

# Safety & Health Performance Report

OF THE AUSTRALIAN  
MINERALS INDUSTRY

## 1999-2000

health

commitment

safety

statistics

benchmark

people

trends



**MINERALS  
COUNCIL**  
OF AUSTRALIA

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# Definitions

## Injury Definitions

### FATAL INJURY – (F)

An injury that results in death.

### LOST TIME INJURY – (LTI)

An injury that results in a minimum of one full shift's absence (AS1885.1 – 1990).

### SEVERE INJURY – (SI)

An injury that results in a minimum of two weeks off work. This definition is used by South Africa as an injury measure.

## Rate Definitions

The performance of the minerals industry is measured as a rate, allowing for the comparison of different sectors or years on a comparable basis. Three rate measures are used to characterise the performance of injury – incidence, frequency and duration.

### INCIDENCE RATE – (IR)

The number of injuries per 1000 employees. This rate is calculated using the following formula:

$$\frac{\text{number of occupational injuries} \times 1000}{\text{number of employees}}$$

### FREQUENCY RATE – (FR)

The number of occupational injuries expressed as a rate per million hours worked.

This rate is calculated using the following formula:

$$\frac{\text{number of occupational injuries} \times 1,000,000}{\text{number of hours worked}}$$

### FATAL INJURY FREQUENCY RATE – (FIFR)

The number of fatal injuries per one million hours worked.

### LOST TIME INJURY FREQUENCY RATE – (LTIFR)

The number of lost time injuries per one million hours worked.

### DURATION RATE – (DR)

The average time lost for every lost time injury. This is a measure of the severity of the injuries occurring.

This rate is calculated using the following formula:

$$\frac{\text{total days lost}}{\text{number of lost time injuries}}$$

### SEVERITY RATE – (SR)

The average number of days lost per one million hours worked

$$\frac{\text{number of days lost} \times 1,000,000}{\text{number of hours worked}}$$

### NUMBER OF HOURS WORKED

The total number of hours worked by employees in the recording unit during the recording period.

SAFETY AND HEALTH

# Vision

“An Australian minerals industry **free** of fatalities, injuries and diseases.”

SAFETY AND HEALTH

# Beliefs

- All fatalities, injuries and diseases are preventable.
- No task is so important that it cannot be done safely.
- All hazards can be identified and their risks managed.
- Everyone has a personal responsibility for the safety and health of themselves and others.
- Safety and health performance can always improve.

SAFETY

# Awareness

“The state of mind where we are constantly aware of the possibility of injury and act accordingly at all times.”

# Introduction

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The Minerals Council of Australia is the national body representing the exploration, mining and minerals processing sector of the Australian economy. Members of the Council are responsible for about 90 per cent of Australian mineral production.

The Minerals Council publishes annual safety and health data to:

- encourage the industry to seek continuous improvement in safety and health performance;
- determine the minerals industry's performance and trends;
- compare the safety and health performance of the major sectors of the industry;
- provide a benchmark for comparison with other major mining countries;
- recommend strategies to improve the industry's safety and health performance;
- recommend strategies to help individual enterprises benchmark their performance;
- compare industry data with that of other recognised Australian sources such as the National Occupational Health and Safety Commission; and
- demonstrate the minerals industry's continuing commitment to improving safety and health performance.

This report includes:

- a review of minerals industry safety performance 1990-91 to 1999-2000 drawn from fatality and injury data collected by State/Territory mines inspectorates;
- a review of minerals industry safety and health performance drawn from preliminary workers' compensation claims data collated by the National Occupational Health and Safety Commission for the last year available, 1998-99; and
- an international benchmarking comparison.

A retrospective analysis of fatalities occurring in the Australian minerals industry over the past decade has been commissioned by the Council and is expected to be published later this year.

**MAY 2001**

# Executive summary

The Minerals Council of Australia has prepared and published this report of available safety and health (S&H) data as part of its strategic leadership initiative which aims to achieve the vision of *an Australian minerals industry free of fatalities, injuries and disease*.

The report presents the most comprehensive data available and the primary indicators, while having inherent limitations in terms of effectively representing the industry's S&H performance, are in line with current Australian standards.

The Minerals Council's Safety and Health Committee is working to extend the range of measures and complement them with other assessments of industry performance.

In 2001, the Council will propose broader outcome measures in addition to the Lost Time Injury Frequency Rate. The committee will also publish guidelines for site – based positive performance indicators (PPI), and move towards the establishment of a national PPI.

This report includes a review of two primary and quite different data sets. The first and most up-to-date set comprises injury data for 1999-2000 collected primarily through the State and Territory mines inspectorates. The second data set is collected through the State and Territory workers' compensation systems and has been collated by the National Occupational Health and Safety Commission (NOHSC).

## Fatal injuries

In 1999-2000 there were 18 fatalities in the Australian minerals industry. This is an increase over the previous year when ten deaths were recorded and is over two and a half times greater than the low of seven fatalities recorded in 1995-96.

In 1999-2000 the Fatal Injury Frequency Rate (FIFR) was 0.09 fatalities per one million hours worked, up from 0.04 in 1998-99. This rate, however, still remains lower than the average total industry rate for the last ten years of 0.11 fatalities per one million hours worked. The national, sector and State FIFRs of the past decade have fluctuated significantly from year to year providing little evidence of a real reduction in the risk of fatalities.

As with previous years the majority (56%) of fatalities in 1999-2000 occurred in the underground metalliferous sector (10 fatalities) with one in the open-cut metalliferous sector, four in underground coal, one in open-cut coal mining and two in the extractive industries.

## 1999-2000 MINERALS INDUSTRY

### Performance at a glance

- There were 18 fatalities in the Australian minerals industry, eight more than in 1998-99, but remaining within the lower range of deaths recorded in the industry in the past decade.
- One miner died for every 11 million hours worked in the industry.
- One miner died for every 5119 workers employed in the industry.
- 2294 injuries occurred requiring at least one full shift's absence.
- For each lost time injury an average of 18 days absence was recorded.
- For every million hours worked, 11 injuries occurred which required at least one full shift absence.

The underground metalliferous sector has consistently recorded the highest FIFR of any sector, with a ten-year average of 0.33. A FIFR of 0.37 was recorded in 1999-2000 (up from 0.17 in 1998-99), reversing the downward trend of the previous two years. This year's rate is within the typical range of past years but is still well above the low of 0.10 recorded in this sector in 1995-96.

The underground coal sector also experienced an increase on last year's FIFR, doubling from 0.11 in 1998-99 to 0.22 in 1999-2000. The 1999-2000 rate falls just below the ten-year average for the sector of 0.23.

Open-cut coal experienced a FIFR equal to the previous year's rate of 0.04 and remains below the ten-year average and within the comparatively low rates seen during the last four years. The FIFR of open-cut coal is consistent over the decade unlike most other sectors where the rate fluctuates.

There are no significant trends in fatalities at State level. As expected States with the most mining activity and the highest risk sectors generally experience the highest number of fatalities.

The National Occupational Health and Safety Commission (NOHSC) workers' compensation system data for 1998-99 (the most recent data available from this source) identified 13 deaths in the mining industry due to injury/poisoning and a further four deaths due to disease. It should be noted that the four disease deaths revealed in the NOHSC data may be in addition to fatalities recorded in mines inspectorate data (as mines inspectorate data is unlikely to include disease deaths). However, it is not possible to confirm this due to confidentiality restrictions.

In 1998-99 the injury/poisoning fatalities included four fatalities in each of the coal mining and metal ore mining sectors. Of the remaining injury/poisoning fatalities, three were recorded in other mining and two were recorded in services to mining.

Of the four disease deaths recorded in 1998-99 three occurred in other mining and one occurred in coal mining.

### **Lost time injuries**

The declining trend in the number of lost time injuries (LTI) and lost time injury frequency rate (LTIFR) has been a key feature for more than ten years, and has continued in 1999-2000.

In 1990-91 the industry recorded 9,075 lost time injuries. This figure had halved by 1995-96 and has recently halved again, with 2,294 lost time injuries recorded in 1999-2000. Similar results have been experienced with the LTIFR.

In 1990-91 the industry recorded a rate of 52 which was halved by 1994-95. In 1999-2000 this rate has fallen again to 11, the lowest rate recorded.

A comparison of performance in each sector produced results similar to those experienced in recent years. The LTIFR in the coal sector (22) is substantially higher than the rate in other sectors (primarily due to underground coal mining) with metalliferous and extractive industries both recording rates of nine and smelting and refining a rate of five.

In a State/Territory comparison, while all States had experienced a downward trend in the LTIFR during the past decade, and consistent rates during the past three years, in 1999-2000 this trend was reversed in Tasmania, Western Australia, Victoria and the Northern Territory. The most marked increase (29%) was recorded in the Northern Territory. Both New South Wales and South Australia experienced a reduction in their LTIFR of over 20% with Queensland equaling its 1998-99 result.

In 1999-2000 the duration rate (DR) for the industry was an average of 18 days lost per injury, equaling that of the previous two years. The severity rate (SR) fell slightly to 200 days lost per one million hours worked.

### **Workers' compensation claims**

In 1998-99, according to NOHSC workers' compensation data, the incidence and frequency rates for new workers' compensation cases for injuries resulting in five or more days lost time for the mining division (excluding Victoria) were 31 and 14 respectively, down from 41 and 18 respectively in the previous year. In addition, 1998-99 is the first year in which the mining industry has *not* recorded the highest rates of the industries selected for comparison.

NOHSC workers' compensation system data for 1998-99 shows that 12.9% of workers' compensation claims in all industries are due to disease. This is considerably lower (a 24% reduction) than the 17% recorded in the previous year.

Within each of the mining sectors at least 84% of total claims are made up of a combination of claims due to injury/poisoning and to diseases of the nervous system and sense organs (with the former being the major contributor). All sectors recorded at least 69% of total claims being due to injury/poisoning and the majority of remaining claims (26%) due to diseases of the nervous system and sense organs ie. hearing loss.

Comparing the mining industry sectors with other selected sectors regarding the direct cost of disease claims, other mining and metal ore mining had the highest average costs of \$12,011 and \$11,340 respectively. Coal mining and storage recorded by far the lowest average costs with \$4,304 and \$5,314 respectively. These results are similar to results in previous years.

The direct workers' compensation cost of injury to the industry in 1998-99 was \$27,846,461. This is an increase of 7% on the 1997-98 cost, but still remains substantially lower than the \$40,416,958 recorded in 1996-97. Note however that these data are preliminary figures and will change (increase) over time. It has been estimated that the indirect costs to the employer such as loss of productivity, incident investigation, rehabilitation, damage to equipment etc can more than double the cost of claims. Taking this into account, the total cost to the minerals industry would be in excess of \$55 million.

## International comparisons

The Australian minerals industry average FIFR for the period 1990-91 to 1999-2000 was 0.11. Internationally, this compares well with South Africa which recorded a 1988-2000 average of 0.41 and is equal to the US average FIFR for 1991 to Sept 2000 of 0.11.

In the metalliferous sector Australia's average FIFR was equal to the US average rate for the minerals sector (0.11). However, in the coal sector, Australia performed comparatively better than the US, recording a rate of 0.13 which is substantially lower than the US rate of 0.18.

The pattern across countries is that more deaths occur in underground mining than in open-cut. This pattern appears to be consistent over time and location. Australia's performance in these two areas varies in comparison with other countries and while it has performed comparatively well in open-cut mining, its performance in the underground mining sectors has been less impressive compared with other countries.

Lost time injury data is difficult to compare internationally due to the different systems and definitions that apply. Traditionally the US has outperformed Australia in this area.

In the coal sector, US rates had fallen consistently between 1991 and 1998 but consecutive increases were recorded in 1999 and 2000. Over the same period, the Australian coal LTIFR also fell substantially and continued to fall in 1999-2000. The latest figures suggest that the Australian performance in this sector is, for the first time, ahead of US performance.

In the metalliferous sector Australia compares well with the US, recording a LTIFR of 9 in 1999-2000 compared with a US rate of 14. However, current trends may indicate that both Australian and US rates are stabilising at their respective levels.

## Conclusion

In last year's report it was noted that a sustained improvement in fatality rates had failed to materialise. This year's rates confirm this conclusion.

Injury rates have continued to improve, albeit on the back of continuing improvements in the worst performing sector – the coal sector. Industry performance on this indicator is beginning to catch that of other industry sectors.

The dollar cost of fatalities and injuries in the industry can be estimated to be \$55 million in 1998-99. However, the tragic cost in terms of human life and pain and suffering cannot be underestimated or quantified.

# Commitment to Safety and Health

Four years after the minerals industry's collective agreement to make safety and health its highest priority, the Minerals Council of Australia continues to take a leadership role on safety and health matters via the implementation of a strategy designed to improve the industry's safety and health performance.

This safety and health leadership strategy is developed and implemented by the Safety and Health Committee, which reports directly to the Council's Executive Committee.

Having undertaken a number of activities in 2000 to assess the value and effectiveness of the Council's safety and health activities, it is clear that there continues to be a role for the Council in working with the industry to pursue the elimination of fatalities, injuries and diseases.

Highlights of the Council's 2000 activities, outcomes and achievements are provided below and are grouped under four headings which represent the key drivers used by the Committee to pursue its goals.

## Leadership –

*Use of leadership by the Council and the industry to drive improvements in safety and health performance.*

- **Business planning and responding to emerging priority issues** – In considering the apparent disconnection between injury performance and the increasing number of fatalities, the Committee changed its focus during calendar 2000 to encompass three additional priority issues. These issues can be summarised as the need to generate:
  - (1) industry-wide commitment and motivation to eliminate fatalities, injuries and diseases;
  - (2) improved understanding and management of catastrophic risk; and
  - (3) enhanced learning from performance indicators.Work on these issues commenced in 2000 and will continue in 2001.
- **Industry leaders' survey** – For the first time, industry leaders were surveyed to determine the perceived value of the Council's safety and health activities. Respondents indicated significant support for the work done to date but suggested that the Council's safety and health activities must continue to move with member companies' evolving needs. This feedback was taken into consideration during the Committee's business planning for 2001.

- **Industry CEOs leading by example** – The Council's Executive Committee continued to address safety and health as the first substantive agenda item at their meetings as well as to share information on fatalities and significant incidents. Individual members of Executive Committee presented to the group on their personal efforts to improve the safety and health performance of their own organisations.
- **CEO Safety and Health Session** – The third annual Session focussed on the implications of the safety culture survey for CEOs. Participants considered the Session to be extremely valuable but were disappointed with the smaller audience compared with previous years. This has been addressed in planning for the 2001 Session.
- **Occupational health activities** – A research report on the industry's occupational health priorities and data needs has been completed and will be used to inform activities in this area during 2001.
- **Influencing policy formulation and implementation** – The Council continued its involvement in the ANZMEC Mine Safety Taskforce's development of a strategic national framework for mine safety regulation. A commitment has been made by ANZMEC Ministers to complete the framework by July 2001.

## Recognition –

*Adoption of best practice and innovation to achieve safety and health improvement.*

- **MINEX Awards** – Pacific Coal's Tarong Coal received the 2000 MINEX Award, becoming the first coal operation to do so. Planning for the 2001 MINEX Awards has resulted in a new marketing approach, enhanced criteria and more flexible eligibility guidelines to encourage increased participation in the process.
- **National Safety and Health Innovation Awards** – The second National Safety and Health Innovation Award was presented to Bayswater Colliery for an employee-based approach to communicating a core risk management plan.

## Risk Management –

*Industry awareness, understanding and adoption of a comprehensive approach to risk management that integrates catastrophic risk, behaviour/culture and systems*

- **Safety and Health Culture Conference** – The Council's first national safety and health conference, which focussed on the results of the safety culture survey, was well attended and considered by participants to be extremely worthwhile.
- **Catastrophic risk** – Having resolved to improve the understanding, identification, communication and management of catastrophic risk, the Committee commenced planning for its 2001 national conference (scheduled for 21 June in Adelaide) with a focus on this issue.

## Learning and Continuous Improvement –

*Rapid and effective information sharing across the industry resulting in learning and continuous improvement beyond current best practice.*

- **Measuring and reporting industry performance** – An examination of the annual minerals industry Safety and Health Performance Report's usefulness provided a number of enhancements that feature in this and future editions.
- **Enhanced performance indicators** – Work continued on the development of positive performance indicators.
- **Enhanced learning from significant incidents** – A proposal for a significant incident reporting scheme and database, *Safety Share*, was developed by the Committee and will be trialed in 2001 before being launched nationally.
- **Fatalities report** – A retrospective analysis of all fatalities in the minerals industry over the past decade, this report was commissioned for the industry to identify trends that have emerged over time and to share any learnings from past incidents.

# About the data used in this report

This report used data primarily from two different sources and for two different time periods:

- The primary, most comprehensive and current data is collected through the State mines inspectorates. This report contains 1999-2000 data from this source.
- The second data set is from the National Occupational Health and Safety Commission (NOHSC) collected through State workers' compensation authorities. This report contains 1998-99 data (the most recent available) from this source.

Both sets of data have their limitations as set out below, but used together they can provide a more complete picture of the minerals industry's safety and health performance.

The sources of international data included in this report are also described below.

## Mines inspectorate data – parameters and limitations

This data is supplied to inspectorates directly by minerals operations. In the majority of States reporting is a mandatory requirement of mining safety and health regulation.

In the NSW coal industry, data is collected by the Joint Coal Board (JCB), through the industry coal mines insurance scheme. All compensable injuries and disease are captured in this system. Companies supply denominator data (numbers of employees and hours worked) to the JCB on a quarterly basis.

Prior to 1992-93 the only complete data sets came from Queensland, New South Wales and Western Australia. Since then, the comprehensiveness of data from other States has improved.

Some inconsistencies remain however. Different State inspectorates have different jurisdictional scope and as a result each has a unique definition of what constitutes the mining industry. Some States include smelters/refineries, extractive industries and exploration activities within their scope. In other States these activities may be completely or partially excluded.

For the purposes of this report, data has been collected in a way to permit separation into the identified minerals sectors, and in most cases State inspectorates were able to provide data in a manner consistent with guidelines supplied by the Minerals Council.

The only difficulty related to the smelting/refinery sector where, with the exception of WA, TAS, NT and SA, smelting/refinery data was gathered directly by the Minerals Council from individual companies.

In summary, the limitations of data contained in this report from the State mining inspectorates include:

- Reliance on minerals operations submitting accurate data;
- Variations in coverage by inspectorates of minerals sectors in each State;
- Exclusion of disease cases.

## National Commission data – parameters and limitations

The following limitations apply to data collected by the National Occupational Health and Safety Commission (NOHSC) from claims for workers' compensation made under the Commonwealth, State and Territory Workers' Compensation Acts:

- Only cases compensated under general Commonwealth, State and Territory workers' compensation legislation are included. Excluded, therefore, are occurrences covered under separate legislation for specific groups of workers.
- The data includes fatality, permanent disability or temporary disability involving an absence from work of five working days or more (Victoria however has estimated the number of workers' compensation cases resulting in five or more days' lost time as they currently report cases of ten or more days' absence).
- Differences in the State workers' compensation arrangements may impact on attempts to make comparisons between States (for example different definitions of compensable deafness cases exist in each State).
- Data for the ACT is not available.
- The data has been adjusted to adhere to NOHSC's confidentiality policy. This includes the suppression of small cell values to ensure that confidential information about employers and employees is protected.
- The data presented here is preliminary and subject to revision.
- The use of Australian Bureau of Statistics (ABS) estimates of numbers employed and subsequent calculations of hours worked can produce errors by under or over estimates of incidence and frequency rates.

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The National Occupational Health and Safety Commission reports according to ANZSIC Classification. The ANZSIC Mining Division includes the following sub-divisions:

- Coal mining including black and brown coal mining;
- Oil and gas extraction;
- Metal ore mining including iron ore mining, bauxite mining, copper ore mining, gold ore mining, mineral sand mining, nickel ore mining, silver, lead zinc ore mining;
- Other mining including construction material mining (including gravel and sand quarrying);
- Services to mining including petroleum and mineral exploration and contracting activities.

### **About the international statistics**

When reporting international accident statistics there is limited data readily available for direct comparisons and benchmarking. Often the injury data is presented using different criteria, depending on each country's legislative reporting requirements. Consequently, some of the data used in this section has been adjusted to provide a comparison of performance.

This report compares injury rates for three countries. It is necessary to recognise that the statistical data has some differences due to variations in the definition of injury, country culture and degree of reporting.

These variables are difficult, if not impossible, to take into account. Therefore, the data presented is assumed to be equivalent quality, but care should be exercised when making direct comparisons or drawing any conclusions. Nonetheless, the analysis below should provide a reasonable indication of the relative qualitative safety performance of the countries concerned.

The USA data is reported annually by the USA Mine Safety and Health Administration. The US injury data for surface and underground mining is for production mining, which excludes office and support workers. Figures for the total sector, for example the coal sector and the minerals sector, include office workers. This will result in higher rates for surface and open-cut operations and lower rates, in relative terms, for the total sector and the whole mining industry. Data for 2000 is available only to 30 September.

The South African injury data has been obtained from reports by the South African Department of Minerals and Energy.

Ontario, Canada, injury data has been collected from the Ontario Mines and Aggregates Safety and Health Association. Ontario does not have a coal mining industry and 2000 data is provisional only.

The qualitative comparison refers to averages when comparing fatality rates. As the number of fatalities is a relatively small figure and can fluctuate significantly, particularly in the case of a multiple fatality incident, it is thought that an average taken over a number of years provides a better basis for comparison. However, the years over which the average is taken varies due to different data availability in each country. For example, while South African data is averaged over 1988 to 2000, Ontario data is only available for the past three years and is therefore averaged only over 1998 to 2000.

# Data from the Mines Inspectorates 1999-2000

## Fatalities statistics

In 1999-2000 the Australian minerals industry recorded eighteen fatalities. As has been the pattern since 1995-96, the highest death toll was recorded in underground metalliferous mines with the tragic multiple fatalities at Northparkes mine in NSW taking four lives, and at Bronzewing mine in WA taking three lives. Underground metalliferous fatalities accounted for more than half the total death toll with ten fatalities. As in the previous two years, surface brown coal mining and smelting and refining have remained fatality free. Exploration has also remained fatality free for the second consecutive year. Of the eighteen deaths recorded, eleven were in New South Wales and five were in Western Australia. The remaining two fatalities were recorded in Queensland. Victoria, Tasmania, South Australia and the Northern Territory remained fatality free.

## Fatalities By Sector

	1997-1998	1998-1999	1999-2000
Open-cut coal	1	1	1
Underground coal	1	2	4
Open-cut metalliferous	2	2	1
Underground metalliferous	12	5	10
Extractive industries	1	0	2
Smelting/refining	0	0	0
Exploration	2	0	0
<b>Total</b>	<b>19</b>	<b>10</b>	<b>18</b>

The eighteen fatalities in 1999-2000 almost doubles the previous year's fatalities and reverses a three-year downward trend.

Since 1990-91 the industry has recorded 223 deaths, an average of more than twenty-two deaths a year. Fatality levels have varied widely from year to year, ranging from a high of forty in 1990-91 to a low of seven in 1995-96.

While there has been no consistent trend in the number of fatalities recorded, there remains a strong consistency in where the fatalities occur. In 1999-2000 over 77% of fatalities were recorded in underground mines (this was preceded by 70% in 1998-99 and over 68% in 1997-98), with underground metalliferous mines accounting on average for almost 80% of those fatalities over the past three years.

Underground coal recorded four deaths and extractive industries recorded two deaths (both up significantly on the past two years), while both surface coal and surface metalliferous recorded a single death.

Brown surface coal mining, exploration and smelting and refining sectors were all free of fatalities in 1999-2000.

CHART 1 Fatal injuries 1990-91 to 1999-2000

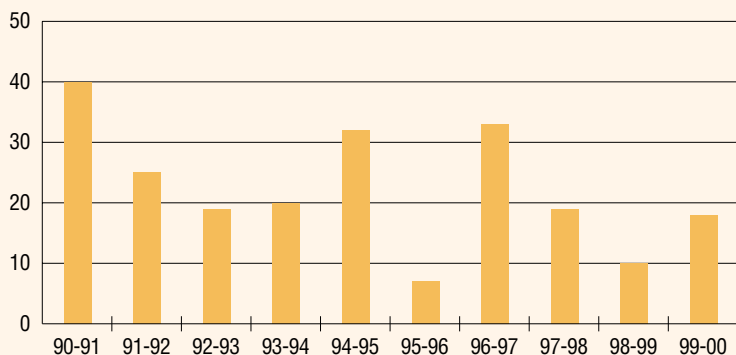
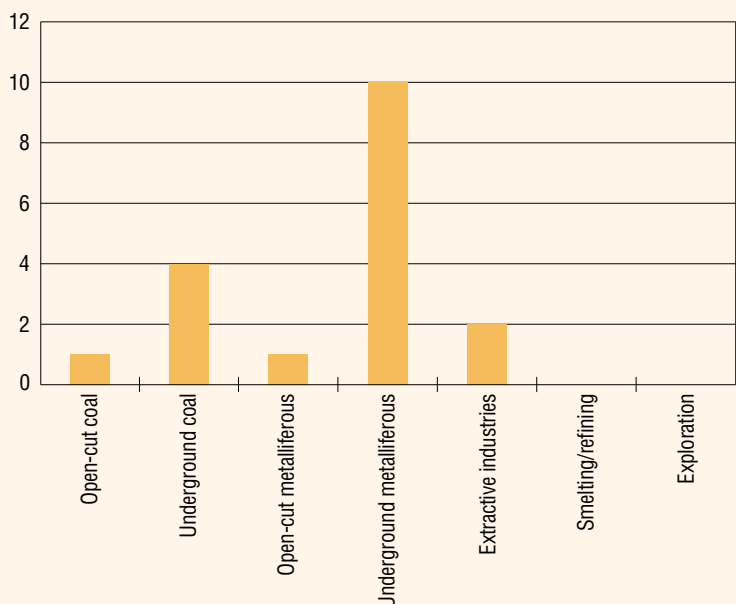
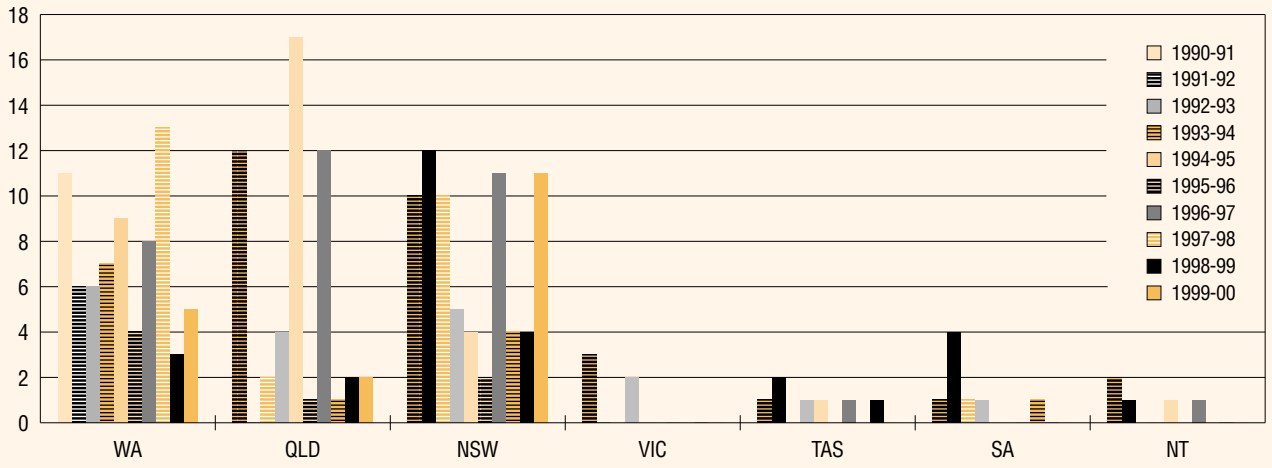


CHART 2 Fatal injuries by sector 1999-2000



**CHART 3 Fatal injuries by State 1990-91 to 1999-2000**



### Fatality Incidence Rate (FIR)

The national fatality incidence rate (FIR – a measure of fatalities per 1,000 employees) was 0.20 in 1999-2000 (up from 0.09 the previous year).

By State, New South Wales recorded the highest rate with 0.64 deaths per 1,000 employees. Western Australia recorded 0.13 deaths per 1,000 employees and Queensland recorded 0.10 deaths per 1,000 employees. All other States recorded a FIR of zero.

By sector, metalliferous underground recorded the highest rate with 0.89 deaths per 1,000 employees. This was almost twice the next highest rate of 0.46 recorded by underground coal mining. The extractive industries recorded a rate of 0.26 deaths per 1,000 employees, with coal surface recording a rate of 0.09, metalliferous surface a rate of 0.03 and brown coal surface, smelting and refining and exploration FIR of zero.

The trends in the FIR data are mirrored in the FIFR data (see Chart 4).

### Fatal Injury Frequency Rate (FIFR)

The risk of fatalities is measured by the Fatal Injury Frequency Rate (FIFR – the number of fatal injuries per one million hours worked).

In 1999-2000 the national FIFR was 0.09 per million hours worked, more than double that of the previous year, reversing a downward trend since 1996-97. Despite remaining below the ten-year average FIFR of 0.11, there is no consistent reduction in the risk of a fatality over the past ten years.

### Sector performance

In 1999-2000, all sectors recorded either the same or an increased FIFR with the exception of open-cut metalliferous which recorded a 50% decrease (from 0.02 to 0.01). Notably, the FIFR for underground metalliferous increased from 0.17 to 0.37, the FIFR for underground coal increased from 0.11 to 0.22 and the FIFR for the extractive industries increased from zero to 0.13. All sectors, with the exception of underground metalliferous, returned rates lower than the ten-year average for their sector, with underground metalliferous returning only a relatively low increase of 0.04 or just over 12%.

Three sectors returned rates higher than the national mining average for the year of 0.09: underground metalliferous (0.37), underground coal (0.22) and extractive industries (0.13). Underground metalliferous and underground coal have had a higher rate than the average each year for the past ten years (with the exception of underground coal in 1997-98).

Underground metalliferous has consistently experienced the highest FIFR over the past ten years (with the exception of 1993-94).

**CHART 4 Fatal Injury Frequency Rate (FIFR) 1990-91 to 1999-2000**

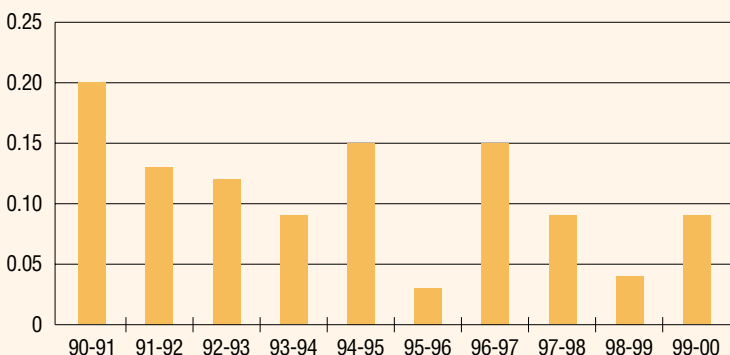


TABLE 1: Australian minerals industry Fatal Injury Frequency Rate

Year	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	Average
Open-cut coal	0.07	0.07	0.07	0.07	0.03	0.06	0.03	0.03	0.04	0.04	0.05
Underground coal	0.37	0.25	0.13	0.10	0.58	0.05	0.41	0.05	0.11	0.22	0.23
<b>Total coal</b>	<b>0.20</b>	<b>0.16</b>	<b>0.09</b>	<b>0.08</b>	<b>0.26</b>	<b>0.06</b>	<b>0.18</b>	<b>0.04</b>	<b>0.07</b>	<b>0.11</b>	<b>0.13</b>
Open cut metalliferous	0.11	0.05	0.06	0.05	0.12	0.00	0.07	0.02	0.02	0.01	0.05
Underground metalliferous	0.75	0.36	0.30	0.15	0.23	0.10	0.46	0.39	0.17	0.37	0.33
<b>Total metalliferous</b>	<b>0.20</b>	<b>0.09</b>	<b>0.13</b>	<b>0.08</b>	<b>0.15</b>	<b>0.03</b>	<b>0.17</b>	<b>0.12</b>	<b>0.05</b>	<b>0.10</b>	<b>0.11</b>
Extractive industries				0.46	0.20	0.00	0.00	0.09	0.00	0.13	0.13
Smelting/refining				0.04	0.02	0.02	0.05	0.00	0.00	0.00	0.02
<b>Total industry</b>	<b>0.20</b>	<b>0.13</b>	<b>0.12</b>	<b>0.09</b>	<b>0.15</b>	<b>0.03</b>	<b>0.15</b>	<b>0.09</b>	<b>0.04</b>	<b>0.09</b>	<b>0.11</b>

## State performance

In 1999-2000, New South Wales recorded 11 fatalities, Western Australia recorded five fatalities and Queensland recorded two fatalities. The remaining States were fatality free with Victoria, notably, having been fatality free for the past six years.

New South Wales' 11 fatalities is almost three times that of the previous two years and is equal to the worst result (also recorded in 1996-97) recorded in New South Wales during the past ten years. Western Australia's record is a 67% increase over past years. However it is also the third lowest number of fatalities in the past ten years in that State. Queensland's two fatalities in 1999-2000 equals the two fatalities recorded in the previous year.

In 1999-2000, New South Wales recorded the highest number of fatalities per million working hours (0.31) followed by Western Australia (0.06) and then Queensland (0.04). For each of these States, this FIFR represents either an increased or equivalent rate. The only reduction in FIFR was experienced in Tasmania where the rate fell from 0.11 to zero.

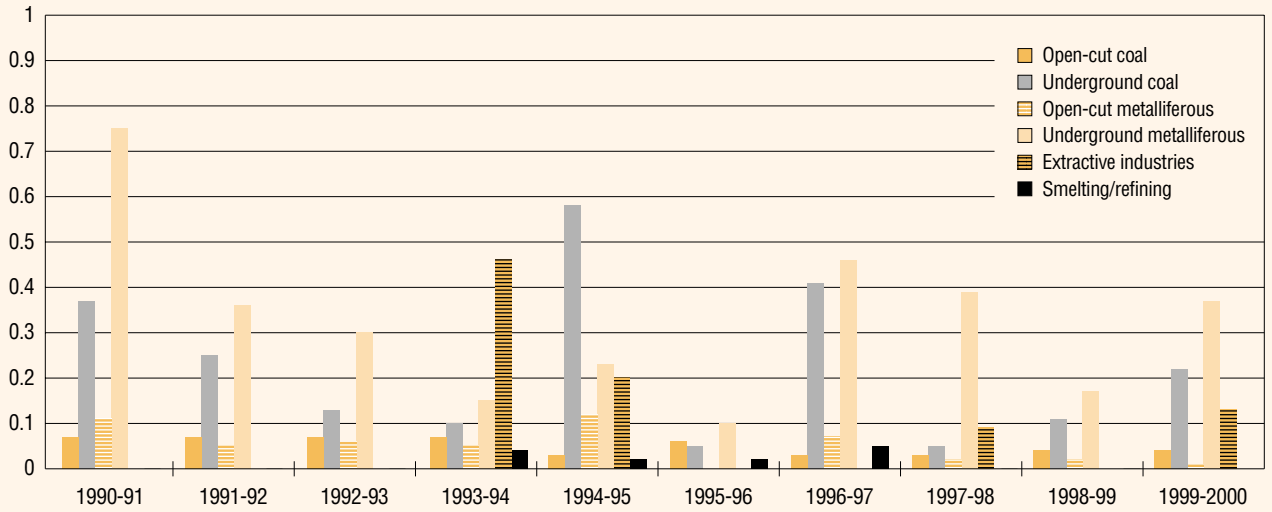
New South Wales has seen substantial variation in the FIFR over the past ten years, with a high of 0.31 in 1999-2000 and a low of 0.05 in 1995-96. While a mid-range result of 0.11 was recorded in the two years prior to this year's high, there is no evidence of any consistent reduction in the risk of fatality during the past ten years. New South Wales' FIFR for this year is also above the year's national mining average, as it has been for most years in the decade.

Western Australia has experienced comparatively less variation in the FIFR over the past decade with a high of 0.15 in 1990-91 and a low of 0.03 in 1998-99. This year's rate of 0.06 seems a fairly typical result. However, again, there is no evidence of any reduction in the risk of fatality during the past ten years.

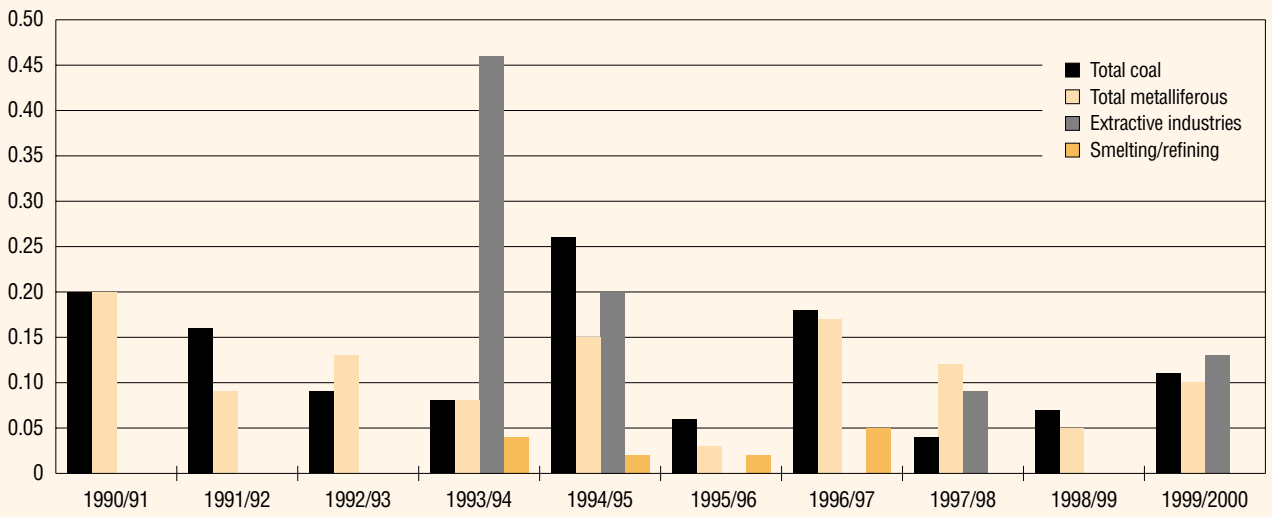
Queensland's FIFR experience is one of the most erratic. A higher rate of 0.28 was recorded in 1990-91 which was immediately followed by their decade low of zero. The highest overall rate of 0.32 was in 1994-95 and this remains the highest FIFR recorded in any State since that time. This year's rate of 0.04 is relatively low and falls below the national average for the year. While again, there is no evidence of a reduction in the risk of fatality over the past decade, a relatively low rate has been sustained for the past three years.

New South Wales, Western Australia and Queensland's results for 1999-2000 each contribute significantly to fluctuations in both the number of deaths and FIFR experienced over the past ten years. Whilst the FIFR for Tasmania, South Australia and the Northern Territory have also varied over the decade, they have recorded no more than one death in any year for the past eight years. Victoria has sustained zero deaths (and therefore a FIFR of zero) since 1994-95.

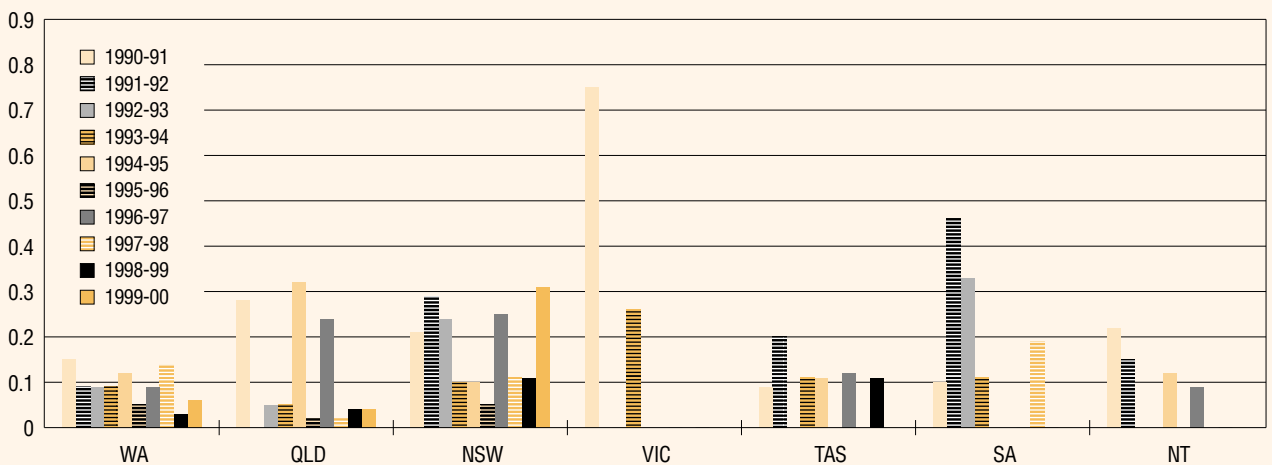
**CHART 5 Fatal Injury Frequency Rate by sector 1990-91 to 1999-2000**



**CHART 5a Fatal Injury Frequency Rate by sector 1990-91 to 1999-2000**



**CHART 6 Fatal Injury Frequency Rate by State 1990-91 to 1999-2000**



# Description of fatalities

## New South Wales

### METALLIFEROUS

- Jesse Ladd, a preschool-aged child was fatally injured after leaving his father's truck and moving towards another truck which was being loaded nearby. The child was found seriously injured some meters behind the rear of the second trailer and died shortly afterwards.
- Mr Ross Bodkin, a mine manager, Mr Michael House, a technical service team leader, Mr Stuart Osmond, a drilling contractor and Mr Colin Lloyd-Jones, a driller's offsider, were fatally injured in an air blast through an underground mine following a sudden caving of the ore body.
- Mr Peter Davenport, a production manager, was fatally injured when he was engulfed by flames while fabricating a diesel fuel tank on site using welding equipment.
- Dr Paul Broese van Groenou, an environmental consultant, was fatally injured when working in a gorge. He was struck by a rolling rock causing him to fall 20 meters down the slope.
- Mr Nick De Bruin, a mining contractor, was fatally injured when he was struck by falling rocks and/or a blow from the protective canopy he was using while removing the drilling head from the bottom of a raise bore development.

### UNDERGROUND COAL

- Mr Christopher Elliot, a mineworker, was fatally injured when crushed while undertaking repairs to a continuous miner.
- Mr David Hill, a mineworker, drowned after having fallen into a 70m deep underground water-filled sump while conducting maintenance of a pump.
- Mr Eugene Borkowski, a fitter, was fatally injured when crushed between a roof bolter and a mine wall.

## Western Australia

### UNDERGROUND METALLIFEROUS

- Three men, Messrs Shane Hamill, Timothy Bell and Troy Woodard, were fatally injured when a fill barricade ruptured and allowed mine-fill to flow into the lower levels of the mine.
- Mr Moana Ngarimu, a load-haul-dump (LHD) unit operator, was fatally injured when crushed between the LHD unit and a charging unit.

### OPEN-CUT METALLIFEROUS

- Mr David Te Moananui, a shotfirer, suffered fatal internal injuries when he reversed the dump truck he was operating over the edge of the Run-of-Mine (ROM) ore stockpile.

## Queensland

### UNDERGROUND COAL

- Mr Michael Morris was fatally injured from a roof fall at a development face.

### OPEN-CUT COAL

- Mr Christopher Lee, a fitter, died as a result of crush injuries received when the tray of haul pack, which was being lifted by a forklift, became dislodged and fell on to him.

# Lost time injury statistics

Last year it was noted that over the past ten years, both the actual number of lost time injuries (LTIs) and the lost time injury frequency rate (LTIFR) had declined in the Australian minerals industry. This trend continues in 1999-2000.

In 1990-91 the number of lost time injuries was 9,075. This has decreased to 2,294 in 1999-2000, while the LTIFR has declined from 52 in 1990-91 to eleven in 1999-2000. This declining trend has occurred for more than ten years.

While the magnitude of this decline is decreasing each year, the improvement in LTIFR has consistently remained between 7% and 21% per annum with an 8% improvement in the LTIFR in 1999-2000.

The 1993-94 to 1999-2000 LTI statistics include the extractive and refinery sectors, which, prior to this, were only partially reported to the State mines inspectorates. As noted in previous years, the impact of this on the underground and open-cut metalliferous data is difficult to determine.

## Sector performance

The total metalliferous and total coal figures for lost time injuries, as in previous years, remain very close: 974 and 971 respectively. However, their LTIFRs are very different, with coal recording 22 and metalliferous recording nine injuries per million hours worked.

Within the coal sector, underground coal recorded 670 LTIs and accounted for almost 70% of all LTIs within the sector. Surface coal recorded 282 LTIs and surface brown coal recorded 19 LTIs.

As a whole, the coal sector experienced an LTIFR of 22, significantly higher than the total mining LTIFR of 13.

This is largely due to underground coal which recorded a rate of 37 (the highest rate of all sectors). While the LTIFR of underground coal has markedly decreased each year during the past ten years, it is still at least 2.5 times higher than every other sector over the past decade, and in most instances much more (see Chart 11).

In the past ten years, the decline in the LTIFR for underground coal has been between 7% and 26% per annum (with the exception of the 1993-94 to 1994-95 decline which was lower). In 1999-2000 the improvement was around 10%, compared with a 28% improvement in the preceding year.

Like underground coal, open-cut coal has also seen a trend of improvement in the LTIFR over most of the past decade, falling from 49 in 1990-91 to 12 in 1999-2000. The magnitude of annual improvement has not been as large as in underground coal and more recent trends indicate that the improvement rate may be leveling off.

CHART 7 Lost Time Injuries 1990-91 to 1999-2000

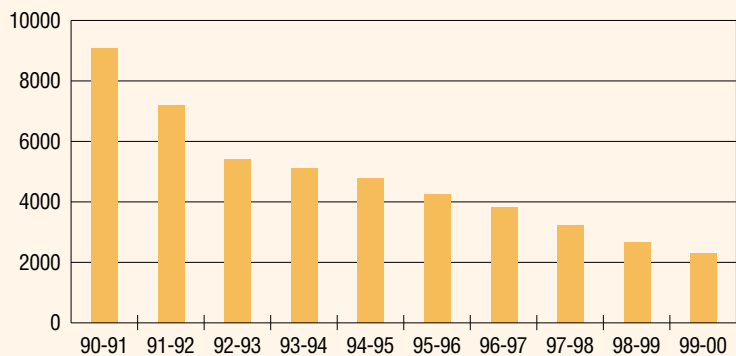


CHART 8 Lost Time Injuries by sector 1999-2000

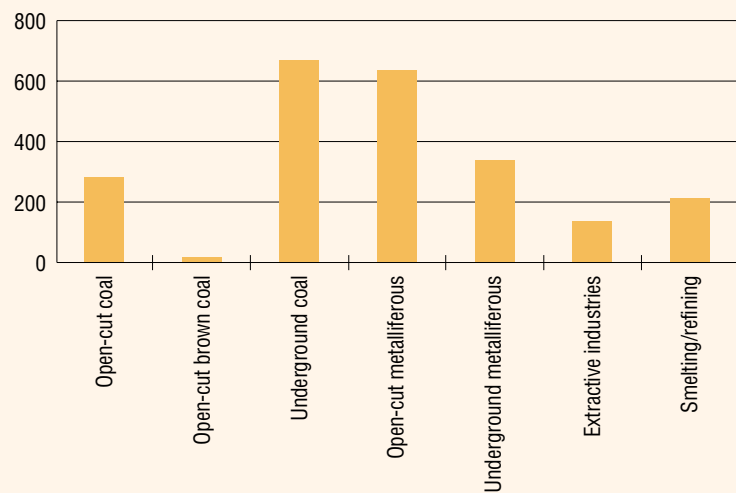
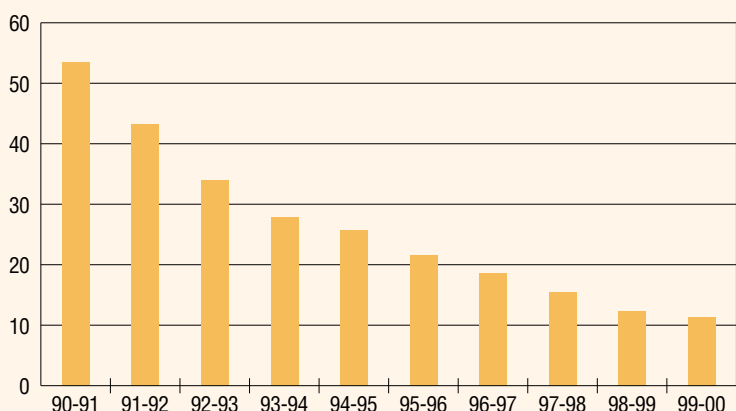


CHART 9 Total industry Lost Time Injury Frequency Rate 1990-91 to 1999-2000



The sector recording the third highest LTIFR was underground metalliferous, with an LTIFR of 12 in 1999-2000, representing that sector's (equally) lowest rate during the decade.

In the remaining sectors, extractive industries recorded an LTIFR of nine and smelting and refining recorded a rate of five.

Open-cut metalliferous was the only sector to record an increase in 1999-2000: an LTIFR of eight, up from seven the previous year. This is however, the only increase recorded in the sector over the decade, and the sector persists as one of the best performing sectors on this indicator, second only to smelting and refining.

## State performance

### LTi

In 1999-2000, three States recorded an increase in LTIs. Tasmania and the Northern Territory recorded increases of 23% and 27% respectively and Victoria recorded a smaller 2% increase. The remaining States experienced a decrease in LTIs of between 11% and 34%.

### LTIFR

While all States had experienced a downward trend in the LTIFR during the past decade, and consistent rates during the past three years, rates for 1999-2000 reverse this trend in four States.

The most marked increase was recorded in the Northern Territory where an LTIFR of nine (up from seven in the previous year) represented a 29% increase.

CHART 10 Total Lost Time Injury Frequency Rate by sector 1990-91 to 1999-2000

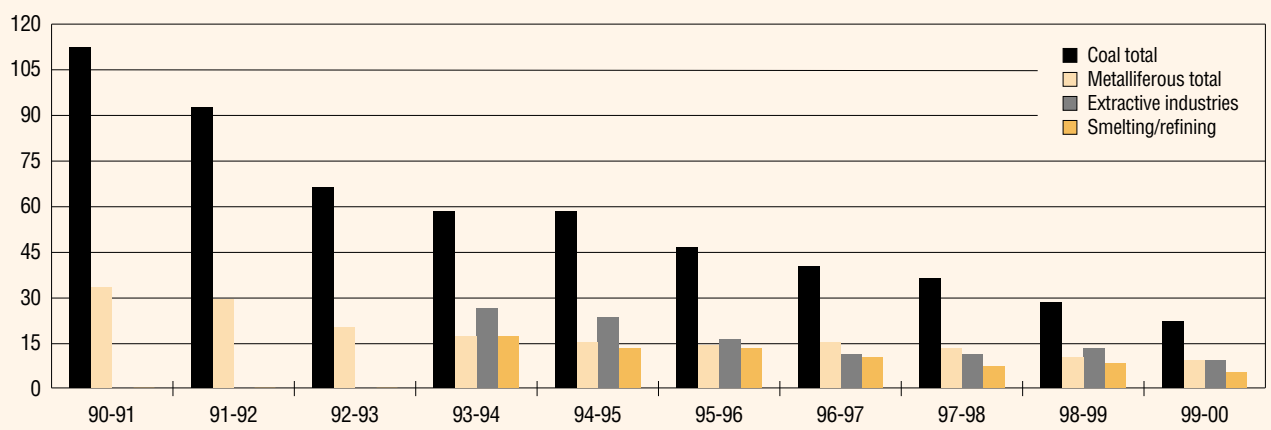


CHART 11 Lost Time Injury Frequency Rate by sector 1990-91 to 1999-2000

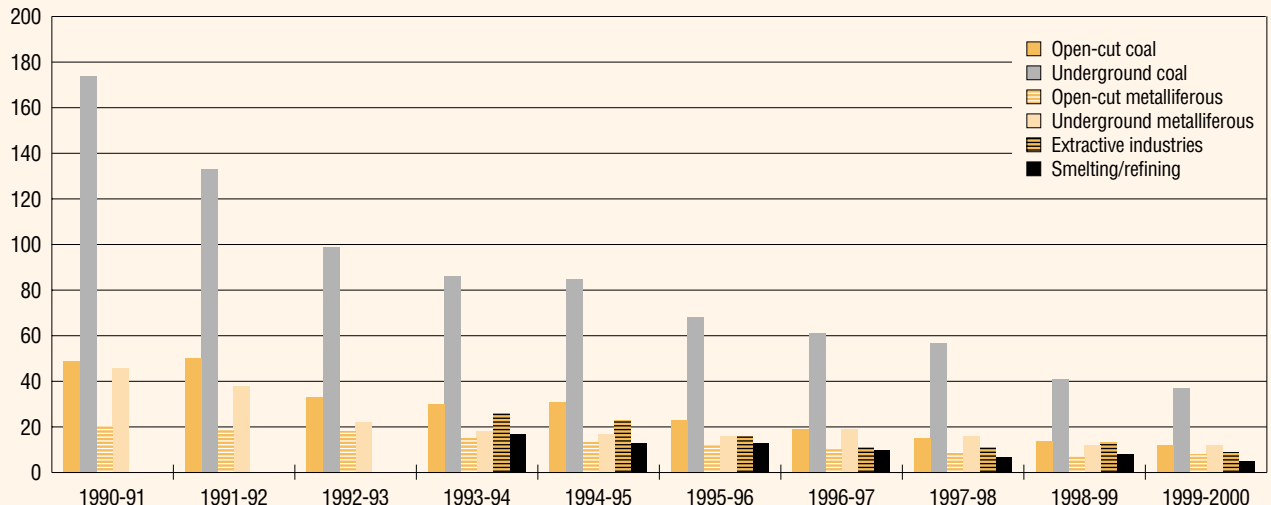


TABLE 2: Australian minerals industry Lost Time Injuries by sector 1999-2000

SECTOR	WA	QLD	NSW	SA	VIC	TAS	NT	AUST
Open-cut coal	21	96	165	0	—	0	—	282
Open-cut brown coal	0	—	—	—	19	—	—	19
Underground coal	0	161	508	—	—	1	—	670
<b>Coal total</b>	<b>21</b>	<b>257</b>	<b>673</b>	<b>0</b>	<b>19</b>	<b>1</b>	<b>—</b>	<b>971</b>
Open-cut metalliferous	414	160	12	3	1	11	34	635
Underground metalliferous	65	97	59	4	8	83	23	339
<b>Metalliferous total</b>	<b>479</b>	<b>257</b>	<b>71</b>	<b>7</b>	<b>9</b>	<b>94</b>	<b>57</b>	<b>974</b>
<b>Mining total</b>	<b>500</b>	<b>514</b>	<b>744</b>	<b>7</b>	<b>28</b>	<b>95</b>	<b>57</b>	<b>1945</b>
Extractive industries	22	26	25	20	40	1	3	137
Smelting/refining	61	28	26	23	17	41	16	212
Other	—	—	—	14*	—	—	3*	17*
<b>ALL</b>	<b>583</b>	<b>568</b>	<b>795</b>	<b>64</b>	<b>85</b>	<b>137</b>	<b>76</b>	<b>2294</b>

\* Not included in totals

Prior to this, the Northern Territory had maintained a consistent downward trend for the past decade.

The Northern Territory's result was closely followed by Tasmania with an LTIFR of 16 (up from 13 in the previous year) representing a 23% increase. Again, prior to this year the State had maintained a relatively consistent downward trend for the past decade.

Western Australia also recorded an increased LTIFR in 1999-2000 of seven (up from six in the previous year) – a 17% increase. Like the Northern Territory and Tasmania, the State had maintained a consistent improvement in its LTIFR for the past decade.

In Victoria the LTIFR for the year increased by 10% from 10 to 11. While Victoria experienced an improvement in the LTIFR in the three years between 1992-93 (when the rate was first recorded) to 1994-95, the rate has hovered between ten and 12 for the past six years.

Of the remaining States, Queensland maintained its result from the previous year – an LTIFR of 12. Prior to this it had experienced a decline in the rate each year for the last nine years. Both New South Wales and South Australia experienced a reduction in their LTIFR of 21% and 25% respectively, with New South Wales' falling from 29 in 1998-99 to 23 in 1999-2000 and South Australia's rate dropping from eight in 1998-99 to six in 1999-2000.

While the overall improvement trend remains positive, it should be noted that the reduction in LTIFR overall can be largely attributed to a reduction in the LTIFR in the underground coal sector. And while decreases in other sectors have occurred over the decade, the base from which improvements can be made is much smaller and the decreases therefore less substantial, particularly in more recent years. The limit of the LTIFR's value as an indicator of continuous improvement has all but been reached in all sectors except underground coal.

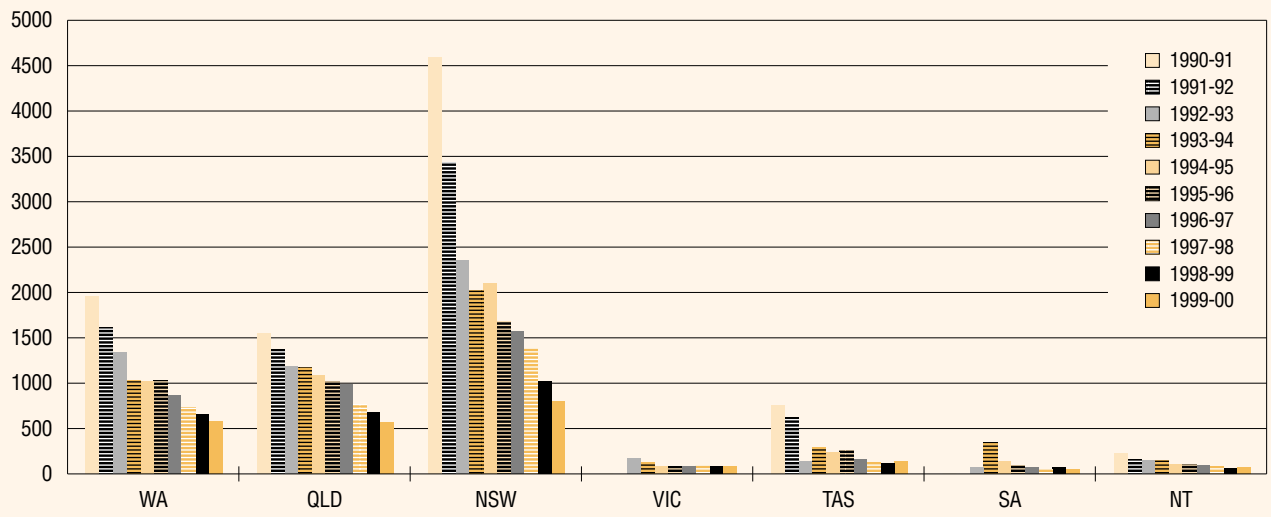
## State by sector

### COAL

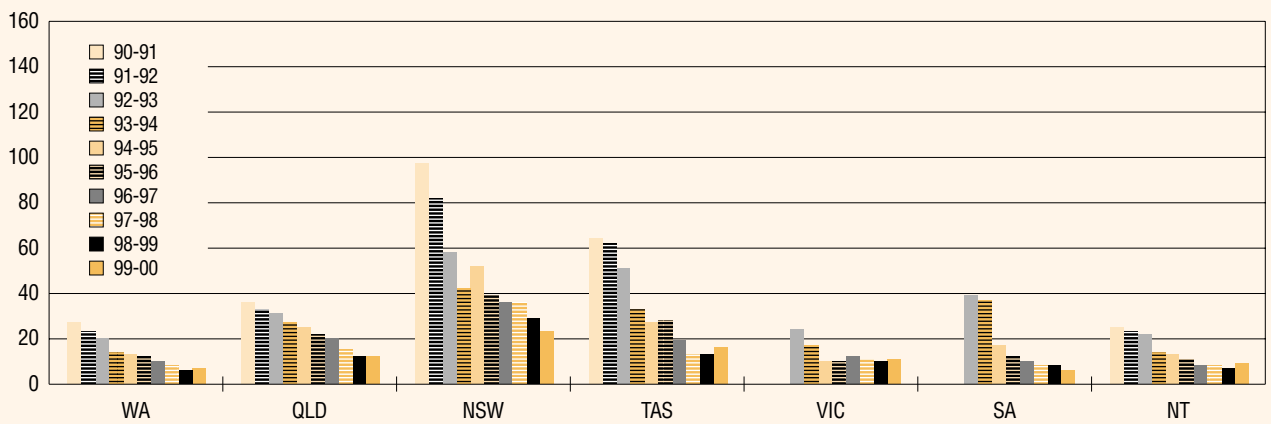
Both the underground and open-cut coal sectors reduced their average LTIFR in 1999-2000, by 10% and 20% respectively.

The underground coal sector recorded the highest LTIFR of any sector, averaging 37 in 1999-2000. In 1999-2000, of the three States with underground coal mines, Queensland recorded a rate of 27 representing a 7% reduction on the 1998-99 rate, New South Wales recorded a rate of 43, the highest rate of any sector/State in the year, yet still representing a reduction of over 10% on the 1998-99 rate and Tasmania recorded a rate of 8 in 1999-2000, compared with zero for the past three years.

**CHART 12 Lost Time Injuries by State 1990-91 to 1999-2000**



**CHART 13 Lost Time Injury Frequency Rate by State 1990-91 to 1999-2000**



The open-cut coal sector recorded an average LTIFR of 12. Western Australia recorded a rate of 16 representing a substantial 45% reduction over the previous year. Queensland maintained its LTIFR of 7, New South Wales recorded a 22% reduction (falling from 27 in 1998-99 to 21) and Tasmania recorded a rate of zero for the third consecutive year. Victoria was the only State to record an increase in this sector – from eight in 1998-99 to nine in 1999-2000, the third consecutive annual increase.

**METALLIFEROUS**

Underground metalliferous recorded an LTIFR of 12 in 1999-2000, maintaining the 1998-99 result. Western Australia maintained its rate of seven LTIs per one million hours worked. Queensland recorded a rate reduction from 16 in 1998-99 to 14 in 1999-2000 (12.5%). New South Wales experienced a more substantial decrease of 17%

(falling from 22 in 1998-99 to 16 in 1999-2000). Victoria also recorded a reduction, falling to 11 in 1999-2000 (an 11% decrease). South Australia, which has recorded low LTIFRs in previous years (remaining below four since 1995-96), maintained its low rate in 1999-2000 with an LTIFR of two.

Open-cut metalliferous recorded an LTIFR of eight in 1999-2000, up from seven in 1998-99. Five States recorded a rate increase. Western Australia (7), Queensland (10), Tasmania (17) and the Northern Territory (9) all recorded increases of between 7% and 25%. South Australia's rate doubled to 12 in 1999-2000. Victoria recorded a rate of seven in 1999-2000 which represents a 61% decrease and also the lowest rate on record for this sector in this State. New South Wales maintained a rate of ten in 1999-2000.

TABLE 3: Lost Time Injury Frequency Rate by sector 1990-91 to 1999-2000

MINING METHOD	STATE	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	
<b>Open-cut metalliferous</b>	WA	22	19	16	13	12	12	9	8	6	7	
	QLD	19		20	13	16	11	13	12	8	10	
	NSW	12	17	16	24	38	18	17	11	10	10	
	VIC			27	38	20	22	10	24	18	7	
	SA			59	42	17	4	19	6	6	12	
	TAS			100	104	68	68	57	18	16	17	
	NT			18	13	11	7	5	7	7	9	
Average		20	19	18	15	13	12	10	9	7	8	
<b>Underground metalliferous</b>	WA	54	41	29	21	24	18	14	9	7	7	
	QLD	28		19	22	18	20	22	19	16	14	
	NSW	56	35	18	13	10	9	30	32	22	16	
	VIC			29	29	18	20	45	30	14	11	
	SA			16	9	11	4	4	2	3	2	
	TAS			28	14	16	20	17	18	19	27	
	NT			66	17	12	14	14	8	8	11	
Average		46	38	22	18	17	16	19	16	12	12	
<b>All metalliferous</b>	WA	25	21	17	14	14	13	10	8	6	7	
	QLD	21	19	19	19	17	15	17	15	10	11	
	NSW	26	23	17	14	13	10	24	21	16	14	
	VIC			14	35	19	22	24	28	15	10	
	SA			23	17	13	4	10	15	4	4	
	TAS			39	26	23	24	19	18	19	25	
	NT			22	14	11	9	8	7	7	9	
Average		24	21	22	20	16	13	12	11	8	9	
<b>Open-cut coal</b>	WA	76	85	88	65	91	61	41	32	29	16	
	QLD	38	34	32	26	22	17	13	8	7	7	
	NSW	64	45	30	33	43	31	29	31	27	21	
	<b>(Brown coal only)</b>	VIC	0	0	19	16	7	4	3	5	8	9
	<b>(Brown coal only)</b>	SA	0	0	28	23	24	14	11	0	4	—
	TAS	0	0	61	54	23	52	19	0	0	0	
	NT										—	
Average		49	50	33	30	31	23	19	15	15	12	
<b>Underground coal</b>	WA	247	217	300	157							
	QLD	144	96	68	74	68	60	62	39	29	27	
	NSW	177	138	104	88	90	71	61	65	48	43	
	VIC											
	SA											
	TAS			33	0	34	9	0	0	0	8	
	NT											
Average		174	132	99	86	85	68	61	57	41	37	
<b>All coal</b>	WA	116	108	130	78	91	61	41	32	29	16	
	QLD	55	46	40	34	31	26	24	16	13	12	
	NSW	140	108	78	68	73	56	48	52	39	34	
	VIC			19	16	7	4	3	5	8	9	
	SA			28	23	24	14	11	0	4	0	
	TAS			37	10	29	30	19	14	0	7	
	NT											
Average		106	83	61	51	53	41	36	32	25	22	

TABLE 3: Lost Time Injury Frequency Rate by sector 1990-91 to 1999-2000 (continued)

MINING METHOD	STATE	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00
<b>Total mining</b>	WA				16	15	14	10	8	7	8
	QLD				28	25	22	21	16	12	12
	NSW				57	61	45	43	44	33	30
	VIC				22	13	12	15	13	11	9
	SA				19	17	7	10	6	4	4
	TAS				25	23	25	19	18	18	24
	NT				14	11	9	8	7	7	9
Average				29	29	23	20	17	12	12	13
<b>Extractive industries</b>	WA				19	15	5	10	11	3	16
	QLD				24	20	11	10	14	15	12
	NSW				25	25	17	8	4	10	3
	VIC				24	18	16	21	17	18	19
	SA				33	38	27	11	20	20	18
	TAS				22	24	17	18	14	3	4
	NT				37	29	12	3	12	17	12
Average				26	23	16	11	11	13	9	9
<b>Smelting/refining</b>	WA				8	8	8	7	6	4	3
	QLD				26	21	23	15	10	19	12
	NSW				21	14	14	9	8	16	9
	VIC				7	5	5	5	4	1	7
	SA				49	13	10	9	7	11	4
	TAS				39	29	31	19	8	9	9
	NT				15	14	15	10	10	4	6
Average				17	13	13	10	7	8	8	5
<b>All mining industry</b>	WA	27	23	20	14	13	12	10	8	6	7
	QLD	36	33	31	27	25	22	20	15	12	12
	NSW	97	82	58	52	52	39	36	36	29	22
	VIC			51	17	10	10	12	11	10	11
	SA			24	37	17	12	10	9	8	6
	TAS			39	33	27	28	19	13	13	16
	NT			22	14	12	11	8	8	7	9
Average		52	42	33	27	25	21	18	15	12	11

#### EXTRACTIVES

The extractive industries recorded an LTIFR of nine in 1999-2000. This is down from last year's rate of 13. Western Australia recorded a substantial increase of 433% (moving from three in 1998-99 to 16 in 1999-2000). Other States to record increases were Victoria and Tasmania. New South Wales recorded a rate of three (down from ten in the previous year) and the Northern Territory a rate of 12 (down from 17 in the previous year). Queensland and South Australia also recorded a decrease in their LTIFR.

#### SMELTING/REFINING

Smelting and refining recorded an LTIFR of five in 1999-2000, which is a reduction from last year's rate of eight. Four States recorded rate improvements between 1998-99 and 1999-2000, three of which were substantial. South Australia recorded a 64% reduction (falling from 11 to four), New South Wales recorded a 44% reduction (falling from 16 to nine) and Queensland recorded a 37% reduction (falling from 19 to 12). Western Australia improved slightly, falling from four to three.

Tasmania maintained its LTIFR in 1999-2000 with a rate of nine. New South Wales experienced a 600% deterioration in LTIFR, moving from one in 1998-99 to seven in 1999-2000). This represents the highest rate recorded for the State since records began in this sector in 1993-94. The Northern Territory recorded an increase of 50% moving from four in 1998-99 to six in 1999-2000.

## Duration and severity rates

By definition, the duration rate (DR) measures the average time lost for every lost time injury and can be seen as a measure of the severity of the injury. The severity rate (SR) is defined as the average number of days lost per million hours worked.

The average DR for the minerals industry was 18 days lost per injury, equaling that of the previous two years. While this was slightly down on the DR of 19 recorded in 1996-97 it remains higher than the rates of 16 and 15 recorded in 1994-95 and 1995-96 respectively.

In 1999-2000 the SR also fell slightly from the 206 days lost per million hours worked recorded in the previous year, to 200 days lost. While the continuing downward trend in the severity rate is positive, the decrease this year falls well short of the decreases of 68 and 60 days lost in the previous two years.

### Duration and Severity Rates by sector

While the DR rate for the minerals industry has remained at 18 for the past two years, this is due largely to a balancing out of increases and decreases in rates in each sector. The SR rate, while showing a small overall decline in 1999-2000 from 206 in 1998-99 down to 200, is more stable across sectors.

### COAL

In 1999-2000 the duration rate for the open-cut coal sector rose sharply – the fourth consecutive increase. The sector's rate moved to 27 from 25 the previous year, and signifies the highest duration rate of any sector, a position it has held since 1997-98.

The underground coal sector experienced its first decline in at least five years – a 4% improvement as DR fell from 23 in 1998-99 to 22 days lost per lost time injury. However, an 8% increase in the DR in open-cut coal has led to an overall increase in the coal sector DR of 4% (a rate of 24 this year, up from 23 in the previous year).

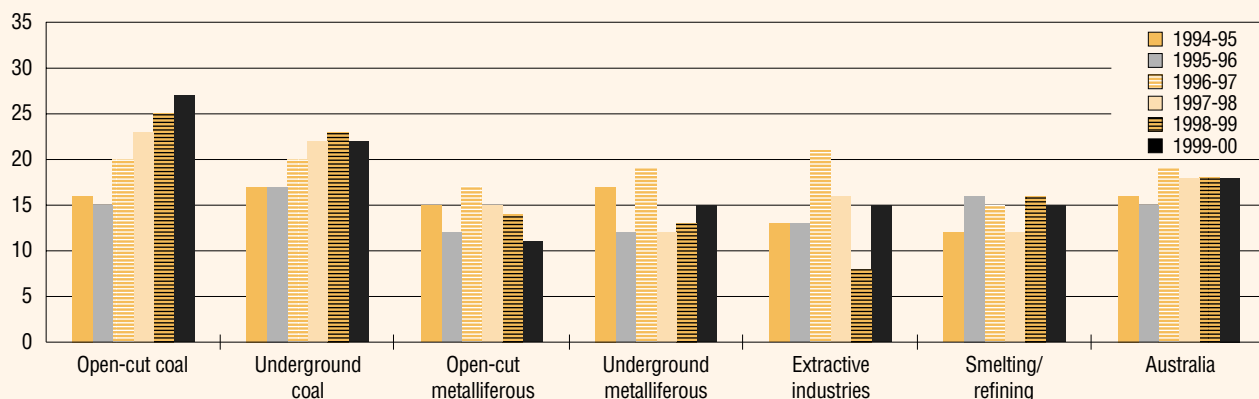
Despite increases in the DR, the coal sector experienced decreases in its SR due to a 12% fall in the open-cut SR (from 355 in 1998-99 to 314 this year), and a 12% decrease in underground coal SR (from 929 to 816 days lost per million hours worked.)

### METALLIFEROUS

In 1999-2000 the duration rate for the open-cut metalliferous sector fell from 14 in 1998-99 to 11, the third decrease in consecutive years and a 21% reduction. It also signifies the lowest DR for open-cut metalliferous in at least six years and the lowest DR of all sectors in 1999-2000.

In the underground metalliferous sector, the DR increased from 13 days lost per lost time injury in 1998-99 to 15 in 1999-2000 (a 15% increase). This result contributes to the erratic history of the rate in this sector, which has recorded both substantial increases (42% in 1996-97) and decreases (20% in 1995-97) during the past six years. The reduction in the DR in open-cut metalliferous together with the increase in the rate in underground metalliferous have led to an overall fall of 7% in the average time lost per lost time injury in the metalliferous sector.

CHART 14 Duration Rate by sector 1994-95 to 1999-2000



When compared with other sectors, the metalliferous sector has recorded relatively poor SR results. While a small reduction of 1% (92 in 1999-2000, down from 93 in the previous year) in the SR was recorded in open-cut metalliferous, a sharp increase of 18% (189 in 1999-2000, up from 160 in 1998-99) was recorded in underground metalliferous. Again, both these sectors have a history of erratic rate movements. This has led to an overall increase of 11% in the days lost per million hours worked in the sector as a whole.

#### EXTRACTIVES

In 1999-2000 the extractive industries experienced an increase in the DR of 88%. This represents the largest increase in any sector during 1999-2000 and of any sector in at least the past six years. This dramatic increase follows a decrease of 50% (or a halving) of the rate in the previous year.

The extractives sector also experienced a sharp increase in SR, rising from 113 days lost per million hours worked in 1998-99 to 134 in 1999-2000 (a 19% increase) reversing the trend of a declining SR in the past two years.

#### SMELTING/REFINING

Over the past six years the smelting/refining sector has also experienced fluctuations in DR, yet this has been within a fairly low and stable range. In 1999-2000 the sector experienced a decrease from 16 to 15 days lost for every lost time injury.

In 1999-2000 the SR rate fell dramatically from 135 in 1998-99 to 83 – a 39% decrease in the days lost per million hours worked. This is the lowest SR of any sector in the year. While the SR in the sector has also been erratic it continues to be one of the best performing sectors on this indicator.

## **Duration and Severity Rate by State**

In 1999-2000 the industry experienced a wide range of DRs across the States. New South Wales recorded the highest DR of all States, 25, and continued a three-year trend of consecutive increases in the average days lost for every lost time injury.

South Australia followed with the next highest DR of 17 representing an 89% increase on the previous year. Queensland registered the third highest DR of 15, also an increase on last year's rate. Both Victoria and Tasmania recorded a rate of 13, and Western Australia a DR of 12, the only state to record a decline (25%), consistent with a three-year downward trend in that State. The Northern Territory recorded the lowest DR, yet still experienced a significant increase on last year's rate (57%).

While most States historically have experienced a general decline in the days lost per million hours worked (the SR), in 1999-2000 a majority of States recorded an increase. As with the DR, New South Wales (567) recorded the highest SR and was one of only two States to record a decline (18%). Despite the downward trend in the rate for NSW, it still maintains a rate almost three times greater than that of any other State.

The second highest SR was recorded by Tasmania, 202, an increase of 21% on last year's rate of 159. Of the remaining States, Queensland (178), Victoria (140), South Australia (113) and the Northern Territory (96) all recorded increases of 6%, 18%, 43% and 109% respectively, yet all remained well below the national average of 202. Western Australia, the second State to record a decrease (12%) also recorded the lowest SR for 1999-2000 of 85.

While there have been strong historical trends for some time showing fewer mining industry employees are suffering lost time injuries, SR and DR data have not improved consistently. This shows that the injuries that are continuing to occur (and result in lost time) are as severe as ever and/or companies in the mining industry need to further improve their return to work management of employees who do suffer a lost time injury (including treatment of the injury and workplace/personnel issues).

**CHART 15 Duration Rate by State 1999-2000**

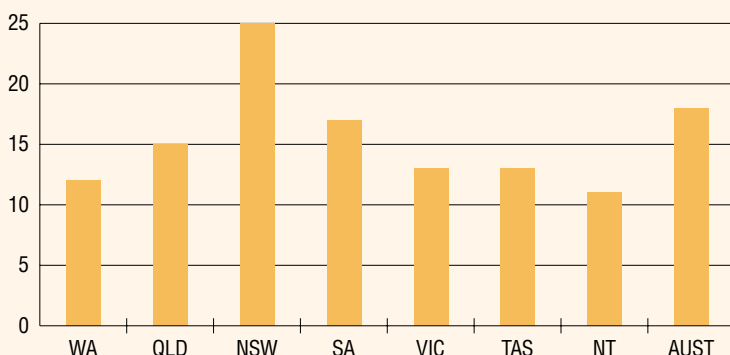


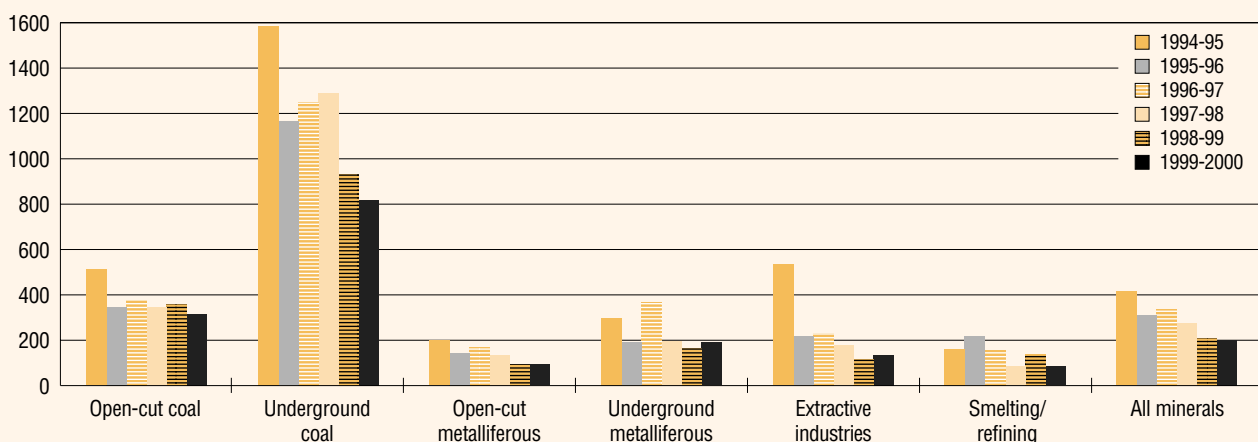
TABLE 4: Duration Rate and Severity Rate by sector 1995-96 to 1999-2000

	1995-96		1996-97		1997-98		1998-99		1999-2000	
	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate
Open-cut coal	15	344	20	374	23	344	25	355	27	314
Underground coal	17	1162	20	1247	22	1288	23	929	22	816
Open-cut metalliferous	12	142	17	166	15	133	14	93	11	92
Underground metalliferous	12	188	19	365	12	195	13	160	15	189
Extractive industries	13	216	21	228	16	174	8	113	15	134
Smelting/refining	16	215	15	151	12	82	16	135	15	83
All minerals	15	307	19	334	18	274	18	206	18	200

TABLE 5: Duration Rate and Severity Rate by State 1996-97 to 1999-2000

	1996-97		1997-98		1998-99		1999-2000	
	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate
WA	17	169	17	133	16	97	12	85
QLD	17	337	18	192	13	168	15	178
NSW	21	749	23	823	24	691	25	567
SA	11	107	23	93	9	79	17	113
VIC	23	277	14	150	12	119	13	140
TAS	24	453	17	216	13	159	13	202
NT	10	88	15	119	7	46	11	96
Australia	19	334	18	274	18	206	18	200

CHART 16 Severity Rate by sector 1994-95 – 1999-2000



# Workers' Compensation data

This section discusses National Occupational Health and Safety Commission (NOHSC) data for 1998-99, the latest such figures available.

## Fatalities in the minerals industry

In 1998-99, 13 injury/poisoning deaths (making up 76%) and four disease deaths (24%) were recorded by the mining industry. This represents a substantial shift on last year's figures where 17 injury/poisoning deaths (making up 90%) and two disease deaths (10%) were recorded. As in previous years, due to confidentiality concerns no further information is available on disease deaths.

It is worth comparing the figures captured through the workers' compensation system and those collected through the mines inspectorates for the same period. This comparison uses only injury/poisoning NOHSC data for consistency, as disease figures are unlikely to be included in the mines inspectorate data. The difference in the numbers of fatalities identified by the two bodies may be explained by inconsistencies in data collection. For example, they have different definitions of what constitutes the minerals industry. In 1998-99 NOHSC recorded higher figures than the mines inspectorate unlike the previous two years.

Year	Mines inspectorate recorded fatalities	NOHSC recorded fatalities
1996-97	33	28
1997-98	19	17
1998-99	10	13

In 1998-99 the injury/poisoning fatalities included four fatalities (31%) in each of the *coal mining* and *metal ore mining* sectors. Of the remaining injury/poisoning fatalities, three were recorded in *other mining* and two were recorded in *services to mining*.

Fatal incidence and frequency rates are shown in Chart 17 for selected additional ANZSIC sub-divisions. Selected industry sub-divisions are those from the higher end of the spectrum traditionally used for comparison purposes.

In 1998-99 the mining sectors performed well compared to other sectors on the FIFR indicator. Each of the mining sectors recorded a rate below 0.1 with the exception of *metal ore mining* which recorded a rate just below 0.2. In comparison, *services to agriculture* and *forestry and logging* both recorded a rate well above 0.2. In 1998-99, again the mining sectors performed relatively well when compared with other sectors.

Each of the sectors sat at or below 0.1 with the exception of *other mining* which recorded a rate of 0.3 – the highest rate of all the selected sectors.

On the FIIR (Fatal Injury Incidence Rate) indicator, in the previous year (1997-98), the mining sectors recorded rates at or below 0.2 (with the exception of *metal ore mining* which recorded a much higher rate of over 0.4). However, when these rates are compared with rates in other sectors such as *forestry and logging* and *services to agriculture* which recorded rates of just below 0.6 and 0.5 respectively, the mining sectors perform comparatively well. In 1998-99 the mining sectors have not compared as well. *Other mining* recorded the highest rate of any sector at 0.6 and *coal mining* (0.3) also recorded a rate increase. In comparing the mining sectors with other selected sectors, although *forestry and logging* recorded a high rate (0.5), most of the other sectors recorded rates within or in most cases below the mining sector rates.

In the previous year (1997-98), four sectors recorded FIFRs higher than 0.1. While three of these sectors, *services to agriculture*, *metal ore mining* and *road transport* recorded a substantially lower rate in 1998-99, *forestry and logging* (recording 0.2 in 1998-99), although experiencing a decrease on the previous year's rate, remained in this higher range. The only sector to make a notable increase on last year's figures was *other mining* which doubled its rate to 0.3, recording the highest rate of any sector. The remaining sectors all experienced much lower rates of 0.1.

In the previous year (1997-98), it was noted that the fatality incidence rate recorded much greater variability between sectors when compared to the FIFR. In 1998-99 this trend continued with six sectors recording rates over 0.1. In line with the FIFR results, the sector recording the highest rate was *other mining* (0.6) which was closely followed by *forestry and logging* (0.5). These sectors were followed by *road transport* and *coal mining* with a rate of 0.3 and *oil and gas extraction* and *services to agriculture* with a rate of 0.2. The remaining sectors recorded rates of 0.1.

As has been noted in the mines inspectorate data, fatality rates vary widely from year to year.

**TABLE 6: Fatality data – injury/poisoning and disease 1998-99**

	Injuring/poisoning	Disease
Coal mining	4	1
Metal ore mining	4	0
Other mining	3	3
Services to mining	2	0

### Mining industry injury claims data

In 1997-98 the incidence and frequency rates for new worker's compensation cases for injuries resulting in five or more days lost time for the mining division (excluding Victoria) were 41 and 18 respectively. In 1998-99 these rates fell to 31 and 14 respectively, representing a substantial improvement. Although this level of improvement has been seen for several years, 1998-99 represents the first year in which the mining industry has *not* recorded the highest rates of the industries selected for comparison – the manufacturing industry recorded both the highest incidence and frequency rates with 32 and 16 respectively.

Within all the selected sectors, the highest incidence and frequency rate was recorded in the *storage* sector (59 and 31 respectively) which was closely followed by the *coal mining* sector (56 and 26 respectively). *Oil and gas extraction* recorded the lowest rates with 12 and 6 respectively.

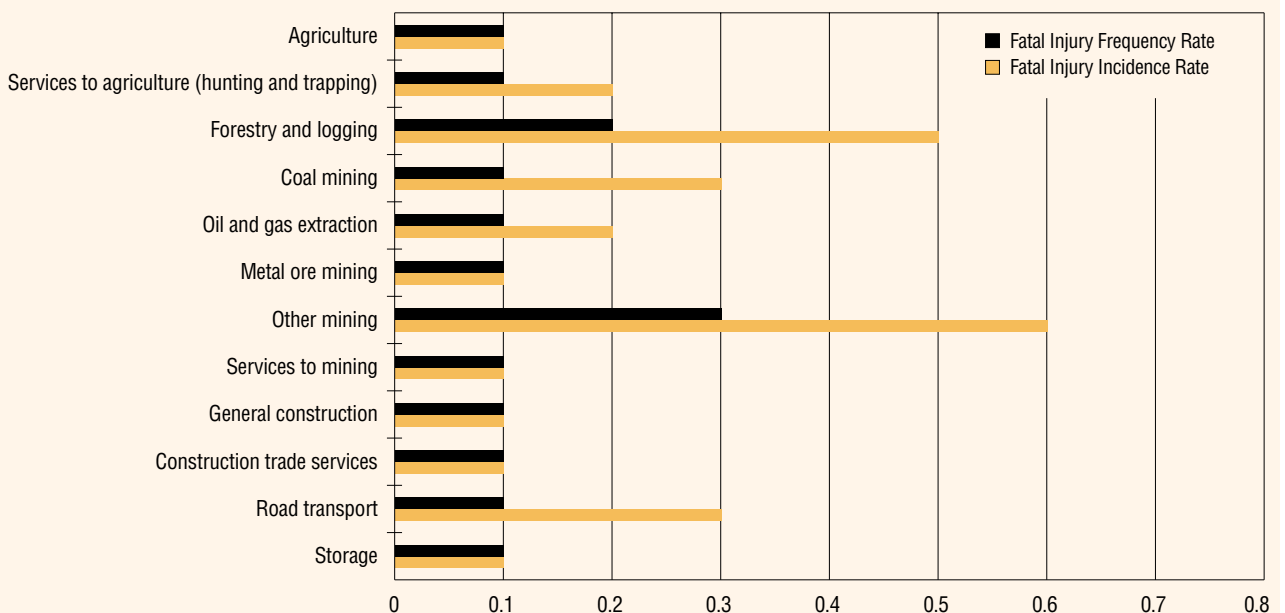
Within the mining industry, *other mining* recorded the highest incidence and frequency rates in 1997-98. In 1998-99, the *coal mining* sector recorded incidence and frequency rates 70% and 73% higher than *other mining*, which recorded the second highest rates (33 and 15).

In 1998-99 only four sectors – *agriculture, oil and gas extraction, metal ore mining* and *construction trade services* – recorded incidence rates below the all-mining average incidence rate of 31. Only three sectors, *oil and gas extraction, metal ore mining* and *services to mining* recorded frequency rates below the all-mining average frequency rate of 14.

Three sectors recorded substantial changes in their incidence rate between 1997-98 and 1998-99: *services to agriculture* fell from 62 to 44 (29%), *other mining* fell from 47 to 33 (30%) and *coal mining* increased from 23 to 56 (143%).

Two sectors recorded substantial changes in their frequency rate between 1997-98 and 1998-99: *services to agriculture* fell from 33 to 21 (36%) and *other mining* fell from 21 to 15 (29%).

**CHART 17 Fatal Injury Incidence Rate and Fatal Injury Frequency Rates for selected industries 1998-99**



Notably, even though *oil and gas extraction* recorded the lowest incidence and frequency rates, it recorded the highest average weeks lost (12.59) with an average at least 15% higher than any other sector. This sector also recorded the highest average cost (\$20,917). In addition, while the *storage* sector recorded the highest incidence and frequency rates, it recorded the lowest average weeks lost (6.6) with an average at least 9% lower than any other sector. This sector also recorded the lowest average cost per claim of all sectors (\$5,563).

The data highlights the high cost of lost time in the mining industry compared with other industries. For example, of the selected sectors, while *coal mining* experienced the second lowest average weeks lost, it experienced only the seventh lowest average cost. Likewise the *metal ore mining* sector has recorded the third lowest average weeks lost but only the tenth lowest average cost, *other mining* recorded the fourth lowest weeks lost but the eighth lowest average cost, and *services to mining* recorded the sixth lowest average weeks lost but the ninth lowest average cost.

The overall cost to the industry in 1998-99 was \$27,846,461. This is an increase of 7% on the 1997-98 cost, but still remains substantially lower than the \$40,416,958 recorded in 1996-97 – note however that these data are preliminary figures and will change over time.

## Disease claims in the mining industry

NOHSC data for 1998-99 shows that 12.9% of workers' compensation claims in all industries are due to disease. This is considerably lower (a 24% reduction) than the 17% recorded in the previous year.

In recent years the mining sectors (except *services to mining*) have recorded a slightly higher percentage of diseases than the all industry percentage. In 1997-98 both *services to mining* and *metal ore mining* fell below the all industry percentage. This trend continued in 1998-99 even though the all industry percentage of disease claims has fallen by 24%.

As in previous years, the *coal sector* recorded the highest proportion of disease-related claims at 29.6% (up from 27.2% in 1997-98 and 20.3% in 1996-97). *Other mining* also recorded an increase, with 19.7% in 1998-99 (up from 17.1% in the previous year). *Metal ore mining* experienced a considerable reduction in the proportion of disease related claims, falling from 16.4% in 1997-98 to 10.1% in 1998-99. *Services to mining* also experienced a fall, moving from 10.8 in 1997-98 to 8.4% in 1998-99.

TABLE 7: New workers' compensation claims, injury/poisoning cases by ANZSIC sub-division 1998-99 (includes fatal and non-fatal) (excludes Victoria)

	Number of cases	Frequency rate	Incidence rate	Average weeks lost	Average cost	Total weeks lost
Agriculture	4342	14	29	10	6620	42552
Services to agriculture	768	21	44	10	8373	7680
Forestry and logging	417	17	33	11	13379	4712
Coal mining	984	26	56	7	9470	7282
Oil and gas extraction	78	6	12	13	20917	1014
Metal ore mining	661	9	21	8	13107	5156
Other mining	311	15	33	9	10066	2675
Services to mining	413	13	31	10	12354	3965
General construction	5752	16	34	9	8526	49467
Construction trade services	7262	15	30	10	8881	75525
Road transport	5375	17	37	10	8390	53750
Storage	1226	31	59	7	5563	8092

## THE NATURE OF CLAIMS

Within each of the mining sectors at least 84% of total claims are made up of a combination of claims due to injury/poisoning and claims due to diseases of the nervous system and sense organs (ie noise-induced hearing loss), with the former being the major contributor.

*Coal mining* recorded the lowest percentage of claims due to injury/poisoning (69.6%), but the highest percentage of claims due to diseases of the nervous system and sense organs (26%). In contrast, *oil and gas extraction* recorded a relatively high rate of claims due to injury/poisoning (84.4%) but a negligible percentage of claims due to diseases of the nervous system and sense organs. However, this sector recorded a comparatively high number of claims due to diseases of the digestive system (9.1% – almost four times that of any other mining sector).

*Metal ore mining* recorded the second highest percentage of claims due to injury/disease (86.8%). The only other category contributing significantly to the claims in this sector were claims due to diseases of the nervous system and sense organs (8.1%). *Other mining* recorded claims due to injury/poisoning and claims due to diseases of the nervous system and sense organs at 80.9% and 14.1% respectively, making up 95% of all claims in that sector. *Services to mining* recorded the highest percentage of diseases due to injury/poisoning at 91.8% with all other claims types contributing only a small or negligible percentage.

**TABLE 8: Mining industry proportion of injury/poisoning cases and disease cases 1998-99**

	% Injury/poisoning	% Disease
Coal mining	69.6	29.6
Metal ore mining	87.0	10.1
Other mining	80.3	19.7
Services to mining	91.6	8.4
All industry	83.5	12.9

## COST

Comparing the mining industry sectors with other selected sectors regarding the direct cost of disease claims, *other mining* and *metal ore mining* had the highest average costs of \$12,011 and \$11,340 respectively. *Coal mining* and *storage* recorded by far the lowest average costs with \$4,304 and \$5,314 respectively. These results are similar to results in previous years.

**TABLE 9: Nature of disease claims in the mining sectors 1998-99**

	Percentage				
	Coal mining	Oil and gas extraction	Metal ore mining	Other mining	Services to mining
Injury and poisoning	69.6	84.4	86.8	80.9	91.8
Diseases of the nervous system & sense organs	26.0	np	8.1	14.1	1.7
Diseases of the musculoskeletal system & connective tissue	0.8	0.0	np	np	2.4
Diseases of the skin & subcutaneous tissue	np	np	np	np	np
Diseases of the digestive system	1.7	9.1	2.1	np	2.4
Infectious and parasitic diseases	np	0.0	np	0.0	np
Diseases of the respiratory system	0.0	0.0	np	0.0	0.0
Diseases of the circulatory system	np	0.0	np	0.0	0.0
Neoplasms (cancers & benign tumors)	0.0	0.0	0.0	0.0	0.0
Mental disorders	1.0	np	1.1	np	0.0
Other diseases	0.0	0.0	0.0	np	np

**TABLE 10: Average cost of disease claims by mining sub-divisions and selected industry sub-divisions 1998-99**

	<b>Average cost of disease claims</b>
Agriculture	11068
Services to agriculture	7080
Forestry and logging	9729
Coal mining	4304
Oil and gas extraction	7356
Metal ore mining	11340
Other mining	12011
Services to mining	10904
General construction	7377
Construction trade services	9587
Road transport	10960
Storage	5314

# International Comparisons

## Fatalities

In the following data, where possible, the Fatal Injury Frequency Rate (FIFR – the number of fatalities per million hours worked) was averaged across a number of years, in an attempt to remove some of the statistical variation resulting from the small annual number of fatalities.

### South Africa

The Australian minerals industry average FIFR for the period 1990-91 to 1999-2000 of 0.11 sits at just over a quarter of that recorded in South Africa for the period 1988-2000 (0.41).

Data collected in South Africa has not distinguished between open-cut and underground rates, however, South Africa's total metalliferous and total coal rates of 0.44 and 0.25 remain well above Australia's corresponding rates of 0.11 and 0.13 respectively.

### USA

Australia's ten-year average FIFR for 1990-91 to 1999-2000 in the metalliferous sector was equal to the US average FIFR for 1991 to Sept 2000 (which includes mines, mills and shops) of 0.11. Two sectors which contributed to the US rate were open-cut minerals (average FIFR of 0.15) and underground minerals (average FIFR of 0.34). Australia's rates for open-cut metalliferous (average FIFR of 0.05) and underground metalliferous (average FIFR of 0.33) fall below the US rates, substantially so in the case of open-cut metalliferous.

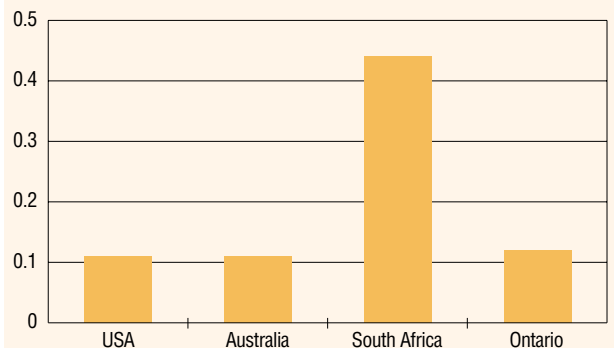
Australia's average FIFR for 1990-91 to 1999-2000 in the coal sector was 0.13 which falls well below the US average FIFR for 1991 to Sept 2000 of 0.18 (up from 0.17 in the previous year).

The US average rates for open-cut coal and underground coal were 0.12 and 0.25 respectively compared with Australia's average rates for open-cut and underground coal which were 0.05 and 0.23 respectively. As with the open-cut metalliferous rates, Australia's open-cut coal rate is substantially below the US rate.

### Canada

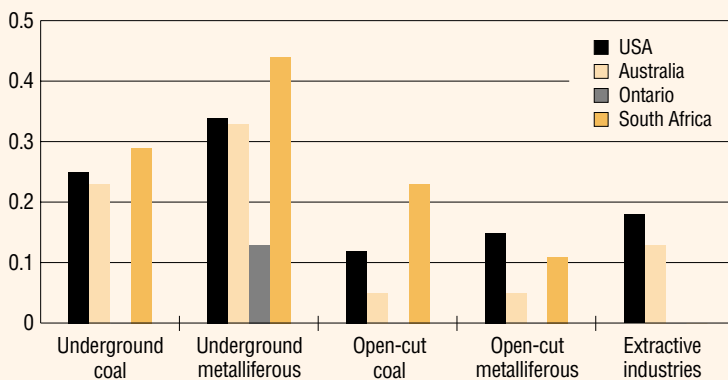
FIFR data for Ontario, Canada, is available only for the past three years and for the metalliferous mining industry only. Ontario has a metalliferous FIFR average of 0.12. For underground metalliferous mining, the average is 0.13. For open-cut, the average is 0.00 (zero deaths in three years).

CHART 19 International metalliferous mining industry fatality rates



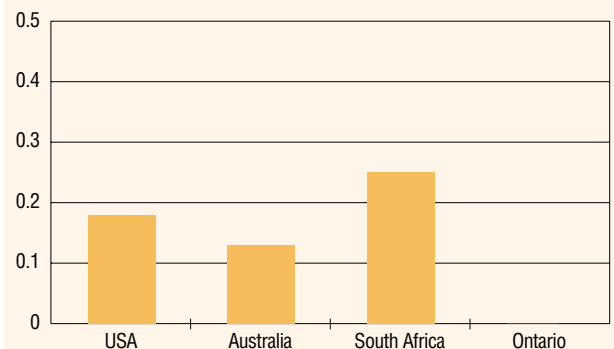
Australia: average for 1991-91 to 1999-2000  
 USA: average for 1991 to Sept 2000  
 South Africa: average for 1988 to 2000  
 Ontario Canada: 1994 to December 1998

CHART 18 International mining industry fatality rates



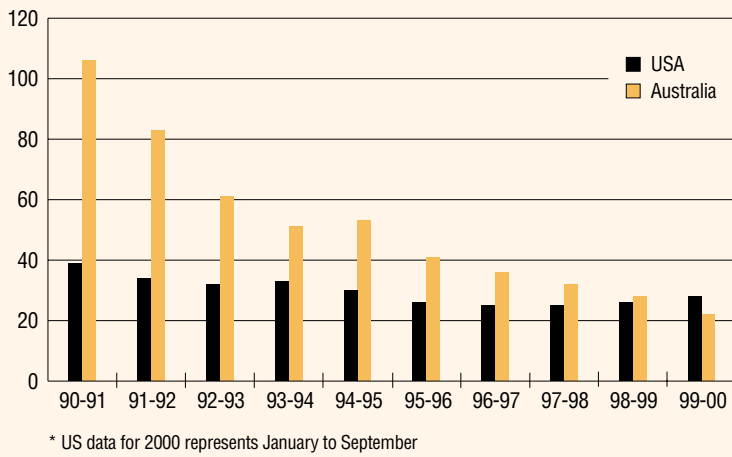
Australia: average for 1990-91 to 1999-2000  
 Extractive industries: average for 1993-94 to 1999-2000  
 USA: average for 1991 to Sept 2000  
 South Africa: average for 1988 to 1998  
 Ontario: average for 1998-2000

CHART 20 International coal mining industry fatality rates



Australia: average for 1989-90 to 1999-2000  
 USA: average for 1991 to Sept 2000  
 South Africa: average for 1988 to 2000  
 Ontario does not have a coal mining industry

**CHART 21 International coal mining lost time injury rates 1990-91 to 1999-2000**



This compares to an Australian underground metalliferous average over the past three years of around 0.31 and an open-cut average of 0.02.

In underground metalliferous mining, the FIFR in Ontario represents just 39% of the Australian rate. The open-cut figures reflect a higher frequency of fatalities in Australia with five deaths in the sector in three years compared to Ontario's zero deaths in three years.

### Summary

The pattern across countries is that more deaths occur in underground mining than in open-cut. This pattern appears to be consistent over time and location.

Australia's performance in these two areas varies in comparison with other countries and while it has performed comparatively well in open-cut mining, its performance is less impressive when compared to the US in the underground sector.

## Lost time injury comparisons

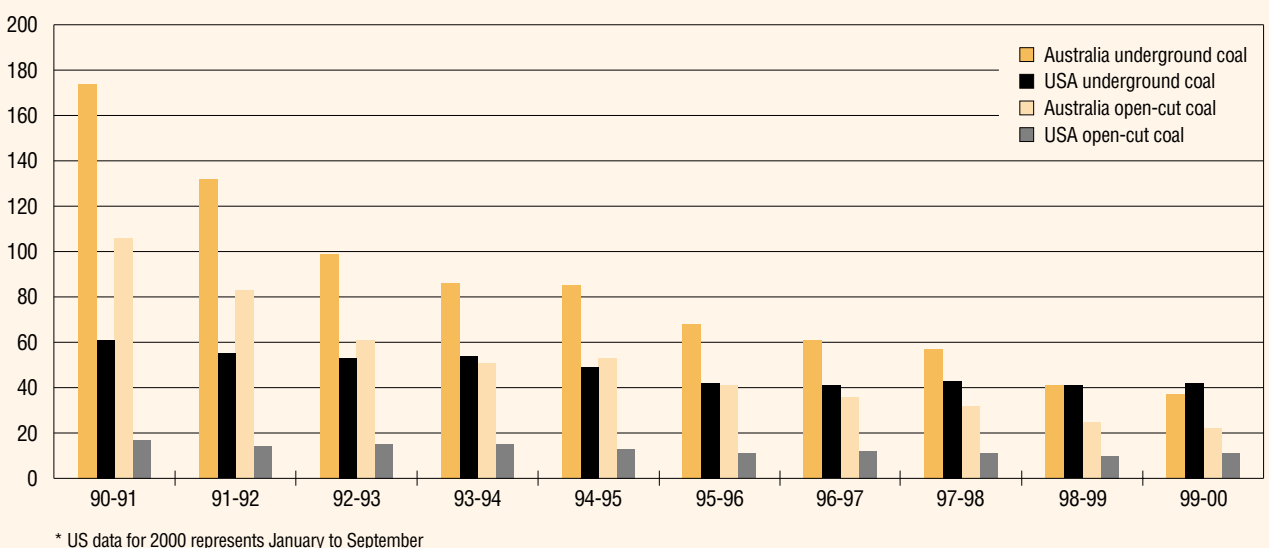
### Coal

The American NFDL/FR (non-fatal days lost frequency rate) for coal, which is an equivalent indicator to Australia's LTIFR, fell consistently between 1991 (when a rate of 39 was recorded) and 1998 (when a rate of 25 was recorded). Over the same period, the Australian coal LTIFR dropped from 106 in 1990-91 to 32 in 1997-98 (a 76% reduction). However, while the US has recorded consecutive increases in the 1999 and 2000, Australia's rate has continued to fall to 22 in 1999-2000.

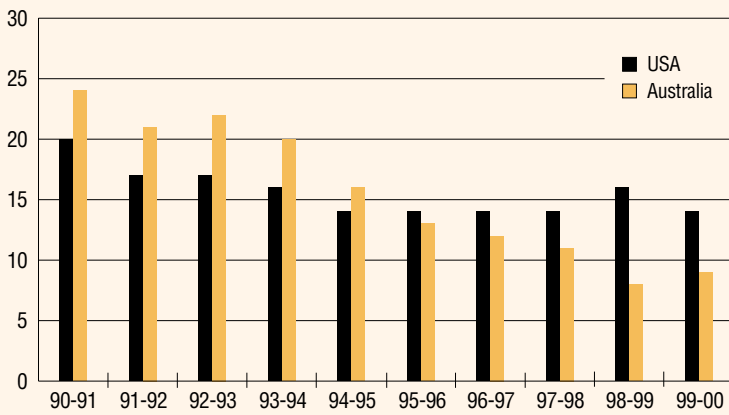
Thus, the latest figures suggest that the Australian performance in this sector is, for the first time, ahead of US performance.

In South Africa, injuries are only reported if accidents result in injuries for which more than 14 days are lost. The figures are therefore not directly comparable with Australian data. However, it is worth noting that the South African LTIFR has fluctuated since 1988 and has shown no sustained improvement during that time. In Australia over the same time, as discussed above, the LTIFR has dropped dramatically.

**CHART 22 International coal mining lost time injury rates 1990-91 to 1999-2000**



**CHART 23 International metalliferous mining lost time injury rates 1990-91 to 1999-2000**



\* US data for 2000 represents January to September

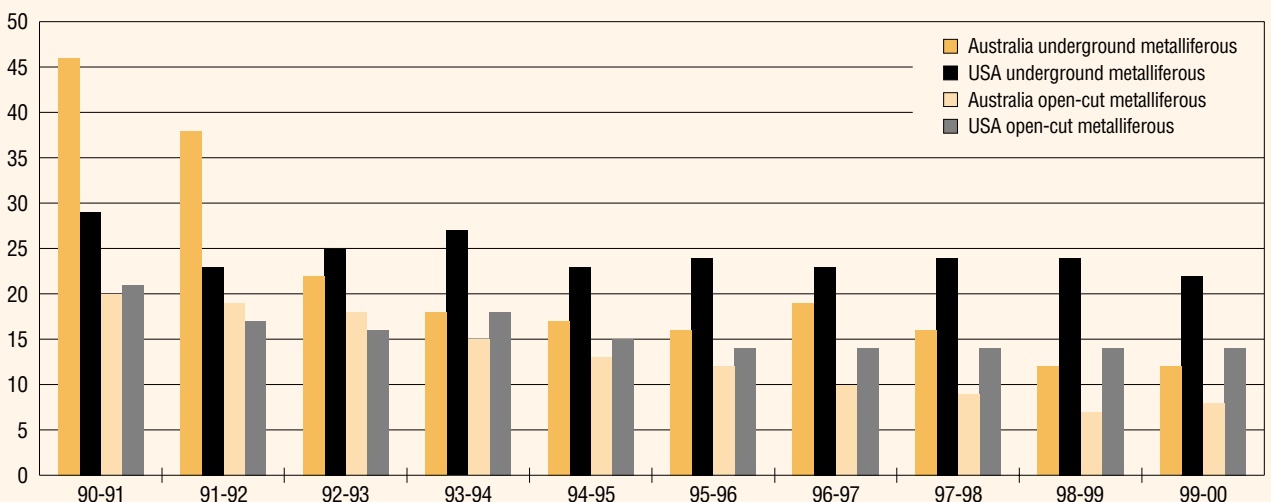
While useful comparisons are hard to make with South Africa because of differences in data collection (see above), its LTIFR for the metalliferous sector has improved over the past decade albeit less substantially and less reliably than US and Australia.

In Ontario, the metalliferous sector in the past three years has remained steady, recording rates of seven, six and seven in 1998, 1999 and 2000 respectively. Over the same period, Australia's LTIFR has dropped from 11 to nine. While Australia's performance has dramatically improved during the decade, it still lags behind Ontario's performance.

## Metalliferous

Since 1991, the USA metalliferous NFDLFR has dropped from 20 to 14, and has remained constant at 14 since 1995 (with the exception of 1999 when a rate of 16 was recorded). In Australia, the LTIFR for metalliferous industries has dropped from 24 to 9, which is slightly up on last year's low of 8. Australia had recorded lower rates than the US since 1995-96. However, current trends may indicate that both Australian and US rates are stabilising at their respective levels.

**CHART 24 International metalliferous mining lost time injury rates 1990-91 to 1999-2000**



\* US data for 2000 represents January to September

# Reference Tables

## Australian minerals industry

TABLE 11: Number of fatalities by State 1990-91 to 1999-2000

State	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
WA	11	6	6	7	9	4	8	13	3	5
QLD	12	0	2	4	17	1	12	1	2	2
NSW	10	12	10	5	4	2	11	4	4	11
VIC	3	0	0	2	0	0	0	0	0	0
TAS	1	2	0	1	1	0	1	0	1	0
SA	1	4	1	1	0	0	0	1	0	0
NT	2	1	0	0	1	0	1	0	0	0
<b>ALL</b>	<b>40</b>	<b>25</b>	<b>19</b>	<b>20</b>	<b>32</b>	<b>7</b>	<b>33</b>	<b>19</b>	<b>10</b>	<b>18</b>

Average number of fatalities = 22.3 per annum; includes exploration fatalities

TABLE 12: Number of fatal injuries by sector 1999-2000

Mine type	WA	QLD	NSW	VIC	SA	TAS	NT	AUSTRALIA
Open-cut coal	0	1	0	0	0	0	0	1
Underground coal	0	1	3	0	0	0	0	4
<b>Total coal</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>
Open-cut metalliferous	2	0	0	0	0	0	0	1
Underground metalliferous	4	0	6	0	0	0	0	10
<b>Total metalliferous</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>
Extractive industries	0	0	2	0	0	0	0	2
Smelting/refining	0	0	0	0	0	0	0	0
Exploration	0	0	0	0	0	0	0	0
<b>ALL</b>	<b>6</b>	<b>2</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>

TABLE 13: Fatal Injury Frequency Rates by State 1990-91 to 1999-2000

State	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	Average
WA	0.15	0.09	0.09	0.09	0.12	0.05	0.09	0.14	0.03	0.06	0.09
QLD	0.28	0.00	0.05	0.05	0.32	0.02	0.24	0.02	0.04	0.04	0.11
NSW	0.21	0.29	0.24	0.10	0.10	0.05	0.25	0.11	0.11	0.31	0.18
VIC	0.75	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.10
TAS	0.09	0.20	0.00	0.11	0.11	0.00	0.12	0.00	0.11	0.00	0.07
SA	0.10	0.46	0.33	0.11	0.00	0.00	0.00	0.19	0.00	0.00	0.12
NT	0.22	0.15	0.00	0.00	0.12	0.00	0.09	0.00	0.00	0.00	0.06
<b>ALL</b>	<b>0.20</b>	<b>0.13</b>	<b>0.12</b>	<b>0.09</b>	<b>0.15</b>	<b>0.03</b>	<b>0.15</b>	<b>0.09</b>	<b>0.04</b>	<b>0.09</b>	<b>0.11</b>

TABLE 14: Australian minerals industry Fatal Injury Frequency Rate 1990-91 to 1999-2000

Sector	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	Average
Open-cut coal	0.07	0.07	0.07	0.07	0.03	0.06	0.03	0.03	0.04	0.04	0.05
Underground coal	0.37	0.25	0.13	0.10	0.58	0.05	0.41	0.05	0.11	0.22	0.23
Open-cut metalliferous	0.11	0.05	0.06	0.05	0.12	0.00	0.07	0.02	0.02	0.01	0.05
Underground metalliferous	0.75	0.36	0.30	0.15	0.23	0.10	0.46	0.39	0.17	0.37	0.33
Extractive industries	—	—	—	0.46	0.20	0.00	0.00	0.09	0.00	0.13	0.13
Smelting/refining	—	—	—	0.04	0.02	0.02	0.05	0.00	0.00	0.00	0.02
<b>Total industry</b>	<b>0.20</b>	<b>0.13</b>	<b>0.12</b>	<b>0.09</b>	<b>0.15</b>	<b>0.03</b>	<b>0.15</b>	<b>0.09</b>	<b>0.04</b>	<b>0.09</b>	<b>0.11</b>

NB: Includes open-cut brown coal from 1992-93 onwards

TABLE 15: Fatal Injury Frequency Rate by State and sector 1999-2000

Sector	WA	QLD	NSW	SA	VIC	TAS	NT	AUST
Open-cut coal	0.00	0.07	0.00	0.00	0.00	0.00	—	0.04
Underground coal	0.00	0.17	0.25	0.00	0.00	0.00	—	0.22
<b>Total coal</b>	<b>0.00</b>	<b>0.10</b>	<b>0.15</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>—</b>	<b>0.11</b>
Open-cut metalliferous	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Underground metalliferous	0.45	0.00	1.61	0.00	0.00	0.00	0.00	0.37
<b>Total metalliferous</b>	<b>0.09</b>	<b>0.00</b>	<b>1.21</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.10</b>
Extractive industries	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.13
Smelting/refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total industry</b>	<b>0.07</b>	<b>0.04</b>	<b>0.31</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.09</b>

NB: Includes brown coal

TABLE 16: Number of Lost Time Injuries by State 1990-91 to 1999-2000

State	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00
WA	1,961	1,611	1,337	1,033	1,025	1,031	863	726	652	583
QLD	1,550	1,367	1,186	1,174	1,088	1,014	983	761	676	568
NSW	4,587	3,432	2,357	2,016	2,098	1,679	1,576	1,383	1,018	795
VIC	—	—	171	129	85	79	82	95	83	85
TAS	750	624	133	293	236	261	158	121	111	137
SA	—	—	73	340	142	93	72	43	76	50
NT	227	156	151	143	106	105	91	78	60	76
<b>Australia</b>	<b>9,075</b>	<b>7,190</b>	<b>5,408</b>	<b>5,128</b>	<b>4,780</b>	<b>4,262</b>	<b>3,825</b>	<b>3,207</b>	<b>2,676</b>	<b>2,294</b>

TABLE 17: Lost Time Injury Frequency Rates by Sector 1990-91 to 1999-2000

Sector	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00
Open-cut coal	49	50	33	30	31	23	19	15	14	12
Underground coal	174	133	99	86	85	68	61	57	41	37
Open-cut metalliferous	20	19	18	15	13	12	10	9	7	8
Underground metalliferous	46	38	22	18	17	16	19	16	12	12
Extractive industries	—	—	—	26	23	16	11	11	13	9
Smelting/refining	—	—	—	17	13	13	10	7	8	5
<b>All mining</b>	<b>52</b>	<b>42</b>	<b>33</b>	<b>27</b>	<b>25</b>	<b>21</b>	<b>18</b>	<b>15</b>	<b>12</b>	<b>11</b>

TABLE 18: Lost Time Injury Frequency Rate by State 1989-90 to 1998-99

State	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00
WA	27	23	20	14	13	12	10	8	6	7
QLD	36	33	31	27	25	22	20	15	12	12
NSW	97	82	58	42	52	39	36	36	29	23
TAS	64	62	51	33	27	28	19	13	13	16
VIC	—	—	24	17	10	10	12	11	10	11
SA	—	—	39	37	17	12	10	7	8	6
NT	25	23	22	14	13	11	8	8	7	9
<b>Australia</b>	<b>52</b>	<b>42</b>	<b>33</b>	<b>27</b>	<b>25</b>	<b>21</b>	<b>18</b>	<b>15</b>	<b>12</b>	<b>11</b>

TABLE 19: Severity Rate by sector 1999-2000

Sector	WA	QLD	NSW	SA	VIC	TAS	NT	AUST
Open-cut coal	56	103	847	0	0	0	0	314
Underground coal	—	448	1011	0	60	17	0	816
<b>Total coal</b>	<b>56</b>	<b>204</b>	<b>947</b>	<b>0</b>	<b>60</b>	<b>14</b>	<b>0</b>	<b>519</b>
Open-cut metalliferous	85	115	49	58	60	145	91	92
Underground metalliferous	133	277	69	32	468	346	162	189
<b>Total metalliferous</b>	<b>92</b>	<b>163</b>	<b>64</b>	<b>35</b>	<b>399</b>	<b>311</b>	<b>116</b>	<b>117</b>
Extractive industries	263	208	28	374	207	39	418	134
Smelting/refining	48	81	269	98	64	128	19	83
<b>Total industry</b>	<b>85</b>	<b>178</b>	<b>567</b>	<b>113</b>	<b>140</b>	<b>202</b>	<b>96*</b>	<b>200</b>

\* Does not include Exploration

TABLE 20: Employment and hours worked by State and sector 1999-2000

State	Sector	No. of employees	No. of hours worked incl O/T
WA	Metalliferous surface	25,365	55,270,000
	Metalliferous underground	3,411	8,910,000
	<b>Metalliferous total</b>	<b>28,776</b>	<b>64,180,000</b>
	Coal surface	717	1,320,000
	Brown coal surface		
	Total coal surface	717	1,320,000
	Coal underground		
	<b>Coal total</b>	<b>717</b>	<b>1,320,000</b>
	Mining total	29,493	65,500,000
	Extractive industries	686	1,400,000
	Smelting/refining	8,625	17,720,000
	Exploration		
	<b>ALL MINING</b>	<b>38,804</b>	<b>84,620,000</b>
QLD	Metalliferous surface	5,606	16,192,000
	Metalliferous underground	2,683	6,776,600
	<b>Metalliferous total</b>	<b>8,289</b>	<b>22,968,700</b>
	Coal surface	6,477	14,655,500
	Brown coal surface		
	Total coal surface	6,477	14,655,500
	Coal underground	2,694	6,059,100
	<b>Coal total</b>	<b>9,171</b>	<b>20,714,600</b>
	Mining total	17,460	43,683,300
	Extractive industries	905	2,117,600
	Smelting/refining	945	2,415,098
	Exploration		
	<b>ALL MINING</b>	<b>19,310</b>	<b>48,215,998</b>
NSW	Metalliferous surface	576	1,244,763
	Metalliferous underground	1,728	3,734,289
	<b>Metalliferous total</b>	<b>2,304</b>	<b>4,979,052</b>
	Coal surface	4,117	7,680,876
	Brown coal surface		
	Total coal surface	4,117	7,680,876
	Coal underground	5,843	11,951,214
	<b>Coal total</b>	<b>9,960</b>	<b>19,632,090</b>
	Mining total	12,264	24,611,142
	Extractive industries	3,516	7,598,616
	Smelting/refining	1,417	2,939,437
	Exploration		
	<b>ALL MINING</b>	<b>17,197</b>	<b>35,149,195</b>
SA	Metalliferous open-cut	127	242,212
	Metalliferous underground	647	1,753,959
	<b>Metalliferous total</b>	<b>774</b>	<b>1,996,171</b>
	Coal open-cut	192	371,515
	Brown coal open-cut		
	Total coal open-cut	192	371,515
	Coal underground		
	<b>Coal total</b>	<b>192</b>	<b>371,515</b>
	Other (minerals open-cut)	147	519,340
	Other (minerals underground)	4	6,500
	In-situ leach	38	62,763
	Extractive industries	710	1,135,943
	Smelting/refining	2,787	5,779,811
Exploration			
<b>ALL MINING</b>	<b>4,652</b>	<b>9,872,043</b>	

TABLE 20: **Employment and hours worked by State and sector 1999-2000** (continued)

State	Sector	No. of employees	No. of hours worked incl O/T
VIC	Metalliferous surface	143	150,075
	Metalliferous underground	475	735,615
	<b>Metalliferous total</b>	618	885,690
	Non-metalliferous	96	82,432
	Brown coal surface	1,018	2,024,431
	Total coal surface	1,018	2,024,431
	Coal underground		
	<b>Coal total</b>	1,018	2,024,431
	Mining total	1,732	2,992,553
	Extractive industries	1,478	2,101,426
	Smelting/refining	1,233	2,572,443
	Exploration		
	<b>ALL MINING</b>	<b>4,443</b>	<b>7,666,422</b>
	TAS	Metalliferous surface	197
Metalliferous underground		1,543	3,102,219
<b>Metalliferous total</b>		1,740	3,744,036
Non-metalliferous		13	26,041
Brown coal surface			
Total coal surface		13	26,041
Coal underground		78	120,546
<b>Coal total</b>		91	146,587
Mining total		1,831	3,890,623
Extractive industries		142	280,349
Smelting/refining		2,395	4,530,071
Exploration			
<b>ALL MINING</b>		<b>4,368</b>	<b>8,701,043</b>
NT		Metalliferous surface	1,595
	Metalliferous underground	800	2,118,678
	<b>Metalliferous total</b>	2,395	6,033,025
	Non-metalliferous		
	Brown coal surface		
	Total coal surface		
	Coal underground		
	<b>Coal total</b>		
	Mining total	2,395	6,033,025
	Extractive industries	134	248,649
	Smelting/refining	1,024	2,631,376
	Exploration	116	214,054
	<b>ALL MINING</b>	<b>3,553</b>	<b>8,913,050</b>
	NATIONAL	Metalliferous surface	33,609
Metalliferous underground		11,287	27,131,360
<b>Metalliferous total</b>		44,896	104,786,674
Non-metalliferous		11,612	24,236,364
Brown coal surface		1,018	2,024,431
Total coal surface		12,630	26,160,795
Coal underground		8,615	18,130,860
<b>Coal total</b>		21,245	44,291,655
Mining total		66,141	149,078,329
Extractive industries		7,571	14,882,583
Smelting/refining		18,426	38,588,236
Exploration			
<b>ALL MINING</b>		<b>92,138</b>	<b>202,549,148</b>

## Workers' Compensation

TABLE 21: Fatal Incidence and Frequency Rates for selected industries 1998-99

Industry	Number of Cases	Fatality Incidence Rate	Fatality Frequency Rate
Agriculture	20	0.1	0.1
Services to agriculture (hunting and trapping)	4	0.2	0.1
Forestry and logging	6	0.5	0.2
Coal mining	5	0.3	0.1
Oil and gas extraction	1	0.2	0.1
Metal ore mining	4	0.1	0.1
Other mining	6	0.6	0.3
Services to mining	2	0.1	0.1
General construction	25	0.1	0.1
Construction trade services	29	0.1	0.1
Road transport	45	0.3	0.1
Storage	2	0.1	0.1

## International

TABLE 22: South African Fatality and Injury Rates for all mines 1988–2000

Gold mines	Labour	Hours	Fatalities	Injuries	FR	LTIFR	FIFR	SIFR
1988	527780	1161116000	510	9576	0.97	18.1	0.44	8.2
1989	520023	1144050600	549	8561	1.06	16.5	0.48	7.5
1990	484738	1066423600	526	8195	1.09	16.9	0.49	7.7
1991	426830	939026000	461	7571	1.08	17.7	0.49	8.1
1992	362196	796831200	407	7585	1.12	20.9	0.51	9.5
1993	343147	754923400	398	7230	1.16	21.1	0.53	9.6
1994	346648	762625600	350	6743	1.01	19.5	0.46	8.8
1995	333257	733165400	401	6100	1.20	18.3	0.55	8.3
1996	317363	698198600	308	5822	0.97	18.3	0.44	8.3
1997	293995	646789000	265	5579	0.90	19.0	0.41	8.6
1998	223498	491695600	239	4543	1.07	20.3	0.49	9.2
1999	211156	464542714	207	4202	0.98	19.9	0.45	9.0
2000	190645	419419355	175	3546	0.92	18.6	0.42	8.46
Average							0.48	
<b>Other mines</b>								
1988	103631	227988200	111	1345	1.07	13.0	0.49	5.9
1989	117716	258975200	132	1175	1.12	10.0	0.51	4.5
1990	127128	279681600	99	1259	0.78	9.9	0.35	4.5
1991	169927	373839400	101	1171	0.59	6.9	0.27	3.1
1992	111944	246276800	99	857	0.88	7.7	0.40	3.5
1993	100530	221166000	58	1212	0.58	12.1	0.26	5.5
1994	101693	223724600	46	1148	0.45	11.3	0.21	5.1
1995	100598	221315600	46	943	0.46	9.4	0.21	4.3
1996	111335	244937000	52	932	0.47	8.4	0.21	3.8
1997	111755	245861000	59	783	0.53	7.0	0.24	3.2
1998	111254	244758800	45	815	0.40	7.3	0.18	3.3
1999	19332	42529833	8	81	0.41	4.2	0.19	1.9
2000	18105	39831579	8	86	0.44	4.8	0.20	2.2
							0.30	
<b>Total metalliferous</b>								
1988	631411	1389104200	621	10921	0.98	17.3	0.45	7.9
1989	637739	1403025800	681	9736	1.07	15.3	0.49	6.9
1990	611866	1346105200	625	9454	1.02	15.5	0.46	7.0
1991	596757	1312865400	562	8742	0.94	14.6	0.43	6.7
1992	474140	1043108000	506	8442	1.07	17.8	0.49	8.1
1993	443677	976089400	456	8442	1.03	19.0	0.47	8.6
1994	448341	986350200	396	7891	0.88	17.6	0.40	8.0
1995	433855	954481000	447	7043	1.03	16.2	0.47	7.4
1996	428698	943135600	360	6754	0.84	15.8	0.38	7.2
1997	405750	892650000	324	6362	0.80	15.7	0.36	7.1
1998	334752	736454400	284	5358	0.85	16.0	0.39	7.3
Average							0.44	
<b>Coal mines</b>								
1988	106803	234966600	53	435	0.50	4.1	0.23	1.9
1989	103065	226743000	54	361	0.52	3.5	0.24	1.6
1990	103304	227268800	50	404	0.48	3.9	0.22	1.8
1991	82790	182138000	42	361	0.51	4.4	0.23	2.0
1992	69489	152875800	46	359	0.66	5.2	0.30	2.3
1993	40599	89317800	25	191	0.62	4.7	0.28	2.1
1994	54251	119352200	44	202	0.81	3.7	0.37	1.7
1995	55667	122467400	25	212	0.45	3.8	0.20	1.7
1996	56770	124894000	30	256	0.53	4.5	0.24	2.0
1997	58246	128141200	33	213	0.57	3.7	0.26	1.7
1998	55218	121479600	35	218	0.63	3.9	0.29	1.8
1999	54762	120476190	28	207	0.51	3.8	0.23	1.7
2000	57568	126648649	30	213	0.52	3.7	0.24	1.7
Average							0.25	

TABLE 22: South African Fatality and Injury Rates for all mines 1988–2000 (continued)

All mines	Labour	Hours	Fatalities	Injuries	FR	LTIFR	FIFR	SIFR
1988	738214	1624070800	674	11356	0.91	15.4	0.42	7.0
1989	740804	1629768800	735	10097	0.99	13.6	0.45	6.2
1990	715170	1573374000	675	9858	0.94	13.8	0.43	6.3
1991	679547	1495003400	604	9103	0.89	13.4	0.40	6.1
1992	543629	1195983800	552	8801	1.02	16.2	0.46	7.4
1993	484276	1065407200	481	8633	0.99	17.8	0.45	8.1
1994	502592	1105702400	440	8093	0.88	16.1	0.40	7.3
1995	489522	1076948400	472	7255	0.96	14.8	0.44	6.7
1996	485468	1068029600	390	7010	0.80	14.4	0.37	6.6
1997	463996	1020791200	357	6575	0.77	14.2	0.35	6.4
1998	389970	857934000	319	5576	0.82	14.3	0.37	6.5
1999	408942	899672131	309	5488	0.76	13.4	0.34	6.1
2000	396644	872617450	285	4728	0.72	11.92	0.33	5.26
Average							0.41	

Note: South African frequency rates are calculated based upon 2200 hours worked per employee per year  
This data does not include mines that are in the Independent States

TABLE 23: US injury and fatality data 1991–2000

Sector	Year	Fatals	NFDL	Hours	FIFR	NFDL/FR
Open-cut minerals	1991	22	2,446	117,003,889	0.19	21
	1992	20	2,008	115,878,200	0.17	17
	1993	10	1,929	117,043,787	0.09	16
	1994	22	3,224	183,033,715	0.12	18
	1995	27	1,934	131,751,905	0.20	15
	1996	18	1,842	130,660,530	0.14	14
	1997	26	1,907	131,909,654	0.20	14
	1998	18	1,779	128,869,555	0.14	14
	1999	19	1,768	129,909,709	0.15	14
	2000	22	2,083	148,018,026	0.15	14
		Average 1991-2000				0.15
Underground minerals	1991	10	920	31,320,784	0.32	29
	1992	7	665	29,338,003	0.24	23
	1993	18	665	27,052,879	0.67	25
	1994	9	753	27,743,947	0.32	27
	1995	7	676	29,148,687	0.24	23
	1996	7	720	30,422,891	0.23	24
	1997	10	698	29,967,186	0.33	23
	1998	7	661	28,079,505	0.25	24
	1999	13	642	26,382,396	0.49	24
	2000	8	413	19,105,339	0.42	22
		Average 1991-2000				0.34
Total minerals Includes mines, mills and shops*	1991	40	7,106	348,486,177	0.11	20
	1992	34	5,646	337,168,630	0.10	17
	1993	38	5,524	330,287,519	0.12	17
	1994	35	5,545	340,084,916	0.10	16
	1995	43	5,113	353,688,787	0.12	14
	1996	36	5,047	358,323,521	0.10	14
	1997	44	5,255	363,107,344	0.12	14
	1998	39	4,852	354,793,004	0.11	14
	1999	40	4,977	312,702,223	0.13	16
	2000	30	3,324	234,392,762	0.13	14
		Average 1991-2000				0.11

TABLE 23: US Injury and Fatality Data 1991–1999 (continued)

Sector	Year	Fatals	NFDL	Hours	FIFR	NFDL/FR
<b>Sand &amp; gravel**</b>	1991	13	1,280	55,412,419	0.23	23
	1992	9	1,124	55,109,784	0.16	20
	1993	13	1,087	55,890,610	0.23	19
	1994	5	1,178	58,447,335	0.09	20
	1995	8	1,043	59,068,034	0.14	18
	1996	10	966	68,375,116	0.15	14
	1997	17	1,012	62,095,958	0.27	16
	1998	12	1,080	64,520,916	0.19	17
	1999	15	1,217	68,723,367	0.22	18
	2000	8	744	51,186,646	0.16	15
	Average 1991-2000					0.18
<b>Open-cut coal</b>	1991	11	1,610	96,324,082	0.11	17
	1992	12	1,351	93,547,344	0.13	14
	1993	12	1,289	87,478,629	0.14	15
	1994	17	1,299	89,351,326	0.19	15
	1995	16	1,031	81,825,127	0.20	13
	1996	5	866	79,883,063	0.06	11
	1997	6	971	82,302,239	0.07	12
	1998	4	859	80,276,812	0.05	11
	1999	9	786	76,346,498	0.12	10
	2000	8	565	53,740,295	0.15	11
	Average 1991-2000					0.12
<b>Underground coal</b>	1991	45	8,658	140,982,065	0.32	61
	1992	40	7,160	131,193,747	0.30	55
	1993	26	5,932	111,758,604	0.23	53
	1994	24	6,224	114,741,933	0.21	54
	1995	26	5,449	110,124,939	0.24	49
	1996	32	4,522	106,712,083	0.30	42
	1997	22	4,376	105,752,094	0.21	41
	1998	22	4,303	100,653,162	0.22	43
	1999	20	3,765	92,283,677	0.22	41
	2000	16	2,660	63,642,155	0.25	42
	Average 1991-2000					0.25
<b>Total coal</b>	1991	61	11,325	288,140,256	0.21	39
	1992	54	9,275	273,896,405	0.20	34
	1993	47	7,901	243,534,975	0.19	32
	1994	44	8,225	253,005,354	0.17	33
	1995	38	7,044	235,164,382	0.16	30
	1996	38	5,858	228,061,776	0.17	26
	1997	30	5,805	228,579,672	0.13	25
	1998	29	5,608	221,017,170	0.13	25
	1999	35	4,983	195,265,625	0.18	26
	2000	29	3,483	122,549,647	0.24	28
	Average 1991-2000					0.18

2000 Figures represent January to September 2000

Includes data reported for operators and contractors

\* Includes sand and gravel contractor hours

\*\* Does not include contractor hours

**TABLE 24: Ontario, Canada fatality and injury rates for all mines 1998–2000**

<b>Sector</b>	<b>Year</b>	<b>Hours</b>	<b>Labour</b>	<b>Lost Time Injuries</b>	<b>Fatalities</b>	<b>LTIFR</b>	<b>FIFR</b>
Open-cut minerals	1998	2928721	1444	23	0	8	0.00
	1999	2479875	1413	19	0	8	0.00
	2000	1721229	848	13	0	8	0.00
	Average						0.00
Underground minerals	1998	25929696	13499	169	2	7	0.08
	1999	19862460	12112	121	2	6	0.10
	2000	22586429	11792	159	5	7	0.22
	Average						0.13
Total metalliferous	1998	28858417	14943	192	2	7	0.07
	1999	22342335	13525	140	2	6	0.09
	2000	24307658	14373	172	5	7	0.21
	Average						0.12

Note: Data does not include contract drillers or miners; open-cut minerals does not include sand and gravel

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# Acknowledgements

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The Minerals Council of Australia wishes to thank:

Alcoa of Australia

Department of Mineral Resources, New South Wales

Department of Mines and Energy, Northern Territory

Department of Natural Resources and Mines  
(formerly Department of Mines and Energy), Queensland

Department of Mines and Energy, South Australia

Department of Minerals and Energy, Western Australia

Department of Natural Resources and Environment, Victoria

Mineral Resources, Tasmania

Joint Coal Board, New South Wales

MIM Holdings Limited

Pasminco Limited

QNI Pty Ltd

Rio Tinto Limited

Tomago Alumina

The Minerals Council of Australia also wishes to thank the following for providing information on international injury data comparisons:

C J Pitzer

Mines and Aggregates Safety and Health Association,  
Ontario, Canada

Mine Safety and Health Administration, Washington, USA

South African Department of Minerals and Energy.

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## **Disclaimer**

The data in this report has been requested by the Minerals Council of Australia in good faith, and in the main has been supplied by State Government mines inspectorates and, where necessary, individual companies.

Some data as supplied has been generalised, consolidated or averaged to present a standardised format to support the report.

The Minerals Council of Australia accepts no responsibility for data that may have been incorrect as supplied and emphasises that the data, as presented, might not represent complete coverage of the industry or of any particular component of it.

Published by the Minerals Council of Australia  
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