

A Chartbook of the Injury Related Impairment Indicators 2001-2008

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Foreword

Presented here is a chartbook of Injury Related Impairment indicators. The development of these outcome indicators was described in the report:

Cryer C, Gulliver P, Russell D, Davie G, Langley J. The development of impairment-related injury outcome indicators. Injury Prevention Research Unit, University of Otago, Dunedin ,New Zealand. Occasional Report OR 069. January 2008.

The main body of the report is purposely short on words and long on charts. The intention is to let the charts speak for themselves with little detail being provided on the background and methods, and minimal commentary on the results. It is recognised, however, that some readers will wish for more detail, particularly relating to methods. These are provided in the report cited above.

Abbreviations

ACC	Accident Compensation Corporation
ICD	WHO International Classification of Diseases
ICD-10	WHO International Classification of Diseases 10 th revision
ICD-10-AM	ICD-10, Australian Modification
IPRU	Injury Prevention Research Unit, University of Otago, New Zealand
NMDS	Ministry of Health National Minimum Data Set of hospital discharges
NZIPS	New Zealand Injury Prevention Strategy
SNZ	Statistics New Zealand
SRR	Survival Risk Ratio
WHO	World Health Organisation

Summary of the charts – key highlights of the chartbook

Below is a summary of the overall changes from baseline in the frequency and age-standardised rates of injury related impairment for ‘All injury’ and each of the six NZIPS priority areas.

The frequency of injury hospitalisations resulting from injury related impairment describes the impact of injury impairment on society. Age standardised rates provide an estimate of an individuals’ average annual risk of sustaining an injury related impairment.

Injury Area	Frequency trends to 2008	Age standardised rate trends to 2008
All injury	Imp-01: increase from baseline of around 8,700 to around 10,000 in 2008.	Imp-02: increase from baseline.
Assault*	Imp-A01: increase from baseline, although this could be the result of reporting behaviour.	Imp-A02: increase from baseline, although this could be the result of reporting behaviour.
Work related*	Imp-W01: increase from baseline.	Imp-W02: increase from baseline
Intentional self harm*	Imp-S01: increase from baseline, although this could be the result of reporting behaviour.	Imp-S02: no change from baseline.
Falls	Imp-F01a-c: increase from baseline for all ages, and for the 0-74 and 75+ age groups.	Imp-F02a-c: no change from baseline for all ages. Increase from baseline for 0-74 years, decrease from the baseline for 75+ years.
MVTC	Imp-M01: substantial increase from baseline.	Imp-M02: increase from the baseline.
Drowning	No indicator presented.	No indicator presented.

*Provisional indicators

Part 1: Background and Methods

1.1 The New Zealand Injury Prevention Strategy

The New Zealand Injury Prevention Strategy (NZIPS) is an expression of the Government's commitment to working with organisations and groups in the wider community to improve the country's injury prevention performance.

The Strategy's broad structure includes a vision, principles, goals, objectives and actions. The Strategy's vision is "a safe New Zealand, becoming injury free", which is supported by two goals:

- to achieve a positive safety culture, and
- to create safe environments.

Ten key objectives are identified which are designed to address the vision and goals of NZIPS. (For further details see www.nzips.govt.nz.)

Six priority areas are referred to in the objectives and actions. These priority areas are:

- Assault,
- Workplace injuries,
- Suicide and deliberate self harm,
- Falls,
- Motor vehicle traffic crashes, and
- Drowning and near-drowning.

1.2 What is an injury related impairment?

Serious injury outcome indicators (fatal and non-fatal, defined in terms of threat to life) have been developed for 'all injury' and for the six NZIPS priority areas as a means of measuring performance of the national Strategy in reducing injury^{1 2}.

When monitoring serious injuries they should not, however, only be considered in terms of threat to life. Injuries which result in long term disability and substantial cost are also serious. Relatively minor injuries (in terms of threat to life) may result in long term disability without adequate management and rehabilitation³. The term 'disability' encompasses outcomes of injury, including the ability to complete activities of daily living and the ability to participate in society⁴, that are not directly related to threat to life. The International Classifications of Functioning, Disability and Health (ICF) describe disability according to three dimensions: (i) impairment, (ii) activity limitations, and (iii) participation restrictions⁴. The first level – impairment, or the loss of body functions or structure, is the focus of the indicators presented in this Chartbook.

1.3 What the chartbook comprises

Part 2 presents the charts for the injury related impairment indicators for ‘All injury’ and for five of the priority areas, with baselines. Drowning has not been included because of insufficient numbers. These charts speak largely for themselves, and so only a brief commentary is provided for each.

1.4 Frequently Asked Questions

Q How were the injury related impairment indicators derived?

A To be considered an indicator of injury related impairment, injury diagnoses from the Ministry of Health’s National Minimum Dataset (NMDS) ⁵ of hospital inpatient data had to satisfy two criteria. Firstly, the diagnosis had to be one that should a patient present with that diagnosis, they would always be admitted to hospital; secondly, if a person with the diagnosis applied for an ACC lump sum payment, they would almost always be entitled to receive a payment. These criteria were assessed by two ACC medical specialists and three emergency department specialists. Only diagnoses for which 100% agreement was obtained for both criteria from all specialists were considered indicator diagnoses. A list of the indicator diagnoses is provided in Appendix 2.

Q What are injury related impairment indicators for all injury?

A The injury related impairment indicators for ‘all injury’ are as follows:

- Frequency of hospitalised injury related impairment
- Age-standardised rate of injury related impairment, per 100,000 person-years at risk

Q What is age standardisation?

Age standardisation is a process of adjusting the rates of injury to account for changes in the age structure of a population over time. It allows comparison of the rates of injury from one year to another, taking into account the aging population.

The methodology for the derivation of the injury related impairment indicators for the priority areas are based on those for ‘all injury’.

Q What data are the indicators based on?

A These indicators are based on the NMDS of hospital discharge data.

Q Why are there provisional indicators?

A For the Serious Injury Outcome Indicators, the validity of the data on which the indicators were based was evaluated. For some of the indicators (specifically assault and self harm), questions were raised about the validity of the NMDS data². The provisional serious injury indicators were candidate NZIPS indicators, but had some identifiable threats to validity. In these cases it was considered that the count of injuries based on the data available could be impacted by factors such as reporting behaviour (people being more willing to report the true cause of an injury because of an increased awareness) or monitoring behaviour (more cases being identified because of increased policing or a cause of injury becoming more of a public health priority). Because the injury related impairment indicators are based on the same data, these indicators have been considered provisional in this report also.

Q What do the frequencies and rates reflect?

A Frequencies reflect the societal burden of injury related impairment^a, while rates reflect individual risk.

Q What is the period presented in the charts?

A Wherever possible, the period presented for serious non-fatal injuries is 2001 to 2008. The indicators have been developed using a diagnosis coding scheme in place in New Zealand hospitals since 2000. As the scheme was still being implemented in 2000, the data from this year is not wholly consistent with that from latter years. As such, 2001 has been used as the start date for the series.

Q What is the coding scheme used for diagnosis of injury?

A The coding system used for classifying injury diagnosis and cause of injury in the NMDS is the World Health Organisation (WHO) International Classification of Diseases (ICD)⁶, version 10 (Australian Modification, ICD-10-AM).

Q What is the significance of the various colours used in the charts?

A The colours used in the charts have been chosen to signal the different status of the indicators. Charts with brown bars indicates some concern about the validity of the data on which they are based and hence the provisional nature of the indicators. There is no such concern with the charts with green bars.

^a In this context, the societal burden of injury is considered to be related to the number of deaths and hospitalisations associated with injury. The majority of injury discharges from hospitals in New Zealand are publicly funded. For 2002 it was estimated that 99% of all hospital injury discharges were publicly funded.

Q Why are some of the indicators presented as a 3-year moving average? What does this mean?

A For some of the injury indicators, the numbers of impairment related injuries attributable to specific causes of death, fall below 100 per year. In these instances, the numbers fluctuate substantially on a year-to-year basis. Such fluctuations may hide trends in the numbers and rates of injury. To overcome this, 3-year moving averages have been estimated. This means, for example, that data from 2001, 2002 and 2003 are used to estimate an indicator value for 2002.

Q What is the 'baseline'?

A The 'baseline' (horizontal line approximately half way up the charts) provides a point from which to compare the frequencies and rates of injuries. It is the average count or rate of injury for the three years leading up to the launch of NZIPS (2001-2003). For those indicators where moving averages were used, the baseline is the average count or rate of injury for the five years closest to the launch of NZIPS (2001-2005). The line has been extended across the graphs to provide an easy point of reference for the description of any injury trends.

Q What are the red lines shown on the graphs and what do these mean?

A Each bar on each chart has confidence intervals shown in red. These give an indication of the amount of random variation associated with a single year's indicator value. Narrow confidence intervals indicate little random variability; wide confidence intervals much random variability. Where wide confidence intervals are displayed, little weight should be given to the variation from one year to the next – it could be due to chance alone.

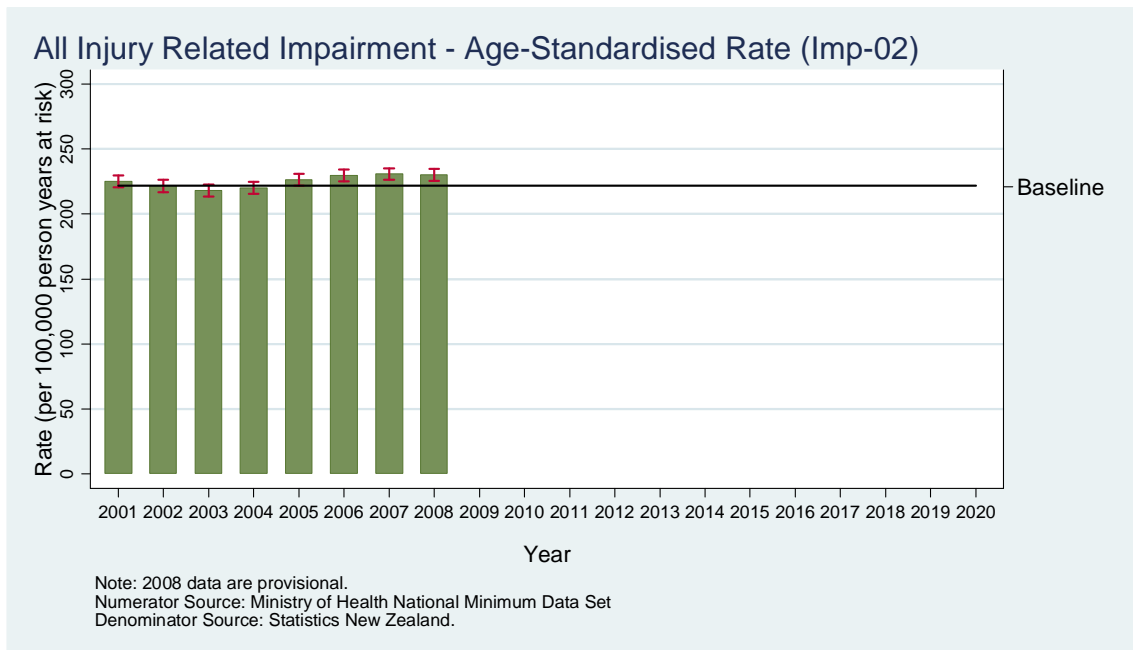
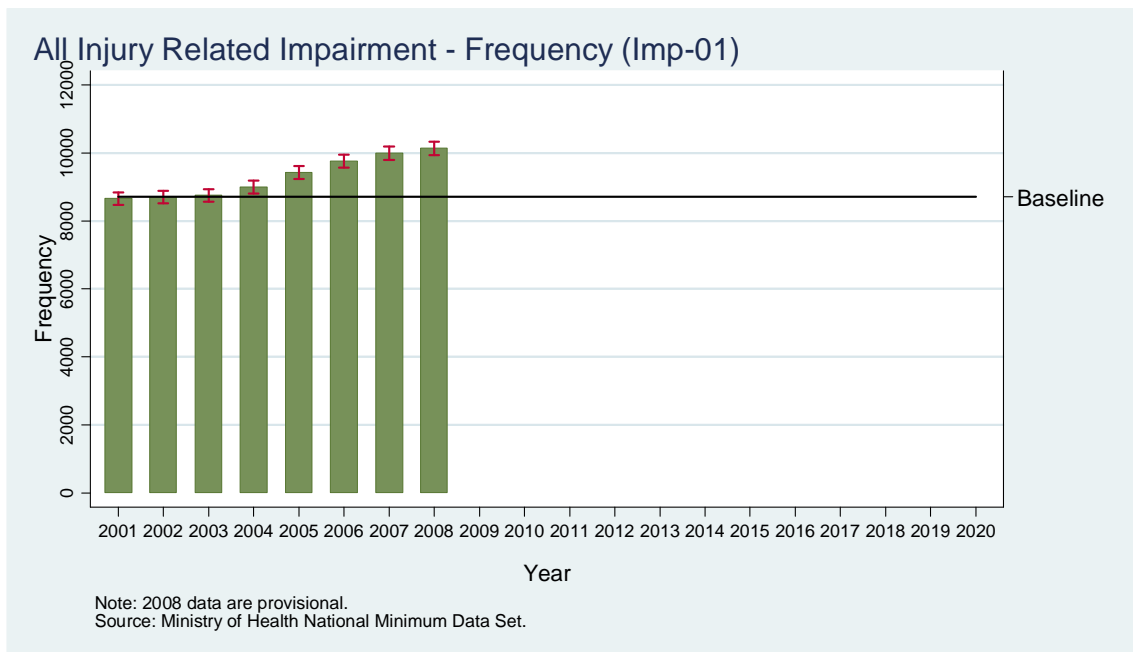
Where there is reader interest in the magnitude of the frequency or rate of serious injury in a given year, there will be particular interest in these confidence intervals for that year. In many other circumstances, it is the trends in the indicators that will be of interest. For example, trends are of interest to gauge how well New Zealand is doing in reducing injury related impairment following the introduction of the NZIPS. When considering trends, observing the degree of overlap of confidence intervals for individual bars (years) is helpful as an aid to interpretation of trends. If confidence intervals do not overlap the baseline, this is indicative of a change from baseline (the years immediately preceding the introduction of NZIPS) that is unlikely to be due to chance alone.

1.5 Interpretation of the charts

Brief comments on each chart are provided at the foot of each page in Part 2. The interpretations provided are based on a visual inspection (as opposed to formal statistical trend analysis). Within a chart, where the confidence intervals do not overlap the baseline, this is indicative of a change from baseline that is unlikely to be due to chance alone. This is likely to represent a real change unless some threats to validity of the indicator have been identified.

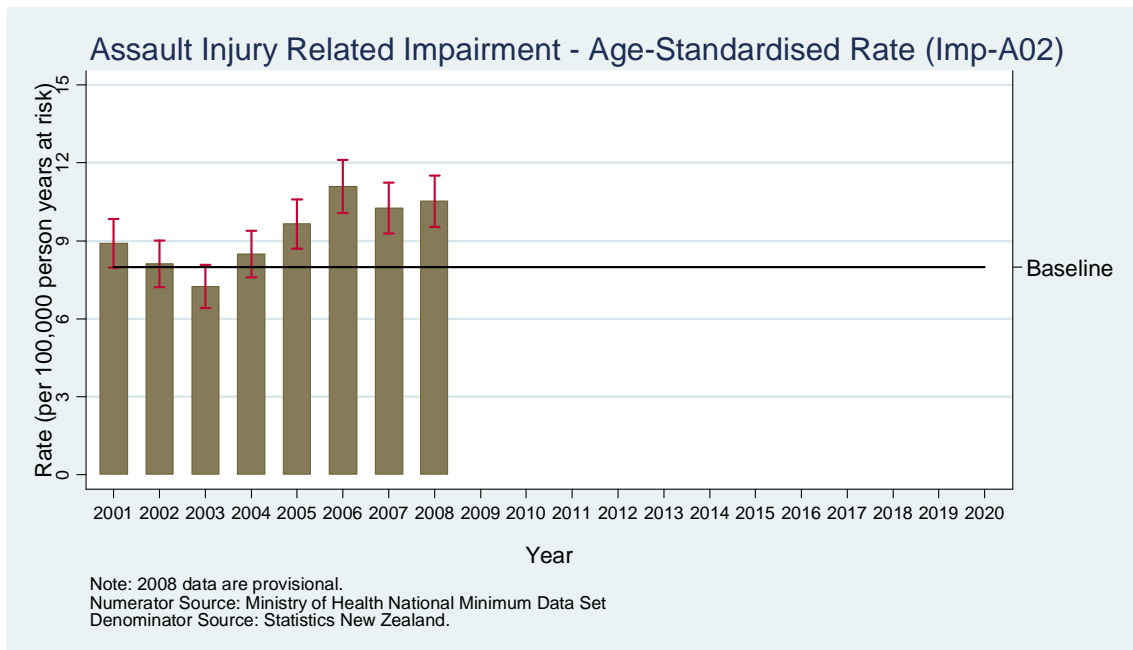
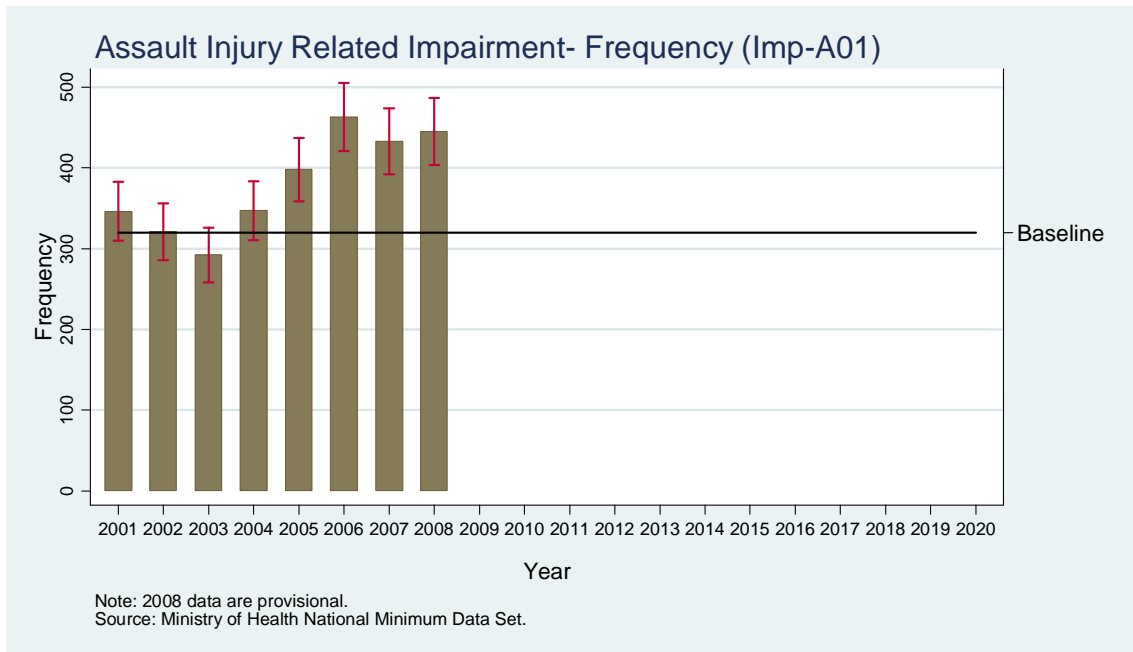
Part 2: The Charts

2.1 All injury



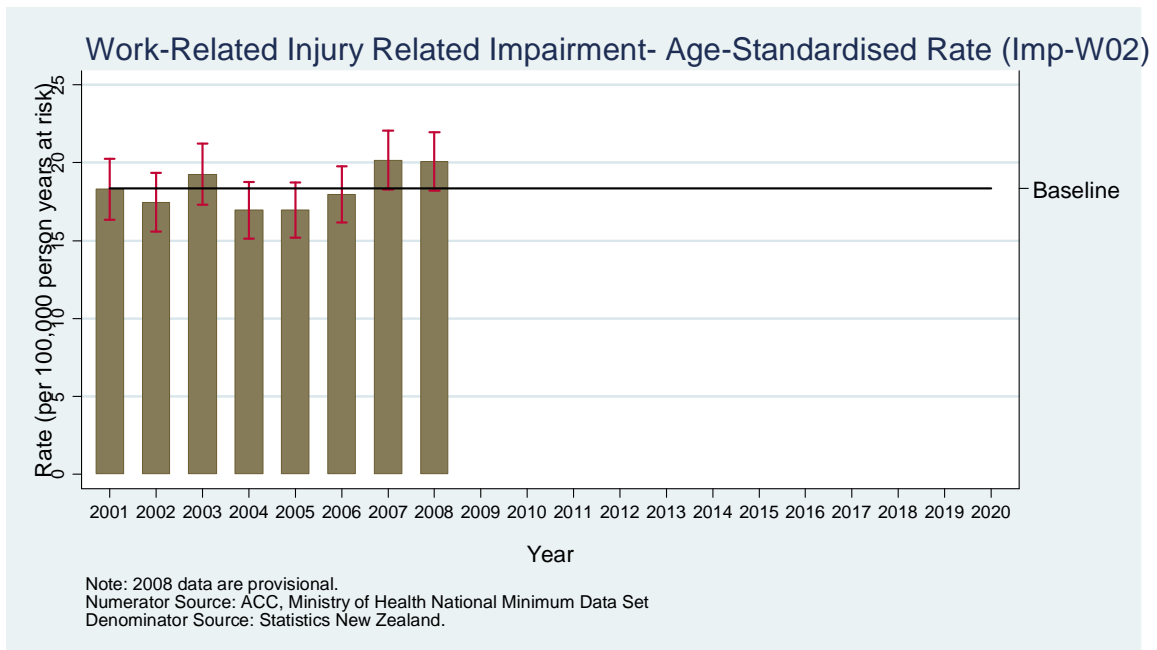
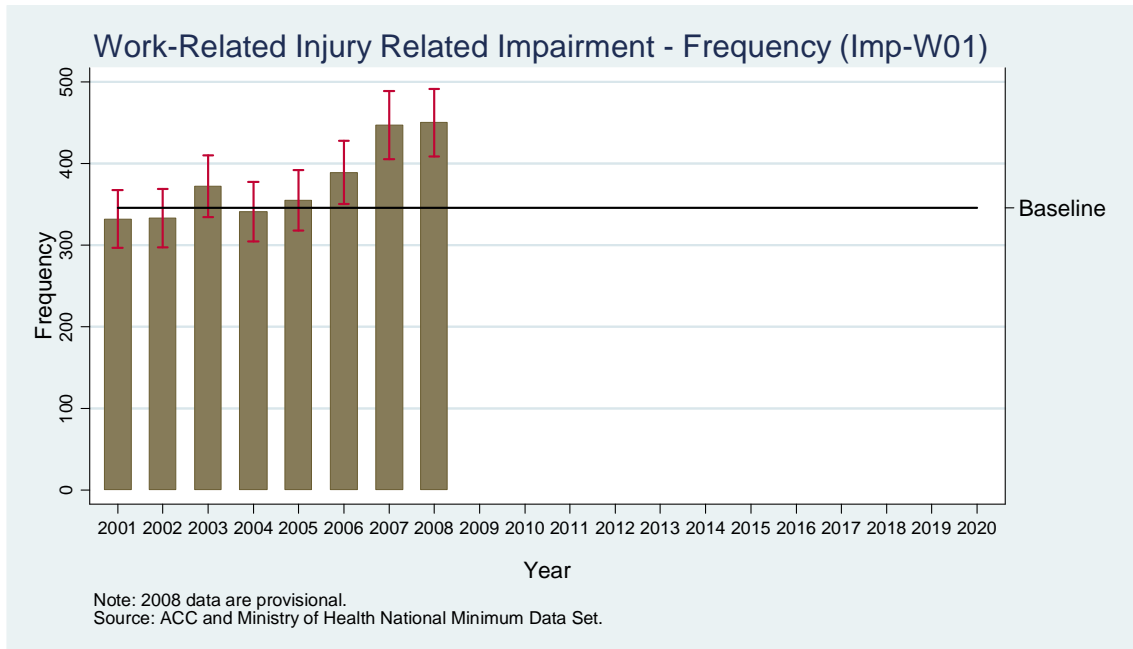
Since 2004, there has been a steady increase in the annual frequencies of injury related impairment. After 2005 the frequencies and rates of injury related impairment have clearly increased from baseline levels.

2.2 Assault



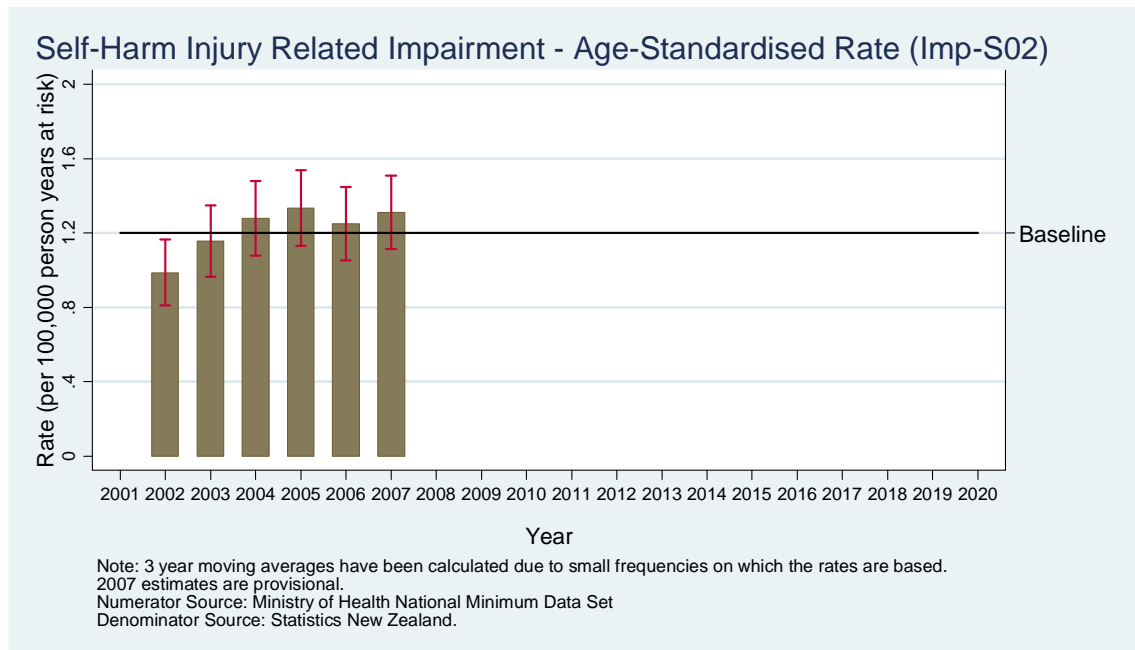
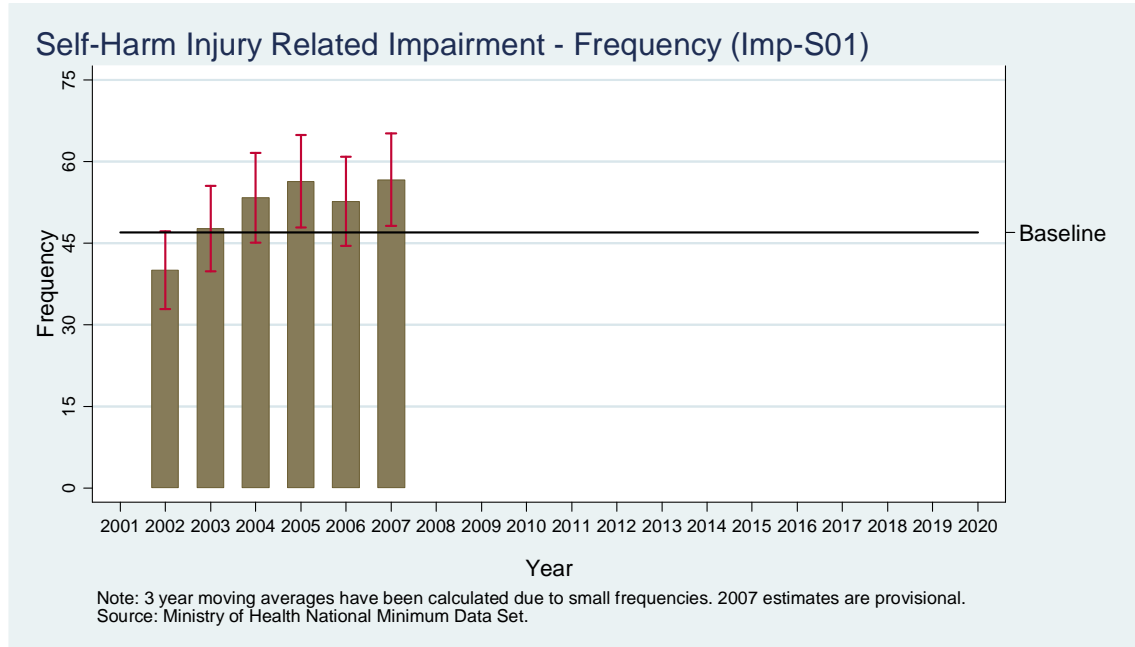
The trends in the frequencies and rates of injury related impairment resulting from assault are variable. However, after 2004 they have clearly been above the baseline. These are, however, provisional indicators and the observed trends could be due to extraneous factors, and care should be taken with interpretation.

2.3 Work related injury



Between 2005 and 2007, the annual frequencies and rates of work related impairment noticeably increased. In 2007 and 2008, the frequencies were above the baseline.

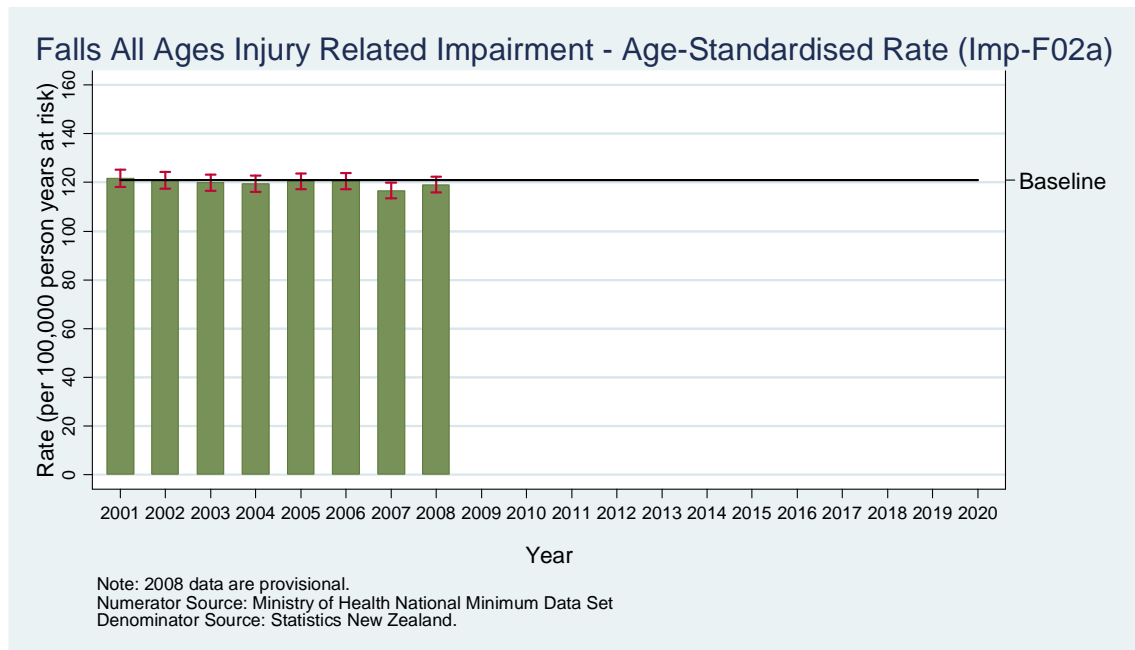
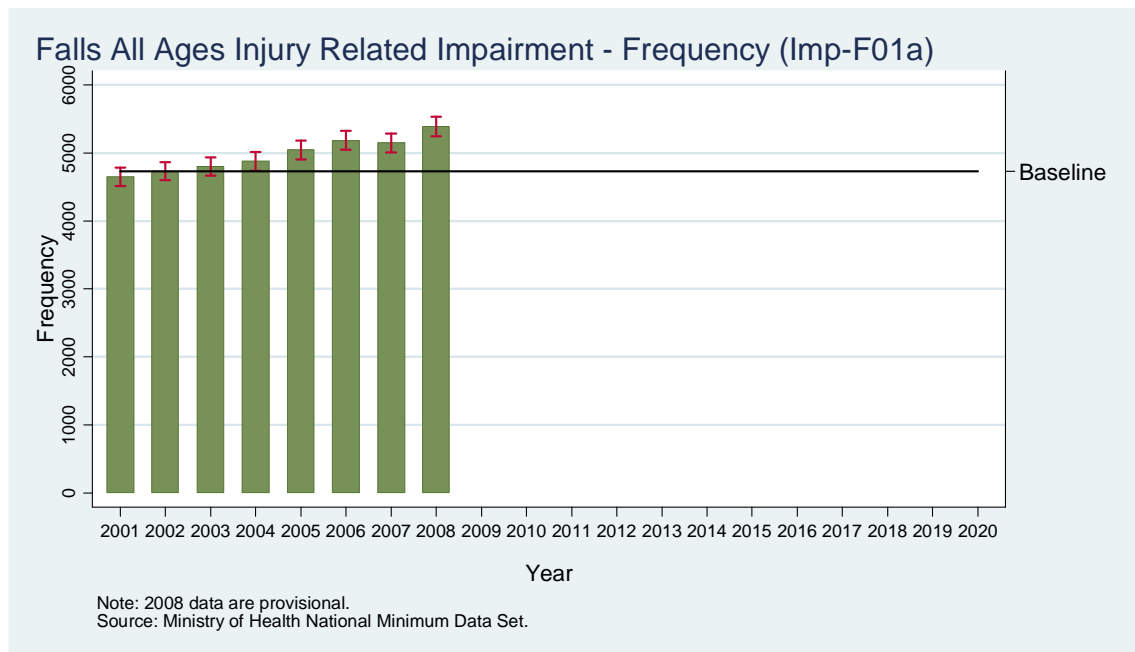
2.4 Intentional self-harm



The annual frequencies (Imp-S01) and rates (Imp-S02) of injury related impairment resulting from self-harm are variable. The frequency estimate for 2007 is above the baseline. There is no clear difference from the baseline in the rate estimate for 2007. Trends over the whole period for these provisional indicators could be influenced by extraneous factors.

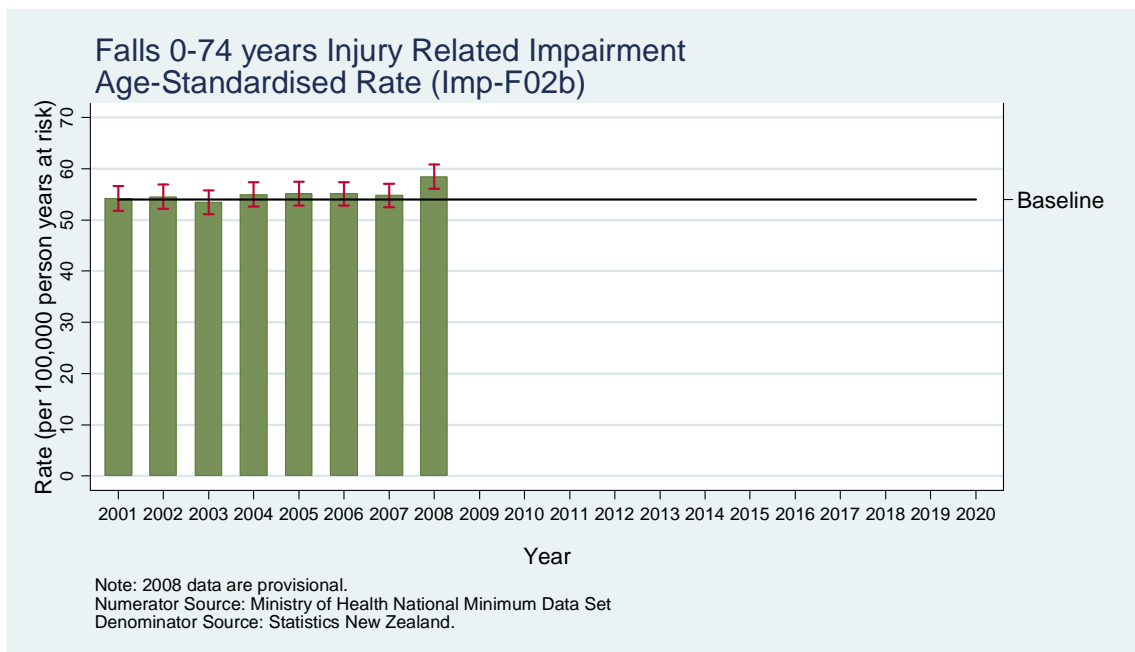
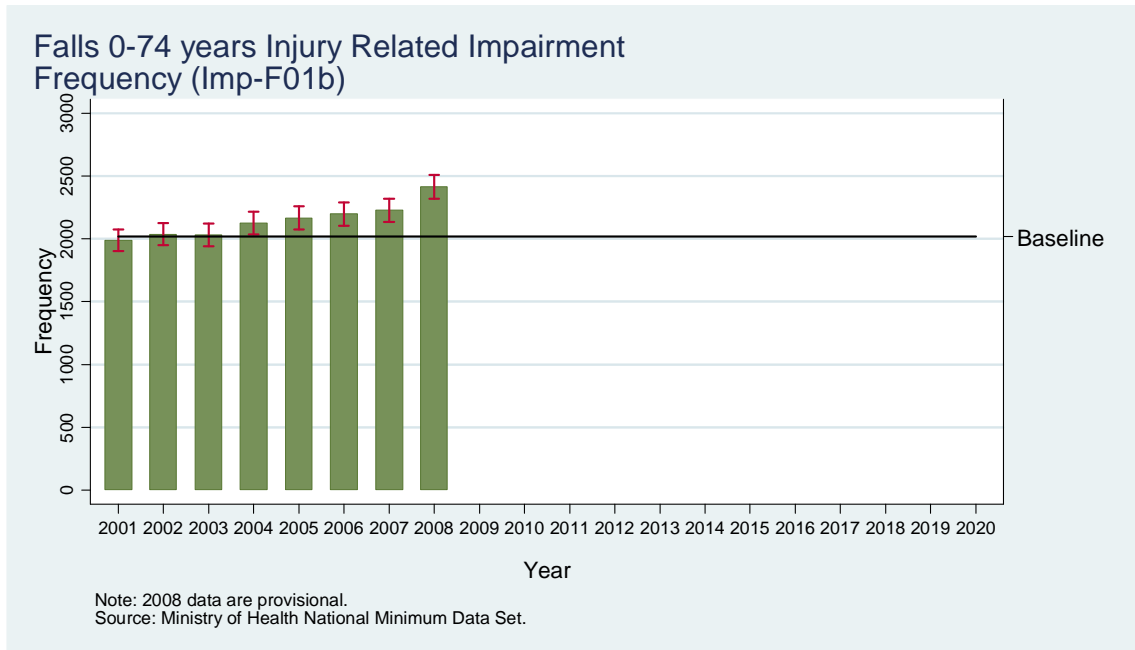
2.5 Falls

All ages



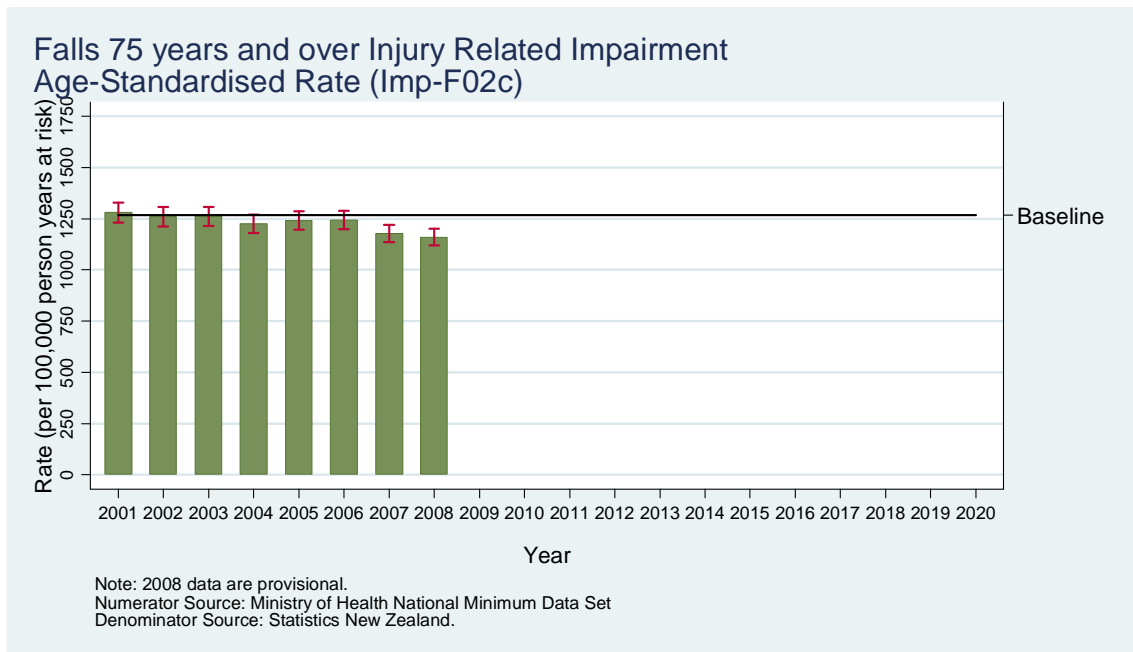
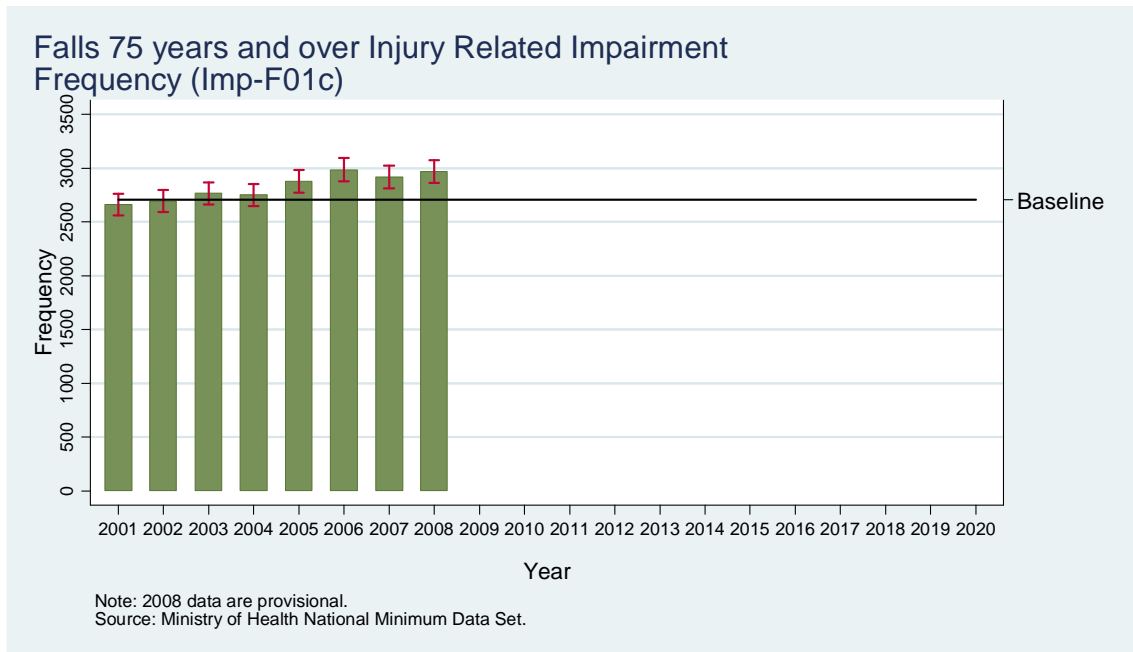
Since 2005, there has been an increase from baseline in the annual frequencies (Imp-F01a) of falls. There is no evidence of an increasing or decreasing trend in the rates of falls (Imp-F02a).

Aged 0-74 years



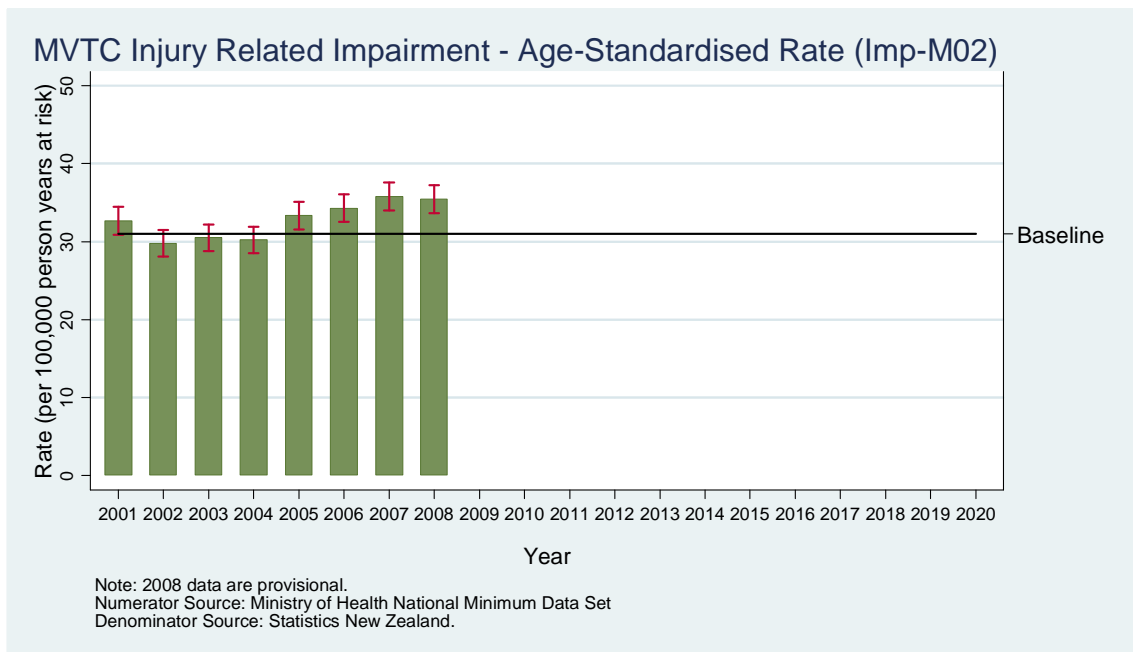
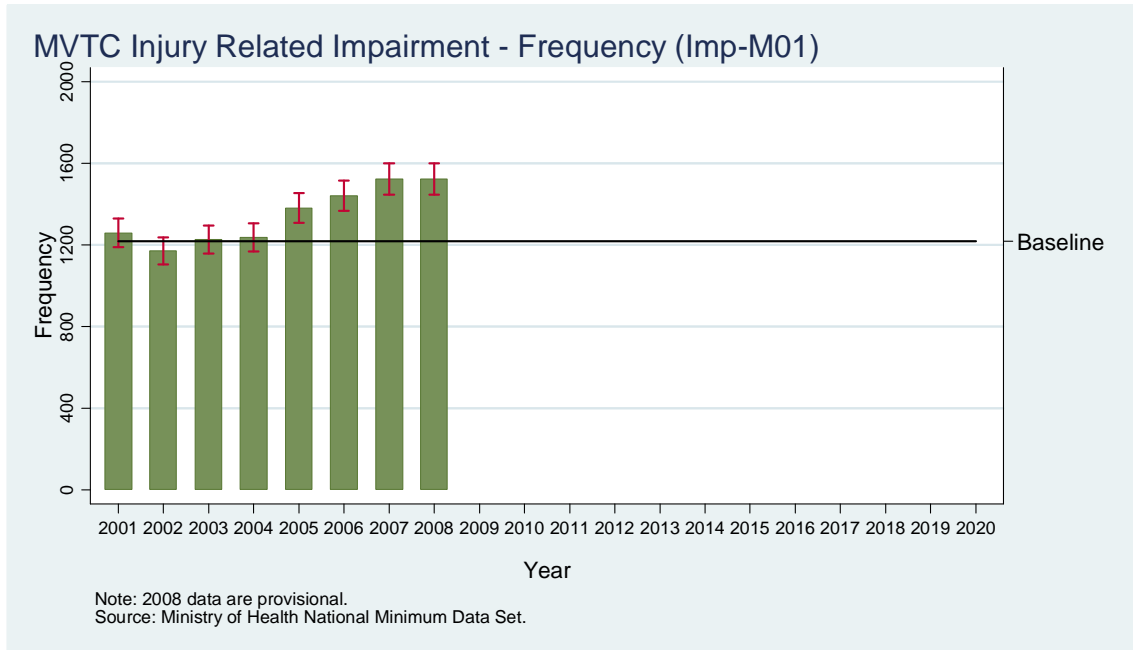
The annual frequencies (Imp-F01b) of injury related impairment resulting from falls has increased from baseline from 2004 onwards for those aged 0-74 years. In 2008, the rate (Imp-F02b) of falls for those aged 0-74 years also increased from baseline.

75 years and over



Since 2004, the annual frequencies of falls (Imp-F01c) for those aged over 75 years has clearly been above the baseline. For 2007 and 2008 there is evidence of a reduction from baseline in the rates of falls injury impairment (Imp-F02c) for those aged over 75 years.

2.6 Motor vehicle traffic crashes (MVTC)



Compared to baseline, there has been a substantial increase in both the annual frequencies (Imp-M01) and the rates (Imp-M02) of MVTC injury related impairment after 2004.

References

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Appendix 1: Tables

Year	Frequency			Age standardised rates		
	Estimate	Lower CI	Upper CI	Estimate	Lower CI	Upper CI
All Injury (Imp-01)						
2001	8653	8471	8835	225	220	230
2002	8705	8522	8888	222	217	226
2003	8751	8568	8934	218	214	223
2004	8995	8809	9181	220	216	225
2005	9421	9231	9611	226	222	231
2006	9757	9563	9951	230	225	234
2007	9990	9794	10186	231	226	235
2008	10134	9937	10331	230	226	235
Baseline = 8703			Baseline = 223			
Assault (Imp-A01)						
2001	346	310	382	9	8	10
2002	321	286	356	8	7	9
2003	292	259	325	7	6	8
2004	347	310	384	8	8	9
2005	398	359	437	10	9	11
2006	463	421	505	11	10	12
2007	433	392	474	10	9	11
2008	445	404	486	11	10	12
Baseline = 320			Baseline = 8			
Work related (Imp-W01)						
2001	332	296	368	18	16	20
2002	333	297	369	17	16	19
2003	372	334	410	19	17	21
2004	341	305	377	17	15	19
2005	355	318	392	17	15	19
2006	389	350	428	18	16	20
2007	447	406	488	20	18	22
2008	450	408	492	20	18	22
Baseline = 346			Baseline = 18			

Year	Frequency			Age standardised rates		
	Estimate	Lower CI	Upper CI	Estimate	Lower CI	Upper CI
	Intentional Self harm (Imp-S01)			Intentional Self harm (Imp-S02)		
2001						
2002	40.0	32.8	47.2	1.0	0.8	1.2
2003	47.7	39.9	55.5	1.2	1.0	1.4
2004	53.3	45.1	61.6	1.3	1.1	1.5
2005	56.3	47.8	64.8	1.3	1.1	1.5
2006	52.7	44.5	60.9	1.3	1.1	1.4
2007	56.7	48.1	65.2	1.3	1.1	1.5
2008						
	Baseline = 47.0			Baseline = 1.2		
	Falls - all ages (Imp-F01a)			Falls - all ages (Imp-F02)		
2001	4650	4516	4784	122	118	125
2002	4732	4597	4867	121	117	124
2003	4798	4662	4934	120	116	123
2004	4876	4739	5013	119	116	123
2005	5044	4905	5183	120	117	124
2006	5184	5043	5325	121	117	124
2007	5147	5006	5288	117	113	120
2008	5385	5241	5529	119	116	122
	Baseline = 4727			Baseline = 121		
	Falls - 0-74 years (Imp-F01b)			Falls - 0-74 years (Imp-F02b)		
2001	1988	1901	2075	54	52	57
2002	2038	1950	2126	55	52	57
2003	2032	1944	2120	53	51	56
2004	2125	2035	2215	55	53	57
2005	2167	2076	2258	55	53	58
2006	2199	2107	2291	55	53	57
2007	2229	2136	2322	55	53	57
2008	2416	2320	2512	58	56	61
	Baseline = 2019			Baseline = 54		

Year	Frequency			Age standardised rates		
	Estimate	Lower CI	Upper CI	Estimate	Lower CI	Upper CI
	Falls - 75+ years (Imp-F01c)			Falls 75+ years (Imp-F02c)		
2001	2662	2561	2763	1280	1232	1328
2002	2694	2592	2796	1260	1213	1307
2003	2766	2663	2869	1262	1215	1308
2004	2751	2648	2854	1225	1180	1271
2005	2877	2772	2982	1242	1197	1287
2006	2985	2878	3092	1244	1200	1289
2007	2918	2812	3024	1178	1136	1220
2008	2969	2862	3076	1160	1119	1202
	Baseline = 2707			Baseline = 1267		
	MVTC (Imp-M01)			MVTC (Imp-M02)		
2001	1259	1189	1329	33	31	34
2002	1171	1104	1238	30	28	32
2003	1227	1158	1296	31	29	32
2004	1236	1167	1305	30	29	32
2005	1381	1308	1454	33	32	35
2006	1441	1367	1515	34	33	36
2007	1524	1447	1601	36	34	38
2008	1523	1447	1599	35	34	37
	Baseline = 1219			Baseline = 31		

Appendix 2: Diagnoses

Table A2: Impairment indicator diagnoses

ICD-10-AM diagnosis code	Description
S0181	Open wound of any part of the head communicating with a fracture, excluding: Malar, maxillary Mandible
S021	Fracture base of skull Fossa: Anterior Middle Posterior Occiput Orbital roof Sinus Ethmoid Frontal Sphenoid Temporal bone (excluding squamous part) Excludes orbital not otherwise specified, orbital floor
S052	Ocular laceration and rupture with prolapse or loss of intraocular tissue
S054	Penetrating wound of orbit with or without foreign body Excludes retained (old) foreign body following penetrating wound of orbit
S055	Penetrating wound of eyeball with foreign body Excludes retained (old) intraocular foreign body
S057	Avulsion of eye Traumatic enucleation
S0623	Multiple intracerebral and cerebellar haematomas 5mLs of blood Multiple intracerebral haemorrhages
S0628	Other diffuse cerebral and cerebellar injury Multiple lacerations of cerebrum and cerebellum
S0631	Focal cerebral contusion <=5 mLs of blood
S0633	Focal cerebral haematoma >5mLs of blood Intracerebral haematoma/haemorrhage
S064	Epidural haemorrhage Epidural [extradural] haematoma Extradural haemorrhage
S065	Traumatic subdural haemorrhage Subdural haematoma
S066	Traumatic subarachnoid haemorrhage Subarachnoid haematoma
S068	Other intracranial injuries Traumatic haemorrhage/haematoma/contusion: Brain NOS Intracranial NOS

S080	Avulsion of scalp
S1101	Open wound of larynx
S1181	Open wound of any part of the neck communicating with a fracture
S120	Fracture of first cervical vertebra Atlas
S121	Fracture of second cervical vertebra Axis
S1222	Fracture of fourth cervical vertebra
S1223	Fracture of fifth cervical vertebra
S1224	Fracture of sixth cervical vertebra
S127	Multiple fractures of cervical spine Excludes multiple fractures of specified levels of cervical vertebrae.
S1313	Dislocation of C3/C4 cervical vertebrae
S1315	Dislocation of C5/C6 cervical vertebrae
S140	Concussion and oedema of cervical spinal cord
S1410	Injuries of cervical spinal cord, unspecified
S1411	Complete lesion of cervical spinal cord
S1412	Central cord syndrome (incomplete cord injury) of cervical spinal cord
S1413	Other incomplete cord syndrome of cervical spinal cord Anterior cord syndrome Incomplete cervical spinal cord lesion NOS Posterior cord syndrome
S143	Injury of brachial plexus
S2181	Open wound of any part of the thorax communicating with a fracture, excluding: Fracture of thoracic vertebrae – T11 and T12 level
S221	Multiple fractures of thoracic spine Excludes multiple fractures of specified levels of thoracic vertebrae.
S2244	Multiple rib fractures, involving four or more ribs Excludes multiple rib fractures involving first rib.
S225	Flail chest
S2410	Injury of thoracic spinal cord, unspecified
S2411	Complete lesion of thoracic spinal cord
S2412	Incomplete cord syndrome of thoracic spinal cord Anterior cord syndrome Central cord syndrome Incomplete thoracic spinal cord lesion NOS Posterior cord syndrome
S2471	Functional spinal cord injury, T1 level
S2474	Functional spinal cord injury, T6/T7 level
S2477	Functional spinal cord injury, T12 level
S250	Injury of thoracic aorta Aorta NOS
S271	Traumatic haemothorax
S272	Traumatic haemopneumothorax
S321	Fracture of sacrum
S323	Fracture of ilium
S324	Fracture of acetabulum

S3283	Fracture of pelvis, part unspecified Fracture of pelvis NOS
S341	Other injury of lumbar spinal cord (conus medullaris) Complete/incomplete lumbar cord lesion
S343	Injury of cauda equina
S3472	Functional spinal cord injury, L2 level
S355	Injury of iliac blood vessels Iliac artery or vein
S3600	Injury of spleen, unspecified
S3604	Massive parenchymal disruption of spleen Rupture of spleen
S3615	Major laceration of liver Laceration with significant disruption of hepatic parenchyma [i.e. 10cm long and 3cm deep] Multiple moderate lacerations, with or without haematoma
S3640	Injury of small intestine, unspecified site
S3649	Injury of other and multiple parts of small intestine Injury to ileum Injury to jejunum
S3682	Injury of mesentery
S3683	Injury of retroperitoneum
S3728	Other injury of bladder Laceration of bladder
S396	Injury of intra-abdominal organ(s) with pelvic organ(s)
S4181	Open wound of any part of the shoulder and upper arm communicating with a fracture
S447	Injury of multiple nerves at shoulder and upper arm level
S450	Injury of axillary artery
S451	Injury of brachial artery
S5181	Open wound of any part of the forearm communicating with a fracture
S551	Injury of radial artery at forearm level
S581	Traumatic amputation at level between elbow and wrist
S650	Injury of ulnar artery at wrist and hand level
S661	Injury of flexor muscle and tendon of other finger at wrist and hand level
S680	Traumatic amputation of thumb (complete)(partial)
S682	Traumatic amputation of 2 or more fingers (complete)(partial)
S683	Combined traumatic amputation of (part of) finger(s) with other parts of wrist and hand
S684	Traumatic amputation of hand at wrist level
S688	Traumatic amputation of other parts of wrist and hand
S7181	Open wound of any part of the hip and thigh communicating with a fracture
S7200	Fracture of neck of femur, part unspecified
S7203	Fracture of subcapital section of femur
S7205	Fracture of base of neck of femur Cervicotrochanteric section
S7211	Fracture of intertrochanteric section of femur
S722	Subtrochanteric fracture
S723	Fracture of shaft of femur

S7240	Fracture of lower end of femur, part unspecified
S7241	Fracture of femoral condyle
S7243	Supracondylar fracture of femur
S727	Multiple fractures of femur
S781	Traumatic amputation at level between hip and knee
S789	Traumatic amputation of hip and thigh, level unspecified
S8181	Open wound of any part of the lower leg communicating with a fracture
S8281	Bimalleolar fracture, ankle
S8282	Trimalleolar fracture, ankle
S851	Injury of (anterior)(posterior) tibial artery
S881	Traumatic amputation at level between knee and ankle
S9181	Open wound of any part of the ankle or foot communicating with a fracture
T203	Full thickness burn of head and neck
T212	Partial thickness burn of trunk (>10%)
T213	Full thickness burn of trunk
T233	Full thickness burn of hand (>10%)
T243	Full thickness burn of hip and lower limb, except ankle and foot (>30%)
T253	Full thickness burn of ankle and foot (>10%)
T292	Burns of multiple regions, no more than partial thickness burns mentioned (>10%)
T293	Burns of multiple regions, at least one burn of full thickness mentioned (>10%)

Appendix 3: Indicator Specifications

ID: IMP-01

Name Serious threat of impairment all injury frequency

Concept of Interest Societal burden of serious threat of impairment injury.

Scope

Area All Injury

Gender Both genders

Age All ages

Source Organisation Developed by IPRU for NZIPS.

Numerator

Description Cases hospitalised for injury in a calendar year, who were discharged alive with a primary diagnosis code shown in Table A2.

Details Hospitalisations have been operationally defined as all publicly funded discharges from hospitals in the relevant year. Injury hospitalisations are those hospitalisations with a principal diagnosis in the range S00-T78 and a first external cause code in the range V01-Y36, where diagnoses and external cause code are coded using the ICD-10-AM classification [7]. Readmissions for subsequent treatment and deaths in hospital have been excluded using the methods described in Langley et al. [8] Serious threat of impairment injury have a principal diagnosis that is included in the list shown in Table A2.

Source NZHIS NMDS

Variations

Assault (Imp-A01): As with Imp-01, but with cases restricted to first external cause code in the range X85-Y09.

Work related (Imp-W01): As with Imp-01, but with cases restricted to those hospitalisations with an associated work-related ACC claim. Work-related ACC claims are those made to the Self-Employed Work and Employers' ACC accounts. Additional cases were also identified from the Residual fund through the ACC 'At work' indicator. Gradual process claims were excluded (i.e. where the case was identified by ACC as a 'gradual process', was coded to an explicit occupational disease code, or if the 'read_id_label' includes one of the following words: 'neoplasm', 'anomalies', 'anomaly', 'asbestos', 'asbestosis', 'mesothelioma', 'lymphoma', 'tumour', 'asthma', 'alveolitis', 'carcinoma', 'stoma appliances', 'leptospirosis', 'personal history of unspecified problems').

Self-harm (Imp-S01): As with Imp-01, but with cases restricted to first external cause code in the range X60-X84.

Falls (Imp-F01): As with Imp-01, but with cases restricted to first external cause code in the range V01-Y36.

Motor Vehicle Traffic Crash (Imp-M01): As with Imp-01, but with cases restricted to first external cause code in the range V02-V04 (with a 4th digit in the range .1-.9), V09 (.2), V12-V14 (.3-.9), V19 (.4-.6), V20-V28 (.3-.9), V29-V79 (.4-.9), V80 (.3-.5), V81-V82 (.1), V83-V86 (.0-.3), V87 (.0-.8) or V89 (.2).

Denominator N/A

Calculation N/A

ID: IMP-02

Name Serious threat of impairment all injury rate.

Concept of Interest Individual's annual average risk of serious threat of impairment injury.

Scope

Area All Injury

Gender Both genders

Age All ages

Source Organisation Developed by IPRU for NZIPS.

Numerator

Description Cases hospitalised for injury in a calendar year, who were discharged alive with a primary diagnosis code shown in Table A2.

Details Hospitalisations have been operationally defined as all publicly funded discharges from hospitals in the relevant year. Injury hospitalisations are those hospitalisations with a principal diagnosis in the range S00-T78 and a first external cause code in the range V01-Y36, where diagnoses and external cause code are coded using the ICD-10-AM classification [7].

Readmissions for subsequent treatment and deaths in hospital have been excluded using the methods described in Langley et al. [8]. Serious threat of impairment injury have a principal diagnosis that is included in the list shown in Table A2.

Source NZHIS NMDS

Variations

Assault (Imp-A01): As with Imp-01, but with cases restricted to first external cause code in the range X85-Y09.

Work related (Imp-W01): As with Imp-01, but with cases restricted to those hospitalisations with an associated work-related ACC claim. Work-related ACC claims are those made to the Self-Employed Work and Employers' ACC accounts. Additional cases were also identified from the Residual fund through the ACC 'At work' indicator. Gradual process claims were excluded (i.e. where the case was identified by ACC as a 'gradual process', was coded to an explicit occupational disease code, or if the 'read_id_label' includes one of the following words: 'neoplasm', 'anomalies', 'anomaly', 'asbestos', 'asbestosis', 'mesothelioma', 'lymphoma', 'tumour', 'asthma', 'alveolitis', 'carcinoma', 'stoma appliances', 'leptospirosis', 'personal history of unspecified problems').

Self-harm (Imp-S01): As with Imp-01, but with cases restricted to first external cause code in the range X60-X84.

Falls (Imp-F01): As with Imp-01, but with cases restricted to first external cause code in the range V01-Y36.

Motor Vehicle Traffic Crash (Imp-M01): As with Imp-01, but with cases restricted to first external cause code in the range V02-V04 (with a 4th digit in the range .1-.9), V09 (.2), V12-V14 (.3-.9), V19 (.4-.6), V20-V28 (.3-.9), V29-V79 (.4-.9), V80 (.3-.5), V81-V82 (.1), V83-V86 (.0-.3), V87 (.0-.8) or V89 (.2).

Denominator

Description Estimated total New Zealand population as at 30 June of the relevant year.

Details The estimates used have been published by Statistics New Zealand. They are based on New Zealand Censuses and post-enumeration surveys adjusted for the estimated number of New Zealand residents overseas on census night, estimated natural increase in population and estimated net long term and permanent migration. (<http://www.stats.govt.nz/tables/nat-popest-tables.htm>).

Source Statistics New Zealand

Calculation Age standardised rate. Age standardisation was via the direct method with age groups of 0-4, 5-9, 10-14, ... 80-84, and 85 and above. The standard population was the estimated New Zealand population as at 30 June 2003. For details of the process of direct standardisation see, for example, Armitage and Berry (1987), *Statistical Methods in Medical Research*, 2nd ed., pp 399-403.