



衛生防護中心  
Centre for Health Protection

# Non-Communicable Diseases Watch

Volume 2 Number 6 June 2009

## Health Tips

Any stress disorder can significantly affect people's day-to-day lives. While there is no one "standard" pattern of reaction to traumatic experiences, early recognition of the problem and seeking appropriate treatment from a doctor or mental health professional are important steps in an individual's road to a healthier life after experiencing a traumatic event.

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This publication is produced by the Surveillance and Epidemiology Branch, Centre for Health Protection of the Department of Health

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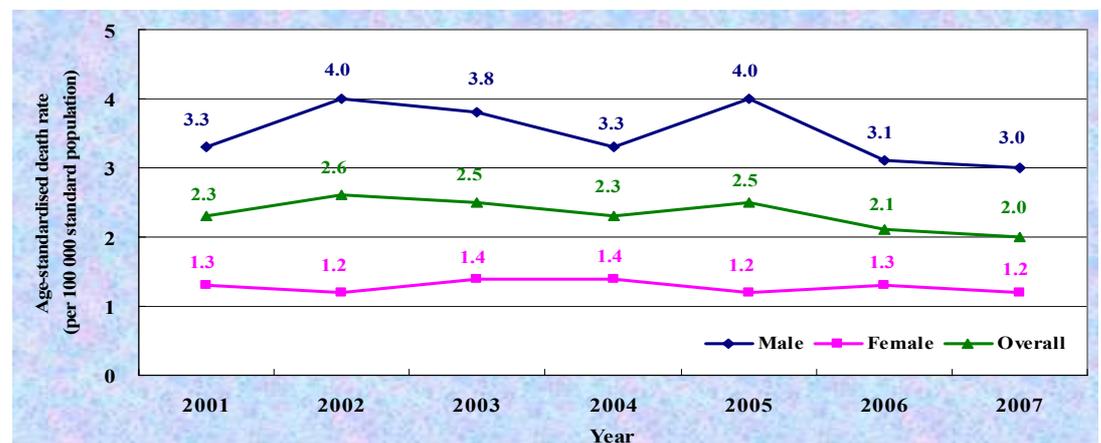
## Transport-related Deaths in Hong Kong: An Overview

Transport activities play a significant part in our life today as they provide us with access to goods and services, opportunities for individual mobility and better quality of life. They also contribute to economic and social development of our community. However, traffic accidents are a significant cause of injury death and serious morbidity with permanent disabilities. The World Health Organization (WHO) estimated that every year up to 1.3 million people around the world were killed in traffic accidents (including land, water and air transports) and many millions more were injured or incapacitated.<sup>1</sup>

In Hong Kong, there were 1 295 registered transport-related deaths between 2001 and 2007. When analysed by mode of transport, 1 203 (93%) of the registered fatalities were attributed to land transport accidents, 86 to water transport accidents, five to air transport accidents and one to unspecified mode. As shown in Figure 1, the overall age-standardised death rate (per 100 000 standard population) increased from 2.3 in 2001 to 2.6 in 2002, but decreased to 2.0 in 2007. While the rates fluctuated between 3.0 and 4.0 per 100 000 standard population in males, the corresponding rates in females remained stable at 1.2 to 1.4 over the 7-year period.<sup>2</sup>

While everyone is exposed to some degree of injury risk from transport, the adverse health effects fall disproportionately on certain groups of population.

**Figure 1: Age-standardised death rate attributed to transport-related injury by sex, 2001- 2007**



Source: Department of Health and Census and Statistics Department .

## Transport-related Deaths in Hong Kong: An Overview

Between 2001 and 2007, nearly 70% of the total registered deaths attributed to transport accidents happened in males (Table 1); about one in every three of the registered fatalities attributed to land transport accidents involved a person aged 65 and above (Table 2). Vulnerable road users including pedestrians, pedal cyclists and motorcycle riders accounted for 849 registered deaths attributed to land transport accidents, which was about 2.5 times as high as that in vehicle occupants (comprising

occupants of car, bus, pick-up truck, van or heavy vehicle with 340 registered deaths) over the 7-year study period. Regarding the water transport-related deaths, males and people aged 35-54 accounted for over 94.2% and 58.1% of all registered deaths attributed to water transport accidents between 2001 and 2007, respectively. Of five registered deaths attributed to air transport accidents, all were occupants of the aircraft aged 25-64 and 80% were males.<sup>2</sup>

**Table 1: Number of registered transport-related deaths by sex and mode of transport, 2001-2007**

Mode of transport	Male	Female	Total
<b>Land transport</b>	<b>817</b>	<b>386</b>	<b>1 203</b>
<i>Pedestrian injured in transport accident</i>	358	304	662
<i>Pedal cyclist injured in transport accident</i>	52	12	64
<i>Motorcycle rider injured in transport accident</i>	112	11	123
<i>Car occupant injured in transport accident</i>	202	45	247
<i>Occupant of pick-up truck or van injured in transport accident</i>	27	2	29
<i>Occupant of heavy transport vehicle injured in transport accident</i>	24	1	25
<i>Bus occupant injured in transport accident</i>	31	8	39
<i>Other land transport accidents</i>	11	3	14
<b>Water transport</b>	<b>81</b>	<b>5</b>	<b>86</b>
<i>Accident to watercraft causing drowning and submersion</i>	17	2	19
<i>Accident to watercraft causing other injury</i>	10	2	12
<i>Water transport-related drowning and submersion without accident to watercraft</i>	11	1	12
<i>Accident on board watercraft without accident to watercraft, not causing drowning and submersion</i>	39	0	39
<i>Other and unspecified water transport accidents</i>	4	0	4
<b>Air transport</b>	<b>4</b>	<b>1</b>	<b>5</b>
<i>Helicopter accident injuring occupant</i>	2	0	2
<i>Accident to commercial fixed-wing aircraft, injuring occupant</i>	2	1	3
<b>Other and unspecified transport accidents</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Total</b>	<b>903</b>	<b>392</b>	<b>1 295</b>

Sources: Department of Health and Census and Statistics Department .

## Transport-related Deaths in Hong Kong: An Overview



**Table 2: Number of registered transport-related deaths by age group and mode of transport, 2001-2007**

Mode of transport	14 and below	15-24	25-34	35-44	45-54	55-64	65 and above	Total
<b>Land transport*</b>	<b>39</b>	<b>140</b>	<b>163</b>	<b>174</b>	<b>146</b>	<b>125</b>	<b>414</b>	<b>1 203</b>
<i>Pedestrian injured in transport accident*</i>	26	19	33	52	72	79	379	662
<i>Pedal cyclist injured in transport accident</i>	6	4	5	7	13	18	11	64
<i>Motorcycle rider injured in transport accident</i>	0	38	44	24	13	4	0	123
<i>Car occupant injured in transport accident</i>	6	70	63	64	22	11	11	247
<i>Occupant of pick-up truck or van injured in transport accident</i>	0	5	8	7	5	4	0	29
<i>Occupant of heavy transport vehicle injured in transport accident</i>	0	2	4	7	10	1	1	25
<i>Bus occupant injured in transport accident</i>	1	1	5	8	8	7	9	39
<i>Other land transport accidents</i>	0	1	1	5	3	1	3	14
<b>Water transport†</b>	<b>1</b>	<b>3</b>	<b>13</b>	<b>28</b>	<b>22</b>	<b>12</b>	<b>4</b>	<b>86</b>
<i>Accident to watercraft causing drowning and submersion†</i>	0	1	2	4	2	6	1	19
<i>Accident to watercraft causing other injury</i>	1	0	2	5	2	2	0	12
<i>Water transport-related drowning and submersion without accident to watercraft</i>	0	1	3	4	3	0	1	12
<i>Accident on board watercraft without accident to watercraft, not causing drowning and submersion</i>	0	1	6	15	12	4	1	39
<i>Other and unspecified water transport accidents</i>	0	0	0	0	3	0	1	4
<b>Air transport</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>5</b>
<i>Helicopter accident injuring occupant</i>	0	0	2	0	0	0	0	2
<i>Accident to commercial fixed-wing aircraft, injuring occupant</i>	0	0	0	1	1	1	0	3
<b>Other and unspecified transport accidents</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Total§</b>	<b>40</b>	<b>144</b>	<b>178</b>	<b>203</b>	<b>169</b>	<b>138</b>	<b>418</b>	<b>1 295</b>

Notes: \* Total included 2 fatalities with unknown age. † Total included 3 fatalities with unknown age. § Total included 5 fatalities with unknown age.

Sources: Department of Health and Census and Statistics Department .

## Transport-related Deaths in Hong Kong: An Overview

In many countries, transport injuries are a major cause of death. The non-fatal consequences are also severe with millions of people requiring medical attention. Many become permanently disabled as a result of the incident. However, many transport accidents are avoidable, and as such the majority of injuries, disability or deaths could be prevented. Tackling this important public health issue entails integration of actions across the board to address all aspects of the traffic system including the design and operation.<sup>3</sup> In Hong Kong, road crashes account for most fatal transport accidents (92.9% of all registered transport-related deaths between 2001 and 2007), reflecting that greater attention should be given to road safety. For preventing road traffic injury, it would involve making vehicles safer, better road infrastructure, along with legislation and enforcement to improve road users' behaviour. In fact, nine out of 10 of road crashes worldwide are preventable simply by modifying behaviours, such as speed reduction, drinking or drugs control, helmet wearing, safety belt use and reducing driver fatigue (Box 1).<sup>3,4</sup> Besides, crossing road safely is a discipline that every road users should develop. When crossing roads, all road users (including pedestrians, bicyclists, motorcyclists, drivers and passengers) should follow the Road Users' Code which is prepared by the Transport Department (TD) for all road users. The book contains a wide range of rules and advice for all types of road users covering most road and traffic conditions. To access the Road Users' Code and other road safety tips, please visit TD's website at <http://www.td.gov.hk>.

### Box 1: Road users' behaviours influencing crashes involvement and severity<sup>3</sup>

#### Effects of speed

- ※ An average increase in speed of 1 km/h is associated with a 4-5% increase in the incidence of a fatal crash.
- ※ In crashes at 80 km/h, the likelihood of death for car occupants is 20 times as high as those at 30 km/h.
- ※ For pedestrians, the probability of being killed rises by a factor of eight as the impact speed of the car increases from 30 km/h to 50 km/h.

#### Effects of alcohol

- ※ For the general driving population, the relative risk of crash involvement starts to increase significantly at a blood alcohol concentration (BAC) of 40mg per 100ml of blood.
- ※ For single-vehicle crashes, each 0.02% increase in BAC level approximately doubles the risk of involvement in a fatal crash.

#### Effects of helmet wearing and safety belt use

- ※ Non-helmeted users of motorized two-wheelers are three times more likely to sustain head injuries in a crash compared to those wearing helmets.
- ※ Wearing seat belts correctly can reduce the risk of death in a crash by about 60%.
- ※ The use of child restraints can reduce infant deaths in car crashes by 71% and toddlers deaths by 54%.

#### Effects of driver fatigue

- ※ Driver fatigue is a factor in about 20% of commercial transport crashes, or 30% of fatal crashes involving heavy commercial transport.

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## Emotional Toll of Road Traffic Crashes

Road traffic accidents are a part of everyday life. Every day thousands of children, men and women were injured or even killed on the roads while they were travelling in the vehicles as passengers, driving, riding, biking, walking to school or work, playing outdoors or setting out on long trips. The World Health Organization estimated that over 1.2 million people around the world lost their lives annually as a result of road traffic accidents, and the number injured could be as high as 50 million.<sup>1</sup> In addition to causing death and physical disability, road traffic crashes can also have profound psychological and social impacts on those surviving, being involved in or merely witnessing the tragic event.

It may be normal for individuals involved in road traffic crashes to have some immediate negative psychological responses (such as fear, anxiety, depression, guilt or anger) and a brief period of difficulty adjusting and coping after the traumatic event. However, many victims develop acute stress disorder (ASD) within the first month of the traumatic event and/or post-traumatic stress disorder (PTSD) with a group of significant symptoms that can last for months or even years (Box 2).

### Box 2: Characteristic symptoms of traumatic stress disorder<sup>2</sup>

**Dissociation with respect to the trauma**, such as feeling of unreality or emotional numbing

**Re-experiencing the phenomena**, such as through recurrent distressing thoughts, upsetting feelings, “flashbacks” or nightmares

**Avoidance of activities or other reminders of the traumatic events**, such as self-imposed limitations on driving (e.g. only in daylight or only on city streets), avoidance of travelling in vehicles, unwillingness to cross roads, unwillingness to cycle or walk near the site of the accident

**Increased arousal**, such as difficulties with sleep or concentration, hypervigilance, exaggerated startle response or increased motor restlessness

The author Charles Dickens suffered from various traumatic stress symptoms after witnessing a tragic rail accident outside of London.<sup>3</sup>



### Prevalence of Traumatic Stress Disorder

A British study on 188 consecutive road traffic accident survivors aged 18-70 with multiple injuries (motorcycle or car) or whiplash neck injury observed that almost one-fifth (18%) of subjects had an acute stress syndrome characterised by anxiety or depression together with ‘horrific’ memories of the accident.<sup>4</sup> Another study on 27 in-patients and 176 out-patients following a road traffic accident reported that about 11% of in-patients and 25% of out-patients met the symptom criteria for ASD at initial assessment. During the first 4 weeks following the accident, the percentage of in-patients and out-patients diagnosed with ASD was about 13% and 10%, respectively.<sup>5</sup> For PTSD, it is common among motor vehicle accident survivors as well. A prospective longitudinal study, which assessed about 1 000 consecutive vehicle passengers or drivers, motorcyclists, bicyclists and pedestrians aged 17-69 years who had attended a general hospital emergency department shortly after a motor vehicle accident, reported that the prevalence of PTSD was 23%, 17% and 11% at 3 months, 1 year and 3 years respectively.<sup>6,7</sup>

Children, like adults, can also develop traumatic stress disorder after experiencing or witnessing a traumatic event. While individual children react in different ways, many may find it hard to sleep or have bad dreams and nightmares immediately after the event. Sometimes, the effects may not appear for days or weeks. However, as time goes on, the children become fearful or anxious about being separated from their parents, start bedwetting or

## Emotional Toll of Road Traffic Crashes

thumb-sucking again, become disobedient and irritable, or complain of physical symptoms (such as headaches and stomach-aches). Such abnormal reactions, stress symptoms or anxious feelings can last for months and interfere with the children's daily living considerably.<sup>8</sup> A study, which assessed traumatic stress symptoms in 57 children two days to two weeks after the child was injured in a traffic crash, observed that 18% had moderate to severe stress symptoms; another 17% had mild symptoms.<sup>9</sup> One prospective cohort study on 97 children aged 5-17 who were involved in motor vehicle crashes, motor vehicle-pedestrian crashes, motor vehicle-bicyclist crashes and bicycle falls reported that 88% had at least one of the four ASD symptom categories (dissociation: 78%; re-experiencing: 51%; avoidance: 53%; arousal: 53%). Overall, 28% had experienced at least one clinically significant symptom in every category.<sup>10</sup> A one-year cohort study of 86 children aged 5-16 who were passengers, pedestrians or cyclists involved in a road traffic accident and were taken to the emergency department reported that 15% met the criteria for ASD. While 29% had PTSD at some stage, 25% had the disorder at 3 months and 18% at 6 months. Besides, the study identified 37% and 34% of subjects who had symptoms of phobic travel anxiety (such as feeling distress when in cars, showing unwillingness to cycle or cross roads) at 3 and 6 months, respectively.<sup>11</sup>

In Hong Kong, an earlier study on 596 survivors of motor vehicle accidents who required medical attention also reported that 5-20% of the participants had a significant level of posttraumatic stress within 6 months after a motor vehicle accident.<sup>12</sup> Consistent with other studies<sup>13,14</sup>, survivors with significant acute stress 1 week after the motor vehicle accident had a higher risk of developing PTSD.<sup>12</sup> In addition, a survey conducted in April 2008 and telephone-

interviewed over 500 people of Hong Kong aged 18 or above found that 23% of the respondents and/or their family members had experienced road traffic accident(s). Among them, 26% claimed to have suffered from psychological distress caused by it.<sup>15</sup>

Other than traffic accidents, anyone who has gone through a life-threatening event can develop ASD or PTSD. These events include natural disasters (such as fire, flood or earthquake), military exposure or combat, sexual abuse, physical assault or terrorist attacks.



## Coping and Support

Any stress disorder can significantly affect people's day-to-day lives, including their ability to work, relationship with others, and opportunities to enjoy social activities. While there is no one "standard" pattern of reaction to traumatic experiences, early recognition of the problem and seeking appropriate treatment from a doctor or mental health professional are important steps in an individual's road to a healthier life after experiencing a traumatic event. Of note, people do not have to be physically hurt to get traumatic stress disorder; and the disorder can happen in people of any age. However, such emotional illness can be treated by "talking" and other psychotherapy methods, along with medications if indicated. There are government and non-governmental organizations (such as Hospital Authority, Mental Health Association of Hong Kong, and Integrated Family Service Centres operated by the Social Welfare Department and Subvented Non-government Organizations) which provide information, counselling and other relevant psychological services (Box 3).

## Emotional Toll of Road Traffic Crashes

### Box 3: Useful Phone Numbers

24-hour Mental Health Hotline of the Hospital Authority: 2466 7350

Mental Health Phone Line Service of the Mental Health Association of Hong Kong: 2772 0047

Hotline Service of the Social Welfare Department: 2343 2255

Central Health Education Hotline of the Department of Health: 2833 0111

Recovery from the disorder is an ongoing process. Drinking alcohol or misusing other drugs will not help but may even make things worse. Other than getting help from relevant health professionals, there are some healthy steps people can take to enhance coping and help restore emotional well-being. These include:

- ◆ **get enough rest and sleep;**
- ◆ **have regular meals and eat a balanced diet;**
- ◆ **exercise regularly;**
- ◆ **stay connected with supportive family and caring friends;**
- ◆ **pursue a hobby or other enjoyable activities;**
- ◆ **learn and practise some relaxation techniques, such as deep breathing exercise, Yoga or Tai Chi;**
- ◆ **avoid smoking and refrain from stimulating drinks such as coffee.**

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## News Bites

While biological findings suggested a plausible pathway from severe or chronic stress exposure to obesity through the release of a specific neuropeptide that could trigger the proliferation of pre-adipocytes and maturation in adipocytes, a prospective community-based study found an association between posttraumatic stress disorder (PTSD) and obesity.

The study included a representative urban Germany community sample of over 3 000 adolescents and young adults aged 14-24 whose mental health status were assessed for four times between 1995 and 2005. From the cross-sectional analyses, there was a significant association between obesity and lifetime PTSD among women (odds ratio (OR)=4.3; 95% confidence interval (CI)=2.1-8.7), but not for men (OR=1.9; 95% CI=0.8-4.6). Furthermore, prospective longitudinal analyses from 4-year follow-up to 10-year follow-up confirmed that PTSD significantly predicted obesity among women (OR=3.0; 95% CI: 1.3-7.0), but not among men (OR=1.7; 95% CI: 0.3-8.9).

In consistent with clinical observational studies which reported higher rates of obesity in military veterans with PTSD, this community-based study also found significant associations between PTSD and obesity, particularly among women.

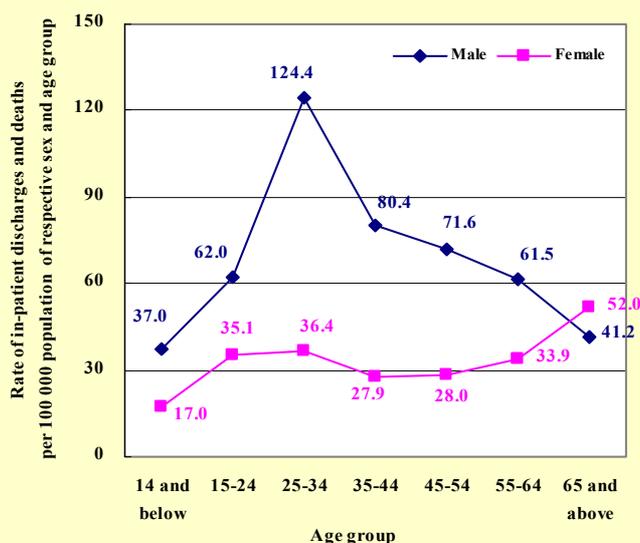
[Source: Perkonigg A et al. Posttraumatic stress disorder and obesity: evidence for a risk association. *Am J Prev Med* 2009; 36(1): 1-8.]



## Data Brief

In Hong Kong, there were 3 468 (2 282 for males and 1 186 for females) episodes of in-patient discharges and deaths attributed to land transport accidents in public and private hospitals in 2007, giving an overall in-patient discharges and deaths rate of 50.1 per 100 000 population (69.4 per 100 000 male population and 32.6 per 100 000 female population). When analysed by age group, males aged 25-34 and females aged 65 and above had a higher rate of in-patient discharges and deaths due to land transport accidents than their respective counterparts.

**Rate of in-patients discharges and deaths attributed to land transport accidents, 2007**



Sources: Hospital Authority, Department of Health and Census and Statistics Department.

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**Non-Communicable Diseases (NCD) WATCH** is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community.

The Editorial Board welcomes your views and comments. Please send all comments and/or questions to [ro\\_dp3@dh.gov.hk](mailto:ro_dp3@dh.gov.hk).