



Serious injury outcome indicators – work-related injury indicators redeveloped



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1 Purpose and summary

This report explains and outlines the background and redevelopment of the serious injury outcome indicators for work-related injury. These indicators have been agreed as the most robust and consistent measure available for monitoring work-related injury outcomes in New Zealand.

The report describes how we evaluated the data required to produce the work-related injury indicators. The full redevelopment process is described in *Serious injury outcome indicators – technical report 2013* (Statistics NZ, 2013).

Summary

In 2012, during the production of the serious injury outcome indicators for 2000–11, Statistics NZ became aware of a quality issue with the work-related injury indicators. We discovered that when a workplace fatality could be attributed to more than one potentially fatal injury, that fatality had been counted more than once. As some deaths result from multiple injuries, the number of deaths being reported was too high. As a result, the work-related indicators were not published with the rest of the indicators in December 2012.

We are committed to producing high-quality information, and since discovering the quality issue last year we have worked collaboratively with the Ministry of Business, Innovation and Employment (MBIE) and the Accident Compensation Corporation (ACC) to improve the quality of the work-related injury indicators. In the course of this work, we have reviewed and updated the definition of work-related injury we use for the serious injury outcome indicators. We have also reviewed the coverage of the data used for the work-related indicators, and investigated the inclusion of additional data sources. This results in some previously unreported work-related injury events now being reported.

As a result of redevelopment, the following changes have been made to the work-related injury indicators:

- A correction has been made so that the number of fatalities is counted, rather than the number of injuries.
- The data source for the fatal work-related injury indicators has been expanded to include MBIE notifications, along with ACC claims.
- The definition of work-related injury has been expanded to include ACC claims when the person can be identified as at work at the time; this includes claims in the motor vehicle and earners' accounts.
- ACC claims with location 'farm' by people with an agricultural occupation (not involved in a sport or recreational activity) are now included.
- The process for identifying and removing occupational disease, illness, and gradual process injury has been updated.



2 Background to the serious injury outcome indicators

The serious injury outcome indicators are summary measures that reflect, directly or indirectly, variations and trends in injuries over time. They present annual numbers and rates for fatal and serious non-fatal injury in New Zealand and are the most robust and reliable measures of serious injury outcomes currently available. The indicators monitor the incidence of serious injury for the following three groups:

- whole population
- Māori
- children (0–14 years).

An annual report is produced for each group.

The serious injury outcome indicators were developed by the Injury Prevention Research Unit (IPRU) at the University of Otago, funded by the Accident Compensation Corporation (ACC). They were developed to monitor the implementation and performance of the New Zealand Injury Prevention Strategy (NZIPS).

The NZIPS (ACC, 2003) establishes a framework for the injury prevention activities of government agencies, local government, non-government organisations, communities, and individuals. The strategy's vision is 'a safe New Zealand, becoming injury free'. The 2003 strategy identified six priority areas for national injury prevention, which together make up more than 80 percent of injury deaths and serious injuries in New Zealand. A government agency is responsible for each priority area. These priority areas are:

- assault
- work-related injuries
- suicide and intentional self-harm
- falls
- motor vehicle traffic crashes
- drowning and near-drowning.

To monitor the impact of the NZIPS, the serious injury outcome indicators present trends for serious injury in each of these priority areas as well as for 'all injury'. In developing the indicators, the IPRU went through a process of validation, to check that the indicators measure what they are intended to measure (the incidence of injury). The criteria used to validate the indicators were those agreed upon by the International Collaborative Effort on Injury Statistics at their 2001 meeting.

More information about the development of the indicators can be found in *Developing valid injury outcome indicators: A report for the New Zealand Injury Prevention Strategy* (Cryer, Langley, & Stephenson, 2004).

In April 2010, lead agencies for the six NZIPS priority areas signed the *Protocol for government agency reporting on injury incidence in New Zealand* (Statistics NZ, 2010). This protocol ensures that the agencies use the serious injury outcome indicators to adopt consistent, high-level injury measures when reporting on injury trends.

Also in 2010, Statistics NZ, as Injury Information Manager, agreed to take responsibility for the annual publication of the serious injury outcome indicators.



3 The work-related injury indicators

Development of the work-related injury indicators

The work-related injury indicators were developed and first published in 2006 by the Injury Prevention Research Unit (IPRU), as part of the serious injury outcome indicators.

Historically, the measurement of work-related injury based on routine data sources in New Zealand has been difficult. Therefore, the development of indicators based on these sources was not an easy task. At the end of the development and validation of the serious injury outcome indicators, the IPRU proposed provisional fatal and serious non-fatal work-related injury indicators for the whole population and for Māori.

The provisional work-related injury indicators have continued to be published as part of the serious injury outcome indicators since 2006.

The problem with the original work-related injury indicators

In 2012, during the production of the serious injury outcome indicators for 2000–11, Statistics NZ discovered quality concerns with the work-related injury indicators. We discovered that when a workplace fatality could be attributed to more than one potentially fatal injury, that fatality had been counted more than once. As some deaths result from multiple injuries, the number of deaths being reported was too high. This has now been corrected.

At the same time, the Ministry of Business, Innovation and Employment (MBIE) was completing some work to better understand work-related fatalities in New Zealand. This involved a comparison of Accident Compensation Corporation (ACC) work-related claims data, MBIE fatal injury notifications and work-related Coronial Services records. The result of this comparison showed that producing the fatal work-related indicators based solely on ACC data may result in some genuine cases of fatal work-related injury not being counted.

Because of these concerns, the work-related injury indicators for 2000–11 were not published with the rest of the serious injury outcome indicators in December 2012. Instead, a working group with members from Statistics NZ, MBIE, and ACC was formed to redevelop the work-related injury indicators for publication in early 2013.



4 Redeveloping the work-related injury indicators

Redevelopment of the work-related injury indicators began in December 2012. The main aim of the work was to ensure that the work-related injury indicators remain the most robust and reliable measure for monitoring work-related injury in New Zealand. To achieve this, the following objectives were identified:

- quantify the anticipated undercount in the fatal ACC claims data
- agree the base data required for the fatal and non-fatal work-related injury indicators
- update and agree on the definition for work-related injury used in the serious injury outcome indicators
- confirm the method used to identify and exclude gradual process claims
- ensure, where possible, consistency in the methodology used for reporting the fatal and serious non-fatal work-related injury indicators.

These objectives are not in order of priority and may overlap in some cases.

Identifying all possible fatal work-related injury data sources

Investigating the anticipated undercount in fatal work-related injury from the fatal ACC claims data required identifying and investigating all other potential data sources.

The development work completed by the IPRU established the linked NMDS and ACC data as the most robust data to monitor serious non-fatal injury in New Zealand (Cryer et al, 2004). This remains the case, particularly for the purposes of the serious injury outcome indicators, where the 'seriousness' of the injury event is established using the NMDS diagnosis codes.

Some of the following datasets contain non-fatal injury data; however, on the whole, non-fatal events are not well reported in these data sources for injury monitoring purposes. Therefore, the additional datasets examined were those that relate in particular to addressing the anticipated undercount in the fatal work-related indicators. These additional data sources are as follows:

- MBIE serious harm notifications
- Maritime New Zealand event notifications
- Civil Aviation Authority notifications
- Coronial data
- Ministry of Health Mortality Collection

For more details on these data sources, refer to *Serious injury outcome indicators – technical report 2013* (Statistics NZ, 2013).

Quantifying the anticipated undercount in the fatal indicator

To determine if there was the anticipated undercount in fatal work-related injury events reported solely from the fatal ACC claims data, this data was compared with that from MBIE, CAA, and Maritime New Zealand fatal notifications data. The coronial and Mortality

Collection datasets were not included in this comparison work. Coronial data is only available from 2007 onwards. Additionally, the Mortality Collection data relies on the time-lagged coronial findings.

Table 1 below shows for each data source how many cases in each potential additional dataset could not be identified in the fatal work-related ACC claims data. The period 2005 to 2010 was used as it is a period for which most agencies hold up-to-date and available data.

Table 1
Fatal work-related injuries not in the ACC data for the period 2005–10

Additional data source	Fatal injuries not in the ACC data	
	Number	Annual average
MBIE	47	7.8
CAA	6	1.0
Maritime New Zealand	6	1.5
<p>Note: Maritime New Zealand data is only available from 2008. Data prior to this is contained in another database and is not easily accessible. The annual average presented here is based on data from 2008–10.</p>		

On average, each year, there are between seven and eight fatal work-related cases notified to MBIE that are not claimed for in the ACC system. However, for the CAA and MNZ data combined there are, on average, fewer than three cases a year that are not included in the ACC claims data.

Base data for the redeveloped work-related injury indicators

Fatal work-related injury indicator

With an average of seven to eight fatalities each year investigated by MBIE but not contained in the ACC claims data, it is clear the inclusion of MBIE notifications data would improve the quality of the work-related injury indicators. However, due to the lack of a systematically defined work-related variable in the CAA and MNZ data, these two data sources will not be included in the redeveloped fatal work-related injury indicator. Therefore, the fatal MBIE notifications data will be included in the redeveloped work-related injury indicators, while the CAA and MNZ data will not.

Serious non-fatal work-related injury indicator

The established base data for the production of the serious non-fatal work-related injury indicator will remain as in previous publications. The non-fatal indicator is based on a link of ACC claims and NMDS injury discharge data. It provides a measure of serious work-related injury hospitalisations. NMDS data provides the means to calculate the severity of the injury event, while the ACC claim data provides the measure of work-relatedness.

The use of NMDS data is in line with all other NZIPS priority area reporting and provides the best coverage for serious non-fatal injury, based on threat to life, currently available in New Zealand.

A wider base of ACC data will be used to indicate work-relatedness in the redeveloped indicators.

Definition of work-related injury

The inter-agency redevelopment working group (Statistics NZ, MBIE, and ACC), has agreed a new definition of work-related injury for the serious injury outcome indicators. The working group agrees that this definition most accurately and consistently captures work-related injury for monitoring purposes from within the currently available administrative datasets.

For the purposes of the serious injury outcome indicators, work-related injury has been defined as: **all fatal and serious non-fatal injuries that occur while a person is at work in New Zealand.**

This definition excludes some injury events that are of interest to agencies such as MBIE, but for reasons of data quality are not appropriate for inclusion in the serious injury outcome indicators. These include:

- injuries classified as occupational disease or illness (gradual process)
- injuries to bystanders (members of the public, customers, or clients injured as a result of someone else's work activity)
- injuries to unpaid workers and volunteers
- injuries to workers commuting to and from work
- injuries to workers as a result of suicide or intentional self-harm
- injuries to workers resulting from natural causes
- injuries to workers who are working outside of New Zealand for a New Zealand organisation (for example, defence forces and New Zealand Police)
- injury claims made to ACC where the scene is on a farm but the claim cannot be systematically identified as occurring while at work.

These are injury events that have always been excluded from the work-related injury indicators. With the updated definition these exclusions are now explicitly stated to enable users to make better-informed decisions about the way they use and report on the data. Additionally, we recognise that some of these excluded injury events are of interest for overall workplace health and safety reporting in New Zealand, and we will work with the relevant agencies to make data available outside of the serious injury outcome indicator publications. The new definition of work-related injury is consistent with the relevant resolution outlined by the International Labour Organisation (ILO, 1998¹).

This definition differs from the previous indicator definition of work-related injury, which only included work-related injury claims that were classified into the ACC work account. For example, motor vehicle traffic crash injury claims that occur while a person is working are prioritised into the ACC motor vehicle account, so would previously have been excluded. A review of the data found that the ACC work-related indicator variable for a motor vehicle road traffic crash is more consistently applied than when the indicators were first developed. Additionally, identifying whether an injury was work-related can be difficult where the workplace is also a home. Farms are one such example and are included in the new definition. The differences in the data are outlined below in table 2.

¹ The resolution concerned the statistics of occupational injuries (resulting from occupational accidents), which was adopted by the Sixteenth International Conference of Labour Statisticians in October 1998.

Table 2
Data differences between the previous and updated definition of work-related injury

	Updated definition	Previous definition
Fatal work-related injury indicator	Linked ACC fatal claims and MBIE fatal harm notifications - ACC claims from the work account - ACC claims in the motor vehicle and earners' accounts with the at-work flag set to 'Yes' - ACC claims with location 'farm' by people with an agricultural occupation and not involved in a sport or recreational activity	ACC fatal claims - ACC claims from the work account only
Serious non-fatal work-related injury indicator	Linked NMDS and ACC claims - NMDS records that meet the criteria for 'serious' - ACC claims from the work account - ACC claims in the motor vehicle and earners' accounts with the at-work flag set to 'Yes' - ACC claims with location 'farm' by people with an agricultural occupation and not involved in a sport or recreational activity	Linked NMDS and ACC entitlement claims - NMDS records that meet the criteria for 'serious' - ACC entitlement claims from the work account only

The difference between fatal and non-fatal indicators

Ideally the fatal and non-fatal work-related injury events would be identified in the same way. However, there is no single optimal method of identifying the fatal and non-fatal work-related injury events. It was decided that the best available data selection criteria differs between fatal and non-fatal injury.

Fatal injury events include:

- all claims in the ACC work account that meet the agreed definition
- all claims in the ACC motor vehicle account, or the ACC earners' account that have a work-related flag set to 'Y' and meet the agreed definition
- all ACC claims with location 'farm' by people with agricultural occupations (excluding non-earners and those involved in a sport or recreational activity) that meet the definition
- all MBIE fatal work-related notifications that are not identified in the ACC data and that meet the agreed definition.

This currently provides the most complete picture available for work-related fatalities, considering data quality and resource requirements.

Serious non-fatal injury events include a link to an NMDS injury record where the case is defined as 'serious', and are also one of the following:

- a claim in the ACC work account that meet the agreed definition

- a claim in the ACC motor vehicle account or the ACC earners' account with a work-related flag set to 'Y' that meets the agreed definition
- an ACC claims with location 'farm' by people with agricultural occupations (excluding non-earners and those involved in a sport or recreational activity) that meet the definition.

Identifying gradual process claims in the ACC data

Gradual process claims are those for a personal injury that develops progressively over time, such as the effects of exposure to noise at a workplace. The Accident Compensation Act 2001 only provides cover for work-related gradual process claims. Gradual process injuries only include occupational disease or illness that is the result of exposure over an extended period of time.

Occupational disease or illness is included in the NZIPS as an important aspect of workplace injury. However, occupational disease or illness is not included in the serious injury outcome indicators. This is because these diagnoses are not included in the 'Injury' chapter of the ICD-10-AM, and also because the nature of these injuries makes them difficult to include in the measures that monitor injury events over time and by calendar year. Consequently, occupational disease or illness (gradual process claims) need to be identified in the ACC claims data so that they can be excluded from the work-related injury indicator counts.

There are two ways to identify gradual process claims in the ACC system. Either by a gradual process flag variable in the claims management system (known as Eos), or by identifying gradual process claims using the diagnosis codes provided to ACC as part of the claim information. There are internal processes underway at ACC to review the identification and classification of gradual process claims.

In the meantime, ACC advises that the injury-diagnosis-based method is the preferred method for gradual process claims to be identified in all reporting. The serious injury outcome indicators will continue to use diagnosis codes to identify and exclude the gradual process claims from the publication.

ACC reviewed the injury-diagnosis-based method used for the indicators in 2012 to ensure its accuracy and relevance for continued use.



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