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Injury as a chronic health issue in Australia

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Key findings

- Injury is the leading cause of mortality, morbidity and permanent disability that affects the quality of life of injured people and their families in Australia.
- In 2003, the burden of injury was 7.0% of total Disability-Adjusted Life Years, with 76% of the overall injury burden due to mortality.
- The injury burden in Australia is dominated by suicide and self-inflicted injuries, road traffic accidents and accidental falls.
- Injury was a major cause of hospitalisation, accounting for 5.5% of all hospital separations.
- People with a prior injury have significantly more health service use (hospital admissions and physician claims) than do the general population.
- Injuries appear to increase mental health service use for those with pre-existing mental health problems and lead to mental health service use among those without pre-injury mental health conditions.
- Post traumatic stress disorder and major depressive disorders were the most frequently diagnosed health conditions following post-injury trauma.
- There appears to be an aetiological link between mental health conditions and injury, particularly in relation to risk taking behaviours, alcohol misuse, and psychological traits such as impulsivity, sensation seeking, and risk perception.
- Given the human and economic costs of injury, it is important to address the chronic health effects of injury and to identify and reduce pre-existing risk factors that predispose people to injury.

Introduction

Acute injury events are the leading causes of mortality and morbidity in Australia. Each year about 7% of hospital separations are due to acute injury. For many of those who are treated in hospital and discharged, there may be long-term health consequences of the trauma associated with their injury and treatment. This briefing focuses on the chronic health effects following injury and the effect injury has on the physical and psychological well-being and social functioning of individuals who were injured.

Prevention and control of chronic non-communicable diseases in Australia is a high priority because of the health burden these conditions place on individuals, communities and the health sector. In 2000–01, Commonwealth and State governments, private health insurance agencies and individuals and households spent an estimated $45 billion (78% of total recurrent health expenditure) on disease, excluding injuries (AIHW 2004). Six disease groups accounted for the greatest health expenditure. These groups are: cardiovascular diseases, nervous system disorders, musculoskeletal diseases, respiratory diseases, oral health and mental disorders and together these disease groups used about $25 billion or over half (51%) of the total allocated health expenditure in 2000–01.

Improvements in health care and changes in risk profiles of the population has resulted in a decrease in mortality for some chronic diseases (e.g. cardiovascular conditions), but with the ageing of the population there has been a concomitant increase in morbidity in several chronic diseases (e.g. ischaemic heart disease, stroke and senile dementias) and for almost all persons over 75 years of age, at least one chronic disease has been reported. In the 2004–05 National Health Survey, 77% of the population aged 15 years or older reported that they had one or more long term medical conditions (ABS 2006a).

Because most chronic diseases are highly preventable, various strategies have been developed to improve early detection, management and addressing risk and protective factors over the life course of individuals. One such strategy, the National Health Priority Areas (NHPA) initiative is a Commonwealth and state and territory government collaborative effort to focus public attention and heath policy on areas that contribute to the burden of disease in Australia.

National Health Priority Areas

Seven National Health Priority Areas were identified in 2002 by the Commonwealth, state and territory governments for attention, four categorised as *chronic diseases* (cardiovascular disease, cancers, diabetes mellitus, asthma and arthritis and musculoskeletal conditions) and two categorised as *other* (mental health and injury). An additional health condition, dementia, was added as an Australian Government priority. These eight identified health categories accounted for 72.8% of the total burden of disease and injury in Australia in 2003 (Begg et al. 2007).

Chronic injury

Acute injury events that result in long term, persisting health problems can be referred to as chronic injuries. Unlike chronic diseases, which often have a long latent period or gradual onset, injuries that lead to chronic health problems can occur suddenly, immediately after exposure to a causal event (e.g. spinal cord injury due to a motor vehicle crash), or come to light later, as long-term co-morbidities (e.g. learning disability following brain injury), or as late effects (e.g. osteo-arthritis due to a knee injury). Persisting injury-related health problems cause a decrease in health status and a reduction in healthy life expectancy.

Health burden of injury

Injury is the leading cause of mortality, morbidity and permanent disability in Australia. According to the ABS disability survey in 2003, 15.2% (600,300) of people with a disability reported that the cause of their main health condition was accident or injury (ABS 2004).

Injury was a major cause of hospitalisation in Australia, responsible for 463,554 hospital separations during 2004–05 or 5.56% of all hospital separations (Bradley & Harrison 2008).

In 2003, the burden of injury was 7.0% of total DALYs (Disability-Adjusted Life Years), a summary measure of population health representing 11.0% of YLL (Years of life lost due to premature mortality) and 3.3% of YLD (Years lost due to disability). In 2003, over 106,000 years of 'healthy' life were lost by Australians due to injury-related disabilities (AIHW 2006).

Current burden of injury values may be under-estimates. According to Mathers et al. (1999), several methodological issues relating to comorbidity remain to be addressed. These include: how comorbidities affect long-term disability; which comorbidities are relevant; and how to deal with the logistics of modelling large numbers of combinations of comorbidities (Mathers C et al. 1999). Clarifying the contribution of pre-existing morbidity to enable the refined calculation of population attributable-burden estimates is vitally important in burden-of-disease approaches to public health policy (Cameron et al. 2005).

According to current methods, the injury burden in Australia is dominated by suicide and self-inflicted injuries, injuries due to road traffic crashes and to unintentional falls, which together accounted for 64% of the total injury burden (Begg et al. 2007). The burden in males was greater than females for most causes of injury and 76% of the overall injury burden was due to mortality. Injury ranked seventh in terms of health burden (185, 100 DALYs) in 2003 and accounted for 8% of total health system expenditures in 2000–01.

Chronic conditions as risk factors for injury

A large proportion of the premature mortality and morbidity associated with chronic disease and injury is preventable by modifying risk and protective factors through an integrated, health system-wide approach that involve primary health care settings, schools and workplaces, and other community-based service centres. To successfully reduce the incidence of injury occurrence, it is important to identify and understand factors that can lead to a higher risk of injury.

Psychiatric morbidity following injury is often the result of traumatic stress associated with the injury event and consequent treatment and appears to be dependent on the patients' ability to cope psychologically to acute stress symptoms following injury.

In a study of level 1 trauma inpatients assessed just before discharge at 3 and 12 months after injury, O'Donnell et al. (2004) found that post traumatic stress disorder (PTSD) and major depressive disorder were the most frequently diagnosed health conditions at both 3 and 12 months, accounting for 53% of all diagnoses (O'Donnell et al. 2004).

There also appears to be an aetiological link between mental health conditions and risk of injury particularly in relation to risk taking behaviours, alcohol misuse, and psychological traits such as impulsivity, sensation seeking, and risk perception. In a hospital-based case control study of trauma and non-trauma patients, Field and O'Keefe (2004) found that behavioural patterns, including alcohol use, and psychological characteristics of trauma patients were significantly different from those of non-trauma

patients. Trauma patients were more likely to use alcohol in a hazardous or harmful way, more likely to describe themselves as impulsive or sensation seeking, less likely to perceive risk while engaging in injury-related risk behaviours and more likely to report driving and violence related risk behaviours (Field & O'Keefe 2004). It appears that alcohol consumption and engagement in dangerous driving and violence related risk behaviours were the strongest predictors of injury status.

Similar findings have been confirmed by a study with a cohort design (Cameron et al. 2005). These investigators conducted a population-based study that utilised an injured incidence group and a non-injured comparison group. They found that people in the injury group had used significantly more health services (hospital admissions and physician claims) prior to their injury than the non-injured group. Compared to non-injured people, injured people were five times more likely to have one or more comorbidities, were admitted to hospital almost twice as often and had higher rates of physician claims.

A further study, quantified the relationship between injury and mental health service use for 10 years post-injury event, controlling for demographic factors and pre-existing co-morbidities such as psychiatric conditions (Cameron et al. 2006). The authors found that injury appeared to be associated with a three-fold increase in mental health hospitalisations and 1.4 times the number of mental health physician claims in the decade following injury. After adjusting for factors including pre-existing mental health conditions, the injured cases continued to have a significantly increased risk of post-injury mental health service use compared to the non-injured group. That is, characteristics of injured people before injury accounted for much, but not all, of their post-injury elevation in health service utilisation.

Chronic effects of injury

The nature and severity of injury often will determine the degree of long-term disability and impairment. Some injuries, often described as 'catastrophic' injuries, have major consequences that are so serious that survivors of these injuries require lifetime care and support. Examples are spinal cord and brain injuries. Other injuries, such as burns, fractures and injuries from self-harm attempts, although often less severe, may have profound effects on the health and wellbeing of the people injured and their healthy life expectancy.

In the following sections, a brief overview of five types of injuries is presented to illustrate some of the injuries that lead to morbidity and permanent disability in Australia.

Spinal cord injuries

Each year in Australia, about 250 people are diagnosed with persisting spinal cord injury due to traumatic causes. Over 80% of these cases are males, with the highest incidence of spinal cord injury occurring in people aged between 15–34 years. Just over half of the cases have injury to the cervical spinal segments and as a result are tetraplegic (impairment or loss of motor and/or sensory function in the arms as well as in the trunk, legs, and pelvic organs). About one-third of the tetraplegic cases have complete lesion of the spinal cord (Cripps 2006).

Survivors of spinal cord injury have a range of secondary complications that affect their health and well-being and life satisfaction. Pressure areas, urinary tract infections, pain, spasticity and psychosocial issues were reported in long term survivors. Other social issues such as financial, housing, transportation and employment were associated with increased reporting of depression and drug and alcohol use (Whiteneck et al. 1992; Johnson et al. 1998; Post et al. 1998).

Based on 2005 cost estimates, the ongoing costs associated with the long-term care of the prevalent population of about 9,000 are estimated to be nearly A$500 million per year. These cost estimates allow for attendant care and equipment only and do not include medical or ancillary treatment (Walsh et al. 2005). An overview of spinal cord injury in 2005–06 is provided in Table 1.

Table 1: New cases of persisting spinal cord injury due to traumatic causes, Australia 2005–06

Indicator	Summary data*
New cases of persisting SCI	284, 82% male
Incidence of new cases of persisting SCI (Age adjusted rate)	15.7 cases per million population aged 15 years and older**
Duration of initial inpatient care (median)	Tetraplegia: 152 days. Paraplegia 124 days***
External causes of SCI	
Transport-related	46%
Falls-related	33%
Water-related sports	9%

* Based on case registration data from the Australian Spinal Cord Injury Register (ASCIR).

** Paediatric cases are not routinely collected.

*** Complete and incomplete cases combined.

Traumatic brain injury

During 2004–05, more than 14,000 cases of traumatic brain injury (TBI) were admitted to hospitals in Australia, representing 1.8% of all injury hospital separations (Table 2). For males, rates of hospitalisation for TBI-related conditions peaked in the late teenage years and early twenties, decreased until age 60 years and then increased to high levels at very old age. Rates for females showed a similar pattern, though male rates were higher than female rates at all ages, and the peak in late teenage years was much less pronounced than for males. Rates are much higher for Indigenous Australians than others, the difference been especially large for females (Jamieson et al. 2008).

In Australia, motor vehicle accident trauma accounts for about two-thirds of moderate and severe TBI, with falls and assaults being the next most common causes. A high proportion of people with mild TBI, particularly from sporting accidents and falls do not present to hospital and alcohol is associated with almost a half of all cases of TBI (Kahn et al. 2003).

Table 2: Hospitalised traumatic brain injury[(a)], Australia 2004–05

	Hospitalisations		
Indicator	**Males**	**Females**	**Persons**
Cases[(b)]	9,743	4,447	14,190
Proportion of all injury hospital separations	2.3%	1.2%	1.8%
Age-adjusted rate (direct)	98.7	41.9	70.1
Mean length of stay (bed-days)[(c)]	5.0	6.1	5.4

(a) Case selection is based on Principal Diagnosis = ICD-10-AM code S06, 'Intracranial injury'.

(b) Excludes inward transfers from other acute care hospitals.

(c) Bed-days for inward transfers from other acute care hospitals are included in numerator.

The impact of TBI at the community level is substantial. In a study conducted in the USA (Sorenson & Kraus 1991), it was estimated that about 16.4% (n = 4,368) of 26,636 newly incident cases of TBI discharged alive from hospital will experience long-term disability and require some form of rehabilitation.

In a review of hospital treated TBI in an Australian community, (Tate et al. 1998) reported that severe and moderate head injuries accounted for 12–14 per 100,000 population and 15–20 per 100,000 population, respectively; and the incidence of mild TBI was 64–131 per 100,000 population.

Although TBI can cause long-term physical disability, it is the complex neuro-behavioural effects of TBI that have the greatest disruption to quality of life. Survivors report that changes in cognition, personality and behaviour, and interpersonal relationships are more disabling than any residual physical deficits (Kahn et al. 2003).

TBI commonly affects people in early adulthood and causes life-long impairments. Depending on a person's premorbid abilities and psychosocial situation, the goals of rehabilitation needs to be holistic, long term and individualised for each survivor and his or her family. According to (Kahn et al. 2003), continuity of care involving family, medical and rehabilitation services, often for the rest of a person's life, is essential to optimise rehabilitation outcomes and to help the person achieve a maximum degree of return to their previous level of functioning.

Severe burns

Burn injuries can be devastating, particularly full-thickness burns that are large or involve areas such as the face or hands. These types of burns result in destruction of the dermal layer of the skin and the patho-physiological consequences are profound. In Australia during the period 1999–04, less than a quarter (24%) of burn-related injury hospitalisations involved full-thickness burns. Ninety-six percent of these cases, had less than 10% of their body surface area burned (Harrison & Steele 2006).

Survival is often dependent on the surface area of the body burned and the availability of specialised treatment at burn centres. Survival of severe burns requires rapid physiological support involving intravenous fluid to manage organ shock and the use of skin grafts and other types of wound covering materials to protect the damaged skin surface from fluid loss and infection.

In Australia during the period 1999–00 to 2004–05, over 1,000 incident cases of full thickness burns were admitted annually, representing proportionally about 0.1% of all injury hospital separations (Table 1). Overall, the age-adjusted rate for severe burns was 5.3 hospital admissions/per 100,000 population, with male rate ratio more than twice the female rate ratio. Male rates were generally higher at all ages, with greatest difference between female rates at ages 0–4 years and teenage to middle ages. After age 70 years the difference in rates between males and females decreased.

Table 3: Hospitalised severe burn injuries [(a)], Australia 1999–00 to 2004-05

	Hospitalisations		
Indicator	**Males**	**Females**	**Persons**
Annual average number of cases	725	306	1,030[(b)]
Proportion of all injury hospital separations	0.2%	0.1%	0.1%
Age-adjusted rate (direct)	7.4	3.1	5.3

(a) See Case Selection (p 10) for inclusion criteria.

(b) Sum of average male and female injuries does not equal persons due to rounding.

The severity of full thickness burns and scalds is dependent on the size of the body surface area burned. Although contact with hot fluids are the most frequent cause of burn and scald injury hospitalisation, serious full thickness burn injury hospitalisations during the period 1999–00 to 2004–05 were caused by accidental exposure to smoke, fire and flames (31%), hot fluids, including fats and oils (11%), household appliances, including heating appliances, (8%) and electrocution (5%). Severe burn admissions were also the result of intentional self-harm, particularly from smoke, fire and flames (2%). These cases tended to be particularly severe.

The treatment of severe burns often results in prolonged periods of acute care required for stabilisation and wound healing, followed by rehabilitation and multiple out-patient visits that may last for many years. Treatment often requires multiple surgical procedures and physiotherapy to improve movement and reduce scar induced immobility, particularly if limbs or the face are involved.

Severe burns have long-term physical and psychosocial consequences due in part to the trauma of the injury event and treatment in the post-burn phase. In a study of psychological problems in patients with full-thickness burns, (Van Loey & Van Son 2003) found that depression and post-traumatic stress disorder (PTSD) are common in 13–23% and 13–45% of severe burn cases, respectively. These psychological symptoms result from the traumatic nature of the burn accident, painful treatment and cosmetically disfiguring burn scars. Risk factors for depression and PTSD were associated with pre-burn depression, type and severity of baseline symptoms, anxiety related to pain, and visibility of burn injury. Treatment of these symptoms utilising cognitive behavioural therapy, exposure therapy and pharmacological interventions have had a positive effect on burn patients and their quality of life.

Injury and comorbidities—fractures and osteoporosis

Osteoporosis is a common chronic disease particularly in post-menopausal women and to a lesser extent in men over 60 years. As a result of the ageing process, changes in bone turnover (bone resorption and bone formation) tend to result in a net increase in rate of bone resorption which causes decreased mineralisation of trabecular and cortical bone (Delmas 2002).

Self-reported prevalence of osteoporosis in the Australian population aged 40 and older, based on the 2004–05 National Health Survey, is 1.95% for males and 10.44% for females (AIHW 2008). Osteoporosis increases risk of fractures of the hip, spine, humerus, forearm and wrist (Nguyen et al. 1996). The combined lifetime risk for these fractures being treated clinically is about 40%, equivalent to the risk of cardiovascular disease (Kanis 2002). In Australia, fractures attributable to osteoporosis have been estimated to cost about $7 billion annually in direct and indirect costs (Access Economics 2001).

In Australia during the period 1999–00 to 2004–05, over 4,000 incident cases of fractures from trauma, diagnosed as principal diagnoses and osteoporosis recorded as a co-morbid diagnosis, were admitted annually, representing 0.5% of all hospital separations (Table 4). However, diagnosed osteoporosis mentioned in hospital data is likely greatly under-estimate population prevalence.

Table 4: Hospitalised fractures with mention of osteoporosis[a], Australia 1999–00 to 2004–05

	Hospitalisations		
Indicator	Males	Females	Persons
Annual average number of cases	526	3,554	4,080
Proportion of all injury hospital separations	0.1%	1.0%	0.5%
Age-adjusted rate (direct)	6.6	29.5	20.4

(a) Case selection is based on a Principal Diagnosis of fracture (Sn2, T02, T08, T10, T12, T14.2) and a second or subsequent diagnosis code of M80, M81 or M82.

The female age-adjusted rate of 29.5 fractures per 100,000 population was about four times the male rate of fractures and reflected the higher prevalence of osteoporosis and of fractures in females.

Sixty per cent of the fractures diagnosed were fractures of the lumbar spine, pelvis and femur with over half recorded as femur fractures (ICD-10-AM S72). Over 92% of the fractures involved falling. Sixty-six per cent of people aged 60 years and over, who had osteoporosis and were admitted to hospital with a fracture from falling had their fall at home or in a residential institution.

Osteoporosis is a preventable and treatable condition. Dietary, hormonal and pharmacological agents such as bisphosphonate compounds can be effective in reducing bone reabsorption and reducing fragility fractures of the spine, hip and wrist (Gardner et al. 2006). According to Nguyen, Center and Eisman (2004), an effective program to reduce osteoporotic fractures would require aggressive measures to detect osteoporosis at early stages. This may be achieved by the establishment of fracture clinic follow-up services in all major and teaching hospitals where people at risk of subsequent fractures (following an osteoporotic fracture) can be treated to reduce the occurrence of future fractures. An increased awareness by clinicians of osteoporosis and its seriousness and the relative simplicity in diagnosis and treatment of the condition is essential for an effective osteoporotic fracture prevention program (Nguyen et al. 2004).

Injury and comorbidities—self-harm and anxiety/depression

In the most recent major study of the burden of disease and injury in Australia, (Begg et al. 2007) reported that suicide and self-inflicted injuries were responsible for 27% of the total injury burden in Australia in 2003. Anxiety and depression and alcohol abuse accounted for nearly three-quarters of this burden. The burden for males was greater than for females for all major causes of suicide and self-inflicted injury.

In Australia during the period 1999–00 to 2004–05, 7,687 incident cases of hospitalised self-harm, with anxiety or depression recorded as a co-morbidity, were admitted annually, representing 1.0% of all injury hospital separations and 34% of all incident self-harm cases admitted (Table 5).

Table 5: Hospitalised self-harm injuries with mention of anxiety or depression[a], Australia 1999–00 to 2004–05

	Hospitalisations		
Indicator	Males	Females	Persons
Annual average number of cases	2,781	4,906	7,687
Proportion of all injury hospital separations	0.6%	1.3%	1.0%
Age-adjusted rate (direct)	28.64	50.0	39.2

(a) Case selection is based on first reported external cause code of Intentional Self-Harm (X60–X84 or Y87.0) and a code for anxiety or depression (see p 10) in any diagnosis field.

The age-adjusted rate for females (50.0 cases per 100,000 population) was almost twice that for males. Eighty-eight per cent of the cases involved the ingestion of poisonous substances, primarily coded to ICD-10-AM X60 and X61 (e.g. sedative-hypnotic drugs, antidepressants, and non-opioid analgesics).

Female rates were highest at early teenage ages and were higher than male rates at all ages except the oldest (75 years and older). Rates for males were highest at ages 30–39 years.

Anxiety and depression are common mental health conditions, with a health burden twice as high for females as for males. These conditions are risk factors for injury and are often associated with post-injury traumatic effects.

Discussion

Many acute injuries are consequences of chronic diseases, and many acute injuries have chronic consequences.

Chronic disease and injury resulting in chronic health problems have many characteristics in common. Both are characterised by complex causality and multiple risk factors. Certain chronic diseases are also important risk factors for acute injury and their presence need to be identified and managed as part of a comprehensive, primary health care based, injury prevention program.

Assessment of the chronic consequences of acute injuries generally requires longitudinal studies. The body of relevant information has been small, due to the difficulty and cost of such studies. As evidence has emerged, it has begun to reveal the chronic dimension of injury. New techniques, such as routine linkage of health data sources, are enabling more to be learned.

In addition to chronic diseases, a person's injury history may also predispose him or her to further injury, due to the physical or psychosocial effects that may persist. Post traumatic stress and depression, often common mental health conditions following trauma, may exacerbate existing, pre-injury mental health problems or be the direct result of the trauma and need to be identified and treated to reduce further risk of injury and decrease the health burden of comorbid health conditions.

The paucity of good data on the chronic consequences of acute injury has tended to result in underestimation of the health burden and cost attributable to injury. For example, the burden weights used in the most recent major burden of disease study in Australia are essentially unchanged since their development more than a decade ago, and do not take account of much of the evidence now available (Begg et al. 2007).

Given the human and economic costs of injury, it is important to address the chronic health effects of injury and to identify and reduce pre-existing risk factors that predispose people to injury. For injury prevention programs to be effective, reliable information on the consequences of injury at the population level needs to be improved. Identifying risk factors, understanding the health and functional outcomes of injury within an integrated, health system-wide approach that involve hospitals, medical clinics, established primary health care settings, schools and workplaces, and other community-based service centres, will assist in reducing the health burden of injury and refine existing injury prevention programs and develop new and possibly novel programs to reduce the burden of injury.

The emergence of health data linkage capabilities in Australia is providing a basis for powerful but relatively low-cost studies of chronic consequences of acute injury. Tapping this potential will do much to improve understanding of the full extent of the costs and burden of injury.

Data issues

Rates

Incidence rates have been calculated as cases per 100,000 of the usually resident population of Australia. Population data were obtained from the AIHW and are similar to data presented in the Demographic Statistics Catalogue No. 3101.0 (ABS 2006b; ABS 2006). Annual rates were calculated using finalised population estimates as at 31 December for each year.

Except where otherwise stated, all-ages rates have been adjusted to overcome the effects of differences in the proportions of people at different ages (and different injury risks) in the populations being compared. Direct standardisation was employed, taking the Australian population in 2001 as the standard.

Case selection

Injury and poisoning cases were selected from Australian hospital separations reported during the period 1999–00 to 2004–05 based on Principal Diagnosis in the ICD-10-AM range S00–T89 using Chapter XIX *Injury, poisoning and certain other consequences of external cause codes*. To reduce over-counting of cases and to provide an estimated incidence of admission, cases whose mode of admission were recorded as being by transfer from acute-care hospital were omitted. Since most injuries occur in settings such as motor vehicle crashes, falls, inter-personal violence, and during work, sports and recreational activities, the focus of tabulations in this briefing is on *Community injury*. The selection criterion for *Community injury* for this report is the presence of an ICD-10-AM Principal Diagnosis in the range S00–T75, or T79. Selection criteria for data presented in each table are give in footnotes and here.

Traumatic brain injury (Table 2)

Principle diagnosis = Intracranial injury: S06

Severe burns (Table 3)

Principle diagnosis any of:

Full thickness burn of head and neck: T20.3

Full thickness burn of trunk: T21.3

Full thickness burn of shoulder and upper limb: T22.3

Full thickness burn of wrist and hand: T23.3

Full thickness burn of hip and lower limb: T24.3

Full thickness burn of ankle and foot: T25.3

Burn of eye and adnexa: T26

Burns of multiple regions, at least one burn of full thickness mentioned: T29.3

Burn of full thickness, body region unspecified: T30.3

Fracture with mention of Osteoporosis (Table 4)

Principal Diagnosis of fracture (Sn2, T02, T08, T10, T12, T14.2) and a second or subsequent diagnosis code of

Osteoporosis with pathological fracture: M80,

Osteoporosis without pathological fracture: M81, or

Osteoporosis in diseases classified elsewhere: M82

Intentional self-harm with mention of Anxiety and depression* (Table 5)

X60–X84 or Y87.0 as first External Cause code plus any of the following codes in any diagnosis field:

Manic episode: F30

Depressive episode: F32

Recurrent depressive disorder: F33

Persistent mood [affective] disorders: F34

Other mood [affective] disorders: F38

Unspecified mood [affective] disorder: F39

Agoraphobia: F40.0

Social phobias: F40.1

Panic disorder [episodic paroxysmal anxiety]: F41.0

Generalised anxiety disorder: F41.1

Mixed anxiety and depressive disorder: F41.2

Obsessive-compulsive disorder: F42

Post-traumatic stress disorder: F43.1

Separation anxiety disorder of childhood: F93.0

* Codes based on Burden of Disability report 2007, Annex Table 1, Disease and injury categories and ICD-10 codes, mental disorders, p. 207. (Begg et al. 2007)

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