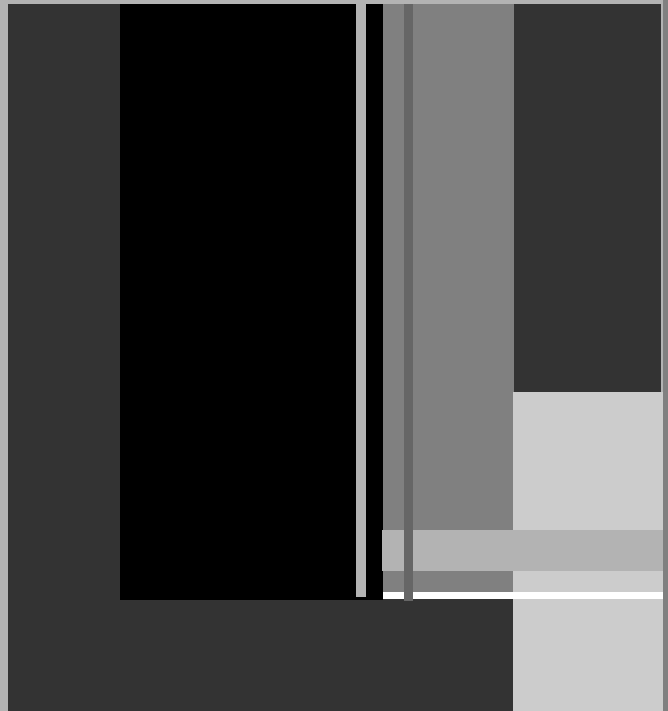


NEW ZEALAND INJURY DATA REVIEW

APRIL 2000 - DECEMBER 2001



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PREFACE

This report presents the results of a review of injury data, which was led jointly by the Department of Labour and Statistics New Zealand.

The review was initiated by the government in response to a need for information to monitor trends in injury events, identify emerging health and safety issues and determine the cost of injury to society. It coincided with a review of the accident compensation legislation, so it was timely to consider what information was needed about injuries for research, policy, monitoring, and other statistical purposes.

This report sets out the objectives of the review, gives an overview of how it was carried out, and documents the conclusions reached. It recommends a conceptual framework for injury data, proposes a minimum set of indicators to monitor trends in injuries, and recommends a minimum data set to support research. The

project team also investigated models for managing injury information, which culminated in Statistics New Zealand's appointment as the Injury Information Manager.

We would like to thank the Data Warehouse Advisory Panel, and the organisations that were involved in the review process – their input was much appreciated. The officials on the project team were Ben McBride and Carol Slappendel from the Accident Compensation Corporation, Mary Adams and Margie Fepulea'i from the Department of Labour, Angela Pidd and Peter Aagaard from the New Zealand Health Information Service, and Wayne Jones from the Land Transport Safety Authority. Other individuals and organisations were also involved from time to time.

Finally, we would like to thank Alicia Wright from the Department of Labour who was the overall project manager, Julie Woolf who was the key contributor from Statistics New Zealand, and Naomi Stephen-Smith from the Department of Labour who compiled and edited this report.



John Chetwin
Secretary of Labour



Brian Pink
Government Statistician

October 2002

EXECUTIVE SUMMARY

The Injury Data Review was established in April 2000 in response to the government's objectives for injury information, which are to have access to data and reporting that will:

- monitor the incidence, trends and distribution of injury events
- identify emerging health and safety hazards, including clusters of events and outbreaks
- determine the cost of injury to society.

Achieving these objectives will allow the government to more effectively measure, monitor, and target injury prevention and management activities, and develop policy on the injury sector.

The objectives for the Injury Data Review were to identify:

- a conceptual framework which would provide for a coherent set of statistics and statistical indicators and research databases(s)
- a set of statistical indicators that meet the requirement to inform on injuries in New Zealand at a high level
- an appropriate approach to manage and report on these indicators (stewardship) in the interim and the long term.

The Department of Labour and Statistics New Zealand co-managed the Injury Data Review, with the assistance of a project team comprising officials from the Accident Compensation

Corporation (ACC), the Land Transport Safety Authority and the New Zealand Health Information Service (NZHIS - part of the Ministry of Health's Corporate and Information Directorate). The review methodology included an extensive literature review of international practice, progressive development at each stage with consultation with stakeholders and an international peer review group, and, where appropriate, contracting experts to assist with specialist pieces of work.

The review problem definition found that injury data is under-reported and fragmented across agencies, agencies use different standards for collecting similar information, and there are gaps and duplications in coverage. The review sought to improve:

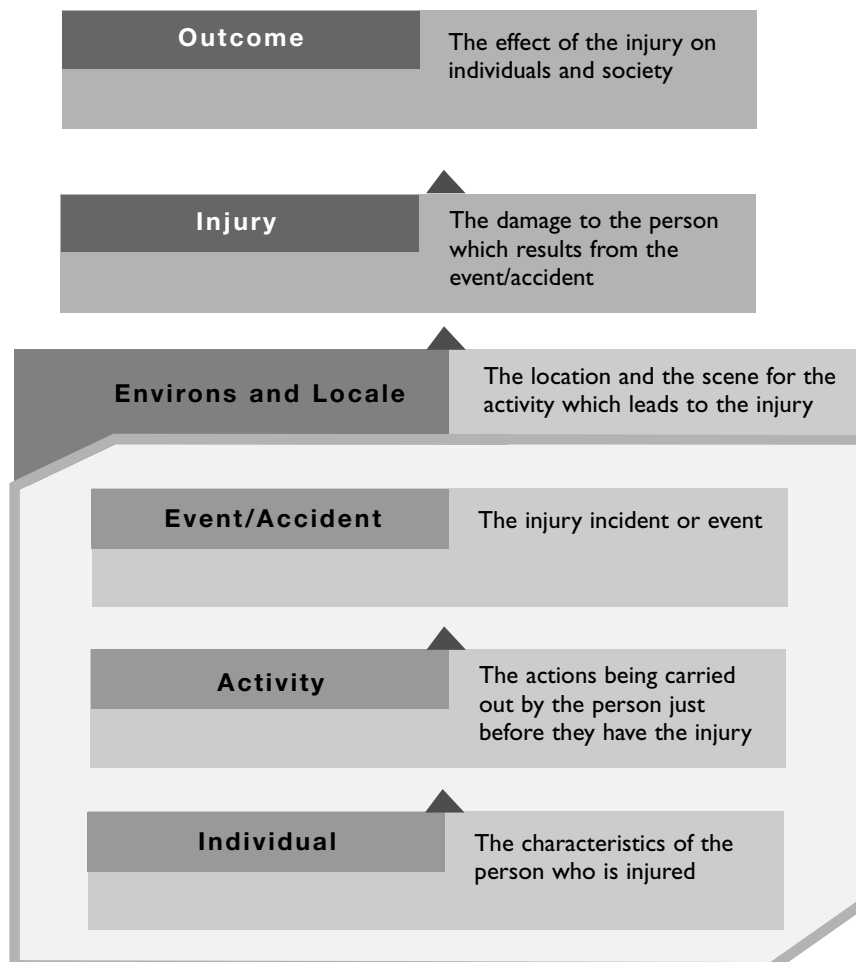
- the quality of the data collected
- monitoring at national level
- targeting of injury prevention programmes
- access to information
- processes involving data providers.

The review consisted of several sub-projects that addressed the problems described above. The review produced, and the government agreed to, a conceptual framework for injury data, a data set, a list of indicators of injury, a gap analysis to determine which information agencies held, a model for long-term information management, and a cost-benefit analysis of the chosen model. These are described below.

CONCEPTUAL FRAMEWORK FOR INJURY DATA

The conceptual framework for injury data (Figure i) was based on a framework for workplace injuries recommended by the International Labour Organisation (ILO) at the Sixteenth International Conference of Labour Statisticians, 1998. The framework can be applied across all injury sectors, deal with different degrees of severity, and enable indicators and data to be identified that will meet the government's objectives in injury prevention and management.

Figure i: Conceptual framework for injury data



INDICATORS OF INJURY, SUPPORTING DATA SET AND DEFINITIONS

Indicators were developed to inform each of the elements of the conceptual framework for injury data. The indicators were based on key policy and injury prevention questions. The proposed indicators were assessed against a series of criteria that were derived from the framework definition and elements, the government's objectives for injury prevention and management, criteria recommended elsewhere, and good practice on measurement selection.

A data set of supporting numerator and denominator variables was developed to inform the indicators. Standards and definitions for each of the variables used in the data set were also developed.

GAP ANALYSIS

Following agreement on the indicators, a gap analysis was undertaken to determine which agencies already collect the supporting variables, and to what standard. The analysis found that the volume of data varied considerably across agencies, and no agency recorded all injuries or had all the data about an injury event. This analysis confirmed that fragmentation is a key problem with existing sources of injury information.

The second major finding confirmed that agencies have inconsistent data standards and in many cases use different definitions or classifications to describe the same concept.

MODEL FOR INFORMATION MANAGEMENT

A long-term approach to manage and report on injury indicators in the interim and the long term was one of the primary objectives of the Injury Data Review. A number of models were identified based on legislative and overseas examples. The models were contrasted with the problems that had been

identified, and a selection was made on the basis of which model would best solve the problems.

The model chosen was an 'injury surveillance' model, which creates a data set that allows comprehensive statistical analysis of injury indicators to occur through the integration of data. Integration helps identify gaps and overlaps in coverage of injuries by the various agencies (vertical integration) and enriches the individual data sets by linking them to new pieces of information (horizontal integration). Integration is efficient because it adds to or extends the value to existing data sets. No agency needs to collect the entire data set and better use is made of the existing data.

Governance and accountability model

The project team designed governance and accountability arrangements for the injury surveillance model based on similar models in Canada and Australia. The key feature of the model is an Information Manager who integrates and provides access to the data.

The functions of and legislative mandate for the Injury Information Manager are described in part 8 of the Injury Prevention, Rehabilitation and Compensation Act 2001 (sections 287-293). The Information Manager's role is to facilitate access to injury related information and data. To do this the Information Manager has been given functions to collect data, produce and disseminate statistical information, establish and maintain data standards and review future information requirements.

Another feature of the model is a Ministerial Advisory Panel. The Panel, comprising users, stakeholders, injury experts and government agencies providing data, will provide advice to the Ministers of ACC and Statistics on guiding the direction and strategy of the model, reporting, and the data set(s).

COST AND BENEFIT ANALYSES

A cost analysis of the injury surveillance model was undertaken that drew on the work of the gap analysis team and interviews with agencies, and was intended to:

- confirm the results of the gap analysis
- determine any system changes planned by the agencies in the future
- obtain agencies' views of compliance costs if they are required to collect and transfer electronically all data specified in the data set to the Information Manager.

The report contains estimates from data provider agencies of the likely cost of collecting and transferring data to the Information Manager, as well as an estimate of the set-up and operating cost of the Information Manager.

A further study was commissioned to assess the benefits of the proposed new injury information system. The study identified that the proposed system would improve:

- monitoring of injury incidence and trends
- identification of risk factors
- assessment of health and financial impacts of injury.

The study also included examples of how good information has improved decision-making, but the researchers were unable to calculate quantitative gains from a better information system. However, based on Land Transport Safety Authority data,¹ the study estimated that the cost

imposed by injuries and fatalities is in the region of NZ\$7 billion per annum. Thus a reduction of even 0.1% in the injury rate (which was found to be a likely scenario) could lead to savings in the 'social cost' of injuries in the region of NZ\$7 million each year.

APPOINTMENT OF INFORMATION MANAGER & INTENDED WAY FORWARD

In June 2002, the Prime Minister appointed Statistics New Zealand as the Information Manager. Within the next three years, Statistics New Zealand is planning to implement a dissemination programme for injury information and to establish the statistical and technical infrastructure needed to support this programme. Within the next five years, Statistics New Zealand envisages the establishment of a robust, authoritative and timely system of public reporting of official injury statistics and the establishment of a data warehouse type service providing information access to a range of users for a range of uses.

FURTHER WORK

The following areas were identified by the review, but were unable to be included within the scope and timeframe of the review: injury clusters, occupational disease, work-related (primary and subsidiary) variables, return to work variables, severity of injury, cost of injury, and distinction between minor and major injury data sets. Further work is planned or underway in several of these areas.

I. INTRODUCTION: THE NEED FOR A REVIEW

The Injury Data Review was established in April 2000 in response to the government's objectives for injury data. *Labour on ACC* stated that the "collection and maintenance of a national database is an integral part of developing injury prevention programmes and will be a requirement of the [Accident Compensation] Corporation in conjunction with other agencies".²

The government's overall objectives for injury information are to have access to data and reporting that will:

- monitor the incidence, trends and distribution of injury events
- identify emerging health and safety hazards, including clusters of events and outbreaks
- determine the cost of injury to society.

Achieving these objectives will allow the government to more effectively:

- measure the impact of injury prevention activities
- target prevention activities
- determine risk of injuries to inform on setting levies
- assess the impact and effectiveness of rehabilitation, treatment and compensation
- develop policy

- monitor agencies effectiveness in preventing and managing injuries.

Delivery of workplace accident insurance was privatised in 1999. At that time, the Accident Insurance Regulator was established to regulate and monitor the market, and a substantial amount of work was put into defining what information should be collected about workplace injuries.

Regulations were passed to ensure the information was collected. A review of the quality and usefulness of the data was planned for a year after privatisation. The subsequent return to the Accident Compensation Corporation (ACC) as the central provider of injury compensation did not affect the necessity of the review.

The review was co-led by the Department of Labour and Statistics New Zealand, with a project team of officials from the Land Transport Safety Authority, the New Zealand Health Information Service (NZHIS – part of the Ministry of Health's Corporate and Information Directorate), and ACC. The objectives, scope, approach, timetable and deliverables for the review were articulated in a paper, titled *Injury Data Review Work Programme* (July 2000),³ the contents of which are attached as Appendix A.

² New Zealand Labour Party, *Labour on ACC*. <http://www.labour.org.nz>

³ Department of Labour, *Injury Data Review Work Programme* (briefing paper to Minister for Accident Insurance and Minister of Labour), 26 July 2000.

1.1 Why report on injury?

WHAT IS AN INJURY?

The definition of an injury used during the Injury Data Review was based on the World Health Organisation and International Labour Organisation definitions, and was reviewed by an international peer review group (refer to Appendix B for the members of this group). Injury was defined as unintentional and/or intentional damage to the body resulting from:

- acute and/or cumulative exposure to, mechanical, thermal, electrical, or chemical energy, and/or
- the application of a force or resistance (including gravity) on the human body, and/or
- acute or cumulative exposure to psychologically damaging events, and/or
- the absence of essentials such as heat or oxygen.

For practical purposes, boundaries were needed around the severity of injury to be recorded for statistical purposes. In particular, many minor injuries fit the injury definition but are difficult to collect (eg, when a child falls over and scrapes their knee, and is treated with antiseptic cream and a sticking plaster). While there may be a case for measuring minor injuries, the focus for injury prevention tends to be major injury. For this reason the project team chose to measure injury when it has been reported to a treatment provider. This means that near misses and incidents that did not result in injury are also excluded.

There was debate over whether occupational disease should be included in the definition of injury. The international peer review group did not recommend its inclusion, so for the purposes of the review it was excluded. Cabinet, however, directed the Department of Labour to do further work on the definition of occupational disease and the relevant indicators, data set and cost.

WHY IS INJURY INFORMATION IMPORTANT?

A review by Colin Cryer and John Langley of the *New Zealand Injury Data Review Initial White Paper* brings

into sharp focus the social and economic significance of injury.

A fundamental reason why we should report on injury ... [is] that it is a major contributor to premature mortality and preventable morbidity. While that may be considered a given, it is our view that the surveillance needs of injury prevention do not get the attention they deserve in some sectors (eg, health) because it is seen as a low priority. We need to constantly remind our health colleagues, and others, of facts such as: 1) injury is the leading cause of death between ages 1-34 years, accounting for approximately 65% of all the deaths in this age group. 2) In the 1998/99 financial year the Accident Compensation Corporation paid out \$1.4 billion for entitlement claims. This is more than the budget for Vote Police (\$0.8b) and the same as the budget for Vote Education (\$1.4b).⁴

Injury information is important because it can identify the:

- incidence of injuries: how often they occur and to whom
- impact of injuries: both social and economic
- injury trends: how injuries and injury rates can change over time.

Information on the frequency, severity, and type of injuries incurred in different sectors or environments can identify patterns of injury. This information can help organisations to:

- plan preventative measures
- identify and target high risk areas
- develop regulations and procedures
- develop more effective injury prevention mechanisms
- monitor and assess high risk groups in different segments of the population
- identify and act on groups that have a high probability of injury and/or are exposed to risks.

Changes in injury patterns can measure improvement or deterioration in safety and warn of emerging risk areas. The information can also help to measure the effectiveness, or otherwise, of injury prevention activities and therefore enable effective targeting.

⁴ Cryer, C and Langley, J. *Review of the New Zealand Injury Data Review Initial White Paper*. Dunedin: Injury Prevention Research Unit, University of Otago, 2000.

1.2 Objectives of the review

The primary objectives for the Injury Data Review were to identify:

- a conceptual framework which would provide a coherent set of statistics and statistical indicators and research databases(s)
- a set of statistical indicators that meet the requirement to inform on injuries in New Zealand at a high level
- an appropriate approach to manage and report on these indicators (stewardship) in the interim and the long term.

1.3 Problem definition

The primary problem the review sought to address was that injury data is under-reported and fragmented across agencies. Data is held by a range of different agencies, including the Accident Compensation Corporation, the Department of Labour (the Occupational Safety and Health Service, and in 1999-2000 by the Accident Insurance Regulator), a range of transport agencies, the New Zealand Health Information Service, and the Coroner's Court. As well as being fragmented, agencies often use different standards for collecting similar information and there are gaps and duplication in coverage.

Therefore it is difficult to determine the extent of injury in New Zealand and the cost of injury to society and the economy, and for the government to develop and implement policy to minimise the overall incidence and cost of injury to the community and society.

A recent study on work-related fatal injuries demonstrates the fragmentation of injury information.⁵ This study determined that of 820 reported work-related deaths from 1985 to 1994, no agency had collected the total number of reported deaths. ACC had records on 63%, the Occupational Safety and Health Service of the Department of Labour had 40% and other agencies had 10%. This data, when consolidated, accounted for 73% of the 820 deaths. The other 27% could only be identified through manual review of all injury deaths (some 4,000) in paper files within the Coroner's Court.

While aiming to address the primary problem, the

review also centred on a number of additional identified problems that are summarised below.

QUALITY OF THE DATA COLLECTED

Much of the data currently collected by agencies is incomplete or inaccurate. For example motor-vehicle-related injuries are not included in ACC records if they do not generate an ACC claim. Agencies also vary in their data management practices (eg, time period for, or unit of, collection) which can make comparisons difficult. These problems are significant because they affect any subsequent analysis of the data and make it difficult to compare or combine different agencies' data.

MONITORING AT NATIONAL LEVEL

It is difficult to monitor injury trends at a national level because there are no common data standards, and there is little co-ordination between relevant government agencies. For example, not all incidents are recorded. The difficulty in monitoring national injury trends means that the government lacks the ability to see the 'big picture', for example, the total cost of injury.

TARGETING OF INJURY PREVENTION PROGRAMMES

Research and injury prevention programmes tend to be ad hoc with insufficient data to ensure that the investment is appropriate. The inability to monitor also creates difficulties when attempting to evaluate the effectiveness of injury prevention activities or other interventions by government agencies, and policy makers have little ability to trend or forecast the impact of policy changes or assess the changes once implemented.

ACCESS TO INFORMATION IS CUMBERSOME AND SLOW

Users must access data from multiple agencies, resulting in expensive time delays and complex privacy issues. Once obtained, data must be integrated prior to any investigative effort. Researchers have estimated that an average project requires NZ\$50,000 to NZ\$100,000 in time and data collection before research can begin.⁶

PROVIDERS OF DATA ARE FRUSTRATED AND ILL-INFORMED

Treatment providers, workplace inspectors and police provide data and rarely see any useful statistical information produced from it. As a result, providers view data collection as unnecessary and expensive.

⁵ Feyer, A, Langley, J, et al. *Work-related Fatal Injuries in New Zealand 1985-1994: Recommendations on the Establishment of Ongoing Work Injury Mortality Surveillance*. Dunedin: Injury Prevention Research Unit, University of Otago, 1999.

⁶ O'Dea, D and Cumming, C. *Implementing the Conclusions of the Injury Data Review: The Economic Benefits to be Expected from an Integrated Data System*. March 2001.

2. METHODOLOGY

The review was carried out between April 2000 and December 2001.

At the beginning of the review process a literature review was undertaken of international practice on injury information collection, how they organised their data (ie, the frameworks they used) and what outputs they produced.⁷ The literature review informed the definition of injury and helped to inform what injury indicators New Zealand should produce.

A conceptual framework for injury data was identified that allowed questions and issues about injuries to be related to appropriate statistical measures and indicators. Agencies involved in the review were asked to identify the questions they wanted to answer about injuries and these formed the basis of the indicators. For example, 'How many people are injured in New Zealand?' was the initial question that could not be answered from existing data. The list of recommended indicators is comprehensive, but not exhaustive.

Once the set of indicators was specified, the project team compiled a list of supporting numerator and denominator variables with definitions and classifications, where applicable. Each agency provided information on which variable they collected and the quality of the data. This information was then summarised.

Next, the project team considered models for managing injury data, including the existing practice of other countries. Canadian and Australian models were examined as they both gathered data from a number of sources and co-ordinated information output (ie, integration).

The team looked at various levels of integration that could occur, from integrating concepts and standards in each agency, with data staying in each agency, through to all data being held centrally and fully inte-

grated. The models were contrasted with the problems that had been identified, and a selection was made on the basis of which model would best solve the problems.

The Injury Data Review was project managed by Alicia Wright who was contracted by the Department of Labour. Various agencies wrote papers on particular topics or took responsibility for various tasks. For example, Statistics New Zealand worked on the conceptual framework for injury data, and the New Zealand Health Information Service wrote a paper on costs and severity. Cost/benefit analysis of the recommended model was contracted out.

2.1 Consultation

In the course of the review there was wide consultation with stakeholders. Internal consultation was conducted within the participating agencies by project team members who took responsibility for disseminating details of work in progress within their agencies and bringing comments or concerns back to the project team.

The output from the project team was reviewed by the Data Warehouse Advisory Panel, a committee established by the Chief Executive of the Department of Labour to give him advice on injury information management in relation to the privatisation and subsequent re-nationalisation of workplace injury compensation. The Injury Data Review project manager attended meetings of the Data Warehouse Advisory Panel regularly and kept the project team up to date with progress. The project team adopted comments by the Data Warehouse Advisory Panel members.

A further group was set up to review the material from the Injury Data Review. The international peer review group was established in October 2000 and comprised representatives from New Zealand,

Australia, Britain, the United States of America, and Sweden. Members were invited on the basis of recommendations from New Zealand injury prevention and data experts.

The group commented on the conceptual framework for injury data and the draft indicators, and provided technical expertise around different aspects of the data, indicators and operational models proposed for the injury data review. In particular, these included definition and standard setting and identification of priorities and benefits of data collection. An internet discussion group was established as the primary communication mechanism for this group. This allowed less formal feedback, and some discussion that might otherwise not have been possible was generated.

The Project Manager met with the General Practitioner Test Panel on Compliance Costs after the Ministry of Health published the test panel's findings in December 2000.⁸ The test panel's recommendations were relevant to the Injury Data Review, particularly when considering the costs and benefits of the proposed system for the management of injury information.

Consultation with a representative of the Privacy Commissioner was undertaken at appropriate stages of the review. The Privacy Commissioner was concerned about the possible use of the National Health Index (NHI) number in linking injury data sets. He strongly recommended a firewall between the incoming (not integrated) and outgoing (integrated) data, particularly if unique identifiers were used in integration. He suggested a test to see if unique identifiers were required to carry out quality integration. It is anticipated that this test will be undertaken when the review results are implemented.

A full list of all those involved in the review or consulted as part of the review is included in Appendix B.

⁸ General practitioner Test Panel on Compliance Cost. *Report to the Minister of Health from the General Practitioner Test Panel on Compliance Cost*. Wellington: Ministry of Health (available on <http://www/moh.govt.nz>).

3. RESULTS OF THE REVIEW

The review sought to address the identified problems by undertaking a number of pieces of work. The review was conducted in two phases. Phase one addressed the first two objectives (to identify a conceptual framework and a set of indicators). Both the framework and the indicators were subjected to international peer review and broad agreement was reached as to their suitability. The process followed in phase one was to:

- review past reports and research and consolidate earlier learning
- research overseas practice on the conceptual frameworks for injury data and relate them to policy needs in New Zealand, and research the indicators used overseas, including how and when they are measured and reported on
- consult with key stakeholders including the Department of Labour, ACC, Ministry of Health, and Privacy Commissioner
- determine which of the identified indicators will best support the government's objectives
- define how the indicators will be measured and the supporting numerator and denominator variables
- determine the appropriate unit of measurement and classifications in order to achieve international comparisons and future integration of injury data across clusters
- collect data dictionaries from relevant agencies including data definitions and classifications
- conduct a gap analysis between the data collected and the data needed for the framework and identify overlaps
- prioritise any recommendations for amendments to data and data classifications

- identify fiscal, legislative, capacity, and data supply risks during data collection and analysis, including lessons learned from other organisations
- determine steps to be taken to achieve an adequate degree of integration across different data sources.

Phase two addressed the third objective, culminating in a paper that set out options for the form, function and selection of an Information Manager for injury statistics. It also proposed a range of operational and funding arrangements for collecting and reporting on injury statistics, and looked ahead to the next steps required to implement the recommendations of the review.

The process for phase two of the review was to:

- determine how overseas and New Zealand-based organisations collect and consolidate data from multiple data sets
- determine how best to progress work on the other sectors
- develop and apply a set of criteria to identify potential stewards and reporting agents
- identify the cost/benefits of each option and make recommendations to proceed
- identify the potential operational models and funding arrangements for collecting and reporting on injury statistics
- select the Information Manager
- determine the next steps to implement the selected model.

Each piece of work is outlined in the following sections of the report. A list of the key papers and other relevant documents produced in the course of the review is in Appendix E.

3.1 Establishing the conceptual framework for injury data

The Injury Data Review project team identified a number of 'clusters' of injury. These were a way of grouping types of injury that have particular attributes and therefore may have some information requirements that are specific to that cluster. The clusters identified were: workplace, transport, home and public safety, sport and recreation, and intentional injuries. It was originally intended that the review process would concentrate on workplace injuries so that it could align with the injury prevention policy framework, which was being developed at the same time (that framework was being developed using workplace injuries as a focus). In addition, the original intent of the review was to deal with workplace accident insurance claim data, which is a subset of workplace injury information. However, once work started on reviewing information needs it became clear that a wider view was needed so it was decided to concentrate first on the information common to all injuries and move on to the special needs of the clusters after that. In the time available, the workplace cluster was the only one the project team investigated in any detail.

WHY HAVE A FRAMEWORK?

A statistical framework organises, structures and standardises data. A framework describes the appearance and overall function of a finished structure and, in doing so, how the various components relate to one another. If conditions change, the design can be altered to better reflect the new environment.

The usefulness of statistical data depends on the quality of its framework. By giving shape to a particular area of data collection, a statistical framework provides a basis on which user needs can be systematically defined, existing statistics assessed, and unmet demands for information determined. The framework provides the basis for developing a coherent strategy for the collection, analysis and presentation of statistical data.

CONCEPTUAL FRAMEWORK FOR INJURY DATA

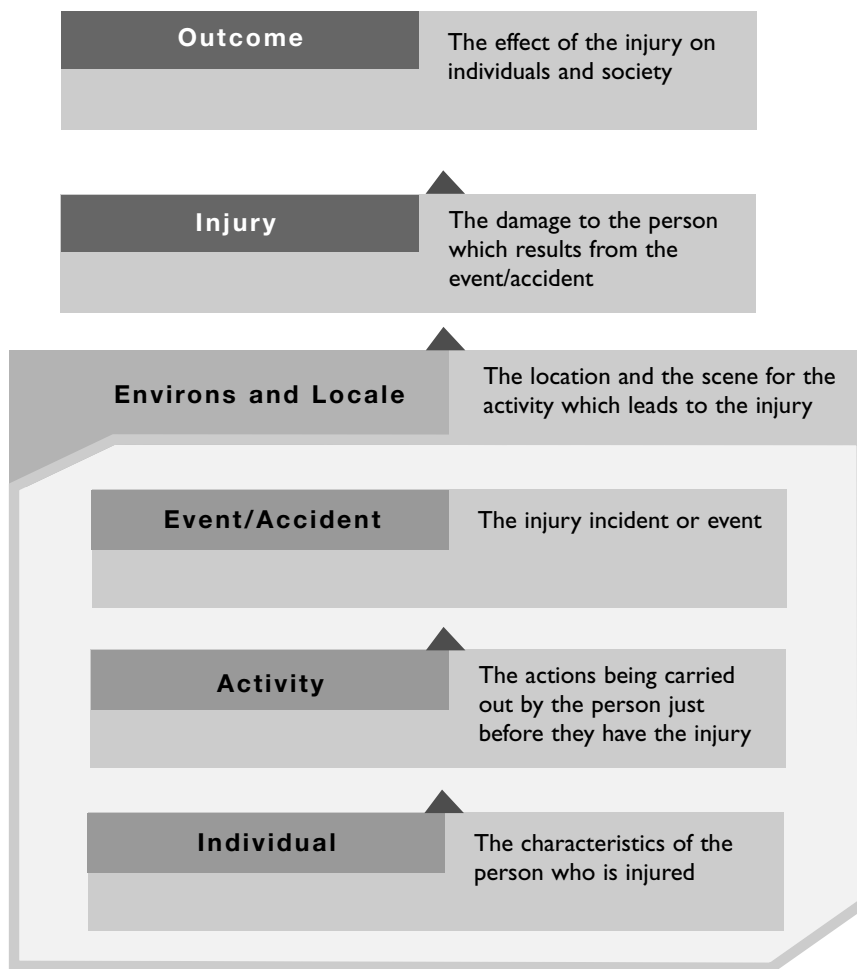
A number of conceptual frameworks for injury data were considered. A description of the frameworks that were considered is in Appendix C.

The project team determined that a generic framework was required that could be applied across all injury sectors, deal with different degrees of severity, and enable indicators and data to be identified to meet the government's objectives in injury prevention and management.

Frameworks that are used internationally for the presentation of statistical information were investigated. Most were found to be either too detailed or too broad for the purposes of the Injury Data Review. For example, the Public Health Conceptual Data Model, developed by the United States Center for Disease Control and Prevention, covered too wide a subject area.

The preferred conceptual framework for injury data (Figure 1) was based on a framework for workplace injuries recommended by the International Labour Organisation at the Sixteenth International Conference of Labour Statisticians, 1998.

Figure 1: Conceptual framework for injury data



ELEMENTS OF THE CONCEPTUAL FRAMEWORK FOR INJURY DATA

Environ and locale

The environs and locale set the scene for the activity that leads to the event or series of events that cause the injury. The individual who is injured cannot usually control the environs and locale. Normally the event or series of events that cause the injury do not affect the environs and locale. However, this is not always the case (earthquakes, avalanches and landslides, for example, change the environs and locale and may injure people). For each cluster, different aspects of the environs and locale are relevant.

Individual

The individual element defines and describes the characteristics of the person who had the injury. The individual who is injured is the unit of measurement for injury statistics. This means that if more than one person is injured in the same accident, there will be a separate record for each individual. Information collected about the individual helps us understand whether particular groups within the population are more subject to injury. Basic demographic data also allows comparisons with other data sets that collect this information. The information about the individual includes age, sex, ethnicity, place of domicile, labour force status, and occupation.

Activity

Activity is the action being carried out by the person just before the event or accident. It is not the action that actually caused the accident (for example, tramping is an activity whereas tripping over the log is an action). Information on this part of the frame-

work tells us which activities tend to generate the most injuries. Activity is important for understanding the background to the accident/event.

Event/accident

The event/accident is the point at which something occurs that results in injury. The event/accident element of the framework describes the factors that lead to the injury. These factors can include the time of the day the event/accident happened, how many other people were involved in the event/accident, whether the event/accident was intentional, the specific action which caused the injury (eg, falling) and whether any object was involved (eg, car). The event/accident is where the conceptual definition of an event/accident causing injury can be measured.

Injury

The injury is the damage to the person that results from the event. Information related to this element includes clinical diagnosis, what site of the body has been injured, and the severity of the injury.

Outcome

The outcome element of the framework measures the effect of the injury on individuals and on society as a whole, including, for example, treatment and rehabilitation. This element is where direct and indirect costs are accumulated and measured. The injured person may be hospitalised, may have to be absent from work, may suffer permanent incapacity, or may die. The event could also lead to the development of an injury at a later date, particularly in the case of exposure to solvent or a virus. Indicators in this element of the framework inform policy on injury prevention and management.

3.2 Indicators of injury

WHY USE INDICATORS?

Indicators are statistics that have been designed to measure topics, issues, or problems of specific interest. Usually the aim of an indicator is not to describe a situation but to signal and warn of the direction of change. It is a means by which comparisons are made. The comparison may be between two points in time, or it may be between one point in time and a predetermined target. Thus a statistic which has no counterpart in another timeframe is not an indicator because it cannot be used to make a comparison over time. Often, but not always, indicators are statistics, that is, they are quantitative entities designed to show difference or change in a summarised way. Indicators may also be qualitative.

Whether a statistic, either simple or derived, is a useful indicator depends largely on whether it serves the purpose for which it is selected, and whether it reflects a useful social idea. Some indicators take the form of a set of statistics, each of which measures a separate dimension. An indicator normally summarises a large amount of

information in a single figure and gives an indication of change over time. However, what the indicator measures will always be the outcome of a group or range of situations that are generally far more complex.

Indicators summarise a change in some aspect of society and the information they provide is deemed to be useful for policy formulation and monitoring. They are used to inform policy decisions within the government and to help the government assess whether, when judged against the benchmarks, we are achieving particular objectives. Indicators are also intended to highlight the key issues and objectives for businesses and individuals and thus help people to understand how they can contribute to particular objectives.

Indicators are used for many purposes including:

- helping to establish goals and priorities (for example, increasing the educational qualities of population)
- providing information on areas of interest, such as employment conditions or income
- identifying problems and issues, which sometimes emerge from indicators that are not the current focus of policy
- anticipating effects of initiatives.

INDICATORS FOR INJURY DATA

The project team undertook initial research and consultation, and two working papers were produced. The first paper, the *Cost of Injury Model* paper, uses a cost of illness model to develop a conceptual framework for modelling the economic and social costs of injuries, from which to derive the cost of injury indicators. The second paper, *A Model for Conceptualising Injury Severity and Consequence*, discusses two types of severity – the first measured by an assessment of the injury on the body (which is easy to measure according to international coding systems) and the second measured by the consequences of the injury (cost, rehabilitation time etc, which have many and varied measurement issues). In addition, a paper prepared by Statistics New Zealand for a previous project provided information on why indicators are needed, and what criteria should be used for developing indicators.

A literature review was commissioned to source other injury indicators used within New Zealand and overseas. The report outlined injury indicators used within public health, occupational safety and health, and accident compensation. It outlined criteria by which indicators were chosen and the rates by which they were measured.

Indicators were developed to inform each of the elements of the conceptual framework for injury data and were based on key policy, and injury prevention questions were determined that were based on early models of framework. Proposed indicators were assessed against a series of criteria that were derived from the framework definition and elements, the

government's objectives for injury prevention and management, criteria recommended elsewhere, and good practice on measurement selection. The criteria were selected from a population-based approach (or a surveillance approach) that concentrates on the magnitude of the problem, rather than for the purposes of monitoring or evaluating specific injury prevention and management programmes or mechanisms.

The criteria for the indicators for the New Zealand Injury Data Review were that the indicator must:

- illuminate and support aspects of the conceptual framework for injury data
- represent an important and salient aspect of the public's health
- be valid and reliable for the general population and diverse population groups
- be readily comprehensible by people who need to act on their own behalf or that of others to improve the status of those indicators
- galvanise action by individuals as well as organised groups and public and private agencies at the national, state, local and community levels
- if measured over time, tangibly reflect the results of action to improve various aspects of the nation's health
- be developed from routinely or easily collected data that serves an operational purpose
- measure, in an unbiased way, the occurrence of injury
- have benefits of collection that are greater than the costs incurred to collect the information.

⁹ Langley, J and Norton, R. 'Indicators for Injury Surveillance'. *Australian Epidemiologist* 7:1, 2000. Chivala, C and Bulger, R (eds). *Leading Health Indicators for Healthy People 2010: Final Report*. Washington: Institute of Medicine, National Academy of Sciences, 1999.

Figure 2 identifies the questions of interest, the indicators that inform these questions, and their definition for the overall injury sector. The list of indicators is a comprehensive, but not exhaustive, set of measures that covers the conceptual framework for injury data. There is potential to combine measures further with some variables to extend the number of questions that can be answered. In addition, there are some indicators that only apply to workplace injuries as a result of the workplace cluster work.

Figure 2: Policy questions, indicators and their definition

	Policy Questions	Indicator	Definition
Outcomes	How many people die as a result of injury?	Number of deaths as a result of injury	Count of new injury-related deaths (ie, injuries that happened in the time period)
		Injury-related deaths per 100,000 population	Numerator: number of injury-related deaths Denominator: average usually resident population divided by 100,000
		Injury-related deaths as a proportion of all deaths	Numerator: number of injury-related deaths Denominator: number of deaths
	How many people are injured?	Number of injuries Number of injured persons	Count of all injuries that occurred Count of all persons injured
		Injuries per 100,000 population Injured people per 100,000 population	Numerator: number of injuries, number of injured persons Denominator: average usually resident population divided by 100,000
	How many potential years of life are lost as a result of injury?	Years of potential life lost (Age at time of death subtracted from the age of 75)	Distribution (ie, 1-10 years, 11-20 years, 21-30 years etc) in the form of a count and % of years of potential life lost
	What is the financial cost of the injury?	Total cost of treatment, compensation and rehabilitation for all injuries	Add all injury-related treatment, rehabilitation, and compensation costs that occur
		Average cost of treatment, compensation and rehabilitation per new injury	Numerator: total cost of treatment, compensation and rehabilitation for those injuries that occurred Denominator: total number of injuries that occurred
		Average cost of treatment, compensation, and rehabilitation per injury for all other ongoing claims	Numerator: total cost of treatment, compensation and rehabilitation for ongoing injuries Denominator: total number of ongoing injuries
		Cost of treatment for all injuries per NZ\$million Gross Domestic Product	Numerator: total cost of treatment, compensation and rehabilitation for those injuries that incurred costs Denominator: Gross Domestic Product divided by 1,000,000
	What is the time lived with a disability and the time lost due to premature mortality?	Disability Adjusted Life Year (DALY)	Quantitative measure of years of life lost due to premature mortality plus years of life disabled
	What proportion of injuries resulted in hospitalisation	Proportion of new injuries that result in hospitalisation	Numerator: total injury-related discharges from hospital for injuries that occurred during a specified time period Denominator: total number of injuries during that time period
		Count of injuries that result in hospitalisation	Number of injury-related discharges from hospital
		Hospitalised injuries as a proportion of all hospitalisation discharges	Numerator: number of injury-related discharges from hospital Denominator: total number of hospital discharges

	Policy Questions	Indicator	Definition
Outcomes continued		Hospitalisation because of injury per 100,000 hospitalisation cases in time period	Numerator: number of injury-related discharges from hospital Denominator: total number of hospital discharges divided by 100,000
	What proportion of injuries result in permanent disability?	The proportion of injuries that occurred in the previous year that have resulted in permanent disability	Numerator: number of injury-related permanent disabilities diagnosed for those injuries that occurred in the previous year Denominator: total number of injuries that occurred in the previous year
		Total number of people that suffered permanent disability as a result of an injury that occurred in the previous year	Number of injury-related permanent disabilities diagnosed for those injuries that occurred in the previous year
	How many injuries require long-term treatment?	Count of injuries that required long-term treatment	Number of injuries requiring long-term treatment
		Proportion of injuries that result in long-term treatment	Numerator: number of new injuries requiring long-term treatment Denominator: total number of new injuries
	Do injured individuals return to any work?	Number of people with a work-related injury who return to work	Numerator: number of people who return to work Denominator: number of people injured who were employed at the time of the injury (Household Labour Force Survey)
	What proportion of injured individuals return to work in 5, 10, 30, 60 days (lost days of work)?	Number of people with a work-related injury who return to work after a certain number of days	Distribution of people and the time taken to return to work in calendar days
	How effective is the treatment injured people receive?	The distribution of treatment type and injury against time taken to recover	Numerator: distribution of treatment type and injuries Denominator: number of injured that received treatment
			Number of recovered people with treatment against number of recovered people that received less treatment (ratio) in a given timeframe. Length of time taken for people with injuries that received treatment to recover (recovery will be an estimate using full/partial return to work, compensation ceases)
	Individual	What is the sex of injured people?	The proportion of all new injuries that happen to males
Male injuries as a proportion of all males			Numerator: number of males with injuries Denominator: total number of males
Male injuries per 100,000 males			Numerator: number of males with injuries Denominator: total number of males divided by 100,000
The proportion of all new injuries that happen to females			Numerator: number of females with injuries Denominator: total number of injuries

	Policy Questions	Indicator	Definition
Individual		Female injuries as a proportion of all females	Numerator: number of females with injuries Denominator: total number of females
		Female injuries per 100,000 females	Numerator: number of females with injuries Denominator: total number of females divided by 100,000
	What is the sex of people with a work-related injury?	Number of males with a work-related injury as a proportion of all males employed	Numerator: number of males with a work-related injury Denominator: total number of males employed
		Number of females with a work-related injury as a proportion of all females employed	Numerator: number of females with a work-related injury Denominator: total number of females employed
	At what age do most injuries occur?	Proportion of new injuries that occur by five-year age groups	Numerator: number of new injuries by five-year age group Denominator: total number of injuries
		Injuries by five-year age group, as a proportion of all people in that age group	Numerator: number of new injuries by five-year age group Denominator: total number of people by age group (population estimates for usual population)
		Five-year age group injuries per 10,000 in that age group	Numerator: number of new injuries by five-year age group Denominator: total number of people in that age group (population estimates for usual population divided by 10,000)
	Do injuries happen to one ethnic group more than another?	Proportion of new injuries that occur by ethnic group	Numerator: number of injuries by ethnic group Denominator: total number of injuries
		Injuries by ethnic group as a proportion of all people in that ethnic group	Numerator: number of injuries by ethnic group Denominator: total number of people in that ethnic group
		Injuries by ethnic group per 10,000 of that ethnic group	Numerator: number of injuries by ethnic group Denominator: total number of people divided by 10,000
	Where do people who are injured live?	Proportion of injuries that occur to people who live in a particular geographic area	Numerator: number of injuries for people by geographic area Denominator: total number of injuries
	What is the socio-economic status of those who are injured?	Proportion of injuries that occur in each decile rating based on the NZ Deprivation Index	Numerator: number of injuries by decile rating Denominator: total number of injuries
	What occupations are at highest risk for injury?	Workplace injury by occupation as a proportion of all workplace injuries	Numerator: number of workplace injuries by occupational classification Denominator: total number of workplace injuries
	Activity	What are the most common activities being carried out where injury occurs?	% of different activities that result in new injury

	Policy Questions	Indicator	Definition
Activity	What are the most common agencies that cause injury (ie, the object(s) or substance(s) involved)?	% of different agencies that result in new injury	Numerator: number of injuries by agency Denominator: total number of injuries
	What are the most common mechanisms that cause injury (ie, the action leading to the injury)?	% of different mechanisms that result in new injury	Numerator: number of injuries by mechanism Denominator: total number of injuries
Event	How many injuries/injury events are work-related?	Proportion of new injuries that are work-related	Numerator: number of workplace injuries Denominator: total number of injuries
		Work-related injuries per 100,000 employed	Numerator: number of workplace injuries Denominator: number of people employed (Household Labour Force Survey) divided by 100,000
	How many injury events involve more than one person?	Number of injuries involving more than one person as a proportion of all injury events	Numerator: number of injuries resulting in more than one injured person Denominator: total number of injuries
	What proportion of injury incidents are intentional?	Proportion of injuries that are intentional	Numerator: number of intentional injuries Denominator: total number of injuries
Intentional injuries per 100,000 population		Numerator: number of intentional injuries Denominator: total population	
Environments/locale	What is the most common scene of the injury event?	% of different scenes that result in new injury	Numerator: number of injuries by scene Denominator: total number of injuries
	Which area of NZ has the greatest rate of injury?	Proportion of injuries that occur in a particular geographic area	Numerator: number of injuries by geographic area Denominator: total number of injuries
	What are the industries with the highest work-related injury rates?	Proportion of work-related injuries that occur in a particular industry.	Numerator: number of work-related injuries by industry classification Denominator: total number of work-related injuries
	What are the industries with the highest work-related fatality rates?	Proportion of work-related fatalities that occur in a particular industry	Numerator: number of work-related fatalities by industry classification Denominator: total number of work-related fatalities
	Does firm size impact on injury rates?	Proportion of people injured at work who work in small, medium, or large businesses	Numerator: number of injured workers per small, medium, large business Denominator: number of injured workers employed in small, medium,
Injury	What are the most common injuries (diagnosis)?	Proportion of injuries with a particular diagnosis	Numerator: number of injuries by READ or ICD10 code. Denominator: total number of injuries
	Where on the body do most injuries occur?	Proportion of injuries on a particular body site	Numerator: number of injuries by body site Denominator: total number of injuries
	How severe are most injuries?	Distribution of severity of injuries	Numerator: number of injuries by severity Denominator: total number of injuries

DATA SET, DEFINITIONS AND STANDARDS TO SUPPORT INDICATORS

The data set, consisting of numerator and denominator variables, that supports the proposed indicators needed to be decided and defined according to standard definitions. A draft data set was developed by the project team to match the indicators.

The project team identified the need to ensure that standard definitions were used by each of the agencies that currently collects injury data. Data dictionaries were consulted, and a list of standards and definitions of each of the variables used in the data set was drafted.

Numerators

Figure 3 below lists and defines the variables proposed by the Injury Data Review that would be supplied from the data set. Those variables marked with an asterisk are specific to the workplace cluster.

Figure 3: Proposed injury data set: numerator variables

Death	Did the person die as a result of injury?
Date of death	Date injured person died
Date of incident	Date when the injury incident occurred
Cost of compensation	Compensation paid (includes total compensation paid)
Cost of treatment	Payments made for treatment
Cost of rehabilitation	Payments for social and vocational rehabilitation
Permanent disability	Nature, if any, of permanent disability as a result of the injury
Hospital admit date	Date person was admitted to hospital
Hospital discharge date	Date person was discharged from hospital
Number of treatment episodes	A count of the total visits to primary health care providers
Sex	Sex of injured person (male, female)
Date of birth	Date injured person was born
Ethnicity	Defined by Statistics NZ Standard Classification - self-identified ethnic classifications of the injured individual
Place of domicile	Address of injured person
Text description	Narrative description of the injury event
Activity	Activity when injured (eg, gardening, jogging, tramping)
Mechanism	Cause of the injury (eg, fall, hit, heat radiation, body stress)
Agent	Object that caused the injury (eg, machinery, animal)
Geographical location of the person when injured	Geographical area where the injury occurred
	<i>Continued next page</i>

Figure 3: Proposed injury data set: numerator variables (continued)

Intent – violent intent by others	Was the injury deliberately inflicted by another person?
Intent – self-inflicted	Was the injury deliberately inflicted by the injured person?
More than one person injured at the incident	Did the incident cause more than one person to be injured?
Incident scene	Type of place where the person was injured (eg, farm, school, park, office)
Diagnosis	Nature of the injury/injuries
Body site	Bodily location of injury (eg, left arm)
Severity	Severity of the injury
Work-related primary*	Injury to a person working on or off the employer's premises (those individuals with employee status)
Work-related subsidiary*	People injured around and as a result of the workplace, or on their way to/from workplace (includes bystanders, visitors and commuters)
Full return to work	Date the injured person returns to full-time work
Partial return to work	Date the injured person returns to partial work
Incapacity until date	Date that compensation and/or treatment ceases for the injured person
Occupation*	Occupation or job at time of injury
Name of organisation*	Organisation responsible for compensation of the injury
Industry classification of workplace*	Industry of the organisation responsible for compensation of the injury
Size of firm*	Number of employees obtained via FTE or Total Liabile Earnings

DENOMINATORS

The choice of appropriate denominators turns incidence into rates. Injury rates involve standardising the injury incidence against a denominator. The most appropriate denominator will be dependent on the injury category. The following table lists the denominators and their source proposed by the Injury Data Review.

Figure 4: Proposed injury data set: denominator variables

Variable	Definition
Average population	Average usually resident same period
Population estimate	Population estimates for usual population
Total population	Total population
Number of deaths	Number of deaths in same period
Number of injuries	Total number of injuries that occurred
Ongoing injuries	Total number of ongoing injuries
Gross domestic product	Gross domestic product
Number of discharges	Total number of hospital discharges
Number of males Number of females	Total number of males, females
Population ethnic	Total number of people in that ethnic group
Number of people employed	Number of people employed (Household Labour Force Survey)

CONSULTATION

For the most part, reviewers were supportive of the approach being taken and made most of their comments around difficult areas such as the definition of an injury, including whether occupational disease should be included, and when an injury is counted. Commentators were concerned at the way 'work-related' was defined and there was strong support to include commuting and bystander incidents within the work-related category.

It was noted that hospital admission should not be used as a proxy for severity because administrative changes in hospitals can change the figures. It was also recommended that more than one indicator of severity should be included and that, if possible, the indicator should be independent of administrative processes. Work on defining severity was noted as further work to be undertaken.

Some indicators were excluded on the advice of the reference group (for example, hours worked in the last five days, pre-injury capacity) mainly because they were difficult to measure and therefore the output would be poor quality. One reviewer strongly supported the narrative description of the injury, because it can be examined for causal factors, and where desired can be re-coded according to different coding schemes.

3.3 Gap analysis

Following agreement on the indicators, a gap analysis was undertaken to determine which agencies already collect or report on the data set, and to what level of completeness. Figure 5 identifies agencies¹⁰ that hold injury data, the

volumes per annum, and the agencies' operational purposes for collection and use. This table demonstrates the volume of injury information per year and the diverse reasons for collection and use.

While the volume of data varies considerably across agencies, no agency records all injuries nor does any agency have all data around an injury event. ACC, for example, has the greatest volume of records; however, it does not collect every injury fatality. Land Transport Safety Authority collects extensive data on motor vehicle crashes but does not provide information on the diagnosis of injury.

This analysis confirmed that fragmentation is a key problem with existing sources of injury information.

Figure 5: Injury data collection: volume and purpose

Agency	Volume per annum ¹¹	Operational Purpose
New Zealand Health Information Service	105,000 hospital records 1,783 mortality records	Ministry of Health and ACC use NZHIS data to monitor hospital contractual performances, assess injury burden and injury rates. Official statistics about the causes of death are provided.
ACC	104,386 entitlement claims 1,088,728 minor claims	ACC uses data to process claims, set levies, monitor and target services and ensure prevention of, cover for, and recovery from injury.
Land Transport Safety Authority	12,508 crash records	Information is collected to reduce the road toll and trauma resulting from road and rail crashes.
Department of Labour: Occupational Safety and Health Service	5,900 injury records	The data is used to facilitate enforcement of the HSE Act.
Department of Labour: Accident Insurance Regulator	217,189 claim records 1.3 million claims	The Regulator analyses the claim records to ensure adherence to the law and regulations. Claims come from the private insurance market (July 2000 to March 2001 only) and ACC (July 2000 to June 2002 only).
Civil Aviation Authority	79 reported injury cases	Data is used to investigate aviation incidents to reduce the rate of injury and their consequences.
Maritime Safety Authority	199 reported injury cases	Data is used to investigate causes of maritime incidents.
Coroner's Court	1,481 cases	Some information stored electronically, but full records are on paper files.

¹⁰ It should be noted that this list is not exhaustive as other agencies hold information related to injury data. For instance, the Ministry of Economic Development has a database of consumer product safety complaints. The review's scope was limited to government agencies that hold injury data around individuals.

¹¹ Data sources include: New Zealand Health Information Service, 'Selected Morbidity Data for Publicly Funded Hospitals and Mortality and Demographic Data'; ACC, 'Accident Compensation Corporation Injury Statistics 2000'; Land Transport Safety Authority 'Motor Accidents in New Zealand 1999'; Department of Labour, extracts from the Occupational Safety and Health Service database, and Accident Insurance Regulator's claim database; Civil Aviation Authority, extract for the year 2000 of aviation injury cases.

The second major problem was the lack of consistent data standards between the agencies. In many cases the agencies use different definitions or classifications to describe the same concept. It was noted that the information was collected by each agency to meet their operational needs, and this does not always translate into good statistical information. Figure 6 below shows the assessment of the collection and quality of data collected by the agencies that hold injury data.

Figure 6: Collection and quality of injury information

Key:

- not collected
- ✓ collected to a high standard
- ◐ problems with collection (poor quality, not for all records, not electronically stored, not mandatory, needs improvement etc)
- collected to a high standard but not the required definition or format for injury data set etc
-) partially collected (not for all injured people, age rather than date of birth etc)
- ✗ irrelevant

Variable	ACC	NZHIS	NZHIS: Mortality	Coroner's Court	DoL	LTSA	CAA	MSA
Death	✓	✓	✓	✓	✓	✓	✓	✓
Date of death	✓	✓	✓	✓	○	○	✓	○
Date of incident	✓	✓	✓	✓	✓	✓	✓	✓
Cost of compensation	✓	○	✗	✗	○	✗	✗	✗
Cost of treatment	✓	✓	○	○	○	✗	✗	✗
Cost of rehabilitation	✓	○	○	○	○	✗	✗	✗
Permanent disability	✓	○	○	○	○	○	○	○
Treatment	✓	✓	○	○	○	○	○	○
Hospital stay date	○	✓	○	✗	○	○	○	○
Hospital discharge date	○	✓	○	✗	○	✗	✗	✗
Number of treatment	✓	○	✗	✗	○	✗	✗	✗
Date of birth	✓	✓	✓	✓	✓	✓	✓	✓
Ethnicity	◐	◐	◐	◐	◐	○	○	◐
Place of domicile	●	✓	✓	●	●)	●	○
Text description	●	●	●	●	◐	●	●	●
Activity	✓	✓	✓	◐	○	●	●	●
Mechanism	◐	●	●	◐	●	●	●	●
Agent	●	✓	✓	◐	●	●	●	●
Geographical location	◐	○	○	◐	●	●	●	●
Intent – violent	○	✓	✓	◐	○	○	○	○
Intent – self-inflicted	○	✓	✓	◐	○	○	○	○
More than one person involved in the accident	○	○	○	◐	✓	●	●	●
Incident scene	●	✓	✓	●	●	●	●	●

Variable	ACC	NZHIS	NZHIS: Mortality	Coroner's Court	DoL	LTSA	CAA	MSA
Diagnosis	●	✓	✓	●	●	○	○	○
Body site	●	✓	✓	●	●	○	○	✗
Severity	●	✓	✓	✓	○	✓	✓	✓
Work-related primary	✓	○	○	○	✓	○	✓	✓
Work-related subsidiary	○	○	○	○	○	○	○	○
Full return to work date	✗	○	○	○	○	○	○	○
Partial return to work date	✓	○	○	○	○	○	○	○
Incapacity until date	✓	○	○	○	○	○	○	○
Occupation at time of injury	✓	●	●	●	✓)	●	●
Name of organisation	◐	○	○	○	✓	✗	✓	○
Industry classification	◐	○	○	○	◐	✗	○	○
Size of firm	◐	○	○	○	◐	✗	○	○

3.4 Data linkage

Following the gap analysis, a data linkage exercise was proposed. The purpose of this was to compare the scope, quality and standards for injury data in New Zealand and to determine the gaps and overlaps. It was intended to collect and compare a sample of injury data from the above agencies and from the Coroner's Court. Although the exercise had the approval of the Privacy Commissioner, it was decided to defer the exercise until a clear programme of development work for injury data co-ordination was determined.

3.5 Model for information management

The problem definition identified a number of issues that the injury data review sought to address. The conceptual framework for injury data, indicators and data set provide the basis for improved information collection however co-ordination, collection, management, and reporting of the data ('information management') are also required.

INFORMATION MANAGEMENT METHOD

An appropriate approach to managing and reporting on injury indicators in the interim and the long term was one of the primary

objectives of the Injury Data Review. A number of models were identified based on legislative and overseas examples. The models were contrasted with the problems that had been identified, and a selection was made on the basis of which model would best solve the problems. The other models that were considered are in Appendix D.

The model chosen was an 'injury surveillance' model, which creates a data set that allows comprehensive statistical analysis of injury indicators to occur through the integration of data. Integration helps to identify gaps and overlaps in coverage of injuries by the various agencies (vertical integration) and enriches the individual data sets by linking them to new pieces of information (horizontal integration). Integration is efficient because it adds or extends the value to existing data sets. No agency needs to collect the entire data set and better use is made of the data already in existence. This recognises that some agencies already collect information for their business purposes to a high standard that can also be used for statistical purposes. For instance, compensation and rehabilitation costs can be obtained from ACC, the Ministry of Health collects mortality and hospitalisation data, and the Land Transport Safety Authority collects information about car crashes.

Most agencies involved in the review strongly supported the injury surveillance model. However, ACC preferred a virtual integration model (where data was held in each agency and was brought together only when required) as it was the least-cost approach.

Once established, the integrated data set will be the basis for producing injury information, be a tool for researchers and enable the government to be informed on the success of injury prevention and management initiatives.

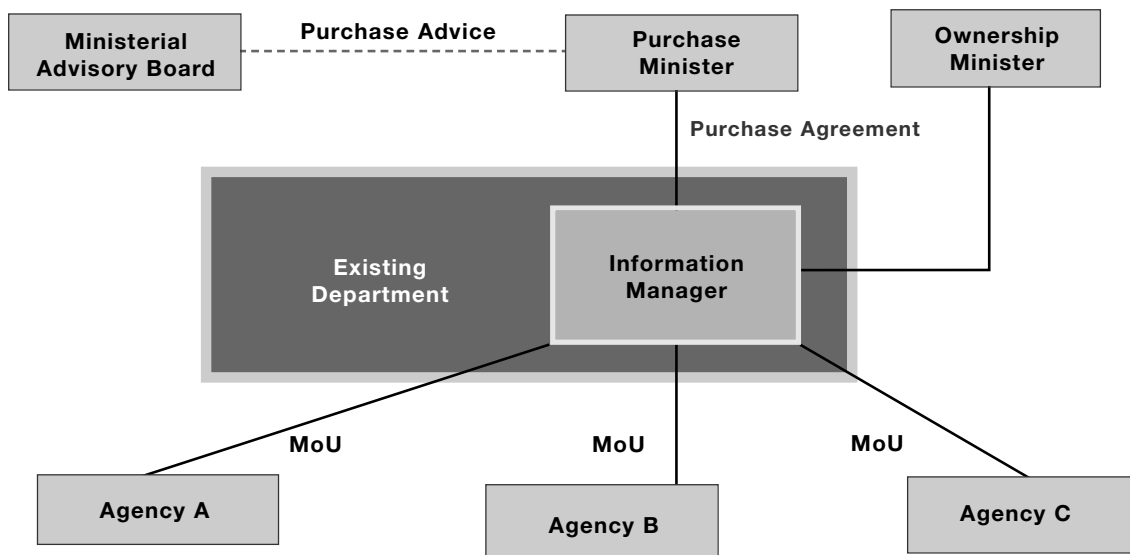
GOVERNANCE AND ACCOUNTABILITY MODEL

A governance and accountability arrangement for the injury surveillance model was recommended to Cabinet in *Injury Data Review: A Model* (June 2001). The governance and accountability model is comparable to similar

models in Canada and Australia and is depicted in Figure 7 below.

The key feature of this governance and accountability model is an Information Manager that integrates and provides access to the data. The model allows for a direct line of accountability from the Information Manager to the Purchase Minister and, in addition, for the Minister to receive advice from a Ministerial Advisory Panel. Under this arrangement, the Purchase Minister purchases outputs from the Information Manager, but does not control the methodology used to produce the results or the manner of their publication and dissemination. The Information Manager reports directly to the Purchase Minister, and is responsible for achieving the outputs specified in the Purchase Agreement with the Minister.

Figure 7: Governance and accountability model



Ministerial Advisory Panel

The Ministerial Advisory Panel provides advice on direction and strategy of the model, reporting and the data sets. It comprises users, stakeholders, injury experts and government agencies providing data. By directly reporting to the Minister, the Advisory Panel has influence, and key stakeholders who provide data have increased commitment to successful implementation of the model. The Panel encourages the Information Manager to consult with and respond to the concerns of stakeholders and data providers and is a forum to provide the Information Manager with external feedback needed to ensure that the information produced is relevant and effective.

Role of the Information Manager

The Information Manager is the central part of Figure 7, and is responsible for implementing the integrated data set. The Information Manager's tasks include:

- promulgating standards and definitions and co-ordinating agencies' implementation of the injury veillance framework
- integrating data from ACC, the New Zealand Health Information Service, Coroner's Court, Department of Labour, Land Transport Safety Authority, Maritime Safety Authority, Civil Aviation Authority, and Statistics New Zealand in the most cost-effective manner to create injury data set(s)
- producing meaningful injury information
- making data set(s) available for research and statistical purposes by developing and implementing protocols for access including managing privacy issues
- publishing meaningful, analytical reports using integrated data
- facilitating or answering ad hoc queries that deal with injuries, such as parliamentary questions or Official Information Act requests.

Legislative provisions

Part 8 of the Injury Prevention, Rehabilitation, and Compensation Act 2001 gives force to the

government's intention to improve injury information collection, analysis and reporting. It builds on current injury reporting by the Accident Insurance Regulator and ACC and extends and includes reporting coverage to other injury-related data.

The legislation was drafted to enable the Information Manager role to be defined in such a way that the Prime Minister is able to require the Chief Executive of any Department of State or Crown Agency to fulfil the role.

The Act specifies that the Information Manager will develop, set, publish, and maintain standards, collect and aggregate injury-related information, facilitate access to achieve particular goals and objectives (including publishing) of injury-related information, and consider and review current and future injury-related information requirements (section 287).

The Act also specifies the governance and accountability parameters for the Information Manager:

- The Prime Minister may designate a person or agency to be an Information Manager.
- The Prime Minister will designate a Purchase Minister to whom the Information Manager will deliver outputs.
- The Purchase Minister will receive advice from a Ministerial Advisory Panel.
- The Purchase Minister and Information Manager will specify purchase agreement outputs.
- The Information Manager may delegate functions subject to ministerial approval.

Because of the need to preserve the Government Statistician's independence, and because the existing powers within the Statistics Act were sufficient, the Act specifies that if the Prime Minister designates the Government Statistician as Information Manager, the Purchase Minister will be the Minister of Statistics, and Statistics New Zealand will be exempt from sections 289(2) to (7), 290, and 292.

3.6 Costs and benefits of the proposed model

COST ANALYSIS

An independent contractor undertook a cost analysis of the proposed injury surveillance and governance and accountability models. The cost analysis drew on the work of the gap analysis and interviews with agencies, and was intended to:

- confirm the results of the gap analysis
- determine any system changes planned by the agencies in the future
- obtain agencies' views of compliance costs if they are required to collect and transfer electronically all data specified in the data set to the Information Manager.

The report contains estimates from data provider agencies of the likely cost of collecting and transferring data to the Information Manager, as well as an estimate of the set-up and operating cost of the Information Manager.

Data collection

Data collection costs included one-off costs such as altering forms and systems to collect and process the data, and ongoing costs included increased staff numbers and/or increased payments to information providers.

The study found that most of the variables specific to the workplace cluster were not collected by the agencies because they have no direct or obvious benefit to the agencies (for example, size of firm). The work variables will therefore be the most costly to collect under the conceptual framework for injury data

because they may need to be added to the data set of particular agencies.

The study also confirmed that the coding systems used by the agencies are not consistent at the 'raw data' level. Depending on the final agreed standard and the approach taken to standardisation, the costs of conversion may be significant. For example, while all agencies collect a 'text description' of the incident, not all of them collect the information in a way that supports a text search for the purposes of analysis.

Two instances in particular were noted where injury statistics are currently incomplete. The Coroner's Court does not collect all deaths on the country's death registry; thus it is possible that the Coroner's Court would not be able to provide information on all injury-related deaths. The New Zealand Health Information Service however, maintains a mortality database containing information on all deaths registered. Further investigation is recommended to determine the best option to collect 'death caused by injury'. The study provided costs for the two options: either the Coroner's Court or the New Zealand Health Information Service to provide fatality data to the Information Manager. Secondly, the study notes that the New Zealand Health Information Service does not collect information on injuries for which the injured person is not hospitalised. Unless an ACC form is submitted for such injuries, the statistics may be incomplete or skewed.

The estimated maximum and minimum one-off costs, including process and system changes, and ongoing costs to agencies of complying with the proposed data provision requirements were calculated as follows:

Figure 8: Cost analysis by agency

Agencies	One-off cost NZ\$		Ongoing cost NZ\$	
	Minimum	Maximum	Minimum	Maximum
ACC	150,000	400,000	24,000	36,000
Land Transport Safety Authority	15,000	60,000	679,000	1,208,000
Department of Labour	90,000	160,000	76,000	155,000
New Zealand Health Information Service	39,000	45,000	0	0
Hospitals that provide NZHIS with data	1,280,000	1,870,000	0	0
Total	1,574,000	2,535,000	779,000	1,399,000
<i>plus either Coroner's Court</i>	<i>5,000</i>	<i>10,000</i>	<i>34,000</i>	<i>45,000</i>
<i>or NZHIS fatality extract</i>	<i>40,000</i>	<i>60,000</i>	<i>3,000</i>	<i>5,000</i>

Figure 9: Information Manager cost analysis

	Minimum	Maximum
Total set-up costs	738,100	1,088,250
Total annual ongoing costs	843,500	1,201,750

Information Manager cost

The study also estimated the set-up and ongoing costs for the Information Manager. Set-up costs were estimated on the basis that the establishment team would consist of a project manager and two senior analysts, and that establishment of the Information Manager could be accomplished in six months. The ongoing costs of the Information Manager were estimated on the basis that the office set-up cost would be a sunk cost, and that the Information Manager would have four permanent staff members: a manager and three analysts.

COSTS TO PROVIDERS

The costs to providers of the proposed injury data system were also considered in meetings with the General Practitioner Test Panel. Their paper, *Report to the Minister of Health from the General Practitioner Test Panel on Compliance Cost*,¹² makes particular reference to the perceived burden on General Practitioners of completing ACC reporting requirements. Administration of ACC requirements was identified as the major source of compliance costs for general practice in direct expenditure of time and money, and clearly outstripped all other compliance costs. No attempt was made to quantify these costs in the above study.

BENEFIT ANALYSIS

A further study was commissioned from health economists Des O’Dea and Jackie Cumming. This study aimed to assess the benefits (quantitatively if possible) of the proposed new injury information system.

Expected benefits of the proposed new system as identified by O’Dea and Cumming included:

- better monitoring of injury incidence and trends
- better identification of risk factors
- better assessment of health and financial impacts of injury
- better setting of priorities and allocation of resources
- better evaluation of outcomes and more timely modification of policies where necessary
- significant savings on data assembly costs for researchers, estimated to be in the region of NZ\$50,000 to NZ\$100,000 per year.

The study identified relevant examples of how good information has improved decision-making; but the researchers were unable to calculate quantitative gains from a better information system.

However, extrapolating from LTSA data,¹³ the study estimated the cost to New Zealand society imposed by injuries and fatalities resulting from accidents and intentional injuries to be in the region of NZ\$7 billion per annum. Thus a reduction of even 0.1% in the injury rate (which was found to be a likely scenario) could lead to savings in the ‘social cost’ of injuries in the region of NZ\$7 million each year.

An analysis of the expected costs in setting up the proposed injury data system concluded that the benefits of the new system, in terms of estimated reduction in social costs, would equal or exceed the costs of the proposed new system.

¹² <http://www.moh.govt.nz>

¹³ Miller, T and Guria, J. *The Value of Statistical Life*.
Leung, J. *The Social Cost of Road Crashes*.

3.7 Appointment of Information Manager and intended way forward

In February 2001, initial indications of interest in the Information Manager position were given by three agencies. Two agencies prepared business cases and estimated costs for the Information Manager role. The Information Manager Establishment Group (a group made up of the Chief Executives of data provider agencies) reviewed the business cases and a paper setting out the options was presented to Cabinet.

In December 2001, Cabinet agreed in principle that the Minister for Accident Insurance invite the Prime Minister to consider assigning the Information Manager role to Statistics New Zealand, subject to a sound business case and sufficient funding. In June 2002, the Prime Minister confirmed Statistics New Zealand as the Injury Information Manager.

Statistics New Zealand's overall planned outcome as the Information Manager appointee is to provide evidence so that agencies can make informed decisions about injury prevention, programme targeting, and accident insurance,

and to provide information that 'describes what is going on' and gives an information context for policy development.

Statistics New Zealand's vision is to improve the range, quality and detail of information available on injury, ensure that users have satisfactory access to the information they need, and build relationships with data providers to ensure the long-term supply and integrity of the data.

They envisage that, in the next five years, they will establish a robust, authoritative, and timely system of published reporting of official statistics. They note their strengths in relation to this mission as being their independence from the policy process, and their reputation as a trusted repository and user of sensitive data.

Statistics New Zealand's costs for the implementation of the Information Manager role are shown in Figure 10 below.

Statistics New Zealand had funding approved in the 2002 Budget for the Information Manager role (figure 10). Of this, NZ\$0.662 million in 2002/03, and NZ\$0.775 million in outyears is a transfer from Vote:Accident Insurance to Vote: Statistics.

Figure 10: Statistics New Zealand Injury Information Manager projected costs

	NZ\$ million						
	2001/02	2002/03	2003/04	2004/05	2005/06	Outyears	GST
Operating costs	-	0.664	0.799	0.754	0.956	0.844	incl
Capital costs	-	0.810	0.230	0.150	-	-	n/a
Capital charge	-	0.073	0.021	0.014	-	-	n/a

4. NEXT STEPS

Development of the new injury information database will begin in the 2002/03 year and extend over the next two years. The bulk of the work, which will involve setting up the data warehouse and the access systems, will take place in the first and second years. During this phase Statistics New Zealand will continue to process and publish work-related injury statistics and will gradually add new data to the publications as it becomes available.

Data provider agencies will gradually align their data sets with the variables and definitions required by the Information Manager. Where possible, this alignment will be made at the same time as the agencies make other changes, therefore minimising compliance costs for those agencies.

4.1 Further work

A number of areas of further work were identified by the review, but were unable to be included within the scope and timeframe of the review. A brief description of each issue, progress to date, and any outstanding work is outlined below.

CLUSTERS

The only cluster that the project team was able to investigate in any detail was the workplace cluster. Further work will be undertaken in the future to examine the other clusters (transport, home and public safety, sport and recreation, and intentional injuries) and to determine whether additional indicators and variables may be required to inform these areas of the conceptual framework for injury data.

OCCUPATIONAL DISEASE

Collating and disseminating occupational disease

information will better inform management strategies. The Department of Labour and ACC collect occupational disease data at present, but each agency has different legislative and operational requirements. The New Zealand Health Information Service database collects diseases, some of which are occupational, but this database does not include any work-related variables. Ministers have agreed that further work is required on the inclusion of occupational disease in the injury database. Ministers further agreed in principle to the inclusion of occupational disease as part of the definition of injury, subject to further work on the definition of occupational disease, and the associated data set, indicators and cost, and directed the Department of Labour to report back to the Information Manager on definition of occupational disease, and the associated data set, indicators and cost by July 2002.

WORK-RELATED (PRIMARY AND SUBSIDIARY)

The work-related (primary and subsidiary) variables in the injury data set determine whether a work-related injury is either to an employee (primary) or bystander and/or visitor (subsidiary). Until injuries are coded and defined consistently, it will be difficult to determine the proportion of injuries that are work-related and to produce work-related indicators. Work to develop boundaries for these variables will be undertaken by the Information Manager.

RETURN TO WORK

Return to work describes a series of variables around individuals returning to work after an injury.¹⁴ No agency collects robust data on return to work. The project team was surprised by the gap in this area given the importance of returning to work to achieving desired

¹⁴ There are several variables under the return to work category, including returning to part-time or full-time work to a former employer; the sustainability of that return and if an individual left or has not returned to a former employer; where they went.

outcomes such as reducing societal and economic costs, and increasing participation in society. ACC's data definition is recommended as a proxy, but further work needs to address this gap. A positive move is the joint Australia/New Zealand Return to Work Monitor, a survey that allows New Zealand to be compared with Australian states on issues around individuals returning to work after injury.

SEVERITY

Severity describes the degree and intensity of an injury (eg, a doctor's visit (minor) through to the Coroner's Court (fatal)). Currently, severity is collected by most agencies but with different and sometimes simplistic definitions. This issue is complex and there is no easy resolution. Severity may differ over time and vary depending on an individual's circumstance (a concert pianist who loses a finger may consider the injury more severe than a gardener). The Information Manager will undertake work to define this variable.

COST

Cost is currently defined as the specific costs of treatment and rehabilitation. The

Department of Labour has received funding from the Cross Departmental Re-search Pool to carry out work to define and collect societal, organisational and economic costs. The Department of Labour is also undertaking work on social consequences of workplace injuries. The social consequences report is expected to be released in October 2002.

MINOR/MAJOR INJURIES

ACC collects more data on severe injuries than on minor injuries and the New Zealand Health Information Service has access to more information on more severe injuries, such as hospitalisation and mortality. Treatment providers and operational agencies are interested to determine if and how a distinction should be made on what variables are collected for minor and major injuries. It can then be applied to agencies' operational environment and inform any regulatory changes. For the purposes of the injury data set, it has been decided that minor injuries will be collected, but with a smaller data set than major injuries. The Information Manager will review this decision from time to time.

APPENDIX A: INJURY DATA REVIEW WORK PROGRAMME¹⁵

BACKGROUND

Cabinet ACR Committee required the review on injury data to identify how the government's overall objectives for injury information can be enhanced through data collection and analysis, and to review the overall injury data requirements. While investigating how best to achieve a feasible and rigorous work programme, it became apparent that the identification of data requirements for injuries could not proceed without an understanding of why the data was important.

Injury data is important because it can identify the:

- incidence of injuries – how often they occur and to whom
- impact – both social and economic
- trends – how injuries and injury rates can change over time.

Data on injuries alone is merely input. To be most useful, the data must be aggregated, analysed and reported as information. We therefore propose that the review produce a series of indicators – measures and rates of fatality and morbidity of injuries – that will best inform on the government's objectives in this area.

OBJECTIVES OF THE REVIEW

The objectives of the review are designed to address Cabinet's requirement to provide injury information. The government requires robust and complete injury information in order to inform on:

- injury prevention, rehabilitation, treatment effectiveness, and compensation
- policy development
- scheme management and premium setting
- monitoring government agencies' effectiveness
- determining the cost to society of injuries and accidents
- compliance.

It is proposed that the review will identify:

- a conceptual statistical framework that will reflect the range of information requirements; the framework will provide a basis for

coherent and robust monitoring, reporting and analysis of injury and accident trends and issues

- a set of statistical indicators that related to key government information needs
- an appropriate approach to manage and report on those indicators (stewardship) in the interim and long term.

It should be noted that the investment for providers and agencies to provide and deliver robust injury data might be substantial. This investment can include adapting systems, changing forms, collecting data and transferring the data. However, it should be noted that by adapting changes agencies may accrue benefits of improved information and services to clients and downstream benefits of targeting resources and preventing injuries. As such, the review has incorporated a close analysis of all the potential investment risks and benefits.

While the main focus of the review is to report on the framework and overall injury indicators, it is intended that stewardship of the ACC data currently held by the Regulator will also be addressed. There are some objectives that are exclusive to ACC, eg, compliance and premium setting, and these will be taken into account. Cabinet required that the Accident Insurance Regulator's data warehouse continue to be the independent manager of both ACC and the private insurer's data until decisions are made by Ministers on advice on the future placement of the stewardship role from the first phase of the review.

SCOPE OF THE REVIEW

The breadth and depth of injury information is quite extensive. According to Statistics New Zealand, to canvass effectively all aspects of injury information is likely to require a comprehensive, time-consuming review that could not meet the deadlines for this project. To begin to achieve the government's objectives around the delivery of injury information in a timely fashion, we are proposing to focus the review on workplace injuries.

¹⁵ This appendix is based on the text of a briefing note to the Ministers for Accident Insurance and the Minister of Labour (*Injury Data Review Work Programme*, 26 July 2000).

We are proposing to report on workplace injury information first because:

- the injury prevention policy framework is addressing this cluster first
- the original intent of the review was to deal with accident insurance claim data, which is a subset of workplace injury information.

While workplace injury information is the focus of the review, it is intended to identify the most appropriate framework for the indicators and potential stewards, under the assumption that the future goal is to aggregate and report on all injury information across all sectors in the future. By doing this, we are endeavouring to avoid the risk that implementation choices will compromise the options for later implementation in other sectors.

For the purposes of the review, the definition of injury will be the same as that used in the work on the Injury Prevention Policy Framework. Specifically, a broad working definition of injury is adopted where injury may be defined as unintentional and/or intentional damage to the body resulting from:

- acute and/or cumulative exposure to mechanical (eg, motor vehicle crash), thermal (eg, fire, flames), electrical (eg, shock), or chemical energy (eg, poisoning); and/or
- the application of a force or resistance (including gravity) on the human body (eg, such as falling down or being hit by an object); and/or
- acute or cumulative exposure to psychologically damaging events (eg, occupational stress or post traumatic disorder); and/or
- the absence of such essentials, such as heat or oxygen (eg, suffocation).

For the purposes of the review, workplace injuries will be defined as set out in the Accident Insurance Act 1998, section 32. Other clusters that will be addressed in part by the review and as part of the work programme for the stewardship of the information include:

- transport system
- home and public safety

- sport and recreational activities
- intentional injuries.

For the purposes of the review, stewardship will be defined as in Appendix A of the ACR paper, entitled *Management of Databases to Enhance Injury Data; and Accident Claims Data Collection and Management*. In summary, that role includes the management of the data and its custodian, being accountable to meet statutory requirements, development of standards of quality, integrity and reliability, ensuring privacy and confidentiality, considering and revisiting current and future data requirements, and being responsible for the ongoing integrity of the statistical database(s).

APPROACH

The work programme to achieve the objectives of the review is as follows:

Phase one: a conceptual framework and a set of statistical indicators that are required to inform on injuries in New Zealand and the data required

- review past reports and research and consolidate earlier learning
- research overseas practice on the conceptual frameworks used and relate them to policy needs in New Zealand; research the indicators used overseas, including how and when they are measured and reported on
- consult with key stakeholders including the Department of Labour, ACC, the Environmental Risk Management Authority, Ministry of Health, Privacy Commissioner
- of the indicators identified, determine those that best support the government's objectives
- define the way the indicators will be measured and the data elements required
- determine the appropriate unit of measurement and classifications in order to achieve international comparisons and future integration of injury data across clusters
- collect data dictionaries from relevant agencies including data definitions and classifications
- conduct a gap analysis between the data collected and the data needed for the framework

- and identify overlaps and redundancies
- prioritise any recommendations to and amend
ments to data and data classifications
- identify fiscal (investments and benefits), legal
(changes necessary to legislation), capacity
(ability of the organisations to supply the infor-
mation), and supply chain (ability of and costs
to providers to supply the information) risks
during data collection and analysis of agency
data, and lessons learned from other
organisations
- determine steps needing to be taken to achieve
an adequate degree of integration across
different data sources.

**Phase two: appropriate approach to manage
and report on those indicators (stewardship)**

- determine how overseas and New Zealand-
based organisations collect and consolidate
data from multiple data sets
- determine how best to progress work on the
other sectors
- develop and apply a set of criteria to enable
the identification of potential stewards and
reporting agents
- identify the cost/benefits of each option and
make recommendations to proceed.

It should be noted that the review has been structured to cut across sectors to identify an appropriate framework, indicators, data definitions and classifications for all injury data. This will allow other cluster groups to be included with minimal changes. Throughout the course of the review we will consult widely with stakeholders in and out of government. Wherever possible, we will build on and avoid repetition of the work being conducted as a part of the Injury Prevention Policy Framework. We will consult with a reference group to address both the wider framework of indicator and stewardship issues and those that are specifically work related. The

consultation will include: all relevant agencies, the Privacy Commissioner, Employers Federation, employers, Council of Trade Unions, injury prevention researchers including the Injury Prevention Research Unit, health providers including the GP Test Panel, and the Data Warehouse Advisory Panel in its capacity as an advisor to the Secretary of Labour.

The review will be co-managed by the Department of Labour and Statistics New Zealand with a working group of officials from the Ministry of Transport, Land Transport Safety Authority, Ministry of Health, Zealand Health Information Service, and ACC. As options that involve fiscal issues arise, Treasury will also participate. The project team will consist of officials from Department of Labour, Statistics New Zealand, New Zealand Health Information Service and ACC.

TIMEFRAMES

The review will be in two phases addressing each of the objectives in turn. On 1 December, the review will report back on the indicators, the data required and the gaps in the current data collected.

The review's final report will be on 31 March 2001 on options on who should be responsible for data collection, analysis and management of those indicators; how the data should be captured and collected from a variety of sources and costs associated with each option.

CONSULTATION

Agencies consulted in the drafting of this paper were the Ministry of Health, ACC, Ministry of Transport, Land Transport Safety Agency, New Zealand Health Information Service, Department of Labour, The Treasury, Ministry of Women's Affairs, Ministry of Youth Affairs, Te Puni Kokiri and State Services Commission.

APPENDIX B: LIST OF PROJECT PARTICIPANTS AND REFERENCE GROUPS

PROJECT CO-ORDINATORS

Department of Labour, Statistics
New Zealand

Project manager

- Alicia Wright, Department of Labour

Project team

- Mary Adams, Margie Fepulea'i, Department of Labour
- Julie Woolf, Statistics New Zealand
- Angela Pidd, Peter Aagaard, New Zealand Health Information Service
- Ben McBride, Carol Slappendel, ACC
- Wayne Jones, Land Transport Safety Authority

The following individuals and agencies were also involved in other capacities:

- Kerry Matthews, Nicolaas Francken, Brian Watson, Lucia Macari, Naomi Stephen-Smith, Geoff Bascand, Julian Silver, Maria McKinlay, Department of Labour
- Paul Brown, Dallas Welch, Statistics New Zealand
- Martin Smithies, New Zealand Health Information Service
- Martin Bonné, Debbie Chin, Ministry of Health
- Bronwyn Donaldson, ACC
- Roger Brown, Reena Kokotailo, Ministry of Transport
- Peter Nalder, Civil Aviation Authority
- David Crawford, Sharyn Forsyth, Maritime Safety Authority
- Raewyn Ogilvie, Department for Courts
- Christine Mullinder, Ministry of Economic Development
- Rebecca Garrett, The Treasury

Data Warehouse Advisory Panel

- Stan Rodger, Chair
- Anne Knowles, New Zealand Employers Federation
- Erik Greenslade, New Zealand Council of Trade Unions
- Rana Wong, Insurance Council of

New Zealand

- Paul Cressey, EastHealth
- Anne-Marie Feyer, New Zealand Environmental and Occupational Research Centre, University of Otago
- Tim Boyd-Wilson, ACC
- Paul Brown, Statistics New Zealand
- John Chetwin, Kerry Matthews, Geoff Bascand, Steve McGill, Department of Labour

International Peer Review group

- James Harrison, Research Centre for Injury Studies, Flinders University of South Australia
- Tim Driscoll, National Occupational Health and Safety Commission, Sydney, Australia
- Dr Jukka Takala, Occupational Safety and Health Branch, International Labour Office
- Nancy Stout, Director, Division of Safety Research, United States of America
- Dr Colin Cryer, Medical Statistician, Centre for Health Services Studies of the University of Kent, Canterbury, United Kingdom
- Dr Gordon Smith, Johns Hopkins University, Baltimore, Maryland, United States of America

New Zealand reviewers

- Professor John Langley, Injury Prevention Research Unit, University of Otago
- Associate Professor Anne-Marie Feyer, New Zealand Environmental and Occupational Research Centre, University of Otago

Other groups consulted

- New Zealand Medical Association
- Royal New Zealand College of General Practitioners
- General Practitioners' Test Panel
- Privacy Commissioner

Information Manager Establishment Group

Chief Executives of data provider agencies (ACC, Ministry of Health, Department of Labour, Land Transport Safety Authority, Maritime Safety Authority, Civil Aviation Authority, Statistics New Zealand, and Ministry of Transport)

APPENDIX C: OPTIONS CONSIDERED FOR CONCEPTUAL FRAMEWORK FOR INJURY DATA

A number of conceptual frameworks for injury data were considered. Frameworks that are used internationally for presenting statistical information were investigated. These are described below, with comments on their suitability for the purposes of the Injury Data Review.

UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES' FRAMEWORK

The United States Department of Health and Human Services' recommended framework for presenting injury mortality data was found to be an output rather than an input framework, and to cover only a small section of the injury data covered in the review.

WORLD HEALTH ORGANISATION 'PUBLIC HEALTH APPROACH'

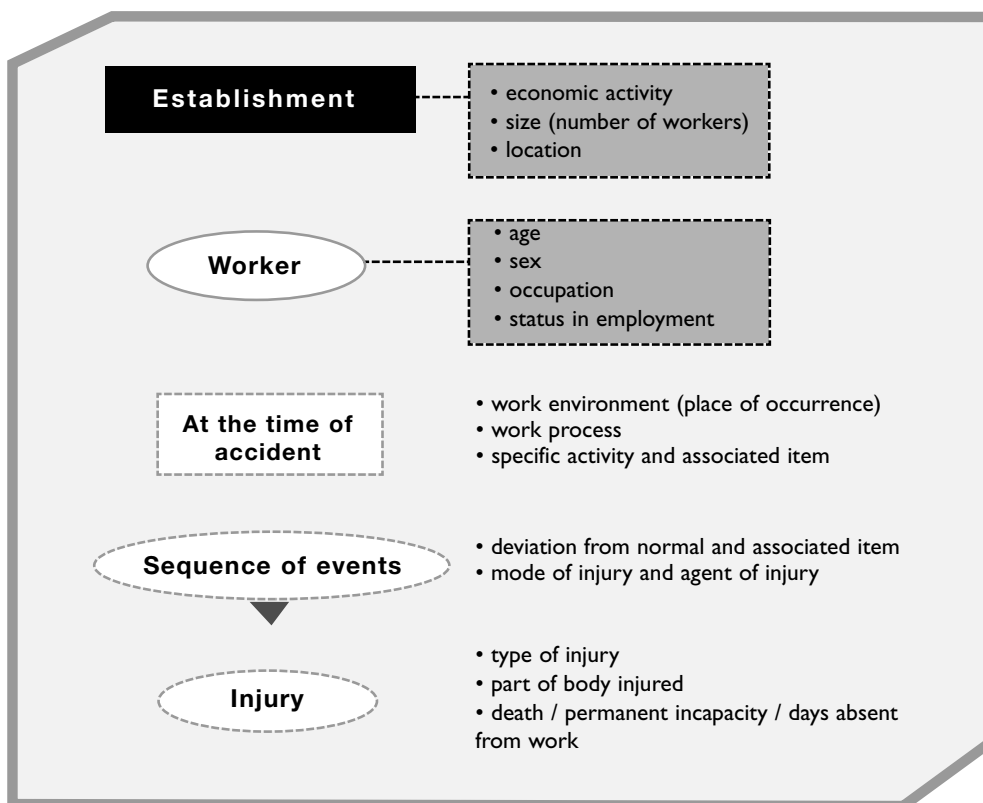
The World Health Organisation 'Public Health Approach' framework for injuries, begins with

defining the problem, and progresses to identifying associated risk and protective factors, developing and evaluating interventions, and implementing interventions into programmes. This approach was not appropriate for the Injury Data Review as it covered too wide a subject area.

INTERNATIONAL LABOUR ORGANISATION FRAMEWORK FOR OCCUPATIONAL STATISTICS

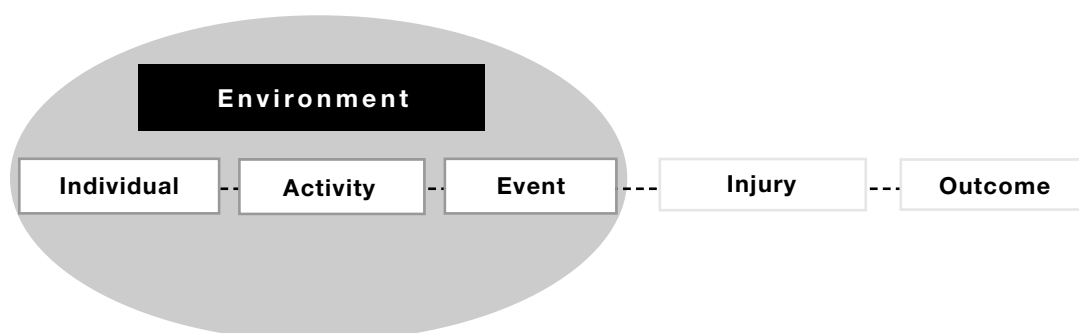
The framework that most met the aims of the Injury Data Review was a framework for workplace injuries recommended by the International Labour Organisation (ILO) at the Sixteenth International Conference of Labour Statisticians, 1998 (refer Figure 11). While the ILO framework is specifically aimed at workplace accidents causing injury, it describes the process of incurring an injury in a very generic way so that, once the workplace terminology is replaced, it can be applied to other clusters like sport, home and transport.

Figure 11: ILO framework for occupational statistics



The ILO framework needed to be modified to cover all injuries, rather than only work-related injuries, and to ensure its appropriateness for the New Zealand situation, including issues for Maori. Therefore, various options for modifying the ILO framework were considered and a draft framework was developed (Figure 12), and offered for assessment by international peer review.

Figure 12: Draft conceptual framework for injury data



Modifications were made to this framework based on comments from officials and from those in the injury sector, and international peer review. There was some debate from the international panel about whether the entry point into the framework was suitable; entry into the framework is at the point of an individual whose injuries are fatal, or severe enough to require medical attention.

APPENDIX D: MODELS CONSIDERED FOR INFORMATION MANAGER ROLE

The Project Team researched models of information management both within New Zealand and overseas. The aim was to determine how overseas and New Zealand-based organisations collect and consolidate data from multiple data sets. Criminal justice and health and safety sectors were canvassed in particular.

Four different models were identified from the research. The project team labelled the four models as the standard setter, the librarian and researcher, the clearing-house, and the injury surveillance model. A thumbnail sketch for each model follows. These are 'high level' models and several operational approaches could be used to implement each model. The options are treated as cumulative, that is, each successive option adds to the previous one.

An underlying assumption is that operational agencies will still collect data as part of their administrative function in the injury area. While additional data may be obtained through the use of surveys or other data collection instruments, the Information Manager will not replace the agencies as the primary collector.

OPTION ONE – THE STANDARD SETTER

The Information Manager as standard setter would encourage agencies to apply consistent definitions for injury-related data. The Manager may scrutinise the forms being used and work with agencies to collect the optimal data

set and modify data reporting to incorporate the indicators.

- The Information Manager promulgates standards and definitions and ensures that appropriate modifications to forms and systems are carried out.
- The Information Manager does not receive any data from agencies and does not publish any injury data.
- The Information Manager may also be the facilitator to researchers and other users to help them identify and manage process to obtain data from agencies.

Advantages

- Most similar to existing situation so may be most palatable to operational agencies.
- May be relatively low cost.
- Agencies do not have to pass data to another party and therefore no privacy concerns.
- Solves the need for standard concepts and definitions.

Disadvantages

- Will not know the number of injuries and injury fatalities in New Zealand.
- May not make access to injury easier.
- Will not be able to target resources effectively.
- May be difficult to encourage agencies to modify definitions and forms as no output will be expected.

OPTION TWO – THE LIBRARIAN AND RESEARCHER

Under the librarian and researcher model, the Information Manager would collect current injury publications in both electronic and paper form from all injury-related agencies. They would add value to that aggregate data and may produce additional publications.

- The Information Manager promulgates standards and definitions and ensures that any modifications to forms and systems are carried out.
- The Information Manager takes the aggregate data produced by agencies and publishes a report that brings together data from all sources, acknowledging the overlaps.
- The Information Manager actively disseminates the information through vehicles such as websites.
- The Information Manager may also be the facilitator to researchers and other users to help them identify and manage processes to obtain data from agencies.

Advantages

- Adds value to existing agency publications and provides a more complete picture of injuries in New Zealand.
- Makes injury statistics more prominent so they receive a higher profile and are more readily accessible.
- Avoids all privacy issues.

Disadvantages

- May be just as costly as more ambitious models due to costs of working with existing data.
- Will not know the number of injuries and injury fatalities in New Zealand.
- May not make access to injury data easier.
- Will not be able to target resources effectively.

NB: A variation to the model above would transfer much of the cost of aggregating data to the agencies by making them responsible for reporting on the indicators.

OPTION THREE – THE CLEARING-HOUSE

The Information Manager as a clearing-house would

collect unit record data from operational agencies and would supply the unintegrated data to researchers and others with injury data requirements.

- The Information Manager promulgates standards and definitions and ensures that any modifications to forms and systems are carried out.
- The Information Manager receives a copy of unidentifiable unit record data from each agency, and makes it available for research and statistical purposes. Protocols to manage this process are established and followed.
- No attempt is made to integrate the data.
- The Information Manager publishes an analytical report, with more sophisticated analysis than is available with aggregate data but still acknowledges the overlaps between the various agency data sets. (In other words, closer adherence to the indicators can be followed with each of the agencies' data sets.)

Advantages

- Improves user access to data.
- Better quality analysis is possible.
- Privacy and security concerns addressed and safeguarded.

Disadvantages

- Overlap between the collections are not identified.
- Will not know the number of injuries and injury fatalities in New Zealand.
- Will not be able to target resources effectively.
- Not necessarily able to be cost-effective.
- Difficult for a third party to integrate with accuracy.

NB: Another option under this model is to collect identifiable unit record data for researchers to consolidate across agencies on a case-by-case basis. It would raise further privacy concerns but would be of added value to researchers whose needs may not be met if the data cannot be integrated easily.

OPTION FOUR – THE INJURY SURVEILLANCE MODEL

The injury surveillance model would see the Information Manager being the caretaker of a fully integrated set of data from all injury-related agencies. The Information Manager would be for producing injury statistics and making them available in carefully controlled conditions.

- The Information Manager promulgates standards and definitions and ensures that any modifications to forms and systems are carried out.
- The Information Manager receives a copy of unit record data, with identifiers, from each agency and, where possible, integrates the data. Privacy issues are dealt with.
- The Information Manager makes unidentifiable data sets available for research and statistical purposes. Protocols are developed to manage this process.
- The Information Manager publishes an analytical report using integrated data.
- The Information Manager responds to ad hoc-queries such as parliamentary questions, and

Official Information Act requests that deal with injuries.

Advantages

- Allows us to have a complete picture of injuries in New Zealand including the total number of injuries and fatalities in New Zealand, ie, big improvement in data quality.
- Improves access for researchers and users to use fully integrated injury data.
- Dissemination of information will improve.
- Capability in benchmarking will increase both trend analysis over time and internationally against other countries.
- Significant bias in operational agency data sets will be overcome
- Will enable, in the long term, additional improvements in data quality and completeness.

Disadvantages

- May be most costly option.
- Agency participation is crucial and may be difficult to achieve.
- Integrating data will not be easy.

APPENDIX E: LIST OF PAPERS AND REPORTS GENERATED

Papers marked with an asterisk * are available at www.dol.govt.nz

Briefing papers

*Department of Labour, Statistics New Zealand, *Injury Data Review Work Programme*, 26 July 2000

*Department of Labour, *Injury Data Review Phase One Report*, 14 December 2000

*Department of Labour, *Injury Prevention and Rehabilitation Bill: Management of Injury-related information*, 6 July 2001
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