

A chartbook of the New Zealand Injury Prevention Strategy serious injury outcome indicators, 1994-2005

Produced by

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Foreword

Presented here is a chartbook of the New Zealand Injury Prevention Strategy serious injury outcome indicators. This is an update of the chartbook that was published in January 2006. The development of these outcome indicators was described in the report:

Cryer C, Langley J, Stephenson S. Developing valid injury indicators. A report for the New Zealand Injury Prevention Strategy. Injury Prevention Research Unit Occasional Report OR 049, Dunedin: University of Otago, September 2004. (<http://www.nzips.govt.nz/documents/serious-injury-indicators-2004-09.pdf>)

The main body of the report is purposely short on words and long on charts. Our 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 and commentary. This is provided in the 3 appendices.

Abbreviations

ACC	Accident Compensation Corporation
Cryer 2004 report	Cryer C, Langley J, Stephenson S. Developing valid injury indicators. A report for the New Zealand Injury Prevention Strategy. Injury Prevention Research Unit Occasional Report (OR 049), Dunedin: University of Otago, September 2004.
ICD	WHO International Classification of Diseases
ICD-9	WHO International Classification of Diseases 9 th revision
ICD-9-CM	WHO International Classification of Diseases 9 th revision, Clinical Modification
ICD-10	WHO International Classification of Diseases 10 th revision
ICD-10-AM	WHO International Classification of Diseases 10 th revision, Australian Modification
ICISS	ICD-based Injury Severity Score
IPRU	Injury Prevention Research Unit, University of Otago, New Zealand
LTNZ	Land Transport New Zealand
MVTC	Motor vehicle traffic crashes
NMDS	NZHIS National Minimum Data Set of hospital discharges
NZHIS	New Zealand Health Information Service
NZIPS	New Zealand Injury Prevention Strategy
SNZ	Statistics New Zealand
SRR	Survival Risk Ratio
TCR	Police Traffic Crash Report
WHO	World Health Organisation
WRFIS	Work-Related Fatal Injury Study
WSNZ	Water Safety New Zealand

Summary of the charts

Below is a summary of the indicator trends contained within this chartbook.

Highlighted in:

- Green - are the NZIPS serious (fatal and non-fatal) injury outcome indicators.
- Brown – are the provisional serious injury outcome indicators

Indicator Code	Description	Interpretation of the indicator trends - from 2000 onwards
All injury		
I01	Frequency of serious non-fatal injuries.	Increase.
I02	Age-standardised serious non-fatal injury rate, per 100,000 person-years at risk.	Little apparent change.
I11	Frequency of injury deaths.	Increase
I12	Age-standardised injury mortality rate, per 100,000 person-years at risk.	Suggestion of an increase.
I21	Frequency of serious (fatal + non-fatal) injuries.	Increase
I22	Age-standardised serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk.	Little apparent change.

Indicator Code	Description	Interpretation of the indicator trends - from 2000 onwards
Assault		
A01	Frequency of assaultive serious non-fatal injuries.	Evidence of an increase – could be an artifact of extraneous factors, eg. reporting behaviour.
A02	Age-standardised assaultive serious non-fatal injury rate, per 100,000 person-years at risk.	Evidence of an increase – could be an artifact of extraneous factors, eg. reporting behaviour.
A11	Frequency of assaultive-related injury deaths.	Too early to say.
A12	Age-standardised assaultive injury mortality rate, per 100,000 person-years at risk.	Too early to say.
A21	Frequency of assaultive serious (fatal + non-fatal) injuries.	No clear trend.
A22	Age-standardised assaultive serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk.	No clear trend.

Indicator Code	Description	Interpretation of the trends - from 2000 onwards
<i>Work-related injury</i>		
W01	Frequency of work-related serious non-fatal injuries.	Suggestion of an increase.
W02	Age-standardised work-related serious non-fatal injury rate, per 100,000 workers.	No change.
W11	Frequency of work-related injury deaths – NZHIS data based.	Only available for the 2003 NZHIS Mortality Collection.
W12	Frequency of work-related injury deaths – ACC data based.	No evidence of a change from 2002 to 2004.
W13	Age-standardised work-related injury mortality rate, per 100,000 workers – NZHIS data based.	Only available from the 2003 NZHIS Mortality Collection.
W14	Age-standardised work-related injury mortality rate, per 100,000 workers – ACC data based.	No evidence of a change from 2002 to 2004.
W21	Frequency of work-related serious non-fatal injuries.	No evidence of a change from 2001 to 2005.
W22	Age-standardised work-related serious non-fatal injury rate, per 100,000 workers.	No evidence of a change from 2001 to 2005.

Indicator Code	Description	Interpretation of the indicator trends - from 2000 onwards
<i>Intentional self-harm</i>		
S01	Frequency of intentional self-harm serious non-fatal injuries.	Little evidence of a change - could be an artifact of extraneous factors, eg. reporting behaviour.
S02	Age-standardised intentional self-harm serious non-fatal injury rate, per 100,000 person-years at risk.	Little evidence of a change - could be an artifact of extraneous factors, eg. reporting behaviour.
S11	Frequency of intentional self-harm injury deaths.	No evidence of a change.
S12	Age-standardised intentional self-harm injury mortality rate, per 100,000 person-years at risk.	No evidence of a change.
S21	Frequency of intentional self-harm serious non-fatal injuries.	No evidence of a change - could be an artifact of extraneous factors, eg. reporting behaviour.
S22	Age-standardised intentional self-harm serious non-fatal injury rate, per 100,000 person-years at risk.	No evidence of a change - could be an artifact of extraneous factors, eg. reporting behaviour.

Indicator Code	Description	Interpretation of the trends - from 2000 onwards
Falls		
F01a	Frequency of fall-related serious non-fatal injuries – all ages.	Increase.
F02a	Age-standardised fall-related serious non-fatal injury rate, per 100,000 person-years at risk – all ages.	No evidence of a change.
F11a	Frequency of fall-related injury deaths – all ages.	Increase.
F12a	Age-standardised fall-related injury mortality rate per 100,000 person-years at risk – all ages	Increase.
F21a	Frequency of fall-related serious (fatal + non-fatal) injuries – all ages.	Increase.
F22a	Age-standardised fall-related serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk – all ages.	No evidence of a change.
F01b	Frequency of fall-related serious non-fatal injuries – age 0-74.	Increase.
F02b	Age-standardised fall-related serious non-fatal injury rate, per 100,000 person-years at risk – age 0-74.	No evidence of a change.
F11b	Frequency of fall-related injury deaths – age 0-74.	Too early to say.
F12b	Age-standardised fall-related injury mortality rate per 100,000 person-years at risk – age 0-74.	Too early to say.
F21b	Frequency of fall-related serious (fatal + non-fatal) injuries – age 0-74.	Frequencies suggest an increase.
F22b	Age-standardised fall-related serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk – age 0-74.	No evidence of a change.

F01c	Frequency of fall-related serious non-fatal injuries – age 75 and over.	Increase.
F02c	Age-standardised fall-related serious non-fatal injury rate, per 100,000 person-years at risk – age 75 and over.	Suggestion of a slight decline.
F11c	Frequency of fall-related injury deaths – age 75 and over.	Increase.
F12c	Age-standardised fall-related injury mortality rate per 100,000 person-years at risk – age 75 and over.	Increase.
F21c	Frequency of fall-related serious (fatal + non-fatal) injuries – age 75 and over.	Suggestion of an increase.
F22c	Age-standardised fall-related serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk – age 75 and over.	No evidence of a change.

Indicator Code	Description	Interpretation of the trends - from 2000 onwards
Motor vehicle traffic crashes		
M01	Frequency of MVTC-related serious non-fatal injuries.	Little apparent change to 2004, with an increase in 2005.
M02	Age-standardised MVTC-related serious non-fatal injury rate, per 100,000 person-years at risk.	Variable from 2000 to 2005.
M11	Frequency of MVTC-related injury deaths.	Little apparent change.
M12	Age-standardised MVTC-related injury mortality rate, per 100,000 person-years at risk.	Little apparent change.
M13	MVTC-related injury mortality rate, per billion vehicle-kilometres.	Little apparent change.
M14	MVTC-related injury mortality rate, per 10,000 registered vehicles.	Little apparent change.
M21	Frequency of MVTC-related serious (fatal + non-fatal) injuries.	Variable from 2000 to 2003.
M22	Age-standardised MVTC-related serious (fatal + non-fatal) injury rate, per 100,000 person-years at risk.	Variable from 2000 to 2003.
M15	Frequency of MVTC-related injury deaths – TCR data based.	Decrease from baseline.
M16	MVTC-related injury mortality rate, per 100,000 person-years at risk – TCR data based.	Decrease from baseline.
M17	MVTC-related injury mortality rate, per billion vehicle-kilometres – TCR data based.	Decrease from baseline.
M18	MVTC-related injury mortality rate, per 100,000 registered vehicles – TCR data based.	Decrease from baseline.

Indicator Code	Description	Interpretation of the indicator trends - from 2000 onwards
<i>Drowning</i>		
D11	Frequency of drowning.	No evidence of a change.
D12	Age-standardised drowning rate, per 100,000 person-years at risk.	No evidence of a change.
D13	Frequency of drowning.	Decrease from baseline.
D14	Age-standardised drowning rate, per 100,000 person-years at risk.	Decrease from baseline.

Part 1: Background and Methods

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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. Those priority areas are:

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

Serious injury outcome indicators (fatal and non-fatal) have been developed for these areas as one of the means of measuring performance in reducing injury. The purpose of this chartbook is to present trends over the period 1994 to 2005 for each of the NZIPS serious injury indicators, for each of these priority areas, in order to judge progress in the prevention of serious injury during the lifetime of the NZIPS.

1.2 What is a serious injury?

Internationally, the most commonly accepted operational definition of injury are those pathologies in the "Injury" chapter of the WHO's International Classification of Disease codes (ICD-codes). ICD codes are used by the New Zealand Health Information Service (NZHIS) to code mortality and hospitalisation data.¹ For hospitalisations, the operational definition of injury, for the serious injury indicators developed for the NZIPS, is given by the following ICD-10 code ranges: for a case to be included it had to have a principal diagnosis code in the range S00-T78, and a first external cause code in the range V01-Y36. For deaths, a case was selected where the underlying cause of death is an external cause code in the range V01-Y36. For the years where ICD-9 was used, close equivalent codes were used to define a case of injury.

There is some dispute in the international community as to which codes within the ICD injury chapter are in fact injuries. This is discussed in Appendix A.

Injuries were regarded as serious if they resulted in death, or resulted in admission to hospital and were associated with at least a 6% threat-to-life (ie. chance of death). Amongst first discharges from hospital with a primary diagnosis of injury, approximately 15% of these exceed this threat-to-life severity threshold. The methods by which such cases of serious injury are identified for the indicators in this chartbook are described briefly in section 1.5, and more fully in Appendix B.

Injuries which result in long term disability and substantial cost should also be regarded as serious. Regrettably, at present the methodologies for deriving valid indicators based on these dimensions have not been developed.

1.3 The indicators

The development of the NZIPS indicators is described in the Cryer 2004 report.² For 'all injury' and for each of the six priority areas, the authors used the following approach to identify candidate indicators:

- they identified existing national indicators through a named contact within the lead agency for the NZIPS priority area
- they suggested new fatal and non-fatal injury indicators for 'all injury' and then sought similar indicators for each of the priority areas.
- they subjected all of the candidate indicators to a systematic assessment of validity, using the ICE criteria³
- based on the results of that validation, they identified proposed and / or provisional indicators for each priority area.

A fundamental part of the development of these indicators was consultation. Consultation was with the NZIPS project team, NZIPS advisory groups, and with selected representatives from within New Zealand, as well as with the international research community. Furthermore the draft of the Cryer 2004 report was subject to formal international peer review.

They used the ICE criteria to validate the candidate indicators. A set of criteria for validating injury indicators were agreed at a meeting of the International Collaborative Effort on Injury Statistics (ICE) in 2001. The criteria suggest that an ideal indicator should:³

- Have a case definition based on diagnosis – on anatomical or physiological damage
- Focus on serious injury
- Have, as far as possible, unbiased case ascertainment
- Be derived from data that are representative of the target population
- Be based on existing data systems (or it should be practical to develop new data systems)
- Be fully specified.

These criteria were developed solely in the context of indicators of injury incidence and, within that, on the characteristics of the incident cases. The less criteria that are satisfied, the more likely it is that the indicator will exhibit some threats to validity.

In this work, each of the above criteria was used to assess the validity of existing and the newly proposed injury outcome indicators. This was achieved by each of the principal authors of the original report^a independently assessing the candidate indicators against these criteria. Those assessments were reconciled and found to be consistent.

Since the 2001 ICE meeting, other important characteristics of indicators, and the data on which they are based, have been suggested, namely:²

- Completeness and accuracy of source data
- Timeliness
- Ability to measure change over time
- Measurement that is practicable
- Readily comprehensible

Although these additional criteria were not considered systematically in the development of the NZIPS indicators, they were taken into account when assessing the existing and new indicators for the Cryer 2004 report.

The validated NZIPS serious injury indicators for 'all injury' are as follows:

- Frequency of injury deaths
- Age-standardised injury mortality rate, per 100,000 person-years at risk
- Frequency of serious non-fatal injuries
- Age-standardised serious non-fatal injury incidence rate, per 100,000 person-years at risk

These indicators are based on the New Zealand Health Information Service (NZHIS) Mortality data and National Minimum Dataset (NMDS - of hospital inpatient data). Frequencies reflect the societal burden of injury^b, while rates reflect individual risk.

The NZIPS serious injury indicators for most of the priority areas are based on those for 'all injury'. Where valid indicators could not be identified, provisional indicators were developed (see Cryer 2004 report).² This chartbook presents both the NZIPS serious injury indicators and the provisional serious injury indicators.

The NZIPS fatal and serious non-fatal injury indicators have been accepted by the government as outcome indicators to monitor the impact of the New Zealand Injury Prevention Strategy. The provisional serious injury indicators were candidate NZIPS indicators, but which had some identifiable threats to validity.

^a Colin Cryer, John Langley and Shaun Stephenson, Injury Prevention Research Unit, University of Otago, New Zealand.

^b 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. [4,5].

These indicators will be used to examine trends over time - as they are in this chartbook. The high threshold used to define serious injury, described above, was chosen for the non-fatal injury indicators to reduce the likelihood of producing misleading time trends. For discussion and illustration of this point, see the Cryer 2004 report.²

The scope and definitions that were used in the development of the NZIPS serious injury indicators for each of these areas are presented in Appendix A. This includes a description of the operational definition of injury and the scope of each of the priority areas. This operational definition excludes medical injuries, pathologies resulting from chronic exposures over time, and the consequences of injury (ie. only the admissions to hospital immediately following the injury event are counted, not subsequent episodes of treatment and care).

The detailed methods used to produce the charts in this chartbook are described in Appendix B, and the indicator specifications are presented in Appendix C. These methods and specifications are the same as those presented in the Cryer 2004 report.²

1.4 What the chartbook comprises

The remainder of the chartbook presents the charts for the NZIPS serious injury indicators - and the provisional serious injury indicators - for 'all injury' and for the six priority areas, with baselines. These charts speak largely for themselves, and so only a brief commentary is provided for each.

Wherever possible, the period presented in each chart is 1994 to 2005. With some exceptions, the indicators are derived from the NZHIS Mortality and NMDS databases. The coding system used for classifying injury diagnosis and external cause of injury in both of these data sources is the World Health Organisation (WHO) International Classification of Diseases (ICD). During the period considered in these charts, the ICD was substantially revised. (See Appendix B7.1 for a description of those changes.) Readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change. That is, it is apparent that, for some of the charts, the years before 1999 cannot be compared with the years after 1999. Accordingly, the commentary will focus mainly on the trends since the implementation of the Australian Modification of the newest revision, ICD 10th revision (ICD-10-AM) for coding diagnosis and external cause of injury in the NZHIS Mortality Collection and the NMDS, ie. from the year 2000 onwards.

Some readers may ask: why include the years before 2000 in the charts, given that our interpretation of the trends in the NZIPS serious injury outcome indicators will only include the years from 2000 onwards? For some of the priority areas, the effect of the changeover is discernable, in others it is not. Since the effects vary for each priority area, we have elected to present the whole of the period from 1994 onwards and let the reader make their own judgments about trends in the period before 2000, and their relevance to the trends from 2000 onwards.

The colours used in the charts have been chosen in order to signal the different status of the indicators, as well as the information used to generate the bars in the charts. The colours distinguish the NZIPS serious injury indicators from the provisional serious injury indicators. The change from ICD-9 to ICD-10 took place on 1 January 2000 for NZHIS Mortality data, and predominantly during 1999 for the NZHIS NMDS data^c. Colours have also been used to designate these changes. So the colour coding is as follows:

Green:	NZIPS serious injury indicator (ICD10-based)
Blue:	NZIPS serious injury indicator back translated to ICD-9.
Brown:	Provisional serious injury indicator
Light brown:	Provisional serious injury indicator, modified to take account of a previous coding change

An intermediate colour was used for the bars for 1999 for indicators based on hospitalisation data, since 1999 was a transitional year when both ICD-9 and ICD-10 coding systems were used.

Some of the fatal injury indicators are presented as 3-year moving averages. This means, for example, that data from 1994, 1995 and 1996 are used to estimate an indicator value for 1995. Consequently, when using 3-year moving averages, the indicator values for 1999 (which use data from 1998, 1999 and 2000) and 2000 (which uses data from 1999, 2000, and 2001) are based on both ICD-9 and ICD-10 coded mortality data. Consequently, in these instances, an intermediate colour is also used for the bars for 1999 and 2000 for fatal injury indicators estimated using 3-year moving averages.

Each bar on each chart includes 95% confidence limits – 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.

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 serious injury 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

^c Hospitals code their own discharge data, which when brought together nationally, form the NZHIS NMDS of hospitalisations. Hospitals transferred from using ICD-9 to ICD-10 during the financial year July 1998 to June 1999. The vast majority made this transfer in 1999, and most of those towards the end of the financial year.

overlap, then this is highly suggestive of a difference that is not due to random variation.

1.5 Summary of the methods

Scope, definitions, detailed methods for the calculation of indicators, and specifications are presented in Appendices A, B and C. The key points are presented here.

Many of the indicators are calculated using NZHIS Mortality and NMDS (hospitalisation) data. Indicators based on the latter source include only publicly funded cases discharged from hospital. Deaths in hospital are excluded from the serious non-fatal injury indicators. The last year's data for both NZHIS Mortality (2003) and NMDS (2005) are considered by NZHIS to be provisional, with all previous data considered final. The operational definition of injury was described in section 1.2 and Appendix A. For hospitalisations, only first admissions were counted.

Serious injury indicators were chosen to draw attention to 'important' injury as judged by their resulting in death, or because of their threat-to-life.² The definition of serious for the non-fatal injury indicators is based on a severity of injury threshold. The method used for measuring severity was the ICD-based Injury Severity Score (ICISS).

The ICISS method involves deriving a Survival Risk Ratio (SRR) - i.e. the probability of survival - for each individual injury diagnosis code, as the ratio of the number of patients with that injury code who have not died to the total number of patients with that diagnosis code. For the ICD-10 based SRRs, they were estimated from hospital discharges for the period 1999-2001. Thus, a given SRR represents the likelihood that a patient will survive a particular injury whilst in hospital, given that they were admitted to hospital. Each patient's ICISS score (survival probability) is, then, the product of the probabilities of surviving each of their injuries individually. ICISS scores are calculated for all patients discharged from hospital during the period (ie. for this report, 2000 to 2005), based on the SRRs derived from the 1999-2001 data set. These methods were adapted for hospitalisations coded to ICD-9.

The definition of serious non-fatal injury used for these indicators was hospitalised cases with an ICISS score of less than or equal to 0.941 ($ICISS \leq 0.941$)^d. This is equivalent to selecting patients whose injuries give the patient a survival probability of 94.1% or worse – in other words, a probability of death, given admission to hospital, of at least 5.9%.

Hospitalisations with ICISS scores less than or equal to 0.941 represented around 15% of all injury discharges. This included (but wasn't limited to) most cases with the following diagnoses:

^d All hospital discharges from public hospital were considered, even ones with 0 days stay; however, only cases that satisfied the severity criterion of $ICISS \leq 0.941$ were selected as cases.

S72	Fracture of the femur
S06.1 - .9	Intracranial injury (excluding concussion)
S14	Injuries of nerves and spinal cord at neck level
S22.4	Multiple fractures of ribs
T71	Asphyxiation
T68	Hypothermia

A full list of single injury principal diagnoses captured by this definition of serious injury is included in Table B1, Appendix B, of the Cryer 2004 report.² The methods were modified for hospitalisations coded to ICD-9, and the threshold was chosen such that, as far as was possible, the same injury diagnoses were selected as cases of serious injury.

The above method represents a conservative approach to the definition for a case of serious non-fatal injury. A person sustaining an injury assigned any of these serious injury diagnoses would be admitted to hospital in the vast majority of cases. This high threshold for inclusion reduces the likelihood of significant threats to the validity of these serious non-fatal injury outcome indicators (see Cryer 2004 report for further details).²

In most instances, rates are expressed per 100,000 person-years (i.e. per 100,000 population per year of exposure). This approach to analyzing population data has technical advantages, described in Appendix B, but the rates presented in the charts can be interpreted in the same way as rates per 100,000 population in a particular year.

Population data were obtained from Statistics New Zealand population estimates (see www.stats.govt.nz). In most instances, rates were age-adjusted to compensate for societal changes in the age distribution of the population over time.

Ninety five percent confidence intervals are displayed for each bar presented on each chart. The indicators are either counts or rates.

- 95% confidence intervals for counts assume Poisson error – standard errors were derived as the square root of the count.
- 95% confidence intervals for age-standardised rates were produced using the method described in Clayton and Hills.⁶

Baselines were calculated using the data from the three years 2001-2003 – where the data were available. Where moving averages are used, they were calculated using data for the years 2000-2004 – again, where the data were available. When all the required years of data were not available, provisional baselines were calculated and presented using the available data from the baseline period. In future years, when the chartbook is updated, the provisional baselines will be finalised when all the data needed for their calculation is available. In these circumstances, the baselines will stay constant for all subsequent chartbooks.

1.6 Interpretation and discussion of the charts

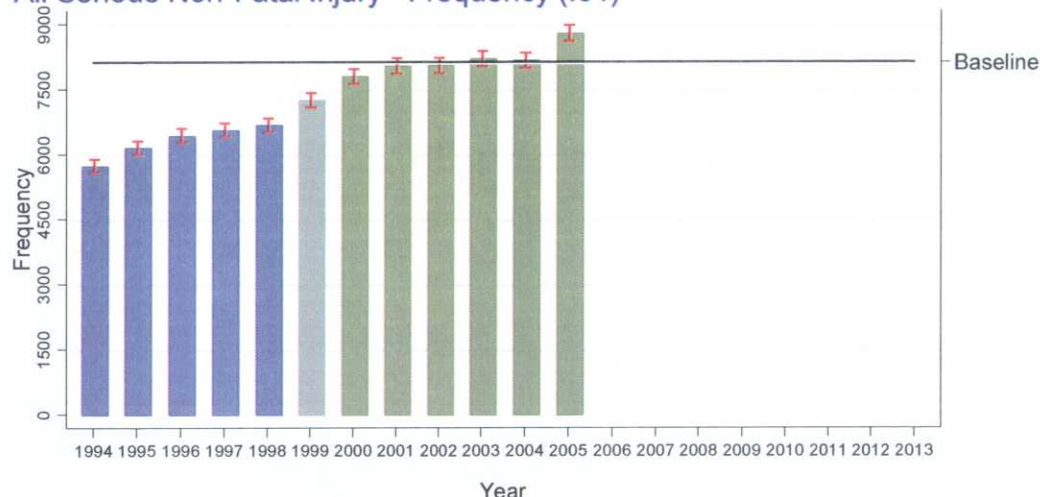
The interpretation and discussion of the charts is presented in the section “*Notes on the interpretation of indicator trends*” at the end of Appendix B. Brief comments on each chart are provided at the foot of each page in Part 2. The interpretations provided are based on a visual inspection (as opposed to formal statistical analysis) of the changes in the indicator values over the period relative to the width of the confidence intervals. Within a chart, where the confidence intervals from two bars during the period from the year 2000 do not overlap, this has been interpreted as a significant change – unless some threats to validity of the indicator have been identified.

Part 2: The Charts

2.1 All injury

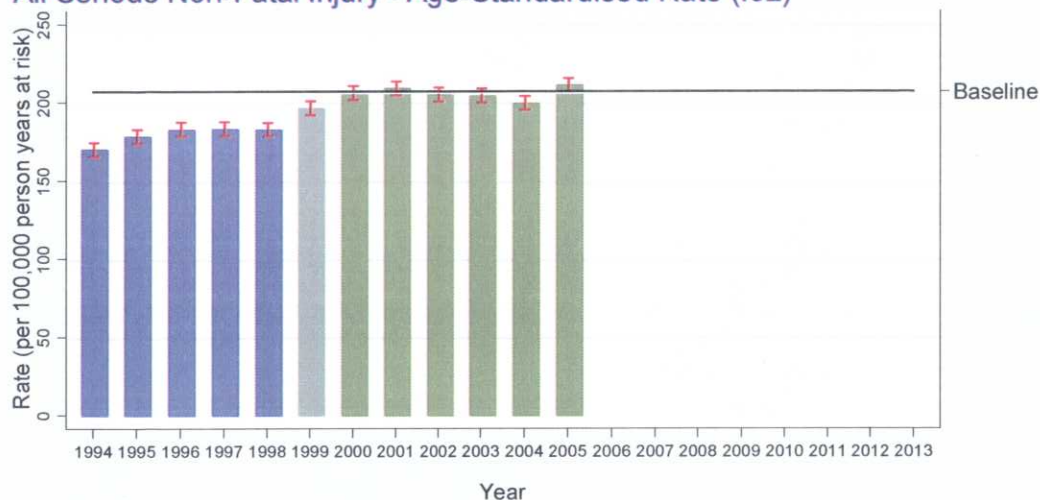
For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change.

All Serious Non-Fatal Injury - Frequency (I01)



Note: 1999 data are affected by the changeover from ICD-9 to ICD-10. 2005 data are provisional.
Source: New Zealand Health Information Service National Minimum Data Set.

All Serious Non-Fatal Injury - Age-Standardised Rate (I02)

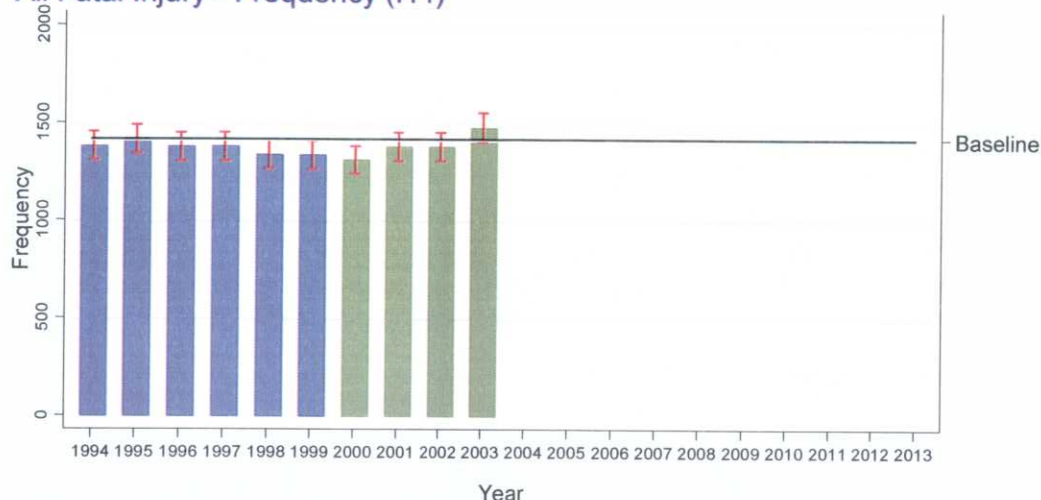


Note: 1999 data are affected by the changeover from ICD-9 to ICD-10. 2005 data are provisional.
Source: New Zealand Health Information Service National Minimum Data Set and Statistics New Zealand.

Since 2000, there has been an increase in the annual frequencies of non-fatal injuries (I01), but little change in the rates (I02).

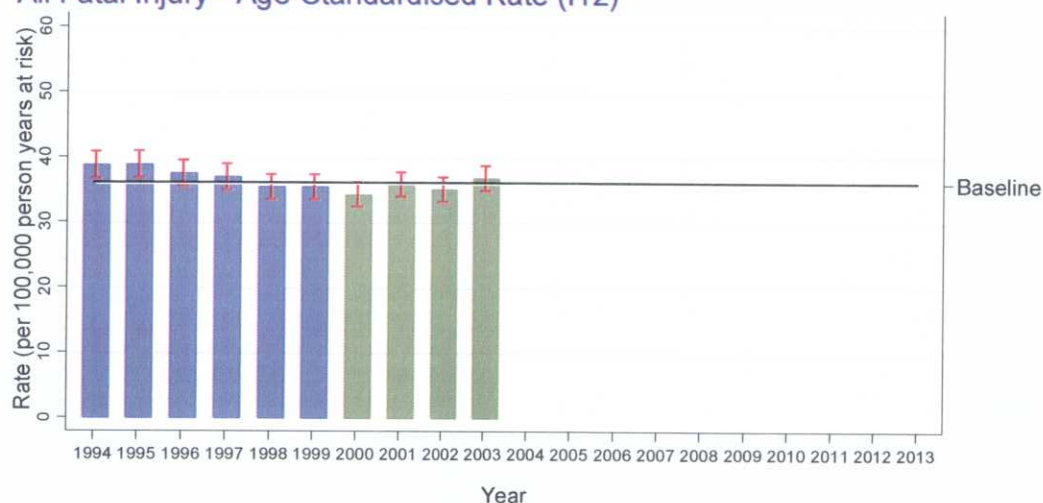
For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change.

All Fatal Injury - Frequency (I11)



Note: 2003 data are provisional.
Source: New Zealand Health Information Service Mortality Collection.

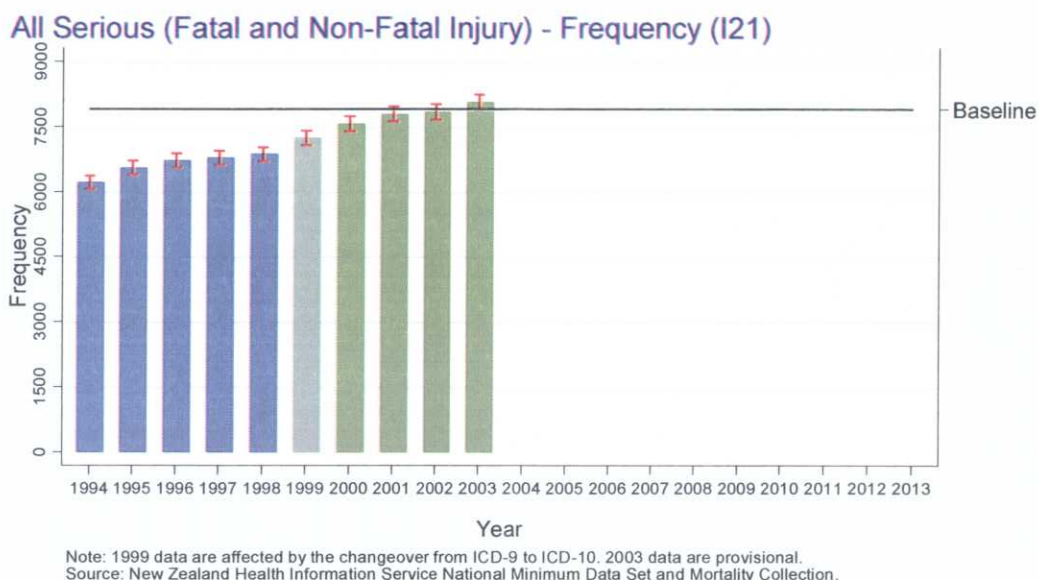
All Fatal Injury - Age-Standardised Rate (I12)



Note: 2003 data are provisional.
Source: New Zealand Health Information Service Mortality Collection and Statistics New Zealand.

Since 2000, there has been an increase in the annual frequencies of fatal injuries (I11), and a suggested increase in the rates (I12).

For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change.

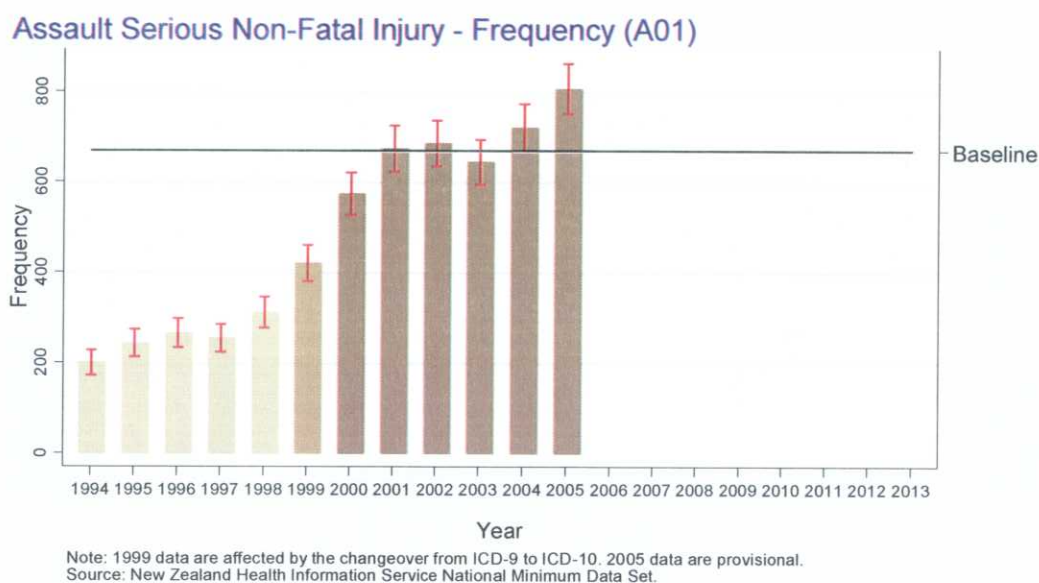


Since 2000, there has been an increase in the annual frequencies of serious injuries (I21), but little change in the rates (I22).

The change from ICD-9 to ICD-10 was accompanied by an increase in serious non-fatal injury frequencies / rates (I01, I02), but little change in fatal injury frequencies / rates (I11, I12). The structural changes from ICD-9 to ICD-10 are discussed in Appendix B7.1.

2.2 Assault

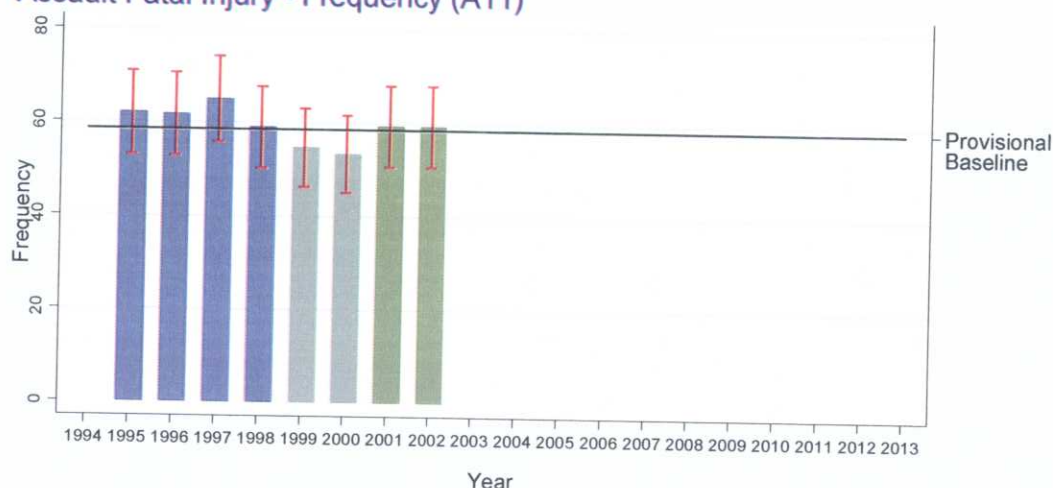
For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change.



The trends for the frequencies (A01) and rates (A02) of assaultive injuries are similar. There is evidence of an increase over the period in the frequency from 2000 to 2005. These trends could be the results of extraneous factors (see the Cryer 2004 report, pp 38-43² and Appendix B7.3), so care must be taken with interpretation.

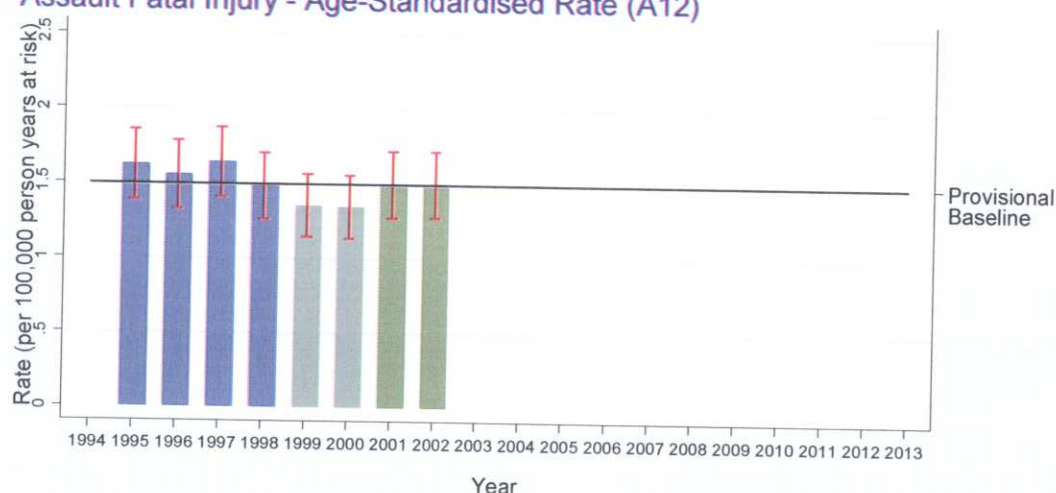
For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change. Since 3-year moving averages are used, the most recent year shown below is 2002 (based on data from 2001, 2002 and 2003).

Assault Fatal Injury - Frequency (A11)



Note: 3 year moving averages have been calculated due to small frequencies.
 Note: 1999-2000 moving averages are affected by the changeover from ICD-9 to ICD-10. Estimate for 2002 is provisional.
 Source: New Zealand Health Information Service Mortality Collection.

Assault Fatal Injury - Age-Standardised Rate (A12)

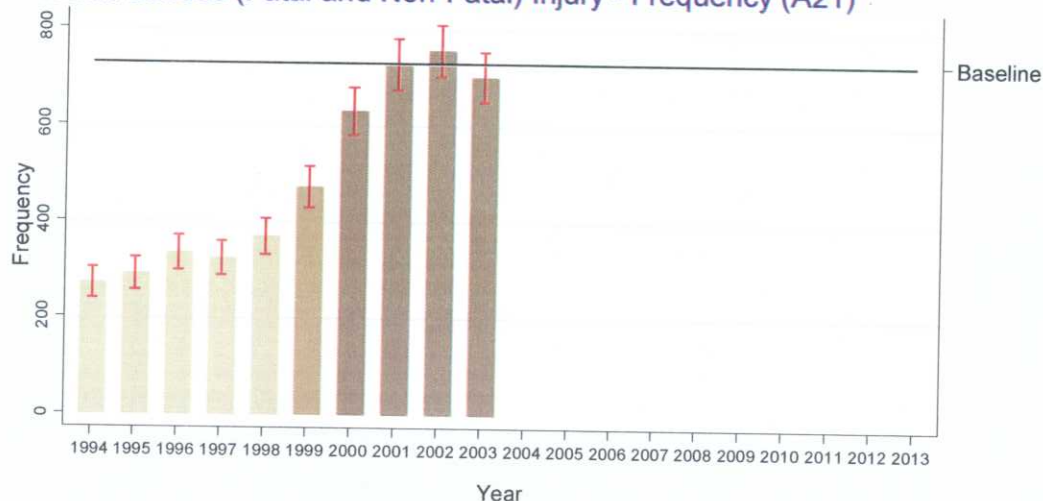


Note: 3 year moving averages have been calculated due to small frequencies on which the rates are based.
 Note: 1999-2000 moving averages are affected by the changeover from ICD-9 to ICD-10. Estimate for 2002 is provisional.
 Source: New Zealand Health Information Service Mortality Collection and Statistics New Zealand.

For this report, only the indicator values (A11, A12) for 2001 and 2002 are purely based on ICD-10 coded data. Consequently, no comment on trends in these values is appropriate.

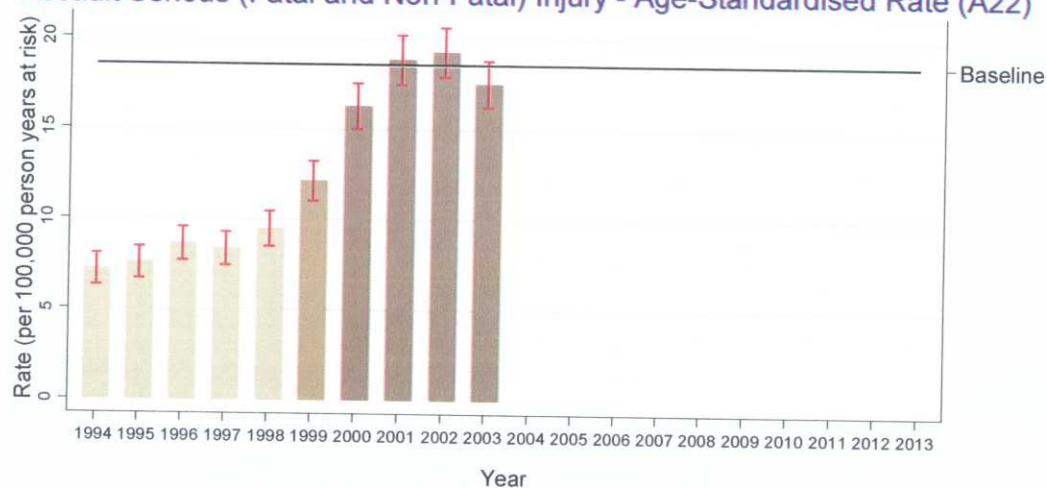
For each of these charts, readers should exercise caution if commenting on trends that include indicator values based on both ICD-9 and ICD-10 coded data, since case ascertainment will be affected by the change.

Assault Serious (Fatal and Non-Fatal) Injury - Frequency (A21)



Note: 1999 data are affected by the changeover from ICD-9 to ICD-10. 2003 data are provisional.
Source: New Zealand Health Information Service National Minimum Data Set and Mortality Collection.

Assault Serious (Fatal and Non-Fatal) Injury - Age-Standardised Rate (A22)



Note: 1999 data are affected by the changeover from ICD-9 to ICD-10. 2003 data are provisional.
Source: New Zealand Health Information Service National Minimum Data Set and Mortality Collection.
Source: Statistics New Zealand.

There is no clear trend in the frequencies or rates of serious assaultive injury over the period 2000 to 2003.