

Broken glass as an injury hazard in the Indigenous community of Cherbourg

Richard John Henshaw
BSc., MHealthProm

Submitted for the fulfilment of the degree of
Master of Health

University of Southern Queensland
2011

Acknowledgements

This research was supported by a full scholarship provided by the Queensland Injury Prevention Council.

I would like to personally thank the Queensland Injury Prevention Council for their support, which enabled me to gain further education and knowledge within the research field of injury prevention.

All participants of this study are gratefully acknowledged. Thank you to the people of Cherbourg for your time and commitment. The outcomes of this project are a result of your efforts.

I would like to thank the staff at the Centre for Rural and Remote Area Health for their ongoing support throughout the project. In particular, I would like to acknowledge and thank both my supervisors Dr Rob Eley and Professor Don Gorman. I am grateful for their time, patience, understanding and guidance.

I am thankful for the support of the Cherbourg Injury Prevention and Safety Promotion Reference group, with special thanks to Andrew Beckett (Injury Prevention and Safety Promotion Officer) who guided me through the community.

I give thanks to the Cherbourg Aboriginal Shire Council for their role in developing and implementing identified strategies of the project.

I would also like to thank the Queensland Injury Surveillance Unit for their role in developing patient injury forms and analysis of injury data.

Finally, to my family, Reg, Carmel, and my partner Deborah, thank you for your encouragement and support throughout the project and my years of study.

Abstract

The research to identify measures to prevent glass-sourced injury is one target of an injury prevention and safety promotion project in Cherbourg, a 1200 resident community 250 kilometres north-west of Brisbane.

Funded by Health Promotion Queensland and the Queensland Injury Prevention Council, the Cherbourg Injury Prevention and Safety Promotion Project (CIPSPP) was established in 2008. Five areas were identified for action, one of which was the environment, in which there was a specific interest in broken glass litter.

Exact data on glass-sourced injury were poor as records from the public hospital, the Aboriginal Medical Service clinic or school-based laceration clinic did not specify cause or location of injury. However the volume of anecdotal evidence backed by community concerns about glass as a cause of injury has resulted in focussed activities to reduce litter and prevent injury.

The broken glass project has three principal objectives of determining the extent of the problem, devising workable strategies within the local context and assessing the outcome and impact following implementation of those strategies.

Determining the extent of the problem was supported by Photovoice, undertaken by the local school children, community survey and interview with community members, health service providers and other stakeholders. Photovoice, in which the school children captured over 100 photographs of potential injury hazards in the community, identified the principal area of interest, glass litter. Fifty three survey respondents and 20 interviewees revealed the perception of glass litter being an increasing problem which was exacerbated by a number of factors including lack of garbage collection and decline in social responsibility in particular by youth.

A number of strategies were designed and implemented that dovetail into the overall safety and injury prevention plan. A Council-driven alcohol management plan has contributed to reducing the amount of glass in the community. This has been supported by a community clean-up campaign and a resumption of a household garbage collection service. Rubbish bins have been purchased and located in high traffic areas.

Education is a key component of the strategy and a poster competition was initiated as part of the litter awareness and education campaign. Glass as the cause of injury to humans and animals, the unattractiveness of litter and the benefits of wearing shoes were the foci of the poster competition. The five winning posters were generated into an anti-litter message for the community.

Certification of Dissertation

I certify that the ideas, experimental work, results, analyses, software and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

Signature of Candidate

Date

Endorsement

Signature of Supervisor

Date

Signature of Supervisor

Date

Table of Contents

List of Tables.....	vi
1. Background.....	1
1.1 Safety concerns.....	4
2. Literature Review.....	7
2.2 Injury: Global.....	7
2.3 Injury: Australia.....	9
2.4 Injury: Queensland.....	12
2.5 Injury: Indigenous.....	13
2.6 Litter.....	15
2.7 Glass.....	16
2.8 Prevention.....	20
3. Methods.....	23
3.1 Aim.....	23
3.2 Objectives.....	23
3.3 Identifying the problem.....	24
3.4 Ethics.....	24
3.5 Governance.....	24
3.6 Observations.....	25
3.7 Community Survey.....	25
3.7.1 Incentive.....	25
3.7.2 Distribution of survey.....	26
3.8 Individual interviews.....	27
3.9 Collection of injury data.....	27
3.10 Student Survey.....	29
3.11 Student Photos (Photovoice).....	29
4. Results.....	30
4.1 General Observations.....	30
4.2 Community Survey.....	30
4.3 Individual Interviews.....	46
4.5 Cherbourg Hospital injury data.....	51
4.5.1 Age and Gender.....	51
4.5.2 Top 10 Major Injury Factors.....	52
4.6 School Survey-Year 6/7 Cherbourg Primary school.....	55
4.7 Photovoice-Cherbourg Primary School.....	56
4.8 Cherbourg School injury data.....	57
4.8.1 Age and gender.....	57
4.8.2 Monthly records of injury.....	57
4.8.3 Type of injury.....	58
4.8.4 Bodily location of injury.....	58
4.8.5 External causes of injury.....	59
4.8.6 Part or place where injury occurred.....	59
4.8.8 Activity when injured.....	61
4.8.9 Method of injury.....	62
4.8.10 Injury Factor- Glass.....	62
5. Discussion.....	64
5.1 Key findings of the study.....	64
5.2 Community Survey.....	67
5.3 Individual Interviews.....	72
5.4 School survey.....	75
5.5 Cherbourg School injury data.....	76
5.6 Hospital injury data.....	77

5.7	Photovoice.....	78
5.8	Activities implemented from recommendations from the project.....	80
6.	Conclusion	83
	List of References.....	85
	Appendix A – Consent Form.....	89
	Appendix B – Community Survey	91
	Appendix C – Map of Cherbourg in relation to Brisbane	93
	Appendix D – Town map of Cherbourg.....	94
	Appendix E – Location of Placement of Community Bins	95
	Appendix F – School Injury Data Form	96
	Appendix G – School Survey	98
	Appendix H – Presentation of Photovoice.....	99

List of Tables

Table 1.1	Action areas	4
Table 1.2	Injury prevention priorities	4
Table 1.3	Injury issues for the Cherbourg community	5
Table 3.1	Survey distribution.....	26
Table 4.1	Age of survey respondents.....	31
Table 4.2	Gender of survey respondents.....	31
Table 4.3	Residency of survey respondents.....	31
Table 4.4	Survey respondents who work in Cherbourg.....	32
Table 4.5	Respondents use of streets and footpaths.....	32
Table 4.6	Perception of litter in Cherbourg	32
Table 4.7	Occurrence of broken glass on the streets.....	33
Table 4.8	Is broken glass a hazard?	33
Table 4.9	Locations of broken glass	34
Table 4.10	Origin of broken glass.....	34
Table 4.11	Perceptions of change in the amount of broken glass.....	35
Table 4.12	Respondents cut by broken glass	35
Table 4.13	Medical treatment sought due to laceration from street glass.....	36
Table 4.14	Were shoes being worn at the time of injury?	36
Table 4.15	How often is footwear worn?.....	37
Table 4.16	Are there enough bins in Cherbourg?	37
Table 4.17	Resident perception of litter problem	38
Table 4.18	Residence cut by broken glass within Cherbourg.....	39
Table 4.19	Survey respondents and their response to being cut by glass	40
Table 4.20	Laceration from glass and the use of footwear	41
Table 4.21	Perception of litter problem and if Cherbourg has enough rubbish bins ...	42
Table 4.22	Age of survey respondents and their perception of the litter problem.....	43
Table 4.23	Age of survey respondents and their perception of the litter problem.....	44
Table 4.24	Areas in which broken glass is a hazard	44
Table 4.25	Reasons for littering	45
Table 4.26	In the past year has the problem worsened or improved, and why?	45
Table 4.27	Solutions for glass.....	46
Table 4.28	Individual interview part one	47
Table 4.29	Individual interview part two.....	48
Table 4.30	Individual interview part three.....	49
Table 4.31	Individual interview part four	50
Table 4.32	Age and gender	51
Table 4.33	Top 10 Major injury factors	53
Table 4.34	External cause of injury	54
Table 4.35	Gender of survey respondents.....	55
Table 4.36	Does Cherbourg have a litter problem?	55
Table 4.37	Is there broken glass in Cherbourg where you walk, skate, cycle or play?55	
Table 4.38	Have you ever been cut by broken glass in Cherbourg?.....	55
Table 4.39	Were you wearing shoes at the time?	56
Table 4.40	Location when cut by glass.....	56
Table 4.41	Age and gender	57
Table 4.42	Injuries per month.....	57
Table 4.43	Nature of injury.....	58
Table 4.44	Bodily location of injury	58

Table 4.45	External causes of injury.....	59
Table 4.46	Where injury occurred	60
Table 4.47	Type of place.....	60
Table 4.48	Activity when injured	61
Table 4.49	Mechanism of injury	62
Table 4.50	Glass- place of injury	63
Table 4.51	Glass- nature of injury	63
Table 4.52	Glass -activity when injured	63

1. Background

Injury and violence represent a health threat for all countries around the world, being responsible for greater than five million deaths each year and accounting for 10% of global mortality and 16% of global disability (World Health Organisation 2007, 2010). For each death, it is estimated that there are dozens of hospitalisations, hundreds of emergency department visits, and thousands of doctor's appointments (World Health Organisation 2007). Many who survive an injury regardless of its nature, often incur temporary or permanent disability or suffer other health problems as a result of the injury such as depression or drug use (World Health Organisation 2007).

Health sectors absorb substantial portions of the direct cost of injury related health problems, globally accounting for a large proportion of healthcare funds (Peden et al. 2002; World Health Organisation 2007). If the current trend continues the global burden of injury and violence is expected to rise during the coming decades (Peden et al. 2002; World Health Organisation 2007). This would undoubtedly require an increase in monetary expenditure to support emergency departments' visits, surgery and physical and psychological care (Peden et al. 2002; World Health Organisation 2007). In Australia alone, during the period of 2004-2005 injuries accounted for \$3.4 billion of the allocated health expenditure (Australian Institute of Health and Welfare 2010a). Comparing admitted patient hospital services, out of hospital medical services, prescription pharmaceuticals and adjusting for inflation saw a 22% increase in injury expenditure at a national level between 2000-01 and 2004-05 (Australian Institute of Health and Welfare 2010a).

In Australia injury prevention has been outlined as one of the Government's National Health Priority Areas. In Queensland the leading cause of death in people younger than 45 years is injury (Pike et al. 2000). It is not surprising therefore that a reduction in injury rates has the greatest potential to reduce mortality and morbidity within the Queensland population (Pike et al., 2000).

Higher risk groups for injury include males, Indigenous populations, and those of low socioeconomic status (Pike et al., 2000). On average Indigenous people experience injury rates three times higher than the wider population, with Indigenous children being three to four times more likely to experience an injury than their non-Indigenous peers. Injury contributes to the fact that Indigenous life expectancy is much less than non-Indigenous Australians (Parker et al. 2006).

For the period of 1996-2001, the life expectancy for Indigenous males was 59 years and 65 years for women, which was the life expectancy of the non-Indigenous Australian male population in 1901-1910 and the female population in 1920-1922. In comparison, for the period of 1998-2000 the life expectancy at birth for all Australians was 77 years for males and 82 years for females (Australian Institute of Health and Welfare 2006).

Furthermore the Indigenous population of Australia on average have higher health risk factors in relation to low birth weights, obesity, and poor nutrition, and are also at risk of ill health through the use of illicit substances, smoking and alcohol (Australian Institute of Health and Welfare 2006; Pink & Allbon 2008).

This situation combined with the knowledge of increased burden of injury in rural and remote locations highlights the concern of injury rates in the Indigenous community of Cherbourg.

The history of Cherbourg is consistent with the historical events that have adversely affected most Indigenous communities in Australia; these events have not only affected their cultural and social health but also their physical health (Parker et al. 2006).

Situated 280 kilometres northwest of Brisbane and approximately 5 kilometres from Murgon, Cherbourg is considered Queensland's third largest Aboriginal community (Department of Communities 2009; see appendix C). The original settlement was derived from forty different groups, including Wakka Wakka and Western Wakka Wakka (traditional owners) and descendants of people brought from other parts of Queensland to Cherbourg under past government policy (Department of Communities 2009; Queensland Government 2008). In 1904, 300 Aboriginal people from 13 different tribes were forcibly relocated by the protector of Aborigines to Barambah (Department of Communities 2009; Queensland Government 2008).

Founded in 1901 and formerly known as Barambah, the community was renamed Cherbourg in 1931 (Department of Communities 2009). Cherbourg became independent in 1986 as a result of a Deed of Grant in Trust issued by the Queensland Government, and in 2004 the community celebrated its centenary (Department of Communities 2009).

The population of Cherbourg was estimated as 1,200 people at the 30th of June 2007, although this figure is arguably incorrect due to community members coming and going, and lack of reporting of census data (Department of Communities 2009). Additionally from 2002 to 2007 Cherbourg has recorded an average annual population

decrease of 0.6 percent (Department of Communities 2009; Queensland Government 2008).

The community of Cherbourg has a range of services available which include a local Council, hospital and health service, primary school, TAFE College, youth justice service, magistrate's court services, police, home and community care, child safety services and Indigenous Knowledge Centre. Cherbourg also has other community level groups which recognise cultural sensitivity; these include men and women's groups and elders (Department of Communities 2009; Queensland Government 2008).

With injury prevention identified as a strategic direction for Queensland Health, in 2008 Health Promotion Queensland (HPQ) placed a tender for an injury prevention research proposal originally for two sites, both Cherbourg and Doomagee. The Darling Downs Public Health Unit (DDPHU) was successful with their proposal for Cherbourg attaining \$700,000 for the Community Injury Prevention and Safety Promotion Project (CIPSP) to be implemented in the community of Cherbourg. DDPHU facilitated a collaborative agreement between the Cherbourg Aboriginal Shire Council, the Centre for Rural and Remote Area Health at the University of Southern Queensland and Health Promotion Queensland to implement the project over five years. Due to unknown circumstances, the proposed injury prevention project for Doomagee was not implemented.

On the 20th of April 2009, Cherbourg Council hosted the inaugural Injury Prevention Safety Promotion reference group meeting. In attendance were Queensland Health (Darling Downs Public Health Unit, Community Health), Education Queensland, Centre for Rural and Remote Area Health, Cherbourg Aboriginal Shire Council (Injury Prevention Safety Promotion Project Coordinator, Mayor, Deputy Chief Executive Officer, Operations Manager), and Barambah Medical Clinic.

An exercise of the reference group was to table and discuss community safety concerns. Workshops with the community prioritised five key areas for action:

- Environment
- Housing
- Children
- Road Safety
- Alcohol Tobacco & Other Drug's/Mental Health

Numerous injury topics were identified by community at the consultative meeting and one key area was that the broken glass littering the streets of Cherbourg had become a serious health hazard. Children were identified as the number one priority for the group. Tables 1.1 to 1.3 express concerns aired on the day, within each of these action areas. Areas of concern were identified and prioritised through a system of votes, with each person present allowed a total of five votes. Safety issues were then ranked as high, medium or low along with who was responsible for reducing the incidence.

1.1 Safety concerns

Table 1.1 Action areas

Environmental	Housing	Children	Road Safety	ATODS/ Mental Health
<ul style="list-style-type: none"> • Water quality • Tree maintenance • Dump burning • Littering • Hygiene • Animal management 	<ul style="list-style-type: none"> • Hygiene • Housing numbers • Overcrowding • Maintenance (lawns) • Vermin and snakes 	<ul style="list-style-type: none"> • Road safety • Cut feet • Drugs and alcohol • Sniffing • Animal attacks • Parenting • Bicycles 	<ul style="list-style-type: none"> • Speeding • Seat belts • Walking off paths • No helmets • No signage • No foot paths 	<ul style="list-style-type: none"> • Dual diagnosis • Alcohol, tobacco and other drugs • Mental health • Sniffing • Syringes • Domestic violence

Table 1.2 Injury prevention priorities

Issue	Environmental	Housing	Children	Road safety	ATODS/ mental health
Votes	20 water quality	19 housing	51 kids	31 road safety	13 ATODS
Votes	35 littering				0 mental health
Priorities	P 4	P 3	P 1	P 2	P 5

Table 1.3 Injury issues for the Cherbourg community

Issues	Risk	Roles and responsibility	Proposed service
Stray animals/ attacks	Low – medium	Animal owners	Council
Littering, broken glass and syringes etc	Medium – high	Personal	Council
Noise pollution	Low – medium	Personal	Police
Foot paths, trips, children off road	Medium – high	Council	Council
Housing, numbers on the house, number of people living in each home	Low – medium	Personal, housing commission	Housing commission
Children safety	Medium – high	Parents	Police
Sewerage, dump burns	Medium – high	Council	Council
Power poles, tree maintenance, yard maintenance	Medium – high	Council, personal	Council
Vehicle safety	High	Personal, police	Police
Hygiene in home and community	Medium	Community and personal	Hospital, council
Water ponding	Low – medium	Community, council	Council
Fires and burns	Medium – high	Personal, council	Council
Lighting and street safety	Medium – high	Personal, council	Council
Noise pollution, parties weeknights	Medium	Personal, police	police
Shade areas	Low – medium	Council	Council
Sports injury	Low – medium	Personal, sporting clubs	Sporting clubs

The research reported in this dissertation endeavoured to address the identified health concern of broken glass in the community which was identified as an issue linked to two of the identified action areas (Table 1.1&1.3), children and the environment. Objectives of the research were a) to determine the extent to which broken glass was a hazard, b) explore with the community what strategies could be used to address the hazard, and c) to implement an identified strategy and determine its effectiveness. It was also the intent of the research to contribute to the evidence base of this rather undocumented social – environmental issue.

Working collaboratively with the Cherbourg Aboriginal Shire Council, the Centre for Rural and Remote Area Health, the Darling Downs Public Health Unit and the community, the research into broken glass has become an actioned strategy of the Cherbourg Injury Prevention and Safety Promotion Project (CIPSPP).

2. Literature Review

The project was undertaken with the aim to improve Aboriginal health within the location of Cherbourg by reducing injury. The literature which follows is provided within the context of injury from an international, national, state, and Australian Indigenous prospective. The structure is intended to provide the reader with an overview of injury, what injury is, what are some of the trends, regional similarities, and at risk groups. From here the review flows into the research topic of broken glass and injury which includes the broader topic of broken glass being litter. Complications of litter and its potential to be a hazard were explored in conjunction with broken glass primarily because there was insufficient documentation concerning broken glass alone. Additionally it seemed only practical to expand the content to litter as broken glass was included as an item of litter. Literature for the review was drawn from both published and unpublished work which included journal articles, government documents and reports from leading health bodies such as the World Health Organisation.

2.2 Injury: Global

Injury has long been viewed as a public health problem which has attracted significant interest. It is a leading cause of death and disability across the globe, with projections the burden will increase in coming years (McClure et al. 2004; World Health Organisation 2010). Over many years societies have continued to change; accompanying this change has been the distribution of injuries sustained as regions expand and technologies evolve (McClure et al. 2004).

New ways of life have exposed the public to increased potential for injury so much that now injury and violence is responsible for approximately 5.8 million deaths each year, accounting for 10 percent of global mortality (World Health Organisation 2010). This amounts to 32 percent more than the fatalities from malaria, tuberculosis, and HIV/Aids combined (World Health Organisation 2010). It is estimated that one quarter of the 5.8 million injury deaths each year are a result of suicide and homicide, with road traffic injuries responsible for another quarter (World Health Organisation 2010). Other contributing causes of injury for remaining deaths are from falls, drowning, burns, poisoning, and war (World Health Organisation 2010).

Injuries are considered a growing problem and the burden is expected to worsen considerably within the next decade (World Health Organisation 2007, 2010). Road

traffic crashes, homicide, and suicide are all forecast to rise in relation to other causes of death in the next few decades placing them among the top 20 causes of death in the world by 2030 (World Health Organisation 2007, 2010). Vietnam provides an example of a contributing factor to these predicted rises where the rapid increase in numbers of vehicles on the road, has led to increases in fatal road crashes (Peden et al. 2004). It is predicted that road traffic crashes could even become the fifth leading cause of death globally by 2030 with suicide twelfth (World Health Organisation 2010). However deaths from injury only represent a small fraction of the total injury burden. It is estimated that tens of millions of people suffer non-fatal injuries which may require medical treatment or hospitalisation (World Health Organisation 2007, 2010). Many who are injured are often left with temporary or permanent disabilities; globally injuries are responsible for 16 percent of all disabilities (World Health Organisation 2010). Furthermore, in addition to their direct physical effect injuries or violence can also lead to other health concerns such as depression, behaviour change or drug use (World Health Organisation 2007, 2010).

The scale of the burden varies considerably; factors such as age, sex, country of origin-area of residence and income, effect rates of injury (World Health Organisation 2007, 2010).

Although injury affects all ages, they have a stronger impact on young people; being one of the main causes of death (World Health Organisation 2010). Between the ages of 5 and 44 years one of the top three causes of death are from injury; in this case a direct result of road traffic injuries (World Health Organisation 2010). Data suggest income and wealth effect injury rates and types of injuries which occur (World Health Organisation 2010). Over 90 percent of injury deaths occur in low and middle income countries, and even within a country injury depicts strong social class gradients (World Health Organisation 2010). They are particularly prominent where unsafe living, working and travelling conditions occur (World Health Organisation 2010). Throughout the world injury and violence is unevenly distributed between the sexes, almost twice as many men than women die as a result of injury and violence each year (World Health Organisation 2010). Injury death rates are usually greater for men with most types of injuries except for those resulting from fire, although some forms of injury do particularly affect women, for example rates of sexual abuse and sexual violence are greater among women (World Health Organisation 2010).

Injuries pose an economic toll as well, both for the individual and their family and the health system of the nation (World Health Organisation 2007, 2010). Much of the cost is linked to treatment and rehabilitation, and that of lost wages, either for the injured individual or the carer (World Health Organisation 2007, 2010). There are limited estimates of the global cost in relation to injury; however the estimated cost of global road traffic crashes stands at 518 billion US dollars (World Health Organisation 2007, 2010). Brazil, Jamaica, and Thailand provide three examples of the economic burden of homicide and suicide, with estimated costs equivalent to 1.2 percent of GDP, 4 percent of GDP, and 0.4 percent of GDP, for the three countries respectively (World Health Organisation 2010).

To determine the rates of injury and its effects on morbidity, disability and mortality, data must be collected from appropriate sources (World Health Organisation 2007). It is these data which informs policy makers to prioritize their country's health expenditure and focus (World Health Organisation 2007). Injury data is also used to evaluate the success and cost effectiveness of injury prevention interventions (World Health Organisation 2007). Data can be obtained from a variety of sources; most countries have data available through registration systems as well as other surveillance systems which have been initiated (World Health Organisation 2007). Reports may be generated from other departments' data, for example the police, hospital inpatient data, emergency department injury records, transport department reports, occupational safety or industrial compensation records or health surveys (ABS 2006; World Health Organisation 2007).

2.3 Injury: Australia

In Australia injury is one of Australia's leading causes of mortality, morbidity and permanent disability and is the primary cause of death in people under the age of 45 (Australian Institute of Health and Welfare 2010c). The National Injury Prevention and Safety Promotion Plan 2004-2014 defines injury within the public health context as physical harm to a person's body commonly seen as broken bones, cuts, brain damage, poisoning and burns (National Public Health Partnership 2004). Injuries occur in multitudes of ways and have the potential to cause a range of physical, cognitive and psychological disabilities and death (Australian Institute of Health and Welfare 2010c).

Injuries can seriously affect a person's quality of life and the life of those around them (Australian Institute of Health and Welfare 2010c). However through precise,

specific implementation of strategies, injuries are viewed as being preventable and for this reason injury prevention and control is now one of the nation's health priority areas (Australian Institute of Health and Welfare 2010c).

In Australia injuries were responsible for 7% of the total burden of disease and injury in 2003 of which males accounted for 70% of those injuries (Begg et al. 2007). Of this burden, self-inflicted injuries including suicide, road traffic accidents and falls accounted for two thirds of all injuries (Begg et al. 2007). Self-inflicted injuries and suicide accounted for 27% of the total injury burden and were linked heavily to anxiety, depression and alcohol abuse (Begg et al. 2007).

There are a variety of factors which can increase the risk of a person being injured; these include age, sex, alcohol use, residence, ethnicity, socioeconomic status and occupation (Australian Institute of Health and Welfare 2010c). In Australia alcohol is considered the greatest risk factor for both fatal and non-fatal injury (Australian Institute of Health and Welfare 2006). Other risks for injury include mental illness, and chronic physical conditions such as osteoporosis (Australian Institute of Health and Welfare 2006). Consistent with global data, Australian men in 2003 experience a greater injury burden than females for most causes of injury (Begg et al. 2007). According to the Australian Institute of Health and Welfare males accounted for 73% of the burden due to road traffic accidents and 78% for suicide and self-inflicted injuries (Begg et al. 2007). However the burden from falls was equally distributed amongst both sexes (Begg et al. 2007). Seventy six percent of the overall injury burden resulted in mortality (Begg et al. 2007).

Community injury is that which occurs within a community during the course of daily life and excludes injuries due to medical intervention or misadventure. During the period of 2003-04 Australia experienced 9,924 community injury deaths, again seeing a higher incidence for males accounting for 63% of deaths (Henley et al. 2007). Rates were highest for young and middle aged males between 20-44 years and for older men 70 years and over (Henley et al. 2007). Unintentional falls were the most common cause of community injury death being responsible for 30% of deaths during this period (Henley et al. 2007). Falls occurred in older age groups and were particularly prevalent in both males and females aged 85 years and over (Henley et al. 2007).

Second to unintentional falls was suicide which accounted for 22% of community injury deaths (Henley et al. 2007). Males had higher suicide rates than females in all age groups, with the overall age adjusted rate of 17.4 per 100,000 population in 2003-04

being almost 4 times the rate of female deaths (Henley et al. 2007). The ratio of male deaths verses female were greatest for young and middle aged men 20-44 years and those over 80 years of age (Henley et al. 2007).

During the 2003-04 period 1,724 community injury deaths occurred in Australia as a result of transport related injuries (Henley et al. 2007). Males contributed heavily again accounting for 73% of these deaths (Henley et al. 2007). Fractures and intracranial injuries were the most common types of injuries recorded in relation to transport related deaths, with the most common location for an injury being the head and thorax region (Henley et al. 2007). Henley et al reported that 1,482 of total transport related deaths resulted from an on road collision in which a motor vehicle was involved, of these 1,482 deaths 64% were motor vehicle occupants (Henley et al. 2007). Pedestrians accounted for 15% of deaths, motorcyclists 12% and cyclists 2% (Henley et al. 2007).

It was noticed that there had been a slight downward trend in injury deaths which continued during the period of 2003-04, this trend was more evident for males (Henley et al. 2007). However there is speculation that the reported fall may be as a result of an under-estimation of injury deaths. The authors suggest there was also strong evidence of under counting of cases within some external cause categories in 2003-04 particularly in relation to transport and homicide. Other areas concerning under counting include suicide, drowning and smoke, fire and flames, heat and hot substances (Henley et al. 2007). Due to a relatively unchanged death rate for community injuries there was also suspicion that the under counting in external causes may have been compensated by some over counting in other external cause categories (Henley et al. 2007). This was evident to some extent for categories on poisoning and other unintentional deaths (Henley et al. 2007).

People living in rural and remote areas have been identified as having higher rates of serious injury than for people living in cities (National Public Health Partnership 2004). As a result of the higher injury rates and the challenges for injury prevention in these areas, these specific populations are a target area for injury prevention action (National Public Health Partnership 2004). Highest rates of injury tend to occur in the most remote areas. It is thought this is because of greater distances to travel, and occupations in these areas such as farming and mining which present higher risks for injury (National Public Health Partnership 2004). In Australia during 2001-02, residents of rural areas represented one in eight of all hospitalised injury cases, with the rate of hospital admissions due to injury being 1.4 times higher for rural residents than for their

city counterparts (National Public Health Partnership 2004). Additionally residents from remote parts of Australia during this period accounted for approximately one in twenty admissions to hospital due to injury with a hospital admission rate due to injury twice that of city residents (National Public Health Partnership 2004). The most common cause of injury hospitalisation for both rural and remote residents was falls at 33% and 22% respectively (National Public Health Partnership 2004). As identified injury rates in rural and remote locations have attracted the need for preventative measures. An example of this is Farm Safe Australia, a national association of agencies which have joined forces in addressing injury and illness with work and life on Australian farms (National Public Health Partnership 2004). Their role is educating and building frameworks for areas such as child safety, machinery, and all-terrain vehicles (National Public Health Partnership 2004).

As indicated in a report issued by the Australian Institute of Health and Welfare, injury accounted for 7% of the total allocated health expenditure during the period of 2004-05 (Australian Institute of Health and Welfare 2010a). The agreed national health priority areas which include injury were allocated at 43% of the total health expenditure, an underestimated figure with the seven priorities accounting for 57% of allocated health expenditure (Australian Institute of Health and Welfare 2010a). The same report indicated that after comparing admitted patient hospital services, out of hospital medical services, prescription pharmaceuticals and adjusting for inflation there was an increase in allocated health expenditure between 2000-01 and 2004-05 of 20% (Australian Institute of Health and Welfare 2010a). For injury this amounted to an above average growth in expenditure of 22% (Australian Institute of Health and Welfare 2010a). To generate these estimates data were extracted and analysed from sources such as broad hospital data, out of hospital medical services, Medicare, Australian Bureau of Statistics, the Australian Government Department of Health and Ageing, pharmaceutical benefit scheme, and private prescriptions (Australian Institute of Health and Welfare 2010a).

2.4 Injury: Queensland

In Queensland the leading cause of death in people younger than 45 years is also injury (Pike et al. 2000). In the period 1994-1998 Queensland had higher mortality rates for injury in the total population than elsewhere in Australia (Pike et al. 2000). In 2006 intentional and unintentional injuries accounted for 7.1% of the total health burden for Queensland (Bright et al. 2009). At this time road traffic injuries, suicide and self-

inflicted injury combined were responsible for the greatest percentage of the injury burden, 25% and 20% respectively (Bright et al. 2009). This injury burden was mostly due to premature mortality with approximately one quarter due to disability (Bright et al. 2009). Analysis of the injury data in 2006 also saw differences for gender and age groups, resulting in three peaks for the injury burden (Bright et al. 2009). Peaks occurred in childhood, followed by another in young adulthood particularly in males, then again for both sexes in older age (Bright et al. 2009). Throughout Queensland people of Indigenous status and those who live in areas of remoteness experienced greater rates of burden than other Queensland people in 2006 (Begg et al. 2008). In particular, Indigenous people experienced disease and injury burden at 2.3 times the rate of non-Indigenous Queenslanders (Begg et al. 2008). Higher risk groups for injury include males, Indigenous populations and those of low socioeconomic status (Pike et al. 2000). Outlined as one of the National Health Priority Areas, a reduction in injury rates was identified within a past state report as the greatest potential to reduce mortality and morbidity within the Queensland population (Pike et al. 2000).

2.5 Injury: Indigenous

In Australia Indigenous communities experience approximately three times the rate of fatal injuries of the general community (Australian Institute of Health and Welfare 2006; Carson et al. 2007). Equality and equity issues between people of Indigenous and non-Indigenous heritage have become well known over the past years (Carson et al. 2007). Reports and recommendations of the problem have led to a demand for improved health conditions and reduction in inequities between Indigenous and non-Indigenous Australians (Carson et al. 2007). The call for action has coincided with a focus on public health strategies for primary and secondary prevention which often encompasses a whole of community population level intervention (Carson et al. 2007). In recognition of this, the Commonwealth and State Governments have declared injury prevention as a National Health Priority Area (Australian Institute of Health and Welfare 2006).

The National Health Priority Areas were Australia's response to The World Health Organisation's global strategy, "Health for all". Since 2000 the National Health and Medical Research Council of Australia has funded more than \$28 million for injury prevention research, and as of 2008 218 active research grants have received total funding of more than \$28 million (Australian Institute of Health and Welfare 2009; National Health and Medical Research Council 2008).

In 2003-04 a national review of injury and safety promotion revealed 300 projects with Indigenous injury prevention components (Carson et al. 2007). The identification of the 300 projects suggests a significant amount of work is being undertaken regarding the topic within Indigenous communities, however relatively few of the projects were injury prevention specific (Carson et al. 2007). Most projects have been directed primarily at violence prevention, drug and alcohol minimisation, capacity building, or general community development (Carson et al. 2007). If effective at all, these programs usually addressed safety or injury as a secondary outcome (Carson et al. 2007).

Injury prevention and safety promotion for Indigenous populations is identified as requiring particular attention in order to reduce the burden of ill health (Australian Institute of Health and Welfare 2006). It is a significant component of the disadvantaged Indigenous population of Australia (Shannon et al. 2001). Injury and safety is an important issue for Aboriginal and Torres Strait Islander people, although it is not a single health issue but rather classified as a range of issues (Carson et al. 2007).

Although injuries tend to be hidden amongst broader health and social concerns affecting Indigenous people, most recent data indicates that injury is the most common cause of hospitalisation and the third most common cause of death for this group (Australian Institute of Health and Welfare 2010b). In 2007-08 one of the most common causes of injury resulting in hospitalisation was that caused by another person, 29%. Injury and safety issues include intentional and unintentional injury resulting from numerous external, environmental and social causes (Carson et al. 2007).

To date, there are few published studies describing the magnitude of injury among Indigenous Australians. The impact of injury is usually assessed from hospital data and deaths (Australian Institute of Health and Welfare 2006; Thomson & Krom 2007). The problem remains that a majority of injuries do not result in hospitalisation or death, and there is very limited information available on cause and type of injury other than National Health Surveys (Thomson & Krom 2007). The most reliable data for Queensland Indigenous populations comes from small, primarily rural, Aboriginal communities (Pike et al. 2000). However these discrete communities only account for 12 percent of Queensland's Indigenous population, they possibly falsely represent the health of the rest of the Queensland Indigenous population (Pike et al. 2000).

Indigenous injury has predominantly been caused by factors which result from exposures and events (Australian Institute of Health and Welfare 2006). Similar to the general population, suicide and transport related injuries are the most common cause of

injury deaths (Australian Institute of Health and Welfare 2006). Research indicates that injury problems within Indigenous communities are complex and are not well illustrated by national statistical information (Australian Institute of Health and Welfare 2006). In the Indigenous community of Cherbourg preliminary data suggest that the injury rates are five times the State average, although details on causation of injury is limited (Bell pers. comm.)

Injury concerns are often interrelated with other health issues, risk taking behaviour, socioeconomic pressure, psychosocial factors, exposure to hazardous environments and lack of access to treatment (Australian Institute of Health and Welfare 2006; Carson et al. 2007; Thomson & Krom 2007). Thus injury rates, like other indicators of Indigenous health, reflect broader social and economic factors. Nevertheless there is scope for improving Indigenous health by targeting specific injury concerns (Shannon et al. 2001).

2.6 Litter

One potential source of external injury is that caused by litter. Litter is an important environmental and public health issue that negatively affects the image of communities, and items such as broken glass are often a health hazard (Karolína & Eade 2003). The New South Wales Environmental Protection Authority (EPA) defines litter as any solid or liquid domestic or commercial refuse; however it is recognised that litter is often defined as waste pertaining to pieces of plastic, glass, paper, metal, cloth, rubber, food or by product which is discarded in a public place and not contained in a waste container (Department of Environment and Climate Change 2009). In a study by the EPA in New South Wales the public identified litter as being potentially dangerous (Department of Environment and Climate Change 2009).

Litter has a range of negative impacts on communities (Araphat et al. 2006). Besides its undoubted aesthetic non-appeal, litter can have an economic impact on a community, possibly influencing people's activities, which in turn illustrates a direct cost of unappealing litter in public places (Araphat et al. 2006). There is a great variance of peoples' perceptions when it comes to litter, many find litter offensive and as a consequence may not utilise or visit the affected area (Araphat et al. 2006).

Environmental settings of places affected by litter can have the potential to influence behaviour. For example the more litter is present, the more likely people are to litter rather than dispose of waste appropriately (Al-Khatib 2009; Araphat et al. 2006).

Uncontained litter can also have a more serious medical impact on populations. Litter such as glass is a frequent cause of wounds and injury; Makary states lacerations as the most common paediatric injury which requires a physician's attention (Makary 1998).

2.7 Glass

Makary cites that both in the United Kingdom and the United States, broken glass bottles have been reported to be the leading cause of lacerations amounting to 15 to 27% of all lacerations observed in an urban emergency department (Makary 1998). A Boston study of children eighteen years or younger who presented to the Emergency Service of the Children's Hospital for treatment of lacerations reported that broken bottles were implicated in 83% of cases (Baker et al. 1986).

Makary's Philadelphia study of 241 children analysed the extent to which littered streets pose laceration dangers and determined that 34% of children had been cut at least once while being active outdoors (Makary 1998). Among these children 86% of cuts were caused by broken glass (Makary 1998). The research also revealed that 75% of the children were not wearing shoes at the time of injury (Makary 1998). A similar study in Palestine revealed 58% of children involved in the study had suffered cuts from broken glass on the streets at some stage, lacerations were predominately to the feet when shoes were not worn or sandals were used (Al-Khatib 2009).

An investigation of 200 consecutive glass injuries sustained by children attending the accident and emergency department at the Children's Hospital of Sheffield identified that 43% of the children had cut their feet on broken bottles (Bell 1984). Other injuries occurred as a result of items such as glass furniture, glass doors, mirrors or drinking glasses (Bell 1984). Forty three percent of the time the accidents occurred at home, with the second common place being the street at 20%. The injuries were sustained at a slightly higher rate for boys, and the most represented age group was that of 5 to 11 years of age (Bell 1984). Of the 200 children who were injured 150 of the cases required an x-ray of which glass fragments were seen on 29 films. Most injuries were less serious superficial lacerations however nine children sustained more serious injuries, seven of which occurred at home. Serious injuries required medication, referrals, incisions, the removal of glass and surgical procedures under a general anaesthetic. Bell made suggestions of preventative measures which could reduce injury from glass objects, one of which was the use of unbreakable material for soda pop bottles. He also stated that the public should be encouraged to dispose of glass receptacles safely in bottle banks or

skips. This study also stressed that injuries could be reduced at home, school and in play areas if supervising adults were more aware of the dangers of glass.

A study by the Royal Liverpool Children's Hospital that investigated injuries caused by glass, found that in five months there were 24,082 new attendances to the emergency department of which 587 (2.4%) were for injuries caused by glass (Armstrong & Molyneux 1992). As reported in several studies, glass injuries were twice as common in boys and more than half of the injuries occurred on the street (Armstrong & Molyneux 1992; Jackson 1981). The most frequently identified objects to have caused injury were broken bottles (Armstrong & Molyneux 1992).

Lacerations from glass can result in many health problems such as delayed wound healing, infection, debilitation and neuropraxia (Makary 1998). These health problems can be potentially exacerbated by low immunisation rates and diseases such as diabetes which are common in Indigenous communities of Australia.

The study in Philadelphia found that 16% of children who were lacerated were not up to date with their tetanus immunisations at the time of injury and 30% did not know their immunisation history (Makary 1998). In a prospective study of 415 children, even after the wounds had been cleaned and sutured, 8.5% still developed infections (Makary 1998). Additionally, foreign body retention was found to be common when the wound was caused by the act of stepping on glass (Makary 1998).

A laceration management study of children aged 1 month to 18 years who presented to the emergency department of the Children's Hospital of Philadelphia for laceration repair, also found that street glass was the most common cause of both infected and non-infected wounds (Baker & Lanuti 1990). It was observed that one of the most important factors associated with the development of a primary infection was a delay in seeking medical attention (Baker & Lanuti 1990). However, after medical attention had been sought the initial delay in seeking that medical care did not seem to influence the possibility of developing further infection. The research concluded that lacerations are common occurrences in children, broken glass in the environment requires investigation and parents should also be educated to avoid delay in seeking medical care.

A Middle Eastern study revealed that one of the main driving causes for littering was the lack of garbage bins (Araphat et al. 2006). Of the thousand people surveyed, 56% claimed that insufficient places to dispose of litter was the main cause, while 20% believed the dirtiness of the street was the driving cause for their littering (Araphat et al. 2006). When questioned about appropriate interventions for the littering 27% believed

moral values needed to be increased, with a similar percentage suggesting an increase in the availability of waste receptacles as most effective (Al-Khatib 2009).

An environmentally aware community would also be an advantage; however only 5% of those involved in the study thought public anti-litter awareness campaigns would be an effective method (Araphat et al. 2006). It was noted in the study that glass bottles were among the most common items of litter thrown, particularly within the age group 12-14 years and 14-20 years (Araphat et al. 2006).

The researchers of these studies in Palestine concluded there was a need for more recreational facilities, litter receptacles and public awareness to prevent glass littering (Al-Khatib 2009; Araphat et al. 2006). Other preventative measures suggested were to educate children to wear shoes and also about the hazards of broken glass. It was also stated that parental awareness of these factors must be improved (Al-Khatib 2009; Araphat et al. 2006).

Similarly Hasan believes public awareness is the key to successful waste management and identifies children as the most successful target group to generate long life environmental awareness (Hasan 2004). To achieve this, a waste and litter control curriculum was introduced to Kansas City schools from kindergarten through to grade eight (Hasan 2004). The curriculum was designed recognising the differences in age groups and education level. Activities were designed for use in arts, language, maths, social studies, and science classes. Short courses have also been developed for teachers so they can adopt the education method.

In the United States the Environmental Protection Agency promotes innovation in environmental education through annual proposals and issued an environmental education grant to conduct short courses for school teachers on issues of waste management (Hasan 2004). The course included topics such as waste types, sources, disposal methods, recycling, waste reduction and public awareness (Hasan 2004). Analysis of the course evaluation revealed a substantial lack of awareness of waste management problems by participants (Hasan 2004). Teachers realised the importance of waste and litter management, and a majority of the teachers who attended the course indicated they would include waste management in their class room teaching (Hasan 2004).

Another approach which utilised partnerships with schools was that of a campaign launched by police and the Council in Bracknell to improve young people's awareness of broken glass in parks and open spaces (Holderness-Roddam 2007). Concerned with over 800 incidents where broken glass had been found in various parks and playgrounds over a

short period of time, a scheme was developed with the help of community safety officers, schools, Bracknell Forest licensing staff, neighbourhood watch coordinators and the police (Holderness-Roddam 2007).

The initiative aimed to develop hundreds of posters designed by school children which illustrated how dangerous broken glass can be. The young artists were rewarded with a financial prize (Holderness-Roddam 2007). Posters were displayed at sport centres, libraries, youth centres, schools, parks, and open spaces (Holderness-Roddam 2007). The initiative also directed school liaison officers to visit primary and secondary schools to inform the students of the impacts of anti-social behaviour, which includes the dangers of smashing glass bottles in public places (Holderness-Roddam 2007).

Although limited, studies have indicated social determinants and socio economic factors can influence public behaviours and attitudes towards littering (Araphat et al. 2006). Region and culture dependant, these underlying factors may be an effective approach to minimise littering tendencies within an individual and across a community (Araphat et al. 2006).

Non-degradable litter such as glass has been identified as a compounding problem which will continue to build over time as an injury hazard if not addressed (Al-Khatib 2009). Another approach to limiting glass in the environment is bottle bill legislation, centred upon a small financial incentive for the return of empty containers (Baker et al. 1986). Returnable bottles are a community practice in parts of Europe and the United States of America (Eley pers comm.) In only one year the state of Massachusetts reduced glass related laceration in children by 60% by introducing recycling legislation (Baker et al. 1986). Specifically in the city of Boston, Massachusetts, outdoor glass was involved in 11% of all non-sutured lacerations in the pre-legislation period 1980 -1982 decreasing to 8% with legislation in 1983 (Baker et al. 1986). However there has been a push against such legislation if it incurs a tax on glassed beverages, with concerns public would face increased prices for their goods (2009).

Armstrong & Molyneux commented from their Liverpool study that if streets were clear of glass 37% of glass related injuries could have been prevented (Armstrong & Molyneux 1992).”The quantity of glass on the streets would be less if cartons replaced bottles, if people disposed of litter responsibly, and if streets were frequently swept” (Armstrong & Molyneux 1992).

2.8 Prevention

As the impact of injuries become more recognised many governments are trying to establish a greater understanding of the problem within their country (World Health Organisation 2010). Numerous strategies have been employed across the world proving effective in lowering rates of injury. Additionally the cost benefits of a number of selected injury prevention measures illustrates that they can provide significant value for money (World Health Organisation 2010).

Indicated in the National Injury Prevention and Safety Promotion Plan 2004-2014, “Whether intended or accidental, most physical injuries can be prevented by identifying their causes and removing these, or reducing people’s exposure to them” (National Public Health Partnership 2004).

Earlier in this dissertation injury was identified as a means of physical harm to a person’s body. To prevent injury and promote safety, the idea of safety must be explained.

The National Injury Prevention and Safety Promotion Plan 2004-2014 identifies safety as being of little or no risk of injury, with a holistic focus to wellbeing; people must feel they are safe in addition to actually being safe (National Public Health Partnership 2004).

One of the leading research teams in Australia characterise safety as

“A state characterised by adequate control of physical, material or moral threats which contributes to a perception of being sheltered from danger”(McClure et al. 2004).

They further define Injury prevention as referring to measures taken to reduce the rate of injurious events and avert an injurious outcome.

The same authors conclude that Injury prevention and safety promotion can modify a person’s or a population’s health by interventions at three levels (McClure et al) which are stated as :

- Primary prevention- involves strategies aimed to prevent disease and injury, also includes interventions which reduce the chance and severity of an injury.
- Secondary prevention- an intervention that can provide early detection, and early treatment.
- Tertiary prevention- Involves interventions which reduce the possibility of disability and prolonged morbidity from disease or injury.

The authors caution that although the injury prevention continuum is characterised in terms of prevention, acute care, and rehabilitation, it is important not to use this categorisation to support the fragmentation of injury control into three professional areas of activity. Rather they suggest the focus should be to prevent injury within the whole population of which most people will pass through different stages of this continuum i.e., from being at risk, to injured, or in recovery (McClure et al. 2004).

As outlined earlier many factors can influence injury rates, for example age, sex, and place of residence. The environment and lifestyle behaviours can also play an important role in determining people's injury risk (National Public Health Partnership 2004). The environment consists of things such as roads, traffic, buildings, and the places in which we live, work and play (National Public Health Partnership 2004). The Ottawa charter for health promotion acknowledges the links between people and their environment and promotes the creation of supportive environments (World Health Organisation 2011). In terms of injury this could be the physical environment creating safer environments through better design and planning or the socio-economic environment which could shape opportunities to increase public knowledge about safety (National Public Health Partnership 2004; World Health Organisation 2011).

The National Injury and Safety Plan 2004-2014 regards preventing situations which may lead to an injury as usually the best approach (National Public Health Partnership 2004). Examples provided of this are a reduced risk of car crashes through better road design and traffic control. Barriers such as pool fences or closures on poisons bottles could also lead to a reduced risk of injury as can safety devices as seen with seat belts and helmets (National Public Health Partnership 2004).

As indicated in the World Health Organisations report, Injuries and Violence The Facts (World Health Organisation 2010), there are many examples of strategies which have been based on good scientific evidence that have been shown to be effective in reducing rates of injury and violence. Reduced rates of injury have been observed in numerous countries by applying prevention and treatment strategies. Sweden has successfully managed to reduce its rates of child injuries over the past few decades by approximately 80 percent and 75 percent for both boys and girls, respectively. Likewise other countries have reduced drowning through restricting access to large bodies of water by providing physical barriers in the form of fences, covers for wells and safe bridges (World Health Organisation 2010).

Reviews of what makes injury prevention work emphasise approaches that engage community participation, multi-disciplinary collaboration and the recognition that those most able to solve injury problems are those who work and live in that community (Nilsen 2004; Pike et al. 2000). Additionally, Nilsen's review emphasised the importance of community cohesion and suggested that community based injury prevention programs could perform better in cohesive, stable and isolated communities (Nilsen 2004). Similarly research such as that based on the Woorabinda Aboriginal community has demonstrated that effective injury prevention programs can be accomplished with best practice models of injury control (Shannon et al. 2001).

Injury among Indigenous people has been noted to be a complicated issue and involves many underlying contributing factors (Carson et al. 2007). Carson stresses that patterns of injury may be unique to each Indigenous community and there may not be a generic solution (Carson et al. 2007). Instead each community's own underlying determinants and contributing factors must be targeted. Furthermore they must be dealt with in a way that involves partnering with many sectors of the community including government and non-government organisations and most importantly must have a local Indigenous community driven focus (Carson et al. 2007).

3. Methods

Community members and Elders of Cherbourg voiced their concerns regarding the issue of broken glass in their community. During community consultation the long term problem of litter in particular broken glass littering there streets was raised. An Elder's comments were that while "*some peoples' paths are paved with gold, Cherbourg's are paved with glass*".

It is evident from the literature that broken glass can cause painful and debilitating injuries. In some instances injuries from broken glass litter can be rather serious and require surgery and a lengthier period of rest. Of the literature cited, glass injuries occur more commonly in children and young teenagers. Consistent with the literature, community members of Cherbourg also stated their concerns for broken glass in the community were directed at the children who were being affected.

This project was born out of those concerns and the knowledge that many forms of injury are preventable, and many preventative measures can lead to a reduction in injuries. There is cause to investigate the claims of broken glass injuries within Cherbourg and means to reduce both injuries and broken glass litter.

It was necessary for the methodology of the project to appropriately fit within the barriers of the larger Cherbourg Injury Prevention and Safety Promotion Project. For this reason a mixed methods format was chosen over other more structured frameworks which enabled greater triangulation, validity and consistency of results.

3.1 Aim

To address the health concern of broken glass in the Indigenous community of Cherbourg

3.2 Objectives

- To determine the extent to which broken glass is a health hazard
- To explore with the community what strategies can be identified to address the hazard
- To implement an identified strategy
- To determine the efficacy of that implementation.

As indicated in the background, personal injury, particularly in children, caused by litter and specifically broken glass, was identified as an issue in Cherbourg. This research project expanded the identification of the perceived problem, and determined the means of addressing it. Data was collected in numerous categories, perceptions of the problem and possible solutions were identified through interview and survey. The following section details the methodology employed.

3.3 Identifying the problem

The community's thoughts and opinions of the broken glass were captured by means of individual interviews, a broader community survey, Photo voice and survey of school children, and injury data forms. These processes were carried out with the assistance of the Cherbourg Aboriginal Shire Council's Community Safety/Injury Prevention Project Coordinator who accompanied the researcher throughout the community.

3.4 Ethics

Prior to consultation with the Cherbourg community, ethical approval for the research project was sought and approved from both the University of Southern Queensland and Queensland Health. All data were collected in accordance with the National Health and Medical Research Council's guidelines for ethical conduct in Aboriginal and Torres Strait Islander Health Research (National Health and Medical Research Council 2003). This required consultation with appropriate external bodies and community members in recognition of cultural requirements and respect to the Indigenous people.

3.5 Governance

Under the structure of the larger injury prevention project (CIPSPP) a reference group of stakeholders consisting of government, non-government and community members guided the broken glass research with governance supported by a smaller action group. As an issue identified and actioned upon by these groups, the research into broken glass routinely reported back to both groups and future activities were informed by their feedback. The reference group convened quarterly with the action group communicating more frequently; weekly to fortnightly.

3.6 Observations

The researcher travelled to Cherbourg no less than once a month, and during busy stages of the project frequented the community weekly. On these visits written comments were recorded in a note book. Recordings included observations of the community, the environment and quantities and types of glass litter, general knowledge gained from community members, and follow up actions. Contact was made with the Cherbourg Injury Prevention and Safety Officer on a weekly basis via phone and emails. Outcomes from these conversations were also recorded.

3.7 Community Survey

To expand on information gathered from individual interviews and gain broader community views, a survey was developed utilising information collected from the individual interviews. The survey design was pilot tested by the Centre for Rural and Remote Area Health and the Centre for Australian Indigenous Knowledges. The survey (see appendix B) was constructed to record a mixture of quantitative and qualitative data which included demographic information along with the individual's perception of the broken glass issue within the community, their exposure to the problem, any injury and solutions or strategies to improve the hazard. However the survey further investigated links to location of activity i.e., did the person utilise the street, footpath where glass had been identified in previous community consultations. Additionally the survey asked respondents how often they wore shoes and if there were enough rubbish bins in the community. The survey also identified specific areas of the community to gauge the problem in these locations. Again attached to each survey was a plain language statement providing an explanation of the research and contact details of the researcher, research supervisor and ethics committee (see appendix A).

3.7.1 Incentive

Five twenty dollar IGA food vouchers were purchased as prizes and an incentive mechanism for returning the surveys. Each survey was numbered and provided with a tear away duplicate number for the survey recipient to retain as proof of the winning survey number. The winning numbers were then announced on the Cherbourg radio station two weeks after the survey completion date.

3.7.2 Distribution of survey

According to the 2006 Census there were 246 occupied private dwellings in Cherbourg's Local Government Area. It was decided that 330 surveys would be distributed to the community of which 280 would cover households, providing a number of excess surveys in case of growth in the area or under representation in the ABS data, and 50 surveys to gather information from organisations identified from the Injury Prevention Safety Promotion Action Group (see appendix D).

Table 3.1 Identifies the distribution of the survey.

Table 3.1 Survey distribution

Location	Number
Cherbourg Aboriginal Shire Council staff	10
Cherbourg TAFE staff	10
Community Health staff	10
Barambah Medical Clinic staff	10
Cherbourg Respite Centre staff	10
Local post office mail distribution centre	100
Cherbourg houses	180

Due to a total lack of mail boxes and mail delivery service to each home the surveys were hand delivered, either placed on a front porch or neatly rolled and wedged into a front boundary fence. It is estimated that 80% of the homes within Cherbourg would have received a survey. Some homes did not receive a survey because the property appeared vacant or was inaccessible, most often due to aggressive behaviour from dogs. An effort was made to reach those homes that were inaccessible by distributing surveys from the Cherbourg mail distribution centre; surveys were handed to people when they came to collect their mail. The remaining surveys were hand delivered to each organisation and placed in staff pigeon holes.

Because there was a low response to the survey (n=53), supplemental surveys were handed out on an individual basis by the researcher to people in the Cherbourg community. People within the community were approached on the street by the researcher and the Injury Prevention and Safety Officer and invited to fill in a survey if they had not already done so. The nature of the survey was explained along with a plain language statement and consent form. An additional 25 surveys were distributed, completed and handed back to the waiting researcher.

Community surveys were analysed with the use of software packages Excel and SPSS, producing frequency distributions and cross tabulations including chi square which was significant at $P < 0.1$.

3.8 Individual interviews

Interviews were arranged by the Cherbourg Injury Prevention and Safety Officer who is an Indigenous member of the community. The Officer accompanied the researcher to all interviews. Twenty people between the age of 18 and over 50 years were interviewed within a three month period in 2009-2010. The exact age of participants was not required due to the personal nature of the question. Interviewees represented a sample of people who were residents of Cherbourg or worked in the small community, and were opportunistically identified by the local Injury Prevention and Safety Officer. For reasons unknown, not all persons approached agreed to be interviewed. The duration of the interviews ranged from 5-10 minutes, and was either conducted at their place of work or their private residence. Each person was provided a plain language statement explaining the research and was required to sign a consent form prior to commencement (see appendix A). A range of open ended and closed questions were asked which were similar to those used in the survey and which generated data of sex, age, their relationship to Cherbourg, their perception of litter and broken glass in the community, types of litter in the community and its source, changes in the amount of litter and why, injury from broken glass and solutions. Responses to the interviews were recorded via hand written notation and voice recording. Data obtain from the interviews was analysed thematically using the 5-stage framework approach by Pope (Pope et al. 2000), which requires familiarisation with the raw data, identifying the thematic framework, coding the framework, organising codes into themes and interpretation of themes.

3.9 Collection of injury data

Hospital or emergency based information systems do not collect injury specific data. In order to collect injury specific data from the community the Queensland Injury Surveillance Unit (QISU), in conjunction with the Cherbourg hospital, was approached to distribute patient injury forms. This process included numerous appointments with QISU and hospital staff including the Director of Nursing to ascertain how best to collect the data. Although many issues were raised, the main barrier to collecting the data was staff time and placing additional workloads on hospital staff. To resolve this concern and

guarantee a consistent completion of forms, a champion within the hospital was sought to coordinate the completion and collection of injury forms. The champion was remunerated for their additional workload by the Cherbourg Injury Prevention and Safety Promotion Project.

The QISU, which is funded by Queensland Health and supported by the Brisbane Mater Health Service, has been collecting level 2 injury patient data across Queensland emergency rooms since 1988. The de-identified data which are collected onto standardised forms is able to be analysed in relation to specified injury topics.

Injury forms were provided by QISU. On entering the hospital with an injury presentation each patient was provided with a plain language statement giving a rationale for recording the injury information. The standard patient injury form was then completed by nursing staff for the first presentation by the patient to the Cherbourg Hospital.

Patient injury forms recorded date and time, demographic details, employment status, type of activity at time of injury, occupation and industry, where the injury occurred, what the person was doing at the time of the injury, how the injury was caused and whether the person was wearing any safety equipment.

Subsequently a similar patient injury collection form was developed in conjunction with QISU and the Barambah Medical Centre in Cherbourg to gather injury data from the Cherbourg State Primary School (see appendix F). Permission was sought from the school principal to utilise the injury forms within the setting of the primary school, it was arranged that the school staff member who provided first aid for the students would fill out the forms when presented with an injury. The standard QISU form was modified in consultation with QISU, Barambah Medical Clinic, Cherbourg State Primary School, and the Centre for Rural and Remote Area Health to be more appropriate for the collection of data from children. Examples of modifications of the injury form included the recording of only sex, date of birth and postcode, yes or no if the patient had been referred to the Cherbourg Hospital, and employment status was reduced to student, teacher, or other.

After modifications had been made to the injury form to suit the school environment, the form was trialled through the Centre for Australian Indigenous Knowledges (CAIK) at the University of Southern Queensland, which encourages and assists the further education of Aboriginal and Torres Strait Islander students.

After being culturally approved by CAIK the patient injury forms were utilised by the Barambah Medical Clinic who also conducted a laceration clinic at the school. The

Cherbourg Primary School also used the modified injury forms to record general accidents and injuries presented during school time.

At the end of each month patient injury forms were collected from the three sites and the de-identified data was collated and analysed by the Queensland Injury Surveillance Unit.

3.10 Student Survey

With approval from the Cherbourg State Primary School Principal, a modified and shorter survey was completed by the single class year 6/7, which has an enrolment of 20 students. The children completed the survey in the presence of their teacher who explained the topic to them. The shorter survey consisted of 7 questions which gathered information such as their age, sex, whether they thought Cherbourg had a litter problem, levels of broken glass in the community, whether they had been injured by glass, and why they thought people littered with glass (see appendix G).

3.11 Student Photos (Photovoice)

Developed by Caroline C Wang and Mary Ann Burris the method of Photovoice blends photography with social action. The process provides cameras to capture health issues, however the cameras are not provided to health specialists, professionals or policy makers but to members of the general public who may have the least access to those who make decisions about their lives (International Centre of Art for Social Change 2008; Wang & Burris 1997).

Students from the Cherbourg State Primary School were provided with eight disposable cameras and were escorted around the community by teaching staff capturing, with the cameras, their perception of safety concerns and hazards within the community. The student's photos and thoughts were then presented to the Injury Prevention and Safety Promotion Reference Group as a PowerPoint presentation for consideration of actions.

4. Results

4.1 General Observations

Observations of the community by the researcher were recorded through the use of a personal diary on numerous visits to Cherbourg and Photovoice gathered observations from the year 6/7 children. It was evident that areas of the Cherbourg community had concerning levels of litter including broken glass. It appeared efforts were made to keep the entrance to the community, the main street, relatively tidy in contrast to back streets, sporting facilities, and play areas where there was an abundance of litter and smashed glass littering footpaths. Litter surrounding streets, homes, ovals etc. consisted mainly of papers and plastics, discarded food and product containers, wrappers, and plastic bags. Less frequently sighted were larger littering objects which included mechanical parts, old signs, parts of broken fences and unwanted building products such as wood, and sheet metal. The broken glass was primarily either of a clear or brown colour in nature, sources most likely would be soft drink bottles (although mostly plastic today), windows, windscreens, beer bottles, or spirit bottles. The brown coloured glass was more abundant throughout the community. The broken glass was observed in many states, from small as a pin head enough to cause a glass splinter, to half beer bottles enough to cause a deep laceration.

On commencement of the research there was a distinct lack of community waste facilities both community bins, and household bins as indicated also from Cherbourg residents. It was also identified that there was inconsistent if not at times total lack of waste removal from residential areas for periods of time. Additionally the waste dump site for the community was poorly maintained resulting in unsecured litter and inappropriate dumping.

4.2 Community Survey

Question 1: What is your age?

Fifty three people responded to the survey. There was an uneven distribution of ages across the three age bands with over 54 percent being 40 years of age or older (Table 4.1). The least represented group were those aged between 31-40 years of age.

Table 4.1 Age of survey respondents

Age band	Number	Percent of all respondents
19-30	15	28.3
31-40	9	17.0
>40	29	54.7
Total	53	100.0

Question 2: What is your gender?

Of the 53 people surveyed almost twice as many women responded than men. (Table 4.2). Comparing this data with that of the Australian Bureau of Statistics data for Cherbourg's adult population (52:48 females:males) indicates the distribution of females and males responding to the survey is not indicative of the Cherbourg community.

Table 4.2 Gender of survey respondents

Gender	Number	Percent of all respondents
Male	19	35.8
Female	34	64.2
Total	53	100

$\chi^2=5.769, n=53, df=1, p=.0163$

Question 3: Are you a resident of Cherbourg?

The majority of survey respondents live in Cherbourg (Table 4.3), with close to 85 percent of respondents indicating to also work in the community (Table 4.4).

Table 4.3 Residency of survey respondents

Resident of Cherbourg	Number	Percent of all respondents
No	20	37.7
Yes	33	62.3
Total	53	100.0

Question 4: Do you work in Cherbourg?

Table 4.4 Survey respondents who work in Cherbourg

Employed in Cherbourg?	Number	Percent of all respondents
No	8	15.1
Yes	45	84.9
Total	53	100.0

Question 5: In Cherbourg do you use the street or footpath to walk, skate or cycle?

Table 4.5 illustrates that the vast majority of those who were surveyed utilise Cherbourg’s streets and footpaths.

Table 4.5 Respondents use of streets and footpaths

In Cherbourg do you use the street or footpath to walk, skate, cycle?	Number	Percent of all respondents
No	6	11.3
Yes	47	88.7
Total	53	100.0

Question 6: Do you think Cherbourg has a litter problem?

Over 92% of those who responded to the question believe Cherbourg has a litter problem (Table 4.6).

Table 4.6 Perception of litter in Cherbourg

Do you think Cherbourg has a litter problem?	Number	Percent of all respondents	Percent responding to question
No	4	7.5	7.7
Yes	48	90.6	92.3
Total	52	98.1	100.0
Missing	1	1.9	
Total	53	100.0	

Question 7: Is there broken glass on the footpaths and streets?

With only one exception, everyone who responded to the question claimed there was broken glass on the streets and footpaths of Cherbourg (Table 4.7), with all respondents declaring the broken glass to be a hazard (Table 4.8).

Table 4.7 Occurrence of broken glass on the streets

Is there broken glass on the footpaths and streets	Number	Percent of all respondents	Percent responding to question
No	1	1.9	1.9
Yes	51	96.2	98.1
Total	52	98.1	100.0
Missing	1	1.9	
Total	53	100.0	

Question 8: Do you find the broken glass to be a hazard?

Table 4.8 Is broken glass a hazard?

Do you find the broken glass to be a hazard	Number	Percent of all respondents	Percent responding to question
Yes	49	92.5	100.0
Missing	4	7.5	
Total	53	100.0	

Question 9: Do you find broken glass to be a hazard in these areas of the community?

Of the three identified sites included in the survey, (Table 4.9) all were identified by at least 40% of the respondents as having broken glass.

Table 4.9 Locations of broken glass

Do you find broken glass to be a hazard in these areas of the community	Number of YES responses	Percentage of total respondents
Football oval	22	41.5
Playground	30	56.6
School yard	27	50.9
Other	23	43.4

Question 10: What is the source of broken glass?

The source of the broken glass was primarily from alcohol bottles; in particular beer bottles (Table 4.10).

Table 4.10 Origin of broken glass

Source of broken glass	Number of YES responses	Percentage of total respondents
Beer bottles	49	92.5
Spirit bottles	34	64.2
Soft drink bottles	16	30.2
Other	8	15.1

Question 12: In the past year has the problem worsened or improved?

Responses to the question (in past the past year has the problem worsened or improved) were equivocal as to whether the amount of broken glass had changed. However a small majority (56%) of people who responded believed the problem of broken glass littering the community had recently improved (Table 4.11).

Table 4.11 Perceptions of change in the amount of broken glass

In the past year has the problem worsened or improved	Number	Percent of all respondents	Percent responding to question
Improved	26	49.1	56.5
Worsened	20	37.7	43.5
Total	46	86.8	100.0
Missing	7	13.2	
Total	53	100.0	

Question 14: Have you ever been cut by broken glass littering the community?

Of the 53 people surveyed, close to 60% responded that they had been cut by broken glass littering the community (Table 4.12). Additionally more than half of those who had been cut by glass had obtained medical attention due to a laceration from street glass (Table 4.13).

Table 4.12 Respondents cut by broken glass

Have you ever been cut by broken glass littering the community	Number	Percent of all respondents	Percent responding to question
No	21	39.6	40.4
Yes	31	58.5	59.6
Total	52	98.1	100.0
Missing	1	1.9	
Total	53	100.0	

Question 15: Have you had to seek medical treatment due to a laceration from street glass?

Table 4.13 Medical treatment sought due to laceration from street glass

Have you had to seek medical treatment due to a laceration from street glass	Number	Percent of all respondents	Percent responding to question
No	12	38.7	38.7
Yes	19	61.3	61.3
Total	31	100.0	100.0

* Note: Data representative of respondents cut by glass

Question 16: Were you wearing shoes at the time?

Of those who provided a response, nearly half of the people who were cut from glass on the streets were not wearing shoes at the time (Table 4.14).

Table 4.14 Were shoes being worn at the time of injury?

Were you wearing shoes at the time	Number	Percent of all respondents	Percent responding to question
No	19	61.3	61.3
Yes	12	38.7	38.7
Total	31	100.0	100.0

* Note: Data representative of respondents cut by glass

Question 17: How often do you wear shoes when you are on the street/footpath?

Out of 53 responses, 42 people claimed to wear shoes all the time when they are on the street or footpath (Table 4.15). Of the 31 people who had been cut by broken street glass in Cherbourg, one person stated they wore shoes only some of the time, nine wore shoes most of the time and 21 wore shoes all the time.

Table 4.15 How often is footwear worn?

How often do you wear shoes when you are on the street or footpath	Number	Percent of all respondents
All the time	42	79.2
Most of the time	10	18.9
Some of the time	1	1.9
Total	53	100.0

Question 18: Do you think there are enough rubbish bins in Cherbourg?

Only three people out of 51 respondents who answered the question thought that Cherbourg had enough litter bins (Table 4.16).

Table 4.16 Are there enough bins in Cherbourg?

Do you think there are enough bins in Cherbourg	Number	Percent of all respondents	Percent responding to question
No	48	90.6	94.1
Yes	3	5.7	5.9
Total	51	96.2	100.0
Missing	2	3.8	
Total	53	100.0	

Table 4.17 shows the results for cross tabulation of the residency of respondents and their perception of litter as a problem in Cherbourg. In total, 92.3% of respondents said litter was a problem. All of the 19 non-residents and 29 of the 33 residents said litter was a problem. There was no significant effect in perception according to residency. Odds ratio indicates survey respondents were no more likely to perceive litter as a problem whether they were residents or non-residents.

Table 4.17 Resident perception of litter problem

		Litter Problem			
		No	Yes	Total	
Residency	No	Count	0	19	19
		% within Residency	.0	100.0	100.0
		% within Problem	.0	39.6	36.5
		% of Total	.0	36.5	36.5
	Yes	Count	4	29	33
		% within Residency	12.1	87.9	100.0
		% within Problem	100.0	60.4	63.5
		% of Total	7.7	55.8	63.5
Total	Count	4	48	52	
	% within Residency	7.7	92.3	100.0	
	% within Problem	100.0	100.0	100.0	
	% of Total	7.7	92.3	100.0	

$\chi^2 = 2.495$, $n=52$, $df=1$, $p=.114$ (with Yates Continuity Correction = 1.080, $p=.299$;
Fisher's Exact Test $p=.284$); Phi = -.219, $p=.114$, OR=.3816 (CI=.039-3.68)
2 cells (50.0%) have expected count less than 5

Although non-residents were affected by broken glass, there was a significantly higher rate of cuts amongst residents as indicated in (Table 4.18) a cross tabulation of residency of respondents and those cut by broken glass in Cherbourg. Odds ratio illustrates you are more than double the risk of being cut by glass if you are a resident of Cherbourg.

Table 4.18 Residence cut by broken glass within Cherbourg

		Cut by broken glass in Cherbourg			
		No	Yes	Total	
Resident of Cherbourg	No	Count	11	9	20
		% within Residency	55.0	45.0	100.0
		% within Injured	52.4	29.0	38.5
		% of Total	21.2	17.3	38.5
	Yes	Count	10	22	32
		% within Residency	31.3	68.8	100.0
		% within Injured	47.6	71.0	61.5
		% of Total	19.2	42.3	61.5
Total	Count	21	31	52	
	% within Residency	40.4	59.6	100.0	
	% within Injured	100.0	100.0	100.0	
	% of Total	40.4	59.6	100.0	

$\chi^2=2.884$, $n=52$, $df=1$, $p=.089$ (with Yates Continuity Correction = 1.981, $p=.159$; Fisher's Exact Test $p=.146$); Phi = .235, $p=.089$, OR=2.69 (CI=.84-3.68)

A cross tabulation of respondents injured and those who sought treatment indicates that of those who were injured (Table 4.19) more than half acquired some form of medical treatment. A significant effect was found. The odds ratio at 36.27 identifies that respondents are 36 times more likely to require treatment if cut in comparison to those who were not cut.

Table 4.19 Survey respondents and their response to being cut by glass

		Treatment			
		No	Yes	Total	
Injured	No	Count	21	0	21
		% within Injured	100.0	.0	100.0
		% within Treatment	65.6	.0	41.2
		% of Total	41.2	.0	41.2
	Yes	Count	11	19	30
		% within Injured	36.7	63.3	100.0
		% within Treatment	34.4	100.0	58.8
		% of Total	21.6	37.3	58.8
Total	Count	32	19	51	
	% within Injured	62.7	37.3	100.0	
	% within Treatment	100.0	100.0	100.0	
	% of Total	62.7	37.3	100.0	

$\chi^2 = 21.197$, $n=51$, $df=1$, $p < .001$ (with Yates Continuity Correction = 18.574, $p < .001$; Fisher's Exact Test $p < .001$); Phi = .645, $p < .001$, OR=36.27 (CI=4.27-308.03)

Table 4.20 indicates that lacerations can occur regardless of footwear. All of the people who were not injured were wearing shoes. However 38.7 percent of respondents who were injured were wearing footwear at the time of injury. This was found to be highly significant. Results from odds ratio also indicate a 14 times greater risk of being cut by glass if not wearing shoes while in Cherbourg.

Table 4.20 Laceration from glass and the use of footwear

		Wearing shoes at the time of injury			
		No	Yes	Total	
Injured	No	Count	0	9	9
		% within Injured	.0	100.0	100.0
		% within Shoes	.0	42.9	22.5
		% of Total	.0	22.5	22.5
	Yes	Count	19	12	31
		% within Injured	61.3	38.7	100.0
		% within Shoes	100.0	57.1	77.5
		% of Total	47.5	30.0	77.5
Total		Count	19	21	40
		% within Injured	47.5	52.5	100.0
		% within Shoes	100.0	100.0	100.0
		% of Total	47.5	52.5	100.0

$\chi^2 = 10.507$, $n=40$, $df=1$, $p=.001$ (with Yates Continuity Correction = 8.193, $p=.004$; Fisher's exact $p=.001$); Phi = -.513, $p=.001$, OR=14.25 (CI=1.59-127.17)
 2 cells (50.0%) have expected count less than 5

Table 4.21 shows the results for cross tabulation of whether Cherbourg has a litter problem and if there are enough bins in the community. Nearly all survey respondents stated that Cherbourg has a litter problem, and only three people thought there were a sufficient amount of bins in the community. No significance was found.

Table 4.21 Perception of litter problem and if Cherbourg has enough rubbish bins

		Are there enough bins in Cherbourg			
		No	Yes	Total	
Does Cherbourg have a litter problem	No	Count	2	0	2
		% within Litter problem	100.0	.0	100.0
		% within Enough bins	4.3	.0	4.0
		% of Total	4.0	.0	4.0
	Yes	Count	45	3	48
		% within Litter Problem	93.8	6.3	100.0
		% within Enough bins	95.7	100.0	96.0
		% of Total	90.0	6.0	96.0
Total		Count	47	3	50
		% within Litter Problem	94.0	6.0	100.0
		% within Enough bins	100.0	100.0	100.0
		% of Total	94.0	6.0	100.0

$\chi^2 = .133$, $n=50$, $df=1$, $p=.715$ (with Yates Continuity Correction = .000, $p=1.000$; Fisher's Exact Test $p=1.000$); Phi = .052, $p=.715$

3 cells (75.0%) have expected count less than 5

Comparison is not valid due to only two observations in the No/No and No/Yes cells

Table 4.22 illustrates a significant difference in age versus perception of litter, with 100 percent of respondents aged over 40 indicating that Cherbourg has a litter problem, almost double any of the other age groups.

Table 4.22 Age of survey respondents and their perception of the litter problem

		Does Cherbourg have a litter problem			Total
		No	Yes		
Age	19-30	Count	2	13	15
		% within Age	13.3	86.7	100.0
		% within Litter problem	50.0	27.1	28.8
		% of Total	3.8	25.0	28.8
	31-40	Count	2	7	9
		% within Age	22.2	77.8	100.0
		% within Litter problem	50.0	14.6	17.3
		% of Total	3.8	13.5	17.3
	40<	Count	0	28	28
		% within Age	.0	100.0	100.0
		% within Litter problem	.0	58.3	53.8
		% of Total	.0	53.8	53.8
Total		Count	4	48	52
		% within Age	7.7	92.3	100.0
		% within Litter problem	100.0	100.0	100.0
		% of Total	7.7	92.3	100.0

$\chi = 5.681$, $n=52$, $df=2$, $p=.058$; Cramer's $v = .331$, $p=.058$; $\phi=.331$, $p=.058$
 3 cells (50.0%) have expected count less than 5

Cross tabulation of the grouped age of respondents and their perception of the litter problem (Table 4.23) illustrates a significant finding in which those over 40 years of age are more likely to state Cherbourg has a litter problem (100%).

Table 4.23 Age of survey respondents and their perception of the litter problem

		Does Cherbourg have a litter problem			
		No	Yes	Total	
Age	Over 40	Count	0	28	28
		% within AG	.0%	100.0%	100.0%
		% within 6Problem	.0%	58.3%	53.8%
		% of Total	.0%	53.8%	53.8%
	<18 19-30 31-40	Count	4	20	24
		% within AG	16.7%	83.3%	100.0%
		% within 6Problem	100.0%	41.7%	46.2%
		% of Total	7.7%	38.5%	46.2%
Total	Count	4	48	52	
	% within AG	7.7%	92.3%	100.0%	
	% within 6Problem	100.0%	100.0%	100.0%	
	% of Total	7.7%	92.3%	100.0%	

$\chi = 5.056$, $n=52$, $df=1$, $p=.025$ (with Yates Continuity Correction = 2.981, $p=.084$; Fisher's Exact Test $p=.039$); Phi = -.312, $p=.025$
 2 cells (50.0%) have expected count less than 5

Question 9: Do you find broken glass to be a hazard in these other areas of the community, other?

Of the 53 respondents 19 made comments and 25 areas were identified as locations where glass was a hazard (Table 4.24).

Table 4.24 Areas in which broken glass is a hazard

In which areas do you find broken glass to be a hazard	
Area	Number
Car park	3
Sports complex	1
Street gutters	1
Respite area footpath	1
Road into town	1
School	1
Store	1
Street	10
TAFE	2
Work areas	1
Yards	3

Question 11: Why do you think people litter the community with glass?

Of the 53 people surveyed 43 people provided responses in which 42 reasons for littering were identified and summarised into themes (Table 4.25).

Table 4.25 Reasons for littering

Why litter	
Cause	Number
Poor behaviour	15
Boredom	3
Bad attitude/apathy	8
Lack of waste facilities	10
Alcohol	2
Violence	1
Lack of signage	1
Lack of education	2

Question 13: In the past year has the problem worsened or improved? why?

Of the 53 people surveyed 32 people provided reasons why the broken glass litter had improved or worsened (Table 4.26).

Table 4.26 In the past year has the problem worsened or improved, and why?

Cause	Worsen	Improved
	Number	
Education	1	
Lack of waste facilities	3	
Behaviour	3	
Attitude	3	
Boredom	1	
Lack of law enforcement	1	
Alcohol	1	
Clean up gang		6
Alcohol management plan		8
Pride		1
Education		2
Council works		2

Question 10: What is the source of broken glass? other

Windows, window glass, any other bottles that are made of glass, drinking glasses/medicine glasses; windscreens, streetlights; unknown.

Question 19: What do you think should or could be done with glass bottles?

Of the 53 survey respondents 47 people provided a response or a multiple response to the question of solutions for glass bottles, 55 solutions were identified in Table 4.27.

Table 4.27 Solutions for glass

What do you think should or could be done with glass bottles	
Solution	Number
More bins	8
Recycle	31
Refund incentive for glass	7
Cherbourg a no glass bottles community	5
Reinforce penalties for littering	2
Education	1
Clean the streets	1

4.3 Individual Interviews

Twenty people were interviewed. Those interviewed were predominately male; the greatest representatives were in the age groups of 18-29 and 4-49. There was an even distribution of those who worked or lived in Cherbourg surveyed, with more than half of respondents having children.

90 percent of people interviewed claimed Cherbourg has a litter problem, of particular interest was glass bottles, plastic materials, and paper (Table 4.28).

Table 4.28 Individual interview part one

Interview question	Response	Number	Percentage
Age	18-29	7	35
	30-39	3	15
	40-49	7	35
	50-99	3	15
Sex	Male	15	75
	Female	5	25
Residency status	Resident	4	20
	Resident and works in Cherbourg	7	35
Place of employment	Works in Cherbourg	8	40
	Visitor	1	5
Children	Yes	12	60
	No	8	40
Do you think Cherbourg has a litter problem?	Yes	18	90
	No	2	10
What types of litter in particular?	Glass: bottles	11	55
	Plastic: bottles, wrappers, chip packets, bags,	10	50
	Paper-cardboard	9	45
	General rubbish	4	20
	Condoms	1	5
	Cans	3	15

The majority of interviewees claimed that the amount of litter had worsened, with the most frequent time frame for this occurrence being in the last 10-15 years. Out of 20 people interviewed, seven responses were provided for reasons as to why litter around the community had improved, and 12 reasons why it had worsened with the most frequent response being attitude (Table 4.29).

Table 4.29 Individual interview part two

Interview question	Response	Number	Percentage
Change in amount of litter	Worse	12	60
	Improved	2	10
	No Change	5	25
When	Last 12 months	1	5
	Last 5 years	1	5
	Last 10-15 years	3	15
	Last 20-25 years	1	5
	Last 30-35 years	1	5
Why	Improved		
	Alcohol management plan	2	10
	More pride	1	5
	Improved waste disposal	2	10
	Council strategies-fencing, yard make over.	2	10
	Worsen		
	Animals-dogs	3	15
	No clean up gang	3	15
	Behaviour-lazy	2	10
	Attitude- no respect	4	20

Almost all people interviewed found broken glass to be of concern in Cherbourg, with glass occurring more frequently on streets and footpaths. There was a broad area identified where broken glass was more abundant, with one of the main streets (Broadway), back streets and the basketball court being more frequently identified. The majority of people reported the type of broken glass to be from beer bottles, and the source of the broken glass to be from incorrect disposal of glass which is then smashed by children. Of those who responded to the question, no-one reported that the amount of broken glass had increased in the recent past and 55 percent stated there had been a decrease in the amount of broken glass recently (Table 4.30).

Table 4.30 Individual interview part three

Interview question	Response	Number	Percentage
Is broken glass a concern in Cherbourg?	Yes	19	95
	No	1	5
Where is the glass usually found?	Footpath	13	65
	Streets	13	65
	Parks-ovals	4	20
	School	3	15
Where is there an abundance of broken glass?	Sports complex	1	5
	School	2	10
	Basketball court	5	25
	Pit stop drinking place	1	5
	Broadway Street	4	20
	Barber Street	3	15
	Marshall Street	2	10
	Barambah Avenue	1	5
	Fisher Street	2	10
	Bulgi Street	3	15
What types of glass is it?	Beer bottles	20	100
	Spirit bottles	6	30
	Soft drink bottles	2	10
Where do you think the broken glass comes from?	Kids smash the glass bottles	10	50
	Incorrect disposal of bottles by adults	9	45
Have you seen any changes in the amount of broken glass recently?	Increase	1	5
	Decrease	10	50
	No Change	8	40

Sixty five percent of people interviewed claimed they or a family member had been affected by broken glass while in Cherbourg. The most frequent location where an injury occurred was on the street, with most injuries resulting in a laceration to the foot. Of the 13 who said they or a family member were injured, eight required medical treatment and only one person was wearing shoes at the time of injury. The most frequent responses for solutions to broken glass were to recycle, increase the number of litter bins, and deploy a clean-up gang (Table 4.31).

Table 4.31 Individual interview part four

Interview question	Response	Number	Percentage
Have you or your family ever been effected by broken glass when in Cherbourg?	Yes	13	65
	No	7	35
Where did it happen?	School	3	15
	Oval	1	5
	Street	5	25
	Play ground	1	5
	Creek	1	5
What type of injury occurred?	Laceration to foot	12	60
	Glass splinter to foot	1	5
Was medical treatment required?	Yes	8	40
	No	5	25
Was the person wearing shoes at the time of injury?	Yes	1	5
	No	12	60
Solutions for broken glass?	Recycle	4	20
	Increase number of bins	5	25
	Clean up gang	4	20
	Ban glass	1	5
	Street sweeper	2	10
	Improve peoples' behaviour	3	15

Themes drawn from individual interviews indicate the major issues that the interviewees believed had an effected on the problem were:

Low use of footwear

- Lack of footwear, particularly among children.

Alcohol Management Plan

- Alcohol Management Plan has reduced the amount of new broken glass within the community.

Waste management

- There is a lack of bins around the community, and within households.
- Need for improved waste management, secure dumping and recycling of glass.

Extreme make over

- Clean up competitions do decrease litter and glass within the community but only temporarily.

Animal management

- Dogs knock over bins and spread the rubbish.

Adults dispose of litter in particular glass inappropriately, children then smash the glass.

Behaviour and attitude

- Poor behaviour and attitudes contribute to litter through incorrect disposal.

4.5 Cherbourg Hospital injury data

Data was collected from the Cherbourg Hospital from September 2009 to November 2010. During which time there were a total of 200 injury presentations to the emergency department. Data which was collated and analysed by the Queensland Injury Surveillance Unit is presented in this section.

4.5.1 Age and Gender

Identified in Table 4.32 the peak age groups for the injury presentations were 15 to 44 years. Results also present a greater representation of males (57%).

Table 4.32 Age and gender

Age Groups	Male	Female	Total	%
Under 1	1	3	4	2.0%
1 – 4	7	13	20	10.0%
5 – 9	20	7	27	13.5%
10 – 14	16	10	26	13.0%
15 – 24	28	23	51	25.5%
25 – 44	31	22	53	26.5%
45 – 64	11	7	18	9.0%
+ 65	1	0	1	0.5%
Total	115	85	200	100.0%

Source: Adapted from data provided by QISU.

4.5.2 Top 10 Major Injury Factors

The greatest incidence of injury was caused by another person (57 presentations of a total of 200, Table 4.33). Table 4.34 identifies the same number of presentations for external causes of injury (n=57) struck by or collided with a person, peak age group for external causes of injury was 25-44 years. Glass was only indicated in 4.5% of injuries (Table 4.33).

Table 4.33 Top 10 Major injury factors

Top 10 Major Injury Factor	Under 1	1 - 4	5 - 9	10 - 14	15 - 24	25 - 44	45 - 64	+ 65	Total	%
Person	1	2	2	5	24	22	1	-	57	28.5%
Other or unspecified factor	-	2	2	1	2	4	-	-	11	5.5%
Glass: sheet, piece, shard, etc	-	1	2	1	1	2	2	-	9	4.5%
Other or unspecified structure or fixture	-	1	2	-	3	-	2	-	8	4.0%
Natural surface	-	1	2	1	-	1	2	1	8	4.0%
Dog	-	1	2	-	-	3	1	-	7	3.5%
Fence, gate	-	1	-	2	2	-	2	-	7	3.5%
Metal: sheet, part, piece, etc	-	-	3	1	1	1	-	-	6	3.0%
Other or unspecified sporting equipment	-	-	-	3	-	2	-	-	5	2.5%
Bicycle	-	1	2	1	1	-	-	-	5	2.5%
Total	1	10	17	15	34	35	10	1	123	61.5%

Source: Adapted from data provided by QISU

Table 4.34 External cause of injury

External Cause	Under 1	1 - 4	5 – 9	10 - 14	15 - 24	25 - 44	45 - 64	+ 65	Total	%
Struck by or collision with person	1	1	2	5	25	22	1	-	57	28.5%
Fall – low	2	8	4	7	4	6	6	1	38	19.0%
Struck by or collision with object	-	4	4	4	8	5	6	-	31	15.5%
Other specified external cause	-	1	5	2	6	8	-	-	22	11.0%
Cutting, piercing object	-	3	4	3	1	6	3	-	20	10.0%
Dog related (incl. Bitten, stuck by)	-	1	2	-	-	3	1	-	7	3.5%
Pedal Cyclist or Pedal Cycle Passenger	-	1	1	1	1	-	-	-	4	2.0%
Animal - related (excludes horse or dog)	-	-	1	-	1	2	-	-	4	2.0%
Fall - high (drop of 1 metre or more)	-	-	2	-	1	-	-	-	3	1.5%
Motorcycle – Driver	-	-	-	2	1	-	-	-	3	1.5%
Motor Vehicle – Driver	-	-	-	-	1	-	1	-	2	1.0%
Fire, flames, smoke	-	-	-	1	1	-	-	-	2	1.0%
Machinery	-	1	-	-	1	-	-	-	2	1.0%
Other threat to breathing	1	-	-	-	-	-	-	-	1	0.5%
Unspecified external cause (incl late effects)	-	-	-	-	-	1	-	-	1	0.5%
Other or unspec Transport related circumstance	-	-	-	1	-	-	-	-	1	0.5%
Horse related (falls from, struck or bitten by)	-	-	1	-	-	-	-	-	1	0.5%
Pedestrian	-	-	1	-	-	-	-	-	1	0.5%
Total	4	20	27	26	51	53	18	1	200	100.0%

Source: Adapted from data provided by QISU

4.6 School Survey-Year 6/7 Cherbourg Primary school

Twelve students were surveyed of which 75% were females (Table 4.35).

Table 4.35 Gender of survey respondents

Gender	Frequency	Percent	Valid Percent
Male	3	25.0	25.0
Female	9	75.0	75.0
Total	12	100.0	100.0

Identified in (Table 4.36) all students who responded to the question thought Cherbourg has a litter problem.

Table 4.36 Does Cherbourg have a litter problem?

Litter problem	Frequency	Percent	Valid Percent
Yes	11	91.7	100.0
Missing	1	8.3	
Total	12	100.0	

All of the students surveyed stated there was a lot of broken glass around the community (Table 4.37).

Table 4.37 Is there broken glass in Cherbourg where you walk, skate, cycle or play?

Glass problem	Frequency	Percent	Valid Percent
Yes	12	100.0	100.0

Every one of the students who surveyed had been cut by broken glass while in Cherbourg (Table 4.38), with three quarters of them not wearing shoes at the time of injury (Table 4.39).

Table 4.38 Have you ever been cut by broken glass in Cherbourg?

Cut by broken glass	Frequency	Percent	Valid Percent
Yes	12	100.0	100.0

Table 4.39 Were you wearing shoes at the time?

Wearing shoes	Frequency	Percent	Valid Percent
Yes	3	25.0	25.0
No	9	75.0	75.0
Total	12	100.0	100.0

There were 11 responses from 12 people surveyed, 32 locations indicated (Table 4.40). The greatest frequencies of children were injured while on the street.

Table 4.40 Location when cut by glass

Where were you when you were cut by glass	
Area	Number
School oval	3
Park	6
Hall	5
Street	10
Skate park	7
Creek	1

4.7 Photovoice-Cherbourg Primary School

Over 100 photographs of many parts of the community were taken by Cherbourg school children. The children then prepared a slide show of the photographs, their concerns and solutions were presented to the Cherbourg Injury Prevention and Safety Promotion Reference Group (appendix H). The students used photographs to illustrate that Cherbourg had a litter problem which was both unsafe and not pleasant to live with. The children requested a clean community, one which was free of broken glass which was identified on the street and playing surface of a public basketball court. Additionally other potential sources of injury within the community were presented to the group these included requests to improve road safety, animal management, unsafe housing, lack of recreational facilities and infrastructure including lighting, alcohol and violence.

The children's photos and requests were documented and discussed by the Cherbourg Injury Prevention and Safety Promotion Reference Group and ultimately shaped many strategies of the project.

4.8 Cherbourg School injury data

Data was collected from the Cherbourg Primary School for eight months (April-December 2010). A total of 70 presentations were recorded of which 69 were for Indigenous children. Data presented in this section were provided by the Queensland Injury Surveillance Unit.

4.8.1 Age and gender

Results indicate that the peak of injuries occurred in the 5-7 age group and declined with age. Males had a slightly higher rate of injury, 57% (Table 4-41).

Table 4.41 Age and gender

Age Groups	Male	Female	Total	%
5-7 yrs	15	12	27	39%
8-10 yrs	13	10	23	33%
11-13 yrs	10	8	18	26%
Unknown	2	0	2	3%
Total	40	30	70	100%

4.8.2 Monthly records of injury

Table 4.42 illustrates that the majority of the recorded injuries occurred in the month of July and October.

Table 4.42 Injuries per month

Injury Months	Male	Female	Total	%
Apr	1	0	1	1%
Jun	0	0	0	0%
Jul	17	11	28	40%
Aug	5	4	9	13%
Sep	3	3	6	9%
Oct	11	10	21	30%
Nov	2	2	4	6%
Dec	1	0	1	1%
Total	40	30	70	100%

4.8.3 Type of injury

Injury resulted in open wounds for most who presented (n=55) (Table 4.43). The foot was indicated as the most frequent location of injury (Table 4.44).

Table 4.43 Nature of injury

Nature of Injury	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total	%
Open wound (excludes eye)	22	16	15	2	55	79%
Superficial (incl. bruise; excl. eye)	3	1	3	0	7	10%
Foreign body in soft tissue	1	3	0	0	4	6%
Burn or corrosion (excl. eye)	1	2	0	0	3	4%
No injury detected	0	1	0	0	1	1%
Total	27	23	18	2	70	100%

4.8.4 Bodily location of injury

Table 4.44 Bodily location of injury

Body Location	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total	%
Foot (includes toes)	13	11	3	0	27	39%
Knee	3	0	5	1	9	13%
Hand (includes fingers)	3	2	3	0	8	11%
Multiple injuries	2	1	2	0	5	7%
Lower leg	0	3	1	0	4	6%
Face(excludes eye)	2	0	0	1	3	4%
Forearm	1	1	1	0	3	4%
Thigh	2	0	1	0	3	4%
Unspecified bodily location	0	1	1	0	2	3%
Shoulder	0	1	0	0	1	1%
Body location not required	0	1	0	0	1	1%
Lower back(inc .loin)	1	0	0	0	1	1%
Ankle	0	1	0	0	1	1%
Elbow	0	1	0	0	1	1%
Hip	0	0	1	0	1	1%
Total	27	23	18	2	70	100%

4.8.5 External causes of injury

As identified in Table 4.45, falls were the greatest external cause of injury (24 %), followed by being struck by or colliding with an object (19%).

Table 4.45 External causes of injury

External Cause	5-7 yrs	8-10 yrs	11-13 yrs	Unkn own	Total	%
Fall - low	6	5	5	1	17	24%
Struck by or collision with object	3	8	2	0	13	19%
Unspecified external cause (incl late effects)	6	3	1	0	10	14%
Other specified external cause	5	3	2	0	10	14%
Cutting, piercing object	3	1	2	1	7	10%
Struck by or collision with person	3	0	1	0	4	6%
Horse related (falls from, struck or bitten by)	0	0	3	0	3	4%
Exposure to hot object or solid substance	1	1	0	0	2	3%
Animal - related (excludes horse or dog)	0	0	1	0	1	1%
Motorcycle - Driver	0	0	1	0	1	1%
Pedal Cyclist or Pedal Cycle Passenger	0	1	0	0	1	1%
Fire, flames, smoke	0	1	0	0	1	1%
Total	27	23	18	2	70	100%

4.8.6 Part or place where injury occurred

The majority of places where injuries occurred were unspecified, of those that were nominated, parks, footpaths, roadways, and fields were indicated most frequently (Table 4.46).

Table 4.46 Where injury occurred

Part of Place & Sub	5-7 yrs	8-10 yrs	11-13 yrs	Un-known	Total
Other or unspecified places	17	17	14	1	49
Other, exterior	12	6	9	0	27
Unspecified part of place	5	10	5	1	21
Other, interior	0	1	0	0	1
Grounds, road, site, street, car park	9	2	2	0	13
Garden, Park, National Park/Backyard	5	0	1	0	6
Footpath/path/foot track	2	1	0	0	3
Roadway	2	0	1	0	3
Paddock/Field/Camping ground	0	1	0	0	1
Sporting or play area	1	1	1	1	4
Playground - with play equipment	1	1	1	1	4
Room or internal area	0	2	0	0	2
Kitchen	0	2	0	0	2
Part of building/Structure	0	1	0	0	1
Stairs	0	1	0	0	1
Outside bodies of water; its shore	0	0	1	0	1
River/creek/lake/reservoir	0	0	1	0	1
Total	27	23	18	2	70

Table 4.47 Type of place

Type of Place	5-7 yrs	8-10 yrs	11-13 yrs	Un-known	Total
Unspecified place	8	9	5	1	23
Primary school	2	7	6	1	16
Other or unspecified	8	3	4	0	15
Free-standing house	5	2	1	0	8
Urban road	1	1	1	0	3
Pre-school, kindergarten	1	0	0	0	1
Farm	0	1	0	0	1
Oval, fields, pitch	1	0	0	0	1
Bush, remote or undeveloped place	1	0	0	0	1
Other specified place	0	0	1	0	1
Total	27	23	18	2	70

4.8.8 Activity when injured

Most children were injured while playing (n=35) (Table 4.48).

Table 4.48 Activity when injured

Activity When Injured	5-7 yrs	8-10 yrs	11-13 yrs	Un-known	Total
Playing	15	14	5	1	35
Other specified activity	4	6	3	0	13
Engaged in formal educational activity	0	1	4	1	6
Football - not specified	3	0	1	0	4
Horse riding	0	0	3	0	3
Unspecified activity	2	0	0	0	2
Skateboarding	1	0	0	0	1
Bicycling	0	1	0	0	1
Resting, sleeping, eating, other	0	1	0	0	1
Football - not spec/other	1	0	0	0	1
Other sports activity (specify in narrative)	0	0	1	0	1
Minibike / trail bike riding	0	0	1	0	1
Other leisure activity (specify in narrative)	1	0	0	0	1
Total	27	23	18	2	70

4.8.9 Method of injury

Cutting and tearing injuries were recorded more frequently (n= 25). The 5-7 age group accounted for the highest total of injuries (Table 4.49).

Table 4.49 Mechanism of injury

Mechanism of Injury	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total
Cutting, Tearing	10	8	6	1	25
Other Specified Fall	3	1	3	0	7
Unspecified mechanism of injury	4	0	2	0	6
Fall by Slipping, Tripping on Same Level	2	1	1	1	5
Foreign body (other) EG. Bead in ear	1	3	0	0	4
Contact with static object	0	2	1	0	3
Unspecified contact	2	1	0	0	3
Fall / Jump from Lesser Height (Less than 1 Metre)	1	2	0	0	3
Other specified mechanism of injury	2	0	1	0	3
Contact with person	1	0	1	0	2
Puncture, Pierce	0	2	0	0	2
Fall on or from Stairs	0	1	0	0	1
Unspecified thermal effect	0	1	0	0	1
Unspecified Fall	0	0	1	0	1
Open fire, flames	0	1	0	0	1
Other specified contact	0	0	1	0	1
Bite, Sting by Animal, Human, Insect	0	0	1	0	1
Hot objects	1	0	0	0	1
Total	27	23	18	2	70

4.8.10 Injury Factor- Glass

(Table 4.50) indicates that glass was the injury factor on 14 occasions, resulting in open wounds 100% of the time (Table 4.51). The majority of injuries from glass occurred while playing (Table 4.52).

Table 4.50 Glass- place of injury

Major Injury Factor /Part of Place	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total
Glass: Sheet, Piece, Shard, Etc	6	4	3	1	14
Unspecified place	2	1	1	1	5
Other or unspecified	3	0	1	0	4
Primary school	0	3	0	0	3
Free-standing house	0	0	1	0	1
Bush,remote or undeveloped place	1	0	0	0	1
Total	6	4	3	1	14

Table 4.51 Glass- nature of injury

Major Injury Factor /Nature of Injury	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total
Glass: Sheet, Piece, Shard, Etc	6	4	3	1	14
Open wound (excludes eye)	6	4	3	1	14
Total	6	4	3	1	14

Table 4.52 Glass -activity when injured

Major Injury Factor/Activity When Injured	5-7 yrs	8-10 yrs	11-13 yrs	Unkno wn	Total
Glass: Sheet, Piece, Shard, Etc	6	4	3	1	14
Playing	3	2	2	1	8
Other specified activity	2	2	0	0	4
Engaged in formal educational activity	0	0	1	0	1
Football - not specified	1	0	0	0	1
Total	6	4	3	1	14

5. Discussion

5.1 Key findings of the study

- Data from the community has confirmed the hypothesis that broken glass is a hazardous problem within the Indigenous community of Cherbourg.
- Despite small survey numbers the results confirm a significant difference between age groups and their perception towards litter. Results indicate that those over 40 years of age are more likely to view litter within the community as a problem.
- Broken glass is identified by most as being an abundant source of litter in the community and poses as a hazardous concern.
- Beer bottles are the major contributing source of broken glass.
- Lack of litter bins, behaviour and attitude of people to litter are considered major factors why people in Cherbourg litter.
- More than half of adults and all the children who were surveyed or interviewed had been cut by broken glass littering the community of Cherbourg.
- Injury data from the hospital and school indicated incidences of injury from broken glass were low when compared to other injuries.
- Wearing of footwear reduced the likelihood of injury through broken glass

As indicated in the literature, litter can cause a wide range of concerns for a community. Not only are there health factors with numerous possible hazards to consider but litter is also costly and impacts on our environment (Karolína & Eade 2003). In fact problems associated with litter are so broad that studies have now linked less obvious factors such as increases in obesity and impacts on mental health to litter (Get Healthy Harlem 2009; Jenkins 2005). A lack of physical activity due to unpleasant environments, stress and disgust as a result of unsightly litter are said to be the causes (Get Healthy Harlem 2009; Jenkins 2005). Contained within litter are objects which also pose a risk of injury, hard sharp objects such as metal or glass can easily puncture skin resulting in obvious pain and discomfort, but also debilitation and infection.

Reviewing the literature on litter and broken glass identified very few studies which have investigated the topic of broken glass, although many litter articles identified broken glass as a hazardous component of litter. Only one unpublished study of Worrabinda in Queensland investigated the phenomenon of broken glass within an

Indigenous community. This was surprising considering literature has identified broken glass as a concerning component of litter and anecdotal evidence suggested that litter and broken glass was a problem for other Indigenous communities of Australia.

The concern of broken glass littering the Cherbourg community was identified through the local Cherbourg Injury Prevention and Safety Promotion project group. That group was and still is, involved in many aspects of safety within the community.

The purpose of this research which fell within the larger project, was to address the health concern of broken glass in the Indigenous community of Cherbourg through a three stage process; firstly by examining the extent to which broken glass is a health hazard; secondly by exploring with the community what strategies could be identified to address the hazard, and then thirdly implementing an identified strategy and determining the efficacy of its implementation. Due to time constraints, particularly linked to logistics and complexities of consulting and working with an Indigenous community and other concurrent activities which were taken in the remit of the larger project, not all aspects of this work could be accomplished. Consequently the following discussion largely provides a response to the question of whether broken glass is viewed as a hazard within the community, and the causes and solutions for reducing the amounts of broken glass. Also discussed are actions that were taken to prevent and reduce the broken glass littering the community, although efficacy could not be measured due to time restrictions.

During the research many factors came into play which may have affected the findings of the study. The larger Cherbourg Injury Prevention Safety Promotion Project influenced Council priorities through the identification of community safety concerns. With the larger project group working in collaboration with the Cherbourg Aboriginal Shire Council advocating for change, strategies began to be implemented for the action areas identified before the completion of the research reported herein. In addition to this the introduction of an alcohol management plan by the government and the Extreme Make Over project by Council directly affected findings through a reduction in glass alcohol bottles being brought into the community and a community clean up.

Only 53 out of 330 surveys that were distributed were returned (16%). However owing to a lack of letter boxes in Cherbourg it is unclear how many recipients received the community survey, therefore an accurate response rate for the survey was not possible. It was later mentioned to the researcher that there were other postal service restrictions which would require many who wanted to return the survey to travel to Murgon to post the envelope. The unfortunate and unexpected lack of letter boxes

required surveys to be strategically placed in fences of restricted access properties or placed at doorways of homes. There they were also exposed to poor weather on the day, constant rain and wind exposed the unsheltered surveys to water damage and the possibility of being blown on the streets. Entering properties also led to negotiations with many unrestrained dogs. In retrospect it would have been advantageous to seek what services are provided in a community before conducting a survey rather than assuming all communities are uniform in regards to media distribution. Ultimately this may have been a contributing cause for the low number of surveys returned. Alternatively in a situation where there are no letter boxes to distribute surveys, data could be generated from several workshops or focus groups with community members which could include a small survey.

Survey research is arguably one of the best methods for a social researcher to collect original data for describing a population that is too large to observe directly (Babbie 2008). Surveys also serve as a good means to measure attitudes and opinions (Babbie 2008). Considering the low return rate of the community survey there is some bias concern, as expected a higher response rate provides less chance of response bias. It is also acknowledged that a low response rate can be problematic as literature indicates that non respondents are likely to differ from respondents (Babbie 2008).

Before distributing the surveys contact was made with numerous community members and government staff to gain permission to enter the community and inform them of the researcher's presence on the day. Of importance was the need to respect culturally significant differences, and understand some members of the community may be suspicious of outsiders entering the community. Cherbourg is a community that has been reported by government authorities of having continuous attention from a number of organisations. Although actions from these organisations come with good intentions, many may not consult with the community which can lead to more harm than good and leave a sense of apprehension. To overcome this, much time was spent in Cherbourg getting to know those who worked and lived in the community for the researcher to become a somewhat familiar face. The researcher's networks and acceptance into the community were supported by always working alongside and travelling the community with the Injury Prevention and Safety Project Coordinator who was a local member of the community.

5.2 Community Survey

Owing to sensitivity of asking specific ages the surveys gathered data from three distinct but broad age groups. Whether the data collected is representative of the Cherbourg community could not be determined because ages indicated in the survey did not align with figures provided from Census data (Australian Bureau of Statistics 2006).

The community survey captured a greater response from the female population of Cherbourg, almost double that of the male representation. According to the 2006 Census this is not an accurate representation of both sexes, with the census indicating there is a close to equal distribution of males to females 48.5% and 51.5% respectively in the Local Government Area of Cherbourg (Australian Bureau of Statistics 2006). It is unclear why the survey captured more women than men, one possible reason could be that the survey captured information from stay at home mums. Regardless of the potential bias due to over representation of women responding to the survey, there was no evidence of differences between male and females views of the injury hazard of broken glass when comparing the individual interviews which numbers were dominated by males.

Residents were well represented in the community survey. Sixty two percent of respondents resided in Cherbourg and close to 85% of respondents working in Cherbourg which indicates the majority of those surveyed either worked or lived in the community. Those who did not reside or work in Cherbourg may have been visitors. As expected nearly all utilised the streets and footpaths, only 6 people surveyed stated they did not. With this combination of respondents it is likely those providing their opinion on the topic of broken glass in the community are familiar with Cherbourg's environment and surroundings. With this in mind the results of the community survey clearly depict that the perception was that Cherbourg does have a litter problem and broken glass was a major source of this litter. It was concerning that all found the broken glass to be a hazard, this indicated that the problem was potentially affecting many members of the community or possibly illustrated large quantities of broken glass in Cherbourg.

Despite the limitations recognised above, there was a strong consensus on numerous questions particularly pertaining to Cherbourg's litter problem, abundance of glass and lack of bins in the community. This prompts the question of what is the quantity of broken glass around the community. The original intention was to investigate this by sub-sampling. One method which was considered to measure quantities of glass spread over the streets and footpaths was to measure volume or quantity of broken glass per

square meter. The task may be performed with a transect and quadrant approach. However owing to time constraints and the other litter management activities noted above this was decided not to be a priority.

Utilising responses from the individual interviews, the survey nominated locations of the broken glass. Parks and ovals were frequently indicated as were streets and footpaths. Alcohol bottles were the most frequently identified origin of the broken glass with beer bottles being the dominant source. Interestingly the third most frequent response for the origin of broken glass was soft drink bottles; this was unexpected since most large manufacturers use plastic bottles now. However there is a soft drink company two hours south of Cherbourg which still produces their product in glass bottles; it could be speculated that their locality may be having an influence on soft drinks sold in Murgon and Cherbourg. Other reported sources of broken glass were from windows and windscreens, street lights, and drinking glasses. Literature supports the findings that the source of the broken glass is predominantly from broken bottles. An example being a Boston study which looked at children 18 years or younger who presented to the hospital's emergency service for treatment of lacerations, in which broken bottles were implicated in 83% of cases (Baker et al. 1986).

Despite many reasons for littering the community with glass, most felt it was because of a combination of poor behaviour, attitude and a lack of waste facilities. Possibly it is this link between behaviour and litter that sees educational programs today as a popular method to tackle anti-social behaviour such as littering (Auntie Litter Inc. 2010 ; Department of Environment and Conservation (NSW) 2005).

Regardless of the community survey indicating that Cherbourg does have a problem with broken glass, many responded there had been an improvement in the past year. The inclusion of a federally pushed alcohol management plan and clean up gangs were said to be the main reasons for the improvement. Talks with local people revealed the clean-up gangs were often a community program to perform community service. The Council was also noted for their spot cleans, and building efforts to improve the community's landscape, much through the efforts of a community project titled the "Extreme Makeover". Funded by the Department of Families, Housing, Community Services and Indigenous Affairs and Council driven, the project in collaboration with many stakeholders including the Cherbourg Injury Prevention and Safety Promotion project group aimed to improve the visual appearance of Cherbourg, reducing litter and vandalism and renewing pride in the community. The project commenced in September

2009, and saw 64 individual homes, 2 streets, and 7 businesses enter the competition. Eight teams entered the public space category, and 14 artists nominated their time to do public art spaces. Those who entered the competition were provided with tools, paint and equipment, along with soil, mulch, and plants to rejuvenate locations (Cherbourg Aboriginal Shire Council 2009). The project resulted in great home improvements; some streets appeared cleaner as did the business area of the community. However months later and often mentioned during interviews, there were views that the project had only been a temporary fix as the surroundings began to take on their previous appearance.

Not everyone agreed that there had been an improvement and of those who disagreed and felt the problem had worsened, behaviour and attitude again were indicated as the main cause along with a lack of waste facilities. Despite an identified increasing theme of poor behaviour contributing to litter, a lack of waste facilities could be compounding the issue considering nearly all survey respondents stated that Cherbourg lacked bins.

Close to 60% of people surveyed and 65% interviewed had been cut by broken glass while in Cherbourg. However considering less than half of respondents had to seek medical treatments for their cuts it is assumed that a majority of injuries were only minor lacerations or glass splinters which would be consistent with those who were interviewed. Al-Khatib's study supports this theory which found lacerations were predominantly to the feet when shoes were not worn or sandals were used (Al-Khatib 2009).

What was unexpected was of those who indicated whether they were wearing shoes at the time of injury that close to 39% were in fact wearing shoes when injured. What can be drawn from this is that not all footwear provides adequate protection from the environment, in particular glass. It can be assumed in these instances that those who were cut when wearing shoes could have been wearing open foot wear such as thongs or sandals. A lack of footwear was observed in the community by the researcher, predominately relating to children, this was also supported by statements from school staff who reported children frequently attended school without footwear.

It is of interest that whereas all non-residents found Cherbourg to have a litter problem, four of the residents stated the community did not have a litter problem. This inconsistency could be due to a sense of pride in their home town and being not willing to admit to a litter problem, or quite possibly the four people who stated that the community did not have a litter problem see their surroundings as normal. This could certainly be the case for different generations who have experienced Cherbourg's environment during

numerous influences and different stages of change. Such an observation was made when conducting individual interviews, while interviewing a community member outside their home, numerous items of litter blew by, still the person interviewed stated Cherbourg did not have a litter problem. After leaving the premises the person was seen making an effort to remove the rubbish which had been blown into his yard. Possibly the person did not see this as an issue because it was the norm or perhaps it was pride which influenced their response.

Grouping of ages into under and over 40 years of age revealed there was a significant difference in perception of litter for those under 40 compared to over 40 years of age. Survey respondents over 40 were more likely to consider Cherbourg as having a litter problem, in fact no one over the age of 40 stated otherwise. This could possibly support the concept already mentioned of different generations and their views of what is normal or common in the environment. After all if a person had always lived in a community with litter would they see their community as having a litter problem?

Solutions for the broken glass littering the community were sought from survey recipients. Although 94% of those surveyed who answered the question felt Cherbourg did not have enough bins, recycling by far was the most frequent solution provided to resolve the broken glass problem. With a strong indication coming from the survey results that the community did not have enough bins it was not a surprise to find that the second most frequent solution provided by respondents was an increase in bins. This is comparable to the Middle Eastern study which revealed that one of the main causes for littering was a lack of bins (Araphat et al. 2006).

Recycling may offer a solution to not only keep glass off the streets but a productive solution to utilise the discarded material. A refund for glass was also a solution proposed; this process has been trialled all over the world with varying degrees of success and could work in well with the recycling focus. As identified in the literature review the process of bottle bill legislation and recycling of beverage containers saw a 60% drop in incidences of glass related lacerations presenting to an emergency ward in Massachusetts (Baker et al. 1986).

Some community members suggested a no glass policy, however when this solution was discussed with other community members including the injury prevention reference group, many found it was an impractical solution to the problem. It was felt a no glass policy for Cherbourg would be difficult to enforce and could possibly spill over to affect neighbouring towns and their businesses resulting in a lack of sales or removal

of glass from their community. Other solutions provided by means of the community survey and often topics of conversations within community group meetings were penalties for littering and a clean-up of the streets. When discussing the topic of litter with community members there was a strong push for those who litter to be made responsible for their actions, much like when vandalism takes place in the community. Those of an older generation speak of a time when there was greater pride in the community and family instilled respect for their surroundings and discipline was dealt out swiftly by a family member to those who forgot. So it is not just a police and government officials presence that is required to provide discipline, but for community members to instil family values of respect and pride for one's community.

The Environmental Protection Act 1994 was changed in 2010 to allow stronger and more enforceable anti-litter provisions of Queensland's litter laws (Department of Environment and Resource Management (Qld) 2010). A person can be fined \$200 dollars on the spot for general littering such as throwing away a wrapper or cigarette butt. Infringements increase for dangerous littering, for example \$400 is the fine for dangerous littering which may cause harm to humans, wildlife or property (Department of Environment and Resource Management (Qld) 2010). The discarding of a glass bottle in a child's playground is provided by the Department of Environment and Resource Management as an example of dangerous littering. Authorised officers from all Queensland local governments and Queensland Environmental Protection Agency and Queensland Parks and Wildlife have the ability to issue littering infringement notices (Department of Environment and Resource Management (Qld) 2010). To have fines imposed would mean that the Cherbourg Aboriginal Shire Council would have to commit and nominate officers to impose a majority of the fines.

Despite Cherbourg's data suggesting that glass, plastic, and paper are the most frequent items of litter found, Queensland data indicates cigarettes make up the bulk of litter items for the state (Department of Environment and Resource Management (Qld) 2010). However plastic represented the highest volume of litter at 3.31 litres per 1000 square meters by material type in the years 06/07. In comparison to plastic for the same time period glass was a low 0.38 litres per square meters by material type. Although cigarette butts were not raised as a litter item for Cherbourg, one would expect the community would be no different from the rest of Queensland. It could be cigarette butts are not viewed as a waste item because of their size and peoples' tendency to simply stub them into the ground. What is noticeable in the state data is a slight increase in volume for

all material types excluding metal from years 05/06 to 06/07. This yearly increase in litter was reported by many through the Cherbourg study, a gradual increase of litter over time.

It is fine to try to prevent more broken glass, though in reality there needed to be something done about the observed abundance that already existed. Cleaning of the streets was often mentioned within survey data. This was often represented as clean up gangs, but within group conversations it was identified that there was a forgotten aspect not mentioned. Concern was expressed that while most clean up gangs removed larger, probably more recently broken pieces of glass, there would still be an issue with the older smaller pieces of glass littering the community. Other possibilities were raised that included a mass clean up square meter by square meter, perhaps with something to filter the glass from the soil, or laying thick top soil may be more practical. These decisions ultimately stand with the Cherbourg Council to decide upon.

5.3 Individual Interviews

Twenty community members with a range of backgrounds, which included residents and non-residents of different ages, were individually interviewed. Unlike the community survey where there was greater representation from women, the majority of interviews were conducted with men. The gender of the interviewees undoubtedly was influenced by the fact that the project officer who chaperoned the researcher during interviews and helped arrange interviews through his local networks was also male. It was felt by the researcher that there was a greater sense of reluctance by female members of the community to participate in the interviews which could also be due to the fact that both the researcher and project officer were men. In Aboriginal culture there is often men's business and women's business, and an unknown white person conducting interviews in the community did create difficulties reaching people despite working with a local person. However despite the survey and interviews capturing predominately female and male data respectively, themes identified and opinions expressed were quite similar. This validates the results in terms of representation from both sexes.

The interview data revealed many similarities to the community survey, again there is a strong indication that Cherbourg does have a litter problem. In contrast to the survey the interview allowed nomination of types of litter and again glass is identified as the main type of litter with the source being glass bottles. Like the survey, those interviewed stated beer bottles as the category of the glass bottles most frequently found as litter followed by spirit bottles and soft drink bottles.

A range of plastics and papers constituted the bulk of other litter responses. Outlining other concerns with the potential for spread of disease was the report of incorrectly disposed condoms, which were also observed by the researcher on several occasions.

Both in the community survey and individual interviews of those who provided a response just over half stated that the glass problem had improved. However the majority of those interviewed stated that the litter problem had worsened in the past year. So it appears although levels of litter had not improved the quantity of glass had reduced. Within this one year period an alcohol management plan had been introduced to the community of Cherbourg. In March 2009, an alcohol carriage limit of 1 carton of 30 cans of light or mid strength beer was introduced in Cherbourg. This alcohol management plan was one of the more frequent responses as reasons for the reduced amounts of broken glass in the community, both in the survey and interviews. Examining responses from the survey and interviews in relation to improvements in the amounts of litter and glass we see consistent themes; the already mentioned alcohol management plan, clean up gangs, pride, and education. There were only slight variations for increases in litter with the interview data introducing aspects of animal management and the role dogs play in spreading rubbish. Again there was assertion of behaviours and attitude being responsible for the increases.

Interviews revealed no consistent timeframe to when there had been a change in the amounts of litter, though the most frequent response was within the last 10-15 years.

The areas where glass was reported by interviewees was consistent with the survey and Photovoice; streets and footpaths were stated most with the school grounds, and ovals also noted. Interview responses saw the sport complex, basketball court and again the school grounds also indicated as sites where there was an abundance of broken glass. Additionally, and in contrast to the community survey, the interviews revealed main streets where people frequently visit for services or congregate waiting for lifts into Murgon, and back streets of Cherbourg of having an abundance of glass. Also identified was an elected drinking site by some which would be on public ground. The difference in sites identified by the individual interviews could be due to the greater response by adult males who may frequent and observed different locations than the adult women and children in the community.

Observations by the researcher support interview statements and survey responses, sighting an increase in both litter and glass in residential areas particularly on the eastern

side and a large quantity of broken glass on streets and footpaths. The eastern side of the community also houses Cherbourg's waste site where there is frequent dumping outside of the waste disposal grounds. The litter then is free to be blown back into residential areas by the wind. Residential areas may have a greater number of dogs which were noted to increase litter as they knock over bins and disperse rubbish whilst looking for food. Additionally residential areas are where most litter originates.

Much litter from these households can be viewed as not adequately secured or disposed of, which can be difficult when waste removal services are affected through a loss of resources. Discussions with the Cherbourg Council and community members revealed the rubbish truck which collected residents waste was frequently out of operation for extended periods of time. Many community members also stated they did not have a household rubbish bin, more commonly known as a wheelie bin. Many people also felt there needed to be more than one bin per household as many homes housed large families or more than one family at any given time. When those interviewed were asked "where do you think the glass comes from", the greatest response (with close to equal frequencies) were incorrect disposal by adults and the kids smashing the glass bottles.

More than half the people interviewed had either been directly affected by broken glass when in the community or knew a family member who had. Supporting statements of where broken glass is usually found, the two most frequent places where the injury had occurred was on the street and within school grounds, others sites were the oval, playground, and creek. The greater majority of injuries sustained from the broken glass were lacerations to the foot, of which 61% required medical treatment. Unlike the community survey, only one of the persons interviewed stated that they or the family member injured were wearing shoes at the time of injury. This is similar to Makary's findings of injuries due to street glass which identified that 75percent of children were not wearing shoes when injured (Makary 1998).

Solutions provided by those interviewed were very similar to that of the community survey. Similarly increasing the number of bins and recycling were the most frequent solutions provided, along with clean up gangs and improve people's behaviour. Again there are similarities with the literature, interventions for littering included both an increase in bins plus an adjustment of peoples values and morals to accompany (Al-Khatib 2009). A street sweeper was indicated as a practical way of keeping the streets clean and again one person felt a ban on glass entering the community would reduce the problem.

By the time data had been gathered from surveys and interviews the notion of banning glass had gained momentum, with Cherbourg's Mayor releasing a statement to a Queensland newspaper urging State Government to stop pubs and bottle shops supplying alcohol stored in glass bottles to the Indigenous community. The Mayor called for the ban to stop injuries to children, stating that the greatest cause of cut feet in children is from broken stubbies and spirit bottles. To date there have been no actions despite the plea from the Mayor.

The collection of survey and interview data from the adult population of the community has illustrated many similarities; the data has identified consistent opinions and themes regardless of age and gender difference. The majority of respondent's opinions indicate a general problem of litter within the community and a specific issue with the unsafe material of glass. It is evident from the data that broken glass is a perceived issue within the community and a concern for those who work and live there.

5.4 School survey

Various data collection methods used enabled the researcher to ascertain the children's views of litter and broken glass in the community, and to see what effect it was having on the younger age group. A workshop of what litter was with year 6/7 school children was followed by a survey to gather specific information about litter and broken glass. In addition to this a surveillance system was developed in conjunction with the school and the Barambah Medical Centre laceration clinic to record injury accounts of the school children and gauge to some extent the frequency of lacerations by broken glass. Photovoice was used to capture the broader aspects of potential hazards in the community.

Due to unexpected absentees on the day, only 12 year 6/7 students were involved in the small workshop and survey. Nevertheless data were consistent to what was identified by adults in the community survey and interviews. All of the children who answered the question stated that Cherbourg had a litter problem, and again 100 percent of students surveyed claimed glass to be a problem where they play. All children had been cut by broken glass while in the community, and in line with responses from the adult interviews the majority were not wearing shoes at the time they were injured. School staff did comment that a lack of footwear was a problem with the children, often the children would grow out of their footwear, remove their footwear to play or be more comfortable not wearing shoes during summer months. It was reported by some staff that

wearing of footwear increased during the winter months as children had a need to keep their feet warm. Although only 12 children were surveyed, 32 areas were identified where they had been injured by glass, in comparison to the adults interviews where only 11 areas were indicated from 20 people interviewed could suggest that the children are being affected by broken glass recurrently. This could be due to children's exploring nature, their greater activity levels, and the likelihood children would visit outdoor areas such as parks more frequently where they are potentially exposed to broken glass.

5.5 Cherbourg School injury data

Injury data which was collected from the Cherbourg Primary School during the period of April through to December 2010 resulted in 70 individual accounts of child injury. Consistent with national trends (Australian Institute of Health and Welfare 2010b), males had a higher rate of injury than females and injuries were reported more frequently with the younger age groups. Within literature which pertained to glass injuries, males were frequently reported as having higher incident rates (Armstrong & Molyneux 1992; Bell 1984; Jackson 1981).

The nature of the injuries comprised mostly of open wounds, with the foot which includes toes being the more frequent location of injury. As expected the majority of children were injured while playing (50%), however close to 20 percent of injuries were a result of an unspecified activity, which could be due to a lack of reporting or the children being involved in an activity they did not want to disclose. For mechanism of injury cutting and tearing injuries had the greatest total, although glass as the cause of injury only accounted for 14 from the 70 injuries reported during the identified period. So despite the creation of a lacerations clinic to treat injured children in particular those affected by broken glass, many of the injuries were in fact not caused by glass at all. Further analysis of the data may reveal the open wounds are more likely to be caused by falls on or collisions with hard abrasive materials such as concrete or bitumen. The data indicates that for specified external causes for injury, falls and collisions with objects accounted for 43 percent. This also suggests why the knee was the second most common body location for injury. Despite the community focus of broken glass injuries greatly affecting the children, could it be that they do not perceive falls and collision from normal play an injury. The school data indicates that this should be an area of interest.

It is of interest that there were a high number of injuries during the winter months in particular the month of July (40%). It would be expected that there would be a decrease

in injury during this period due to less time outdoors. It could be suggested that this could coincide with sporting codes played in the winter such as rugby league, however the data indicates very few injuries were caused while playing sports.

The implementation of injury forms at the Cherbourg Primary School proved successful in gaining specific data of an intended age group and also doubled as a recording and reporting mechanism for the school. Thus a process had been created that could inform parents or guardians of any accidents or reason for treatment while at school. The injury forms also provided the Queensland Injury Surveillance Unit with data to complement the records being received from the Cherbourg Hospital. Injury data collected from the school will allow monitoring of specific injuries and allow strategies effectiveness to be measured.

Data collected from the Cherbourg school at the time of the research doesn't substantiate claims that there are a high number of children being cut from broken glass. However, community, Council and recent statements from the Mayor have indicated independent opinions that glass is the predominant cause of injury. The lower than expected injuries may be due to the recent measures identified such as community and Council clean ups and the alcohol management plan.

5.6 Hospital injury data

Low incidences of injury caused by glass were also observed in the Cherbourg Hospital data provided by the Queensland Injury Surveillance Unit. Capturing information from the broader community, the hospital data only recorded glass as the cause of injury 9 times out of 200 presentations. What is not revealed is the age group of the 4.5% injured by glass, what would be of interest to observe is if they were in fact predominantly children. A similarity seen between the school and hospital data is higher presentation rate in males. If a comparison within the survey data had been performed between those who had been injured by glass and their sex may have revealed the same finding. An interesting finding provided by injury data from the hospital, is that the peaks within age groups are not consistent with national data (Australian Institute of Health and Welfare 2010b). Cherbourg's peak age group for injury presentations was 15 to 44 years whereas national data of hospitalisation cases due to injury sees a peak for teenagers and young adults (Australian Institute of Health and Welfare 2010b). Furthermore national data sees a smaller peak again within the age group 80 to 84 years (Australian Institute of Health and Welfare 2010b). The variation in peaks could illustrate that Cherbourg's

causes of injury may differ from those represented at the national level. For example, at the national level the second peak in the older age group is predominantly due to unintentional falls (Australian Institute of Health and Welfare 2010b). Considering there is a lower life expectancy within the indigenous population and ABS indicates only 3.2 percent of Cherbourg's population to be 65 years or over the concern of elderly falls may not be so great (Australian Institute of Health and Welfare 2010b; Statistics 2006). Low number of injury incidents reported at the Cherbourg Hospital for children and teenagers could also be a result of the children being treated at the school clinic.

Although the data collected from the Cherbourg hospital and Primary School indicates lower than expected rates of injury from broken glass and identifies other greater causes of injury. This does not exclude glass injuries as a concern for the community; it could be perceived that broken glass injuries are preventable and that community and the Cherbourg Aboriginal Shire Council view even low rates of this cause of injury as unacceptable.

5.7 Photovoice

After reviewing numerous methodologies Photovoice was chosen to gain broader views of hazards and concerns in the community from the children. Consistently mentioned in the literature, the process of Photovoice enables people to comment and expose their community's strengths and concerns; additionally Photovoice promotes awareness of particular issues through the discussion of photographs. Thirdly what is captured can be directed at policy makers to inform change (Wang & Burris 1997). It was envisaged that this process would provide similar means for the students of the Cherbourg Primary school.

In addition to information about litter, 100 photographs of potential dangers in the community were captured by the children and used for a variety of functions. Photos were presented to the Cherbourg Injury Prevention and Safety Promotion Project group, as well as their ideas to reduce an array of problems within Cherbourg. In agreement with other data from the community survey, individual interviews and school survey, litter in general was identified by the children as not only a health issue for the community but also an injury hazard. The students photographed litter from plastics, paper, small pieces of metal and glass. The children's views identified in the PowerPoint presentation illustrated that again litter was interlinked with many factors in the community some individual, others the environment. Solutions for the litter included increased opportunities to dispose of

wastes appropriately, education, and encourage community members to reduce their use of bags. The children also thought it would be good to see clean up days, possibly much like the extreme make over driven by the local Council which supplied resources and incentives for households and businesses to remove unwanted waste and improve the aesthetics of their dwellings.

Another environmental factor identified by Photovoice was animals, both livestock which wander and destroy property and defecate around the community and dogs. Dogs have been an issue for the community for some time, with the potential to spread disease and harass community members as they walk or drive through the community. Many children have to protect their lunch from dogs as they eat in the school grounds. In regards to litter the dogs are seen to knock over unsecured bins and spread the rubbish. Like every community not all bins will always be secure, hence the suggestion to reduce the dog population through registration and controlled veterinary measure such as de-sexing. A suggested measure to keep livestock out of the community was fencing, which seems logical but would require significant contribution of funds by the Local Council. Fencing off from livestock would also require a commitment to regular maintenance or repair of the fence. Recycling was also provided as a solution for rubbish in particular glass. Both the fencing off of livestock and dog control measures have now been implemented and a proposal for a recycling plant has been developed by the Cherbourg Aboriginal Shire Council.

Other injury prevention priorities identified by means of Photovoice were old dilapidated houses which could potentially injure someone for example a child if they were playing in or around the abandon structure and parts of it collapsed. Yards and ovals littered with old machinery, sheet metal and broken structures i.e. water tanks were viewed as a hazard. As were broken fences and homes, which could not keep dogs out or keep children safe. Similar to other reports of injury to Indigenous Australians road safety and safety within the home was also a priority in the photos, it was noticed that the community had a distinct lack of road signage, crossings, lighting and footpaths. The photos and presentation also had a focus of safety beginning in the home requesting support to reduce drinking and violence which could affect the children's mental state, whether they get adequate food or sleep. It was stated that how were the children meant to perform at school if they are tired and hungry. The children also feared that if this is seen as normal behaviour they may grow up and behave the same way.

The children felt there was a lack of recreational and sporting activities. Identified was a community basketball court which was unusable, due to vandalism, lack of hoops and broken glass which litter the court. Along with education about disposing of litter, the children felt in this instance with the basketball court that there needed to be a reminder to take pride and care of community facilities. It was stated that supplying avenues for children to be active would keep them busy and potentially out of harm's way, and perhaps reverting to destroying property through boredom.

Photovoice was arranged with school staff as curriculum for the school students. The outdoor task of surveying the community was enjoyed by students, and provided a low cost view of the children's perceptions of hazards and needs in the community. Strack et al, comment that the process of Photovoice empowers participants, and that youth should be provided the opportunity to comment on their experiences and insights (Strack et al. 2004). Further to this, Photovoice allows youth the opportunity to develop their personal and social identities (Strack et al. 2004). A noticeable disadvantage of the process is particular photographs can be hard to analyse. The photographers do not always capture a photograph which represents to a broader audience the message they are choosing to relay.

5.8 Activities implemented from recommendations from the project

The research into the health concern of broken glass in the Indigenous community was undertaken by the researcher in a multiple role; as an employee of the Darling Downs Public Health Unit (Queensland Health); a member of the Cherbourg Injury Prevention and Safety Promotion group and as a research student of the Centre for Rural and Remote Area Health, University of Southern Queensland. Constant monitoring of the project occurred by the Cherbourg Injury Prevention and Safety Promotion Project group and Queensland Health. The group was frequently informed of findings and constraints by the researcher. After consulting the community results presented to the group informed stakeholder actions. Strategies were identified and it was decided the project would require further support from the Cherbourg Aboriginal Shire Council. Both the researcher and the Injury Prevention and Safety Promotion Officer met with Council representative on numerous occasions and advocated for the required attention to the communities broken glass problem. Negotiations led to the partnering of identified strategies and mutual links were recognised which led to further involvement with Council waste

management plans. Advocacy from the Injury Prevention Safety Promotion Reference Group members also led to the recognition that injury prevention needed to be incorporated into Council planning.

Several CIPSPP and Council activities occurred that were related to litter and glass and resulted from activities within the glass research project.

a) Bins: In an effort to reduce the amount of litter in the community including glass, a waste management plan developed by the Cherbourg Aboriginal Shire Council was informed by the research. Included in the plan and identified as a barrier to the correct disposal of rubbish and glass were community bins and the reestablishment of household litter collection. A partnership between the Cherbourg Aboriginal Shire Council and the Injury Prevention and Safety Promotion Project saw a total of ten bins purchased, four were purchased by the Council and six by the project group. Those purchased by the project group were fire and graffiti resistant. Locations of the bins within the community were negotiated with Council, with emphasis being placed on high traffic areas (see appendix E).

b) Public awareness: To support the implementation of the Councils waste management plan and community bins, a community service announcement was created. Guided by the Cherbourg Injury Prevention Safety Promotion Reference Group an announcement was developed to inform community members of waste collection days and inform the people of Cherbourg to dispose of litter appropriately and take pride in their community. It was decided by the Reference Group that the announcement would be aired daily for three months by the local radio station and placed in the Cherbourg US Mob newsletter.

c) Posters: Continuing with the education theme further consultation with the Cherbourg Primary School led to the development of anti-litter posters. Following discussions with both the principal and deputy principal, teachers of the primary school were informed of the activity through their usual staff meeting. Each teacher then invited their class to participate in the activity which had a deadline which was advised by the principal of two weeks. The short duration to have the posters completed was intended to keep the children focused and on track. Food vouchers from IGA were used as incentives as prizes for the students with the top five posters being awarded a prize. The posters were graded by the Injury Prevention Safety Promotion Reference group at one of the quarterly meetings. The initial design from the first and seconding placing were then chosen to be incorporated into an antilitter poster for the community of Cherbourg. The

students' initial design would be recreated by artistic computer software to create a sticker poster of a range of sizes to be placed around the community, including the school, the community bins and wheelie bins of the houses.

6. Conclusion

After analysing data consisting of different age groups, sex, and residency it is evident that Cherbourg does have a litter problem. More so, glass is a key component of litter causing injury. Broken glass littering the community is considered a hazard to those who work and live in the community.

Contrary to anecdotal evidence and perceptions of community members, data collected from the Cherbourg Primary school did not provide evidence that children suffer a high rate of injury from broken glass. Although it must be noted that the majority of people involved in the study had been affected by broken glass while in the community at some stage if not repeatedly, the research suggests that community members would be less likely to be cut from broken glass littering the community if footwear was worn, in particular closed in footwear such as running shoes, or boots.

Glass within Cherbourg is predominantly sourced from beer and spirit bottles which need to be disposed of correctly. This would be an alternative to the difficult task of preventing glass bottles entering the community.

Data collection methods were effective in determining Cherbourg's problem with litter, the methods also proved useful in ascertaining solutions. Information gathered from the community is suggestive of a multi-strategic approach to reduce the numerous causes of excess litter and broken glass identified. A collaborative effort such as that of Local Government, Health Services, Department of Sport and Recreation and Education Queensland could positively influence the concern through recycling, community education which would also target children. Increase opportunities to dispose of waste correctly through the provisions of waste receptacles both in the community setting and at home.

Creation of activities for the children, rejuvenating unusable parks and sports facilities to provide access for the children to play may also provide some diversion from current unwanted behaviour. There is evidence the younger age groups of the community require greater attention in regards to education evoking a change in behaviour, like the act of littering including smashing glass. Education would also need to be targeted at altering perceptions of litter.

Working synergistically, a combination of strategies would offer the greatest response.

The introduction of recycling which is aimed at reducing volumes of littering material present in the community which are predominantly the recyclable materials of glass, plastics and paper. Recycling is also considered a positive for the environment and the process could have the potential to create local jobs. Education to alter behaviours and attitudes to be litter conscious would be supported through the creation of supportive environments which provides waste receptacles for appropriate waste disposal.

List of References

- Australian Bureau of Statistics, *Injury in Australia: A Snapshot, 2004-05*, 2006, Australian Bureau of Statistics, Australia.
- Al-Khatib, IA 2009, 'Childrens perceptions and behaviour with respect to glass littering in developing countries: A case study in Palestine's Nablus district', *Waste Management*, vol. 29, pp. 1434-7.
- ANON 2009, *Trash the bottle bill*, <<http://www.trashthebottlebill.com/>>.
- Araphat, HA, Al-Khatib, IA, Daoud, R & Shwahneh, H 2006, 'Influence of socioeconomic factors on street litter generation in the Middle East: Effects of education level, age, and type of residence.', *Waste Management & Reserach*, pp. 363-70.
- Armstrong, A & Molyneux, E 1992, 'Glass Injuries to Children', *BMJ*, vol. 304, p. 360.
- Auntie Litter Inc. *Auntie Litter, Inc: Nationally acclaimed environmental education and awareness program*, viewed 15 August 2010, <<http://www.auntielitter.org/>>.
- Australian Bureau of Statistics, ABS, *2006 Census QuickStats : Cherbourg (S) (Local Government Area)*, 2006, Canberra.
- Australian Institute of Health and Welfare 2006, *Australia's Health 2006*, AIHW, Canberra.
- 2009, *Health Priority Areas*, Australian Institute of Health and Welfare, viewed 10 January 2010, <<http://www.aihw.gov.au/nhpa/index.cfm>>.
- 2010a, 'Health System Expenditure on disease and injury in Australia, 2004-05', *Health and Welfare expenditure series no. 36*, viewed 12 May 2010,
- 2010b, *Australia's Health 2010*, Australian Institute of Health and Welfare, Canberra.
- 2010c, *Injury Prevention and Control*, viewed 4 October 2010, <<http://www.aihw.gov.au/nhpa/injury/index.cfm>>.
- Babbie, E 2008, *The Basics of Social Research*, 4th edn, Thomson Wadsworth, USA.
- Baker, M & Lanuti, M 1990, 'The management and outcome of lacerations in urban children.', *Ann Emerg Med*, vol. 19, pp. 1001-5.
- Baker, MD, Moore, SE & Wise, PH 1986, 'The impact of "Bottle Bill" legislation on the incidence of laceration in childhood', *American Journal of Public Health*, vol. 76, no. 10, pp. 1243-4.
- Begg, S, Bright, M & Harper, C, *Differentials in burden of disease and injury in Queensland, 2006*, 2008, Q Health, Brisbane.

Begg, S, Vos, T, Barker, B, Stevenson, C, Stanley, L & Lopez, A 2007, *The burden of disease and injury in Australia 2003*, Canberra.

Bell, D 1984, 'Two Hundred Glass Injuries', viewed 19 March 2009,

Bright, M, Begg, S & Harper, C 2009, *Leading causes of burden of disease and injury in Queensland 2006*, Brisbane.

Carson, B, Dunbar, T, Chenhall, RD & Bailie, R (eds) 2007, *Social Determinants of Indigenous Health*, 10 January 2010.

Cherbourg Aboriginal Shire Council 2009, Cherbourg Extreme Make Over.

Department of Communities 2009, *Cherbourg community*, Queensland Government, viewed 17 June 2009, <www.atsip.qld.gov.au/people/communities/cherbourg/>.

Department of Environment and Climate Change 2009, *Litter*, New South Wales Government, viewed 21.7.09, <<http://www.environment.nsw.gov.au/warr/litter.htm>>.

Department of Environment and Conservation (NSW) 2005, *Educating the community about litter: Changing Knowledge, Attitudes and Behaviour 2000 to 2003*, Department of Environment and Conservation (NSW), Parramatta.

Department of Environment and Resource Management (Qld) 2010, *The new litter laws*, Department of Environment and Resource Management, viewed 24 January 2011, <http://www.derm.qld.gov.au/environmental_management/waste/the_new_litter_laws/index.html>.

Farmsafe Australia Inc. *Farm Safe Australia Inc.*, viewed 26 October 2010, <<http://www.farmsafe.org.au/index.php?article=content/home>>.

Get Healthy Harlem 2009, *Did you know litter and dirty streets can affect your mood as well as your health*, Get Healthy Harlem, viewed 9 January 2011, <<http://www.gethealthyharlem.org/articles/did-you-know-litter-and-dirty-streets-can-affect-your-mood-well-your-health>>.

Hasan, SE 2004, 'Public awareness is key to successful waste management', *Journal of Environmental Science and Health*, vol. A39, no. 2, pp. 483-92.

Henley, G, Kreisfeld, K & Harrison, J 2007, *Injury deaths, Australia 2003-04*, Adelaide.

Holderness-Roddam, B (ed.) 2007, *The dangers of broken glass*, GetBracknell, Bracknell Forest Standard - S&B media 2009, Bracknell, viewed 19 November 2009, <http://www.getbracknell.co.uk/news/s/2008153_the_dangers_of_broken_glass>.

International Centre of Art for Social Change 2008, *Photovoice: Social Change Through Photography* viewed 5 May 2011, <<http://www.icasc.ca/node/655>>.

Jackson, RH 1981, 'Lacerations from glass in childhood', *British Medical Journal*, vol. 283, pp. 1310-2, viewed 16 May 2009,

Jenkins, R 2005, 'Litter Linked to Obesity', viewed 09 January 2011, <<http://health.dailynewscentral.com/content/view/0001528/48/>>

Karolína, R & Eade, C 2003, 'An Environmental Education Program of the Prague Post Endowment Fund,' *The Prague Post*, vol. Vol 4, no. no 9, viewed February 19 2010, <<http://www.praguepost.cz/PPEF/09SC030219.pdf>>

Makary, MA 1998, 'Reported incidences of injuries caused by street glass among urban children in Philadelphia', *Injury Prevention*, vol. 4, pp. 148-9, viewed 25 March 2009,

McClure, R, Stevenson, M & McEvoy, S (eds) 2004, *The Scientific Basis of Injury Prevention and Control*, IP Communications, Melbourne, 22 January 2010.

National Health and Medical Research Council 2003, *Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research*, Canberra.

---- 2008, *National Health Priority Areas -Injury related issues*, viewed 10 January 2010, <<http://www.nhmrc.gov.au/grants/dataset/disease/injury.php>>.

National Public Health Partnership, *The National Injury Prevention and Safety Promotion Plan:2004-2014*, 2004, Canberra.

Nilsen, P 2004, 'What makes community based injury prevention work? In search of evidence of effectiveness.', *Injury Prevention*, vol. 10, pp. 268-74.

Parker, E, Meiklejohn, B, Patterson, C, Edwards, K, Preece, C, Shuter, P & Gould, T 2006, 'Our games our health: a cultural asset for promotion health in Indigenous communities', *Health Promotion Journal of Australia* vol. 17, pp. 103-8.

Peden, M, Mcgee, K & Sharma, G 2002, *The injury chart book:a graphical overview of the global burden of injuries*, World Health Organisation, Geneva.

Peden, M, Scurfield, R, Sleet, D, Mohan, D, Hyder, A, Jarawan, E & Mathers, C 2004, *World Report on Road Traffic Injury Prevention*, World Health Organisation, Geneva.

Pike, A, Muller, S, Baade, P & Ward, J 2000, *Injury Morbidity and Mortality in Queensland*, Queensland Government, Brisbane.

Pink, B & Allbon, P 2008, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, Australian Institute of Health and Welfare, Canberra.

Pope, C, Ziebland, S, Mays, N 2000, Analysing qualitative data, *British Medical Journal*, 320, pp114-116.

Queensland Government 2008, *Quarterly report on key indicators in Queensland's discrete Indigenous communities*, Brisbane.

Shannon, C, Canuto, C, Young, E, Craig, D, Schluter, P, Kenny, G & McClure, R 2001, 'Injury prevention in Indigenous communities: Results of a two-year community development project', *Health Promotion Journal of Australia*, vol. 12, no. 3, pp. 233-7.

Shannon, C, Young, E, Haswell-Elkins, M, Hutchins, C, Craig, D, Canuto, C, Kenny, G & McClure, R 2001, 'Injury Prevention in Indigenous Communities: Policy to practice', *Health Promotion Journal of Australia*, vol. 11, no. 1, pp. 61-6.

Strack, R, W, Magill, C & McDonagh, K 2004, 'Engaging youth through photovoice', *Health Promotion Practice*, vol. 5, pp. pp. 49-58.

Thomson, N & Krom, I 2007, 'Summary of Indigenous health: Injury', *Aboriginal & Islander Health Worker Journal.*, vol. 31, no. Nov/Dec, pp. 20-2.

Wang, C & Burris, MA 1997, 'Photovoice: Concept, methodology, and use for participatory needs assessment', *Health Education & Behavior*, vol. 24, no. 3, pp. 369-87.

World Health Organisation 2011, *The Ottawa Charter for Health Promotion*, viewed 26 October 2010, <<http://www.who.int/healthpromotion/conferences/previous/ottawa/en/>>.

World Health Organisation 2007, *Preventing injuries and violence*, World Health Organisation, Geneva.

---- 2010, 'Injuries and violence: the facts', viewed 10 October 2010, <http://whqlibdoc.who.int/publications/2010/9789241599375_eng.pdf>

Appendix A – Consent Form

Broken glass in the Indigenous community of Cherbourg

Researchers at the Centre for Rural and Remote Area Health, a research centre of the University of Southern Queensland and the University of Queensland, are working in partnership with the Cherbourg Aboriginal Council and Queensland Health to explore and address the community's concern of broken glass within Cherbourg. This task has been requested through community discussion as part of the Cherbourg Injury and Safety Prevention Project implemented by the Cherbourg Aboriginal Council and the projects coordinator Andrew Beckett. Funding for the project is from the Queensland Injury Prevention Council,

The project will:

- Determine if broken glass is a danger for the people who live in Cherbourg;
- Find out what steps can be identified to address the problem;
- Put into action one or more of the identified suggestions;
- Assess the success of the project.

Your views are important and we request your support. You may be asked to complete a survey which will be distributed in the community. You may also be asked to provide information when we talk to people either in groups or individually.

In addition representatives from many of the organisations working in Cherbourg, for example Education Queensland, Queensland Health, Cherbourg Aboriginal Council, Nurunderi TAFE, Barambah Regional Medical Services, Elders, and community representatives, will be invited for their views.

When we write up the study we will not use any names that could identify you, your employer or where you live. You are free to withdraw from the study at any time. To do this you need to contact Richard Henshaw, 07 46319 860 or richard.henshaw@health.qld.gov.au at the Darling Downs Population Health Unit (DDPHU) in Toowoomba. If you do withdraw your information will not be used.

Any questions regarding the study can be directed to Richard Henshaw at the address above or to Dr Robert Eley on 07 4631 5477 or email eleyr@usq.edu.au

Any concerns you may have about ethical issues in this study should be directed to the Human Research and Ethics Committee, University of Southern Queensland. Phone: 07 4631 2956, or alternatively Jennifer Beatty - Coordinator of the Darling Downs – West Moreton (Toowoomba & Darling Downs) Health Service District Human Research Ethics Committee on 07 4616 5916 or email Jennifer_beatty@health.qld.gov.au

CONSENT FORM

I have had the study “Broken glass in the Indigenous community of Cherbourg” explained to me. I have read the Plain Language Statement and agree to participate in the study. I am aware that my participation is voluntary, and that I can withdraw from the study at any time by contacting Mr Richard Henshaw. I agree that the information I contribute to the study can be used as long as I cannot be identified in any way.

Name of participant _____

Signed _____ Date _____

Witness Signed _____ Date _____

Parent or guardian to sign to agree for the participation of their child

Parent or Guardian signature _____ Date _____

Appendix B – Community Survey



Broken glass in the Indigenous community of Cherbourg

Researchers at the Centre for Rural and Remote Area Health, a research centre of the University of Southern Queensland and the University of Queensland, are working in partnership with the Cherbourg Aboriginal Shire Council and Queensland Government to explore and address the community's concern of broken glass within Cherbourg. This task has been requested through community discussion as part of the Cherbourg Injury Prevention and Safety Promotion Project implemented by the Cherbourg Aboriginal Council and the projects coordinator, Andrew Beckett. Funding for the project is from the Queensland Injury Prevention Council.

The project will:

- Determine if broken glass is a danger for the people who live in Cherbourg
- Find out what steps can be identified to address the problem
- Put into action one or more of the identified suggestions
- Assess the success of the project.

Your views are important and we request your support. You may also be asked to provide information when we talk to people either in groups or individually.

In addition, representatives from many of the organisations working in Cherbourg, e.g. Education Queensland, Queensland Health, Cherbourg Aboriginal Council, Barambah Regional Medical Services, Nurunderi TAFE, Elders, and community representatives, will be invited for their views.

The survey does not ask for your name or address and you will not be able to be identified.

Any questions regarding the study can be directed to Richard Henshaw at the email address above or to Dr Robert Eley (tel. 4631 5477; email eleyr@usq.edu.au). Any concerns you may have about ethical issues in this study should be directed to the Human Research and Ethics Committee, University of Southern Queensland (tel 4631 2956) or alternatively Jennifer Beatty - Coordinator of the Darling Downs – West Moreton (Toowoomba & Darling Downs) Health Service District Human Research Ethics Committee (tel. 4616 5916; email Jennifer_Beatty@health.qld.gov.au).

Should you wish to withdraw from the study you may do so at any time. To do this, you will need to contact Richard Henshaw at the Darling Downs Public Health Unit (DDPHU) in Toowoomba (tel. 4631 9860; email Richard_Henshaw@health.qld.gov.au) with your survey number. If you do withdraw your information will not be used.

Please complete the attached survey and send to the Centre for Rural and Remote Area Health using the reply-paid envelope supplied.

Tear off and retain the duplicate survey number in the bottom right hand corner to enter a draw to win one of five \$20 IGA gift vouchers. Winners will be announced by the Cherbourg radio station 4UM 941FM at 4.00pm on Wednesday, 31 March. Present the duplicate survey number to Andrew Beckett, Community Safety/Injury Prevention Project Coordinator at Council Training Rooms.

✂-----

Winners will be announced by the Cherbourg radio station 4UM 941FM at 4.00pm Wednesday, 31 March. Present the duplicate survey number to Andrew Beckett, Community Safety/Injury Prevention Project Coordinator at the Council Training Rooms.

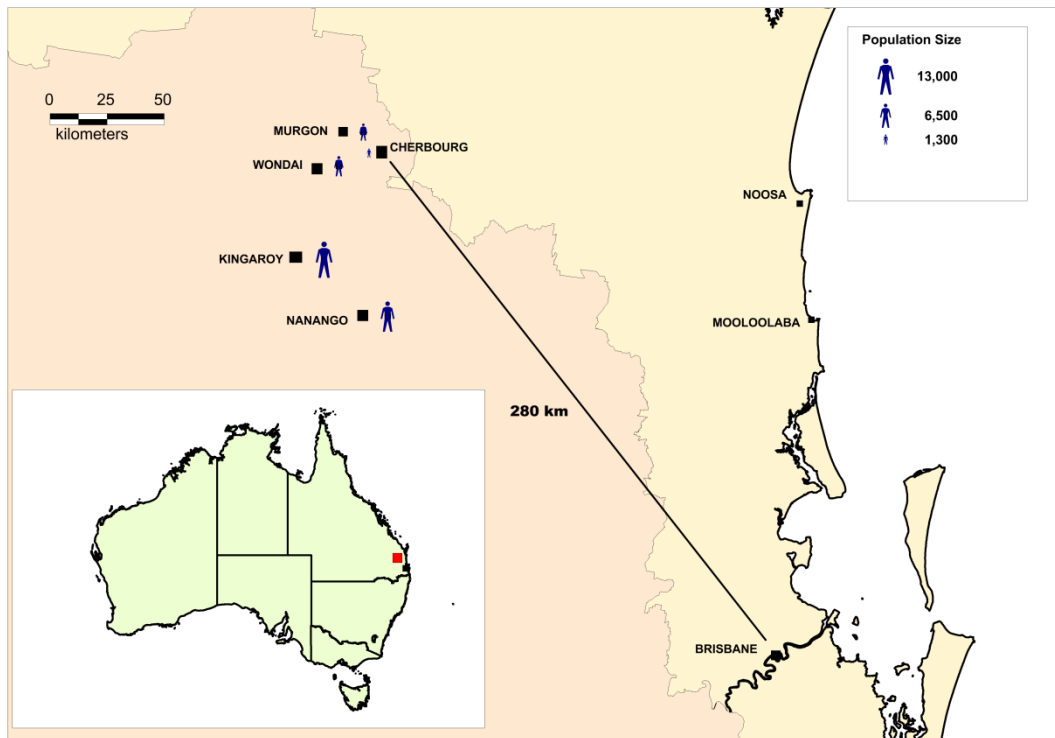
Please answer each question by ticking the appropriate box.

1. Age <18 19-30 31-40 over 40
2. Gender Male Female
3. Are you a resident of Cherbourg? Yes No
4. Do you work in Cherbourg? Yes No
5. In Cherbourg, do you use the street or footpath to walk, skate or cycle?
 Yes No
6. Do you think Cherbourg has a litter problem? Yes No
7. Is there broken glass on the footpaths and streets? Yes go to Question 8
 No go to Question 14
8. Do you find the broken glass to be a hazard? Yes No
9. Do you find broken glass to be a hazard in these other areas of the community
 football oval playground school yards
 other, please specify _____
10. What is the source of broken glass? beer bottles spirit bottles soft drink bottles
 other, please specify _____
11. Why do you think people litter the community with glass?

12. In the past year has the problem Worsened? Improved?
13. Why? _____
14. Have you ever been cut by broken glass littering the community? Yes No
15. Have you had to seek medical treatment due to a laceration from street glass? Yes No
16. Were you wearing shoes at the time? Yes No
17. How often do you wear shoes when you are on the street/footpath?
 all the time most of the time some of the time never
18. Do you think there enough rubbish bins in Cherbourg? Yes No
19. What do you think should or could be done with glass bottles?

Thank you for your time. Please return the completed survey in the reply-paid envelope.

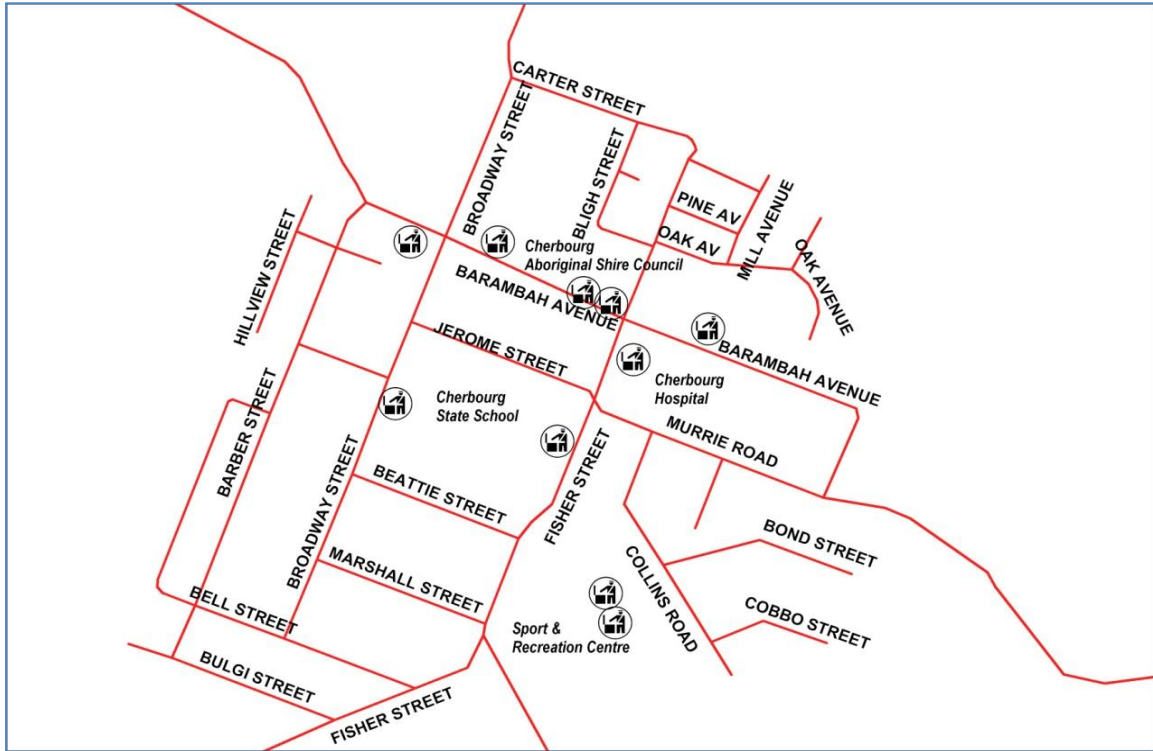
Appendix C – Map of Cherbourg in relation to Brisbane



Appendix D – Town map of Cherbourg



Appendix E – Location of Placement of Community Bins



Appendix F – School Injury Data Form

QUEENSLAND INJURY SURVEILLANCE UNIT Complete this form for the FIRST attendance for this particular injury	BARAMBAH Clinics																																																																
STAFF: Please complete this form on behalf of injured patients. Today's Date: Today's Time: Date of Injury: Time of Injury:	PATIENT DETAILS HERE Name: Date of Birth: SEX: Postcode: Was Patient REFERRED to the Hospital: Y/N.....																																																																
Your Country of Birth: Main Language spoken at home: <table style="width: 100%; border: none;"> <tr> <td colspan="2"></td> <td style="text-align: center; font-size: small;">Tick One</td> <td></td> </tr> <tr> <td style="font-size: small;">Indigenous Status:</td> <td style="font-size: small;">Non Indigenous</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">4</td> </tr> <tr> <td></td> <td style="font-size: small;">Aboriginal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1</td> </tr> <tr> <td></td> <td style="font-size: small;">Torres Strait Islander</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">2</td> </tr> <tr> <td></td> <td style="font-size: small;">Aboriginal & TSI</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">3</td> </tr> <tr> <td></td> <td style="font-size: small;">Not Known</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">9</td> </tr> </table>				Tick One		Indigenous Status:	Non Indigenous	<input type="checkbox"/>	4		Aboriginal	<input type="checkbox"/>	1		Torres Strait Islander	<input type="checkbox"/>	2		Aboriginal & TSI	<input type="checkbox"/>	3		Not Known	<input type="checkbox"/>	9																																								
		Tick One																																																															
Indigenous Status:	Non Indigenous	<input type="checkbox"/>	4																																																														
	Aboriginal	<input type="checkbox"/>	1																																																														
	Torres Strait Islander	<input type="checkbox"/>	2																																																														
	Aboriginal & TSI	<input type="checkbox"/>	3																																																														
	Not Known	<input type="checkbox"/>	9																																																														
<p>Q1. Employment Status: Tick one</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Student</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Teacher</td> <td style="text-align: center;">3</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Other (please specify)</td> <td></td> <td></td> <td>.....</td> </tr> </table> <p>Q2. Indicate the type of activity the patient was engaged in when injured.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 20%;">2 <input type="checkbox"/> Leisure/recreational</td> <td style="width: 10%; text-align: center;">3</td> <td style="width: 10%; text-align: center;"><input type="checkbox"/></td> <td style="width: 60%;">Paid work (specify)</td> </tr> <tr> <td>5 <input type="checkbox"/> Vital activity (eating, drinking, dressing, bathing)</td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Nursed (eg infant)</td> </tr> <tr> <td>7 <input type="checkbox"/> Educational Activity (eg Student)</td> <td style="text-align: center;">1</td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sport (organised) (specify)</td> </tr> <tr> <td>4 <input type="checkbox"/> Unpaid work (eg house work/yard work)</td> <td></td> <td></td> <td>.....</td> </tr> <tr> <td>9 <input type="checkbox"/> Other</td> <td></td> <td></td> <td></td> </tr> </table> <p>Q3. Where did the injury occur? eg. At home in the lounge room, on a bicycle path, in a school playground, on a dirt road. <u>Please be very specific.</u></p> <p>Q4. What was the patient doing at the time of injury? Eg. Eating/making lunch, walking down footpath, playing football, riding a bike, jumping on trampoline, etc. <u>Please be very specific.</u></p> <p>Q5a Was alcohol or drugs a factor? Yes/No.....If Yes (specify).....</p> <p>Q6. How was the injury caused? eg. Slipped and landed on wet tiles, caught hand in car door, swallowed tablets left on bench, punched in face, etc. <u>Please be very specific.</u></p> <p>Q7. When injured were you using any safety equipment? Please tick boxes</p> <table style="width: 100%; border: none;"> <tr> <td>Seatbelt</td> <td><input type="checkbox"/></td> <td>Safety glasses</td> <td><input type="checkbox"/></td> <td>Mouth guard</td> <td><input type="checkbox"/></td> <td>Safety boots/shoes</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Helmet</td> <td><input type="checkbox"/></td> <td>Machinery guards</td> <td><input type="checkbox"/></td> <td>Ear protection</td> <td><input type="checkbox"/></td> <td>Face mask</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Child care restraint</td> <td><input type="checkbox"/></td> <td>Gloves</td> <td><input type="checkbox"/></td> <td>Harness</td> <td><input type="checkbox"/></td> <td>Pool fence</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Other</td> <td colspan="7">.....</td> </tr> </table>		Student	2	<input type="checkbox"/>		Teacher	3	<input type="checkbox"/>		Other (please specify)			2 <input type="checkbox"/> Leisure/recreational	3	<input type="checkbox"/>	Paid work (specify)	5 <input type="checkbox"/> Vital activity (eating, drinking, dressing, bathing)		<input type="checkbox"/>	Nursed (eg infant)	7 <input type="checkbox"/> Educational Activity (eg Student)	1	<input type="checkbox"/>	Sport (organised) (specify)	4 <input type="checkbox"/> Unpaid work (eg house work/yard work)			9 <input type="checkbox"/> Other				Seatbelt	<input type="checkbox"/>	Safety glasses	<input type="checkbox"/>	Mouth guard	<input type="checkbox"/>	Safety boots/shoes	<input type="checkbox"/>	Helmet	<input type="checkbox"/>	Machinery guards	<input type="checkbox"/>	Ear protection	<input type="checkbox"/>	Face mask	<input type="checkbox"/>	Child care restraint	<input type="checkbox"/>	Gloves	<input type="checkbox"/>	Harness	<input type="checkbox"/>	Pool fence	<input type="checkbox"/>	Other						
Student	2	<input type="checkbox"/>																																																															
Teacher	3	<input type="checkbox"/>																																																															
Other (please specify)																																																																
2 <input type="checkbox"/> Leisure/recreational	3	<input type="checkbox"/>	Paid work (specify)																																																														
5 <input type="checkbox"/> Vital activity (eating, drinking, dressing, bathing)		<input type="checkbox"/>	Nursed (eg infant)																																																														
7 <input type="checkbox"/> Educational Activity (eg Student)	1	<input type="checkbox"/>	Sport (organised) (specify)																																																														
4 <input type="checkbox"/> Unpaid work (eg house work/yard work)																																																																
9 <input type="checkbox"/> Other																																																																	
Seatbelt	<input type="checkbox"/>	Safety glasses	<input type="checkbox"/>	Mouth guard	<input type="checkbox"/>	Safety boots/shoes	<input type="checkbox"/>																																																										
Helmet	<input type="checkbox"/>	Machinery guards	<input type="checkbox"/>	Ear protection	<input type="checkbox"/>	Face mask	<input type="checkbox"/>																																																										
Child care restraint	<input type="checkbox"/>	Gloves	<input type="checkbox"/>	Harness	<input type="checkbox"/>	Pool fence	<input type="checkbox"/>																																																										
Other																																																																

THANK YOU FOR YOUR ASSISTANCE. PLEASE RETURN FORM TO ANDREW BECKETT.

QUEENSLAND INJURY SURVEILLANCE UNIT PATIENT INJURY RECORD

TO BE COMPLETED BY CLINIC STAFF ONLY:

INTENT	Tick one	
<input type="checkbox"/>	01	ACCIDENT, INJURY WAS NOT INTENDED
<input type="checkbox"/>	02	POSSIBLE OR STATED SELF- HARM
<input type="checkbox"/>	03	ALLEGED ASSAULT- SEXUAL (BODILY FORCE)
<input type="checkbox"/>	04	POSSIBLE OR STATED MALTREATMENT BY PARENT
<input type="checkbox"/>	05	ALLEGED ASSAULT- SPOUSE OR PARTNER
<input type="checkbox"/>	06	ALLEGED ASSAULT - OTHER
<input type="checkbox"/>	07	EVENT OF UNDETERMINED INTENT
<input type="checkbox"/>	08	LEGAL INTERVENTION (INCL. POLICE) OR OPERATIONS OF WAR
<input type="checkbox"/>	10	OTHER SPECIFIED INTENT
<input type="checkbox"/>	11	INTENT NOT SPECIFIED

TYPE OF MAIN INJURY:

Tick one	
<input type="checkbox"/>	01 SUPERFICIAL (INCL. BRUISES; EXCL. EYE)
<input type="checkbox"/>	02 OPEN WOUND (EXCL. EYE)
<input type="checkbox"/>	03 FRACTURE (EXCL. TOOTH)
<input type="checkbox"/>	04 DISLOCATION
<input type="checkbox"/>	05 SPRAIN OR STRAIN
<input type="checkbox"/>	06 INJURY TO NERVE (INCL. SPINAL CORD; EXCL. INTRACRANIAL INJ)
<input type="checkbox"/>	07 INJURY TO BLOOD VESSEL
<input type="checkbox"/>	08 INJURY TO MUSCLE OR TENDON
<input type="checkbox"/>	09 CRUSHING INJURY
<input type="checkbox"/>	10 TRAUMATIC AMPUTATION (INCL. PARTIAL)
<input type="checkbox"/>	11 INJURY TO INTERNAL ORGAN
<input type="checkbox"/>	12 BURN OR CORROSION (EXCL. EYE)
<input type="checkbox"/>	13 EYE INJURY (EXCL. FB)
<input type="checkbox"/>	14.1 FB ON EXTERNAL EYE
<input type="checkbox"/>	14.2 FB IN EAR
<input type="checkbox"/>	14.3 FB IN NOSE
<input type="checkbox"/>	14.4 FB IN RESPIRATORY TRACT (EXCL. NOSE)
<input type="checkbox"/>	14.5 FB IN ALIMENTARY TRACT
<input type="checkbox"/>	14.6 FB IN GENITO-URINARY TRACT
<input type="checkbox"/>	14.7 FB IN SOFT TISSUE
<input type="checkbox"/>	14.9 FB OTHER / UNSPECIFIED
<input type="checkbox"/>	20 INTRACRANIAL INJURY (INCL. CONCUSSION)
<input type="checkbox"/>	21 DENTAL INJURY (INCL. #TOOTH)
<input type="checkbox"/>	22 DROWNING OR IMMERSION
<input type="checkbox"/>	23 ASPHYXIA OR OTHER THREAT TO BREATHING (EXCL. DROWNING)
<input type="checkbox"/>	24 ELECTRICAL INJURY
<input type="checkbox"/>	25 POISONING OR TOXIC EFFECT (EXCL. BITE)
<input type="checkbox"/>	26 BITE-VENOMOUS AND NONVENOMOUS
<input type="checkbox"/>	27 OTHER SPECIFIED NATURE OF INJURY
<input type="checkbox"/>	28 INJURY OR UNSPECIFIED NATURE
<input type="checkbox"/>	29 MULTIPLE INJURIES OF MORE THAN ONE NATURE
<input type="checkbox"/>	30 NO INJURY DETECTED

BODY PART INJURED:

Tick one	
<input type="checkbox"/>	01 HEAD (EXCLUDES FACE)
<input type="checkbox"/>	02 FACE (EXCLUDES EYE)
<input type="checkbox"/>	03 NECK
<input type="checkbox"/>	04 THORAX, CHEST AND UPPER BACK
<input type="checkbox"/>	05 ABDOMEN
<input type="checkbox"/>	06 LOWER BACK
<input type="checkbox"/>	07 PELVIS (INCL. PERINEUM & ANOGENITAL AREA)
<input type="checkbox"/>	08 SHOULDER
<input type="checkbox"/>	09 UPPER ARM
<input type="checkbox"/>	10 ELBOW
<input type="checkbox"/>	11 FOREARM
<input type="checkbox"/>	12 WRIST
<input type="checkbox"/>	13 HAND (INCL. FINGERS)
<input type="checkbox"/>	14 HIP
<input type="checkbox"/>	15 THIGH
<input type="checkbox"/>	16 KNEE
<input type="checkbox"/>	17 LOWER LEG
<input type="checkbox"/>	18 ANKLE
<input type="checkbox"/>	19 FOOT (INCL. TOES)
<input type="checkbox"/>	20 UNSPECIFIED BODILY LOCATION
<input type="checkbox"/>	21 MULTIPLE INJURIES (INVOLVING MORE THAN ONE SITE)
<input type="checkbox"/>	22 BODY LOCATION NOT REQUIRED (EG. FB EYE)

Appendix G – School Survey

1. Are you Male Female

2. Do you think Cherbourg has a litter problem? Yes No

3. Is there a lot of broken glass in Cherbourg in the places where you walk, skate, cycle or play? Yes No

4. Have you ever been cut by broken glass in Cherbourg Yes No- go to Q7

5. Where was that (e.g. street, park, tennis court, school)

6. Were you wearing shoes at the time Yes No

7. Why do you think people litter the community with glass?

Appendix H – Presentation of Photovoice

***A Safer and Healthier
Cherbourg Community***



**Cherbourg State School
students
June 2009**

***We talked, in our classrooms, about
making our community a healthier and
safer place.***



We took photos to show Council what some of the problems are.



We came up with ideas for fixing the problems.



Broken glass is everywhere



We need to pick up and recycle glass

We need a clean community



Problem:

Rubbish lying around is unhealthy and dangerous

Solution:

- Organise a clean up day
- Recycle
- Encourage people not to use plastic bags.