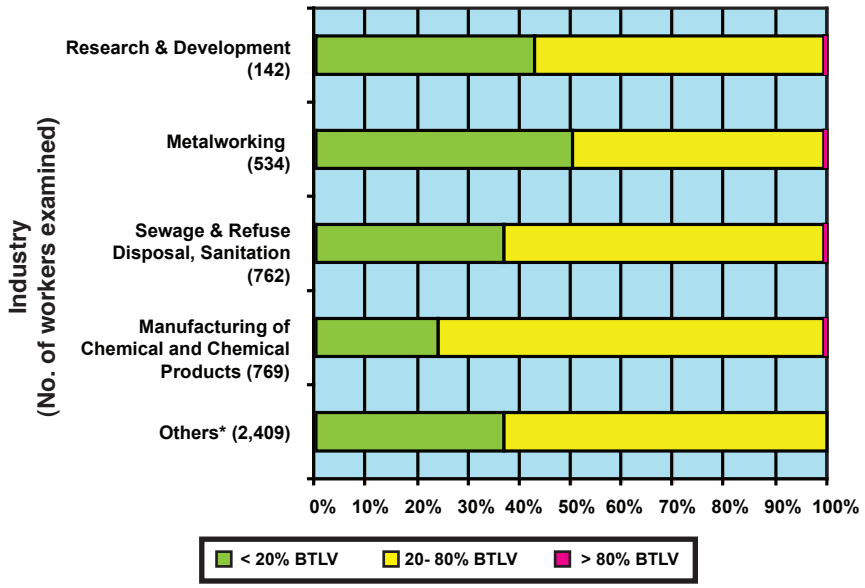
EXPOSURE TO CHEMICALS

Results of Biological Monitoring for Chemical Exposure, 2003-2007



^Excludes medical examinations where biological monitoring is not applicable, viz., chest x ray, lung function and skin examinations for asbestos, silica, raw cotton, tar, pitch and bitumen exposure.

Results of Biological Monitoring for Chemical Exposure, 2007



* Others: include manufacturing of food/beverages/tobacco/wearing apparel/wood/paper and paper products/printing/coke and refined petroleum products/pharmaceutical and biological products/rubber and plastic products/non-metallic mineral products/medical, precision and optical instruments/electronic products and components//transport equipment/furniture, other service activities, other business activities and construction.

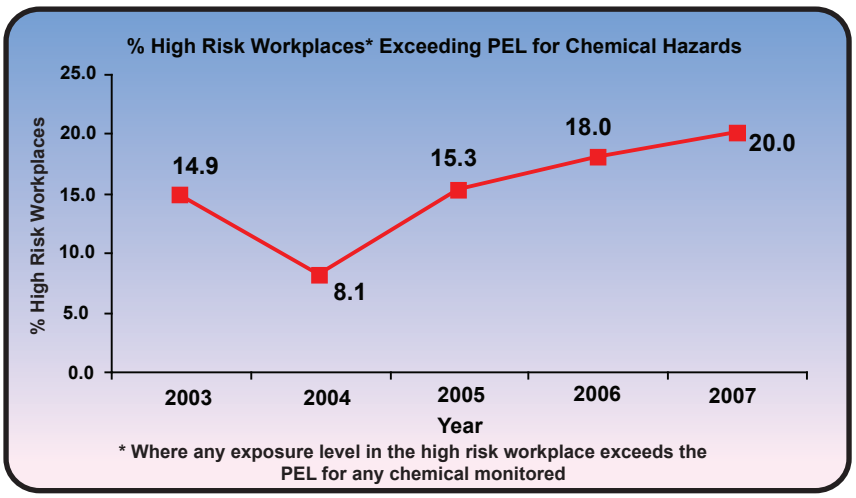
^Excludes medical examinations where biological monitoring is not applicable, viz., chest x ray, lung function and skin examinations for asbestos, silica, raw cotton, tar, pitch and bitumen exposure.

RECOMMENDED BIOLOGICAL THRESHOLD LIMIT VALUES (BTLV)

Hazard	Type of examination	BTLV
Arsenic & its compounds	Urine inorganic arsenic	300 mcg/L
Benzene	Urine s-phenylmercapturic acid (spma)	45 mcg/g creat
	Urine tt-muconic acid (ttma)	1.6 mcg/g creat
Cadmium & its compounds	Blood cadmium	5 mcg/L
Lead (inorganic)& its compounds	Blood lead	50 mcg/dl (male) 30 mcg/dl (female)
Lead (organic) & its compounds	Urine lead	150 mcg/L
Manganese & its compounds	Urine manganese	50 mcg/L
Mercury & its compounds	Urine mercury	50 mcg/L
Perchloroethylene	Urine trichloroacetic acid	7 mg/L
Perchloroethylene/Trichloroethylene mixture	Urine trichloroacetic acid	50 mg/L
Sodium silicofluoride	Urine fluoride	10 mg/L
Toluene	Blood toluene	0.05 mg/L
Trichloroethylene	Urine trichloroacetic acid	100 mg/L
Xylene	Urine methylhippuric acid	1.5 g/g creat

Chemical exposure levels

Overall, chemical exposure levels remained satisfactory. The percentage of high-risk workplaces which had excessive chemical exposure increased from 18% in 2006 to 20% in 2007. Efforts are ongoing to reduce chemical exposure in high-risk workplaces.

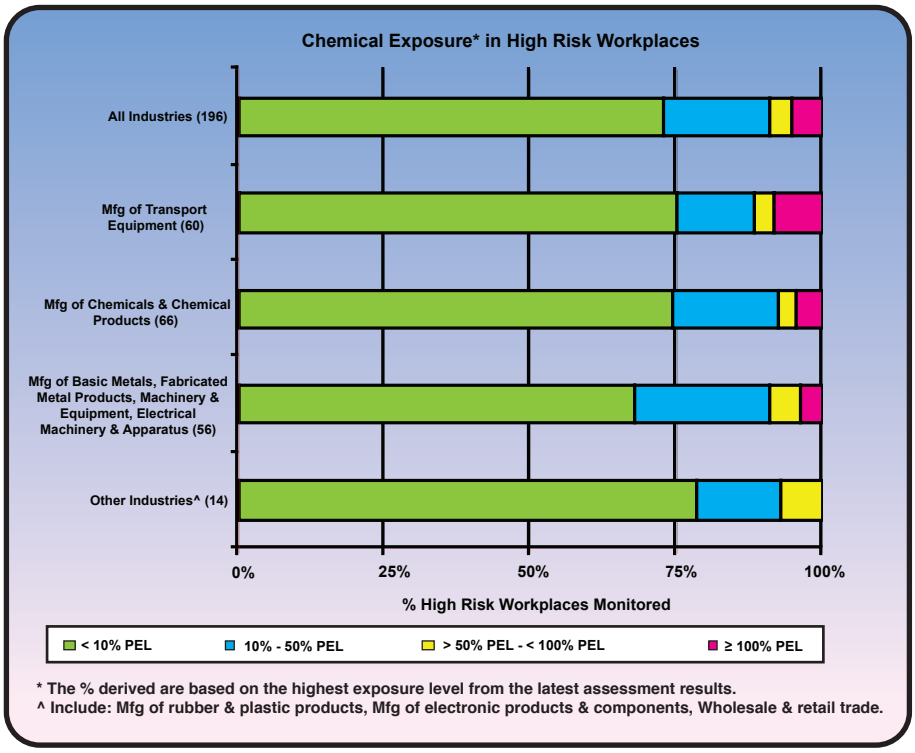


Our surveillance data indicate that workplaces with significant chemical exposure levels (of over 50% PEL), were largely from the following industries:

(1) Manufacturing of Chemicals and Chemical Products,

(2) Manufacturing of Basic Metals, Fabricated Metal Products, Machinery & Equipment, Electrical Machinery & Apparatus

(3) Manufacturing of Transport Equipment.



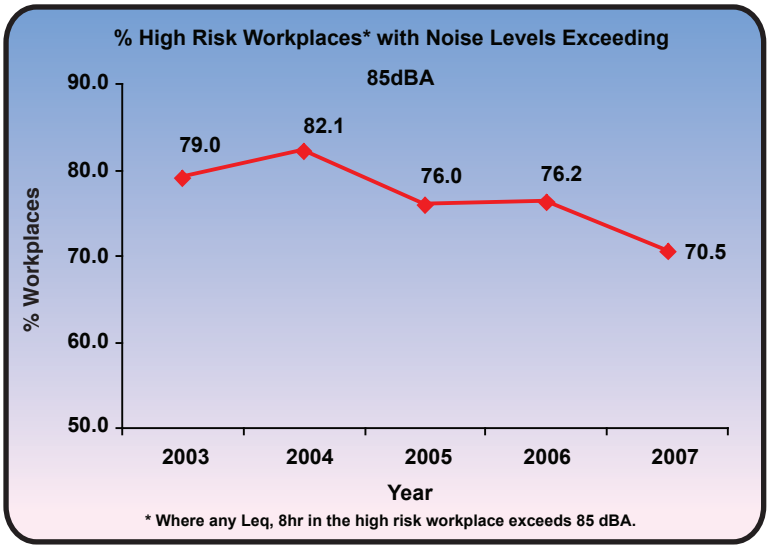
Air levels for benzene, toluene and xylene were lower in 2007 as compared to 2006. This was following our effort in assisting printing factories to implement engineering controls to reduce solvent exposure.

Significant increase in solvent levels was noted in factories that manufactured chemicals and chemical products, and transport equipment. The companies concerned were advised on the implementation of engineering controls, including local exhaust ventilation, and general ventilation improvements.

Noise exposure levels

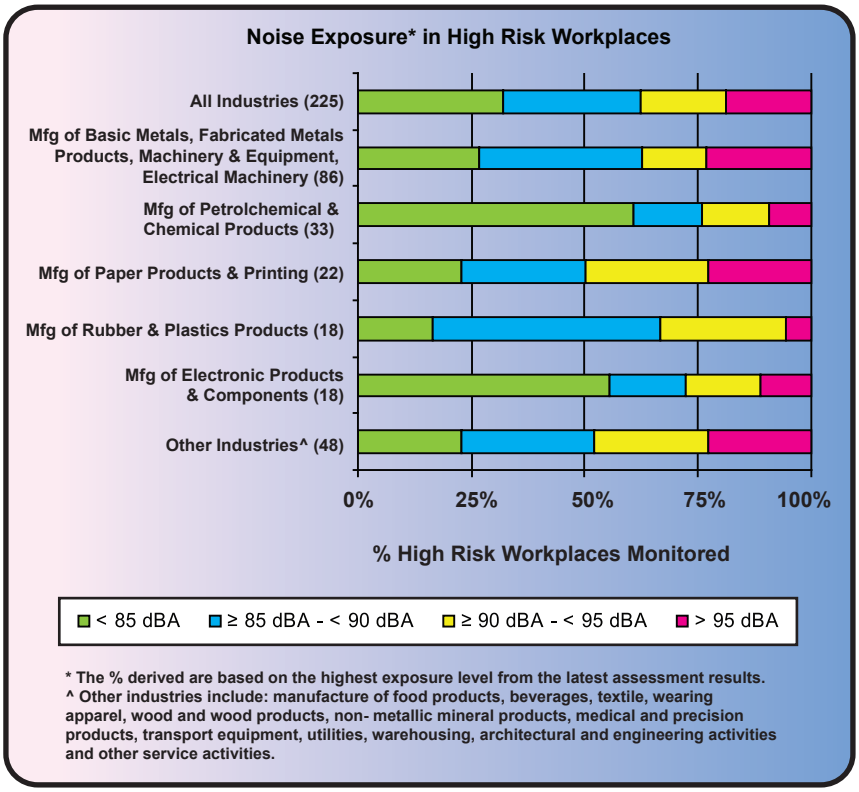
Under the Factories (Noise) Regulations, companies with 10 or more workers exposed to excessive noise are required to monitor the noise exposure at least once every three years.

The average noise levels in high-risk workplaces showed a slight decrease in 2007. This was mainly due to the reduction in noise exposure in the manufacture of transport equipment industry, following the successful implementation of engineering controls in workplaces involved in aircraft repair and aircraft components manufacture.



Our surveillance data indicate that workplaces with very high noise levels (90dBA and above) were largely from the following industries:

- Manufacturing of Electronic Products & Components
- Manufacturing of Rubber & Plastic Products
- Manufacturing of Paper Products & Printing
- Manufacturing of Petrochemical & Chemical Products
- Manufacturing of Basic Metals, Fabricated Metal Products, Machinery & Equipment, Electrical Machinery
- Other industries such as Manufacturing of Transport Equipment



Work Injury Compensation Report

In year 2007, OSHD received a total of 16,991 accident notifications under the Workmen's Compensation Act, an increase of 3.7% compared to 16,389 notifications in the preceding year.

The number of cases with compensation payable, including temporary incapacity assessed, in the same year was 14,927 with the total sum amounting to $71 million. This was a 2.7% decrease from $73 million in the previous year.

Chart 1 to 3 below show the number of accidents, number of cases with compensation payable and total amount of compensation assessed in the past 5 years.