SAFETY PERFORMANCE

IN THE WESTERN AUSTRALIAN MINERAL INDUSTRY

ACCIDENT AND INJURY STATISTICS 2011-2012

Government of **Western Australia**
Department of **Mines and Petroleum**
Resources Safety

Reference

The recommended reference for this publication is: Department of Mines and Petroleum, 2013, Safety performance in the Western Australian mineral industry — accident and injury statistics 2011-12: Resources Safety, Department of Mines and Petroleum, Western Australia, 46 pp.

ISBN 978 1 922149 13 8

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY

Statistics generated from Resources Safety's Safety Regulation System (SRS) for the fiscal year 2011-12 show a continued levelling out of injury performance indicators for the Western Australian mining industry.

An average of 94,012 workers in the mining industry in 2011-12 (an increase of 15%) worked a total of 186.23 million hours.

Two mining industry workers lost their lives during the year, one less than the previous year.

The lost time injury frequency rate (LTIFR) for serious injuries in 2011-12 fell to 2.0, which is an improvement of 5%. However, the number of lost time injuries (LTIs) reported in recent years has become so small that the value of the LTIFR as an indicator of safety performance is

questionable, and recorded improvements in the rate are more marginal.

It is sometimes alleged that LTIs are "managed" to provide favourable accident reporting data. However, disabling injuries (restricted work injuries) are generally not amenable to such manipulation and are more numerous than LTIs. Disabling injury statistics have been collected since the beginning of fiscal 2001-02, with a view to establishing a more effective safety performance indicator than the current LTI-based system. There has been expanded coverage of disabling injury statistics in the annual compilation since 2006-07.

In 2011-12 there were 857 disabling injuries (DIs) recorded, an increase of 39 on the 2010-11 figure of 818. The disabling injury incidence and frequency rates fell to 9.1 and 4.6 respectively from their 2010-11 values of 10.0 and 5.2.

Annual compilations up to and including 2007-08 did not report injury statistics for exploration activities away from mine sites or on exploration leases. However, following the 2008 amendment of the *Mines Safety and Inspection Act 1994* to clarify provisions dealing with the duties of exploration managers, the compilations now include injury statistics for the exploration sector.

The average exploration workforce in 2011-12 was 3,651. There were 43 LTIs, three less than for the previous year. The overall exploration LTIFR was 5.4.

For some years there has been a plateau in most injury performance indicators, and the mineral industry has struggled to maintain an acceptable rate of improvement. Only a significant change in approach is going to provide the mechanisms to achieve the next step change in performance. Traditionally, strategies have been technically oriented, focusing on equipment and systems.

As part of the Reform and Development at Resources Safety (RADARS) strategy, approved in September 2009, the State Government committed to supporting positive cultural change in the mineral industry to improve outcomes, with a focus on collaboration and participation in the delivery of safety and health programs.

Resources Safety continues to regulate the mining industry using compliance and enforcement functions such as statutory inspections, investigations and high impact function audits, but there is also an important role in providing education, training support and information to industry. During the year, safety meetings, presentations to mine site workers, and briefings to industry safety and health representatives complemented these regulatory activities.

Resources Safety continues to participate in and assist with development of the National Mine Safety Framework, an initiative of the Ministerial Council on Mineral and Petroleum Resources to achieve a national consistent occupational health and safety regime for the Australian mining industry. The division is also monitoring the national occupational health and safety harmonisation process overseen by Safe Work Australia.

STATISTICAL SUMMARY

MINING

- There were two fatal accidents during 2011-12 — one on the surface at an iron ore mine and one at the port facilities of an iron ore operation.
- There were 457 LTIs during 2011-12, 40 more than the previous year (417 injuries in 2010-11). Table 5 and Appendix A show a breakdown of the number of injuries by commodity mined.
- There was an average workforce of 94,012 workers in 2011-12, an increase of approximately 15% over the previous year's average of 81953. Table 5 and Appendix A show a breakdown of the number of workers by commodity mined.
- The overall LTI duration rate deteriorated by 5% during 2011-12, rising from 21.6 to 22.7.
- The overall LTI frequency rate improved by 7% during 2011-12, falling from 2.7 to 2.5.
- The overall injury index improved slightly, by less than 2%, falling from 57 in 2010-11 to 56 in 2011-12.
- Serious LTIs in the mining industry during 2011-12 totalled 370, 37 more than for 2010-11.
- The overall serious LTIFR improved by 5% during 2011-12, falling from 2.1 to 2.0.
- The iron ore sector LTIFR improved by 8% during 2011-12, falling from 1.3 to 1.2.
- The bauxite and alumina sector LTIFR deteriorated by 4% during 2011-12, rising from 2.8 to 2.9.
- The gold sector LTIFR improved by 17% during 2011-12, falling from 3.6 to 3.0
- The nickel sector LTIFR improved by 28% during 2011-12, falling from 3.2 to 2.3.
- There were 857 DIs during 2011-12, 39 more than the previous year (818 DIs reported in 2010-11). Table 11 shows the breakdown of the number of injuries by commodity mined.
- The overall DI frequency rate improved by 12%, falling from 5.2 to 4.6.

EXPLORATION

- There were no exploration fatalities in 2011-12.
- There were 43 LTIs during 2011-12, three less than the previous year.
- There was an average workforce of 3,651 workers, an increase of 9% over the previous year's average.
- The overall LTIFR improved by 19% during 2011-12, falling from 6.7 to 5.4.
- There were 53 exploration disabling injuries reported during 2011-12, resulting in a DI frequency rate of 6.7, an increase of 24%.

EXPLANATORY NOTES

Introduction

The statistics published in this annual compilation mainly relate to accidents between 1 July 2011 and 30 June 2012 (2011-12) involving time lost from work of one day or more (lost time injuries) on mines in Western Australia. The day on which the accident occurred is not counted as a day lost. The total number of working days lost through injury in 2011-12 has three components:

i) Initial injuries — days lost in 2011-12 from injuries that occurred in 2011-12

ii) Recurrent injuries — days lost in 2011-12 through recurrences of injuries that occurred in 2011-12 and previous years

iii) Carry-over injuries — days lost in 2011-12 by persons continuously off work from injuries that occurred before 1 July 2011.

Scope

Injuries to all company and contractor employees who worked at mining operations are included in these statistics. The definition of "mining operation" is stated in section 4 of the *Mines Safety and Inspection Act 1994* and includes mining company treatment plants, port facilities and railways.

Mineral exploration is not covered by this report, apart from Tables 4, 8 and 10, and Appendix N.

Disabling injuries are only covered in the "Disabling injuries" section and Appendices L and M.

Injuries that occurred in journey accidents not on mine sites (i.e. travelling to or from work) have not been included in calculations of incidence, frequency or duration rates.

Fatal accidents

Work days lost have not been allocated to fatal accidents, nor have fatalities been included in injury incidence, frequency or duration rate calculations except in Tables 8 and 9, which are in accordance with Australian Standard AS 1885.1:1990 *Measurement of occupational health and safety performance – Describing and reporting occupational injuries and diesease* (known as the National Standard for Workplace Injury and Disease Recording). This Standard treats fatalities as lost time injuries with a penalty of 220 work days lost for each.

Collection of information

Accident and injury details are reported monthly to Resources Safety by mine managers and exploration managers, as are the number of persons employed (including contractor employees) and hours worked during the month.

During the twelve months covered in this compilation, an average of 328 mines or groups of mines and 239 exploration companies reported to SRS.

Some of the terms most commonly used to describe the accident type in incident reports are listed in Appendix O.

Charts

For clarity, most bar charts in this publication are restricted to 15 or fewer categories.

The term "other" is used for a grouping of accident types that individually contain a smaller proportion of injuries than the smallest individual type shown on the chart (typically less than 2%).

DEFINITIONS

LOST TIME INJURY (LTI)

Work injury that results in an absence from work for at least one full day or shift any time after the day or shift on which the injury occurred

SERIOUS INJURY

Work injury that results in the injured person being disabled for a period of two weeks or more

DAYS LOST

Rostered days absent from work due to work injury

MINOR INJURY

Work injury that results in the injured person being disabled for a period of less than two weeks

DISABLING INJURY (DI)

Work injury (not LTI) that results in the injured person being unable to fully perform his or her ordinary occupation (regular job) any time after the day or shift on which the injury occurred, regardless of whether or not the person is rostered to work, and where alternative or light duties are performed or hours are restricted

INCIDENCE RATE

Number of lost time injuries per 1,000 employees for a 12 month period

FATAL INJURY INCIDENCE RATE

Number of fatal injuries per 1,000 employees for a 12 month period

LOST TIME INJURY FREQUENCY RATE (LTIFR)

Number of lost time injuries per million hours worked

SERIOUS INJURY FREQUENCY RATE

Number of serious injuries per million hours worked

DISABLING INJURY FREQUENCY RATE

Number of disabling injuries per million hours worked

DURATION RATE

Average number of workdays lost per injury

INJURY INDEX

Number of workdays lost per million hours worked

METALLIFEROUS MINES

All mines other than coal mines are classed as metalliferous mines

DAYS OFF

Total calendar days, whether rostered or not, absent from work or on alternative duties, restricted duties or restricted hours due to work injury

EXPLORATION

Exploration activities not under the control of a Registered Mine Manager; usually associated with exploration leases

ABBREVIATIONS

C/BY BETWEEN	caught by or between moving or stationary objects or both
C/BY MACHINE	caught by or between operating machine
CHEM/FUMES	chemicals or fumes
COMP	compressed
C/W	contact with
DETON	detonation
DI	disabling injury
ENV	environment
EXP	exposure
FR	frequency rate
HI PRESS FLUID	high pressure fluid
JOLT/JAR	jolting or jarring
LTI	lost time injury
LTIFR	lost time injury frequency rate
NOC	not otherwise classified
ON/OFF	on or off
PRESS	pressure
OVER/STREN MOV	over-exertion or strenuous movements
S/AGAINST	struck against
S/BY	struck by
SLIP/TRIP	slip or trip
U/G	underground
U/G ACCESS/HAUL	underground access, travelling or haulage ways
U/G PROD/DEV	underground production or development areas
VEH/MOB	vehicle or mobile equipment

FATAL ACCIDENTS

Fatal accidents during 2011-12

There were two fatal accidents in the Western Australian mineral industry during 2011-12, one at a mine site and the other at a mining port facility.

- A fitter, working with others to change out the hydraulic bucket tilt cylinder on a front-end loader, received fatal head injuries when the cylinder, which was being supported by chains from an overhead gantry crane, dropped suddenly onto the loader boom as the fitter was working beneath it.
- A conveyor services contractor employee, standing on a belt winder platform, was fatally injured when a 40 tonne mobile crane, which was lowering a loaded belt reel onto the winder, toppled onto its side and crushed the worker between the crane boom and the belt winder platform.

Fatal injury incidence rate by mineral mined 2007-08 to 2011-12

Table 1 lists fatal injury incidence rates by mineral mined for the past five years, as well as the grouped information for all surface and underground mines.

The underground fatal injury incidence rate over that period is 2.5 times higher than the fatal injury incidence rate for surface operations.

TABLE 1 FATAL INJURY INCIDENCE RATE BY MINERAL MINED 2007-08 TO 2011-12

Category		Fatalities per thousand employees
Mineral	Gold	0.05
	Nickel	0.04
	Iron ore	0.07
	Bauxite and alumina	0.02
Underground		0.10
Surface		0.04
Exploration		0.07

FATAL ACCIDENTS CONTINUED

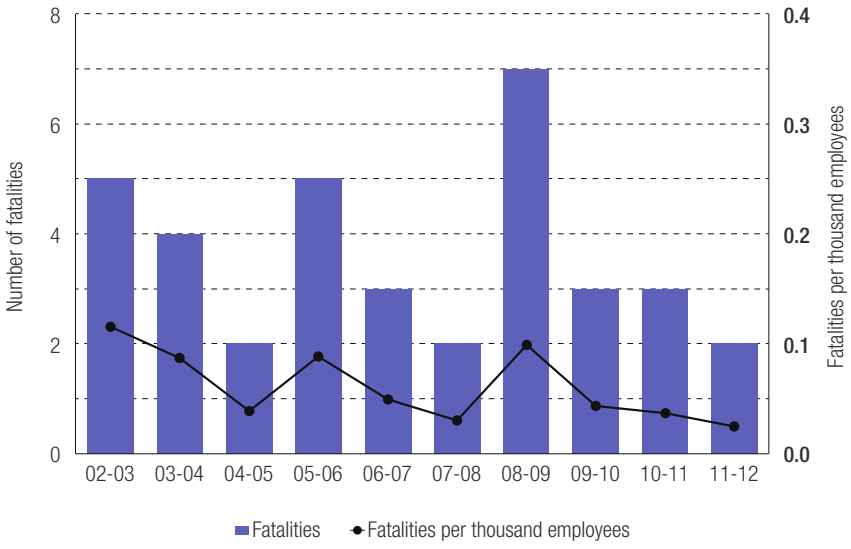
Fatal injury incidence rate 2002-03 to 2011-12

The fatal injury incidence rate for 2011-12 was 0.021, 43% lower than the previous year.

Although the overall trend continues to decline, as shown in Figure 1, there is a year-by-year scatter of the incidence rate because of the low number of occurrences.

Resources Safety maintains the view that no fatal accident is acceptable, and a fatal injury incidence rate of zero is achievable and sustainable.

FIGURE 1 FATAL INJURY INCIDENCE RATE 2002-03 TO 2011-12



Fatal accidents by type of accident 2007-08 to 2011-12

Table 2 indicates the type of accidents for the 18 fatalities in the mining industry (including exploration) over the past five years, with four underground, 13 at surface operations and one in exploration.

The two types of underground fatal accident which occurred during the past five years were fall from height and vehicle or mobile equipment driving over the edge (two fatalities each).

The most common types of surface fatal accident in the past five years were fall from height and struck by object (four fatalities each).

The exploration fatality was due to exposure to environmental heat.

TABLE 2 NUMBER OF FATALITIES BY TYPE OF ACCIDENT 2007-08 TO 2011-12

Category		Number of fatalities
Underground	Fall from height	2
	Veh/mob over edge	2
Surface	Fall from height	4
	S/by object	4
	S/by veh/mob	2
	Veh/mob collision	2
	S/by between	1
Exploration	Exposure to env heat	1
Total		**18**

SERIOUS INJURIES

Review of serious injuries during 2011-12

There were 370 serious injuries reported in the mining industry during 2011-12 (333 in 2010-11). Of these, 354 were in metalliferous mines and 16 were in coal mines.

Typical serious lost time injuries are described below:

A driller fractured his forearm when he slipped and fell about 4 metres to the ground from the lowered mast of a drill rig. He was attempting to kick free a drill rod that had become stuck while being loaded into the drill rig carousel.

A 7.5 metre long 1.5 tonne roll of poly liner being loaded by an integrated tool carrier (ITC) rolled off a table-top truck and struck a truck driver on the knee, fracturing his leg.

Sheets of steel concrete-reinforcing mesh, which had been stacked against the wall of an underground magazine under construction, fell while being moved and trapped two underground miners. Both workers sustained a fractured pelvis. A third worker was also struck by the toppling mesh and sustained a broken leg.

A worker's foot was fractured when the bucket of a skid steer loader, which he was changing, fell after he released a holding pin.

A diamond drill operator walking underground jarred his lower back when he lost his footing on loose rocks and tried to avoid a fall.

A fitter received burns to his ankle while repairing the rod carriage of a drill rig in the pit. He was cutting metal using an oxy-acetylene torch when a piece of hot metal dropped into the back of his boot.

A trade's assistant received soft tissue damage to his lower back when he attempted to remove an item from a shelf above head height. The item was heavier than expected and he twisted awkwardly while attempting to support its weight.

A worker suffered lacerations and bruising to his hip, shoulder and ear when he fell through the rear door of a light vehicle ("troop carrier") after it swung open as the vehicle was travelling up an incline on a site road.

A fitter strained his lower back when the truck in which he was a passenger ran over the spoil pushed up by a grader. He jarred against the seat belt and felt immediate pain.

A fixed plant maintenance worker conducting roller checks on a plant conveyor noticed a roller that was not turning. He tapped it with a hammer then reached in with his hand to turn the roller. The roller began moving and his hand and forearm were pulled between the roller and belt, resulting in crush injuries to his wrist.

A truck driver washing the rear lights of his truck slipped on uneven ground and sprained his ankle while pulling the water hose. During hospital treatment, his lower leg was found to be fractured.

A trainee dump truck operator sustained lower back injuries when an excavator struck the tray of her truck, causing her seat to bottom out. The excavator had slipped halfway down the bench rill during loading.

A geologist checking a pit face was struck on the head and knocked to the ground by a large rock that had dislodged from the face. The rock hit his hard hat then grazed the side of his face before trapping his index finger. His finger was deeply lacerated,with an open wound to the bone.

While working in a ladderway, a worker was struck on the lower leg by a dislodged stone, resulting in a laceration. Although the wound was small, it subsequently became infected and required surgery and skin grafts.

SERIOUS INJURIES CONTINUED

While working from a work basket attached to an ITC in a pump cuddy, a contract worker handling a length of poly pipe slipped and fell to the floor of the cage. He apparently slipped on a scaling bar lying on the basket floor and fell with his leg folded under him, fracturing his ankle.

A worker strained a shoulder tendon when a tyre he was rolling from the tyre rack to a trailer began to overbalance and he tried to prevent it falling.

A rigger received crush injuries to his arm when it became trapped between a hopper nozzle and the motor of a pump that was being removed using a crane. The pump had been unbolted from the base and the rigger had mounted the base plinth to attach a sling on the pump to the crane hook. His arm was trapped when the pump moved off the base plate.

While attempting to remove a ground-engaging tooth (GET) from the bucket of a front-end loader, an apprentice fitter struck the tooth with a hardened hammer. A metal fragment struck him on the knee, penetrating his clothing and skin, and lodging behind his kneecap. The metal fragment required surgical removal.

A truck driver exited his truck at shift change and was standing at the entrance to a shed trying to attract the attention of a loader operator. His foot was fractured and lacerated when run over by the trailer of a truck entering the shed.

A worker rolled his ankle while walking on uneven ground in a pit, resulting in a partial tear of a tibiotalar ligament. The injury appeared minor at first but his condition gradually deteriorated and a subsequent MRI scan revealed the extent of the injury.

A jumbo drill operator sustained a soft tissue injury to his neck when his head struck the jumbo's roof as he drove over a rock in some water. He had earlier lowered the roof of the jumbo to avoid hitting vent bags.

Serious injury incidence rate by mineral mined 2007-08 to 2011-12

Figure 2 is a chart of incidence rates for serious injuries for the past five years. The top of the chart shows the serious injury incidence rates for surface and underground operations. The lower part shows serious injury incidence rates by mineral mined.

The chart shows that the serious injury incidence rate for underground mining (6.4) was 49% higher than that for surface operations (4.3).

Of the major mining sectors, coal had the highest five-year average serious injury incidence rate (11.1), followed by base metals at 9.5, whereas iron ore and salt had the lowest (each 2.7). The mining sector referred to as "other", with a five-year average serious injury incidence rate of 7.8, contained 3% of the total number of workers spread over 17 commodity groups.

Serious injury frequency rate 2007-08 to 2011-12

Figure 3 shows that the serious injury frequency rate improved for surface and underground metalliferous operations, but deteriorated significantly for the coal sector, resulting in a 5% improvement overall during 2011-12.

FIGURE 2 SERIOUS INJURY INCIDENCE RATE 2007-08 TO 2011-12

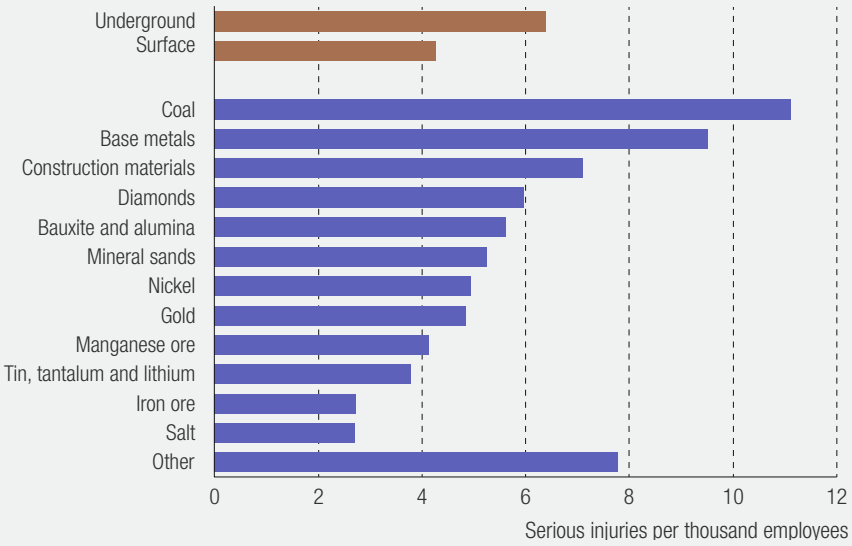
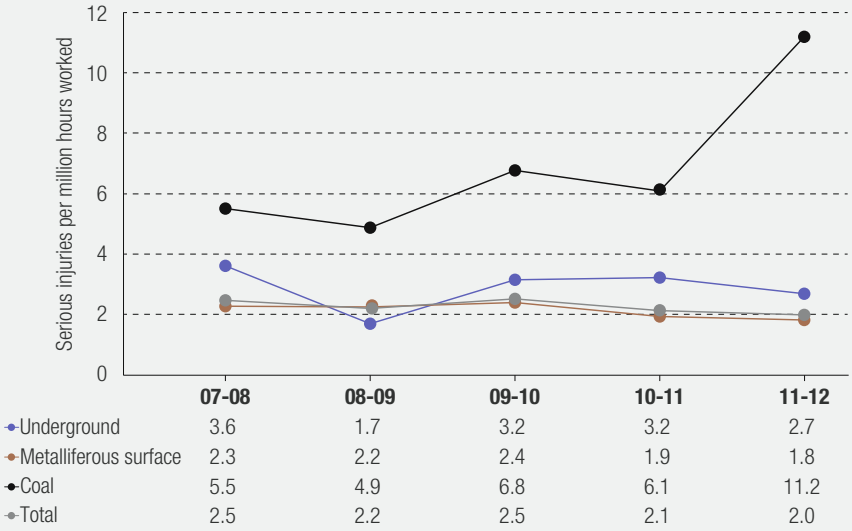


FIGURE 3 SERIOUS INJURY FREQUENCY RATE 2007-08 TO 2011-12



	07-08	08-09	09-10	10-11	11-12
Underground	3.6	1.7	3.2	3.2	2.7
Metalliferous surface	2.3	2.2	2.4	1.9	1.8
Coal	5.5	4.9	6.8	6.1	11.2
Total	2.5	2.2	2.5	2.1	2.0

Serious injury percentage breakdown for 2011-12

Appendices B and C provide a percentage breakdown of the number of serious injuries by part of body, nature of injury, location of accident, and type of accident for underground and surface operations, respectively.

Underground

- Injuries to legs accounted for the largest proportion of serious injuries at 27%, followed by arm injuries at 18% then back injuries and hand injuries, both at 11%. Of the serious leg injuries, 47% were to knees and 33% were to ankles. Of the serious arm injuries, 60% were to shoulders.
- Consistent with the high proportion of knee, ankle, shoulder and back injuries, sprain or strain represented the highest proportion by nature of injury (41%), followed by crushing at 14%, then fracture and laceration, both at 11%.
- The largest proportion of serious injuries underground was in production and development areas (66%), followed by access and haulage ways at 14%.
- The most common accident type associated with serious injuries underground was over-exertion or strenuous movements at 23%, followed by slip or trip at 16%, then struck by object and stepping, both at 12.5%.

Surface

- Injuries to legs accounted for the largest proportion of serious injuries at 33%, followed by arm and back injuries, both at 18%, and then hand injuries at 15%. Of the serious arm injuries, 52% were to shoulders while 20% were to wrists. Injuries to knees and to ankles accounted for 41% and 27% of serious leg injuries respectively.
- Consistent with the high proportion of knee, ankle, back and shoulder injuries, sprain or strain represented the highest proportion by nature of injury (53%). Fracture was the next highest (22%), followed by crushing at 5%.
- The largest proportion of serious injuries on the surface occurred in treatment plants (30%), followed by open pits at 26% then surface general at 17%.
- The most common accident types associated with serious injuries on the surface were over-exertion or strenuous movements (28%) then stepping and slip or trip (each 13%).

LOST TIME INJURIES

Review of lost time injuries during 2011-12

In 2011-12, 20,447 days were lost through occupational injuries on mines in Western Australia. This figure is made up of the number of days lost from injuries occurring in 2011-12 (10,377), recurrences of injuries sustained before 2011-12 and in 2011-12 (1,363), and LTIs and recurrences carried over into 2011-12 from accidents before July 2011 (9,564). A breakdown of work days lost in coal and metalliferous mining is given in Table 3.

During 2011-12, there were 457 LTIs in the State's mining industry. Of those, 421 were in metalliferous mines and 36 in coal mines. A breakdown of these data with performance indicators is given in Tables 4 and 5.

In addition to the initial injuries, there were 45 recurrences of previous injuries, resulting in 1,363 work days lost during 2011-12. A breakdown of recurrent injuries by calendar year of initial injury is given in Table 6.

One hundred and twenty-five people who were still off work from injuries received before July 2011 lost 9,564 work days in 2011-12. A breakdown of these carry-over injuries is given in Table 7.

TABLE 3 TIME LOST THROUGH INJURY DURING 2011-12

Mines	Initial injuries	Recurrent injuries	Carry-over injuries	Total
	Days lost			
Metalliferous	9,692	1,282	8,953	19,392
Coal	685	81	611	1,055
Total mining	**10,377**	**1,363**	**9,564**	**20,447**

TABLE 4 INITIAL LOST TIME INJURIES DURING 2011-12

Sector	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Metalliferous surface	83,265	355	4.3	2.2	23.5	51	8,352
Metalliferous underground	10,158	66	6.5	3.2	20.3	64	1,340
Metalliferous total	**93,423**	**421**	**4.5**	**2.3**	**23.0**	**52**	**9,692**
Coal total	**589**	**36**	**61.1**	**25.2**	**19.0**	**479**	**685**
Total mining	**94,012**	**457**	**4.9**	**2.5**	**22.7**	**56**	**10,377**
Exploration total	**3,651**	**43**	**11.8**	**5.4**	**16.1**	**88**	**694**

TABLE 5 INJURIES BY MINERAL MINED DURING 2011-12

Mineral mined	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Iron ore	38,306	93	2.4	1.2	27.9	33	2,594
Gold	22,343	124	5.5	3.0	24.8	74	3,073
Bauxite and alumina	10,145	61	6.0	2.9	17.7	51	1,078
Nickel	8,705	41	4.7	2.3	23.6	55	968
Base metals	2,908	15	5.2	2.9	36.7	105	550
Diamonds	2,248	27	12.0	5.7	17.0	97	458
Mineral sands	2,194	9	4.1	2.4	26.4	63	238
Salt	1,097	1	0.9	0.6	5.0	3	5
Construction materials	9,34	14	15.0	8.1	16.3	132	228
Manganese ore	799	2	2.5	1.3	56.0	73	112
Tin, tantalum and lithium	650	4	6.2	2.5	21.3	53	85
Coal	589	36	61.1	25.1	19.0	478	685
Other	3,094	30	9.7	6.3	10.1	64	303
Total mining	**94,012**	**457**	**4.9**	**2.5**	**22.7**	**56**	**10,377**

Note: Duration in Tables 4 and 5 does not take into consideration time lost after 30 June 2012 by persons still off work at the end of the fiscal year, time lost from recurrent injuries, or time lost by persons with carry-over injuries from before July 2011.

TABLE 6 RECURRENT INJURIES DURING 2011-12

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2012*	5	89			5	89
2011	24	674	1	10	25	684
2010	7	405			7	405
2009			1	65	1	65
2008	3	89			3	89
2007	2	17	1	6	3	23
2006	1	8			1	8
Total	**42**	**1,282**	**3**	**81**	**45**	**1,363**

Note: Apart from the information shown in Tables 3, 6 and 7, analysis of recurrent and carry-over injuries has not been presented in this publication.

** Covers period from 1 January to 30 June 2012*

LOST TIME INJURIES CONTINUED

TABLE 7 CARRY-OVER INJURIES DURING 2011-12

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2011*	70	4,337	5	390	75	4,727
2010	33	2,854	2	221	35	3,075
2009	9	909			9	909
2008	4	444			4	444
2006	1	252			1	252
2005	1	157			1	157
Total	**118**	**8,953**	**7**	**611**	**125**	**9,564**

** Covers period from 1 January to 30 June 2011*

Review of lost time injuries during 2011-12 in accordance with Australian Standard AS 1885.1

The National Standard for Workplace Injury and Disease Recording is designed to be used by individual workplaces. Tables 8 and 9 provide statistical information in accordance with AS 1885.1:1990.

There are two major differences between reporting for AS 1885.1:1990 and Resources Safety's SRS database.

The Australian Standard treats fatalities as LTIs with a penalty of 220 workdays lost for each, whereas fatalities are reported separately from other injury data in the SRS database.

The incidence rate reported in accordance with the Australian Standard definition is injuries per hundred employees, rather than injuries per thousand employees.

TABLE 8 INITIAL LOST TIME INJURIES DURING 2011-12 (AS 1885.1:1990)

Sector	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Metalliferous surface	83,265	357	0.43	2.2	24.6	8792
Metalliferous underground	10,158	66	0.65	3.2	20.3	1340
Metalliferous total	**93,423**	**423**	**0.45**	**2.3**	**24.0**	**10132**
Coal total	**589**	**36**	**6.11**	**25.2**	**19.0**	**685**
Total mining	**94,012**	**459**	**0.49**	**2.5**	**23.6**	**10,817**
Exploration total	**3,651**	**43**	**1.18**	**5.4**	**16.1**	**694**

Note: Duration in Tables 8 and 9 does not take into consideration time lost after 30 June 2012 by persons still off work at the end of the fiscal year, time lost from recurrent injuries, or time lost by persons with carry-over injuries from before July 2011.

TABLE 9 INJURIES BY MINERAL MINED DURING 2011-12 (AS 1885.1:1990)

Mineral mined	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Iron ore	38,306	95	0.25	1.2	31.9	3,034
Gold	22,343	124	0.55	3.0	24.8	3,073
Bauxite and alumina	10,145	61	0.60	2.9	17.7	1,078
Nickel	8,705	41	0.47	2.3	23.6	968
Base metals	2,908	15	0.52	2.9	36.7	550
Diamonds	2,248	27	1.20	5.7	17.0	458
Mineral sands	2,194	9	0.41	2.4	26.4	238
Salt	1,097	1	0.09	0.6	5.0	5
Construction materials	934	14	1.50	8.1	16.3	228
Manganese ore	799	2	0.25	1.3	56.0	112
Tin, tantalum and lithium	650	4	0.62	2.5	21.3	85
Coal	589	36	6.11	25.1	19.0	685
Other	3,094	30	0.97	6.3	10.1	303
Total mining	**94,012**	**459**	**0.49**	**2.5**	**23.6**	**10,817**

WORKERS' COMPENSATION

Premium rates for the Western Australian mineral industry

The workers' compensation recommended premium rates determined by the Premium Rates Committee are published in a dedicated Western Australian Government Gazette, and are effective from 30 June in the year of issue.

Figure 4 indicates trends in workers' compensation costs for selected mineral groups for the ten-year period 2003-2004 to 2012-13.

Over this period, the coal mining compensation rate decreased, by 17%, to 2.11% of payroll. The compensation rate for surface gold operations decreased, by 62%, to 1.13% of payroll, and that for iron ore operations decreased, by 30%, to 0.70% of payroll. The rate for underground gold operations increased, by 18%, to 4.65% of payroll.

Figure 5 shows premium rates recommended in 2011-12 for the following year for a variety of mineral groups and other industries. Although premium rates in isolation are not necessarily reliable indicators of risk, they do represent a cost to industry and, in part, reflect past safety performance.

The average premium rate recommended in 2011-12 for the Western Australian mining industry for 2012-13 was 1.94% of payroll, a 9% increase on the rate recommended in 2010-11 for 2011-12 (1.78% of payroll).

In 2011-12, apart from underground gold mining, premium rates recommended for mining industry groups compared favourably with other industry groups such as structural steel fabrication and sheet metal product manufacturing, which had premium rates of 3.22% and 3.21% of payroll, respectively.

FIGURE 4 MINE WORKERS' COMPENSATION RATE TRENDS 2003-04 TO 2011-12

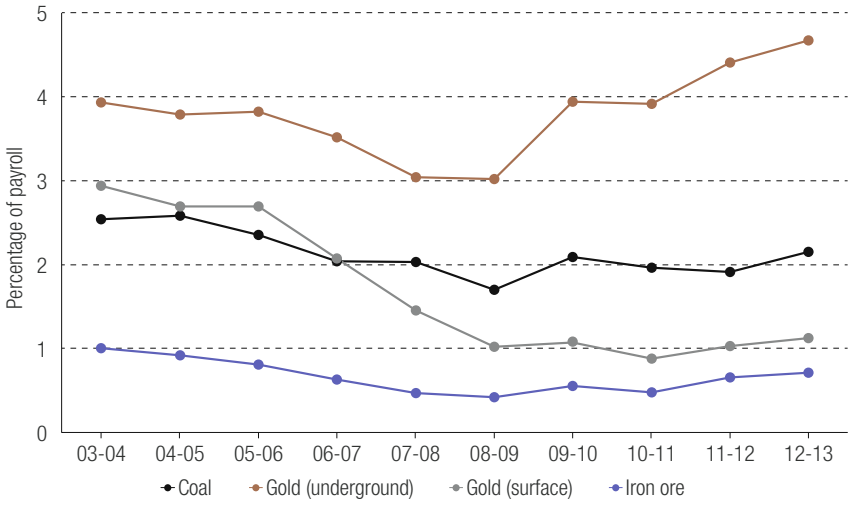
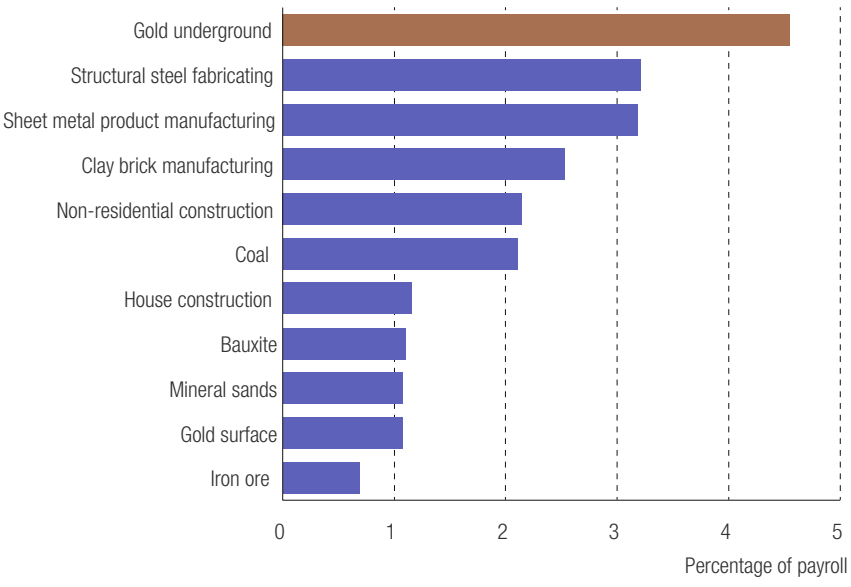


FIGURE 5 RECOMMENDED PREMIUM RATES 2012-13



INJURIES BY COMMODITIES

Metalliferous performance indicators

The performance indicators for the metalliferous mining sector show mixed results for 2011-12. Figures 6 to 9 depict the performance indicators of incidence, frequency, duration rates and injury index (see page 3 for definitions).

Performance indicator trends for metalliferous mining in 2011-12 are summarised below.

- The overall incidence rate improved by 8%, falling from 4.9 to 4.5. The surface incidence rate improved by 7% (from 4.6 to 4.3) and the underground incidence rate improved by 21% (from 8.2 to 6.5).
- The overall frequency rate improved by 12%, falling from 2.6 to 2.3. The surface frequency rate improved by 13% (from 2.4 to 2.1) and the underground frequency rate improved by 18% (from 3.9 to 3.2).
- The overall duration rate deteriorated by 6%, rising from 21.7 to 23.0. The surface duration rate deteriorated by 7% (from 22.0 to 23.5) whereas the underground duration rate improved slightly, by 1% (from 20 5 to 20.3).
- The fall in frequency rate was greater than the rise in duration rate, resulting in an overall improvement of 7% to the injury index (from 56 to 52). The surface injury index improved by 4% (from 53 to 51), while the underground injury index improved by 19% (from 79 to 64).

Metalliferous injury percentage breakdown for 2011-12

Appendices D and E provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident for underground and surface operations, respectively.

Injuries by part of body

- Underground: Leg injuries, at 24%, accounted for the largest proportion of underground injuries. Arm injuries, at 17%, accounted for the next largest proportion, followed by back injuries at 15%. Shoulder injuries accounted for 55% of arm injuries, while injuries to knees and ankles contributed 50% and 31% of leg injuries respectively.
- Surface: Leg injuries, at 32%, accounted for the largest proportion of surface injuries, followed by back injuries, arm injuries and hand injuries, at 17%, 16% and 15% respectively. Of the surface leg injuries, 26% were to ankles, and 40% were to knees.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 39%, followed by crushing and laceration, both at 12%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 48%, followed by fracture at 19% and laceration at 6%.

Injuries by location

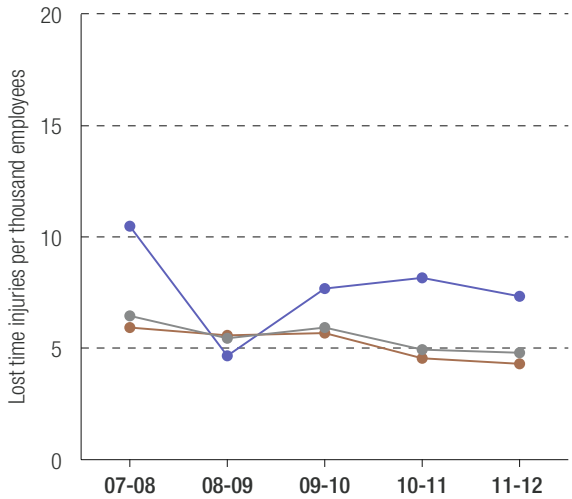
- Underground: The largest proportion of underground injuries occurred in production and development areas (67%), followed by access and haulage ways at 14%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (31%) followed by open pits at 22% then general surface areas at 16%.

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 26%, followed by slip or trip at 15%, then struck by object, at 14%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 27%, followed equally by stepping and slip or trip, both at 12%.

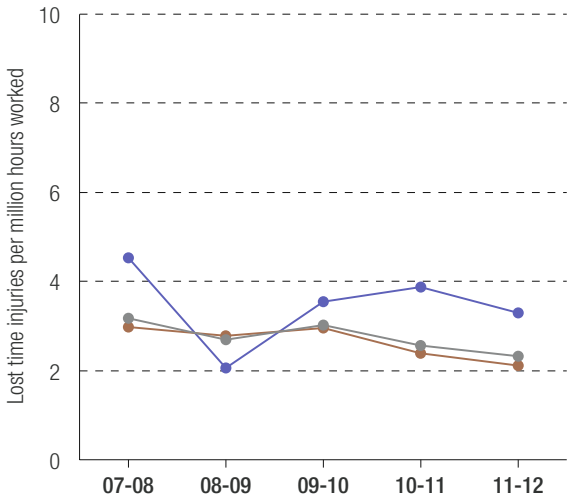
Metalliferous performance indicators 2007-08 to 2011-12

FIGURE 6 INCIDENCE RATE



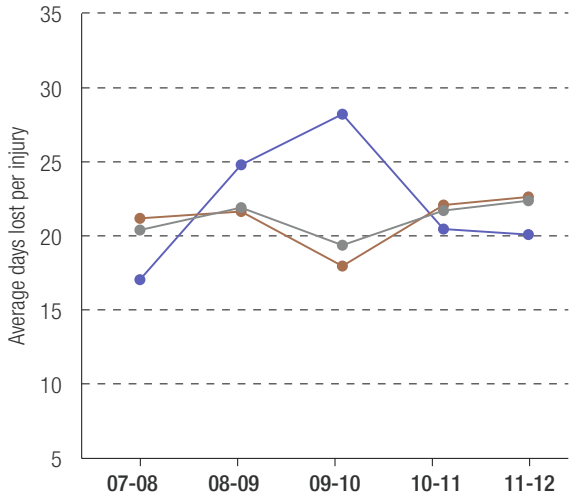
	07-08	08-09	09-10	10-11	11-12
Underground	10.5	4.6	7.7	8.2	6.5
Surface	5.9	5.6	5.7	4.6	4.3
Total	6.5	5.5	5.9	4.9	4.5

FIGURE 7 FREQUENCY RATE



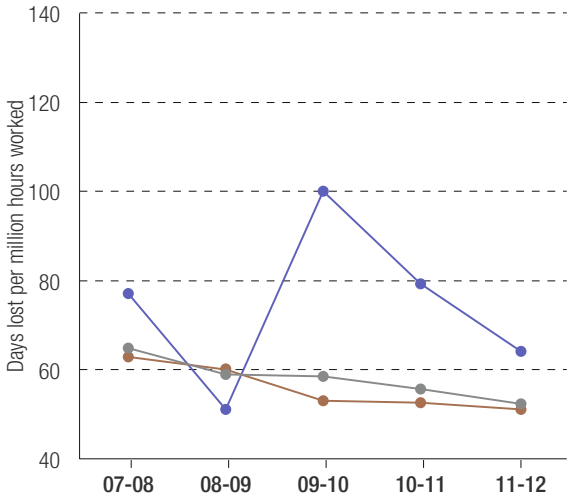
	07-08	08-09	09-10	10-11	11-12
Underground	4.5	2.1	3.5	3.9	3.2
Surface	3.0	2.8	2.9	2.4	2.1
Total	3.2	2.7	3.0	2.6	2.3

FIGURE 8 DURATION RATE



	07-08	08-09	09-10	10-11	11-12
Underground	17.0	24.8	28.2	20.5	20.3
Surface	21.2	21.6	18.0	22.0	23.5
Total	20.4	21.9	19.4	21.7	23.0

FIGURE 9 INJURY INDEX



	07-08	08-09	09-10	10-11	11-12
Underground	77	51	100	79	64
Surface	63	60	53	53	51
Total	65	59	58	56	52

INJURIES BY COMMODITIES CONTINUED

Gold performance indicators

The performance indicators for the gold sector improved during 2011-12. Figures 10 to 13 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Performance indicator trends for the gold sector in 2011-12 are summarised below.

- The overall incidence rate improved by 18%, falling from 6.7 to 5.5. The surface incidence rate improved slightly, by 5% (from 6.1 to 5.8), while the underground incidence rate improved by 39% (from 8.2 to 5.0).
- The overall frequency rate improved by 17%, falling from 3.6 to 3.0. The surface frequency rate improved by 6% (from 3.4 to 3.2) and the underground frequency rate improved significantly by 38% (from 4.0 to 2.5).
- The overall duration rate improved slightly by 2%, falling from 25.4 to 24.8. The surface duration rate remained almost unchanged, falling from 25.6 to 25.5, whereas the underground duration rate improved by 8% (from 24.8 to 22.7).
- Falls in both frequency and duration rate resulting in a 19% overall improvement in the injury index, falling from 91 to 74. The surface injury index improved by 8% (from 88 to 81), while the underground injury index improved significantly by 41% (from 98 to 58).

Gold injury percentage breakdown for 2011-12

Appendices F and G provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident and type of accident for the underground and surface sectors, respectively.

Injuries by part of body

- Underground: Hand injuries, at 19%, accounted for the largest proportion of underground injuries, followed by arm, back and leg injuries, each of which accounted for 16% of injuries.
- Surface: Leg injuries made up the largest proportion of injuries underground at 33%, followed by back injuries at 18% then arm and hand injuries, each accounting for 14%. Of the leg injuries 47% were to knees. Of the arm injuries, 54% were to shoulders.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 38%, followed by crushing at 19% and laceration at 13%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 51%, followed by fracture at 22%.

Injuries by location

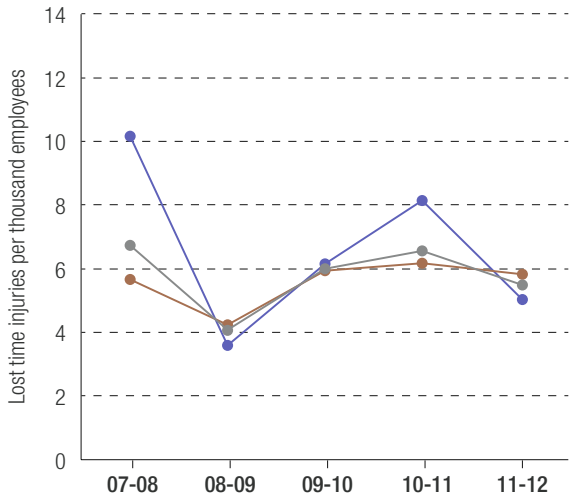
- Underground: The largest proportion of underground injuries occurred in production and development (78%) followed by access and haulage ways at 13% then underground storage at 9%.
- Surface: The largest proportion of surface injuries occurred in open pits (30%), followed by treatment plant at 28% and then general surface areas at 18%.

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 25%, followed by struck by object at 22% and then caught by or between objects and slip or trip, at 12.5% each.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 22%, followed by stepping at 15%, then struck by object and slip or trip, each at 9%.

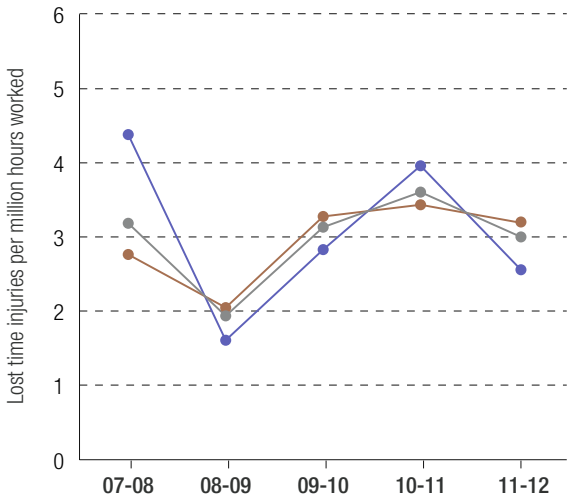
Gold performance indicators 2007-08 to 2011-12

FIGURE 10 INCIDENCE RATE



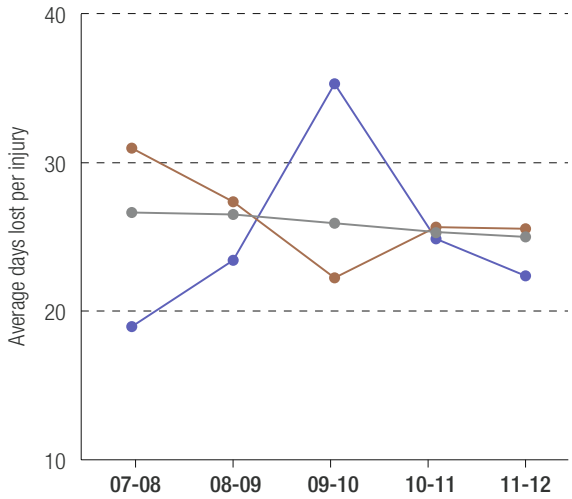
	07-08	08-09	09-10	10-11	11-12
Underground	10.2	3.6	6.2	8.2	5.0
Surface	5.7	4.3	6.0	6.1	5.8
Total	6.8	4.1	6.0	6.7	5.5

FIGURE 11 FREQUENCY RATE



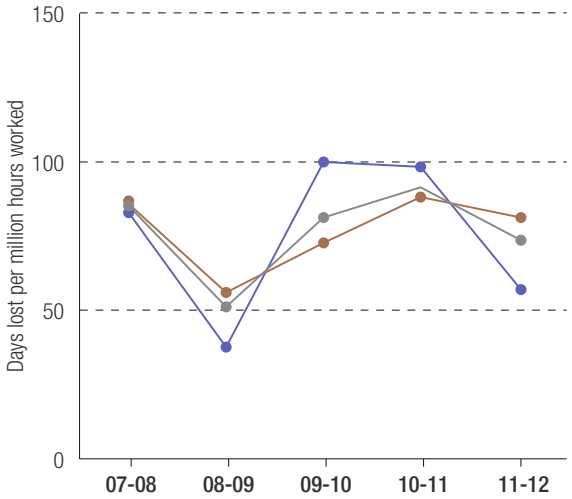
	07-08	08-09	09-10	10-11	11-12
Underground	4.4	1.6	2.8	4.0	2.5
Surface	2.8	2.0	3.3	3.4	3.2
Total	3.2	1.9	3.1	3.6	3.0

FIGURE 12 DURATION RATE



	07-08	08-09	09-10	10-11	11-12
Underground	18.9	23.4	35.3	24.8	22.7
Surface	31.0	27.3	22.2	25.6	25.5
Total	26.7	26.5	25.9	25.4	24.8

FIGURE 13 INJURY INDEX



	07-08	08-09	09-10	10-11	11-12
Underground	83	38	100	98	58
Surface	86	56	73	88	81
Total	85	51	81	91	74

INJURIES BY COMMODITIES CONTINUED

Iron ore performance indicators

The performance indicators for the iron ore sector showed mixed results during 2011-12. Figures 14 to 17 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Performance indicator trends for the iron ore sector in 2011-12 are summarised below.

- The incidence rate improved by 8%, falling from 2.6 to 2.4.
- The frequency rate improved by 8%, falling from 1.3 to 1.2.
- The duration rate deteriorated by 23%, rising from 22.6 to 27.9.
- The rise in the duration rate was greater than the fall in the frequency rate, resulting in a deterioration of 10% in the injury index (from 30 to 33).

Iron ore injury percentage breakdown for 2011-12

Appendix H provides a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident.

Injuries by part of body

- Leg injuries, at 30%, accounted for the largest proportion of injuries, followed by back injuries at 20%, hand injuries at 17% and arm injuries at 15%.
- Of the leg injuries, 36% were to knees and 21% were to ankles.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 47%.
- Fracture was the second highest ranking nature of injury at 25%, followed by crushing at 9%.

Injuries by location

- The largest proportion of injuries occurred in open pits, which accounted for 31%.
- The second largest proportion occurred in workshops at 20%, followed by general surface areas at 17%.

Injuries by type of accident

- Over-exertion or strenuous movement was the most common type of accident resulting in injury at 25%.
- Struck by object, slip or trip, and stepping accounted for 15%, 14% and 13% of injuries respectively.

Iron ore performance indicators 2007-08 to 2011-12

FIGURE 14 INCIDENCE RATE

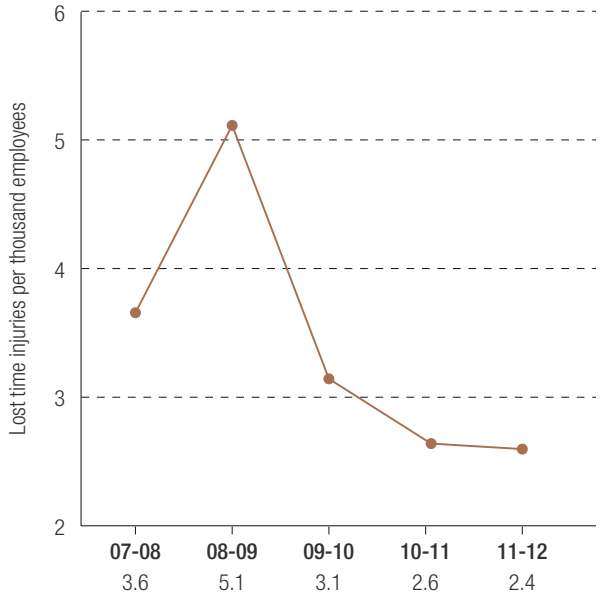


FIGURE 15 FREQUENCY RATE

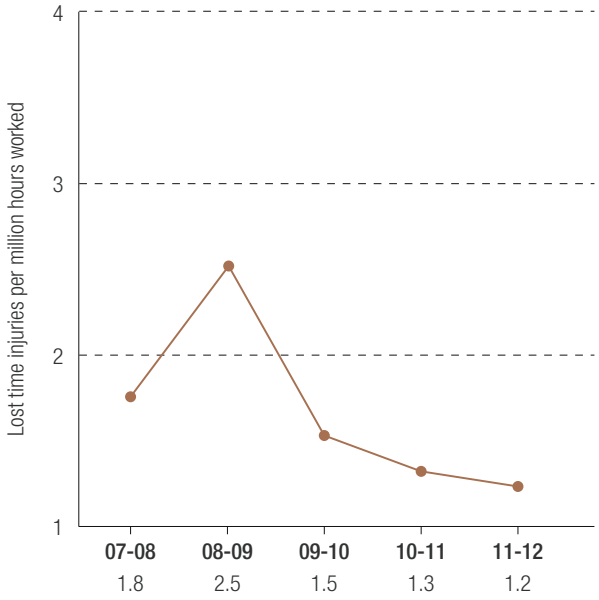


FIGURE 16 DURATION RATE

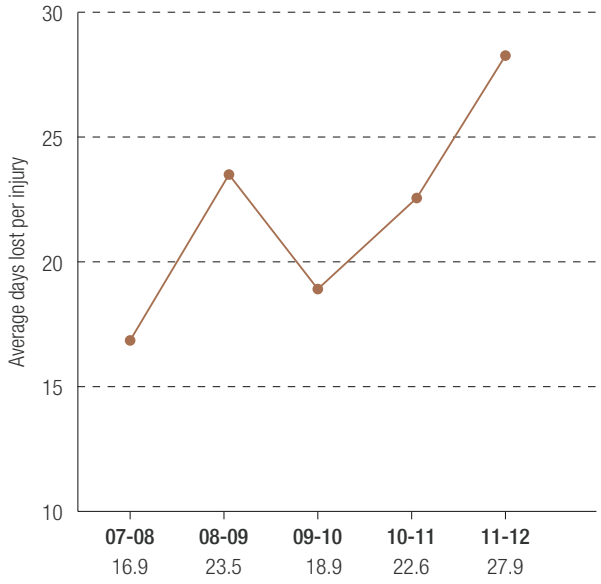
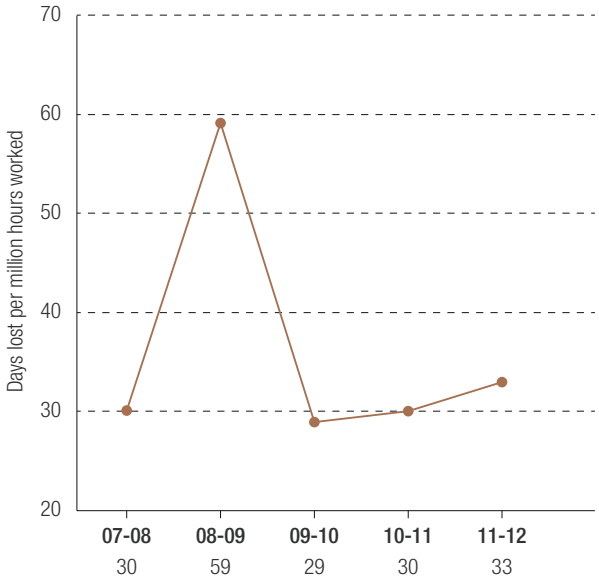


FIGURE 17 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Bauxite and alumina performance indicators

The performance indicators for the bauxite and alumina sector deteriorated in 2011-12. Figures 18 to 21 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Performance indicator trends for the bauxite and alumina sector in 2011-12 are summarised below.

- The incidence rate deteriorated by 5%, rising from 5.7 to 6.0.
- The frequency rate deteriorated slightly by 4%, rising from 2.8 to 2.9.
- The duration rate deteriorated significantly, rising by 39% from 12.7 to 17.7.
- The rise in both frequency rate and duration rate resulted in a significant deterioration of 46% for the injury index (from 35 to 51).

Bauxite and alumina injury percentage breakdown for 2011-12

Appendix I provides a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident.

Injuries by part of body

- Leg injuries accounted for the largest proportion of injuries at 31%. Of the leg injuries, 47% were to knees and 16% were to ankles.
- Arm injuries and back injuries, each at 20%, accounted for the next largest proportion of injuries.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 57%.
- Bruise or contusion was the second highest ranking nature of injury at 13%, followed by fracture at 8%.

Injuries by location

- The largest proportion of injuries occurred in treatment plants, which accounted for 51%.
- The second largest proportion occurred in workshops, at 20%, followed by general surface areas at 16%.

Injuries by type of accident

- Over-exertion or strenuous movements was the most common type of accident resulting in injury at 41%.
- Slip or trip was the second most common type, at15%, followed by stepping at 10%.

Bauxite and alumina performance indicators 2007-08 to 2011-12

FIGURE 18 INCIDENCE RATE

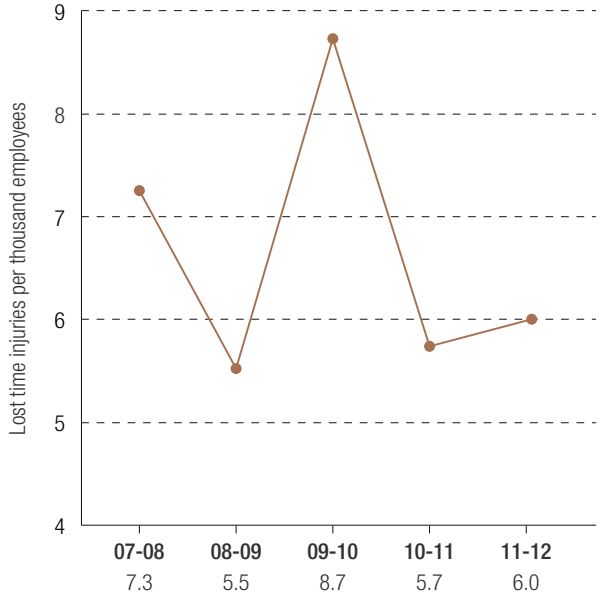


FIGURE 19 FREQUENCY RATE

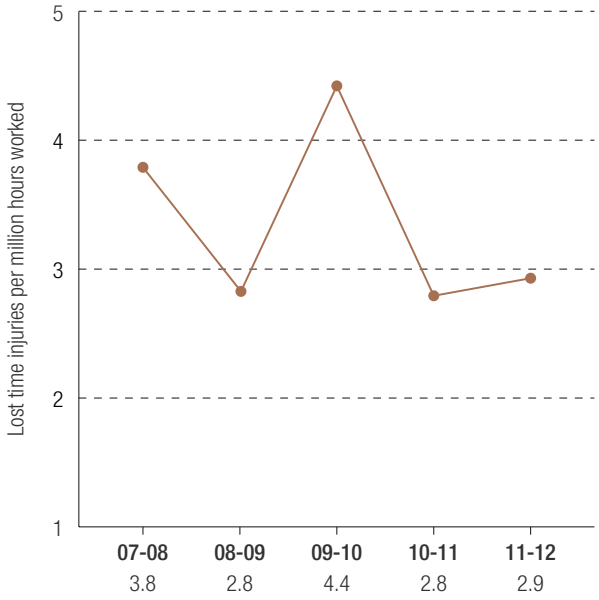


FIGURE 20 DURATION RATE

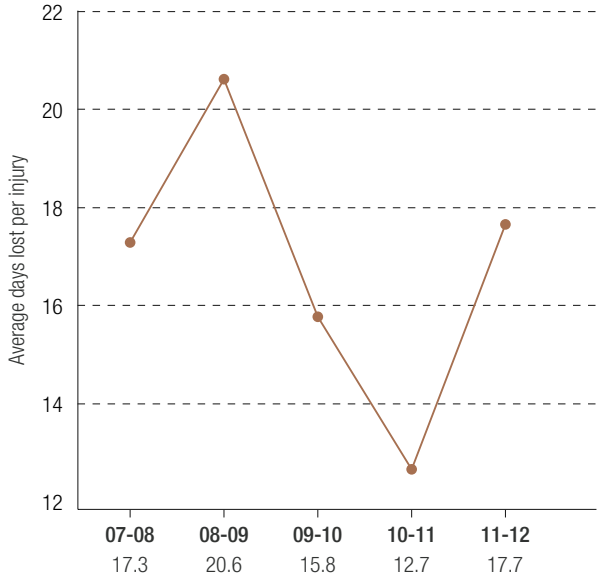
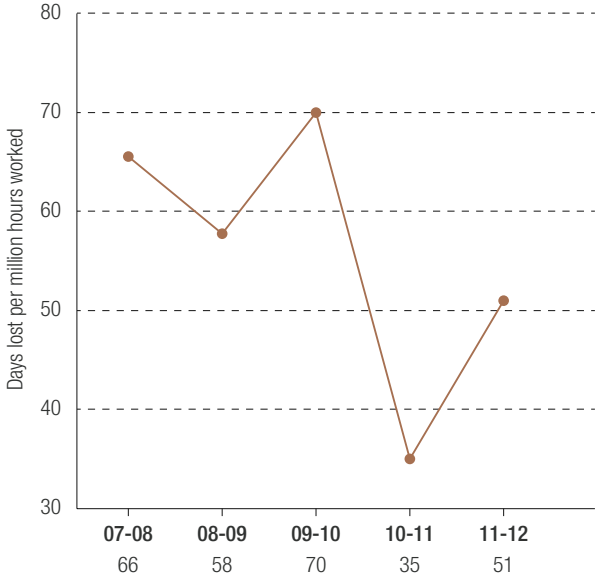


FIGURE 21 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Nickel performance indicators

The performance indicators for the nickel sector showed improvement for 2011-12. Figures 22 to 25 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Performance indicator trends for the nickel sector in 2011-12 are summarised below

- The overall incidence rate improved by 27%, falling from 6.4 to 4.7. The surface incidence rate improved by 35% (from 5.7 to 3.7) and the underground incidence rate improved by 4% (from 9.1 to 8.7).
- The overall frequency rate improved by 28% falling from 3.2 to 2.3. The surface frequency rate improved by 37% (from 3.0 to 1.9) and the underground frequency rate improved by 8% (from 4.0 to 3.7).
- The overall duration rate improved by 17%, falling from 28.5 to 23.6. The surface duration rate improved by 12% (from 34.2 to 30.2) and the underground duration rate improved by 19% (from 14.9 to 12.1).
- The fall in both duration rate and frequency rate resulted in an improvement of 41% in the injury index (from 93 to 55). The surface injury index improved by 44% (from 103 to 58) and the underground injury index improved by 24% (from 59 to 45).

Nickel injury percentage breakdown for 2011-12

Appendices J and K provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident, and type of accident for the underground and surface sectors, respectively.

Injuries by part of body

- Underground: Leg injuries accounted for the largest proportion of underground injuries at 27%, followed by arm injuries, at 20%. Of the underground arm injuries, 67% were to shoulders.
- Surface: Leg injuries, at 35%, accounted for the largest proportion of surface injuries, followed by arm injuries at 23% and hand injuries at 19%. Of the leg injuries, knees and ankles each accounted for 33% of injuries.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 53%. The remaining injuries were distributed evenly over 7 different categories.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 42%, followed by fracture at 19%.

Injuries by location

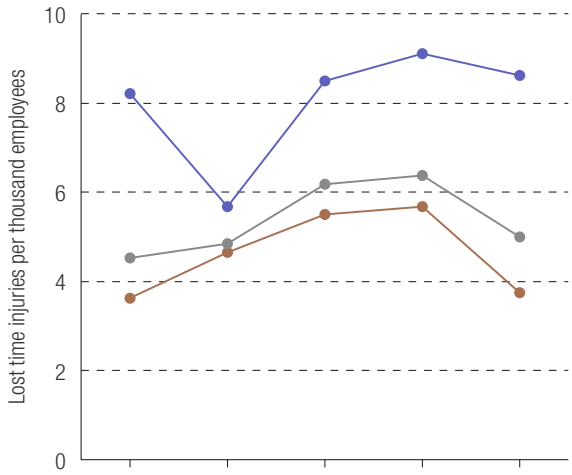
- Underground: The largest proportion of underground injuries occurred in production and development areas (73%), followed by access and haulage ways, and underground workshops, both at 13%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (50%), followed by administration areas at 19% and then open pit and general surface areas, both at 12%.

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 33%, followed by slip or trip and rockfall, both at 20%.
- Surface: The most common accident type for surface injuries was slip or trip at 23%, followed by over-exertion or strenuous movements at 19%, then caught by or between objects at 15% and stepping at 12%.

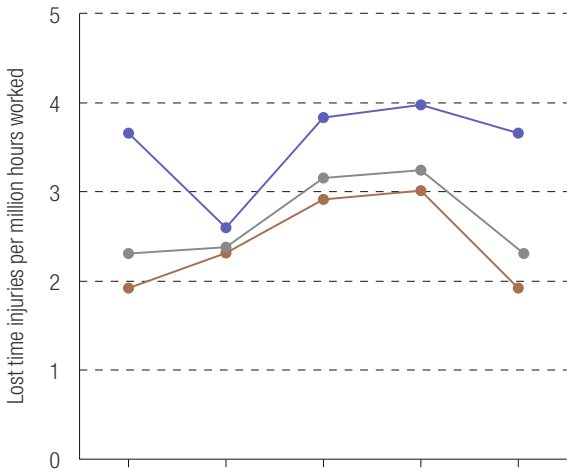
Nickel performance indicators 2007-08 to 2011-12

FIGURE 22 INCIDENCE RATE



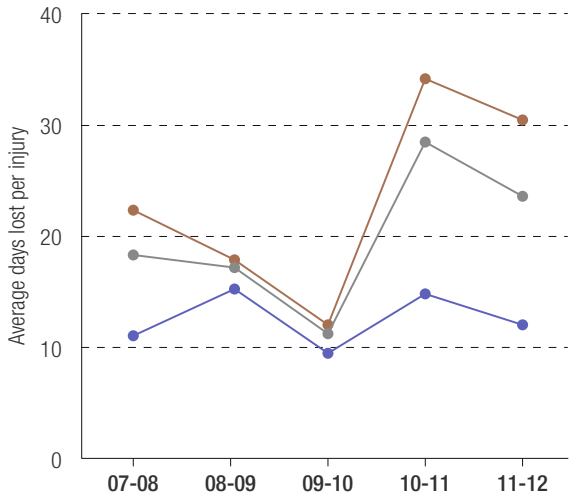
	07-08	08-09	09-10	10-11	11-12
Underground	8.2	5.7	8.5	9.1	8.7
Surface	3.6	4.6	5.5	5.7	3.7
Total	4.5	4.9	6.2	6.4	4.7

FIGURE 23 FREQUENCY RATE



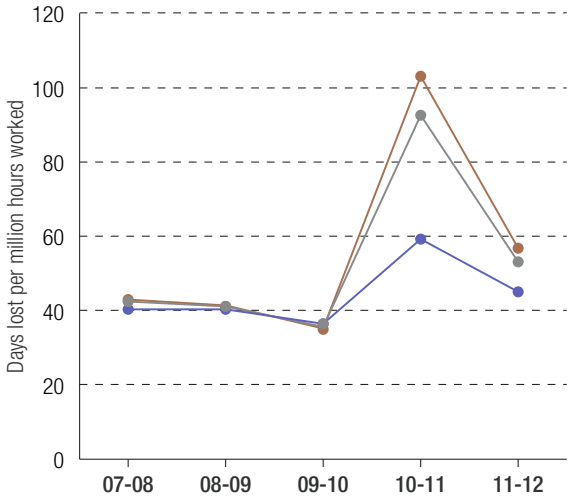
	07-08	08-09	09-10	10-11	11-12
Underground	3.7	2.6	3.8	4.0	3.7
Surface	1.9	2.3	2.9	3.0	1.9
Total	2.3	2.4	3.2	3.2	2.3

FIGURE 24 DURATION RATE



	07-08	08-09	09-10	10-11	11-12
Underground	11.0	15.3	9.5	14.9	12.1
Surface	22.4	17.9	12.1	34.2	30.2
Total	18.4	17.2	11.3	28.5	23.6

FIGURE 25 INJURY INDEX



	07-08	08-09	09-10	10-11	11-12
Underground	40	40	36	59	45
Surface	43	41	35	103	58
Total	42	41	36	93	55

DISABLING INJURIES

Review of disabling injuries during 2011-12

In addition to the 457 mining LTIs in 2011-12, there were 857 disabling injuries (DIs) reported (840 in metalliferous mines and 17 in coal mines), bringing the total number of reportable injuries to 1,314. A breakdown of these data with performance indicators is shown in Tables 10 and 11.

Of the disabling injuries, 560 resulted in the injured person being disabled for two weeks or more.

Note: Disabling injury includes circumstances where the injured person:

- *is placed in a different occupation or job, whether on full or restricted work hours*
- *remains in his or her normal occupation or job, but is not able to perform the full range of work duties*
- *remains in his or her normal occupation or job, but on restricted hours.*

TABLE 10 DISABLING INJURIES 2011-12

Sector	No. of employees	Disabling injuries			Reportable injuries (DIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Metalliferous surface	83,265	637	7.7	3.9	992	11.9	6.1
Metalliferous underground	10,158	203	20.0	9.7	269	26.5	12.9
Metalliferous total	**93,423**	**840**	**9.0**	**4.5**	**1261**	**13.5**	**6.8**
Coal total	**589**	**17**	**28.9**	**11.9**	**53**	**90.0**	**37.1**
Total mining	**94,012**	**857**	**9.1**	**4.6**	**1314**	**14.0**	**7.1**
Exploration total	**3,651**	**53**	**14.5**	**6.7**	**96**	**26.3**	**12.1**

TABLE 11 DISABLING INJURIES BY MINERAL MINED 2011-12

Mineral mined	No. of employees	Disabling injuries			Reportable injuries (DIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Iron ore	38,306	256	6.7	3.2	349	9.1	4.4
Gold	22,343	248	11.1	6.0	372	16.6	8.9
Bauxite and alumina	10,145	104	10.3	4.9	165	16.3	7.8
Nickel	8,705	134	15.4	7.6	175	20.1	9.9
Base metals	2,908	6	2.1	1.1	21	7.2	4.0
Diamonds	2,248	43	19.1	9.1	70	31.1	14.8
Mineral sands	2,194	17	7.7	4.5	26	11.9	6.9
Salt	1,097	1	0.9	0.6	2	1.8	1.2
Construction materials	934	2	2.1	1.2	16	17.1	9.3
Manganese ore	799	2	2.5	1.3	4	5.0	2.6
Tin, tantalum and lithium	650	1	1.5	0.6	5	7.7	3.1
Coal	589	17	28.9	11.9	53	90.0	37.0
Other	3,094	26	8.4	5.5	56	18.1	11.7
Total mining	**94,012**	**857**	**9.1**	**4.6**	**1314**	**14.0**	**7.1**

DISABLING INJURIES CONTINUED

Disabling injury performance indicators

The disabling injury performance indicators for the mining sector deteriorated slightly during 2011-12. Figures 26 to 29 depict the performance indicators of incidence rate, frequency rate, days off per injury and days off per million hours worked.

- The overall incidence rate improved by 9%, falling from 10.0 to 9.1. The surface incidence rate improved by 10% (from 8.7 to 7.8), and the underground incidence rate improved by 4% (from 20.9 to 20.0).
- The overall frequency rate improved by 12%, falling from 5.2 to 4.6. The surface frequency rate improved by 13%, falling from 4.6 to 4.0, while the underground frequency rate improved slightly, by 2%, falling from 9.9 to 9.7.
- The average days off per disabling injury deteriorated by 13%, rising from 37.8 to 42.9. The days off per surface disabling injury deteriorated by 12% (from 41.0 to 46.0), and the days off per underground disabling injury deteriorated by 24% (from 26.5 to 32.8).
- The fall in frequency rate was slightly less than the rise in days off per disabling injury, resulting in a slight deterioration of 1% to the overall days off per million hours worked, up from 196 to 197. The days off per surface million hours worked improved by 3% (from 188 to 182), although the days off per underground million hours worked deteriorated by 21% (from 263 to 318).

Disabling injury percentage breakdown for 2011-12

Appendices L and M provide a percentage breakdown of the number of injuries for part of body, nature of injury, location of accident and type of accident for the underground and surface sectors, respectively.

Injuries by part of body

- Underground:Arm injuries accounted for the largest proportion of underground injuries, at 25%, followed closely by leg injuries at 22%, then hand injuries at 19%. Of the arm injuries, 51% were to shoulders. Of the leg injuries 49% were to ankles.
- Surface: Arm injuries accounted for the largest proportion of surface disabling injuries at 26%, followed by hand injuries at 22%, back injuries at 21% and leg injuries at 19%. Of the arm injuries, 51% were to shoulders. Of the leg injuries, 43% were to knees.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground disabling injuries at 58%, followed by laceration at 8% and bruise or contusion at 7%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface disabling injuries at 61%, followed by laceration at 10% and fracture at 8%.

Injuries by location

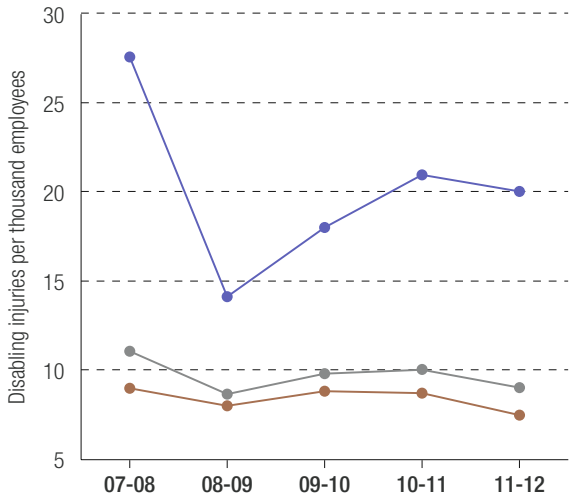
- Underground: The largest proportion of underground injuries occurred in production and development areas (61%), followed by access and haulage ways at 21% then workshops at 5%.
- Surface: The largest proportion of surface injuries occurred in open pits followed closely by treatment plants, at 27% and 26% respectively. Injuries in workshops accounted for a further 16% of injuries, followed by general surface areas at 13%.

Injuries by type

- Underground: Over-exertion or strenuous movements at 33% was the most common accident type for underground injuries, followed by stepping at 14%, slip or trip at 9% and caught by or between objects at 8%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 37%, then slip or trip and stepping, both at 11%, followed by caught by or between moving objects, at 10%.

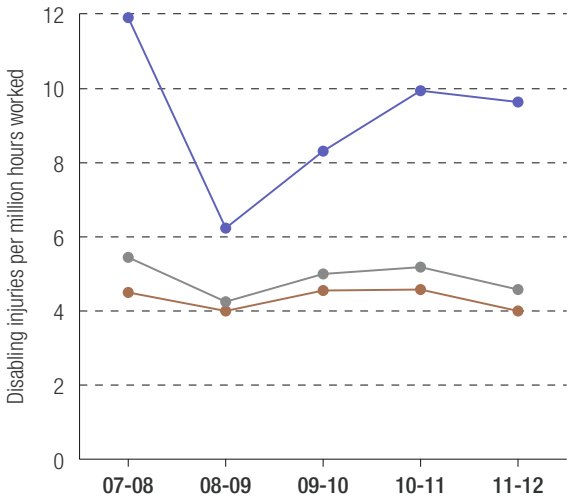
Disabling injury performance indicators 2007-08 to 2011-12

FIGURE 26 INCIDENCE RATE



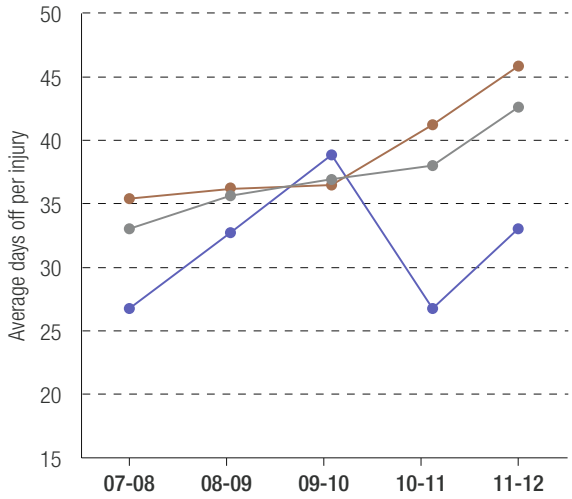
	07-08	08-09	09-10	10-11	11-12
Underground	27.6	14.1	18.0	20.9	20.0
Surface	9.0	8.0	8.8	8.7	7.8
Total	11.0	8.6	9.8	10.0	9.1

FIGURE 27 FREQUENCY RATE



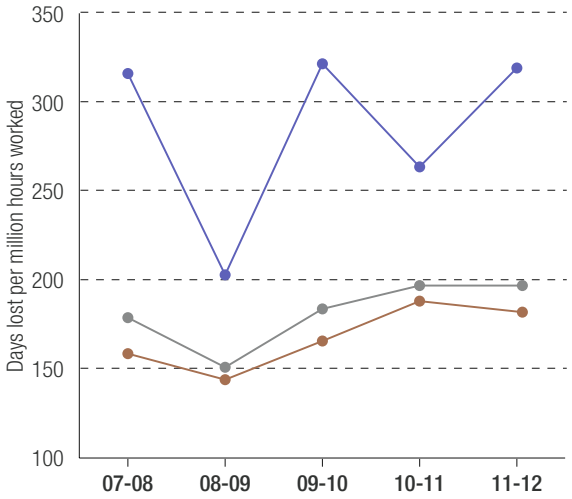
	07-08	08-09	09-10	10-11	11-12
Underground	11.9	6.2	8.3	9.9	9.7
Surface	4.5	4.0	4.6	4.6	4.0
Total	5.5	4.3	5.0	5.2	4.6

FIGURE 28 AVERAGE DAYS OFF PER INJURY



	07-08	08-09	09-10	10-11	11-12
Underground	26.5	32.5	38.6	26.5	32.8
Surface	35.2	36.0	36.2	41.0	46.0
Total	32.8	35.4	36.7	37.8	42.9

FIGURE 29 DAYS OFF PER MILLION HOURS WORKED



	07-08	08-09	09-10	10-11	11-12
Underground	316	203	321	263	318
Surface	158	144	165	188	182
Total	179	150	183	196	197

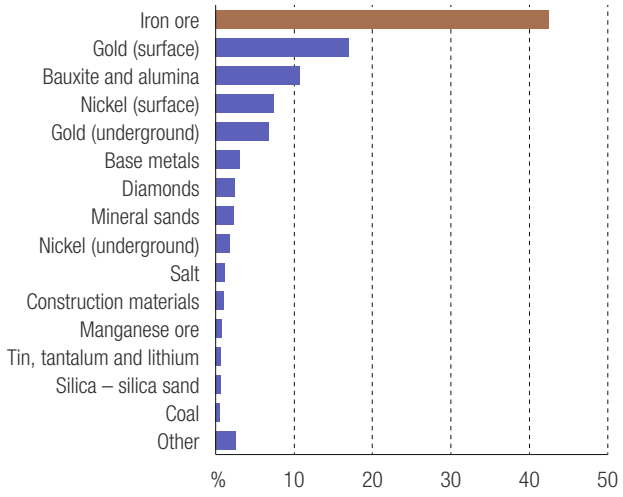
APPENDICES

APPENDIX A

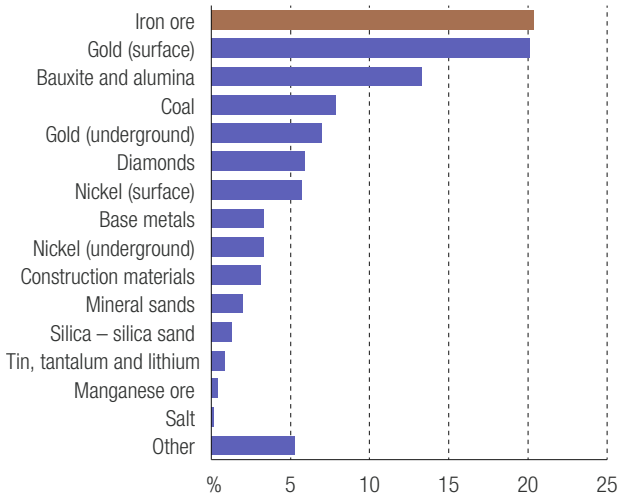
WESTERN AUSTRALIAN MINES 2011-12

457 lost time injuries

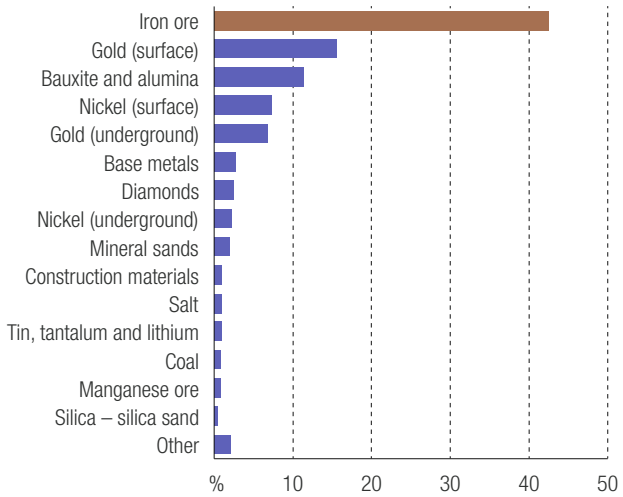
PERCENTAGE OF EMPLOYEES



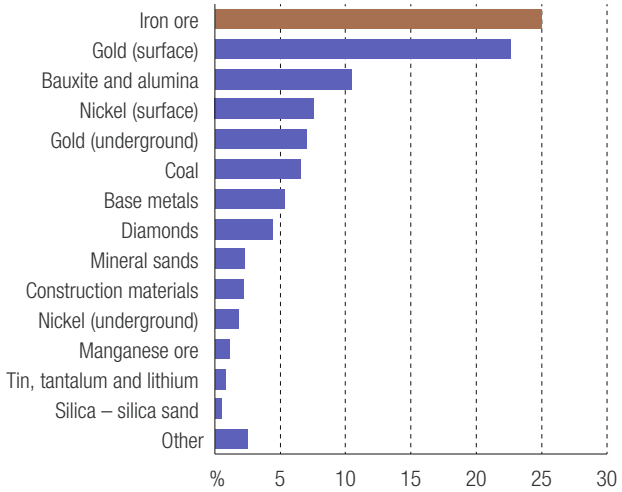
PERCENTAGE OF INJURIES



PERCENTAGE OF MILLION HOURS WORKED



PERCENTAGE OF WORK DAYS LOST

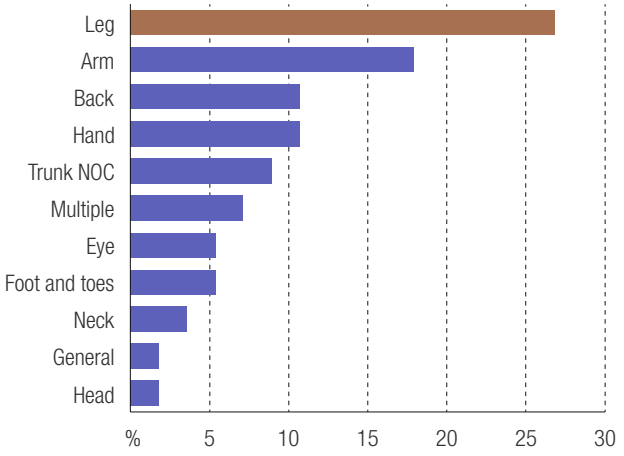


APPENDIX B

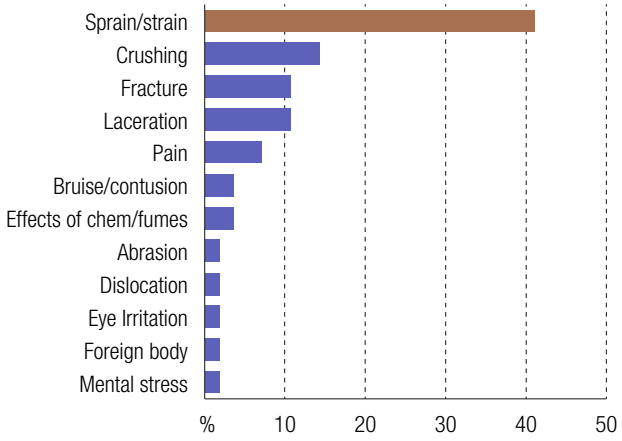
SERIOUS INJURIES UNDERGROUND 2011-12

56 lost time injuries

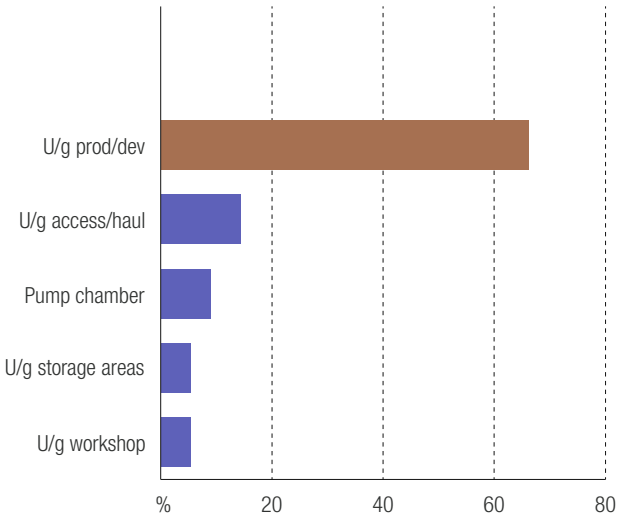
PART OF BODY



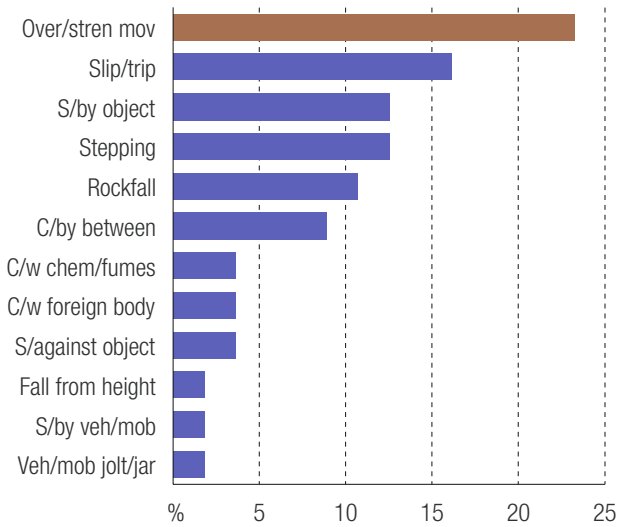
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

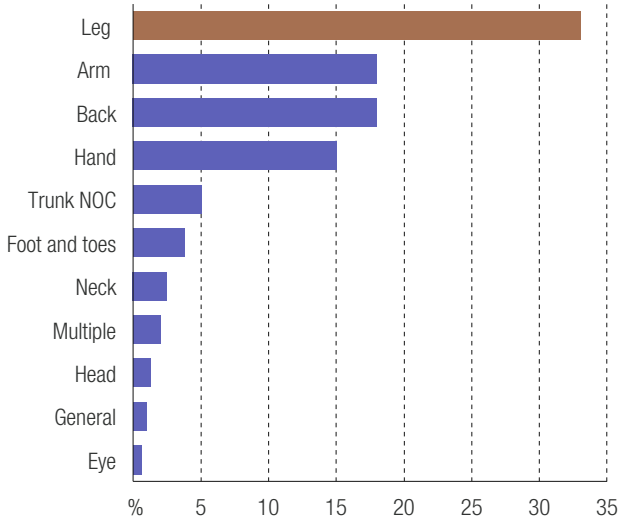


APPENDIX C

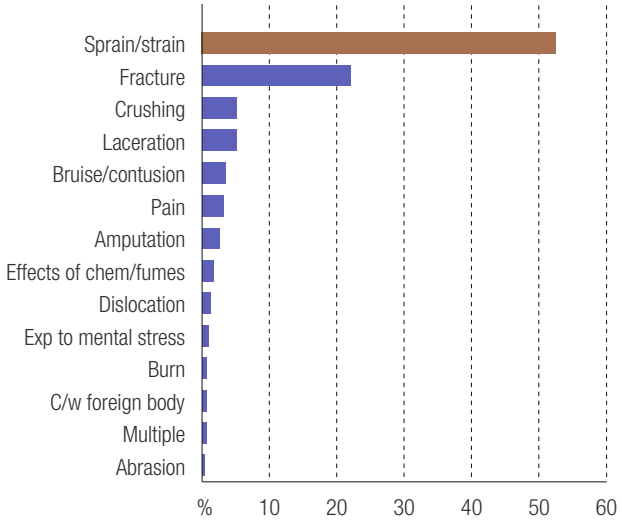
SERIOUS INJURIES SURFACE 2011-12

313 lost time injuries

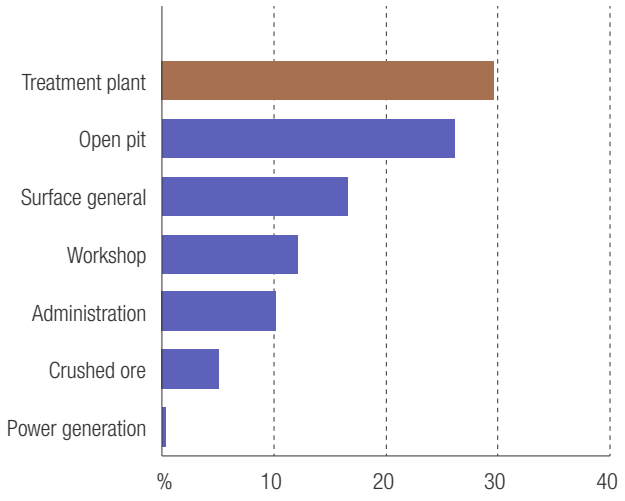
PART OF BODY



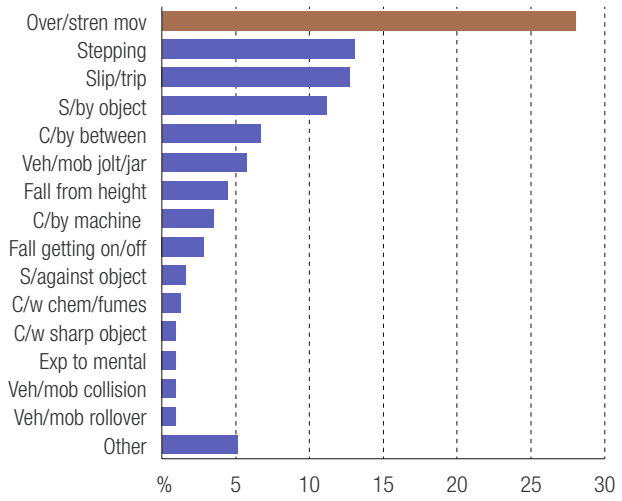
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

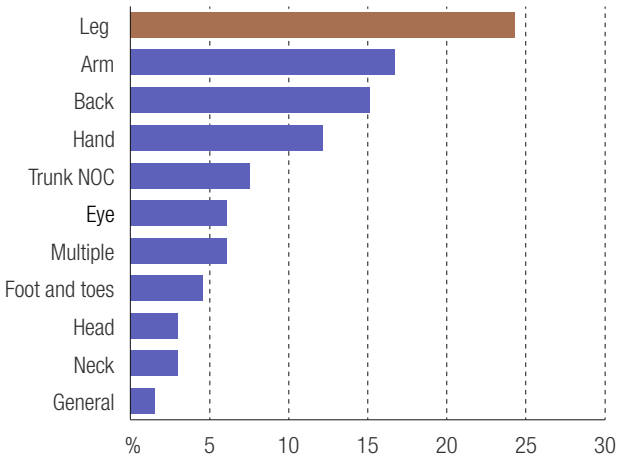


APPENDIX D

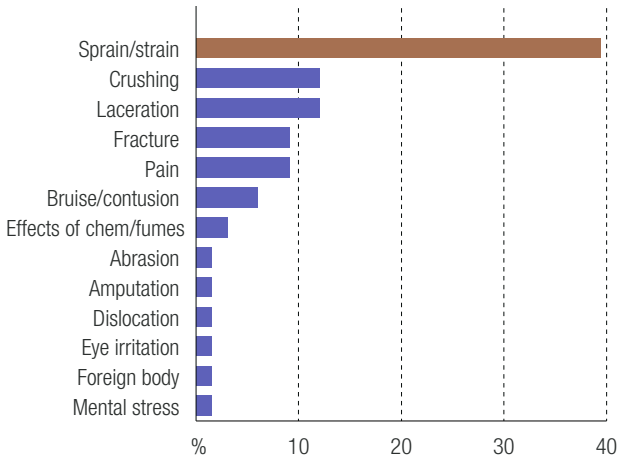
METALLIFEROUS UNDERGROUND INJURIES 2011-12

66 lost time injuries

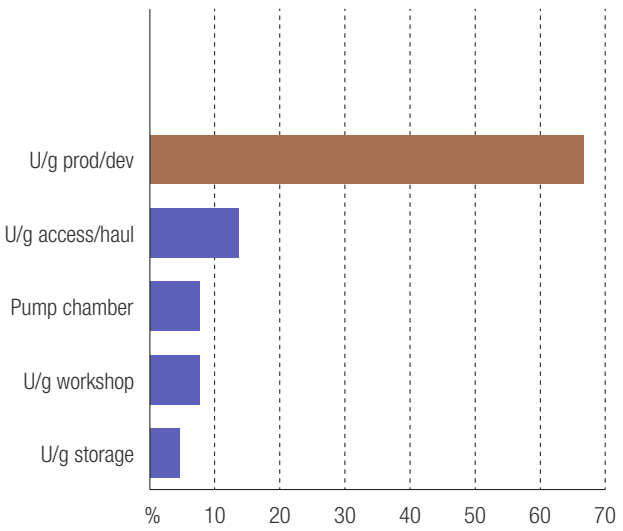
PART OF BODY



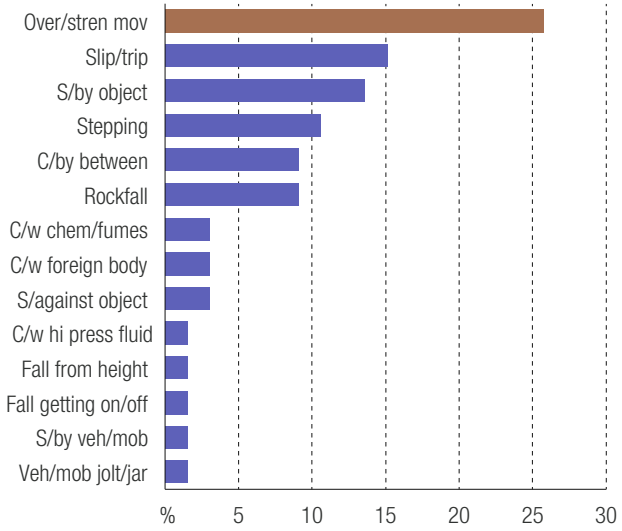
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

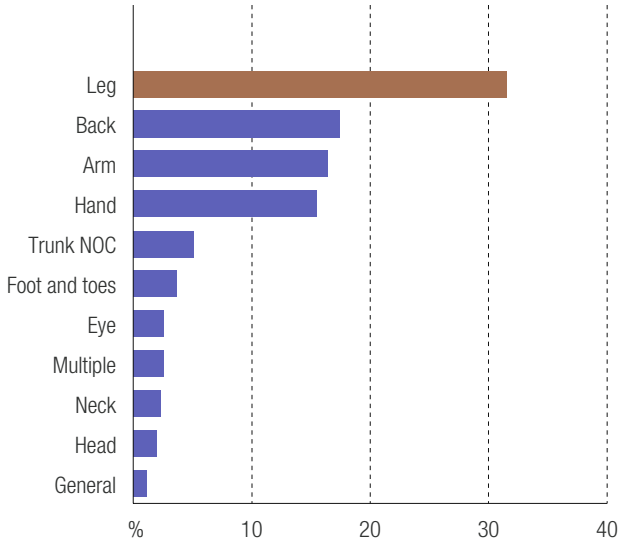


APPENDIX E

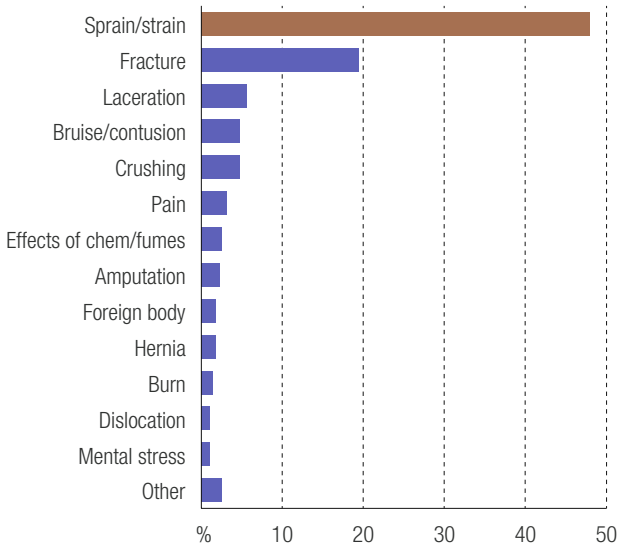
METALLIFEROUS SURFACE INJURIES 2011-12

355 lost time injuries

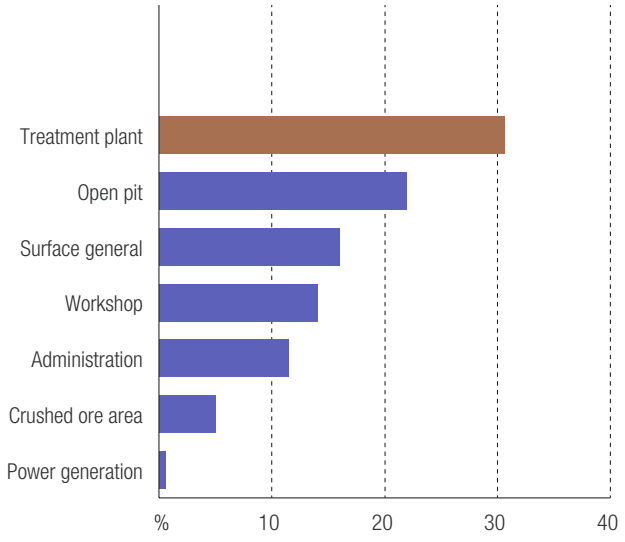
PART OF BODY



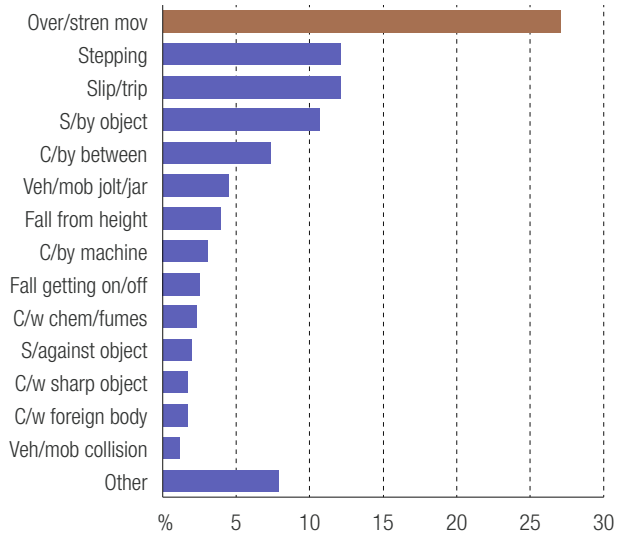
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

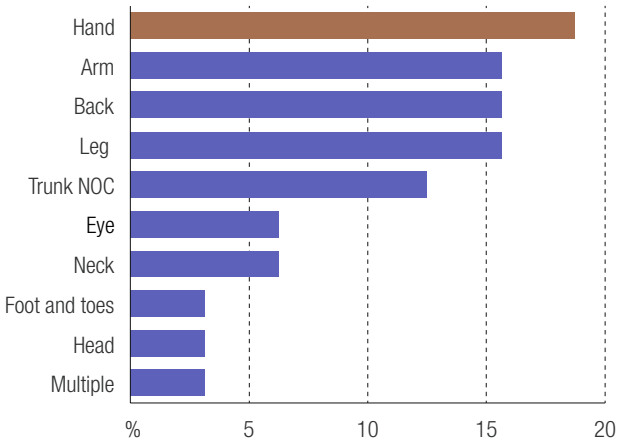


APPENDIX F

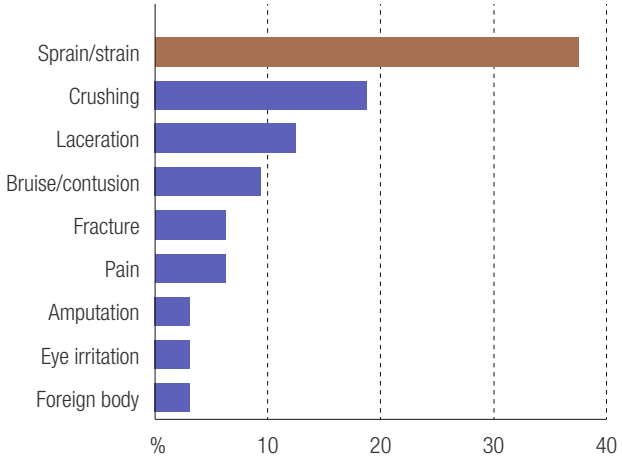
GOLD UNDERGROUND INJURIES 2011-12

32 lost time injuries

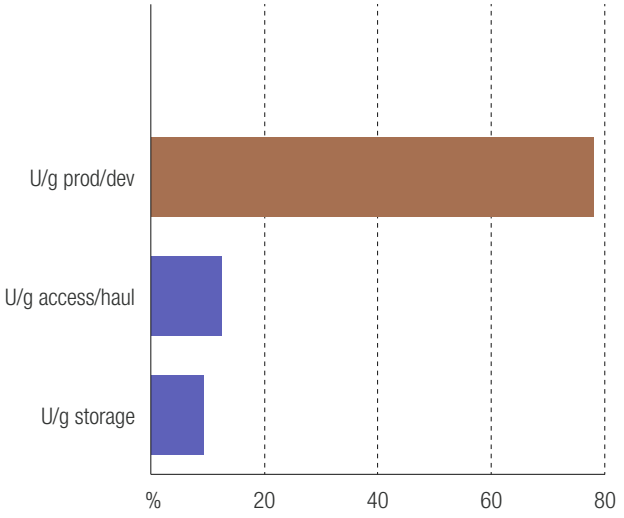
PART OF BODY



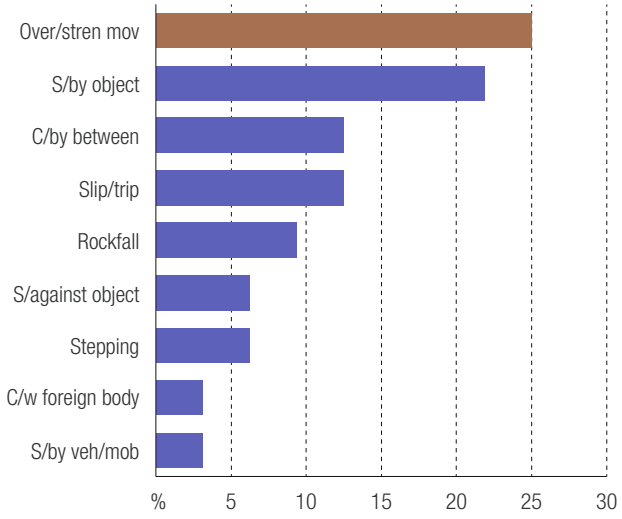
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

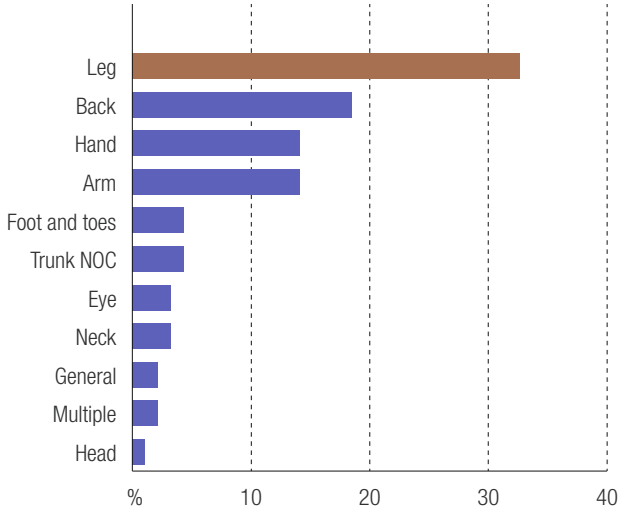


APPENDIX G

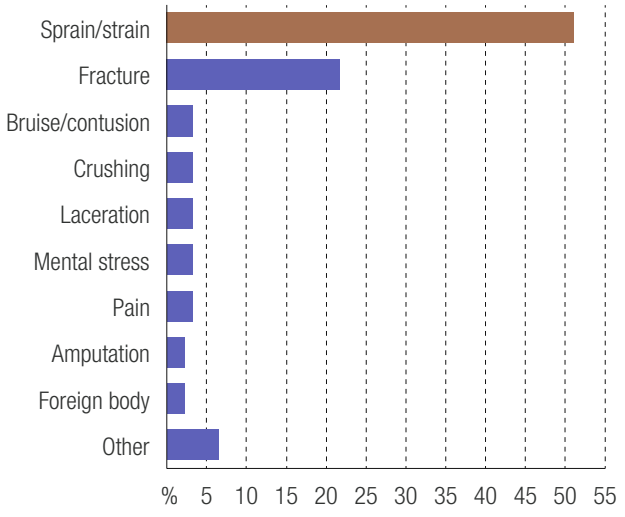
GOLD SURFACE INJURIES 2010-11

91 lost time injuries

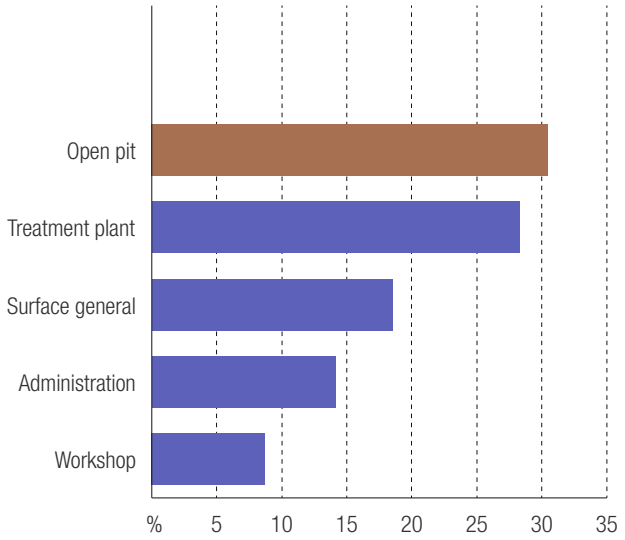
PART OF BODY



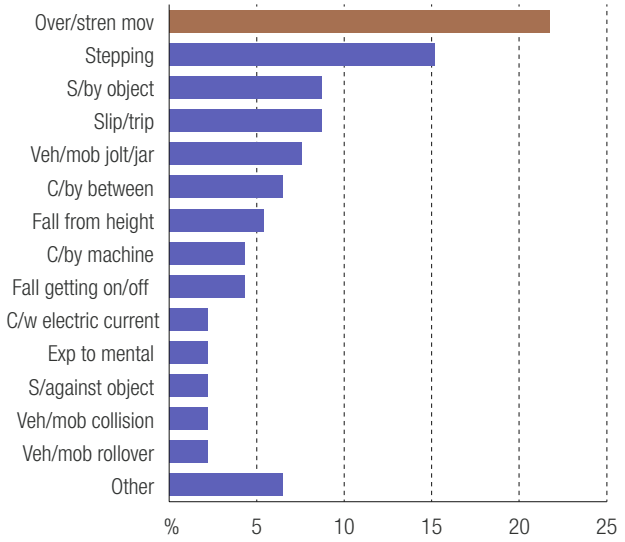
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

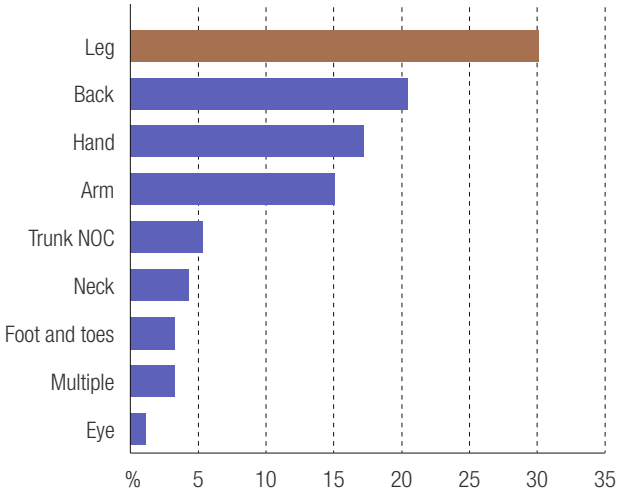


APPENDIX H

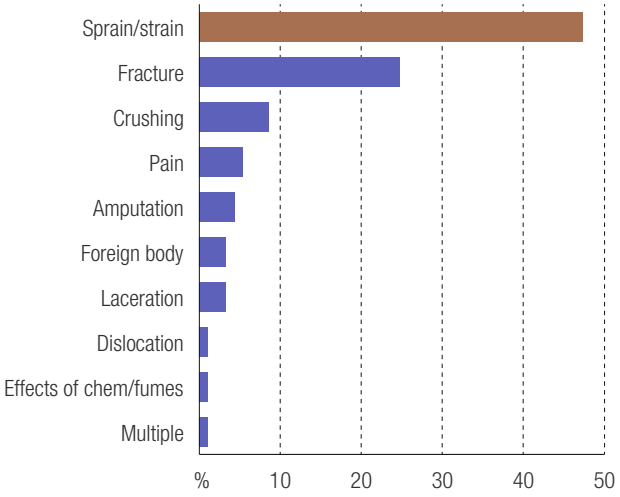
IRON ORE INJURIES 2011-12

93 lost time injuries

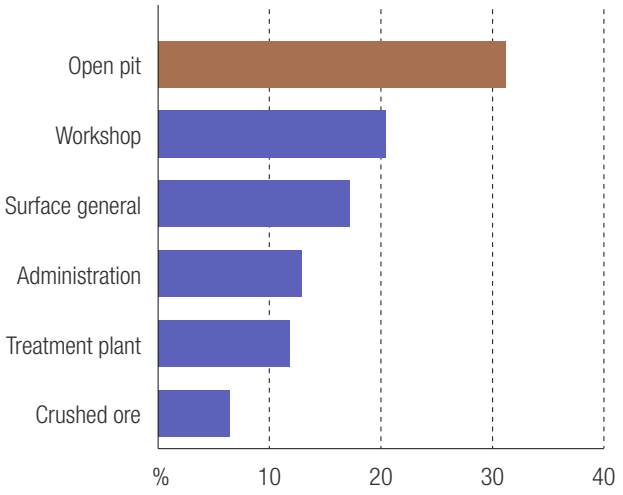
PART OF BODY



NATURE OF INJURY



LOCATION OF ACCIDENT



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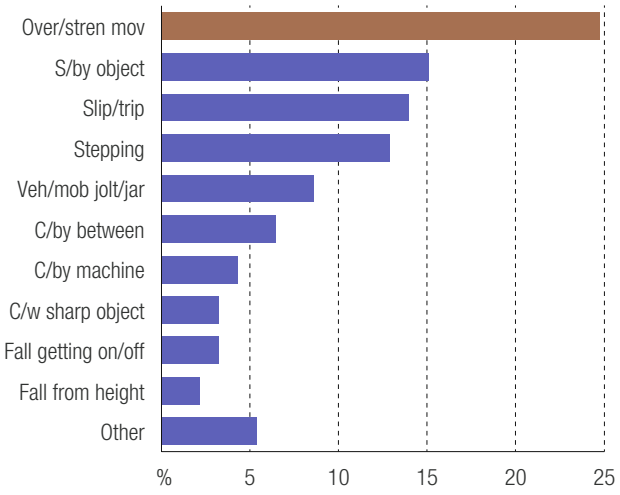
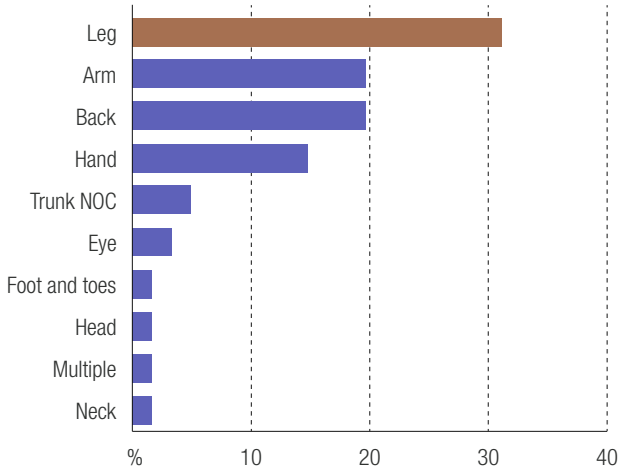


APPENDIX I

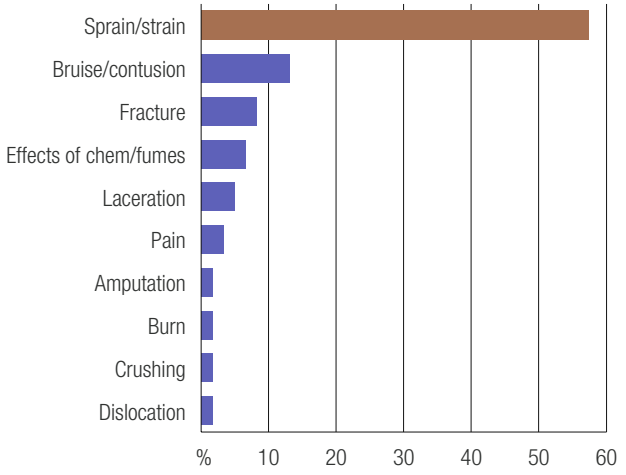
BAUXITE AND ALUMINA INJURIES 2010-11

61 lost time injuries

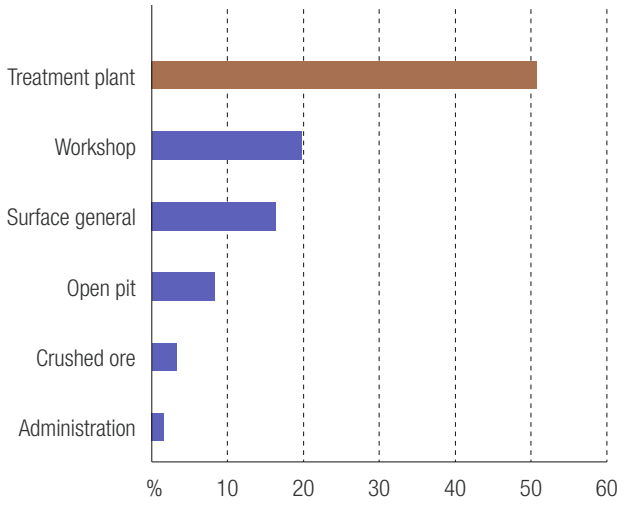
PART OF BODY



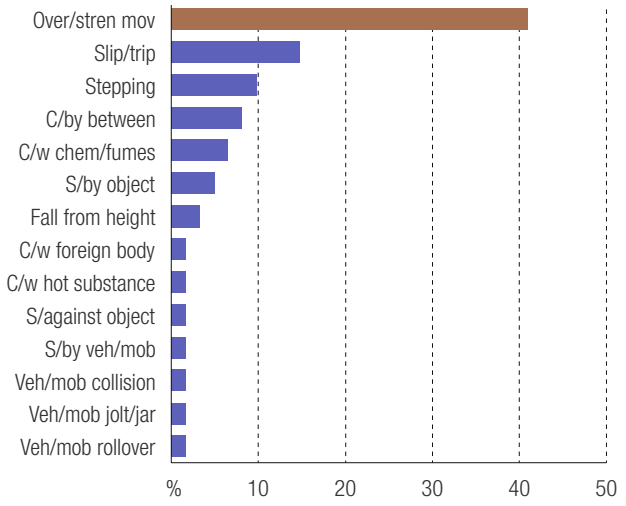
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

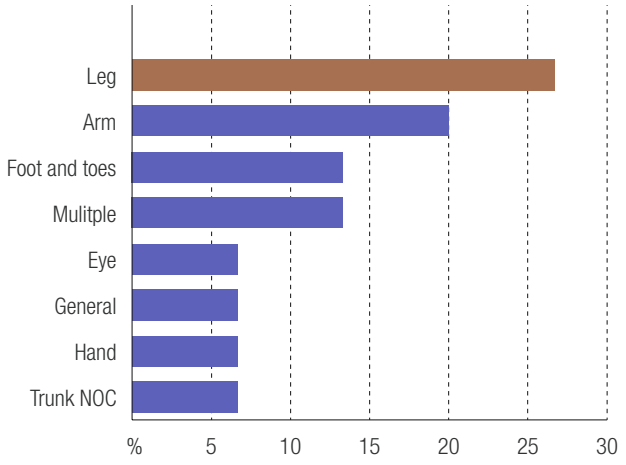


APPENDIX J

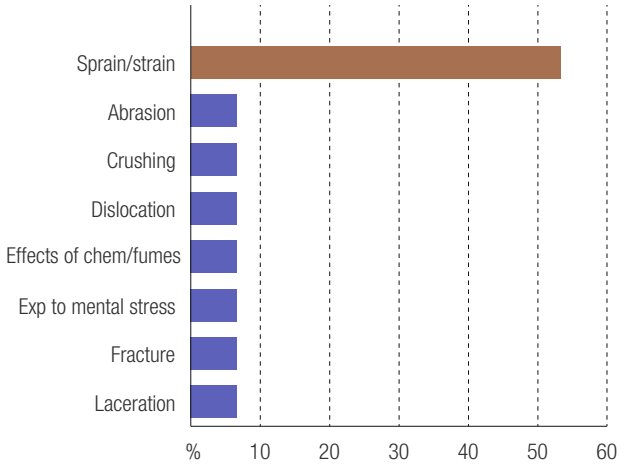
NICKEL UNDERGROUND INJURIES 2011-12

15 lost time injuries

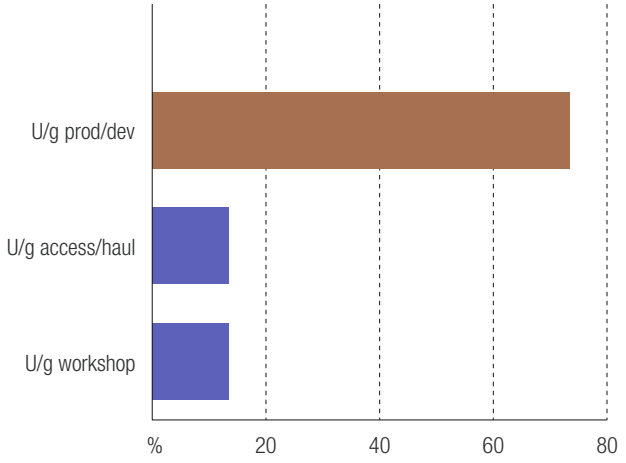
PART OF BODY



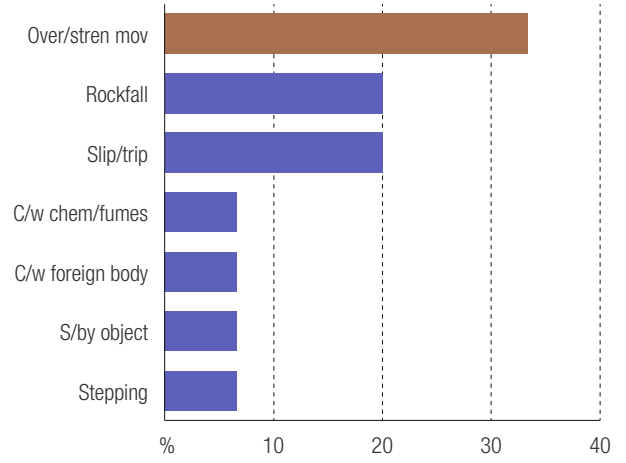
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

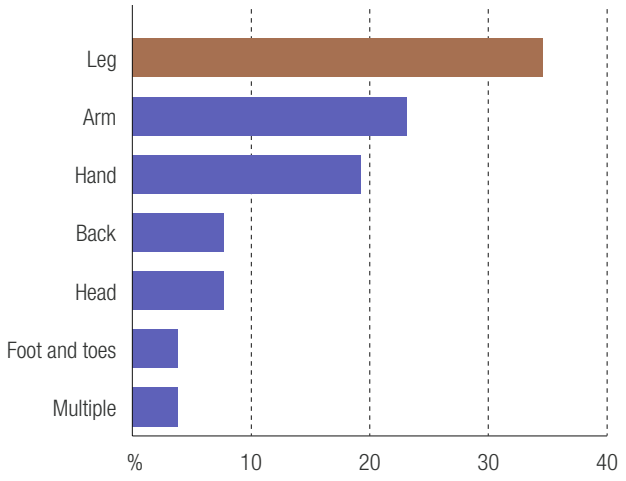


APPENDIX K

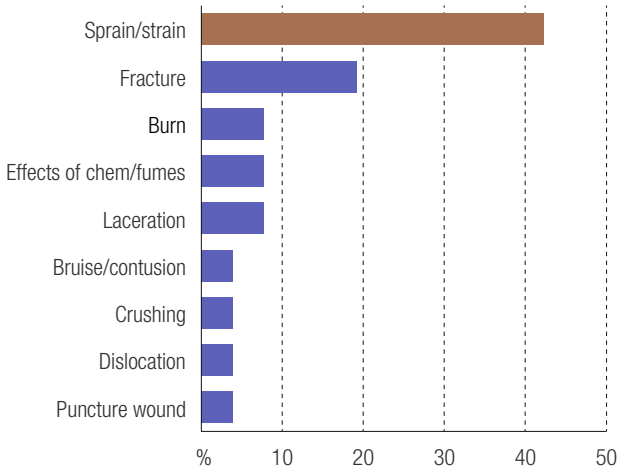
NICKEL SURFACE INJURIES 2011-12

26 lost time injuries

PART OF BODY



NATURE OF INJURY



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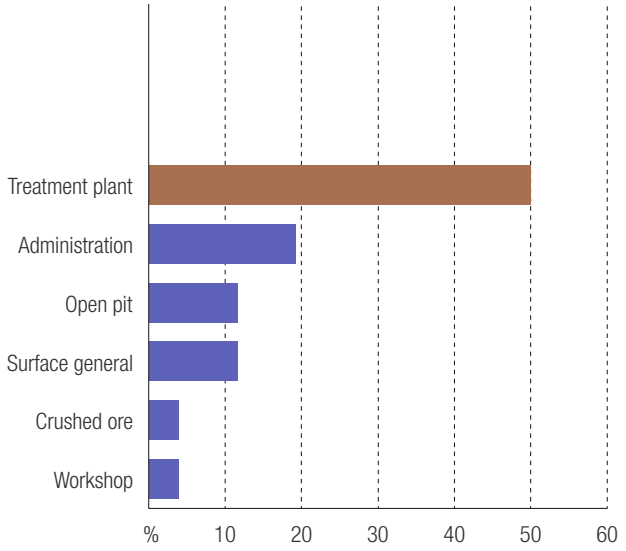
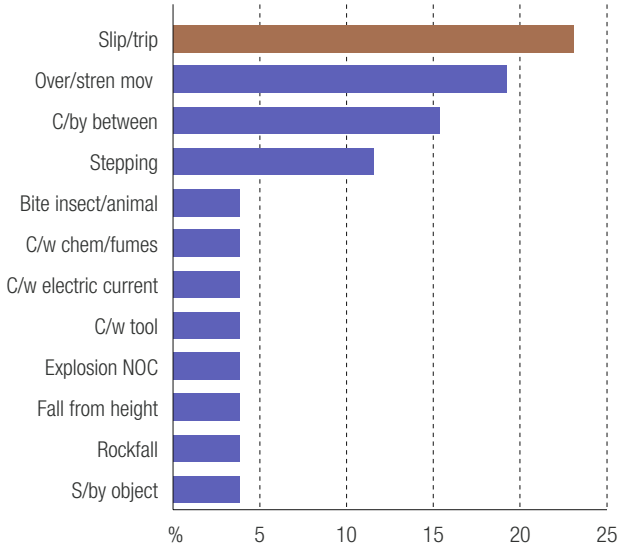


TYPE OF ACCIDENT

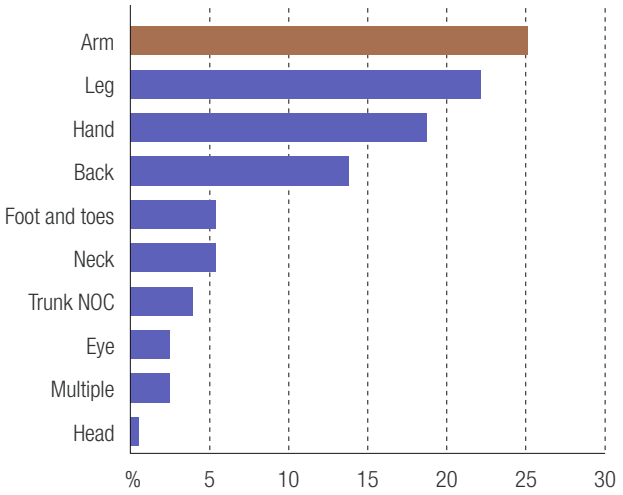


APPENDIX L

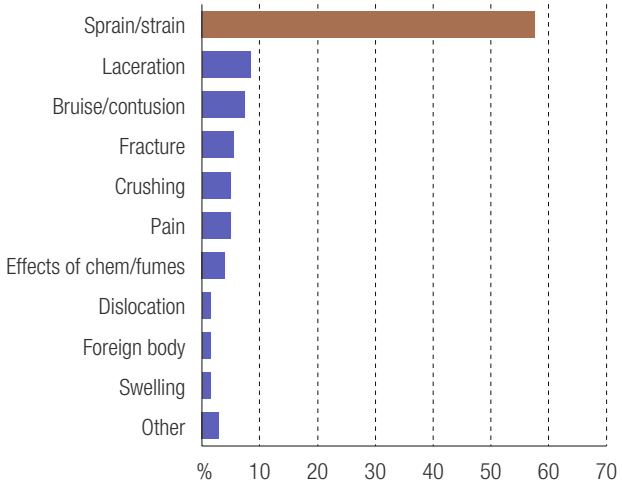
DISABLING INJURIES UNDERGROUND 2011-12

203 disabling injuries

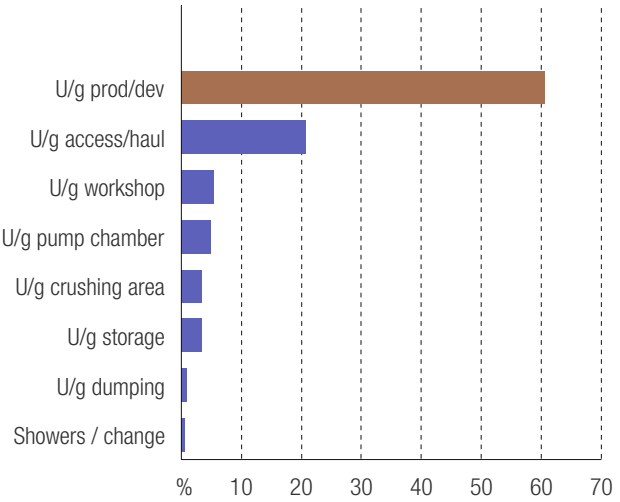
PART OF BODY



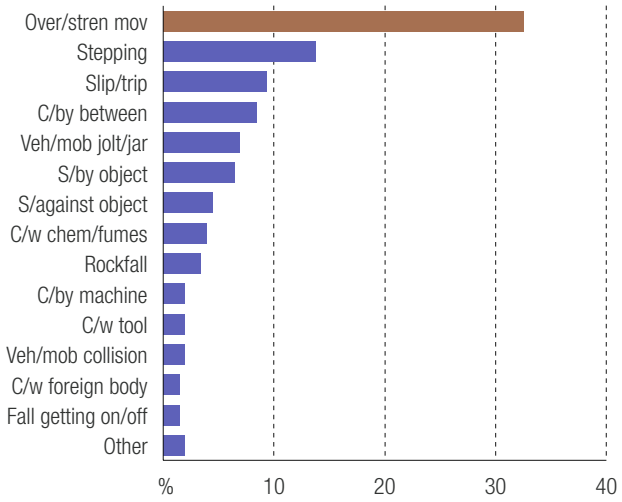
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

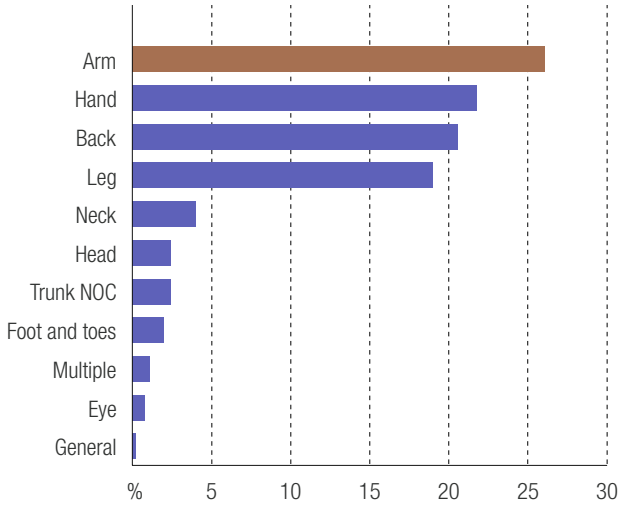


APPENDIX M

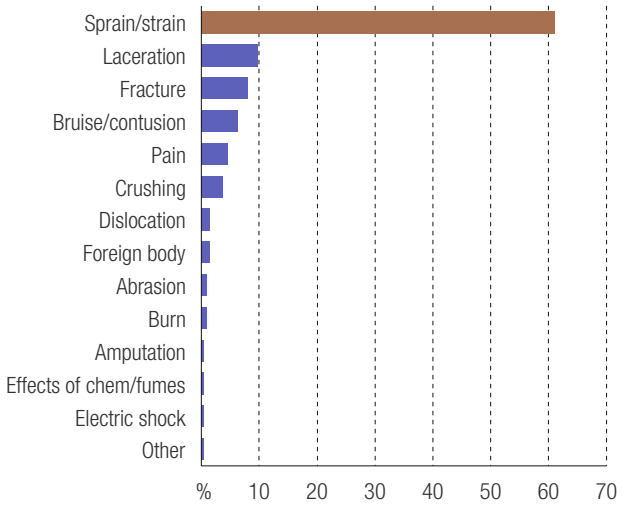
DISABLING INJURIES SURFACE 2011-12

654 disabling injuries

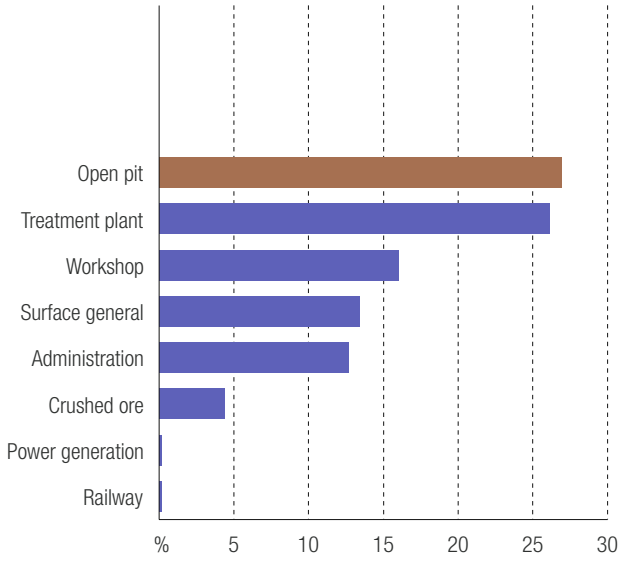
PART OF BODY



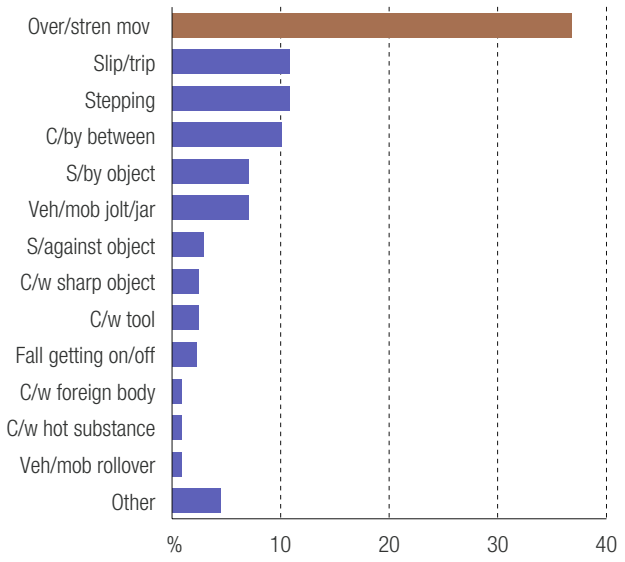
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

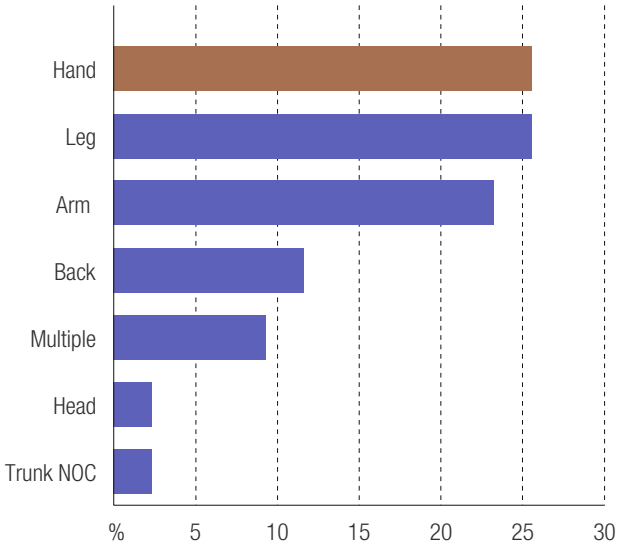


APPENDIX N

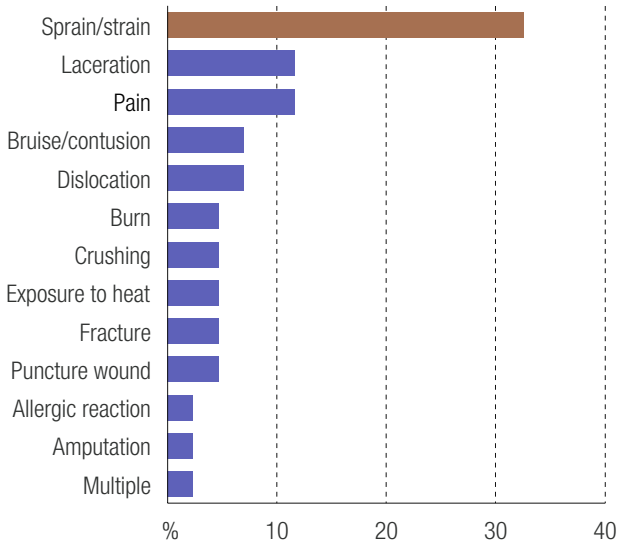
EXPLORATION INJURIES 2011-12

43 lost time injuries

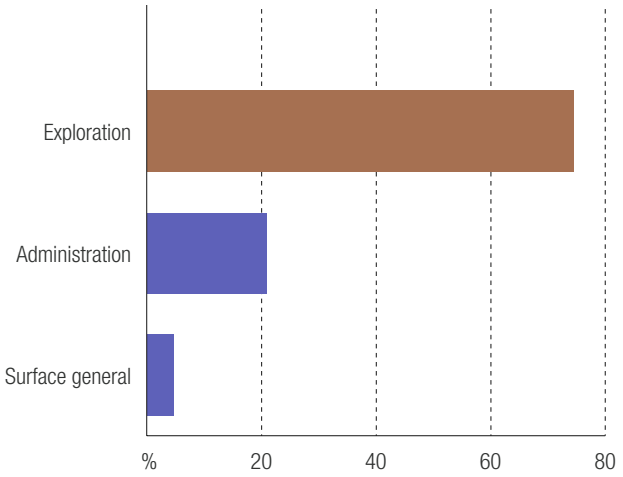
PART OF BODY



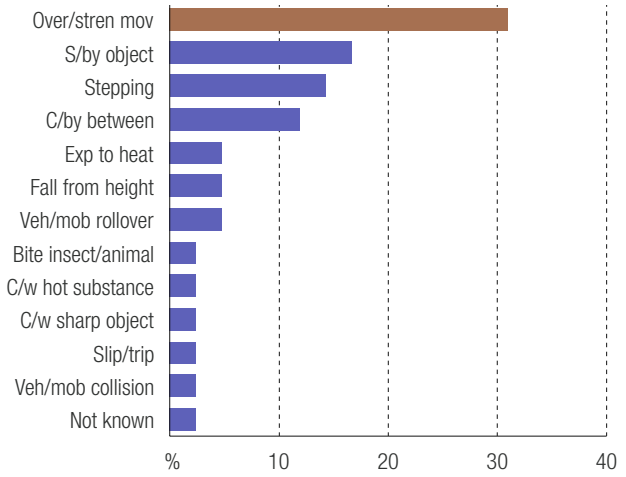
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT



APPENDIX 0

DESCRIPTIONS OF COMMONLY USED TERMS FOR TYPE OF ACCIDENT

Bite insect/animal – bites or stings from insects, spiders, snakes and other animals

C/by between – caught by or between still or moving objects (e.g. finger caught between two pipes while attempting to move one of them) but does not include getting caught between parts of an operating machine

C/by machine – caught between parts of an operating machine

C/w chem/fumes – inhalation, absorption or ingestion of chemicals or fumes; includes smoke, blast fumes, acids, caustic substances and industrial solvents

C/w electric current – contact with electric current; includes electric shock, electrocution, burning from electric current and static electricity discharge

C/w foreign body – contact with foreign body; includes entry into the skin, eyes, nose, ears, mouth or other part of the body by an object, but does not include sharp objects such as metal splinters

C/w friction/rubbing – blistering or abrasion due to rubbing by footwear, clothing or personal equipment

C/w hi press fluid – contact with high pressure fluid, including hydraulic fluid

C/w hot substance – contact with hot solid, liquid, gas or steam, molten metal or naked flame; usually results in burns

C/w sharp object – contact with sharp object (e.g. metal splinter) but does not include objects such as sharp tools or operating machines

C/w tool – contact with a handheld manual or power tool

Exp to heat – exposure to environmental heat; usually results in injuries related to heat stress

Exp to mental stress – stress-related conditions; includes post-traumatic stress and effects of workplace harassment

Explosion NOC – gas ignition

Fall from height – fall from height equal to or greater than 0.5 metres; includes falls from vehicles or mobile equipment but does not include falls while getting on or off the vehicle or mobile equipment

Fall getting on/off – falls getting on or off vehicles or mobile equipment but does not include falls stepping on uneven ground while disembarking from a vehicle or mobile equipment

Jumping – jumping by a person; includes jumping to a higher or lower level or from a moving object

Over/stren mov – over-exertion or strenuous movements; usually associated with lifting, carrying, pulling, pushing and moving objects; also includes strenuous movements, repetitive movements with no specific event, and working in a confined area or while in an awkward posture

Rockfall – falls of rock usually from the face, walls and backs of underground excavations or from the face and walls of surface excavations

S/against object – struck against stationary or moving objects (e.g. hitting head on low structure while walking)

S/by object – stuck by falling, flying, sliding or moving objects but does not include rockfalls or being struck by persons, vehicles or mobile equipment

S/by veh/mob – struck by a vehicle or mobile equipment

Slip/trip – other falls not from height or while getting on or off vehicles or mobile equipment; includes falls on stairs, falls on slippery or uneven ground, falls over loose or fixed objects and falls while handling equipment

Stepping – stepping on object, loose rock, uneven surface or to a higher or lower level; includes stepping on uneven ground while disembarking from a vehicle or mobile equipment; usually results in a sprain or strain to the ankle or knee

Veh/mob collision – vehicle or mobile equipment collision; includes colliding with stationary objects or walls

Veh/mob jolt/jar – vehicle or mobile equipment jolting or jarring (e.g. jolting or jarring while driving over an uneven surface, sitting in a truck being loaded with large material, bogging a face, ripping with a bulldozer)

Veh/mob rollover – vehicle or mobile equipment rollovers; includes partial rollovers

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RSDNov13_852