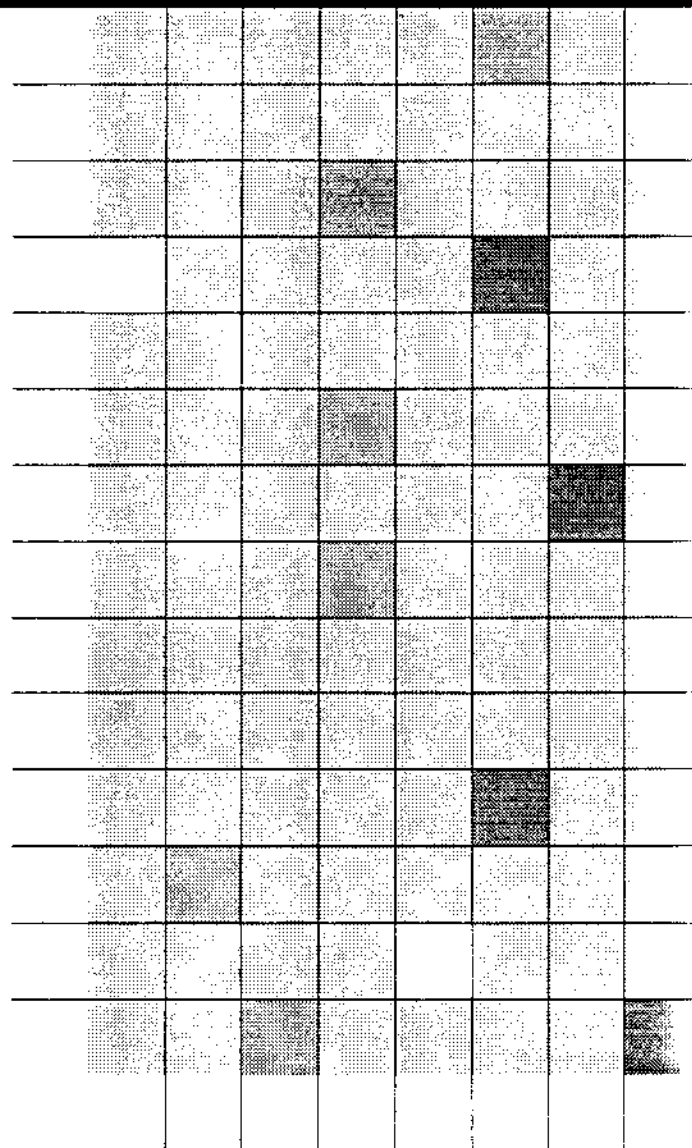




**INJURIES** *(with particular reference to Head Injuries)*



*Information Circular No. 19*

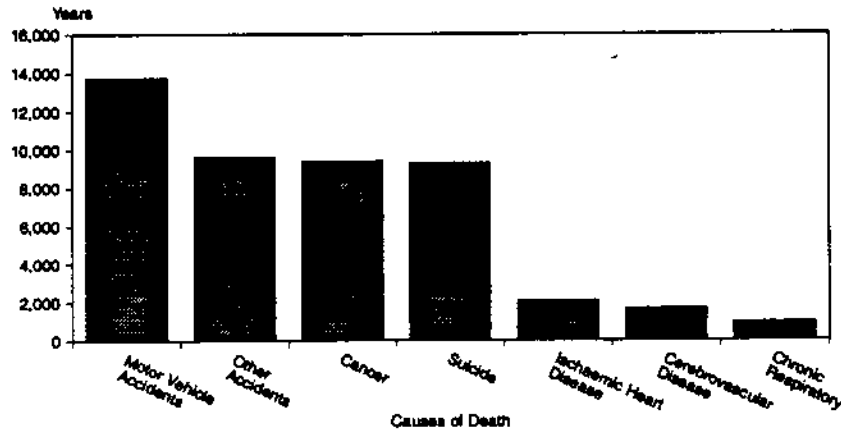


**EPIDEMIOLOGY AND HEALTH INFORMATION BRANCE**  
**HEALTH ADVANCEMENT BRANCE**

## MORTALITY

- Accidental injury and suicide are the leading causes of premature death in Queensland (Figure 1). Death due to all injuries (accidents and suicide) in 1989 represented 52% of years of potential life lost up to the age of 46 years.

**Fig.1: Causes of death<sup>a</sup> in terms of years of potential life lost<sup>b</sup> to age 46 years, Queensland, 1989**

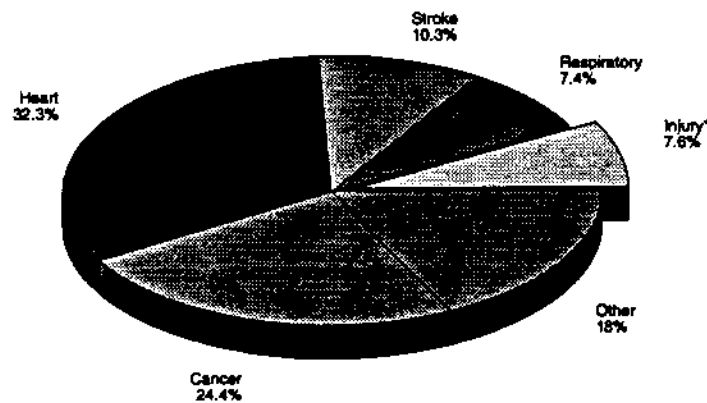


- Only major causes of death shown.
- Years of Potential Life Lost were calculated for deaths of persons aged 1 to 45 years based on average life expectancy of 46 years. Assumes that up to age 46 years, decedent would not have died from other causes.

Source: Epidemiology and Health Information Branch, Queensland Health

- Injury ranked as the number 4 cause of death in Queensland in 1990 causing 7.6% of deaths (Figure 2).

**Fig.2: Major causes of death, Queensland, 1990**

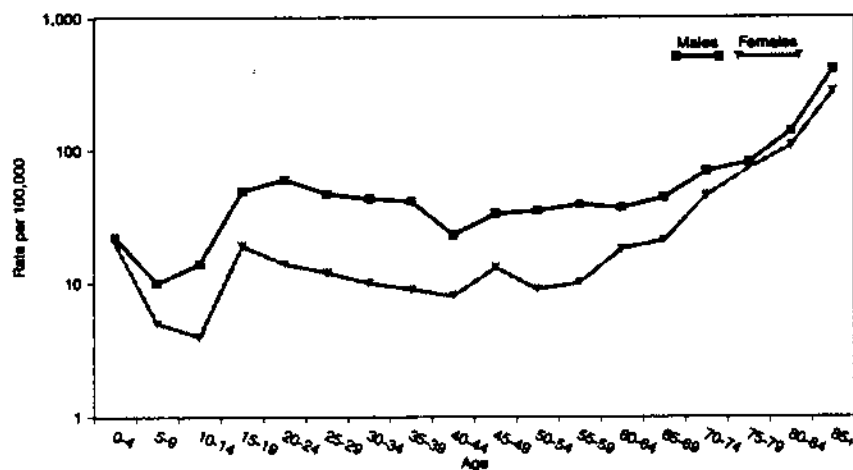


\* ICD codes E800-E999

Source: Deaths, Queensland, 1990 Cat. No 3312.3

- The rate of fatal injuries in Queensland in 1984-88 was 6% higher than the Australian average<sup>1</sup>.
- Motor vehicle accidents were the greatest single contributor to fatal injury (30% of deaths from external causes) in Queensland in 1989 followed closely by suicide (28%)<sup>2</sup>. Of 1991 Queensland road traffic crash fatalities, 69% were vehicle occupants, 17% pedestrians, 10% motorcyclists, and 4% bicyclists<sup>3</sup>.

**Fig.3: Accidents\*, age specific mortality rates, Queensland, 1989-1991**

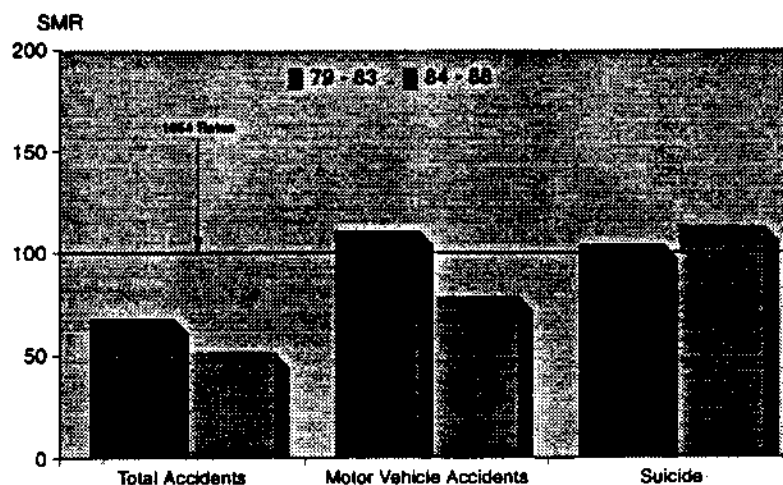


\* ICD codes 800-929.9

Source: Mortality Collection, Epidemiology and Health Information Branch, Queensland Health

- Injury mortality is age and sex dependent (Figure 3). There are 3 peaks in the age specific mortality rates:
  1. Early childhood (0-4 years) - drowning is the major cause of death.
  2. Adolescence / Early Adulthood (15-24 years) - motor vehicle accidents are the major cause.
  3. Elderly (>70 years) - falls are the major cause.
- Male injury death rates are higher than female rates at all ages .
- Injury mortality rates have been declining since the early 1970s. The decline in total accident fatalities parallels the decline in motor vehicle accident fatalities (Figure 4). This probably represents the impact of road safety strategies. The Queensland Transport report<sup>3</sup> noted that between 1986 and 1991, the largest decrease has been for motorcycle riders with the number of deaths halving.
- The rising trends in suicides have been discussed in Information Circular no. 13.

**Fig. 4: Standardised\* mortality ratios, Queensland, 1979-83 & 1984-88**



\* Indirect standardisation to the 1984 Queensland population

Source: Epidemiology and Health Information Branch, Queensland Health

## MORBIDITY

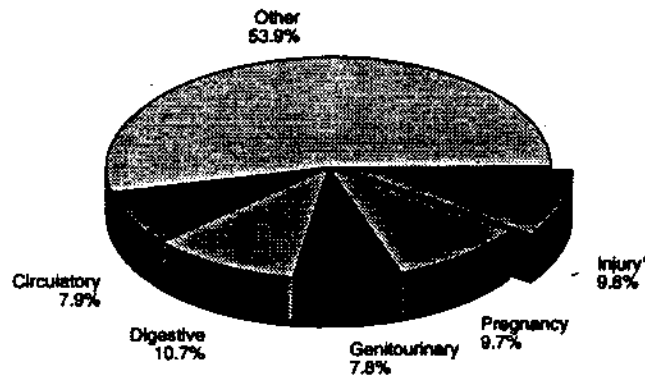
- ❑ The community prevalence of recently experienced injury and poisoning was reported as 10.1% in Queensland in the 1989/90 National Health Survey (NHS)<sup>4</sup>.
- ❑ In Queensland, injury ranked second as a cause of recent ill-health in the 2 weeks preceding the NHS interview<sup>5</sup>.
- ❑ The prevalence of recent injury in Queensland was 32.7% above the Australian average<sup>6</sup>. The prevalence of recent injury was higher than the Australian average in both Brisbane and rural/provincial Queensland.
- ❑ Queensland 1990 hospital data shows injury admissions rank second after admissions for digestive disorders (Figure 5).
- ❑ Falls caused 25% of injury related admissions to hospital in Queensland in 1990. This was the leading cause of injury admissions with motor vehicle accidents resulting in 14% of the injury related admissions<sup>7</sup>.

## PATTERNS OF INEQUALITY

### 1. Sex Differential

- ◆ The main differential is the higher injury mortality rates in males which ranges from 2 to 4.5 times higher than the female rate between the ages of 5 years and 69 years. (Fig 3)

**Fig.5: Major causes of hospitalisation, Queensland, 1990**



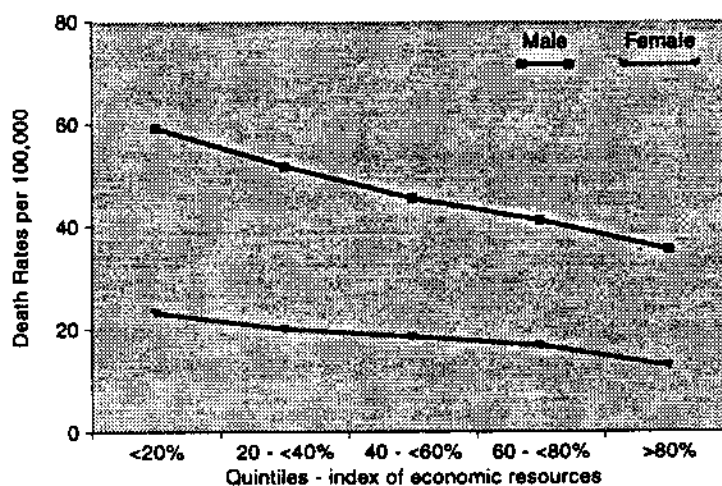
\* ICD codes 800-999

Source: ABS, Hospital Morbidity Queensland, 1990, Cat. No. 4303.3

## 2. Socioeconomic Status

- ♦ Mortality due to accidents shows a clear gradient of risk across all socio-economic groups.(Fig 6)
- ♦ For deaths from all accidents, the most disadvantaged groups have 66% higher mortality for males and 75% higher mortality for females when compared to the most advantaged group (Figure 6).
- ♦ When accident subgroups are examined, the socio-economic differential is seen for both sexes in the mortality pattern due to motor vehicle

**Fig.6: Standardised\* death rates for accidents by socio-economic status, Queensland, 1984-88**



\* Directly standardised to the world population

Source: Epidemiology and Health Information Branch, Queensland Health

accidents. For mortality due to falls, the socio-economic differential is not so pronounced<sup>8</sup>.

### 3. Aboriginal and Torres Strait Islanders (ATSI)

- ♦ Injury ranks second as a cause of death in ATSI males and third for ATSI females<sup>9</sup>.
- ♦ In Queensland areas where the ATSI population is greater than 50% of the area population, the 1979-88 ATSI death rates were higher than the Queensland average. For accidents, excluding motor vehicles, ATSI male mortality was 3.2 times higher than the Queensland male rate and the ATSI female mortality was 2 times higher<sup>1</sup>.

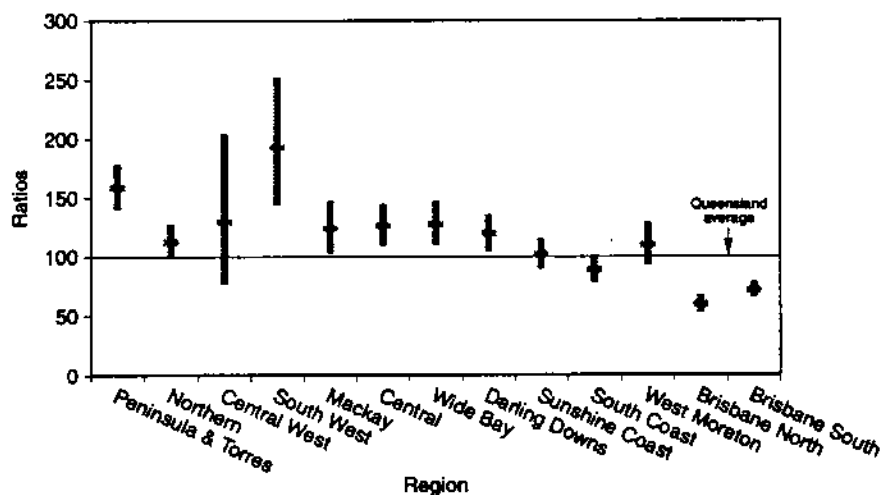
### 4. Non English Speaking Background (NESB) Groups

- ♦ NESB women were twice as likely as other women to experience accidents in the home<sup>10</sup>.
- ♦ The four most common injuries in order of frequency were scalding, falls involving the head, burns and bad cuts.

### 5. Rural and Provincial Areas

- ♦ In Queensland between 1986-1991, the injury mortality rates were higher in rural and provincial areas.
- ♦ For motor vehicle related injuries, the death rates were higher than the Queensland average for most rural and provincial regions outside the Brisbane, South and Sunshine Coast areas (Figure 7).

**Fig.7: Motor Vehicle Accidents\*, standardised mortality ratios, Queensland, 1986-91**



\* ICD codes E810-E825.9

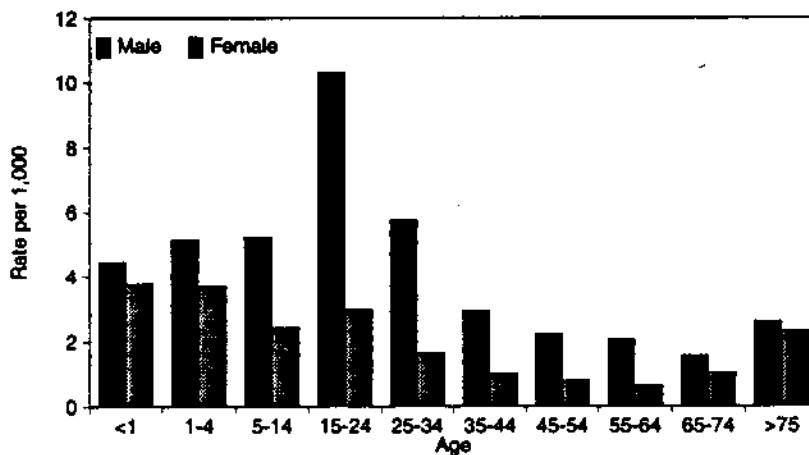
Source: Mortality Collection, Epidemiology and Health Information Branch, Queensland Health

# HEAD INJURY - An Example

## 1. Morbidity

- Age specific hospitalisation patterns are shown for head injury, motor vehicle accidents, and falls (Figures 8-10).

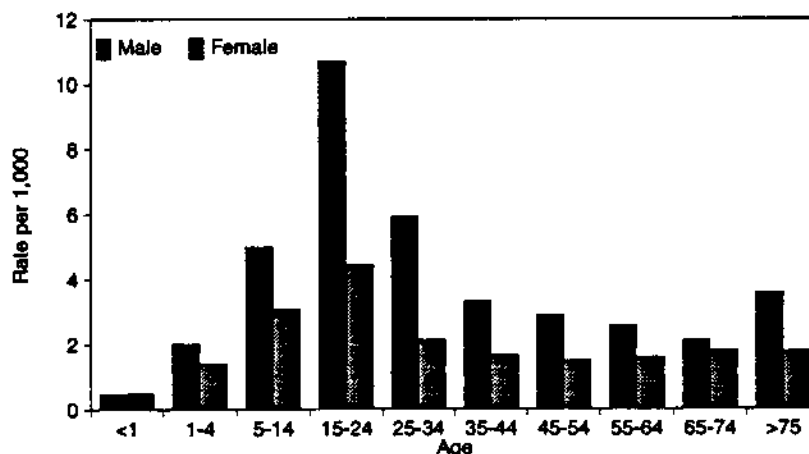
**Fig.8: Head Injury\*, age specific separation rates, Queensland, 1990**



\* ICD codes 800-804, 850-854

Source: ABS Hospital Morbidity, 1990, Cat. No. 4303.3

**Fig.9: Motor vehicle accident\*, age specific separation rates, Queensland, 1990**

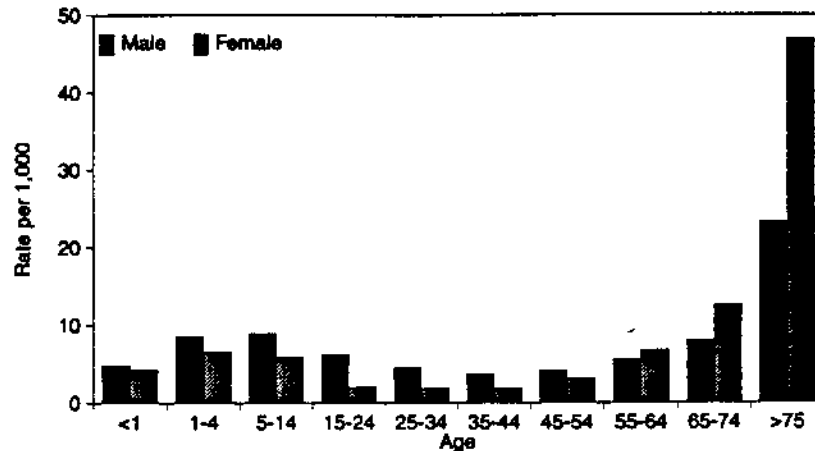


\* ICD codes E810-E828

Source: ABS Hospital Morbidity, 1990, Cat. No. 4303.3

- Head injury and motor vehicle accident rates peak in males aged 15-24 years. The morbidity rates from falls are highest in elderly persons, especially women.

**Fig.10: Falls\*, age specific separation rates, Queensland, 1990**



\* ICD codes E880-E888

Source: ABS Hospital Morbidity, 1990, Cat. No. 4303.3

- ◆ In a Brisbane study, head injuries due to falls were responsible for 42% of admissions to hospital whereas head injuries related to traffic accidents caused 34% of admissions<sup>11</sup>.
- ◆ Traumatic brain injuries are the cause of 200-300 hospital admissions in a population of 100,000 every year in Western countries<sup>12</sup>. Many of these admissions are for milder head injuries requiring more limited hospital stays for observation only.
- ◆ The incidence of severe head injury is approximately 5% to 10% of this hospital caseload. Clinical experience indicates that of the hospitalised severe head injury group at 3 months, approximately 33% have died, 35% to 40% are classified as having a good outcome but some may have higher level cognitive and psychosocial disabilities, and 25 to 33% are left with significant permanent disabilities<sup>11</sup>.
- ◆ This is consistent with the 100 new cases presenting to the Specialist Head Injury Rehabilitation Unit at Princess Alexandra Hospital each year<sup>11</sup>.

## 2. Mortality

- ◆ In the Brisbane study, traffic accidents were responsible for more severe head injuries being associated with a 5.6% case fatality at 3 months whereas mortality due to head injuries related to falls was 3.7%<sup>11</sup>.



- ♦ It has been estimated that each year, over 300 deaths in Queensland are attributable to a head injury<sup>11</sup>.
- ♦ The first report of the Trauma Subcommittee of the Neurological Society of Australasia concluded that neurotrauma was the single most important cause of death in the first half of life. Neurotrauma was the cause of 70% of all road accident deaths and 50% of all accidental deaths<sup>13</sup>.
- ♦ In the hospital based NSW study of neurotrauma patients in 1977-78, preventable factors were studied and the large majority were due to delay in instituting treatment or inappropriate hospital transfer<sup>14</sup>.

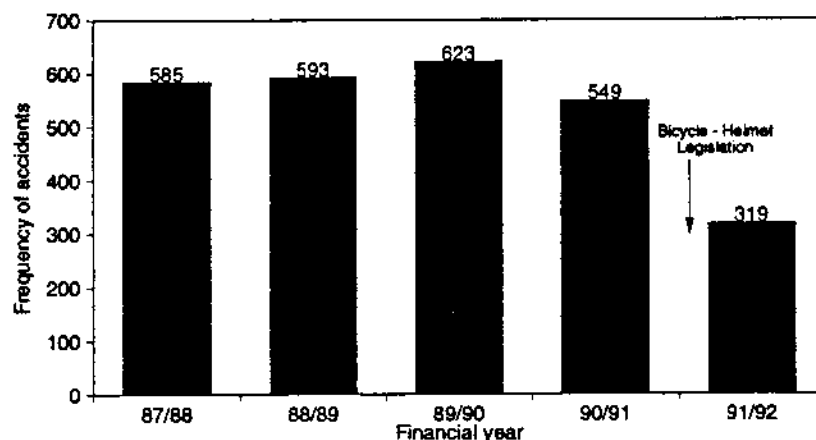
## **THE QISPP DATABASE**

- The Queensland Injury Surveillance and Prevention Project (QISPP) provides information collected in the Accident and Emergency Departments of 7 SE Queensland hospitals and is available in the form of a software package. Systems are available for implementation at a regional or hospital level.
- The QISPP surveillance data is important because it identifies the actual mechanism of injury, e.g. if it were a fall on a wet floor, or a fall down steps, the specific location of the injury, e.g. which room in the house, the time and data on a product if it was responsible for the injury. From a prevention perspective, this information is vital in developing programs relevant to a specific problem.
- Injuries which are not fatal nor admitted to hospital are still an important issue for cost containment. Ms D Jones, State Coordinator, QISPP has developed a hazard scoring system which ranks non-fatal injury factors according to frequency and severity.
- The Hazard Score System was applied to a subset of head injuries reported to QISPP in 1992 excluding those sustained in road traffic accidents (pedestrians, cyclists, motor bike riders and vehicular occupants).
- The factor contributing most frequently to head injuries was football in this sample.
- The hazard score system ranked steps and stairs as a priority area for the prevention of non-road traffic head injury, followed by alcohol, football, beds and nursery equipment.
- This hazard score ranking correlates closely with the cost rankings on the same sample data.

## 1. Road Safety Programs

- ♦ Road Safety programs have made important contributions to the decline in road crash fatalities with a variety of strategies including seat belt, safety helmet, drink driving legislation, improved motor vehicle design standards and road/traffic engineering improvements. Figure 11 shows the impact of bicycle helmet legislation in South Australia demonstrating a 45% reduction in bicycle-related head injuries following the introduction of legislation<sup>15</sup>.

**Fig.11: Frequency of bicycling accidents requiring hospitalization in South Australia (first 10 months of the financial years between 1987/88 & 1991/92)**



Source: 1992 Annual Report Epidemiology Branch  
South Australia Health Commission p.56

## 2. Strategic Approach: Example of head injuries in the home

- ♦ The Health Sector which incurs much of the cost of injury needs to take more of a lead role in preventing injury.
- ♦ Having identified an issue of concern, whether it be a state, regional or local problem, the challenge is how to address that problem given the resources available. The first step is to look at the issue under the "five E's". This is a variation of the three E's developed by the Child Accident Prevention Trust (U.K.)

### Engineering, Enforcement, Education, Environment, Evaluation

- ♦ One cause of head injuries in children under 5 years old is falls from nursery furniture. Taking high chairs as an example, the five E's can be used in the following manner:

### ***Engineering***

- ♦ Design of chair, e.g. base stability, entrapment areas, permanent fixed shoulder harness. Engineers, designers, Australian Standards, Consumer Affairs, paediatricians, advocacy groups, Child Accident Prevention Foundation Australia (CAPFA), Health, Early Childhood Association etc all need to be involved.

### ***Enforcement***

- ♦ Ensure only "safe" designs are to be imported and sold at retail outlets. Legislators, standards groups, Health, Consumer Affairs, Trades Association etc have this responsibility.

### ***Education***

- ♦ Education programs at various levels and targeted to the appropriate groups. Inform the target group of the safety issues. If there are choices to be made in product purchase, give clear indicators of what to look for. Brochures, existing child safety programmes, e.g. Early Childhood Injury Prevention Project (ECIPP) and the Child Safety Series (Queensland Health), media, public seminars, etc are suitable approaches. Antenatal staff, child health nurses, GP's, Queensland Health, Consumer Affairs all have a role.

### ***Environment***

- ♦ Encourage parents or carers to always use the harness. Keep the chair away from steps, bench tops with sharp or hot objects on top, curtains or blinds which may have cords which are a threat for strangulation. If the product has protruding legs, keep away from a passageway where there is potential for tripping. Parenting groups, child health nurses, doctors, preschools, childcare centres, paediatric groups, CAPFA, Queensland Health etc are the responsible parties.

### ***Evaluation***

- ♦ All parties have a responsibility to evaluate these processes. It is important to report limitations as well as successes. Injury control needs to become a positive learning experience. Sharing information is vital in the development of cost-effective programs.

## **3. Intersectoral Collaboration**

- ♦ It is clear that there are a number of interested parties for any one issue. This highlights the need for intersectoral collaboration. If these stakeholders are not identified early on, and consulted, major gaps may prohibit addressing the issue in a complete manner.
- ♦ This exercise also highlights the extended resources available and suggests that if each interested party works collaboratively, seeing it as a combined responsibility, their actual input is supported by the other identified groups and is, in effect, far less than the total project.

- ♦ Another issue is that each of these processes may occur in similar or different timeframes, and the momentum for each must be supported. Not all projects or issues will need to address all 5 E's and some will certainly have a greater concentration on one or two aspects.

#### **4. Regional Implementation**

- ♦ Injury surveillance systems will become important components of hospital based computerised case information systems.
- ♦ The National Injury Surveillance Unit and the Australian Institute of Health and Welfare have recently developed a national minimum data set of injury variables called Basic Routine Injury Surveillance (BRIS).
- ♦ The QISPP system has just been further developed and is based on the principles of BRIS. It is available as an integrated, simple software package for all A&E departments.

#### **5. Examples of National Goals and Targets<sup>16</sup> for the Year 2000 include:** ( There are over 30 targets which have been listed for the injury area)

- ♦ To reduce motor vehicle-related deaths for males aged 17-24 years by 27% from a baseline of 54.7 per 100,000 in 1989.
- ♦ To reduce the rate of hospital admission due to injury and road crashes in all cyclists by 32% from a baseline of 31 per 100,000 in 1989.
- ♦ To reduce the mortality from falls in people 65 years or older by 10% from a baseline of 45 per 100,000.

**Note:** This circular has focussed predominantly on head injuries as an example but other injury topics will be canvassed in future circulars.

#### ***For further information contact***

1. Dr I Papajcsik, Health Advancement Branch, Ph: 234 1803
2. Ms D Jones, QISPP, Ph: 840 8569

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Queensland Health acknowledges the contributions of:

Staff of Health Advancement Branch

Ms D Jones (QISPP) and

Dr P Hopkins (Head Injury Rehabilitation Unit, Princess Alexandra Hospital)