Queensland Injury Surveillance Unit

INJURY BULLETIN

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QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland.

QISU publications and data are available on request for research, prevention and education activities.

HOSPITALS:
Mater Children's, Mater Adult, Queen Elizabeth II Jubilee, Princess Alexandra, Redland, Logan, Royal Children's, Mount Isa , Mackay Base, Mackay Mater, Proserpine, Sarina, Clermont, Dysart and Moranbah.

Addressing Childhood Injury in Mount Isa: a Safe Communities Initiative

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Summary

- In Australia, injury is the leading cause of death in children, accounting for one-third of all deaths in those aged 1 to 14 years (compared with 3% of deaths in adults).
- In Mt Isa, in the 5 year period 1998 to 2002, there were 5912 injury presentations to the Mt Isa Base Hospital Emergency Department (ED) involving children aged 0-14 years, 2165 (37%) of these in children aged 0-4.
- Each year on average there was one death, 76 hospitalisations and 1182 ED presentations in children aged 0-14.
- Transport incidents resulted in one death and 497 ED presentations in children of which 67 ED presentations occurred in children aged 0-4. Leading causes of ED presentation in children of this age were for bicycle (54%), motor vehicle passenger (24%), and pedestrian (15%) injuries.
- Falls resulted in 2,097 ED presentations in children aged 0-14 and 895 occurred in children aged 0-4. The most important causes of falls in children of this age were beds, tables, baths, chairs, trampolines, stairs, balconies and windows. The more serious falls were those that involved bunk beds, trampolines and balconies.
- Poisoning resulted in 178 ED presentations in children aged 0-14 of which 142 were to children aged 0-4. In the 0-4 age group 39% were the result of poisoning by medications, 13% plant ingestions and the remaining 48% were due to other household chemicals.
- Burns resulted in 224 ED presentations in children aged 0-14 of which 114 were children aged 0-4. Most common causes for the 0-4 age group were contact with hot objects (55), scalds (42) and flame burns (12).
- Each type of injury has its own distinctive pattern and age demographic. Significant causes of injury in children aged 0-4 often involve children of primary school age as well eg. falls from trampolines. Interventions targeting young children may be more effective in the context of interventions simultaneously aimed at older children.

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Introduction

Injury is the leading cause of death in children (persons under the age of 15)[1]. It is responsible for one third of childhood deaths in Queensland, half of these occurring in children aged 0-4[2]. Childhood injury death rates in Queensland are higher than all other Australian states with the exception of the Northern Territory[1].

Children aged 0-4 years are at greater risk of being hospitalised due to injury than any other age group[3].

Three of the four priority injury prevention issues endorsed in the National Injury Prevention Plan[4] are concerned with injury prevention in childhood:

- falls in children,
- drowning in children,
- poisoning in children.

The Queensland Government's Human Services CEO's Committee Childhood Injury Prevention Project (CHIPP)[3] jointly sponsored by the Department of Emergency Services and Queensland Health is establishing two demonstration child injury prevention projects in Mt Isa and Mackay using the WHO Safe Communities model. This project provides an excellent opportunity to reduce harm due to injury for children living in these communities. The project aims to co-ordinate a systematic, intersectoral, sustained response to injury in the region. Queensland Injury Surveillance Unit (QISU) is assisting by profiling local injury patterns so that communities can identify priorities and develop solutions.

This report reviews the patterns of childhood injury in Mt Isa. It explores local issues of concern and seeks to identify strategic opportunities to reduce childhood injury within the local community, with a particular focus on injury affecting children aged 0-4.

Results

There were 24,294 injury presentations for all ages to Mt Isa Hospital in the five-year study period from January 1998 to December 2002. One quarter (24%) were in children less than 15 years of age (an average of 1182 presentations per year).

Mt Isa reported eight childhood deaths due to injury during the seven year period from 1994 to 2002, an average of one death each year. In children aged 0-4 the leading causes of death were homicide (4) followed by drowning (2), poisoning (1) and transport (1). The homicide frequency was elevated because of a family murder suicide with three siblings dying due to carbon monoxide poisoning.

In Mt Isa, ED injury presentations initially peak in the toddler age group and after a slight reduction in early primary school children, rise again in adolescence (Figure 1).

In the 5-year period there were 378 hospitalisations in Mt Isa due to injury in children with 8 children requiring transfer to other acute facilities. One hunderd and fifty-two admissions (40%) were in children 0-4 years of age.

Drowning

There were two deaths due to drowning (1994 to 2000) and both occurred in home pools to children less than five years. There were five near-drowning episodes (1998-2002); four were children aged 0-4 years and one child was aged 5-9. Four of these incidents occurred in domestic swimming pools while one occurred in an unidentified body of water in the garden.

Using 2001 census data, the near drowning rate and drowning rate for children 0-4 in Mt Isa is 40 and 14 per 100,000 respectively. The Queensland death rate for toddler drowning over a similar period is estimated at 6.4 per 100,000, with a rate of 3 per 100,000 for deaths occurring in domestic swimming pools.

A number of interventions have been shown to reduce drowning deaths in swimming pools [3, 6]:

1) Review state legislation to strengthen requirements for domestic swimming pool fencing and enforce these requirements,
2) Obtain local government support for regular pool fence inspections,
3) Develop and distribute information regarding fencing requirements to pool builders and real estate associations,
4) Promote CPR training and the installation of CPR instruction charts around all domestic pools.

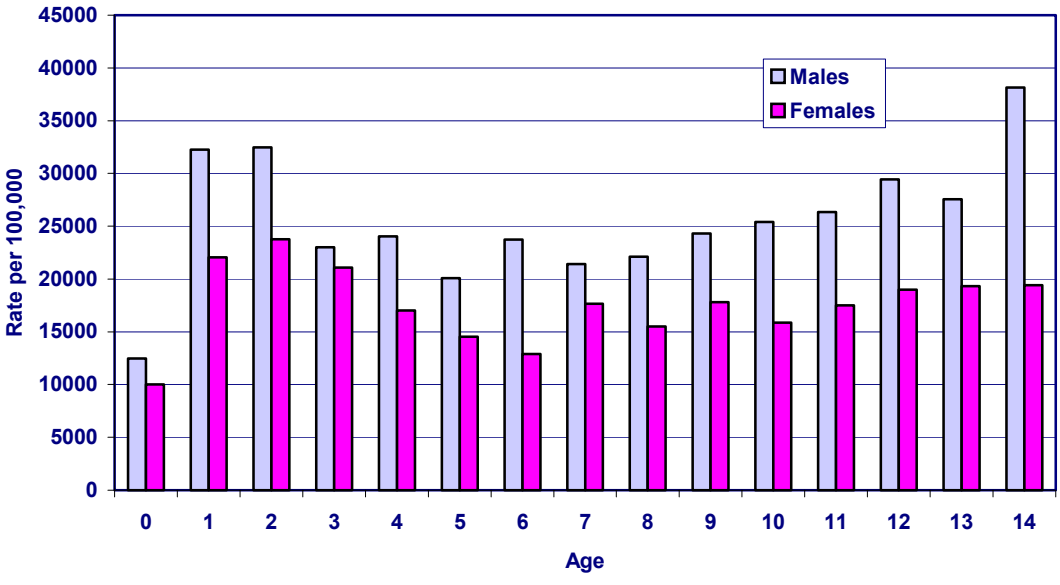

Figure 1 QISU child ED injury presentation rates, Mt Isa, by age and sex, 1998 - 2002

Transport

Mt Isa reported one transport-related child death between 1994 and 2000. The child was aged six months and was a motor vehicle passenger.

In the 5 year period 1998 to 2002, there were 497 ED presentations of childhood transport injury (8.4% of childhood ED injury presentations). Of these, 350 (5.9% of all childhood injury presentations) were due to bicycle injuries. Half (179 or 51%) of the bicycle injuries occurred on a public road, but none of these involved a collision with a motor vehicle.

There were 67 transport related ED presentations in children aged 0-4 (3% of ED presentations in this age group). The leading causes of transport related injury in children in this age group were:

1) Motor vehicle passengers – one death and 16 (24%) ED transport presentations,
2) Bicycles – 36 (54%) ED transport presentations,
3) Pedestrian – 10 (15%) ED transport presentations, including five low speed runovers.

Twenty-eight (78%) of bicycle injuries in children aged 0-4, occurred at home with only five (7%) occurring on the road. This compares to children aged 5-9 years, where out of 116 bicycle injuries, 37 (32%) occurred at home and 58 (50%) occurred on the road.

Strategies to reduce bicycle related injury include[7]:

1) Bike Education programs (currently offered to primary school children in the region through the Police Citizens Youth Club),
2) Lobby for the provision of bike paths and safe riding areas,
3) Encourage parents to stop children under 5 years of age from riding bicycles on roads,
4) Promote the use of bike helmets.

The best opportunities for reducing harm from motor vehicle crashes is to increase the effective use of child restraints[3, 7]:

1) Promote use of Queensland Ambulance Service program for the correct fitting of baby capsules and child restraints,
2) Encourage the disposal of old capsules and restraints and educate target groups of the dangers of using equipment that has been involved in an impact.

Strategies aimed at reducing pedestrian injury include[7]:

1) Education programs teaching safe road use for pedestrians eg. "Walking bus" programs, providing adult supervised walking from home to school,
2) Promotion of the new Department of Housing 'Smart House' design for all new dwellings which recommends driveways and garages be situated separately from child accessible areas,
3) Encourage installation of fencing between driveways and play and living areas in houses.

Falls

Falls are the leading cause of ED injury presentations in children. There were 2097 ED presentations due to falls in Mt Isa over the study period which accounted for 35% of all child ED injury presentations. There were 895 falls in children aged 0-4 (41% of ED injury presentations in this age group).

High falls (> 1 metre) are more likely to result in hospitalisation and occur in younger children at a rate just double that of older children (1323 per 100,000 per year in the 0-4 age group, compared to 1291 and 657 in the 5-9 and 10-14 year age groups respectively). Examination of the causes of falls provides a strategic focus for initial analysis and planning of interventions to reduce their incidence. Table 1 lists the major injury factors associated with high and low falls by age group.

Five strategic areas for intervention are evident. In order of priority, they are:

1) Falls involving nursery equipment – 2.6% of all falls for children aged 0-4 years (7.6% of high falls and 1.7% of low falls).
2) Falls from playground equipment (including trampolines)- 15% of high falls in children aged 0-4. Leading causes of high falls include trampolines (6%) monkey bars (4%) and slides (2%).
3) Falls from beds – bunk beds account for 13% of high falls and 10% of low falls in children aged 0-4.
4) Falls from stairs – 11% of high falls and 7% of low falls in children aged 0-4.
5) Falls from balconies and windows –7% of high falls in children aged 0-4.

Effective interventions to prevent falls include :

1 Nursery furniture[3]
- Promote the removal of unsafe nursery equipment including baby walkers
- Educate and motivate local retailers and second-hand dealers to supply goods which are compliant with current Australian Standards
- Devise checklists for consumers to assist in the identification of unsafe nursery products.

2 Playground equipment [3, 6]
- Obtain support from Local Government and State and Private Schools for the installation and maintenance of 'safer playgrounds'
- Conduct an audit of playgrounds situated in public parks, schools, preschool and childcare centres.
- Devise a playground safety checklist to be distributed to all child care centres and home carers.

3 Stairs [3]
- Promote the use of stair guards
- Discourage the use of babywalkers.

4 Trampolines[8]
- Encourage supervision of children aged 0-4
- Clarify and promote rules for using trampolines
- Promote the use of protective padding
- Provide advice on appropriate positioning of trampolines including safe fall zone.

5 Balconies & windows [3, 6]
- Encourage builders and property owners to comply with Australian standards for balcony rails and window guards
- Educate parents of young children to ensure there are no step-holds that may encourage children to climb balconies.

6 Bunk Beds [3]
- Encourage retailers and second hand dealers to comply with Australian standards and provide point of sale advice,
- Discourage use by children aged less than 6 years.

	All Age				0-4 years				5-9 years				10-14 years			
	High falls		Low falls		High falls		Low falls		High falls		Low falls		High falls		Low falls	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Nursery Product																
Pram	2	0.6%	8	0.4%	**2**	1.5%	**7**	0.9%	0	0.0%	1	0.0%	0	0.0%	0	0.0%
Baby walker	1	0.3%	3	0.2%	**1**	0.8%	**3**	0.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
High Chair	3	1.0%	1	0.1%	**3**	2.3%	**1**	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cot	1	0.3%	2	0.1%	**1**	0.8%	**2**	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Change Table	3	1.0%	0	0.0%	**3**	2.3%	**0**	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	10	3.2%	14	0.8%	10	7.6%	13	1.7%	0	0.0%	1	0.0%	0	0.0%	0	0.0%
Toy / Playground Equip																
Monkey Bars	12	3.9%	14	0.8%	**5**	3.8%	**4**	0.5%	**7**	4.8%	**9**	1.2%	0	0.0%	1	0.3%
Slide	10	3.2%	14	0.8%	**3**	2.3%	**6**	0.8%	**7**	4.8%	**8**	1.1%	0	0.0%	0	0.0%
Swing	4	1.3%	23	1.3%	**1**	0.8%	**13**	1.7%	**3**	2.1%	**10**	1.4%	0	0.0%	0	0.0%
Other Play Equip	7	2.3%	19	1.1%	**3**	2.3%	**8**	1.0%	**3**	2.1%	**10**	1.4%	1	3.3%	1	0.3%
total	33	10.7%	70	3.9%	12	9.1%	31	4.1%	20	13.7%	37	5.1%	1	3.3%	2	0.7%
Furnishing																
Bed	8	10.7%	89	5.0%	**8**	6.1%	**72**	9.4%	0	0.0%	16	2.2%	0	0.0%	1	0.3%
Bunk Bed	24	7.8%	4	0.2%	**9**	6.8%	**4**	0.5%	**14**	9.6%	0	0.0%	1	3.3%	0	0.0%
Chair	0	0.0%	46	2.6%	0	0.0%	27	3.5%	0	0.0%	16	2.2%	0	0.0%	3	1.0%
Sofa	1	0.3%	9	0.5%	0	0.0%	8	1.0%	0	0.0%	0	0.0%	1	3.3%	1	0.3%
Table	3	1.0%	30	1.7%	3	2.3%	25	3.3%	0	0.0%	5	0.7%	0	0.0%	0	0.0%
Total	36	11.7%	178	9.9%	20	15.2%	136	17.8%	14	9.6%	37	5.1%	2	6.7%	5	1.7%
Utensil or container																
Clothes line	2	0.6%	0	0	2	1.5%	0	0.0%	2	1.4%	0	0.0%	0	0.0%	0	0.0%
Total	2	0.6%	0	0	2	1.5%	0	0.0%	2	1.4%	0	0.0%	0	0.0%	0	0.0%
Sport																
Trampoline	38	12.3%	40	2.2%	**8**	6.1%	**13**	1.7%	**25**	17.1%	**24**	3.3%	5	16.7%	3	1.0%
Skateboard	1	0.3%	30	1.7%	0	0.0%	1	0.1%	**1**	0.7%	**10**	1.4%	**0**	0.0%	**19**	6.3%
Rollerblade	0	0.0%	18	1.0%	0	0.0%	0	0.0%	**0**	0.0%	**14**	1.9%	0	0.0%	4	1.3%
Scooter	1	0.3%	15	0.8%	0	0.0%	2	0.3%	0	0.0%	8	1.1%	1	3.3%	5	1.7%
Ball	0	0.0%	13	0.7%	0	0.0%	0	0.0%	0	0.0%	8	1.1%	0	0.0%	5	1.7%
Total	40	13.0%	116	6.5%	8	6.1%	16	2.1%	26	17.8%	64	8.8%	6	20.0%	36	12.0%
Natural Object / animal																
Tree /Plant	31	10.1%	9	0.5%	2	1.5%	2	0.3%	**26**	17.8%	**7**	1.0%	3	10.0%	0	0.0%
Person	0	0.0%	17	1.0%	0	0.0%	4	0.5%	0	0.0%	10	1.4%	0	0.0%	3	1.0%
Natural surface	4	1.3%	116	6.5%	1	0.8%	22	2.9%	3	2.1%	59	8.1%	0	0.0%	35	11.7%
Total	35	11.4%	142	7.9%	3	2.3%	28	3.7%	29	19.9%	76	10.5%	3	10.0%	38	12.7%
Structure																
Window	4	1.3%	3	0.2%	2	1.5%	2	0.3%	2	1.4%	1	0.1%	0	0.0%	0	0.0%
Stairs	21	6.8%	83	4.6%	**14**	10.6%	**52**	6.8%	**3**	2.1%	**19**	2.6%	4	13.3%	12	4.0%
Fence / wall	12	3.9%	16	0.9%	5	3.8%	7	0.9%	5	3.4%	8	1.1%	2	6.7%	1	0.3%
Balcony	7	2.3%	20	1.1%	**7**	5.3%	**11**	1.4%	0	0.0%	5	0.7%	0	0.0%	4	1.3%
Floor	4	1.3%	65	3.6%	4	3.0%	35	4.6%	0	0.0%	18	2.5%	0	0.0%	12	4.0%
Door	0	0.0%	18	1.0%	0	0.0%	12	1.6%	0	0.0%	4	0.6%	0	0.0%	2	0.7%
Bath	0	0.0%	41	2.3%	**0**	0.0%	**31**	4.1%	0	0.0%	7	1.0%	0	0.0%	3	1.0%
Total	48	15.6%	246	13.8%	32	24.2%	150	19.7%	10	6.8%	62	8.5%	6	20.0%	34	11.3%
Grand total	**308**		**1789**		**132**		**763**		**146**		**726**		**30**		**300**	

Table 1 QISU child (0-14 years) ED presentations for high falls (> 1 metre) by major injury factor, 1998-2002

	%	No.
Plant	20.7%	18
Pesticides	9.2%	8
Bleach	6.9%	6
Cleaner	5.7%	5
Petrol	5.7%	5
Dishwashing Detergent	4.6%	4
Paint	4.6%	4
Other Chemical	20.7%	18

Table 2 QISU child (0-14 years) non-medication poisoning ED presentations by type of agent, 1998-2002

Poisonings

There were 178 ED presentations in children 0-14 years due to poisoning over the 5 year study period. Most (142) occurred in children aged 0-4 (6.6% of all ED injury presentations in this age group). Of these, 39% were the result of poisoning by medications, 13% plant ingestions and the remaining 48% were due to other household chemicals.

One quarter (24%) of ED poisoning presentations aged 0-4 were admitted to hospital. Poisoning accounted for 23% of all ED injury admissions in children aged 0-4 and is the most common reason for admission in this age group.

Interventions useful in reducing unintentional poisonings include[3]:

1 Extend the use of child resistant closures to include essential oils and all household chemicals,
2 Promote the installation of and use of child resistant poisons cabinets in all homes,
3 Promote use of non toxic household chemicals for cleaning, pest control and personal hygiene,
4 Encourage the effective disposal of unwanted household chemicals and medications,
5 Provide poisons centre information and contact numbers to households.

Interventions useful in reducing admission to hospital from unintentional poisonings include:

1) Improved clinical information about best practice management of the common childhood poisonings in Queensland,
2) Study of the best means of delivering information to Emergency Department staff that make the decisions regarding admission.

Burns

There were 224 ED presentations due to burns (Table 3). Of the 200 thermal burns, 109 were in children aged 0-4 years (5% of all injury presentations in that age group). About one in ten (9.2%) thermal burns required admission to hospital. Of the 32 fire/ flame related burns, seven were due to campfires and six of these injuries were in children aged less than nine years. In those aged 0-4 all (3) campfire injuries were sustained by walking through hot coals. In those aged 5-9 years (3), one was due to walking through coals and the remaining two were flame burns. The peak age group for injury due to scalds and touching

	0-4 yrs	5-9 yrs	10-14 yrs	TOTAL
Fire	12	15	5	32
Scald	42	16	21	79
Hot object	55	13	21	89
Chemical	5	5	3	13
Sunburn	0	2	5	7
Friction	2	2	0	4
	116	53	55	224

Table 3 QISU child (0-14 years) ED presentations by type of burn, 1998 - 2002

hot objects (Eg stoves, irons) was 0-4 whereas for fire and flame burns the incidence peaked in the 5-9 age group. A common pattern of injury in that age group was the inappropriate use of flammable liquids on fires.

Within the chemical burn group, four were due to commonly available cleaning products and one each due to kerosene and turpentine. Of these six, all but one were aged 0-4.

Effective interventions to reduce the occurrence of burns include[3, 6]:

1 Promote installation of smoke alarms and safety switches in rental properties and older dwellings,
2 Increase number of homes with hot water temperature regulation (thermostat reduction / tempering valves),
3 Educate and engage support of local plumbers and electricians to promote safety devices,
4 Encourage local retailers/suppliers to stock and promote safety products (eg. stove guards),
5 Encourage installation of stove top rail guards,
6 Promote and provide samples of spill proof mugs for use around young children.

All Chemical–related injury

Overall there were 90 children 0-14 years with injuries related to chemical products. Chemical effects were due to ingestion, inhalation and burns (flame or chemical). Chemical injury accounted for 1.7% of injuries overall and 3% (64) of injuries in those 0-4.

The pattern was of unintentional ingestion of or contact with common household cleaners or products in the 0-4 year old, trending towards more deliberate experimentation with or abuse of petrol and inhalants in older children. Burns due to playing with fire and petrol occurred most frequently in the 5-9 year age group. For deliberate misuse of inhalants, 3 children aged 5-9 and 8 children aged 10-14 presented following inhalation of paint fumes. Three children aged 10-14 presented following inhalation of glue fumes. No presentation was directly attributable to deliberate inhalation of petrol.

Interventions useful in reducing unintentional chemical injury are as described above for prevention of poisoning. However different strategies will need to be developed to address the issue of inhalant abuse. Some indigenous communities have adopted the strategy of using aviation fuel and diesel instead of petrol. However, paint and glue remain a readily available alternative and effective prevention will require a primary prevention approach addressing underlying causation in various forms of substance abuse.

Glass

Glass related injuries have been identified as an issue of concern for the Mt Isa community. Over the study period there were 132 glass-related injuries in children 0-14 years (2.2% of all child injury presentations), of which 51 occurred in children aged 0-4. Over half (74) were lacerations to feet due to walking on broken glass, 27 in the 0-4 age group. Three-quarters of glass related injuries occurred at home (99) with 33 injuries occurring outside of the home (street, park, shop/ business area).

There has been concern in Queensland communities that broken drinking glass and alcohol bottles have contributed significantly to this problem. Whilst this is not entirely clear from the surveillance data, suggested interventions could be:

1) Cooperation with local drinking venues and bottle shops to minimise the sale of alcohol in glass,
2) Strategies to encourage return of glass bottles for recycling (bottle refund),
3) Council to target clean-ups in relevant areas.

Other strategies include ensuring that glass structures and furniture comply with Australian Standards for use of safety glass.

Dog Bites

Dog bites were also a significant problem with 154 presentations in children 0-14 years (2.6% of all injury presentations) of which 48 presentations occurred in children aged 0-4. The majority (68%) of dog bites occurred at home. Dog bites occurring outside the home more commonly affected older children aged 10 -14, usually on the street. Almost half (48%) of dog bites in the 0-4 age group were to the head/ face with this percentage dropping to 27% and 4% respectively in the 5-9 and 10-14 age groups.

Strategies to minimise dog bites in children include [9]:

1) Appropriate restraint of dogs when not at home (maintained on a leash),
2) Appropriate containment of dogs to the home yard,
3) Supervision of children when around dogs,
4) Feeding dogs away from children,
5) Appropriate dog population control.

Discussion

Injury is an important cause of morbidity for children living in Mt Isa. This paper identifies strategic opportunities to reduce harm from injury to children living in Mt Isa; particularly injury affecting children aged 0-4. The focus has been on injuries causing the most social and health impact in this age group either because of the severity of the injury (death, disability or admission to hospital) or because of the frequency of occurrence of the particular injury.

While the age group at greatest risk has been shown to be 0-4, it is clear that many significant causes of injury in children in this age group also effect children of primary school age. Similarly, some interventions targeting children aged 0-4 may be more effective if simultaneously aimed at older children. Children currently aged 0-4 may benefit from established programs in school aged children in years to come.

The most important task is to identify the types of injury to young children that the Mt Isa community thinks are important to prevent. Intervention can occur at two broad levels. On one level, a broad integrated approach is needed to change community attitudes and promote a culture of safety. On another level, specific intervention plans aimed with precision at well thought out and defined injury targets are needed to produce measurable results. Mass media campaigns and targeted education programs may fall into the latter category but work best in the context of a broad integrated approach.

Effective interventions seek to develop and strengthen community self-sufficiency while at the same time producing social and environmental changes that reduce the risk of injury. The Mt Isa Safe Communities Project is a community based safety promotion project established in November 2002. The project aims to co-ordinate a systematic, inter-sectoral, sustained response to injury in Mt Isa. By involving the community in finding their own solutions, it hopes to be a catalyst for structural, social and political change.

The combination of an established credible community based action group, state government commitment, a full time local project co-ordinator through CHIPP, QISU population based local surveillance system to inform strategic planning and the expertise of tertiary universities and the Tropical Pubic Health Unit provides Mt Isa with a unique opportunity to work together to reduce the incidence of childhood injury.

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