

QUEENSLAND INJURY SURVEILLANCE UNIT



INJURY BULLETIN

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Bicycle Injuries

Summary

- 1565 cycling injury ED presentations in 1998
- cycling injuries represented 35% of all transport injury presentations
- cycling injuries represented 75% of transport injuries for children 5-14
- 60% of those injured were school age (5-14)
- Male female ratio was 2:1
- Few female casualties aged 15 and over
- Fractures were most common injury (26%)
- Lower arm injuries were the most common site (30%) followed by head or face (22%)
- 15% of cases were admitted to hospital
- Around half of the injuries occurred on a roadway
- 17% occurred on a footpath or bikeway
- Most injuries occurred at the weekend and between 3pm and 6pm
- Only 7% involved a collision with a motor vehicle
- Regional Queensland appeared to have higher rates of injury associated with bicycles
- Official crash statistics record around only one in ten injury bicycle crashes

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Introduction

Bicycle related injuries are a significant source of morbidity in our community and particularly amongst children, one of the major reasons for attendance at emergency departments (EDs).

In 1998 road crashes involving pedal cyclists in Queensland resulted in 9 fatalities, 238 injuries requiring hospitalisation and another 413 injuries requiring medical treatment (3%, 5% and 7% respectively of all road crash victims)¹.

In recent years much has been done in an effort to reduce bicycle injuries, in particular the 1991 legislation requiring the compulsory use of an approved bicycle helmet while cycling on public roads. In addition greater attention has been paid to the provision of bike lanes and shared use paths to increase cyclist safety and in most Australian states children under 12 are allowed to ride on footpaths and in Queensland all ages may now legally ride on footpaths.

* QISU data is based on emergency department presentations to the following hospitals: Mater Children's Hospital, Mater Adult Hospital, Mater Private Emergency Care Centre, Queen Elizabeth II Jubilee Hospital, Redland Hospital, Logan Hospital, Princess Alexandra Hospital, Royal Children's Hospital, Mt Isa Hospital, Mackay Base Hospital, Proserpine Hospital, Sarina Hospital, Clermont Hospital, Dysart Hospital and Moranbah Hospital



Results

During 1998 the Queensland Injury Surveillance Unit recorded 1565 cycling-related presentations at participating Emergency Departments in Queensland. (*list of hospitals p1) These injuries made up 35% of all transport related injury presentations and 3% of all injury presentations in 1998.

Age and gender

Sixty percent of bike related injuries involved school age children (5-14) with males outnumbering females two to one. Bicycle injuries made up 75% of all transport injuries and 9% of all injuries for this age group. For those aged 15 years and over there were five times more male victims than female while for those aged less than five years, which comprised 7% of the cases, the numbers were similar.

Nature and part of body

The most common injuries were fractures (26%) and open wounds (24%) followed by superficial injuries (17%) and strains and sprains (16%). Intracranial injuries comprised 7% of the presentations. Most injuries (30%) were to the elbow,

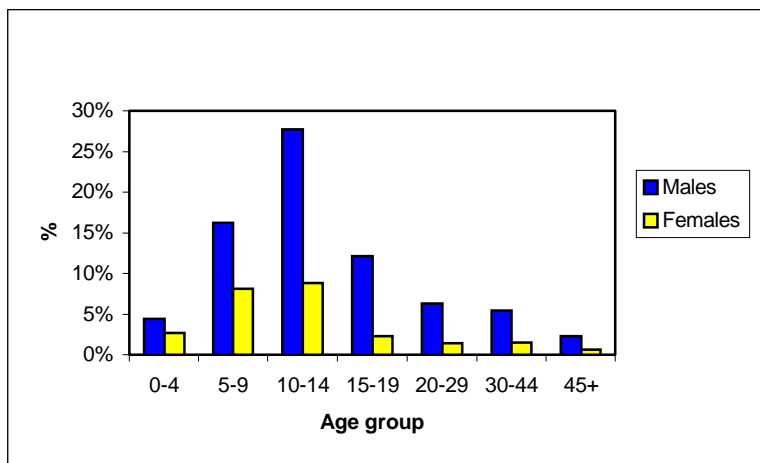


Figure 1 Bicycle injuries presenting at participating EDs by age and gender, Queensland, 1998

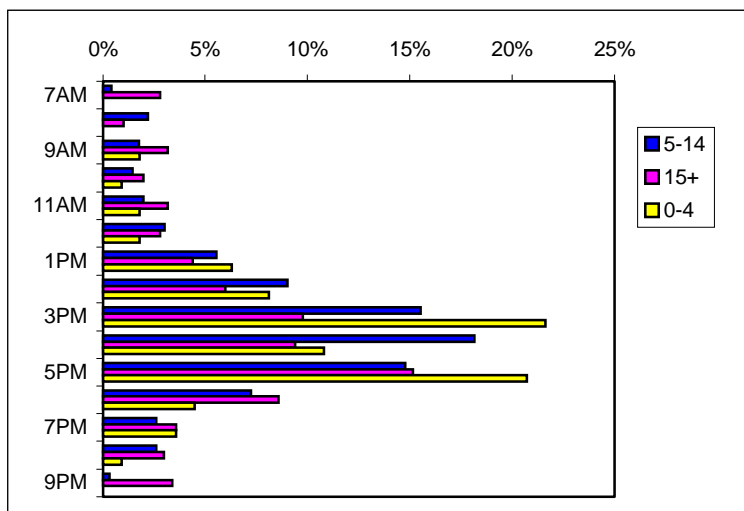


Figure 2 Bicycle injuries presenting at participating EDs by time of day, Queensland, 1998

forearm, wrist or hand followed by the head or face (22%). Injuries to the head mostly comprised intracranial injury (62%) while those to the face were mainly open wounds (71%) and superficial injuries (16%). The pattern of injury was similar for all ages.

Place of injury

Nearly half the injuries occurred on a roadway followed by a footpath or bikeway (17%) and garden 9%. Children aged less than five years were most likely to be injured in the garden while those aged 15 years or greater were injured predominantly on a roadway.

The majority of the injuries were the result of single vehicle crashes with only 7% being reported as involving an actual collision with a motor vehicle.

Day and time

The most common days of the week and time to be injured for all ages were Saturday and Sunday (43%) and between 3 and 6pm (44%) although this was not as marked for those age 15 years and over.

Injury severity

As an indicator for severity of the injury triage score and admission rate were examined. Thirty four percent of cases were recorded as having a triage category of resuscitation, emergency or urgent while 15% of cases were admitted, this compares with 43% and 17% for all transport and 32% and 13% for all injuries.

Regional results

For all ages the rate of bicycle related injury in Mackay and Mt Isa was around double that observed in South Brisbane (Table 1).

Helmet use

Of the 16% of cases in which bicycle helmet usage was recorded 90% reported wearing a helmet. Helmet use data compiled by Queensland Transport for 1998 showed that 17% of the cycle riders and pillion passengers injured

| Region | N | Total Rate | | 15+ Rate | | 5-14 Rate | | 0-4 Rate | |
|-----------------------------|-----|------------|---------|----------|---------|-----------|---------|----------|---------|
| | | Males | Females | Males | Females | Males | Females | Males | Females |
| South Brisbane [‡] | 978 | 26 | 9 | 14 | 3 | 75 | 31 | 15 | 8 |
| Mackay | 354 | 49 | 18 | 29 | 9 | 129 | 54 | 30 | 13 |
| Mt Isa | 78 | 53 | 16 | 24 | 9 | 175 | 42 | 25 | 17 |

Table 1: Regional rates of presentation at emergency departments for bicycle related injury, Queensland 1998. [‡]Includes PAH data

or killed were not wearing a helmet¹. In a survey conducted by RACQ in 1997 it was found that 71% of cyclists were wearing helmets an increase of 19% since their 1991 survey. Amongst primary school cyclists the compliance rate was 84%, the same rate as in 1991, and for secondary school cyclists 66%, an increase of 28%².

Other injuries associated with bikes

In 1998 QISU also recorded 70 injuries involving bikes which were not transport related. Of these injuries 17% involved exercise bikes; all but one involving children aged under 10 years, usually trapping their fingers in moving parts. These injuries highlight the need for care to be taken while using exercise bikes and appropriate supervision of young children. Most of the other injuries involved the victims either falling over a bike or injuring themselves while fixing a bike.

Discussion

Cycling is widely recognised as a beneficial activity as well as a legitimate form of transport, but as with all activities and forms of transport it entails some risk. Although cycling does carry some risk of injury compared to other forms of transport this is outweighed by its benefits through increased physical activity. In *Cycling to Health and Safety*, a report compiled by the British Medical Association the authors found a 20 to 1 advantage in life-years gained through cycling compared to those lost due to death and injury³. In a population which is becoming increasingly less active it is important that an activity which is relatively safe and easily incorporated into our lifestyle be encouraged.



Prevention strategies for bicycle injuries are largely concentrated around helmet use, education (for both cyclist and other road users) and modifying the cycling environment. The benefits of helmet use have been well documented⁴ and the legislative requirement to wear a helmet in Australia has by and large been accepted by the cycling community. There is evidence that increased helmet usage has resulted in a decline

in bicycle related head injury⁵ but there is still debate on whether the observed decline in head injuries is actually the result of a reduction in cyclist numbers⁶.

Educating cyclists particularly children in safe riding technique as well as educating other road users in their responsibilities in sharing the road environment seems to have merit although there have been few studies examining their effectiveness. In one of the few case-control studies looking at a school based bicycle education program the authors found that the intervention did not reduce the risk of bicycle injuries and may possibly produce more injuries in some children, particularly boys⁷.

There is some indication that the provision of bike paths and lanes separating bike traffic from other users may provide a degree of protection from cycle/motor vehicle crashes but only if it is in the same direction as other traffic^{8,9}. Riding on the footpath, on the other hand, has been found to be more dangerous than riding on the road^{9,10,11}. This suggests that allowing cyclists to ride on footpaths may not have been based on the best available evidence.

Official statistics on injury pedal cyclist crashes in Queensland are based on police crash reports which, while accurately reporting fatalities, are known to grossly under-report non-fatal injury crashes¹². Official crash statistics for the whole of Australia only reported a quarter of hospitalised bicycle road crash injuries while for injuries presenting only at hospital emergency departments the figure would be considerably lower. Based on data from Queensland Transport for 1998 and estimates of all ED presentations for bicycle injuries in the State it was estimated that only approximately 10% of bicycle injuries were reported. The high level of under-reporting for bicycle and other road crashes underlines the need for ongoing ED based injury surveillance to continue if insight is to be gained into the circumstances surrounding these injuries.

Prevention Initiatives

While the predisposing factors associated with bicycle injuries are complex it seems that the following areas are priorities:

- Wearing a standards approved bike helmet in the correct manner
- Improving the awareness and application of road rules for all road users - bicyclists, pedestrians and drivers
- All road users acknowledging bicycles as legitimate vehicles with a right to share the road
- High as well as primary school education programs
- Continuous monitoring to reduce hazards such as surfacing irregularities and upgrading and provision of road, cycle paths and footpaths
- Further research and evaluation of interventions

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5. Pitt WR, Thomas S, Nixon J, Clark R, Battistutta D, Acton C. *Trends in head injuries among child cyclists*. BMJ 1994; 308: 177.

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DID YOU KNOW THAT



- 40% of Queensland adults own a bicycle
- In Queensland it is legal to ride on the footpath as long as you give way to pedestrians
- Children under 10 years do not have good peripheral vision or sufficient developmental skills to ride without an adult on the road
- Working in partnership with your local council, bicycle user group, transport or police department will increase the chances of action toward creating a safer place for bicycle riding
- Brisbane City Council has a dedicated road safety team
- Queensland Transport has 18 road safety officers across the state to assist with bicycle safety and the State Cycle Unit to develop policies and programs to help more people to cycle more safely and more often.
- The *Queensland Driver's Guide* is available from newsagents and Queensland Transport Customer Service Centres and includes a section for cyclists
- Brisbane City Council operates a School Community Road Safety Program that assists schools in identifying and solving their local road safety issues
- The BP Bike Ed Program provides 8 to 13 year old children with a practical safe riding program
- Queensland Transport's SWAP program aims to improve safety while encouraging children to walk and cycle to school

Contact details for information on any of the prevention initiatives above are available at www.qisu.qld.gov.au.

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QISU Web site www.qisu.qld.gov.au

QISU Data

QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals (acknowledged on page 1) represent three distinct regions of Queensland. QISU publications and data are available on request for research, prevention and education activities.

QISU Injury Bulletin

Injury Bulletin comment or feedback is welcomed and can be directed to:
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