

Safety & Health Performance Report

OF THE AUSTRALIAN
MINERALS INDUSTRY

1998-99

health

commitment

safety

statistics

benchmark

people

trends



**MINERALS
COUNCIL**
OF AUSTRALIA

Contents

Introduction	2
Executive Summary	3
Commitment to Safety and Health	5
About the data used in this report	7
Fatalities statistics	9
Description of fatalities	13
Lost Time Injury statistics	14
Workers' Compensation data	22
International comparisons	26
Reference Tables	29
References	38
Acknowledgements	39

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.

SEVERE INJURY FREQUENCY RATE – (SIFR)

The number of severe 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

Mission

- 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

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;
- 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 1988-89 to 1998-99 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 1997-98; and
- an international benchmarking comparison.

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 efforts to achieve the vision of an Australian minerals industry free of fatalities, injuries and diseases.

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. For example, in 1999 a survey of industry safety culture was conducted (reports are available from the Minerals Council) and work was conducted to identify positive performance indicators. In 2000 the Committee will undertake an assessment of occupational health issues, including performance measurement and reporting, as well as continuing to examine safety culture and to foster continuous improvement.

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 1998-99 collected primarily through the State Mines Inspectorates. The second data set is collected through the State workers' compensation systems and has been collated by the National Occupational Health and Safety Commission (NOHSC).

Fatal injuries

In 1998-99 there were ten fatalities in the Australian minerals industry. This represents an improvement over the previous year (19 deaths) but falls well short of a low of seven in 1995-96 and the objective of zero fatalities.

In 1997-98 the fatality injury frequency rate (FIFR) was 0.09 per million hours, down from 0.15 in 1996-97. In 1998-99, the risk has dropped again, to 0.04 per million hours worked, and is much lower than the ten-year average of 0.11. However, looking over a ten-year cycle, there is little evidence of a real reduction in the risk of fatalities. Indeed the possibility of further improvement in 1999-2000 is unlikely given recent fatalities in New South Wales.

As with previous years the majority of fatalities (five) occurred in the underground metalliferous sector with two in the open cut metalliferous sector, two in underground coal and one in open cut coal mining.

The underground metalliferous sector has consistently recorded the highest FIFR of any sector, with a ten-year average of 0.38. However, over the past three years there has been a steady drop, from 0.46 in 1996-97 to 0.17 in 1998-99.

1998-99 MINERALS INDUSTRY

Performance at a glance

- Ten miners died in the Australian minerals industry, nine fewer than in 1997-98 but three more than the low of seven recorded in 1995-96.
- One miner died for every 25,000,000 hours worked in the industry.
- One miner died for every 11,111 workers employed in the industry.
- 2676 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, 12 injuries occurred which required at least one full shift's absence.

These figures, while an improvement, are still significantly higher than in some earlier years (for example, 0.1 in 1995-96).

The underground coal sector, which on average is the sector with the second worst performance, performed significantly better this year (FIFR 0.11) than its ten-year average of 0.21.

Open cut coal has a rate (0.04) consistent with its ten-year average.

In 1997-98 NOHSC-collated workers' compensation data revealed a further two disease related minerals sector fatalities. Unfortunately due to confidentiality restrictions it is not possible to confirm whether or not these are additional to fatalities recorded in 1997-98 through the Mines Inspectorates – although this seems more likely the case than not.

NOHSC comparative data also showed that coal mining, which in 1996-97 recorded the third highest fatality incidence rate against a range of other industry sectors, recorded the second lowest in 1997-98, after oil and gas extraction. Its fatality frequency rate also fell dramatically.

Lost time injuries

Lost time injury frequency rate (LTIFR) for the minerals industry has declined from 61 in 1989-90 to 12 in 1998-99. While the downward trend is slowly levelling off, the overall rate of improvement in the numbers of lost time injuries and in LTIFR is continuing at over 15% per annum.

The coal sector continues to experience the highest numbers and rate of lost time injury but matches this with the highest rate of improvement.

LTIFR for the underground coal sector has dropped each year for the past ten years, from a high of 200 in 1989 to 41 in the past year. Decreases have been in the 20-25% range for most years, with the last decrease being 28.07%, significantly better than the 16.66% average annual improvement of the national minerals industry.

Open cut coal has also recorded steady decreases over most of the past decade, falling from 50 in 1991-92 to 14 in 1998-99. The extractive industry shows the next lowest LTIFR with 13 and underground metalliferous with 12.

Other sectors have very low, single digit LTIFRs and show a continuing levelling off in performance improvement.

In 1997-98 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 40.52 and 18.35 respectively. This is an improvement over 1996-97 figures of 45.55 and 20.79 respectively.

Over the past few years the mining sector performance in terms of both incidence of injuries and frequency of injuries has been the worst of any of the selected industries. However, the rate of improvement in these indicators outstrips that of other industries such as agriculture (this is consistent with the Mining Inspectorate data).

Overall, the direct workers' compensation cost of injuries to the industry in 1997-98 was \$25,913,327. It has been estimated that the indirect costs to the employer such as loss of productivity, incident investigation, rehabilitation, damage to equipment et cetera can more than double the cost of claims. Taking this into account, the total cost to the minerals industry would be in excess of \$50 million.

Disease claims

NOHSC data for 1997-98 shows that approximately 16.6% of workers' compensation claims in all industries are due to disease. This is slightly lower than the 18% recorded in 1996-97.

Within mining, coal mining has the highest incidence and frequency rates of disease cases (43.77 and 22.73 respectively*. Metal ore mining generally recorded lower rates of disease than coal mining, as did services to mining.

In 1997-98 deafness accounted for 69.64% of disease related claims (452 cases). Of these, 80.75% were in the coal sector, which also had the highest incidence (14.85 compared with the next highest, other mining, at 6.99). In addition, coal mining recorded the highest frequency of deafness (7.71), also more than double the next highest sector, other mining (3.04).

* These figures exclude Victoria.

The other major disease categories are hernia, diseases of the musculo-skeletal system, dermatitis and mental disorders such as stress. For hernia cases, other mining and coal mining had the highest incidence rates (0.54 and 0.5 respectively), followed closely by services to mining (0.44).

International comparisons

Australian minerals industry safety and health performance generally compares favourably with the performance of the USA, South Africa and Ontario mining industries.

Australian fatality injury frequency rates (FIFR) are significantly better than South African rates. Australia performs slightly better than the USA overall and in all sectors except underground metalliferous mining, where the USA rates are slightly better than Australian rates.

Ontario has a better FIFR performance than Australia in underground metalliferous mines and a poorer performance than Australia in the open cut metalliferous sector.

Lost time injury data is difficult to compare internationally given the different systems and definitions that apply. Rates of improvement are therefore probably more useful indicators than the absolute levels.

On lost time injury rates in the coal sector, the USA has traditionally outperformed Australia. However, the gap in performance is continuing to narrow as Australian performance continues to improve and that of the USA levels off. South Africa's LTIFR in this sector has in fact increased over the past ten years.

In the metalliferous sector Australia has recorded a better performance than the USA on lost time injury rates and in the rates of improvement; however, it continues to be outperformed by Ontario, which is continuing to improve slightly.

Conclusion

While the numbers and rates of fatalities reduced in 1998-99, the minerals industry is well short of an acceptable zero fatality objective. A sustained improvement trend in fatality rates has thus far failed to materialise.

Two disease cases were highlighted through NOHSC data, adding weight to the industry's moves to analyse in more detail its occupational health needs and performance in 2000.

Injury rates continue to decline but, particularly in the coal sector, compare poorly with those of other industries.

The tragic cost in terms of human life and pain and suffering cannot be underestimated. The dollar cost to the industry is also significant, totalling an estimated \$50 million in 1997-98.

Commitment to Safety and Health

The Minerals Council of Australia has continued to take a leadership role on safety and health matters through the implementation of a strategy designed to improve the industry's safety and health performance.

The Council's safety and health leadership strategy is developed and pursued through its Safety and Health Committee, which reports directly to the Council's Executive Committee. During 1999 the Committee continued to implement initiatives with the ultimate aim of achieving the Council's vision of an Australia minerals industry free of fatalities, injuries and diseases. These initiatives included the following activities.

Fostering leadership

The Council continued to foster leadership by providing an opportunity for industry CEOs to gather together and share experiences and lessons at the annual CEO Safety and Health Session. Following on from the very successful inaugural session in 1998, the 1999 session focussed on the role of leadership in driving safety and health improvement. Nearly 70 participants attended, representing Council member and non-member companies, legislators and regulators as well as each of the State and Territory Minerals Councils and Chambers. A feature of the day was the signing by participants of a collective statement of personal commitment to demonstrate strong personal leadership, show zero tolerance to unsafe behaviours and promote an attitude/culture of an injury-free workplace.

Influencing the agenda

The Council utilised several opportunities during 1999 to take the lead on key safety and health issues.

Through its involvement in the Australian and New Zealand Minerals and Energy Council (ANZMEC) Mine Safety Taskforce, the Council continued to contribute to the development of a national framework for mine safety management.

The Council adopted a policy on operator/contractor safety and health management which states that operators have the responsibility to protect the safety and health of every person on site and that the relationship between an operator and contractor should include the agreement and implementation of a plan to effectively identify and manage safety and health issues.

The Council also developed a leadership strategy on workplace health issues as they relate to the Australian minerals industry which will be implemented as part of the 2000 safety and health work program.

MINEX Safety and Health Excellence Awards

The 1999 MINEX Safety and Health Excellence Awards were held in conjunction with the Tasmanian Minerals Council's occupational health and safety seminar in Launceston on 23 September 1999. The winner of the 1999 MINEX Award was Osborne Mines, which became the first minerals operation to twice win the award. Five other minerals sites received commendations from the MINEX judges. They were: Cadia Hill Gold Mine, Mt Owen Mine, Normandy Kaltails, Northparkes Mines and Ravensworth/Narama Mine.

To facilitate information sharing and benchmarking, the Council again produced a MINEX case study in 1999. This publication not only provides extensive information on the winning site but also features examples of best practice which had been identified at other MINEX applicant sites during the 1999 evaluation process.

Continuing last year's initiative to increase awareness and adoption of the MINEX approach to safety and health improvement, two non-council member small mineral sites participated in the 1999 MINEX Small Mine assessment process. The mines were provided with an analysis of their sites' strengths and opportunities for improvement according to the MINEX criteria.

National Safety and Health Innovation Awards

The National Safety and Health Innovation Awards were a new initiative in 1999 aimed at fostering the development of innovative solutions to everyday safety and health issues. Based on the innovation awards being run by the State and Territory Minerals Councils and Chambers, the national competition selects its winner from the State and Territory award winners.

The winner of the inaugural National Safety and Health Innovation Award, which was announced at the Council's annual seminar on 2 June 1999, was a Quarry Crushing Plant Guarding and Isolation/Lockout System from CSR Construction Materials. In addition, a Gas Cylinder Handle developed by Western Metals Ltd received a high commendation from the judges.

In order to promote the innovations as broadly as possible throughout the industry as well as to encourage similar searches for solutions to safety problems, the Council produced a booklet featuring profiles of the 11 national finalists. Each profile provides a description of the innovation, its benefits and practical applications as well as information on how it might be applicable to other sectors and industries.

Lead indicators and safety culture

Several activities were undertaken in 1999 to identify lead indicators to provide more effective measures of safety and health performance.

The most significant of these was a project to examine safety culture as the source of possible lead indicators and to achieve a better understanding of the contribution that workplace culture makes to safety and health performance. On behalf of the Council, the consulting firm SAFEmap conducted a survey and analysis of the Australian minerals industry's safety culture during the first quarter of 1999.

The survey, which involved almost 7000 minerals industry employees, measured and examined 41 factors at all employee levels of the participating mine sites. A report detailing the survey findings was widely distributed in July 1999, drawn to the attention of all key stakeholders and generated much interest. It identified trends in employee perceptions on a wide range of organisational factors which are considered to influence behaviour. The Council used the survey results to develop a safety culture strategy which focussed on addressing weaknesses and fostering strengths in order to improve safety culture and therefore safety performance. This strategy forms a significant part of the Council's safety and health work program for 2000.

About the data used in this report

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

- The primary and most comprehensive and current data is collected through the State Mines Inspectorates. This report contains 1998-99 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 1997-98 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 mines. 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 minerals 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, Tasmania, 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 Mines Inspectorates include:

- reliance on mines submitting accurate data;
- variations in coverage by Inspectorates of minerals sectors in each State; and
- 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's reporting threshold is for cases involving greater than ten working days and this has meant that data for this jurisdiction is excluded from many of the statistics.
- 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.

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); and
- 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.

The South African injury data has been obtained from reports by the South African Chamber of Mines and includes only member mines of the Chamber.

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.

Data from the Mines Inspectorates 1998-99

Fatalities statistics

In 1998-99 the Australian minerals industry recorded ten fatalities. Of the ten, four were in NSW and three in Western Australia (down from 13 the year before).

As in previous years, the highest death toll was in underground metalliferous mines (five deaths, down from 12 the year before). Brown surface coal mining, extractive industries, smelting and refining and exploration sectors were all free of fatalities in 1998-99. Underground coal and metalliferous surface mining recorded two deaths each and coal surface recorded one death.

From the description of each fatality (see page 13) four involved falls of roof or ground, three involved mobile equipment and three involved falls.

Fatalities by sector

	98-99	97-98	96-97
Open cut coal	1	1	1
Underground coal	2	1	9
Open cut metalliferous	2	2	6
Underground metalliferous	5	12	13
Extractive industries	0	1	0
Smelting/refining	0	0	2
Exploration	0	2	2
Total	10	19	33

The 1998-99 result represents a reduction in fatalities from that of the previous year (19), and continues the previous downward trend (from 33 in 1996-97 to 19 in 1997-98). However, it is higher than the seven deaths recorded in 1995-96 and cannot yet be taken as evidence of sustained improvement. As this report is written, there have already been nine fatalities in the Australian minerals industry for the 1999-2000 year.

Since 1989-90 the industry has seen 225 deaths, an average of more than 20 deaths a year. Fatality levels have varied widely from year to year, ranging from a high of 40 in 1990-91 to seven in 1995-96.

While there has been no consistency in numbers of fatalities, there has been strong consistency in where deaths occur: around two-thirds of deaths occur in underground mines and, substantially, in underground metalliferous mines. The proportion of underground mining fatalities occurring in metalliferous mines rose from 60% of underground deaths in 1996-97 to 92% in 1997-98. This year that proportion is 71% (five out of seven deaths, spread almost evenly through the States).

While underground coal mines have recorded significant numbers of deaths, there is not the consistent pattern of high numbers of fatalities occurring year after year. Open cut metalliferous mines also record relatively high numbers of fatalities, giving the metalliferous mining sector by far the worst record for fatalities.

CHART 1 Fatal injuries 1989-90 to 1998-99

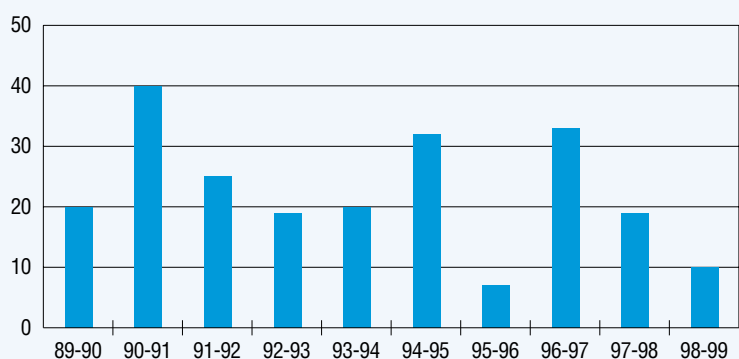


CHART 2 Fatal injuries by sector 1998-99

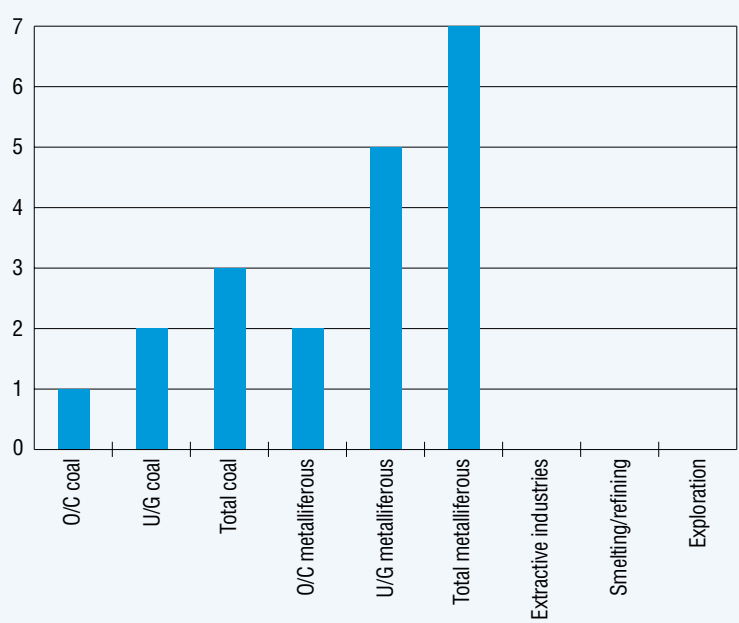
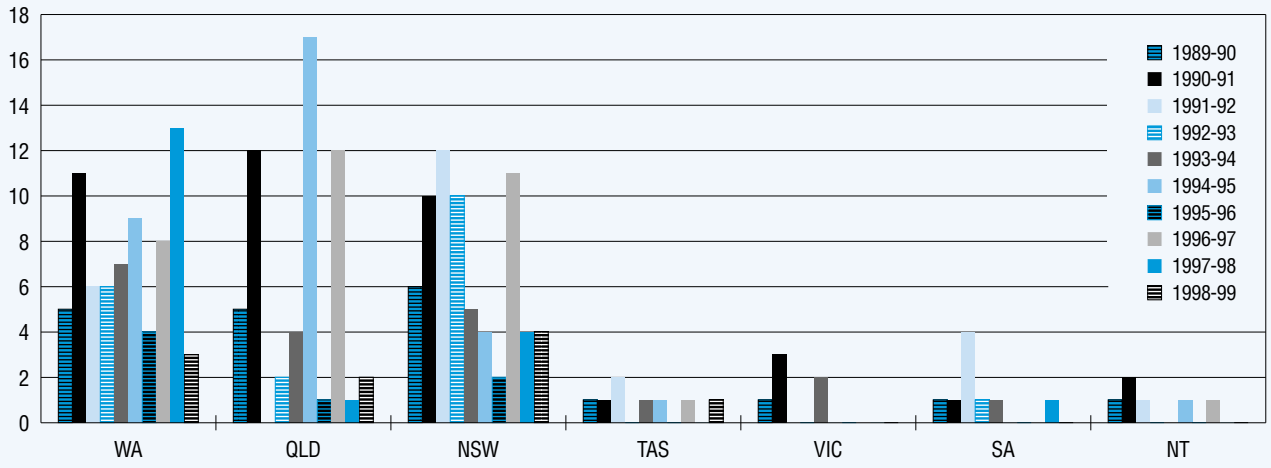


CHART 3 Fatal injuries by State 1989-90 to 1998-99



Fatality Incidence Rate (FIR)

Nationally, the fatality incidence rate (FIR – a measure of fatalities per 1000 employees) was 0.09. NSW and Tasmania had the highest rates, with 0.22 and 0.21 respectively. They were followed by Queensland (0.09) and Western Australia (0.06). All other states recorded a FIR of zero.

By sector, metalliferous underground had the highest rate (0.38 deaths per 1000 employees). This was substantially higher than that of underground coal (0.23) followed by open cut coal mining (0.08). Metalliferous surface recorded 0.04 and extractive and smelting/refining sectors had an FIR of zero.

Fatal Injury Frequency Rate (FIFR)

The risk of fatalities is measured by the fatal injury frequency rate (FIFR – see definitions).

In 1997-98 the FIFR was 0.09 per million hours, down from 0.15 in 1996-97. In 1998-99, the risk has dropped again, to 0.04 per million hours worked. This is much lower than the ten-year average of 0.11.

Over the ten-year cycle, there has been little evidence of a real reduction in the risk of fatalities. However, this three-year pattern may prove to be such a reduction. This will need to be tracked for some years further before firm conclusions can be drawn.

Sector performance

In 1998-99, only underground metalliferous and extractive industries recorded an improvement in their sector's FIFR over the previous year. Open cut metalliferous remained the same and smelting/refining continued with zero fatalities. Underground coal this year recorded an increase in FIFR (0.05 to 0.11).

Last year, it was noted that the rate for extractive industries had risen above zero for the first time in three years; this year that rate returns to zero.

Two sectors returned rates higher than the 1998-99 national mining average of 0.04 per million: underground metalliferous (0.17) and underground coal (0.11).

Last year, only the underground metalliferous sector was above the national mining average (0.39 compared with 0.09). This sector has consistently recorded the highest FIFR of any sector, with a ten-year average of 0.38. However, over the past three years there has been a steady drop, from 0.46 in 1996-97 to 0.39 in 1997-98 to 0.17 in 1998-99. These figures, while an improvement, are still significantly higher than some earlier years (for example, 0.1 in 1995-96, 0.15 in 1993-94).

The underground coal sector, which is the sector with the second worst performance on average, has a ten-year average FIFR of 0.21.

Open cut coal this year recorded a FIFR of 0.04, which is equivalent to its ten-year average.

CHART 4 Fatal Injury Frequency Rate 1989-90 to 1998-99

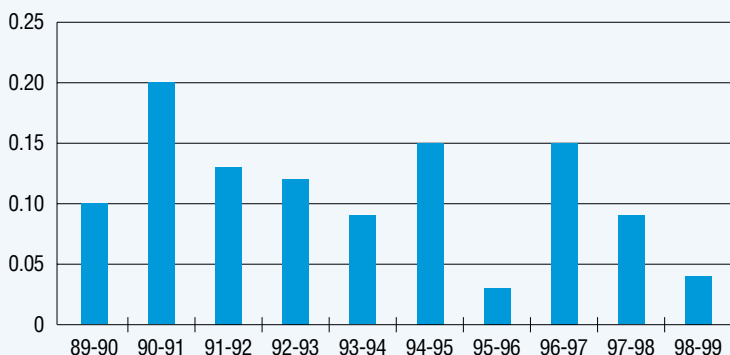


TABLE 1: Australian minerals industry Fatal Injury Frequency Rate

Year	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average
Open cut metalliferous	0.07	0.11	0.05	0.06	0.05	0.12	0.00	0.07	0.02	0.02	0.06
Underground metalliferous	0.83	0.75	0.36	0.30	0.15	0.23	0.10	0.46	0.39	0.17	0.38
Total metalliferous	0.17	0.20	0.09	0.13	0.08	0.15	0.03	0.17	0.12	0.05	0.12
Open-cut coal	0.04	0.07	0.07	0.07	0.07	0.03	0.06	0.03	0.03	0.04	0.05
Underground coal	0.08	0.37	0.25	0.13	0.10	0.58	0.05	0.41	0.05	0.11	0.21
Total coal	0.06	0.20	0.16	0.09	0.08	0.26	0.06	0.18	0.04	0.07	0.12
Extractive industries					0.46	0.20	0.00	0.00	0.09	0.00	0.13
Smelting/refining					0.04	0.02	0.02	0.05	0.00	0.00	0.02
Total Industry	0.10	0.20	0.13	0.12	0.09	0.15	0.03	0.15	0.09	0.04	0.11

State performance

In 1998-99, Western Australia had three deaths, behind NSW's four. Queensland recorded two fatalities and Tasmania one. In 1997-98, 13 of the 19 fatalities occurred in Western Australia. The second highest was New South Wales, with four deaths.

Numbers of deaths, however, are not a good comparative indicator of safety, as more deaths can be expected in those States (Western Australia, NSW and Queensland) where most mining takes place. FIFR is a better comparative measure overall for States where significant mining occurs.

On this measure in 1998-99, over all sectors, NSW and Tasmania recorded the worst rate (0.11 per million hours), followed by Queensland (0.04) and Western Australia (0.03).

For Western Australia, this is the best result in the past ten years. The closest was 1995-96, when the FIFR for WA was 0.05 per million. However, there is no pattern of sustained improvement in WA figures; FIFR has varied unpredictably.

For Queensland, the FIFR has also varied widely over the past decade, from 0.32 per million hours in 1994-95 to 0.02 in 1995-96 and 1997-98 to 0.00 in 1991-92. The FIFR of 0.04 in 1998-99, is therefore a good result for Queensland but is still higher than in some years.

New South Wales has seen substantial variation in FIFR over the past ten years (from a high of 0.29 in 1991-92 to a low of 0.05 in 1995-96). A result of 0.11 is typical of several years' performance, shows no evidence of improvement over time and is above the national mining average – as it has been for most years in the last decade. NSW is this year the only State recording significant numbers of deaths and an FIFR above the national mining average.

As with numbers of fatalities, the FIFR shows no real evidence of sustained improvement nationally. While the last two years have shown a drop, the rate is still above that of 1995-96. There seems to be no pattern to FIFR figures; they vary from year to year and from State to State.

The exception to this is Victoria, which, for a five-year period since 1993-94, has recorded no deaths. However, it must be noted that the minerals industry in Victoria is a much smaller industry than in other states (such as WA, Queensland or NSW) and exposure hours per year are thus much lower. Western Australia's exposure hours are ten times that of Victoria, in any one year, so that ten years fatality free in Victoria would be equivalent to one year fatality free in WA.

CHART 5 Fatal Injury Frequency Rate by sector 1989-90 to 1998-99

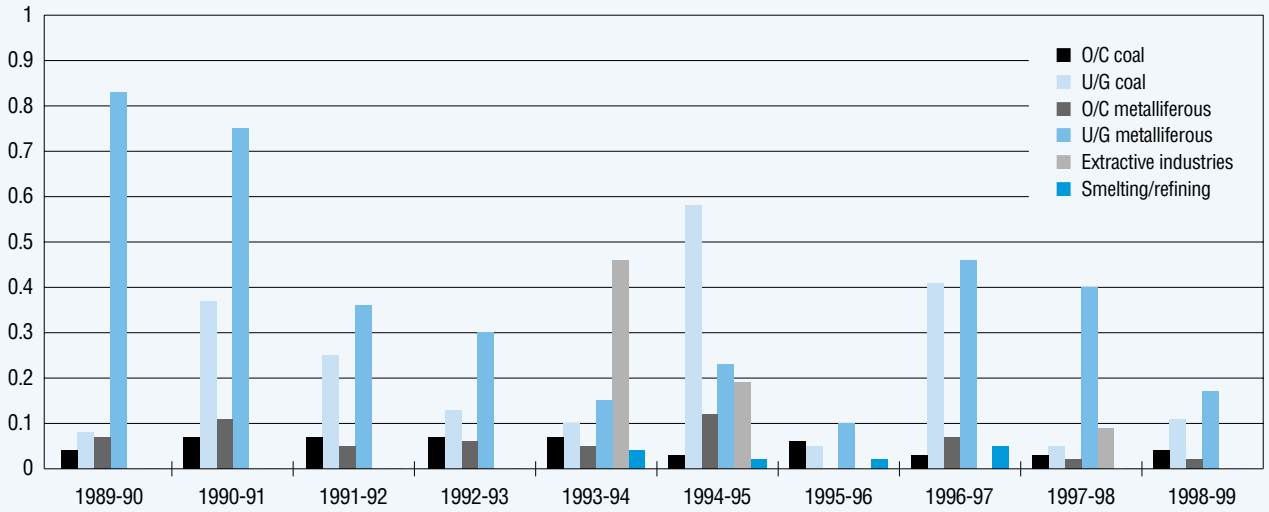


CHART 5a Fatal Injury Frequency Rate by sector 1989-90 to 1998-99

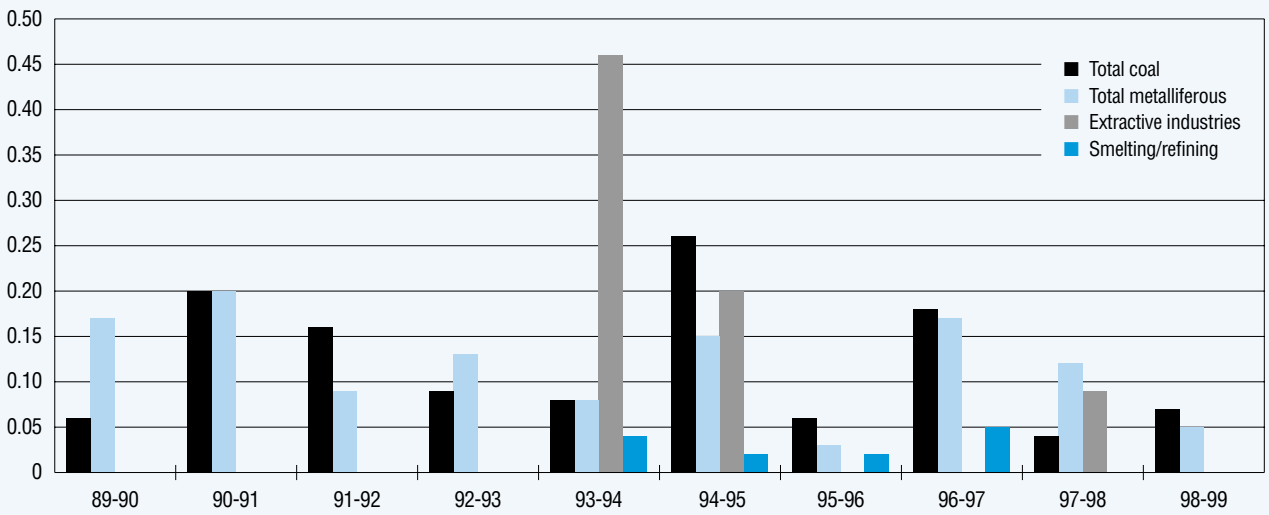
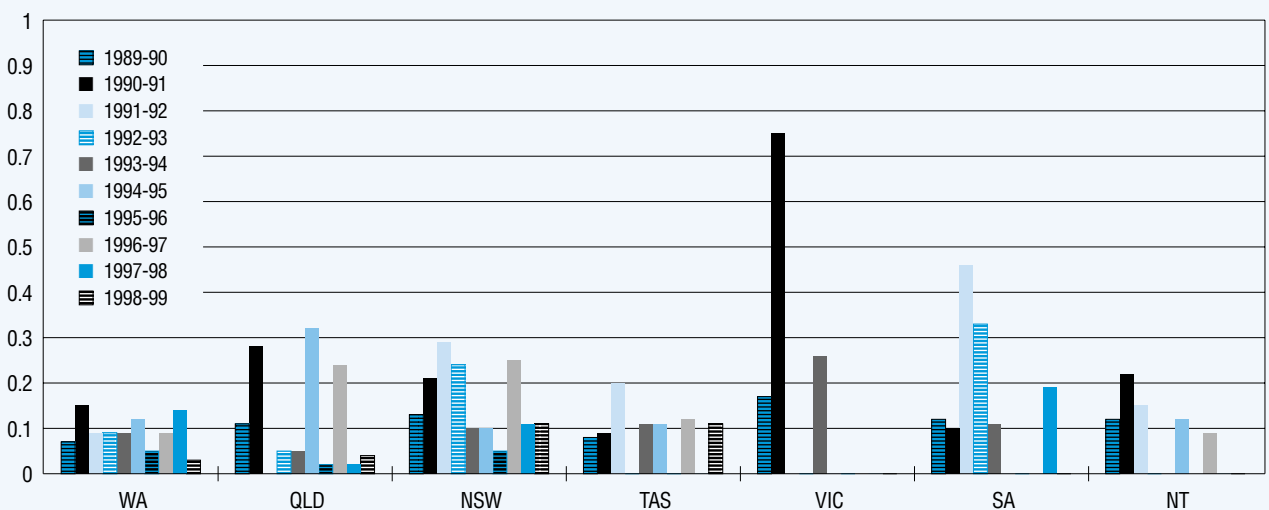


CHART 6 Fatal Injury Frequency Rate by State 1988-89 to 1998-99



Description of fatalities

New South Wales

UNDERGROUND METALLIFEROUS

- Mr David Kittle, a rotary drill operator, was buried when rock fell from the lower portion of the side wall alongside the rotary drill rig. It appeared that Mr Kittle was washing cuttings away from the hole being drilled.

OPEN CUT COAL

- Mr Ron Paine was driving his vehicle along an access road when his vision was obstructed by the sun, which caused him to drive into the end of a partially open pipe gate. The pipe smashed through the windscreen of the cabin, fatally striking him.

UNDERGROUND COAL

- Mr Anthony Carroll received fatal injuries when the roof of the colliery collapsed while being supported.
- Mr Barry Edwards was fatally injured when a large piece of roof rock fell.

Western Australia

UNDERGROUND METALLIFEROUS

- Mr Paul Fyfe was found unconscious at the bottom of a rise after apparently falling when he was preparing to bore a new cut in a rock face.
- Mr Lee Irvin was killed when eight tonnes of rock fell onto him as he and two other people were charging the face underground. The cage platform of a tool carrier being used to access higher levels of the face caught the end of a rock bolt and may have consequently contributed to the dislodging of the slab.

OPEN CUT METALLIFEROUS

- Mr Frank Derchaw was fatally injured while driving a road grader northwards on an access road running parallel to the railway line. When the grader crossed the line at a designated crossing point it was struck by a rail maintenance vehicle (ballast regulator) which was on the line, also travelling northwards.

Queensland

UNDERGROUND METALLIFEROUS

- Mr Scott Johnston was fatally injured when he fell from the sinking stage in a shaft. At the time of the incident he was scaling down the shaft sidewall in preparation for concrete lining. He fell between the stage handrail and the shaft sidewall, first to the bench at shaft bottom, a distance of approximately 9 metres, and then via a raised hole to the muckpile another 27 metres below.

OPEN CUT METALLIFEROUS

- Mr Sang Chul Kim received fatal injuries when he fell approximately 13 metres into a sulphuric acid tank which was being constructed. Mr Kim was involved in welding and metal plate preparation activities on the top of the tank at the time of the incident.

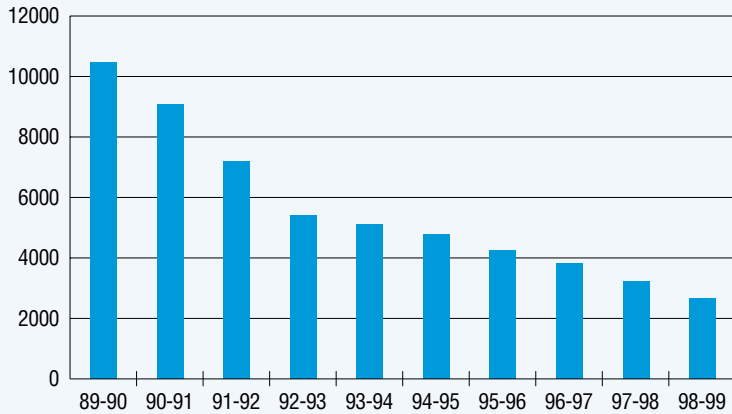
Tasmania

UNDERGROUND METALLIFEROUS

- Mr Bonney was driving a machine underground when it clipped a vertical roof support, causing the horizontal roof support to collapse onto him.

Lost time injury statistics

CHART 7 Lost Time Injuries 1989-90 to 1998-99



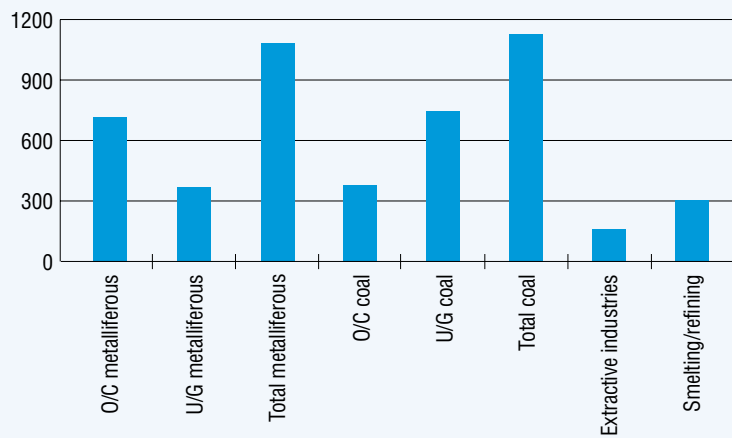
Over the past ten years, both the actual number of lost time injuries (LTIs) and the lost time injury frequency rate (LTIFR) have declined in the Australian minerals industry (see definitions).

In 1989-90, the number of lost time injuries was 10,465. This has decreased to 2676 in 1998-99, while the LTIFR has declined from 61 in 1989-90 to 12 in 1998-99. This decline has been proceeding for longer than ten years.

While the downward trend is slowly levelling off (see Charts 7 and 9), the overall rate of improvement in lost time injuries and in LTIFR is continuing at over 15% per annum.

The 1993-94 to 1998-99 LTI statistics include the extractive and refinery sectors, which in previous years were only partially reported by the State Mines Inspectorates. As noted in last year's report, the impact of this on the underground and open cut metalliferous data is difficult to determine.

CHART 8 Lost Time Injuries by sector 1998-99

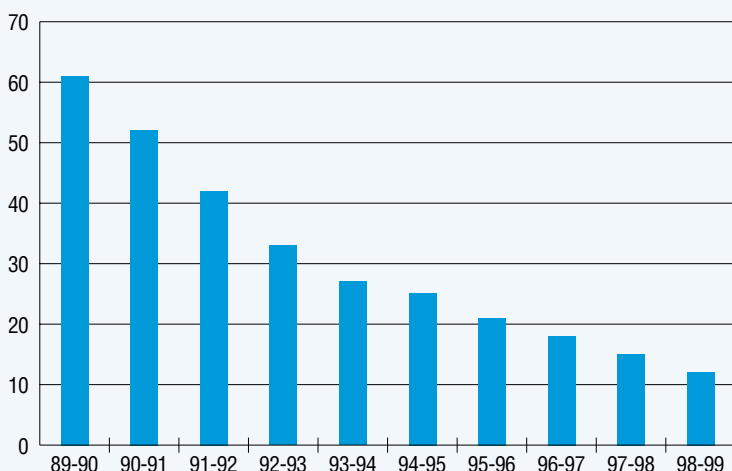


Sector performance

The total numbers of lost time injuries for metalliferous and coal sectors are very similar: 1083 and 1129 respectively. However, the LTIFRs are very different, with coal recording 25 and metalliferous eight injuries per one million hours worked.

Within these sectors, underground coal accounted for 748 LTIs (66% of total coal LTIs) and had an LTIFR of 41, 3.4 times the national mining average. This is a reduction from last year's result of 57 per million exposure hours, which was 3.8 times the national mining average. Looking at underground coal over time, LTIFR has dropped each year for the past ten years, from a high of 200 in 1989-90 to 41 in 1998-99. Decreases have been in the 20-25% range for most years, with the last decrease being 28%, significantly better than the 17% average annual improvement of the national minerals industry.

CHART 9 Total Industry Lost Time Injury Frequency Rate 1989-90 to 1998-99



While this decrease is positive, underground coal has an LTIFR almost triple that of the next highest sector, open cut coal.

Open cut coal has also recorded steady decreases over most of the past decade, falling from 50 in 1991-92 to 14 in 1998-99. The rate of decrease has not been as strong as in underground coal, and may be levelling off.

The third highest result was the extractive industries sector, which recorded an LTIFR of 13, representing a total of 159 lost time injuries. This was a slight increase on last year's LTIFR of 11 (120 injuries), and brings to an end the pattern of decreasing and then level LTIFRs recorded by this sector since 1993-94, when data was first collected.

CHART 10 Total Lost Time Injury Frequency Rate by sector 1989-90 to 1998-99

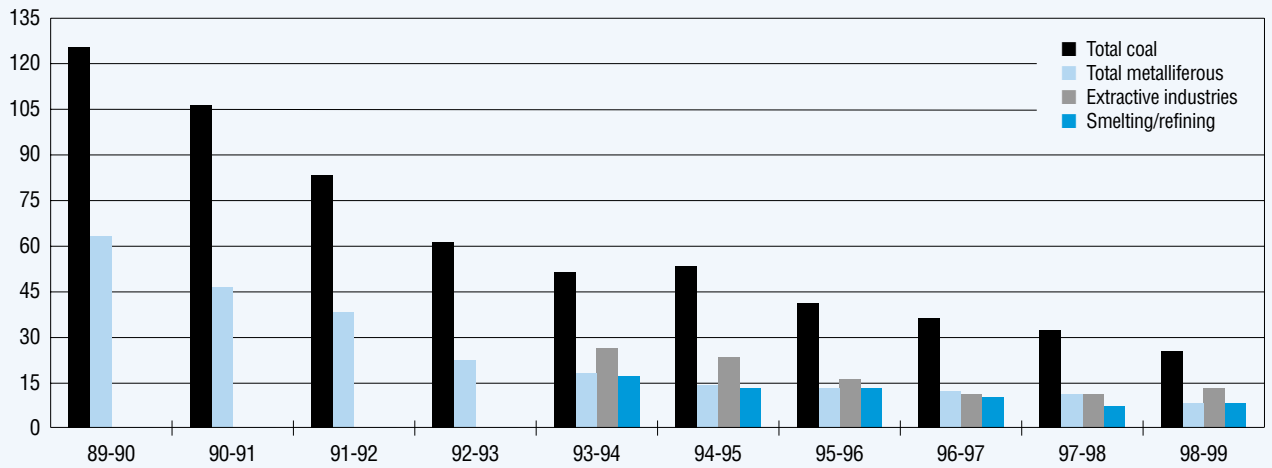
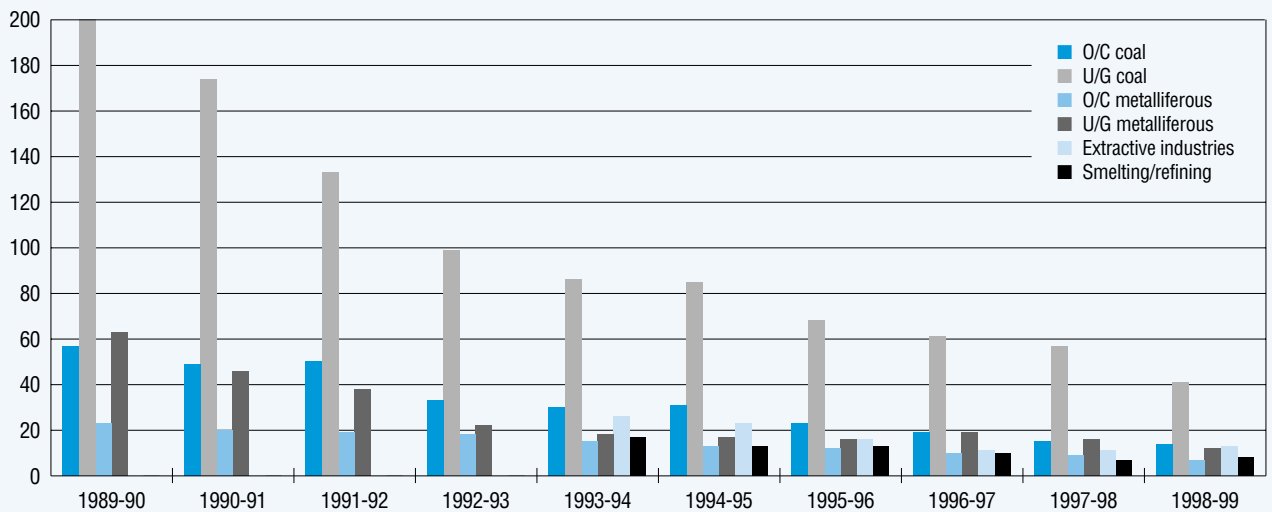


CHART 11 Lost Time Injury Frequency Rate by sector 1989-90 to 1998-99



The LTIFR for the underground metalliferous sector, at 12, represents a total of 367 LTIs. It was noted last year that, after a sharp decrease between 1988-89 and 1993-94, the rate had levelled off to between 16 and 19. This is therefore the first notable drop in LTIFR in this sector for several years.

Smelting and refining recorded an LTIFR of eight, a slight increase since 1997-98 (LTIFR of seven). This sector and extractive industries were the only sectors to record increases.

Open cut metalliferous recorded an LTIFR of seven, down from nine in 1997-98 which, along with that of smelting and refining, is below the national mining average. All other sectors are above the average.

The past ten years have seen a significant decrease in LTIs and LTIFRs in the Australian minerals industry. Most sectors with already very low LTIFRs show a continuing levelling off in performance.

State performance

All States except South Australia have recorded decreases in the number of lost time injuries in 1998-99 over the previous year. LTIs in South Australia increased from 42 to 76. However, despite this rise, the lost time injury frequency rate (LTIFR) has remained steady, at eight per million hours exposed.

NSW recorded the biggest reduction, from 1383 in 1997-98 to 1018 in 1998-99 (reduced by 26%). This decrease does not merely reflect a drop in activity, since the NSW LTIFR has also decreased significantly, from 36 to 29 (reduced by 19%). This decrease is welcome, since NSW has consistently recorded the highest LTIs and LTIFR over the past ten years and it was noted in the last report that the steady decrease in LTIFR appeared to have levelled off. Although NSW has been successful in reducing its LTIFR from 114 in 1989-90 to 29 in the previous financial year, nonetheless the rate is still more than double that of the next highest State, Tasmania (13 per million hours).

TABLE 2: Australian minerals industry Lost Time Injuries by sector 1998-99

Sector	WA	QLD	NSW	SA	VIC	TAS	NT	AUST
Open-cut metalliferous	487	145	36	9	6	6	27	716
Underground metalliferous	63	122	84	8	10	63	17	367
Metalliferous total	550	267	120	17	16	69	44	1083
Open-cut coal	37	98	226	—	—	0	—	361
Open-cut brown coal	—	—	—	2	18	—	—	20
Underground coal	—	167	581	—	—	0	—	748
Coal total	37	265	807	2	18	0	—	1129
Mining total	587	532	927	19	34	69	44	2212
Extractive industries	2	32	45	29	45	1	5	159
Smelting/refining	63	112	46	28	4	41	11	305
ALL	652	676	1018	76	83	111	60	2676

Over the previous two years, LTIs had risen slightly in Victoria. The trend has been interrupted this year with a drop in LTIs from 95 to 83, and a consequent decrease in LTIFR from 11 to 10.

The Northern Territory, whose LTIFR remained steady between 1996-97 and 1997-98, has again fallen, from eight to seven, with an accompanying drop in LTIs from 78 to 60.

Queensland has reduced both LTIs and LTIFR significantly, with a 12% fall in LTIs and a 20% fall in LTIFR (from 761 to 676 and from 15 to 12 respectively).

Western Australia now has the lowest LTIFR of any State (six per million hours), a drop of 25% from last year, with an accompanying fall in LTIs (from 726 to 652, down 10%). Western Australia's LTIFR is now one-fifth of what it was in 1989-90 (30 per million hours). Only Tasmania has recorded a larger proportional decrease (from 68 in 1989-90 to 13 this year).

Tasmania has maintained its LTIFR of 13 from 1997-98. Last year this result put Tasmania under the national average for the first time. However, due to an overall drop in LTIFR from 15 to 12 nationally, Tasmania is once again above the average, as is NSW. Queensland is on the national average. Other States' LTIFRs performed better than the average.

CHART 12 Lost Time Injuries by State 1989-90 to 1998-99

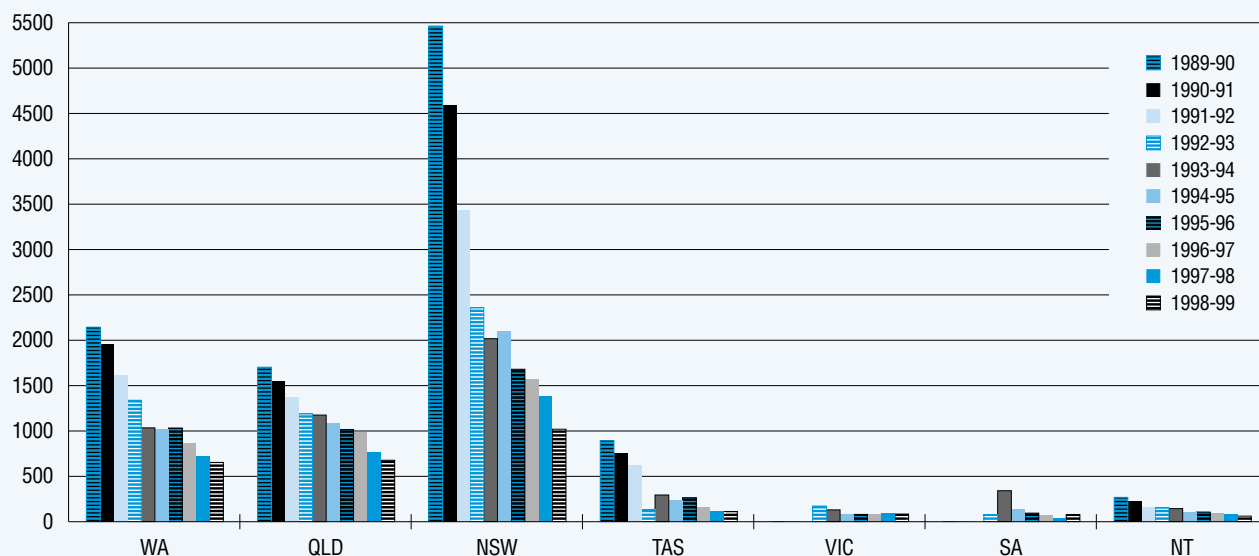
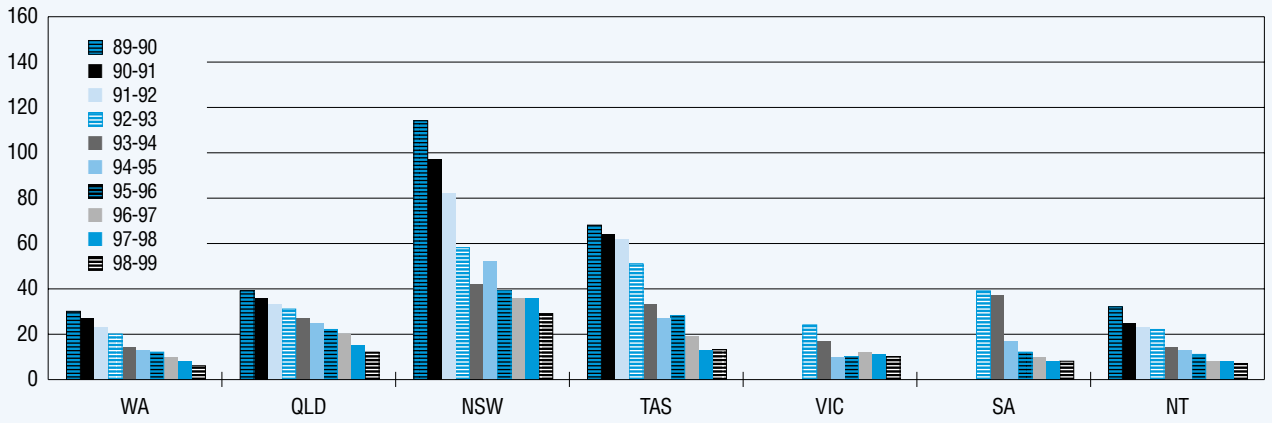


CHART 13 Lost Time Injury Frequency Rate by State 1989-90 to 1998-99



State by sector

COAL

The underground coal sector recorded the worst LTIFR of any sector, with an average of 41.

Underground coal mining in NSW, as in past years, recorded the worst LTIFR of any State/sector: 48 per million hours exposed. Last year NSW recorded its first increase on this measure in five years. This year the rate has dropped once more, from 65 to 48, bringing it substantially below the previous best figure for NSW of 61 in 1996-97. Since 1989-90, the NSW underground coal sector has reduced its LTIFR from 204 to 48.

Queensland has, over the past ten years, reduced its LTIFR from 168 to 29 and, unlike NSW, this has been a steady decrease. Although Queensland's result in 1998-99 (29) was a substantial improvement over the 39 recorded in 1997-98, it is still the second highest LTIFR for State/sector. Its rate is matched only by Western Australia's open cut coal industry. Note, however, that the Western Australian coal industry is very small and has a much lower exposure than the Queensland industry.

After underground coal, open cut coal had the next highest LTIFR, with an average of 14 overall. New South Wales (27) and Western Australia (29) had the poorest performance in this sector. In contrast, Queensland recorded a rate of seven and Victoria and South Australia eight and four respectively (brown coal only for these States).

Tasmania recorded a rate of zero, down from 14 in 1997-98. The Tasmanian industry is very small, with only 18 employees down from 33 last year. Hours worked, however, have more than doubled from last year.

Coal overall (underground and open cut) in NSW experienced a LTIFR of 39 in 1998-99, down from 52 in the previous year.

METALLIFEROUS

As with coal, NSW metalliferous underground sector LTIFR is the worst of any State (22). It compares poorly with Tasmania (19), Queensland (16) and Victoria (14), the next highest rates in this sector. Northern Territory recorded a rate of eight, Western Australia seven, and South Australia three.

It was noted in 1996-97 that the NSW metalliferous data had been affected by the improved accuracy of exposure hour data in this sector. More accurate data has now been collected for three years and in that time there has been an increase (from 30 to 32) between 1996-97 and 1997-98 followed by a decrease in 1998-99 to 22.

Victoria has the highest rate in open cut metalliferous, as it did last year. However, this rate has dropped from 24 in 1997-98 to 18 in 1998-99. Although an improvement, this year's LTIFR is still substantially above that achieved in 1996-97 (ten).

It was noted last year that all other States had continued to reduce their LTIFR for the open cut metalliferous sector. This trend has continued in most States, although there appears to have been a levelling off in South Australia and Northern Territory, where the rate remained constant from last year.

EXTRACTIVES

In extractive industries, which had an overall LTIFR of 13, just above the national mining average of 12, four states have recorded increases (Queensland, NSW, Victoria and the Northern Territory) while South Australia has remained constant. Only Western Australia and Tasmania have recorded decreases. Both of these are substantial drops, with Western Australia moving from 11 in 1997-98 to three in 1998-99, and Tasmania moving from 14 to three. Over the past ten years, these States have been the most successful at maintaining improvements on this measure.

NSW, which in 1997-98 recorded the lowest figure (four), this

TABLE 3: Lost Time Injury Frequency Rate by State and sector 1989-90 to 1998-99

Mining method	State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
Open-cut metalliferous	WA	25	22	19	16	13	12	12	9	8	6
	QLD	22	19		20	13	16	11	13	12	8
	NSW	14	12	17	16	24	38	18	17	11	10
	VIC				27	38	20	22	10	24	18
	SA				59	42	17	4	19	6	6
	TAS				100	104	68	68	57	18	16
	NT				18	13	11	7	5	7	7
Average		23	20	19	18	15	13	12	10	9	7
Underground metalliferous	WA	74	54	41	29	21	24	18	14	9	7
	QLD	26	28		19	22	18	20	22	19	16
	NSW	90	56	35	18	13	10	9	30	32	22
	VIC				29	29	18	20	45	24	14
	SA				16	9	11	4	4	2	3
	TAS				28	14	16	20	17	18	19
	NT				66	17	12	14	14	8	8
Average		63	46	38	22	18	17	16	19	16	12
All metalliferous	WA	29	25	21	17	14	14	13	10	8	6
	QLD	23	21	19	19	19	17	15	17	15	10
	NSW	34	26	23	17	14	13	10	24	21	16
	VIC				14	35	19	22	24	28	15
	SA				23	17	13	4	10	3	4
	TAS				39	26	23	24	19	18	19
	NT				22	14	11	9	8	7	7
Average		29	24	21	22	20	16	13	12	11	8
Open-cut coal	WA	81	76	85	88	65	91	61	41	32	29
	QLD	44	38	34	32	26	22	17	13	8	7
	NSW	79	64	45	30	33	43	31	29	31	27
	(Brown coal only) VIC				19	16	7	4	3	5	8
	(Brown coal only) SA				28	23	24	14	11	0	4
	TAS				61	54	23	52	19	14	0
	NT										—
Average		57	49	50	33	30	31	23	19	15	14
Underground coal	WA	220	247	217	300	157		0	0	—	—
	QLD	168	144	96	68	74	68	60	62	39	29
	NSW	204	177	138	104	88	90	71	61	65	48
	VIC										—
	SA										—
	TAS				33	0	34	9	0	0	0
	NT										—
Average		200	174	132	99	86	85	68	61	57	41
All coal	WA	114	116	108	130	78	91	61	41	32	29
	QLD	63	55	46	40	34	31	26	24	16	13
	NSW	168	140	108	78	68	73	56	48	52	39
	VIC				19	16	7	4	3	5	8
	SA				28	23	24	14	11	0	4
	TAS				37	10	29	30	19	14	0
	NT										—
Average		125	106	83	61	51	53	41	36	32	25

TABLE 3: Lost Time Injury Frequency Rate by State and sector 1989-90 to 1998-99 (continued)

Mining method	State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
Total mining	WA					16	15	14	10	8	7
	QLD					28	25	22	21	16	12
	NSW					57	61	45	43	44	33
	VIC					22	13	12	15	13	11
	SA					19	17	7	10	4	4
	TAS					25	23	25	19	18	18
	NT					14	11	9	8	7	7
Average					29	29	23	20	17	12	
Extractive industries	WA					19	15	5	10	11	3
	QLD					24	20	11	10	14	15
	NSW					25	25	17	8	4	10
	VIC					24	18	16	21	17	18
	SA					33	38	27	11	20	20
	TAS					22	24	17	18	14	3
	NT					37	29	12	3	12	17
Average					26	23	16	11	11	13	
Smelting/refining	WA					8	8	8	7	6	4
	QLD					26	21	23	15	9	19
	NSW					21	14	14	9	8	16
	VIC					7	5	5	5	4	1
	SA					49	13	10	9	7	11
	TAS					39	29	31	19	8	9
	NT					15	14	15	10	10	4
Average					17	13	13	10	7	8	
All mining industry	WA	30	27	23	20	14	13	12	10	8	6
	QLD	39	36	33	31	27	25	22	20	15	12
	NSW	114	97	82	58	52	52	39	36	36	29
	VIC				51	17	10	10	12	11	10
	SA				24	37	17	12	10	7	8
	TAS				39	33	27	28	19	13	13
	NT				22	14	12	11	8	8	7
Average	61	52	42	33	27	25	21	18	15	12	

year recorded 10, higher even than the 1996-97 figure of eight.

SMELTING/REFINING

For the first time in six years, four States recorded increases in LTIFR for the smelting/refining sector. In some States these increases were substantial: Queensland moved from nine to 19 and NSW doubled from eight to 16. South Australia moved from seven to 11 while Tasmania increased from eight to nine.

Western Australia and Victoria recorded decreases, while the Northern Territory dropped from ten to four. Victoria had the second lowest LTIFR of any State/sector, with an LTIFR of one (1).

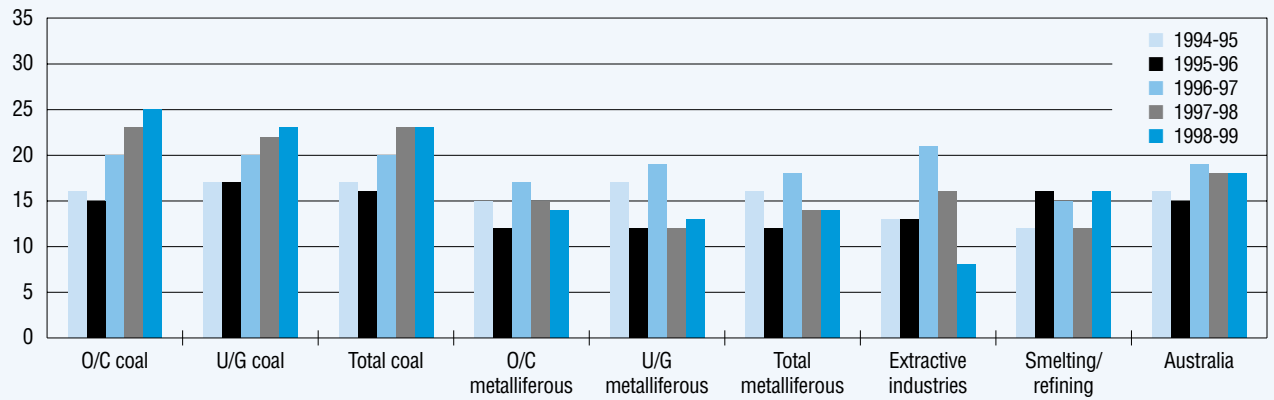
Duration and Severity Rates

The duration rate (DR) represents the average number of days lost for each injury, while the severity rate (SR) measures the average days lost per one million hours worked.

The average minerals industry DR was 18 days lost per injury in both 1998-99 and 1997-98, slightly down from 1996-97 (19) but higher than the 1995-96 figure of 15.

The SR for mining overall has dropped to 206 days lost per million hours worked in 1998-99 from 273 in 1997-98.

CHART 14 Duration Rate by sector 1994-95 to 1998-99



Duration and Severity Rates by sector

DR overall has remained the same for the industry, while severity rate has reduced slightly (from 334 days lost per million hours worked to 206). Only the extractives sector has experienced any major shift in duration rates – a reduction from 16 days' lost per lost time injury to eight. All sectors except open cut coal and smelting/refining reduced severity rates.

COAL

The duration rate for both underground and open cut coal sectors has remained relatively stable.

The accompanying severity rate rose slightly for open cut from 344 to 355 and dropped substantially from 1288 to 929 days lost on average per million hours worked for underground coal. This result in underground coal has occurred in the context of a 9% increase in hours worked between 1997-98 and 1998-99 with a 14% decrease in employee numbers.

EXTRACTIVES

Extractive industries' duration rate this year (eight) was only half that of the previous year. Most of this improvement has occurred in NSW and South Australia, where the rate has

reduced from 14 in 1997-98 to six in 1998-99 and from 20 to four respectively. However, all States recorded decreases in this rate.

The severity rate for extractive industries, which has dropped from 228 in 1996-97 to 174 in 1997-98 to 113 in 1998-99, displays almost the same pattern of consistent improvement across the States. The exception is Tasmania, where SR has risen from 250 in 1997-98 to 376 in 1998-99. It should be noted, however, that the extractive sector in Tasmania experienced only one LTI in 1998-99 and five the previous year.

Taken together these trends indicate that (with perhaps the exception of Tasmania) the seriousness of injuries in the extractive industries is reducing and/or that rehabilitation and return to work practices are improving.

SMELTING/REFINING

The smelting/refining sector experienced an increase in duration rate from 12 in 1997-98 to 16 in 1998-99. This is the highest rate after coal.

Duration and Severity Rates by State

State performance on these measures differs markedly.

NSW has the highest duration and severity rates (24 and 691 respectively), with these figures dominated by coal mining (particularly with regard to severity) and smelting/refining.

There is a large gap between NSW and the next highest State for duration rate, Western Australia (16). Queensland (168) has the next highest severity rate to NSW.

Duration rates range from 24 (NSW) to nine (South Australia). Severity rates range from 691 (NSW) to 46 (Northern Territory).

While there is little consistency between States, within some States there are consistent patterns. For example, severity rates in South Australia are low across all sectors, as are rates in the Northern Territory.

CHART 15 Duration Rate by State 1998-99

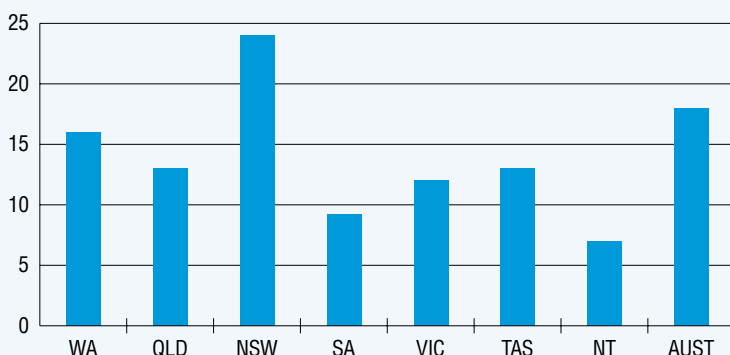


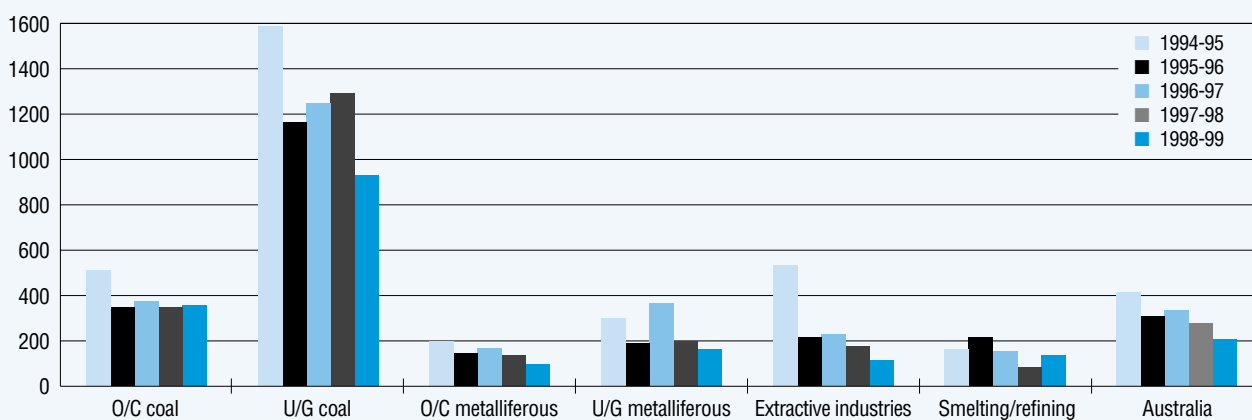
TABLE 4: Duration Rate and Severity Rate by sector 1995-96 to 1998-99

	1995-96		1996-97		1997-98		1998-99	
	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate	Duration Rate	Severity Rate
O/C coal	15	na	20	374	23	344	25	355
U/G coal	17	na	20	1247	22	1288	23	929
O/C metalliferous	12	na	17	166	15	133	14	93
U/G metalliferous	12	na	19	365	12	195	13	160
Extractive industries	13	na	21	228	16	174	8	113
Smelting/refining	16	na	15	151	12	82	16	135
All minerals	15	na	19	334	18	274	18	206

TABLE 5: Duration Rate and Severity Rate by State 1996-97 to 1998-99

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

CHART 16 Severity Rate by sector 1994-95 – 1998-99



Workers' Compensation data for 1997-98 from National Occupational Health and Safety Commission

This section discusses National Occupational Health and Safety Commission (NOHSC) data for 1997-98, the latest such figures available.

Fatalities in the mining industry

In 1997-98, 17 injury/poisoning deaths (89.5%) and two disease deaths (10.5%) were recorded by the mining industry. This compares with 28 injury/poisoning deaths and two disease deaths in 1996-97. Unfortunately, as in the previous year due to confidentiality concerns, no further information is available on the disease related deaths.

It is worth comparing the workers' compensation figures with the Mines Inspectorate figures for the same periods. The comparison has been made using only injury/poisoning deaths from NOHSC, since deaths from disease are unlikely to be included in Mines Inspectorate data.

Year	Mines Inspectorate data	NOHSC data
1996-97	33	28
1997-98	19	17

There are some differences in data collected by the two bodies (for example, definitions of what constitutes the minerals industry), leaving open a possibility of mismatches in numbers. It is interesting, however, that the NOHSC data is below that of the Mines Inspectorates in both years.

Of the 17 injury/poisoning deaths recorded for the mining industry by NOHSC in 1997-98, 12 (70.6%) occurred in the metal ore mining sector, and two (11.8%) in coal mining. The comparable figures for 1996-97 were ten in both sectors.

TABLE 6: Fatality data, injury poisoning and disease 1997-98

	Injuring/poisoning	Disease
Coal mining	2	0
Metal ore mining	12	1
Other mining	1	0
Services to mining	2	1

Fatal incidence and frequency rates are shown in Chart 19 for selected additional ANZSIC sub-divisions. Selected industry sub-divisions are those from the higher end of the spectrum and those traditionally used for comparison purposes.

Coal mining, which in 1996-97 recorded the third highest fatality incidence rate of these sectors, recorded the second lowest in 1997-98, after oil and gas extraction. Its frequency rate also fell dramatically. This matches Mines Inspectorate fatal injury frequency rate data for these years, when the FIFR for underground coal fell from 0.41 to 0.05 (although the FIFR for open cut coal remained the same at 0.03).

Metal ore mining, in contrast, almost doubled its fatality incidence rate in this period, although its frequency rate has risen only slightly. This sector recorded the third highest rates of any sector on both measures. Forestry/logging and services to agriculture recorded worse rates. Mines Inspectorate data shows FIFR for underground metalliferous mining to have dropped slightly (from 0.46 to 0.39) between 1996-97 and 1997-98, as did the rate of

CHART 17 Fatality incidence and frequency rates for selected industries 1997-98

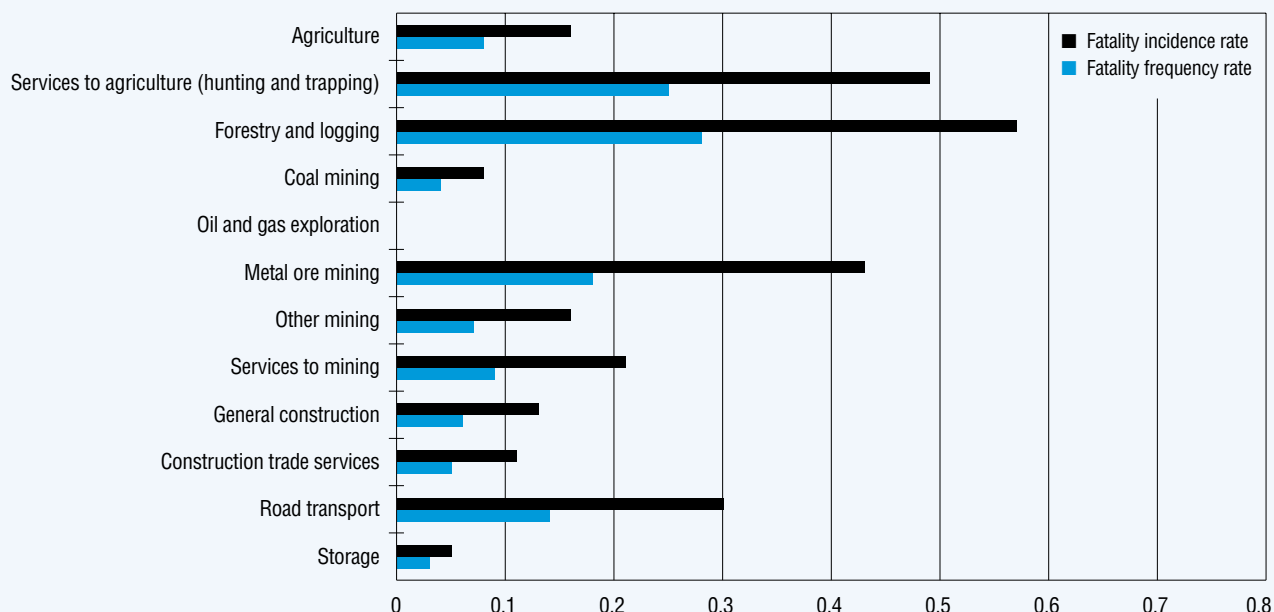


TABLE 7: New workers' compensation claims, injury/poisoning cases by ANZSIC sub-division 1997-98 (includes fatal and non-fatal) (excludes Victoria)

	Number of cases	Incidence rate	Frequency rate	Average weeks lost	Average cost	Total weeks lost
Agriculture	3405	28.97	13.55	9.27	6262	31552
Services to agriculture	690	61.52	32.98	8.58	8123	5919
Forestry and logging	312	30.51	15.33	7.08	8098	2210
Coal mining	1055	43.77	22.73	6.94	7773	7319
Oil and gas extraction	48	13.25	6.23	12.59	16183	604
Metal ore mining	650	21.78	9.22	8.57	14127	5569
Other mining	256	46.95	20.51	8.39	10025	2148
Services to mining	452	32.91	13.95	9.64	12643	4359
General construction	3949	32.04	15.32	8.09	6875	31963
Construction trade services	5505	32.63	16.37	9.61	7600	52906
Road transport	3663	35.59	16.62	8.84	7671	32372
Storage	713	54.23	27.47	6.65	5140	4744

open cut metalliferous (0.07 to 0.02). Differences in the timing of data collection and methods of collecting denominator data (for example, employee numbers and hours worked) may account for this.

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

Mining industry injury claims data¹

In 1997-98 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 41 and 18 respectively. In 1996-97 the figures were 46 and 21.

Despite this, in 1997-98 (as in previous years) mining still recorded the worst result of any of the selected industries. However, over the past few years mining sector performance, in terms of both incidence of injuries and frequency of injuries, has improved (this is consistent with the Mines Inspectorate data). This rate of improvement has outstripped that of other industries.

Of the mining sectors, the other mining sector recorded the highest incidence rate (47 compared with 41 for all mining), with coal mining coming next (44). These were the third and fourth highest rates respectively for the selected industries, after services to agriculture (62) and storage (54). Services to mining (33) and metal ore mining (22) were much lower and are closer to other sectors' results. They are the only sectors with results below the all mining average.

In terms of frequency of new injury/poisoning cases, coal mining (23 compared with 18 for all mining) and other mining (21) again took third and fourth places (although their positions were reversed), again behind services to agriculture (33) and storage (27). Services to mining (14) and metal ore mining (9) were considerably lower than coal and other mining.

A total of 2461 new injury/poisoning claims were recorded by the mining industry in 1997-98. Sprains and strains was the largest category of claim (1483), accounting for more than half of all injury claims. Fractures was the next largest category (293), followed by contusions/crushing injuries (250), and open wounds not involving amputation (214).

Regarding the average time lost per claim, coal mining recorded the second lowest average (seven weeks) after storage². Other mining sectors are similar to the selected industries on this measure.

In terms of average cost of injuries, metal ore mining, services to mining and other mining recorded the second, third and fourth highest cost, after oil and gas extraction. Coal mining was much lower, being the fifth lowest of the industries listed.

¹ Victoria is not included in this data. Last year's report included estimates of Victorian data and there may therefore be discrepancies between rates quoted in this year's and last year's reports.

² Note that no figures were provided for 'all mining' on this and cost measures.

There is a notable difference between injury costs in metal ore mining (\$14,127 on average) and coal mining (\$7773). While metal ore mining injuries involve more time lost on average, this difference (nine weeks versus seven) is not so great as to explain the large difference in costs, particularly since wages costs are generally higher in coal than metal ore mining. Average cost in coal mining has dropped sharply from 1996-97, when the average was \$13,559 (42.67%). Metal ore mining dropped from \$20,455 to \$14,127 (30.93%). Other sectors also reduced their costs significantly.

Although average cost differs between metal ore and coal mining, because of the high incidence rate in coal mining, total cost for the year 1997-98 is not dramatically different for the two sectors, with coal mining recording a total cost of \$8,177,640 and metal ore mining a total cost of \$8,815,354.

Overall cost to the industry was \$25,913,327 in 1997-98, compared with \$40,416,958 in 1996-97.

Disease claims in the mining industry

NOHSC data for 1997-98 shows that approximately 17% of workers' compensation claims in all industries are due to disease. This is slightly lower than the 18% recorded in 1996-97.

TABLE 8: Mining industry proportion of injury/poisoning cases and disease cases 1997-98

	% Injury/poisoning	% Disease
Coal mining	72.7	27.2
Metal ore mining	83.3	16.4
Other mining	82.6	17.1
Services to mining	89.0	10.8
All industry	83.0	16.6

Mining industry sectors, apart from services to mining, have in the past recorded slightly higher proportions of disease versus injury than other sectors. In 1997-98 this was not the case. As well as services to mining recording a significantly lower percentage of disease related claims (11%, up from 9% in 1996-97), metal ore mining recorded 16% of claims as disease related. This is substantially lower than 1996-97 when the figure was 21%. Coal mining has risen since 1996-97 (from 24% to 27% of claims), widening the gap between it and the all industries average.

TABLE 9: Incidence and frequency rates for disease cases, mining sectors

	Incidence	Frequency
Coal mining	16.43	8.53
Metal ore mining	4.36	1.84
Other mining	9.9	4.33
Services to mining	4.08	1.73

Within mining, coal mining has the highest incidence and frequency rates of disease cases (44 per 1000 employees and 23 per million hours worked respectively.* These rates rose between 1996-97 and 1997-98, at a time when all other mining sectors recorded reductions (except other mining incidence rate, which rose slightly).

At the jurisdictional level (excluding Victoria), the highest disease incidence and frequency rates were experienced by Queensland coal mining (22 and 11 respectively), followed at some distance by coal mining in NSW (14 and seven). The other mining sector in NSW had an incidence rate of 25, higher than Queensland coal mining, but frequency rates were not available for this sector. This was also true for other mining in South Australia (incidence rate of 13).

Metal ore mining generally recorded lower rates of disease than coal mining, as did services to mining.

In 1997-98 deafness accounted for 70% of disease related claims (452 cases). Of these 81% were in the coal sector, which also had the highest incidence (15 compared with the next highest, other mining, at seven). In addition, coal mining recorded the highest frequency of deafness (eight), also more than double the next highest sector, other mining (three).

The first figure is comparable to that from 1996-97, which saw deafness account for around 65% of disease related claims. However, there has been a sharp increase in the proportion of deafness related claims from the coal sector. In 1996-97, just over 60% occurred in the coal sector (compared with over 80% in 1997-98). However, incidence and frequency rates have remained relatively constant in the coal sector (14 and seven in 1996-97 compared with 15 and seven respectively).

The other major disease categories are hernia, diseases of the musculo-skeletal system, dermatitis and mental disorders such as stress. For hernia cases, other mining, coal mining and services to mining had the highest incidence rates (0.5).

* These figures exclude Victoria.

Last year it was noted that coal mining had the highest incidence of mental disorders. This year, however, only metal ore mining recorded any substantial numbers of mental disorder cases (12, an incidence of 0.4). Figures for other sectors were not provided.

Comparing the mining industry sectors with other selected industries regarding direct cost of disease claims, services to mining and metal ore mining had the highest and second highest average cost (\$15,903 and \$11,274 respectively). Other mining had an average cost of \$8563, very close to the all industries average of \$8566. Coal mining, in contrast to the other sectors, had a much lower average cost (\$2674).

In 1996-97, the average cost of disease claims was lower than injury claims across all sub-divisions. In 1997-98, this was not true, with services to mining recording a substantially higher average cost for disease claims (\$15,903 compared with \$12,643 for injury claims).

TABLE 10: Average cost of disease claims by mining sub-divisions and selected industry sub-divisions 1997-98

	Av. Cost of disease claims
Agriculture	9652
Services to agriculture (hunting and trapping)	7910
Forestry and logging	7733
Coal mining	2674
Oil and gas extraction	5234
Metal ore mining	11274
Other mining	8563
Services to mining	15903
General construction	6248
Construction trade services	8925
Road transport	9720
Storage	9810
All industries	8566

International Comparisons

Fatalities

In the following data, where possible, the fatal injury frequency rate (FIFR, number of fatalities/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 past decade of 0.11 compares well with the South African average of 0.45. The South African total metalliferous FIFR average is 0.43, with an average of 0.26 for coal mining.

Unfortunately, the South African data does not distinguish between underground and open cut mines. However, the South African FIFR of 0.45 is worse than the Australian underground FIFR for both metalliferous and coal sectors (0.38 and 0.21 respectively).

USA

Although Australia has slightly better averages than the USA in mining overall, Australia has a poorer record in the highest risk sector (metalliferous underground mining). The US average FIFR for 1991-1999 for coal was 0.17 and for metalliferous mining, 0.11. The USA underground metalliferous mining sector recorded an average FIFR of 0.32 (0.38 in Australia) and underground coal an average of 0.24 (0.21 Australia).

Australia's performance in open-cut mines is considerably better than in the USA (0.06 compared to 0.16 for open cut metalliferous and 0.05 compared to 0.12 for open cut coal), leading to lower rates of fatal injuries overall.

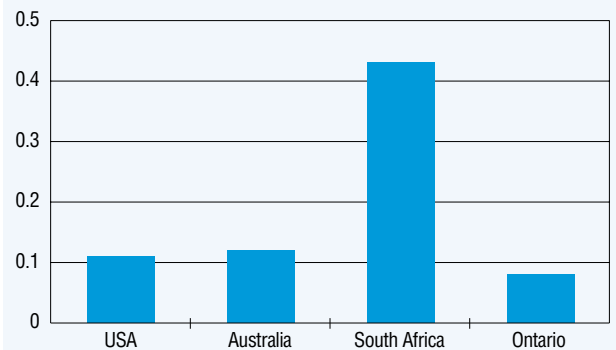
Canada

FIFR data for Ontario, Canada, is available only for the past two years and for the metalliferous mining industry only. Ontario has a metalliferous FIFR average of 0.08. For underground metalliferous mining, the average is 0.9. For open cut there have been no fatalities.

This compares with an Australian underground metalliferous average over the past two years of 0.28 and an open cut average of 0.02.

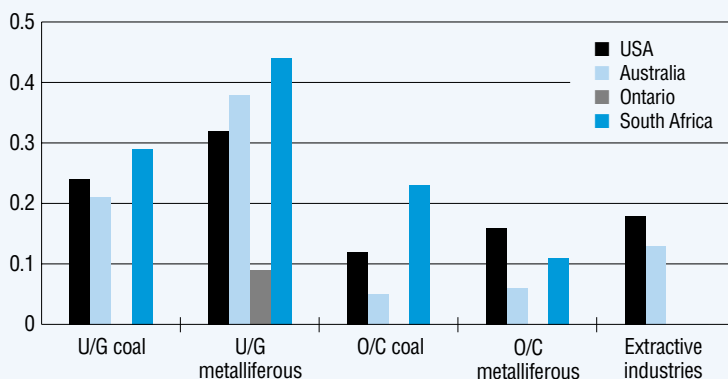
In underground metalliferous mining, then, FIFR is much lower in Ontario and although the open cut figures reflect a higher incidence of fatalities in Ontario, the actual numbers of fatalities are very small. In 1999 there were two fatalities in Ontario mining.

CHART 19 International metalliferous mining industry fatality rates



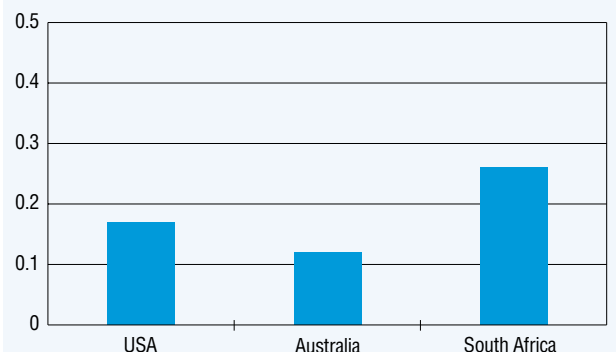
Australia: average for 1989-90 to 1998-99
 USA: average for 1991 to June 1999
 South Africa: average for 1988 to 1998
 Ontario: 1998 to October 1999

CHART 18 International mining industry fatality rates



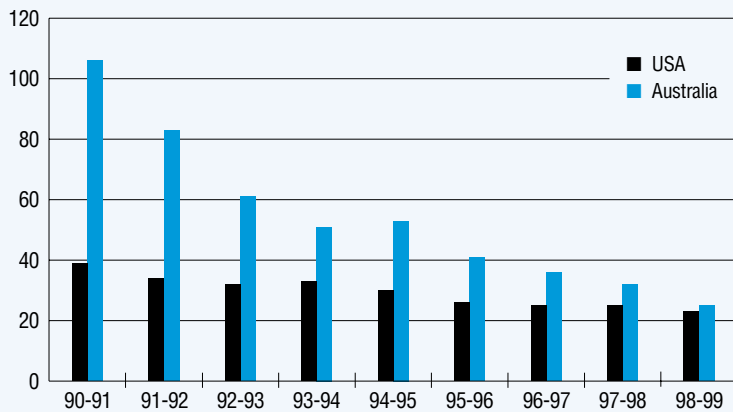
Australia: average for 1988-89 to 1998-99
 Extractive industries: average for 1993-94 to 1998-99
 USA: average for 1991 to June 1999
 South Africa: average for 1988 to 1998
 Ontario: average for 1998-1999

CHART 20 International coal mining industry fatality rates



Australia: average for 1989-90 to 1998-99
 USA: average for 1991 to June 1999
 South Africa: average for 1988 to 1998
 Ontario does not have a coal mining industry

CHART 21 International coal mining lost time injury rates 1990-91 to 1998-99



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, it has performed less well in underground mining, particularly metalliferous mining.

Lost time injury comparisons

Coal

The American NFDL/FR (non-fatal days lost frequency rate) for coal has dropped over the past nine years, from 39 to 23 (41%). Over the same period, the Australian coal LTIFR has dropped from 125 to 25 (80%). Perhaps more interestingly, the decrease is apparently levelling off in the USA (the NFDL/FR figures for the past four years are 26, 25, 25 and 23), although the downward trend continues. In Australia, while the rate of decrease has slowed, it is still higher than in the US (comparable LTIFR figures are 41, 36, 32, 25).

Thus, the latest figures suggest that the Australian performance in this sector is, for the first time, drawing close to the 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 risen in the coal sector over the past decade, from 0.50 in 1988 to 0.63 in 1998. This has occurred in the context of a significantly reduced workforce. In Australia over the same time, as discussed above, the LTIFR has dropped dramatically, from 125 to 25.

Ontario does not have a coal mining industry.

CHART 22 International coal mining lost time injury rate 1990-91 to 1998-99

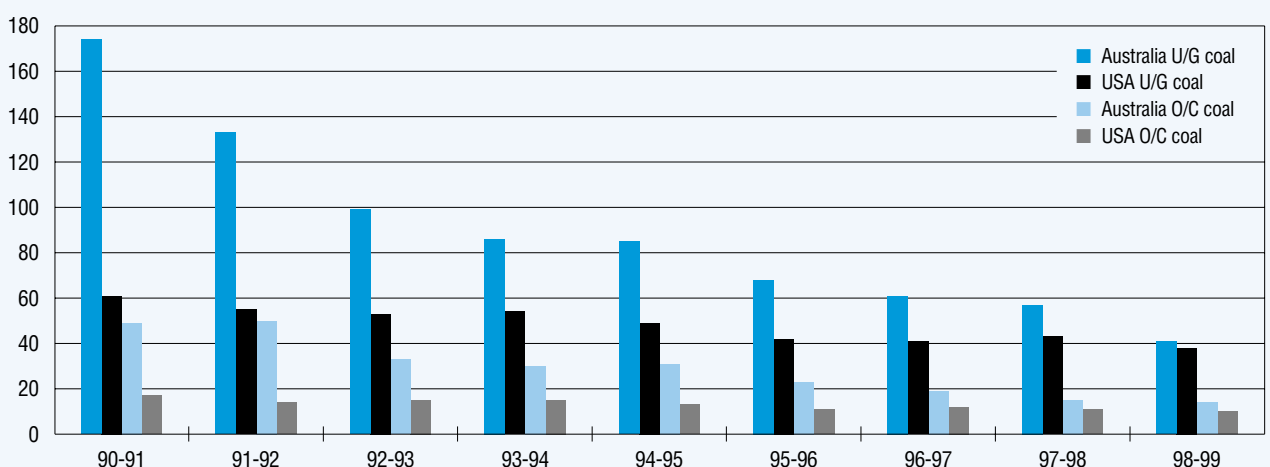
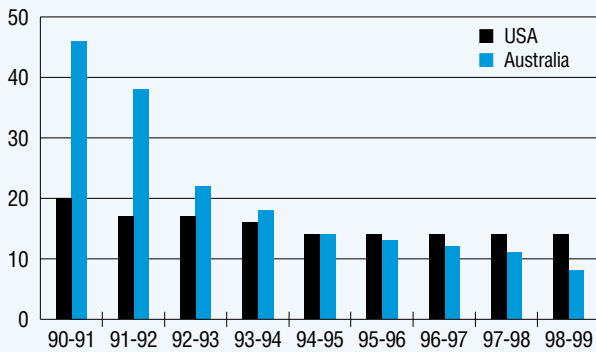


CHART 23 International metalliferous mining lost time injury rates 1990-91 to 1998-99



Metalliferous

Since 1991, the USA metalliferous NFDL/FR has dropped from 20 to 14, and has remained constant at 14 for the past five years. In Australia, the LTIFR for metalliferous industries has dropped from 24 to eight.

For the past few years (when the Australian figures for 1994-95 to 1997-98 were 16, 13, 12 and 11), the two industries seemed comparable in performance. However, Australia has continued to improve its results, while the USA has levelled off.

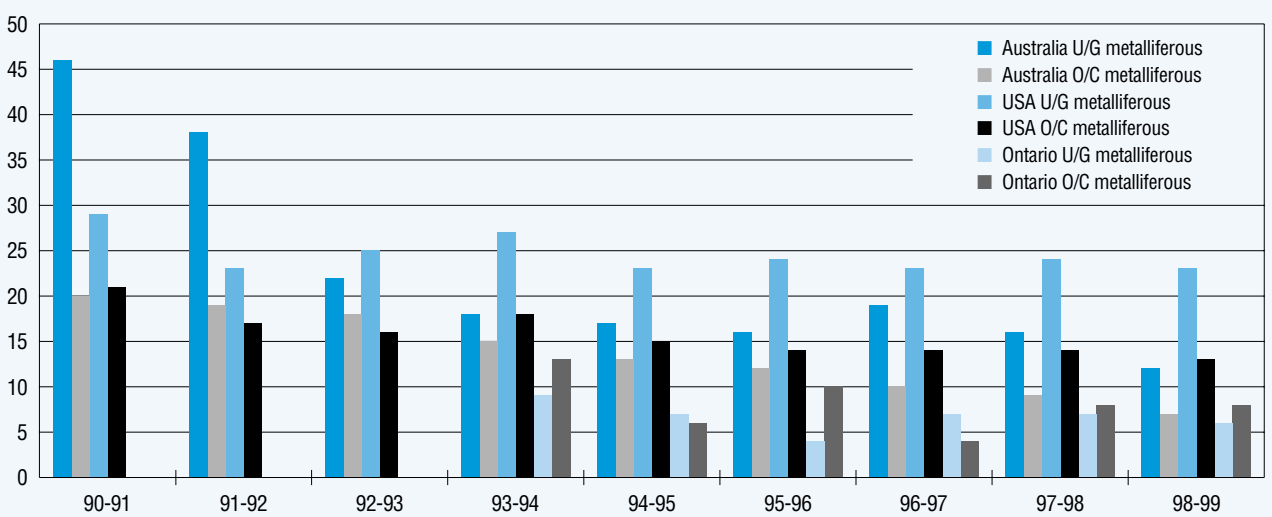
Within the sector, the US open cut metalliferous sector has improved from a NFDL/FR of 21 in 1991 to 13 in 1999, being considerably lower than the underground sector's results of 29 and 23 respectively.

This difference in sectors is mirrored in the Australian results, where the open cut metalliferous sector has dropped from 19 in 1991 to seven in 1999, while the underground sector has moved from 46 to 12. It is worth noting that the Australian underground metalliferous sector, which started the decade with much higher rates than the comparable US sector, has not only closed the gap but outstripped the USA improvement rate by a considerable margin.

In Ontario, the metalliferous sector in the past three years has improved slightly, from an LTIFR of eight in 1997 to six in 1999. Over the same period, Australia's LTIFR has dropped from 12 to eight. While Australia's performance continues to improve, it still lags behind that of Ontario.

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 slightly over the past decade, moving from 0.98 to 0.85. However, this improvement has not been steady as it has been in Australia. In South Africa, LTIFR has ranged from a low of 0.80 in 1997 to a high of 1.07 in 1989 and 1992. As late as 1995 the rate was 1.03. For the past three years, however, the rate has been in the 0.8-0.84 range.

CHART 24 International metalliferous mining lost time injury rates 1990-91 to 1998-99 by sector



Reference Tables

Australian Minerals Industry

TABLE 11: Number of Fatalities by State 1989-90 to 1998-99

State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
WA	5	11	6	6	7	9	4	8	13	3
QLD	5	12	0	2	4	17	1	12	1	2
NSW	6	10	12	10	5	4	2	11	4	4
TAS	1	1	2	0	1	1	0	1	0	1
VIC	1	3	0	0	2	0	0	0	0	0
SA	1	1	4	1	1	0	0	0	1	0
NT	1	2	1	0	0	1	0	1	0	0
ALL	20	40	25	19	20	32	7	33	19	10

Average fatalities = 22.5 per annum
Includes explorations fatalities

TABLE 12: Number of Fatalities by sector 1998-99

Mine type	WA	QLD	NSW	VIC	SA	TAS	NT	AUST
O/C coal	0	0	1	0	0	0	0	1
U/G coal	0	0	2	0	0	0	0	2
Total coal	0	0	3	0	0	0	0	3
O/C metalliferous	1	1	0	0	0	0	0	2
U/G metalliferous	2	1	1	0	0	1	0	5
Total metalliferous	3	2	1	0	0	1	0	7
Extractive industries	0	0	0	0	0	0	0	0
Smelting/refining	0	0	0	0	0	0	0	0
Exploration	0	0	0	0	0	0	0	0
ALL	3	2	4	0	0	1	0	10

TABLE 13: Fatal Injury Frequency Rates by State 1989-90 to 1998-99

State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average
WA	0.07	0.15	0.09	0.09	0.09	0.12	0.05	0.09	0.14	0.03	0.09
QLD	0.11	0.28	0.00	0.05	0.05	0.32	0.02	0.24	0.02	0.04	0.11
NSW	0.13	0.21	0.29	0.24	0.10	0.10	0.05	0.25	0.11	0.11	0.16
TAS	0.08	0.09	0.20	0.00	0.11	0.11	0.00	0.12	0.00	0.11	0.08
VIC	0.17	0.75	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.12
SA	0.12	0.10	0.46	0.33	0.11	0.00	0.00	0.00	0.17	0.00	0.13
NT	0.12	0.22	0.15	0.00	0.00	0.12	0.00	0.09	0.00	0.00	0.07
ALL	0.10	0.20	0.13	0.12	0.09	0.15	0.03	0.15	0.09	0.04	0.11

TABLE 14: Fatal Injury Frequency Rate by sector 1989-90 – 1998-99 (per million exposure hours)

Sector	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average
O/C coal*	0.04	0.07	0.07	0.07	0.07	0.03	0.06	0.03	0.03	0.04	0.05
U/G coal	0.08	0.37	0.25	0.13	0.10	0.58	0.05	0.41	0.05	0.11	0.21
O/C metalliferous	0.07	0.11	0.05	0.06	0.05	0.12	0.00	0.07	0.02	0.02	0.06
U/G metalliferous	0.83	0.75	0.36	0.30	0.15	0.23	0.10	0.46	0.39	0.17	0.38
Extractive industries	—	—	—	—	0.46	0.19	0.00	0.00	0.09	0.00	0.12
Refining/smelting	—	—	—	—	0.04	0.02	0.02	0.05	0.00	0.00	0.02
All mining	0.10	0.20	0.13	0.12	0.09	0.15	0.03	0.15	0.09	0.04	0.11

* Includes Open-cut brown coal from 1992/93 onwards

TABLE 15: Fatal Injury Frequency Rate by sector and State 1998-99

Mining type	WA	QLD	NSW	VIC	SA	TAS	NT	AUST
O/Cut coal*	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.04
U/G coal	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.11
Total coal	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.07
O/C metalliferous	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.02
U/G metalliferous	0.22	0.13	0.26	0.00	0.00	0.31	0.00	0.17
Total metalliferous	0.03	0.08	0.13	0.00	0.00	0.28	0.00	0.05
Extractive industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Refining/smelting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All mining	0.03	0.04	0.11	0.00	0.00	0.11	0.00	0.04

* Includes brown coal

TABLE 16: Number of Lost Time Injuries by State 1989-90 to 1998-99

State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
WA	2,143	1,961	1,611	1,337	1,033	1,025	1,031	863	726	652
QLD	1,702	1,550	1,367	1,186	1,174	1,088	1,014	983	761	676
NSW	5,462	4,587	3,432	2,357	2,016	2,098	1,679	1,576	1,383	1,018
TAS	891	750	624	133	293	236	261	158	121	111
VIC	—	—	—	171	129	85	79	82	95	83
SA	—	—	—	73	340	142	93	72	42	76
NT	267	227	156	151	143	106	105	91	78	60
Australia	10,465	9,075	7,190	5,408	5,096	4,767	4,262	3,825	3,206	2,676

TABLE 17: Lost Time Injury Frequency Rates by sector 1989-90 to 1998-99

Mine type	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
O/C coal	57	49	50	33	30	31	23	19	15	14
U/G coal	200	174	133	99	86	85	68	61	57	41
O/C metalliferous	23	20	19	18	15	13	12	10	9	7
U/G metalliferous	63	46	38	22	18	17	16	19	16	12
Extractive industries	—	—	—	—	26	23	16	11	11	13
Smelting/refining	—	—	—	—	17	13	13	10	7	8
All mining	61	52	42	33	27	25	21	18	15	12

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

State	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
WA	30	27	23	20	14	13	12	10	8	6
QLD	39	36	33	31	27	25	22	20	15	12
NSW	114	97	82	58	42	52	39	36	36	29
TAS	68	64	62	51	33	27	28	19	13	13
VIC	0	0	0	24	17	10	10	12	11	10
SA	0	0	0	39	37	17	12	10	7	8
NT	32	25	23	22	14	13	11	8	8	7
Australia	61	52	42	33	27	25	21	18	15	12

TABLE 19: Severity Rate by sector 1998-99

Mine type	WA	QLD	NSW	SA	VIC	TAS	NT	AUST
O/C coal	271	103	907	23	63	0	—	355
U/G coal	—	392	1,197	—	—	0	—	929
Total coal	271	185	1,079	23	63	0	—	585
O/C metalliferous	92	109	91	54	147	87	55	93
U/G metalliferous	161	188	136	65	363	236	54	160
Total metalliferous	99	133	114	61	293	221	55	108
Extractive industries	37	133	55	79	214	376	55	113
Smelting/refining	76	267	458	122	14	101	24	135
All	97	168	691	79	119	159	46	206

TABLE 20: **Employment and hours worked by State and sector 1998-99**

State	Sector	Employees	Hours worked (inc. O/T)
Western Australia	Open-cut metalliferous	38,464	79,100,000
	Underground metalliferous	3,809	9,220,000
	Total metalliferous	42,273	88,320,000
	Open-cut coal	903	1,260,000
	Open-cut brown coal	—	—
	Total open-cut coal	903	1,260,000
	Underground coal	—	—
	Total coal	903	1,260,000
	Total mining	43,176	89,580,000
	Executive industries	346	620,000
	Smelting/refining	8,062	15,140,000
	ALL MINING	51,584	105,340,000
	Queensland	Open-cut metalliferous	6,708
Underground metalliferous		3,044	7,796,600
Total metalliferous		9,752	25,626,318
Open-cut coal		6,133	14,745,440
Open-cut brown coal		—	—
Total open-cut coal		6,133	14,745,440
Underground coal		2,428	5,846,535
Total coal		8,561	20,591,975
Total mining		18,313	46,218,293
Executive industries		1,022	2,103,277
Smelting/refining		2,877	5,931,088
ALL MINING	22,212	54,252,658	
New South Wales	Open-cut metalliferous	1,821	3,642,000
	Underground metalliferous	1,953	3,906,000
	Total metalliferous	3,774	7,548,000
	Open-cut coal	4,604	8,348,540
	Open-cut brown coal	—	—
	Total open-cut coal	4,604	8,348,540
	Underground coal	6,321	12,146,689
	Total coal	10,925	20,495,229
	Total mining	14,699	28,043,229
	Executive industries	2,282	4,564,000
	Smelting/refining	1,498	2,930,650
ALL MINING	18,479	35,537,879	
South Australia	Open-cut metalliferous	395	1,616,909
	Underground metalliferous	1,023	2,927,999
	Total metalliferous	1,418	4,544,908
	Open-cut coal	—	—
	Open-cut brown coal	200	479,928
	Total open-cut coal	200	479,928
	Underground coal	—	—
	Total coal	200	479,928
	Total mining	1,618	5,024,836
	Executive industries	858	1,434,680
	Smelting/refining	1,923	2,612,652
ALL MINING	4,399	9,072,168	

TABLE 20: **Employment and hours worked by State and sector 1998-99** (continued)

State	Sector	Employees	Hours worked (inc. O/T)
Victoria	Open-cut metalliferous	229	339,113
	Underground metalliferous	398	708,227
	Total metalliferous	627	1,047,340
	Open-cut coal	—	—
	Open-cut brown coal	1,060	2,159,547
	Total open-cut coal	1,060	2,159,547
	Underground coal	—	—
	Total coal	1,060	2,159,547
	Total mining	1,687	3,206,887
	Executive industries	1,545	2,463,257
	Smelting/refining	1,257	2,827,003
	ALL MINING	4,489	8,497,147
	Tasmania	Open-cut metalliferous	241
Underground metalliferous		1,702	3,251,643
Total metalliferous		1,943	3,631,328
Open-cut coal		18	33,517
Open-cut brown coal		—	—
Total open-cut coal		18	33,517
Underground coal		71	123,129
Total coal		89	156,646
Total mining		2,032	3,787,974
Executive industries		173	340,193
Smelting/refining		2,617	4,717,711
ALL MINING		4,822	8,845,878
Northern Territory		Open-cut metalliferous	1,540
	Underground metalliferous	1,092	2,233,325
	Total metalliferous	2,632	6,129,875
	Open-cut coal	—	—
	Open-cut brown coal	—	—
	Total open-cut coal	—	—
	Underground coal	—	—
	Total coal	—	—
	Total mining	2,632	6,129,875
	Executive industries	141	291,373
	Smelting/refining	1,100	2,794,623
	ALL MINING	3,873	9,215,871
	Australia	Open-cut metalliferous	49,398
Underground metalliferous		13,021	30,043,794
Total metalliferous		62,419	136,847,769
Open-cut coal		11,658	24,387,497
Open-cut brown coal		1,260	2,639,475
Total open-cut coal		12,918	27,026,972
Underground coal		8,820	18,116,353
Total coal		21,738	45,143,325
Total mining		84,157	181,991,094
Executive industries		6,367	11,816,780
Smelting/refining		19,334	36,953,727
ALL MINING		109,858	230,761,601

Workers' Compensation

TABLE 21: **Fatality Incidence and Frequency Rates for selected industries 1997-98**

	Number of cases	Fatality Incidence Rate	Fatality Frequency Rate
Agriculture	24	0.16	0.08
Services to agriculture (hunting and trapping)	7	0.49	0.25
Forestry and logging	7	0.57	0.28
Coal mining	2	0.08	0.04
Oil and gas extraction	0	0.00	0.00
Metal ore mining	13	0.43	0.18
Other mining	1	0.16	0.07
Services to mining	3	0.21	0.09
General construction	21	0.13	0.06
Construction trade services	24	0.11	0.05
Road transport	43	0.30	0.14
Storage	1	0.05	0.03

TABLE 22: **Incidence of new compensated cases reported: selected industries (excludes Victoria)**

	1991-92	1992-93	1993-94	1994-95	1996-97	1997-98
Manufacturing	40.8	45.0	50.3	50.7	42.75	38.96
Construction	48.0	48.4	50.7	47.5	39.06	38.86
Transport and storage	40.3	51.3	52.7	51.4	40.11	36.19
Mining	61.0	67.6	66.6	64.17	45.55	40.52

TABLE 23: **Frequency of new compensated cases reported: selected industries**

	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Manufacturing	25.1	27.7	26.0	25.9	25.5	21.86	20.05
Construction	27.6	27.3	25.7	23.5	21.9	19.33	19.10
Transport and storage	24.3	30.8	26.8	26.0	22.3	20.00	18.30
Mining	34.7	37.9	30.5	29.3	24.1	20.79	18.35

International

TABLE 24: South African Fatality and Injury Rates for All Mines 1988–1998

Gold mines	Labour	Fatalities	Injuries	FR	SIR	FIFR	SIFR
1988	527780	510	9576	0.97	18.1	0.44	8.2
1989	520023	549	8561	1.06	16.5	0.48	7.5
1990	484738	526	8195	1.09	16.9	0.49	7.7
1991	426830	461	7571	1.08	17.7	0.49	8.1
1992	362196	407	7585	1.12	20.9	0.51	9.5
1993	343147	398	7230	1.16	21.1	0.53	9.6
1994	346648	350	6743	1.01	19.5	0.46	8.8
1995	333257	401	6100	1.20	18.3	0.55	8.3
1996	317363	308	5822	0.97	18.3	0.44	8.3
1997	293995	265	5579	0.90	19.0	0.41	8.6
1998	223498	239	4543	1.07	20.3	0.49	9.2
Other mines							
1988	103631	111	1345	1.07	13.0	0.49	5.9
1989	117716	132	1175	1.12	10.0	0.51	4.5
1990	127128	99	1259	0.78	9.9	0.35	4.5
1991	169927	101	1171	0.59	6.9	0.27	3.1
1992	111944	99	857	0.88	7.7	0.40	3.5
1993	100530	58	1212	0.58	12.1	0.26	5.5
1994	101693	46	1148	0.45	11.3	0.21	5.1
1995	100598	46	943	0.46	9.4	0.21	4.3
1996	111335	52	932	0.47	8.4	0.21	3.8
1997	111755	59	783	0.53	7.0	0.24	3.2
1998	111254	45	815	0.40	7.3	0.18	3.3
Total metalliferous							
1988	631411	621	10921	0.98	17.3	0.45	7.9
1989	637739	681	9736	1.07	15.3	0.49	6.9
1990	611866	625	9454	1.02	15.5	0.46	7.0
1991	596757	562	8742	0.94	14.6	0.43	6.7
1992	474140	506	8442	1.07	17.8	0.49	8.1
1993	443677	456	8442	1.03	19.0	0.47	8.6
1994	448341	396	7891	0.88	17.6	0.40	8.0
1995	433855	447	7043	1.03	16.2	0.47	7.4
1996	428698	360	6754	0.84	15.8	0.38	7.2
1997	405750	324	6362	0.80	15.7	0.36	7.1
1998	334752	284	5358	0.85	16.0	0.39	7.3
Average						0.43	7.5
Coal mines							
1988	106803	53	435	0.50	4.1	0.23	1.9
1989	103065	54	361	0.52	3.5	0.24	1.6
1990	103304	50	404	0.48	3.9	0.22	1.8
1991	82790	42	361	0.51	4.4	0.23	2.0
1992	69489	46	359	0.66	5.2	0.30	2.3
1993	40599	25	191	0.62	4.7	0.28	2.1
1994	54251	44	202	0.81	3.7	0.37	1.7
1995	55667	25	212	0.45	3.8	0.20	1.7
1996	56770	30	256	0.53	4.5	0.24	2.0
1997	58246	33	213	0.57	3.7	0.26	1.7
1998	55218	35	218	0.63	3.9	0.29	1.8
Average						0.26	1.9
All mines							
1988	738214	674	11356	0.91	15.4	0.42	7.0
1989	740804	735	10097	0.99	13.6	0.45	6.2
1990	715170	675	9858	0.94	13.8	0.43	6.3
1991	679547	604	9103	0.89	13.4	0.40	6.1
1992	543629	552	8801	1.02	16.2	0.46	7.4
1993	484276	481	8633	0.99	17.8	0.45	8.1
1994	502592	440	8093	0.88	16.1	0.40	7.3
1995	489522	472	7255	0.96	14.8	0.44	6.7
1996	485468	390	7010	0.80	14.4	0.37	6.6
1997	463996	357	6575	0.77	14.2	0.35	6.4
1998	389970	319	5576	0.82	14.3	0.37	6.5

South African Frequency Rate is calculated based upon 2200 hours worked per employee per year.
This data does not include mines that are in the Independent States.

TABLE 25: US Injury and Fatality Data 1991–1999

Sector	Year	Fatals	NFDL	Hours	FIFR	NFDL/FR
O/C 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	10	836	62,595,302	0.16	13
Average 1991-1999					0.16	
U/G 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	4	320	13,736,076	0.29	23
Average 1991-1999					0.32	
Total minerals * Includes mill and office workers	1991	40	7,106	348,486,177	0.11	20
	1992	34	5,646	337,168,630	0.10	177
	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	48	5,255	363,107,344	0.13	14
	1998	39	4,852	354,793,004	0.11	14
	1999	16	2,419	172,767,989	0.09	14
Average 1991-1999					0.11	
Sand & gravel**	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	6	453	36,170,083	0.17	13
Average 1991-1999					0.18	
O/C coal	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	6	367	37,028,633	0.16	10
Average 1991-1999					0.12	
U/G coal	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	7	1,783	47,470,326	0.15	38
Average 1991-1999					0.24	

TABLE 25: US Injury and Fatality Data 1991–1999 (continued)

Sector	Year	Fatals	NFDL	Hours	FIFR	NFDL/FR
Total Coal	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	16	2,379	103,912,092	0.15	23
	Average 1991-1999					0.17

1999 Figures represent January to June 1999

Includes data reported for operators and contractors

* Includes sand and gravel contractor hours

** Does not include contractor hours

TABLE 26: Ontario, Canada Fatality and Injury Rates for all mines 1998–99

Sector	Year	Hours	Labour	Lost Time Injuries	Fatalities	LTIFR	FIFR
O/C minerals	1998	2,928,721	1,444	23	0	8	0.00
	1999	2,479,875	1,413	19	0	8	0.00
U/G minerals	1998	25,929,696	13,499	169	2	7	0.08
	1999	19,862,460	12,112	121	2	6	0.10
Total metalliferous	1998	28,858,417	14,943	192	2	7	0.07
	1999	22,342,335	13,525	140	2	6	0.09

* 1999 data is to 31 October 1999 only.

* Data does not include contract drillers or miners.

* O/C Minerals does not include sand and gravel.

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