SAFETY PERFORMANCE

IN THE WESTERN AUSTRALIAN MINERAL INDUSTRY

ACCIDENT AND INJURY STATISTICS 2010-2011

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

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SUMMARY

Statistics generated from Resources Safety's Safety Regulation System (SRS) for the fiscal year 2010-11 show a continued levelling out of injury performance indicators for the Western Australian mining industry.

An average of 81,953 employees in the mining industry in 2010-11 (an increase of 19%) worked a total of 157.33 million hours.

Four mining industry employees lost their lives during the year (three in mining, one in exploration), one more than the previous year.

The lost time injury frequency rate (LTIFR) for serious injuries in 2010-11 fell to 2.1, which is an improvement of 16%. 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.

Statistics for disabling injuries (restricted work injuries) have been collected since the beginning of the 2001-02 fiscal year to establish a more effective safety performance indicator than the LTI-based system. There has been expanded coverage of disabling injury statistics in the annual compilation since 2006-07.

In 2010-11 there were 818 disabling injuries (DIs) recorded, an increase of 145 on the 2010-11 figure of 673. The disabling injury incidence and frequency rates rose to 10.0 and 5.2, respectively, from their 2009-10 values of 9.8 and 5.0.

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 2010-11 was 3,340. There were 46 LTIs, eight more than for the previous year. The overall exploration LTIFR was 6.7.

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, commenced in 2010, 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 2010-11, safety meetings, presentations to mine site employees, and briefings to industry safety and health representatives complemented these regulatory activities.

In 2010-11, Resources Safety continued 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 nationally consistent occupational health and safety regime for the Australian mining industry. The Division also monitored the national occupational health and safety harmonisation process overseen by Safe Work Australia.

STATISTICAL SUMMARY

MINING

- There were three mining fatal accidents during 2010-11 — one underground at a gold mine, one on the surface at an iron ore mine and one at the port facilities of an iron ore operation.
- There were 417 LTIs during 2010-11, five fewer than the previous year (422 injuries in 2009-10). Table 5 and Appendix A show a breakdown of the number of injuries by commodity mined.
- There was an average workforce of 81,953 employees in 2010-11, an increase of 19% over the previous year's average of 68,778. Table 5 and Appendix A show a breakdown of the number of employees by commodity mined.
- The overall LTI duration rate deteriorated by 11% during 2010-11, rising from 19.4 to 21.6. The breakdown of the work days lost for each commodity mined is shown in Table 5 and Appendix A.
- The overall LTI frequency rate improved by 13% during 2010-11, falling from 3.1 to 2.7.
- The overall injury index improved by 6%, falling from 61 in 2009-10 to 57 in 2010-11.
- Serious LTIs in the mining industry during 2010-11 totalled 333, seven fewer than for 2009-10.
- The overall serious LTIFR improved by 16% during 2010-11, falling from 2.5 to 2.1.
- The iron ore sector LTIFR improved by 13% during 2010-11, falling from 1.5.to 1.3.
- The bauxite and alumina sector LTIFR improved significantly by 36% during 2010-11, falling from 4.4 to 2.8 and returning to the level of the 2008-09 LTIFR.
- The gold sector LTIFR deteriorated by 16% during 2010-11, rising from 3.1 to 3.6
- The nickel sector LTIFR remained unchanged at 3.2 in 2010-11.
- There were 818 DIs during 2010-11, 145 more than the previous year (673 DIs reported in 2009-10). Table 11 shows the breakdown of the number of injuries by commodity mined.
- The overall DI frequency rate deteriorated by 4%, rising from 5.0 to 5.2.

EXPLORATION

- There was one exploration fatality in 2010-11.
- There were 46 LTIs during 2010-11, eight more than the previous year.
- There was an average workforce of 3,340 employees, an increase of 19% over the previous year's average.
- The overall LTIFR remained unchanged from the 2009-10 value of 6.7.
- There were 37 exploration disabling injuries reported during 2010-11, resulting in a DI frequency rate of 5.4.

EXPLANATORY NOTES

Introduction

The statistics published in this annual compilation mainly relate to accidents between 1 July 2010 and 30 June 2011 (2010-11) 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 2010-11 has three components:

i) Initial injuries — days lost in 2010-11 from injuries that occurred in 2010-11

ii) Recurrent injuries — days lost in 2010-11 through recurrences of injuries that occurred in 2010-11 and previous years

iii) Carry-over injuries — days lost in 2010-11 by persons continuously off work from injuries that occurred before 1 July 2010.

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 (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 12 months covered in this compilation, an average of 301 mines or groups of mines and 212 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
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 2010-11

There were four fatal accidents in the Western Australian mineral industry during 2010-11, three at mine sites and one at an exploration site.

- A rise miner at an underground gold mine was found deceased at the bottom of a newly excavated emergency escape rise. He had been installing fixed, permanent ladders in the escape rise.
- A scaffolder working under the wharf at an iron ore port facility, dismantling a cantilevered section on the end of a hanging scaffold structure, drowned when the section he was working on failed and collapsed, falling into the water beneath the wharf. His body was retrieved by Water Police divers.
- A fitter conducting work on the front suspension of a haul truck at an iron ore mine was fatally injured when there was a release of energy and he was struck by a component of the suspension strut.
- An exploration geologist collapsed after spending a day collecting samples at an exploration site in the north of the State.

Fatal injury incidence rate by mineral mined 2006-07 to 2010-11

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 four times higher than the fatal injury incidence rate for surface operations.

TABLE 1 FATAL INJURY INCIDENCE RATE BY MINERAL MINED 2006-07 TO 2010-11

Category		Fatalities per thousand employees
Mineral	Gold	0.06
	Nickel	0.06
	Iron ore	0.07
	Bauxite and alumina	0.02
Underground		0.16
Surface		0.04
Exploration		0.17

FATAL ACCIDENTS CONTINUED

Fatal injury incidence rate 2001-02 to 2010-11

The fatal injury incidence rate for 2010-11 was 0.037, slightly lower than the previous year. While there were three fatal mining accidents in both years, the greater number of employees in 2010-11 resulted in a lower incidence rate.

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 2001-02 TO 2010-11

Fatal accidents by type of accident 2006-07 to 2010-11

Table 2 indicates the type of accidents for the 20 fatalities in the mining industry (including exploration) over the past five years, with six underground, 12 at surface operations and two in exploration.

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

Of the two exploration fatalities, one was due to exposure to environmental heat and in the other, the person was struck by an object.

TABLE 2 NUMBER OF FATALITIES BY TYPE OF ACCIDENT 2006-07 TO 2010-11

Category		Number of fatalities
Underground	Fall from height	2
	Veh/mob over edge	2
	Rockfall	1
	Veh/mob collision	1
Surface	S/by object	4
	Fall from height	4
	Veh/mob collision	2
	C/by between	1
	S/by veh/mob	1
Exploration	Exposure to env heat	1
	S/by object	1
Total		**20**

SERIOUS INJURIES

Review of serious injuries during 2010-11

There were 333 serious injuries reported for the mining industry during 2010-11 (340 in 2009-10). Of these, 325 were in metalliferous mines and eight were in coal mines.

Some typical serious lost time injuries are described below.

A haul truck operator was jolted around the cab and sustained strain injuries to her neck and left shoulder when the boom of a front-end loader dropped onto the side of the truck tray after the boom lever was accidentally knocked during loading.

A scaffolder fell about 3 metres and injured his ankle when the scaffolding he was dismantling collapsed beneath him. Vertical scaffold modules, used earlier to suspend work platforms on the underside of a wharf, had been removed by crane lift and transported to a designated area for dismantling. Two scaffolders had stripped one module without incident. While accessing the stairway of the second module to begin dismantling, the scaffolder had stepped onto the fourth flight of stairs, which gave way without warning.

A face shovel operator suffered leg injuries after being forced to jump to the ground when a fire broke out on the machine. A wheel dozer operator working adjacent to the shovel noticed the fire and issued a mayday. On hearing the mayday, the operator of the shovel manually activated the fire suppression system and exited the cabin, but found he could not access the points of emergency egress.

A fitter in the surface workshop carrying out a maintenance task on a drill jumbo was injured when the jumbo boom moved unexpectedly, trapping his foot and ankle beneath it.

While climbing into a "troop carrier" light vehicle at the heavy vehicle park-up area, a truck driver injured his shoulder when he slipped on the light vehicle running board and stretched out his arm to break his fall.

Three contractors were injured when the single-cab utility vehicle they were travelling in rolled over on an access road. One contractor suffered cracked neck vertebrae while another had a fractured shoulder blade.

A dump truck driver, who had parked to take a break at a designated parking area, fell on uneven ground and struck her head on a rock while walking beside the truck. The driver made her way back into the truck and called for assistance before losing consciousness.

An employee carrying a 4 metre by 2.4 metre sheet of mesh, in readiness for a jumbo in the decline, sustained shoulder strain injuries when the sheet moved away from the left side of his body and he attempted to move it back by reaching across with his right hand.

A fitter reassembling a pump in the infrastructure workshop had the tip of a finger partially amputated when the end plate moved on the final fitting, causing the studs to align with the holes and allowing the plate to drop down and catch the finger as he attempted to withdraw his hand.

While working from a charge-up basket in a drive, a charge-up operator suffered severe swelling and bruising to his left upper arm, left rib cage, trunk and face and a laceration above his left eye when a rock fall resulted in rock, mesh and fibrecrete falling onto the basket in which he was standing. The fallen material trapped the operator in the basket but he was able to free himself by cutting through a section of basket safety mesh with bolt cutters. He walked down the escapeway to raise the alarm.

The top of a boilermaker's foot was burnt when a piece of molten slag entered the top of his boot while he was plasma cutting a section of feed bin that had been taken to the workshop.

SERIOUS INJURIES CONTINUED

Hydraulic oil from a faulty high-pressure hydraulic line in a workshop injected into a heavy duty fitter's index finder while he was working

While using a rattle gun to tighten wheel nuts on a wheeled loader in the workshop, a fitter trapped the fingers of one hand between the rattle gun and the wheel rim. This damage to his index finger required a nerve and skin graft.

A miner removing old rise ladders from an escape way fell and slid about 13.5 metres after he overbalanced. The miner and an offsider had been unhooking the ladder sections and carrying them out the top of the escape way. While attempting to remove the fifth section of ladder, the miner unhooked his fall arrest lanyard after finding that he could not fully reach the bottom ladder to pull it out from under the one above. He reached down to pull up the ladder section and fell, breaking bones in his ankle and foot.

An excavator operator, climbing down from the machine for a break, twisted and strained his leg when he dropped from the ladder without being able to see the ground, landing on uneven ground.

A dump truck driver suffered jarring to the neck when a large rock was loaded into the truck. The driver continued working but, three days after the incident, was unable to drive the truck due to increased pain.

Two fitters were working in an underground workshop doing a scheduled tyre change-out on a load haul dump unit (bogger) when one fitter, on the ground guiding while the other worked from an integrated tool (IT) carrier, was pinned between the wheel hub and replacement tyre when the tyre fell forward onto him. He fell to the ground beneath the bogger and lost consciousness. Upon regaining consciousness, he managed to crawl underneath the vehicle to the other side where he was attended to by work colleagues.

A fitter suffered a severe compound fracture to the lower leg when a roll-over protection canopy from a load haul dump unit (bogger) being removed in the surface workshop fell onto his legs. Two fitters had been attempting to remove the canopy using an integrated tool carrier (IT) with its forks through the canopy window holes. One of the canopy support pins was bent, so the other fitter was using a scaling bar to lever out the support pins (on the opposite side of the bogger from the IT). When the canopy released, it sprang off the forks and flipped over onto him, striking his legs.

An exploration field assistant suffered a fractured ankle and torn ligaments when she twisted her ankle and fell while carrying samples down a hill over uneven and rocky terrain.

Serious injury incidence rate by mineral mined 2006-07 to 2010-11

Figure 2 plots incidence rates for serious injuries over 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 (7.1) was 54% higher than that for surface operations (4.6).

Of the major mining sectors, base metals had the highest five-year average serious injury incidence rate (11.2) whereas iron ore had the lowest (3.0). The mining sector referred to as "other", with a five-year average serious injury incidence rate of 9.0, contained 3% of the total number of employees spread over 16 commodity groups.

Serious injury frequency rate 2006-07 to 2010-11

Figure 3 shows that the serious injury frequency rate was unchanged since 2009-10 for underground metalliferous operations, and improved for surface metalliferous operations and the coal sector, resulting in a 16% improvement overall during 2010-11.

FIGURE 2 SERIOUS INJURY INCIDENCE RATE 2006-07 TO 2010-11

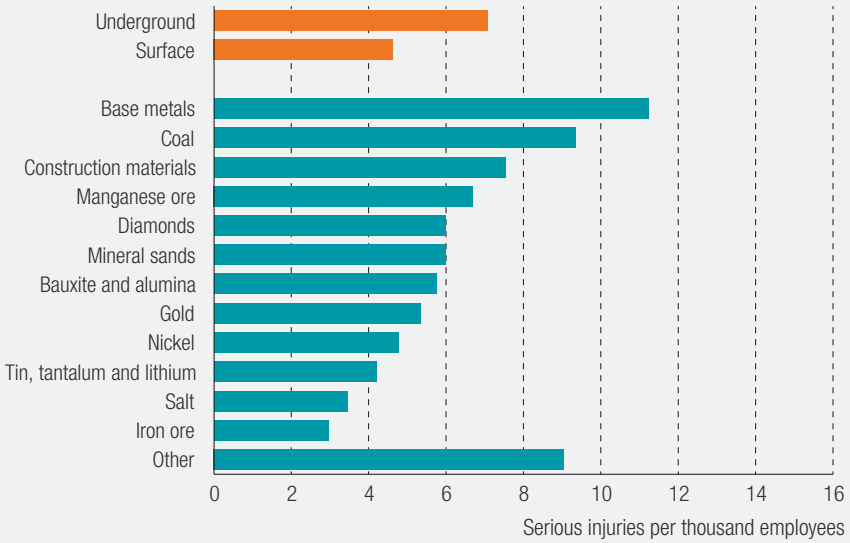
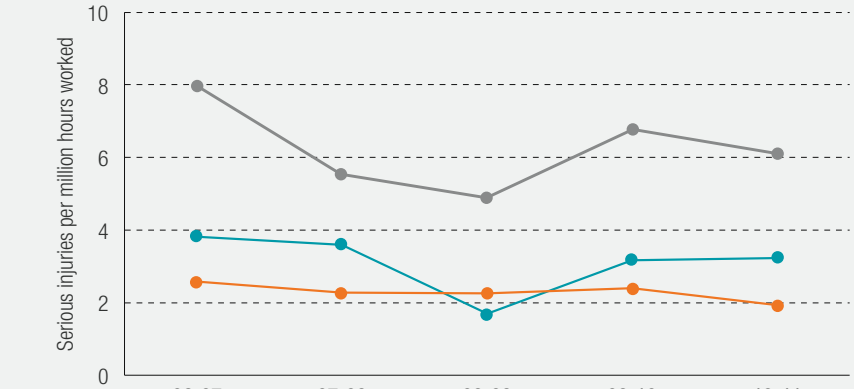


FIGURE 3 SERIOUS INJURY FREQUENCY RATE 2006-07 TO 2010-11



	06-07	07-08	08-09	09-10	10-11
Underground	3.8	3.6	1.7	3.2	3.2
Surface	2.6	2.3	2.2	2.4	1.9
Total	7.9	5.5	4.9	6.8	6.1

Serious injury percentage breakdown for 2010-11

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 25%, followed by back injuries at 22% and arm injuries at 20%. Of the serious leg injuries, 67% were to knees and ankles. Of the serious arm injuries, 64% 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 (53%), followed by fracture at 15%, then crushing at 10%.
- The largest proportion of serious injuries underground was in production and development areas (75%), followed by access and haulage ways at 15%.
- The most common accident type associated with serious injuries underground was over-exertion or strenuous movements at 20%, followed by rockfall at 19%, then slip or trip and stepping, both at 14%.

Surface

- Injuries to legs accounted for the largest proportion of serious injuries at 26%, arm injuries accounted for 18%, followed by hand injuries at 16% and back injuries at 14%. Of the serious arm injuries, 51% were to shoulders while 20% were to wrists. Injuries to knees and to ankles each accounted for 35% of serious leg injuries.
- Consistent with the high proportion of knee, ankle, back and shoulder injuries, sprain or strain represented the highest proportion by nature of injury (47%). Fracture was the next highest (19%), followed by crushing at 7%.
- The largest proportion of serious injuries on the surface occurred in treatment plants (33%), followed by open pits at 20% and workshops at 18%.
- The most common accident types associated with serious injuries on the surface were over-exertion or strenuous movements (23%), caught by or between moving objects (14%), stepping (12%), and slip or trip (9%).

LOST TIME INJURIES

Review of lost time injuries during 2010-11

In 2010-11, 20,862 days were lost through occupational injuries on mines in Western Australia. This figure represents the number of days lost from injuries occurring in 2010-11 (9,018), recurrences of injuries sustained before 2010-11 and in 2010-11 (1,289), and LTIs and recurrences carried over into 2010-11 from accidents before July 2010 (10,555). A breakdown of work days lost in coal and metalliferous mining is given in Table 3.

During 2010-11, there were 417 LTIs in the State's mining industry. Of those, 400 were in metalliferous mines and 17 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 51 recurrences of previous injuries, resulting in 1,289 work days lost during 2010-11. A breakdown of recurrent injuries by calendar year of initial injury is given in Table 6.

One hundred and thirty-two people who were still off work from injuries received before July 2010 lost 10,555 work days in 2010-11. A breakdown of these carry-over injuries is given in Table 7.

TABLE 3 TIME LOST THROUGH INJURY DURING 2010-11

Mines	Initial injuries	Recurrent injuries	Carry-over injuries	Total
	Days lost			
Metalliferous	8,684	1,078	10,204	19,966
Coal	334	211	351	896
Total mining	**9,018**	**1,289**	**10,555**	**20,862**

TABLE 4 INITIAL LOST TIME INJURIES DURING 2010-11

Sector	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Metalliferous surface	72,280	329	4.6	2.4	22.0	53	7,230
Metalliferous underground	8,688	71	8.2	3.9	20.5	79	1,454
Metalliferous total	**80,968**	**400**	**4.9**	**2.6**	**21.7**	**56**	**8,684**
Coal total	**985**	**17**	**17.3**	**12.9**	**19.6**	**254**	**334**
Total mining	**81,953**	**417**	**5.1**	**2.7**	**21.6**	**57**	**9,018**
Exploration total	**3,340**	**46**	**13.8**	**6.7**	**12.7**	**85**	**583**

TABLE 5 INJURIES BY MINERAL MINED DURING 2010-11

Mineral mined	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Iron ore	30,309	80	2.6	1.3	22.6	30	1,805
Gold	18,895	127	6.7	3.6	25.4	91	3,220
Nickel	9,080	58	6.4	3.2	28.5	93	1,655
Bauxite and alumina	10,808	62	5.7	2.8	12.7	35	785
Base metals	2,316	18	7.8	4.4	17.2	76	309
Mineral sands	1,871	10	5.3	3.6	12.1	43	121
Diamonds	1,686	5	3.0	1.4	18.2	26	91
Salt	1,296	7	5.4	4.6	6.0	27	42
Coal	985	17	17.3	12.9	19.6	254	334
Manganese ore	866	3	3.5	3.5	31.0	52	93
Construction materials	697	5	7.2	7.2	7.6	29	38
Tin, tantalum and lithium	554	3	5.4	5.4	4.0	11	12
Other	2,590	22	8.5	5.6	23.3	131	513
Total mining	**81,953**	**417**	**5.1**	**2.7**	**21.6**	**57**	**9,018**

Note: Duration in Tables 4 and 5 does not take into consideration time lost after 30 June 2011 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 2010.

TABLE 6 RECURRENT INJURIES DURING 2010-11

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2011*	3	13	2	32	5	45
2010	28	840	3	39	31	879
2009	5	70	1	23	6	93
2008	1	8	-	-	1	8
2007	1	17	1	4	2	21
2006	1	70	-	-	1	70
2005	2	38	-	-	2	38
Pre-2005	1	22	2	113	3	135
Total	**42**	**1,078**	**9**	**211**	**51**	**1,289**

Note: Apart from the information shown in Tables 3, 6 and 7, data for recurrent and carry-over injuries are not analysed in this publication.

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

LOST TIME INJURIES CONTINUED

TABLE 7 CARRY-OVER INJURIES DURING 2010-11

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2010*	87	5,112	2	126	89	5,238
2009	26	2,931	2	173	28	3,104
2008	11	1,736	1	52	12	1,788
2007	1	14	-	-	1	14
2006	1	256	-	-	1	256
2005	1	155	-	-	1	155
Total	**127**	**10,204**	**5**	**351**	**132**	**10,555**

** Covers period from 1 January to 30 June 2010 calendar year*

Review of lost time injuries during 2010-11 in accordance with Australian Standard AS 1885.1:1990

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 the Resources Safety's annual safety performance digest.

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 Resources Safety's digests.

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 2010-11 (AS 1885.1:1990)

Sector	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Metalliferous surface	72,280	331	0.46	2.4	23.2	7,670
Metalliferous underground	8,688	72	0.83	3.9	23.3	1,674
Metalliferous total	**80,968**	**403**	**0.50**	**2.6**	**23.2**	**9,344**
Coal total	**985**	**17**	**1.73**	**12.9**	**19.6**	**334**
Total mining	**81,953**	**420**	**0.51**	**2.7**	**23.0**	**9,678**
Exploration total	**3,340**	**47**	**1.41**	**6.8**	**17.1**	**803**

Note: Duration in Tables 8 and 9 does not take into consideration time lost after 30 June 2011 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 2010.

TABLE 9 INJURIES BY MINERAL MINED DURING 2010-11 (AS 1885.1:1990)

Mineral mined	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Iron ore	30,309	82	0.27	1.4	27.4	2,245
Gold	18,895	128	0.68	3.6	26.9	3,440
Nickel	9,080	58	0.64	3.2	28.5	1,655
Bauxite and alumina	10,808	62	0.57	2.8	12.7	785
Base metals	2,316	18	0.78	4.4	17.2	309
Mineral sands	1,871	10	0.53	3.6	12.1	121
Diamonds	1,686	5	0.30	1.4	18.2	91
Salt	1,296	7	0.54	4.6	6.0	42
Coal	985	17	1.73	12.9	19.6	334
Manganese ore	866	3	0.35	1.7	31.0	93
Construction materials	697	5	0.72	3.8	7.6	38
Tin, tantalum and lithium	554	3	0.54	2.7	4.0	12
Other	2,590	22	0.85	5.6	23.3	513
Total mining	**81,953**	**420**	**0.52**	**2.7**	**23.0**	**9,678**

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 in the ten-year period since 2002-03.

Over this period, the coal mining compensation rate decreased by 27%, to 1.91% of payroll. The compensation rate for surface gold operations decreased by 65%, to 1.03% of payroll, and that for iron ore operations decreased by 39%, to 0.66% of payroll. The rate for underground gold operations increased by 6%, to 4.41% of payroll.

Figure 5 shows the premium rates recommended in 2010-11 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 2010-11 for the Western Australian mining industry for 2011-12 was 1.78% of payroll, an 11% increase on the rate recommended for the previous year (1.61% of payroll).

In 2010-11, apart from underground gold mining, the premium rates recommended for mining industry groups for the following year compared favourably with other industry groups such as structural steel fabrication and sheet metal product manufacturing, which had premium rates of 2.96% and 2.89% of payroll, respectively.

FIGURE 4 MINE WORKERS' COMPENSATION RATE TRENDS 2002-03 TO 2011-12

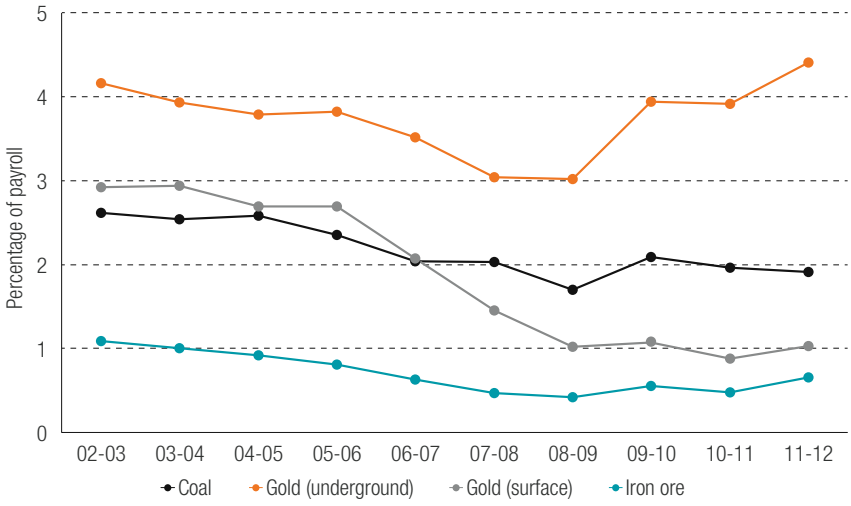
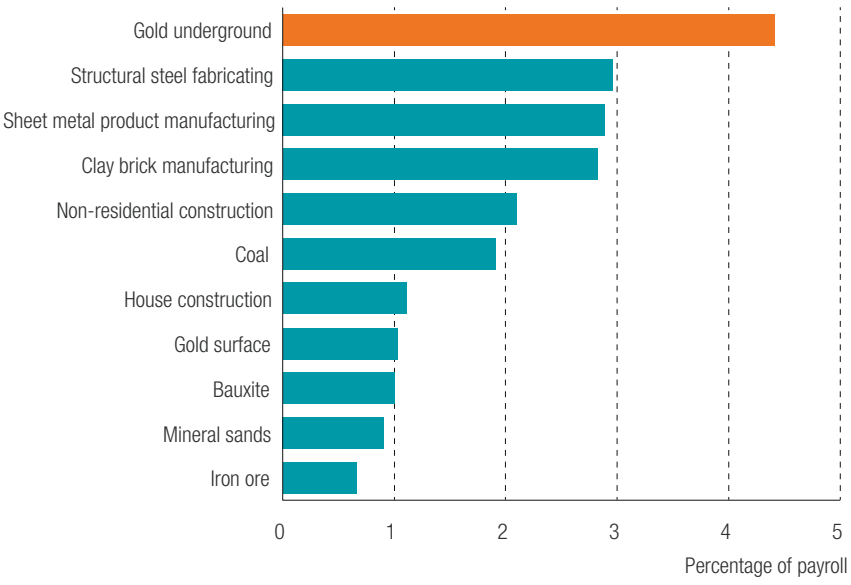


FIGURE 5 RECOMMENDED PREMIUM RATES 2011-12



INJURIES BY COMMODITIES

Metalliferous performance indicators

The performance indicators for metalliferous mining show mixed results for 2010-11. Figures 6 to 9 depict the performance indicators of incidence, frequency, duration rates and injury index (see page 5 for definitions).

Performance indicator trends for metalliferous mining in 2010-11 are summarised below.

- The overall incidence rate improved by 17%, falling from 5.9 to 4.9. The surface incidence rate improved by 19% (from 5.7 to 4.6) whereas the underground incidence rate deteriorated by 6% (from 7.7 to 8.2).
- The overall frequency rate improved by 13%, falling from 3.0 to 2.6. The surface frequency rate improved by 17% (from 2.9 to 2.4) whereas the underground frequency rate deteriorated by 11% (from 3.5 to 3.9).
- The overall duration rate deteriorated by 12%, rising from 19.4 to 21.7. The surface duration rate deteriorated by 22% (from 18.0 to 22.0) whereas the underground duration rate improved by 27% (from 28 2 to 20.5).
- The decrease in frequency rate was marginally greater than the rise in duration rate, resulting in a small overall improvement of 3% for the injury index (from 58 to 56). The surface injury index remained unchanged at 53 whereas the underground injury index improved by 21% (from 100 to 79).

Metalliferous injury percentage breakdown for 2010-11

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: Back injuries, at 23%, accounted for the largest proportion of underground injuries. Arm and leg injuries, both at 21%, accounted equally for the next largest proportion, followed by hand injuries at 18%. Shoulder injuries accounted for 53% of arm injuries, while knees and ankles together made up 67% of leg injuries.
- Surface: Leg injuries, at 24%, accounted for the largest proportion of surface injuries, followed by arm injuries and hand injuries, both at 16%. Of the surface leg injuries, 36% were to ankles, and 34% were to knees, together making up 70% of leg injuries.

Injuries by nature

- Underground: Sprain or strain, at 46%, was the highest ranking nature of injury for underground injuries, followed by fracture at 14%, then laceration at 10%.
- Surface: Sprain or strain, at 42%, was the highest ranking nature of injury for surface injuries, followed by fracture at 16%, then crushing at 7%.

Injuries by location

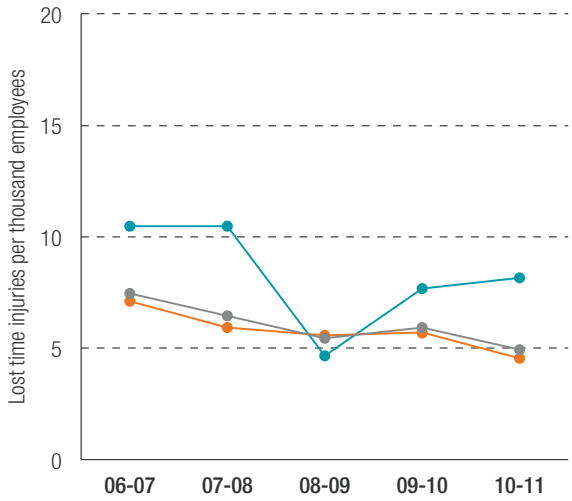
- Underground: The largest proportion of underground injuries occurred in production and development areas at 76%, followed by access and haulage ways at 14%, then workshops and dumping areas, both at 3%.
- Surface: The largest proportion of surface injuries occurred in treatment plants at 34%, followed by open pits at 19%, then workshops at 16%.

Injuries by type of accident

- Underground: The most common accident type for underground injuries was rockfall at 20%, followed by over-exertion or strenuous movements at 17%, then slip or trip and stepping, both at 13%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 22%, followed by stepping and caught by or between moving objects, both at 12%.

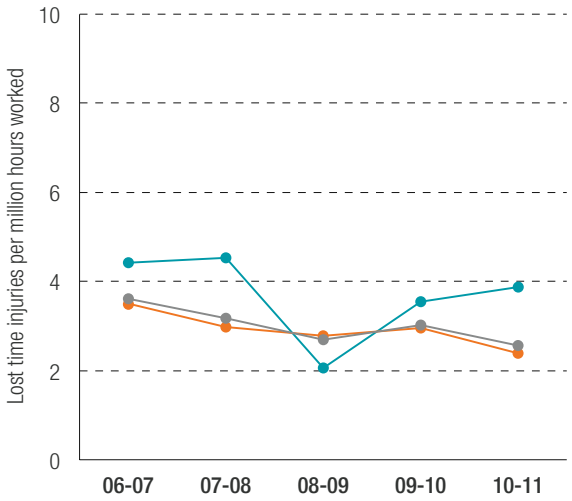
Metalliferous performance indicators 2006-07 to 2010-11

FIGURE 6 INCIDENCE RATE



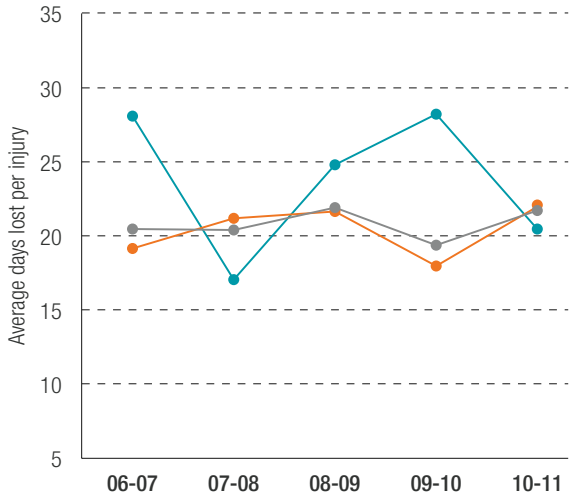
	06-07	07-08	08-09	09-10	10-11
Underground	10.5	10.5	4.6	7.7	8.2
Surface	7.1	5.9	5.6	5.7	4.6
Total	7.5	6.5	5.5	5.9	4.9

FIGURE 7 FREQUENCY RATE



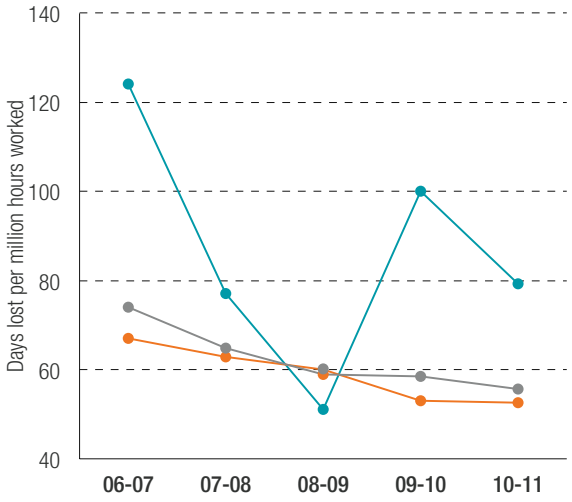
	06-07	07-08	08-09	09-10	10-11
Underground	4.4	4.5	2.1	3.5	3.9
Surface	3.5	3.0	2.8	2.9	2.4
Total	3.6	3.2	2.7	3.0	2.6

FIGURE 8 DURATION RATE



	06-07	07-08	08-09	09-10	10-11
Underground	28.1	17.0	24.8	28.2	20.5
Surface	19.2	21.2	21.6	18.0	22.0
Total	20.5	20.4	21.9	19.4	21.7

FIGURE 9 INJURY INDEX



	06-07	07-08	08-09	09-10	10-11
Underground	124	77	51	100	79
Surface	67	63	60	53	53
Total	74	65	59	58	56

INJURIES BY COMMODITIES CONTINUED

Gold performance indicators

The performance indicators for the gold sector deteriorated during 2010-11. 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 2010-11 are summarised below.

- The overall incidence rate deteriorated significantly by 92%, rising from 6.0 to 11.5. The surface incidence rate deteriorated significantly by 148% (from 6.0 to 14.9), while the underground incidence rate deteriorated by 32% (from 6.2 to 8.2).
- The overall frequency rate deteriorated by 16%, rising from 3.1 to 3.6. The surface frequency rate deteriorated by 3% (from 3.3 to 3.4), while the underground frequency rate deteriorated significantly by 43% (from 2.8 to 4.0).
- The overall duration rate improved slightly by 2%, falling from 25.9 to 25.4. The surface duration rate deteriorated by 15% (from 22.2 to 25.6) whereas the underground duration rate improved by 30% (from 35.3 to 23.4).
- The rise in frequency rate was greater than the fall in duration rate, resulting in a 12% overall deterioration for the injury index (from 81 to 91). The surface injury index deteriorated by 21% (from 73 to 88) whereas the underground injury index improved slightly by 2% (from 100 to 98).

Gold injury percentage breakdown for 2010-11

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: Arm injuries and leg injuries, both at 22%, accounted for the largest proportion of underground injuries, followed by back and hand injuries, both at 20%.
- Surface: Leg injuries, at 27%, accounted for the largest proportion of surface injuries, followed by arm and hand injuries, both at 17%, then back injuries at 11%. Of the leg injuries, 55% were to knees. Of the arm injuries, 64% were to shoulders.

Injuries by nature

- Underground: Sprain or strain, at 38%, was the highest ranking nature of injury for underground injuries, followed by fracture at 18%, then laceration at 13%.
- Surface: Sprain or strain, at 43%, was the highest ranking nature of injury for surface injuries, followed by fracture at 16%, then laceration at 9%.

Injuries by location

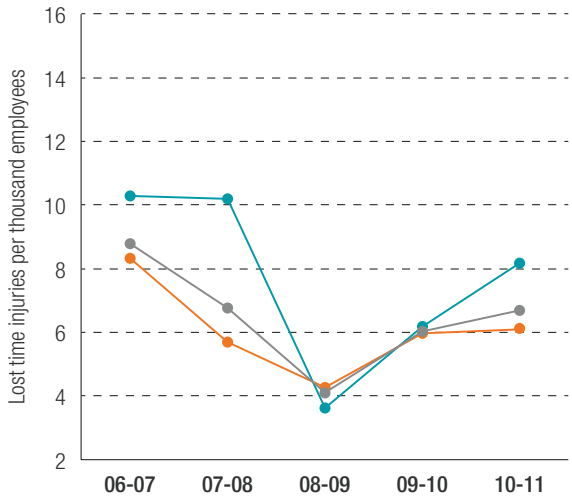
- Underground: The largest proportion of underground injuries occurred in production and development at 84%, followed by access and haulage ways at 13%, then dumping areas at 2%.
- Surface: The largest proportion of surface injuries occurred in treatment plants at 28%, followed closely by open pits at 27%, then workshops at 18%.

Injuries by type of accident

- Underground: The most common accident type for underground injuries was rockfall at 18%, followed by over-exertion or strenuous movements and slip or trip, both at 13%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 21%, followed by caught by or between moving objects at 15%, stepping at 12%, then slip or trip at 11%.

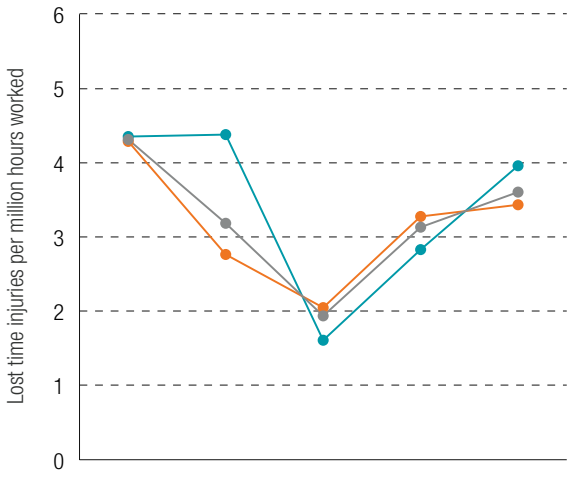
Gold performance indicators 2006-07 to 2010-11

FIGURE 10 INCIDENCE RATE



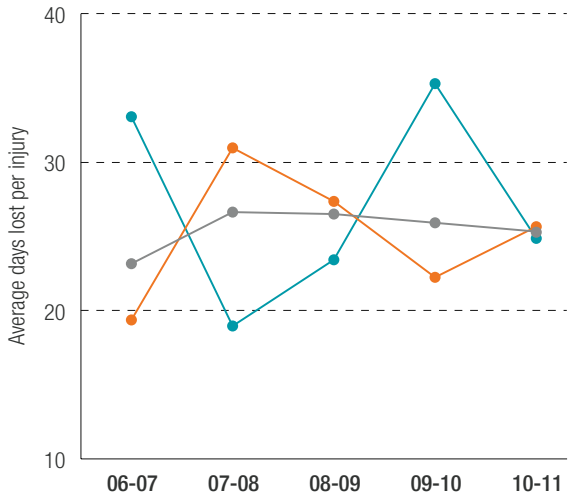
	06-07	07-08	08-09	09-10	10-11
Underground	10.3	10.2	3.6	6.2	8.2
Surface	8.3	5.7	4.3	6.0	6.1
Total	8.8	6.8	4.1	6.0	6.7

FIGURE 11 FREQUENCY RATE



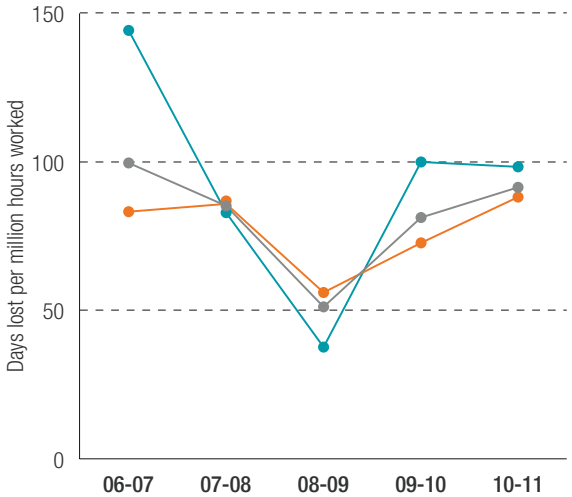
	06-07	07-08	08-09	09-10	10-11
Underground	4.4	4.4	1.6	2.8	4.0
Surface	4.3	2.8	2.0	3.3	3.4
Total	4.3	3.2	1.9	3.1	3.6

FIGURE 12 DURATION RATE



	06-07	07-08	08-09	09-10	10-11
Underground	33.1	18.9	23.4	35.3	24.8
Surface	19.4	31.0	27.3	22.2	25.6
Total	23.2	26.7	26.5	25.9	25.4

FIGURE 13 INJURY INDEX



	06-07	07-08	08-09	09-10	10-11
Underground	144	83	38	100	98
Surface	83	86	56	73	88
Total	100	85	51	81	91

INJURIES BY COMMODITIES CONTINUED

Iron ore performance indicators

The performance indicators for the iron ore sector improved during 2010-11. 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 2010-11 are summarised below.

- The incidence rate improved by 16%, falling from 3.1 to 2.6.
- The frequency rate improved by 13%, falling from 1.5 to 1.3.
- The duration rate deteriorated by 20%, rising from 18.9 to 22.6.
- The rise in duration rate was greater than the fall in frequency rate, resulting in a slight deterioration of 3% for the injury index (from 29 to 30).

Iron ore injury percentage breakdown for 2010-11

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

- Hand injuries, at 21%, accounted for the largest proportion of injuries, followed by leg injuries at 18%, back injuries at 16%, then arm injuries at 14%. Of the leg injuries, 50% were to ankles.

Injuries by nature

- Sprain or strain, at 39%, was the highest ranking nature of injury.
- Fracture, at 24%, was the second-highest ranking nature of injury, followed by crushing at 14%.

Injuries by location

- The largest proportion of injuries occurred in open pits at 31%.
- The second-largest proportion occurred in general surface areas at 19%, followed by workshops at 16%.

Injuries by type of accident

- The most common accident type for injuries was over-exertion or strenuous movements at 18%, followed by caught by or between moving objects at 16%.
- Slip or trip, vehicle or mobile plant jolting or jarring, and fall from height accounted for 11%, 10% and 9% of injuries, respectively.

Iron ore performance indicators 2006-07 to 2010-11

FIGURE 14 INCIDENCE RATE

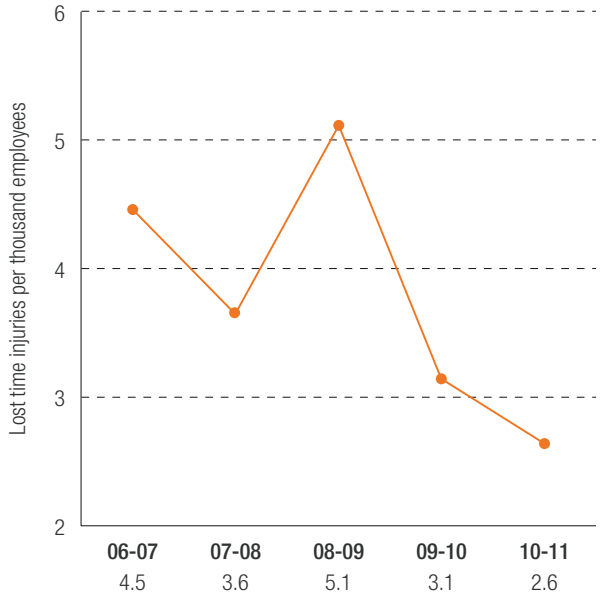


FIGURE 15 FREQUENCY RATE

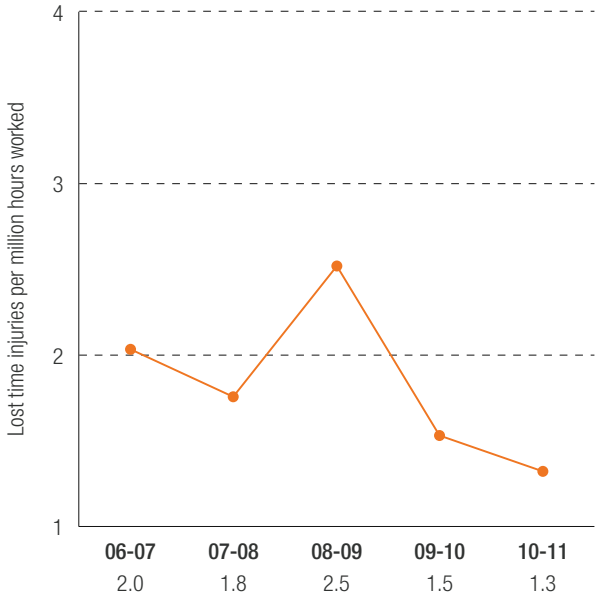


FIGURE 16 DURATION RATE

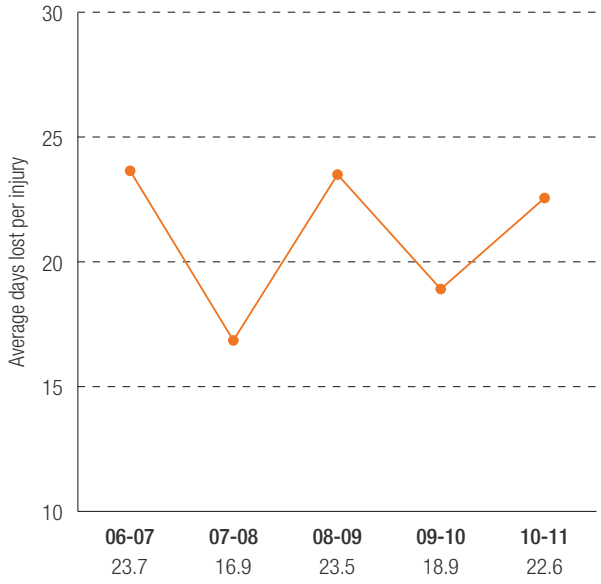
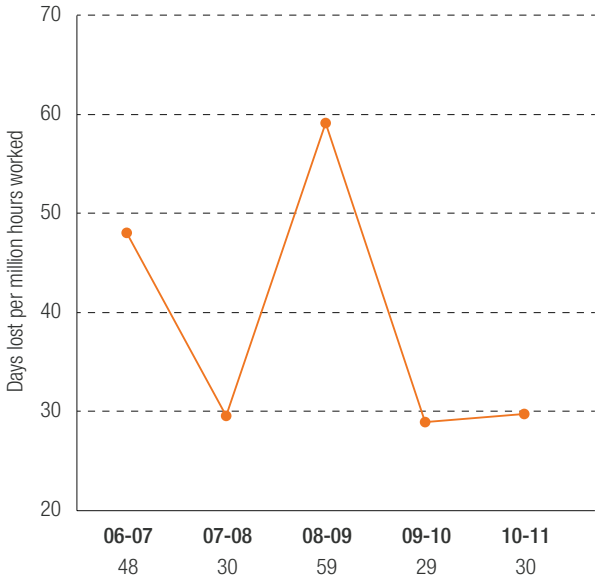


FIGURE 17 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Bauxite and alumina performance indicators

The performance indicators for the bauxite and alumina sector showed improvement in 2010-11. 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 2010-11 are summarised below.

- The incidence rate improved significantly by 34%, falling from 8.7 to 5.7 and almost returning to the 2008-09 rate of 5.5.
- The frequency rate improved significantly by 36%, falling from 4.4 to 2.8, which was a return to the 2008-09 rate.
- The duration rate improved by 20%, falling from 15.8 to 12.7.
- The fall in both frequency rate and duration rate resulted in a significant improvement of 50% for the injury index (from 70 to 35).

Bauxite and alumina injury percentage breakdown for 2010-11

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, at 31%, accounted for the largest proportion of injuries. Of the leg injuries, 42% were to ankles and 26% were to knees.
- Arm injuries, at 16%, accounted for the second-largest proportion of injuries, followed by back injuries at 15%.

Injuries by nature

- Sprain or strain, at 55%, was the highest ranking nature of injury.
- Effects of chemicals or fumes, at 18%, was the second-highest ranking nature of injury, followed by fracture at 11%.

Injuries by location

- The largest proportion of injuries occurred in treatment plants, which accounted for 73%.
- The second-largest proportion occurred in open pits at 10%, followed by crushed ore areas and workshops, both at 5%.

Injuries by type of accident

- The most common accident type for injuries was over-exertion or strenuous movements at 27%, followed by contact with chemicals or fumes at 18%.
- Struck by moving object, slip or trip, and stepping accounted for 10% each.

Bauxite and alumina performance indicators 2006-07 to 2010-11

FIGURE 18 INCIDENCE RATE

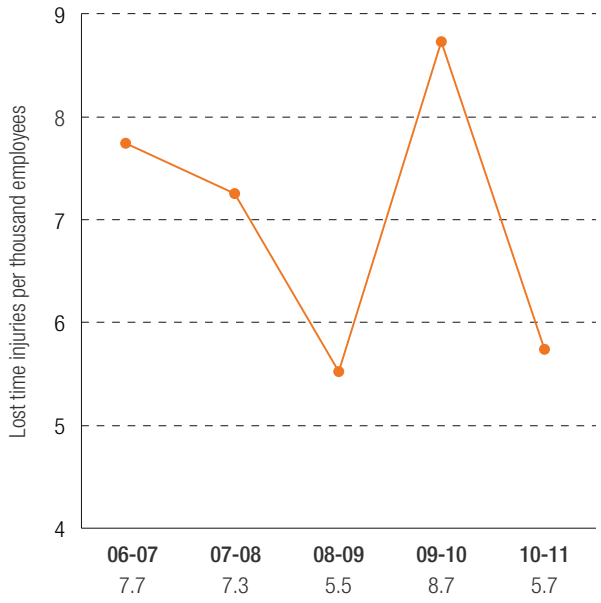


FIGURE 19 FREQUENCY RATE

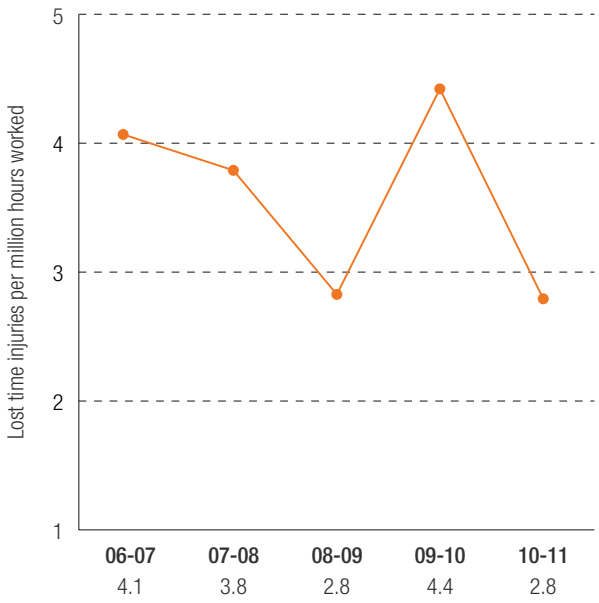


FIGURE 20 DURATION RATE

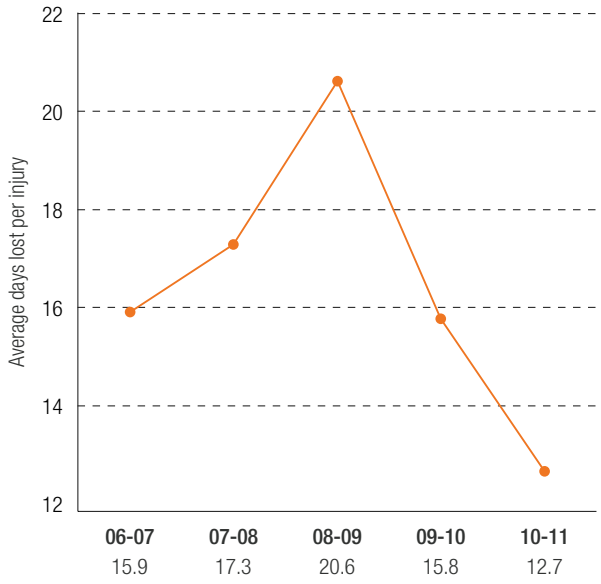
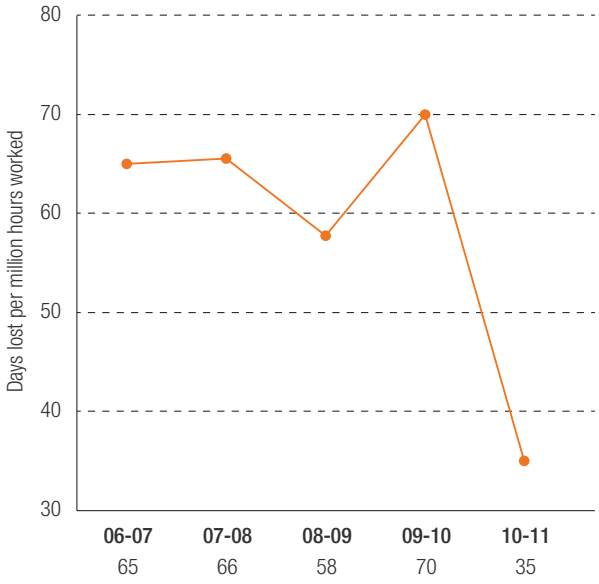


FIGURE 21 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Nickel performance indicators

The performance indicators for the nickel sector showed deteriorating results for 2010-11. 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 2010-11 are summarised below.

- The overall incidence rate deteriorated slightly by 3%, rising from 6.2 to 6.4. The surface incidence rate deteriorated by 4% (from 5.5 to 5.7), while the underground incidence rate deteriorated by 7% (from 8.5 to 9.1).
- The overall frequency rate, while appearing to have remained unchanged at 3.2, actually deteriorated slightly by 3% (from 3.15 to 3.24). The surface frequency rate deteriorated by 3% (from 2.9 to 3.0), while the underground frequency rate deteriorated by 5% (from 3.8 to 4.0).
- The overall duration rate deteriorated significantly by 152%, rising from 11.3 to 28.5. The surface duration rate deteriorated significantly by 183% (from 12.1 to 34.2), while the underground duration rate deteriorated by 57% (from 9.5 to 14.9).
- The rise in both duration rate and frequency rate resulted in a significant deterioration of 158% for the injury index (from 36 to 93). The surface injury index deteriorated by 194% (from 35 to 103), while the underground injury index deteriorated by 64% (from 36 to 59).

Nickel injury percentage breakdown for 2010-11

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: Arm injuries, at 29%, accounted for the largest proportion of underground injuries, followed by leg and hand injuries, both at 18%. Of the arm injuries, 40% were to shoulders.
- Surface: Leg injuries, at 27%, accounted for the largest proportion of surface injuries, followed by hand injuries at 20%, then arm injuries at 17%. Of the leg injuries, 45% were to ankles.

Injuries by nature

- Underground: Sprain or strain, at 53%, was the highest ranking nature of injury for underground injuries, followed by fracture at 12%.
- Surface: Sprain or strain, at 44%, was the highest ranking nature of injury for surface injuries, followed by fracture at 17%, then crushing at 10%.

Injuries by location

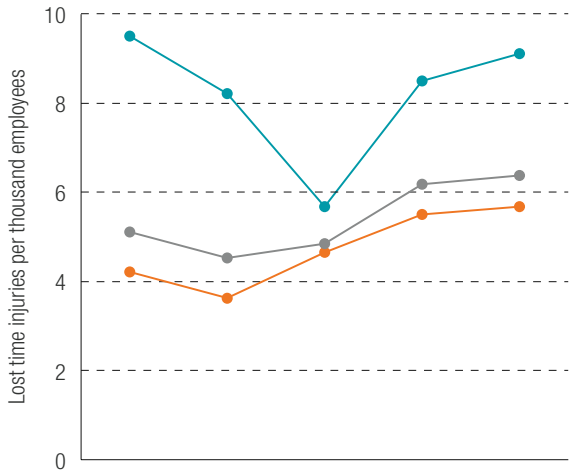
- Underground: The largest proportion of underground injuries occurred in production and development areas at 65%, followed by access and haulage ways at 18%.
- Surface: The largest proportion of surface injuries occurred in treatment plants at 37%, followed by workshops at 32%, then surface general areas at 15%.

Injuries by type of accident

- Underground: The most common accident type for underground injuries was rockfall at 29%, followed by over-exertion or strenuous movements at 24%. The remaining injuries were equally distributed over eight categories.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 20%, followed by stepping at 17%, then struck by moving object at 15%.

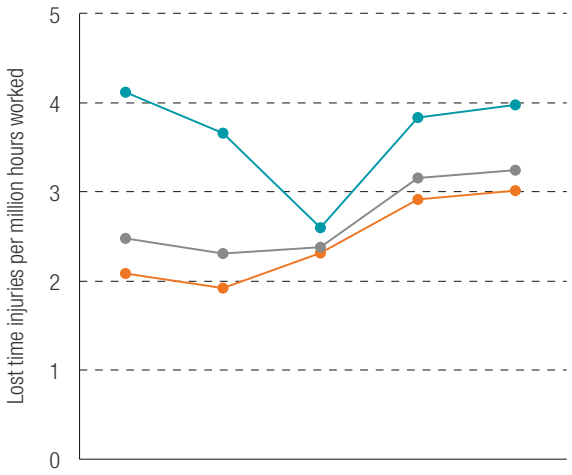
Nickel performance indicators 2006-07 to 2010-11

FIGURE 22 INCIDENCE RATE



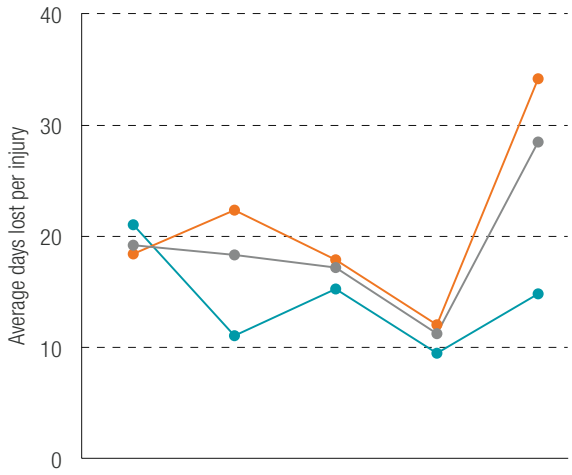
	06-07	07-08	08-09	09-10	10-11
Underground	9.5	8.2	5.7	8.5	9.1
Surface	4.2	3.6	4.6	5.5	5.7
Total	5.1	4.5	4.9	6.2	6.4

FIGURE 23 FREQUENCY RATE



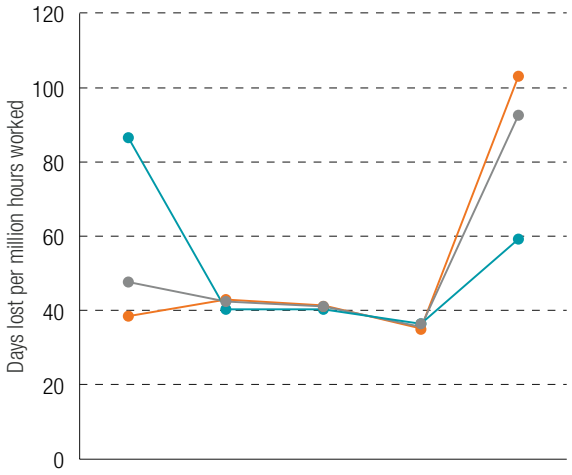
	06-07	07-08	08-09	09-10	10-11
Underground	4.1	3.7	2.6	3.8	4.0
Surface	2.1	1.9	2.3	2.9	3.0
Total	2.5	2.3	2.4	3.2	3.2

FIGURE 24 DURATION RATE



	06-07	07-08	08-09	09-10	10-11
Underground	21.1	11.0	15.3	9.5	14.9
Surface	18.4	22.4	17.9	12.1	34.2
Total	19.3	18.4	17.2	11.3	28.5

FIGURE 25 INJURY INDEX



	06-07	07-08	08-09	09-10	10-11
Underground	87	40	40	36	59
Surface	38	43	41	35	103
Total	48	42	41	36	93

DISABLING INJURIES

Review of disabling injuries during 2010-11

In addition to the 417 mining LTIs in 2010-11, there were 818 DIs reported (801 in metalliferous mines and 17 in coal mines), bringing the total number of reportable injuries to 1,235. Tables 10 and 11 show the injury data and performance indicators.

Of the disabling injuries, 539 resulted in the injured person being disabled for two weeks or more.

TABLE 10 DISABLING INJURIES 2010-11

Sector	No. of employees	Disabling injuries			Reportable injuries (DIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Metalliferous surface	72,279	619	8.6	4.5	948	13.1	6.9
Metalliferous underground	8,689	182	20.9	9.9	253	29.1	13.8
Metalliferous total	**80,968**	**801**	**9.9**	**5.1**	**1,201**	**14.8**	**7.7**
Coal total	**985**	**17**	**17.3**	**12.9**	**34**	**34.5**	**25.9**
Total mining	**81,953**	**818**	**10.0**	**5.2**	**1,235**	**15.1**	**7.8**
Exploration total	**3,340**	**37**	**11.1**	**5.4**	**83**	**24.9**	**12.1**

TABLE 11 DISABLING INJURIES BY MINERAL MINED 2010-11

Mineral mined	No. of employees	Disabling injuries			Reportable injuries (DIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Iron ore	30,309	191	6.3	3.1	271	8.9	4.5
Gold	18,895	211	11.2	6.0	338	17.9	9.6
Nickel	9,080	169	18.6	9.5	227	25.0	12.7
Bauxite and alumina	10,808	134	12.4	6.0	196	18.1	8.8
Base metals	2,316	30	13.0	7.3	48	20.7	11.8
Mineral sands	1,871	11	5.9	3.9	21	11.2	7.5
Diamonds	1,686	19	11.3	5.5	24	14.2	6.9
Salt	1,296	3	2.3	2.0	10	7.7	6.5
Coal	985	17	17.3	12.9	34	34.5	25.9
Manganese ore	866	10	11.5	5.6	13	15.0	7.3
Construction materials	697	1	1.4	0.8	6	8.6	4.6
Tin, tantalum and lithium	554	1	1.8	0.9	4	7.2	3.5
Other	2,590	21	8.1	5.4	43	16.6	11.0
Total mining	**81,953**	**818**	**10.0**	**5.2**	**1,235**	**15.1**	**7.8**

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.*

DISABLING INJURIES CONTINUED

Disabling injury performance indicators

The disabling injury performance indicators for mining deteriorated during 2010-11. Figures 26 to 29 depict the performance indicators of incidence rate, frequency rate, days off per injury and days off per million hours worked.

Performance indicator trends for disabling injuries in 2010-11 are summarised below.

- The overall incidence rate deteriorated slightly by 2%, rising from 9.8 to 10.0. The surface incidence rate improved by 1% (from 8.8 to 8.7), whereas the underground incidence rate deteriorated by 16% (from 18.0 to 20.9).
- The overall frequency rate deteriorated by 4%, rising from 5.0 to 5.2. The surface frequency rate remained unchanged at 4.6, whereas the underground frequency rate deteriorated by 19% (from 8.3 to 9.9).
- The average days off per disabling injury for all mining deteriorated slightly by 3%, rising from 36.7 to 37.8. The days off per surface disabling injury deteriorated by 13% (from 36.2 to 41.0), whereas the days off per underground disabling injury improved by 31% (from 38.6 to 26.5).
- The rise in both frequency rate and days off per disabling injury resulted in a deterioration of 7% for the overall days off per million hours worked (from 183 to 196). The days off per surface million hours worked deteriorated by 14% (from 165 to 188), whereas the days off per underground million hours worked improved by 18% (from 321 to 263).

Disabling injury percentage breakdown for 2010-11

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 and back injuries, at 25% and 24% respectively, accounted almost equally for the largest proportion of underground injuries, followed by leg injuries at 18%, then hand injuries at 15%.
- Surface: Arm injuries, at 25%, accounted for the largest proportion of surface disabling injuries, followed by back injuries at 23%, then hand injuries and leg injuries, both at 20%. Of the arm injuries, 45% were to shoulders.

Injuries by nature

- Underground: Sprain or strain, at 59%, was the highest ranking nature of injury for underground disabling injuries, followed by laceration at 10%, then bruise or contusion at 8%.
- Surface: Sprain or strain, at 65%, was the highest ranking nature of injury for surface disabling injuries, followed by laceration (8%), bruise or contusion (7%), then crushing (6%).

Injuries by location

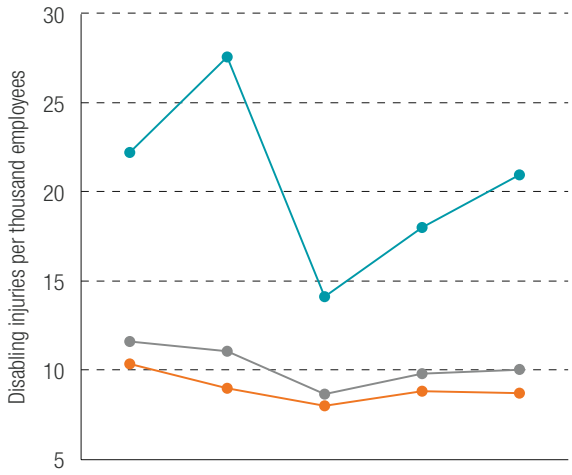
- Underground: The largest proportion of underground injuries occurred in production and development areas at 56%, followed by access and haulage ways at 26%, then workshops at 5%.
- Surface: The largest proportion of surface injuries occurred in treatment plants at 34%, followed by open pits at 22%, then workshops at 16%.

Injuries by type

- Underground: The most common accident type for underground injuries was over-exertion or strenuous movements at 36%, followed by vehicle or mobile equipment jolting or jarring at 10%, stepping at 9%, then slip or trip and rockfall, both at 8%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 39%, followed by stepping at 10%, then slip or trip and caught by or between moving objects, both at 8%.

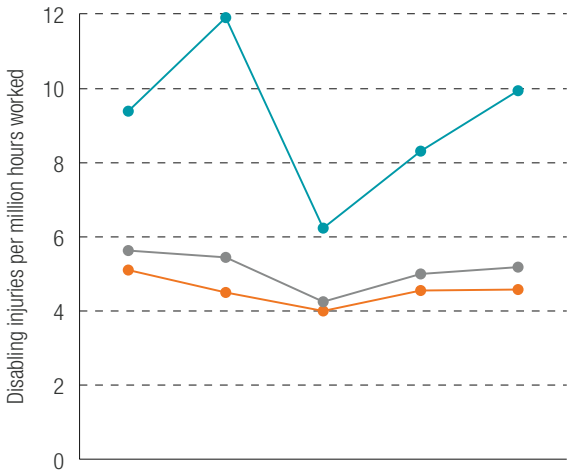
Disabling injury performance indicators 2006-07 to 2010-11

FIGURE 26 INCIDENCE RATE



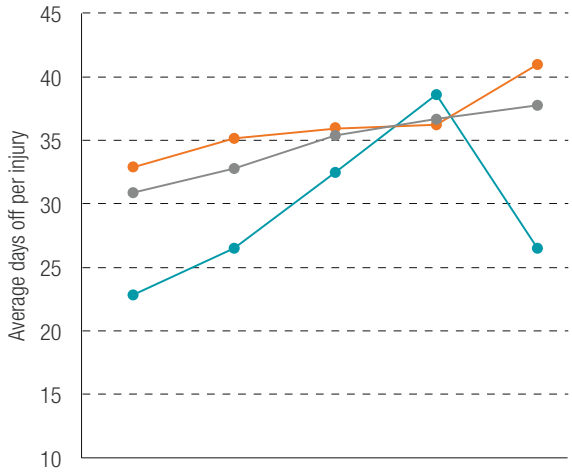
	06-07	07-08	08-09	09-10	10-11
Underground	22.2	27.6	14.1	18.0	20.9
Surface	10.4	9.0	8.0	8.8	8.7
Total	11.6	11.0	8.6	9.8	10.0

FIGURE 27 FREQUENCY RATE



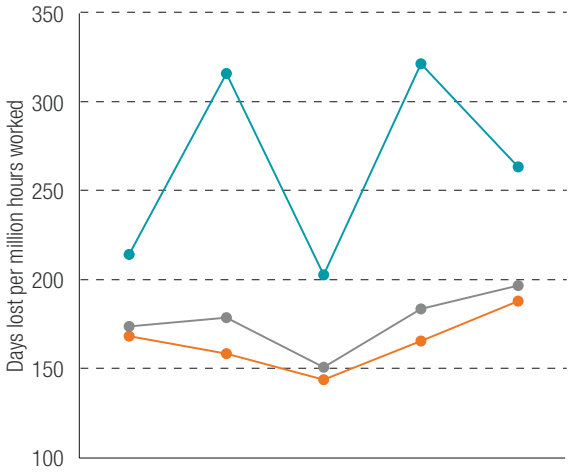
	06-07	07-08	08-09	09-10	10-11
Underground	9.4	11.9	6.2	8.3	9.9
Surface	5.1	4.5	4.0	4.6	4.6
Total	5.6	5.5	4.3	5.0	5.2

FIGURE 28 AVERAGE DAYS OFF PER INJURY



	06-07	07-08	08-09	09-10	10-11
Underground	22.8	26.5	32.5	38.6	26.5
Surface	32.9	35.2	36.0	36.2	41.0
Total	30.9	32.8	35.4	36.7	37.8

FIGURE 29 DAYS OFF PER MILLION HOURS WORKED



	06-07	07-08	08-09	09-10	10-11
Underground	214	316	203	321	263
Surface	168	158	144	165	188
Total	174	179	150	183	196

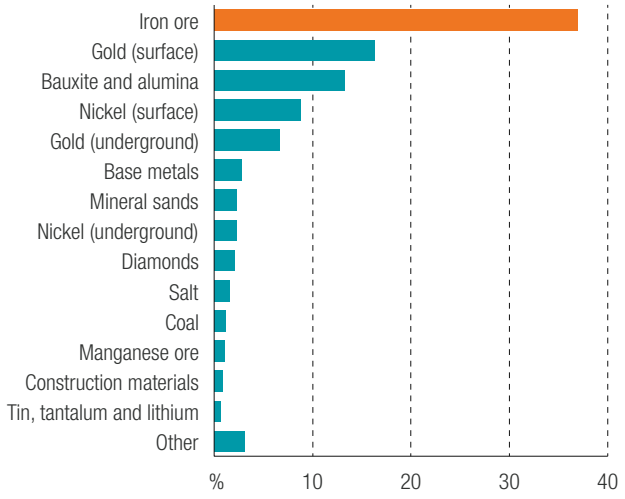
APPENDICES

APPENDIX A

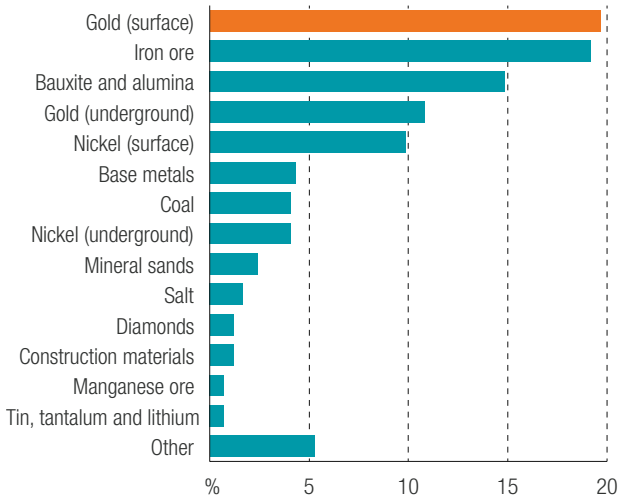
WESTERN AUSTRALIAN MINES 2010-11

417 lost time injuries

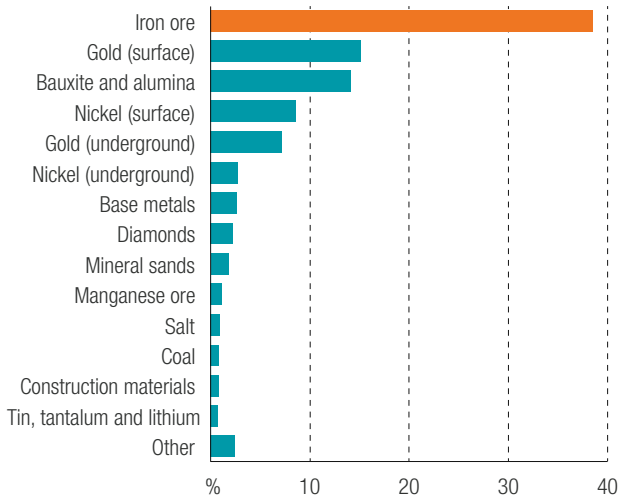
PERCENTAGE OF EMPLOYEES



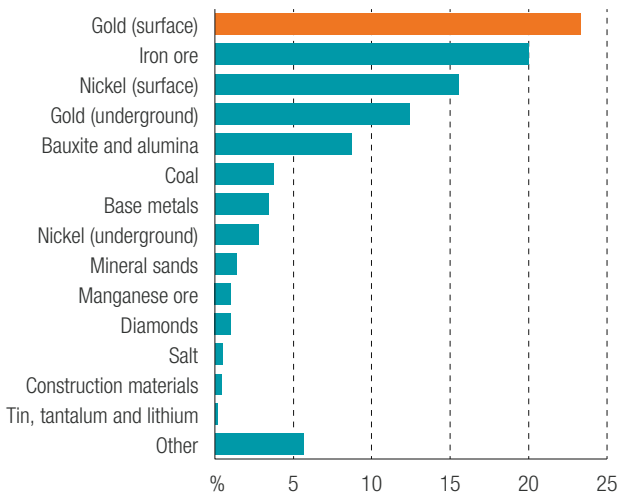
PERCENTAGE OF INJURIES



PERCENTAGE OF MILLION HOURS WORKED



PERCENTAGE OF WORK DAYS LOST

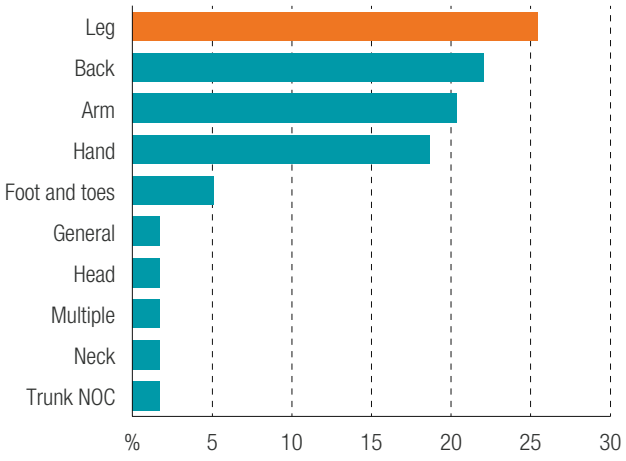


APPENDIX B

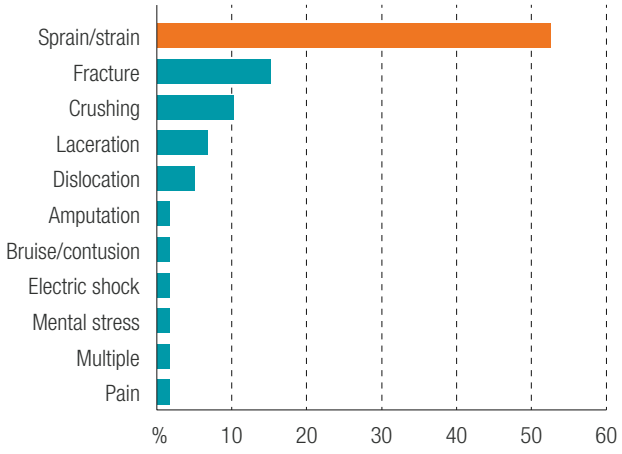
SERIOUS INJURIES UNDERGROUND 2010-11

59 lost time injuries

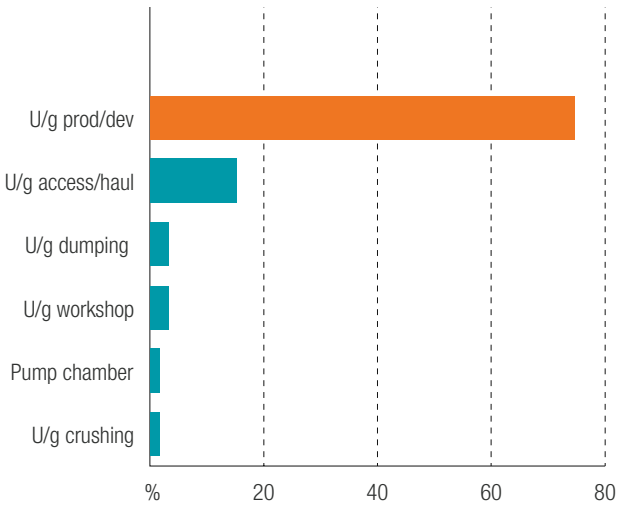
PART OF BODY



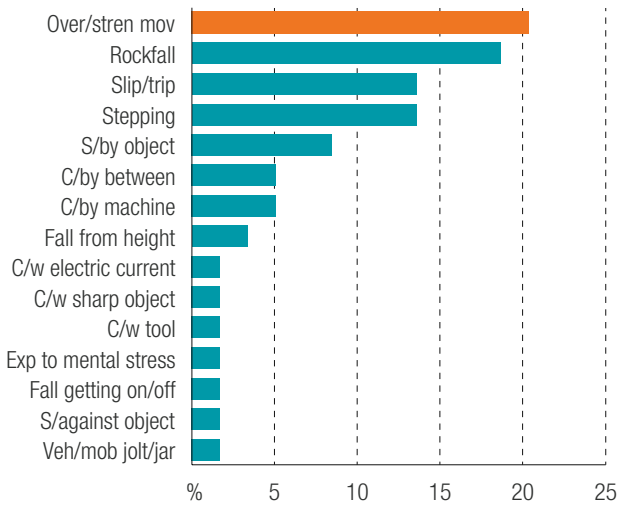
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

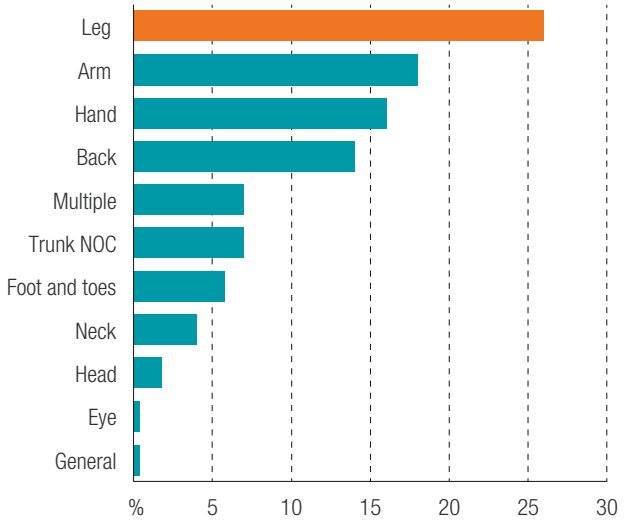


APPENDIX C

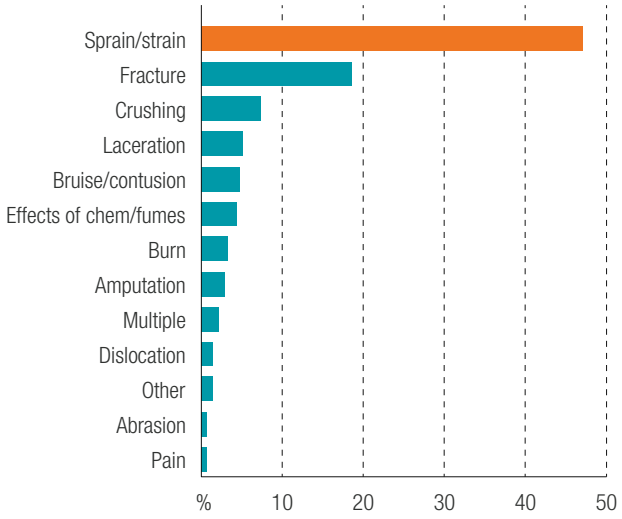
SERIOUS INJURIES SURFACE 2010-11

274 lost time injuries

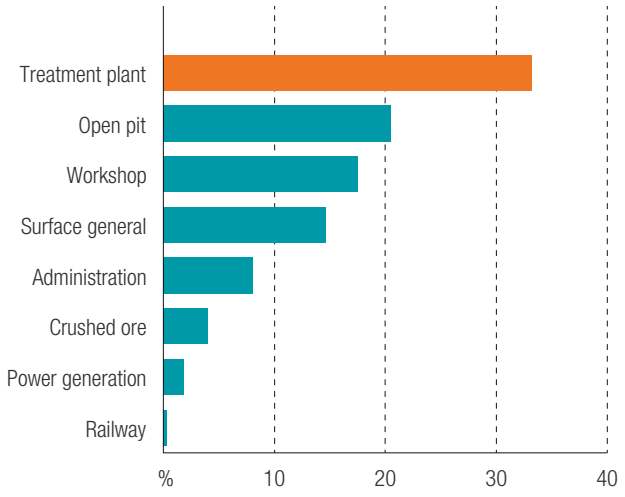
PART OF BODY



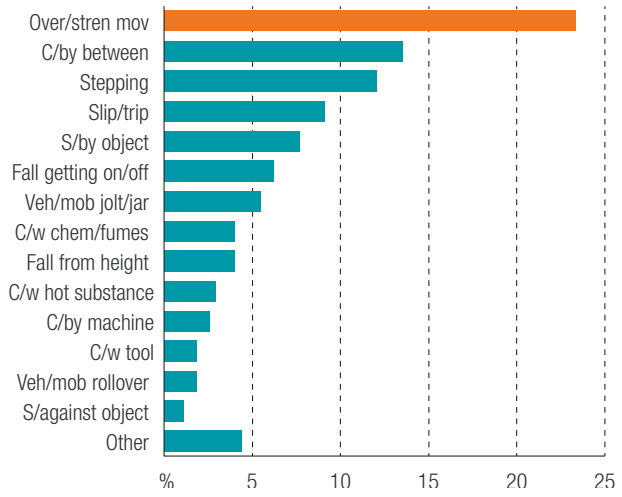
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

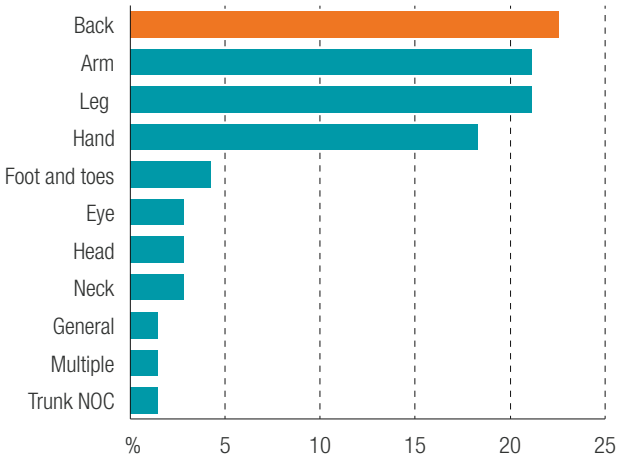


APPENDIX D

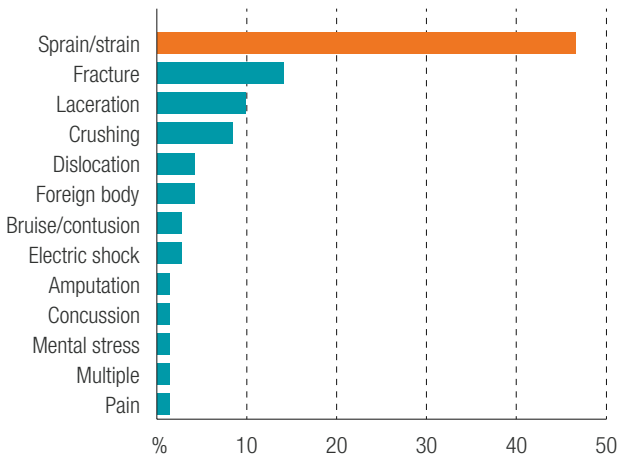
METALLIFEROUS UNDERGROUND INJURIES 2010-11

71 lost time injuries

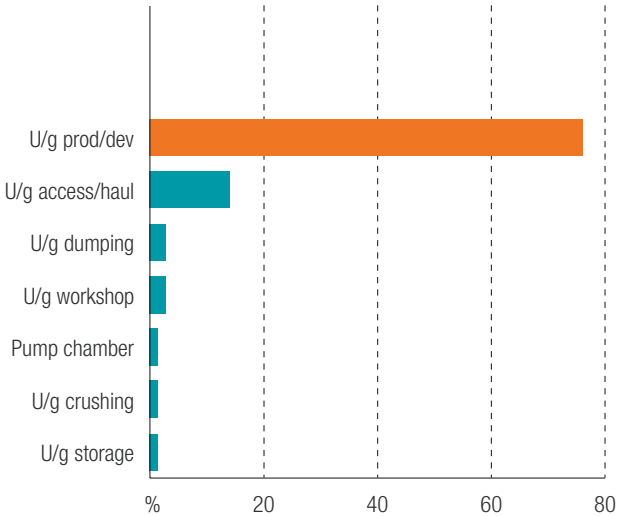
PART OF BODY



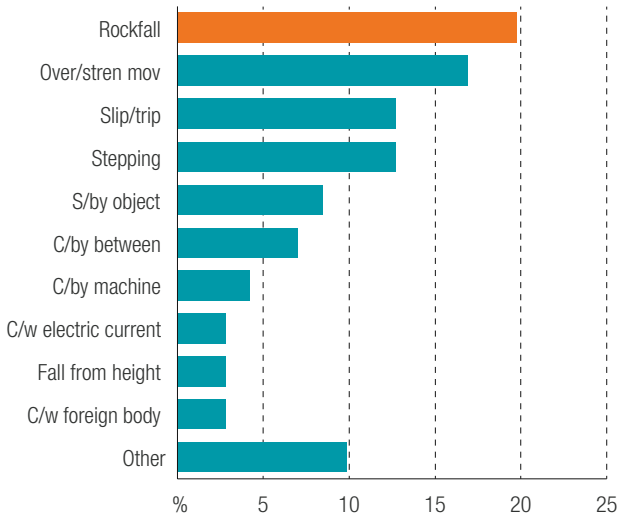
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

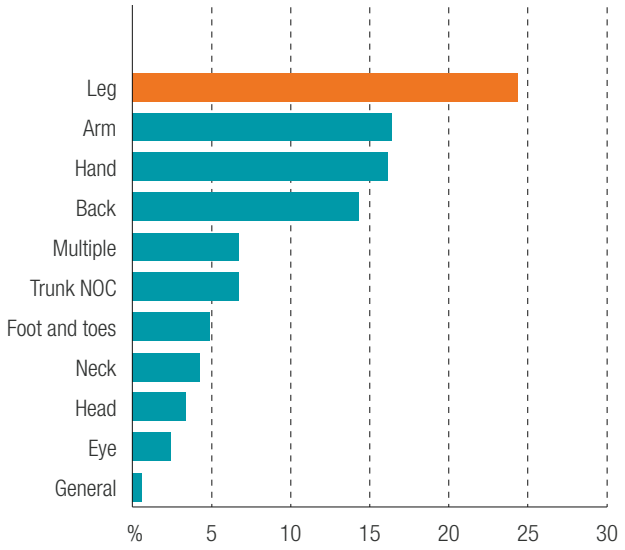


APPENDIX E

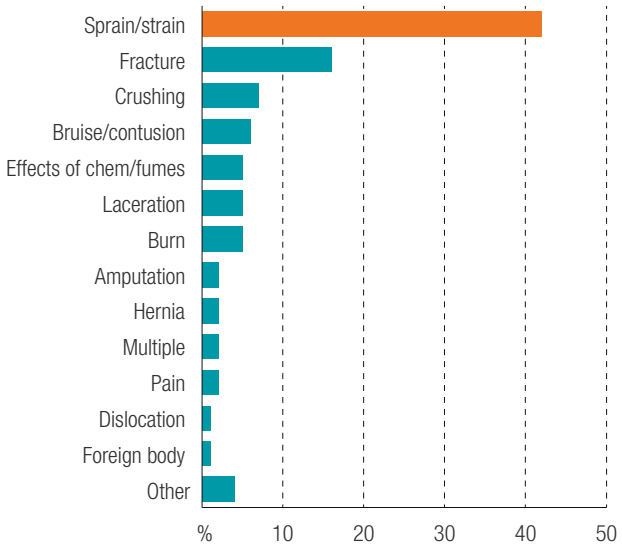
METALLIFEROUS SURFACE INJURIES 2010-11

329 lost time injuries

PART OF BODY



NATURE OF INJURY



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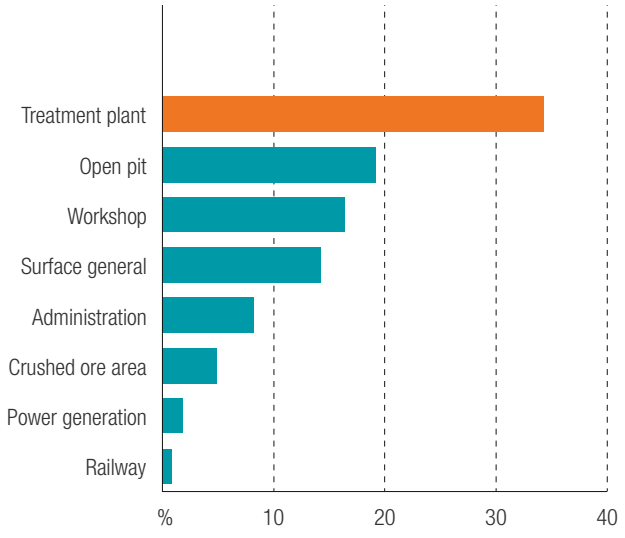
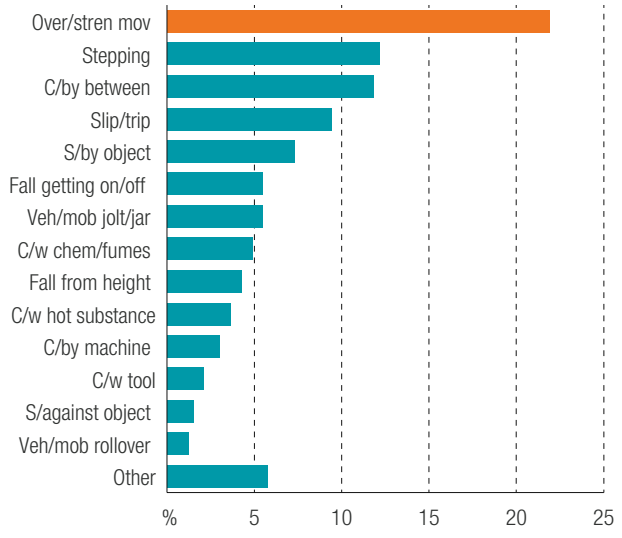


TYPE OF ACCIDENT

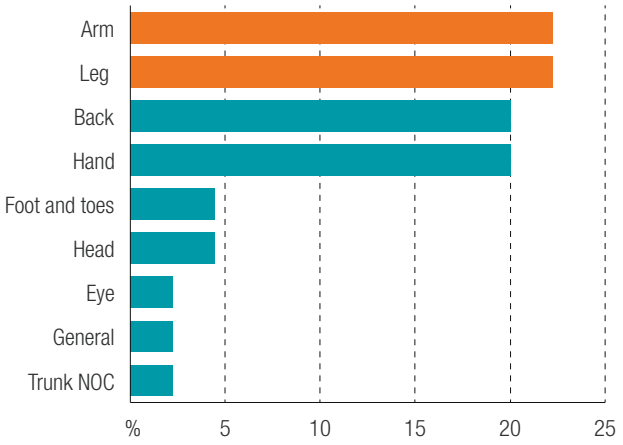


APPENDIX F

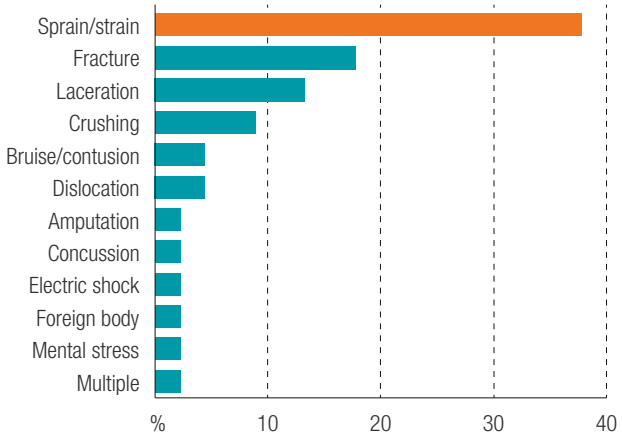
GOLD UNDERGROUND INJURIES 2010-11

45 lost time injuries

PART OF BODY



NATURE OF INJURY



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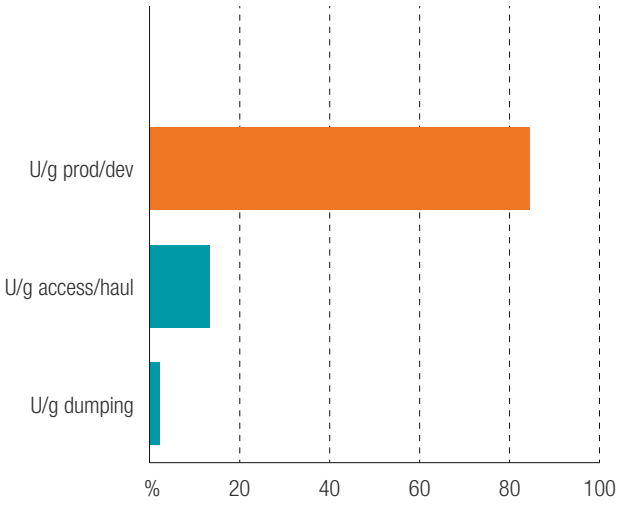
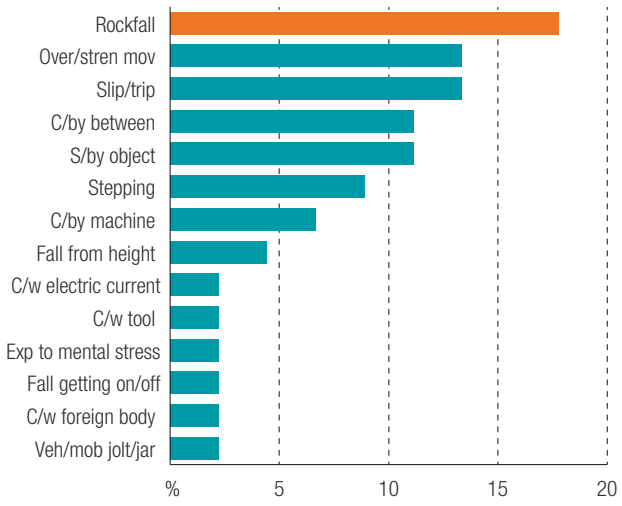


TYPE OF ACCIDENT

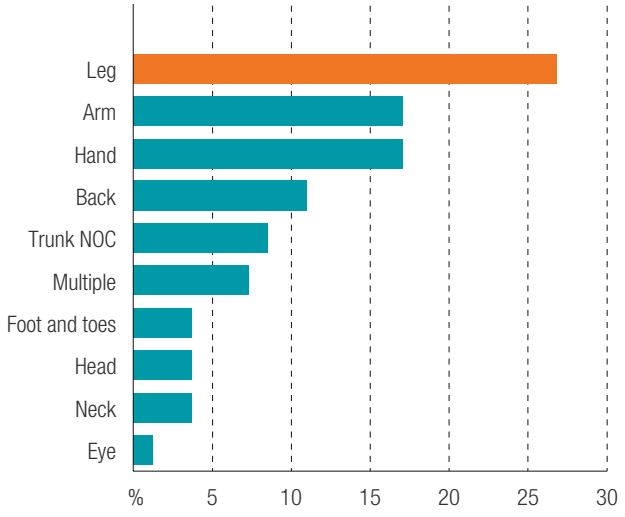


APPENDIX G

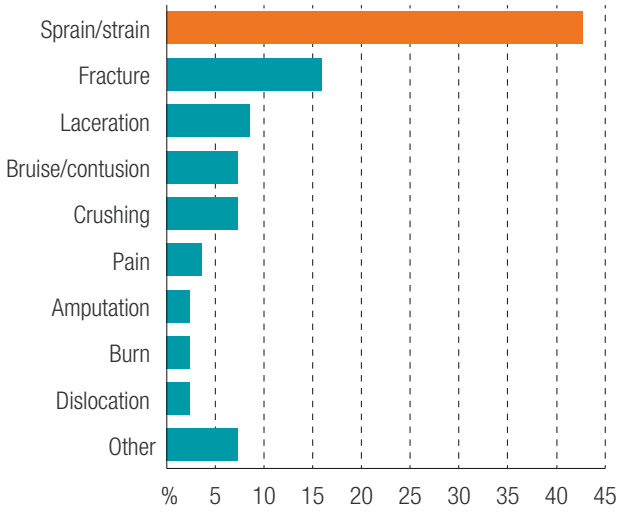
GOLD SURFACE INJURIES 2010-11

82 lost time injuries

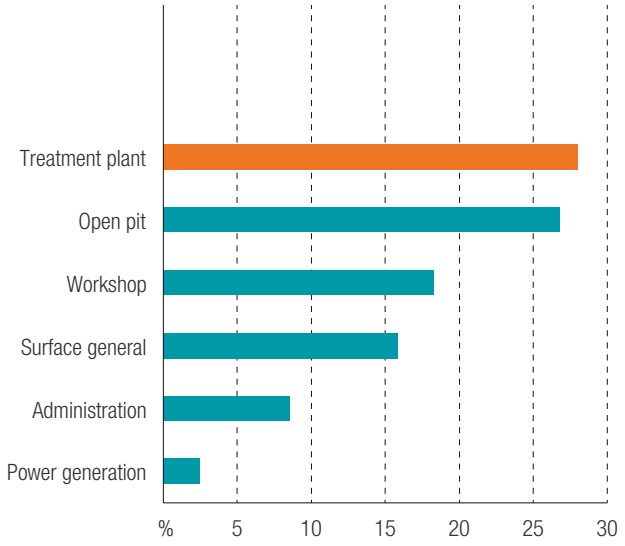
PART OF BODY



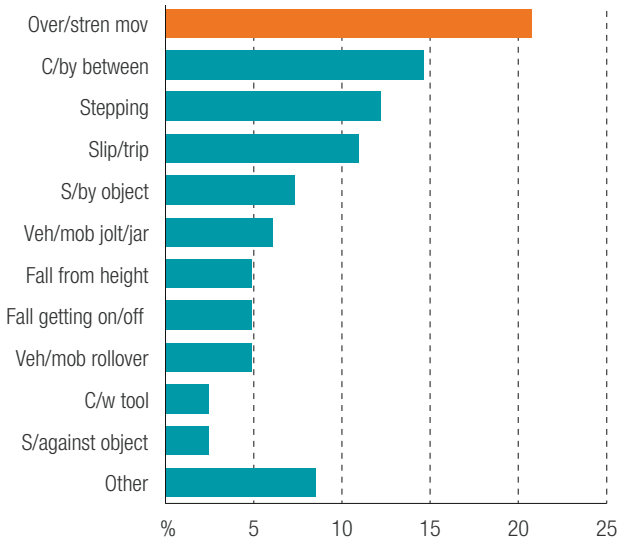
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

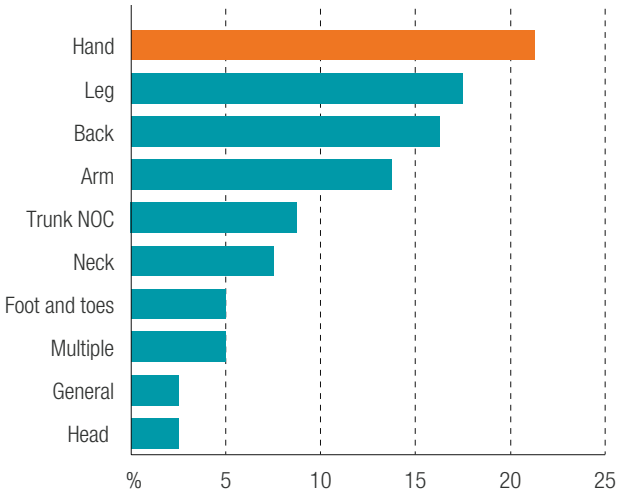


APPENDIX H

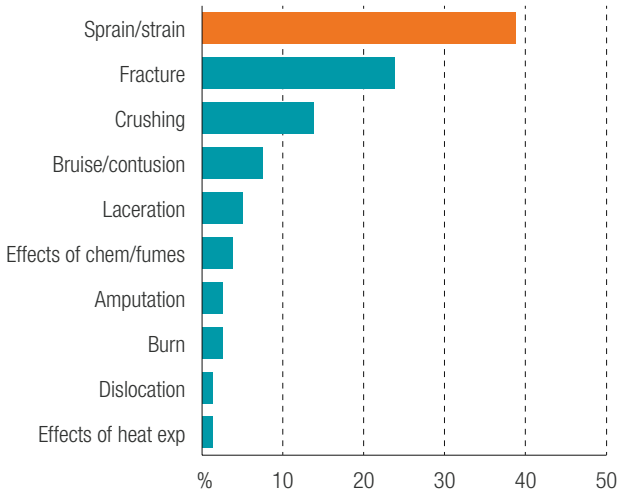
IRON ORE INJURIES 2010-11

80 lost time injuries

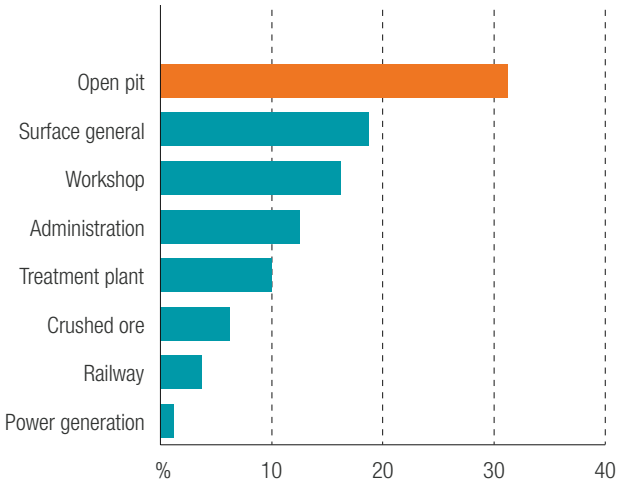
PART OF BODY



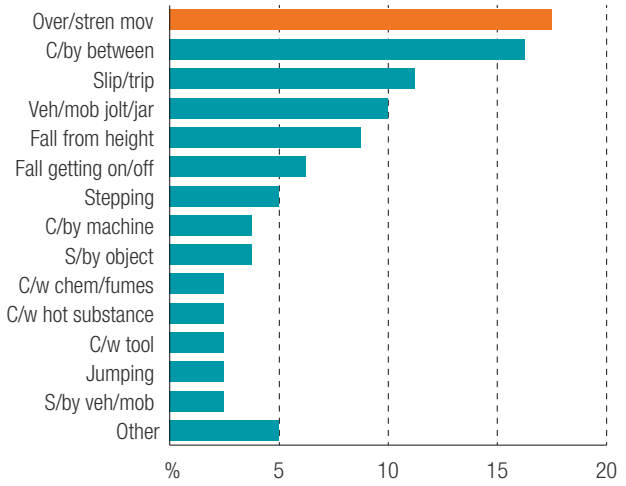
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

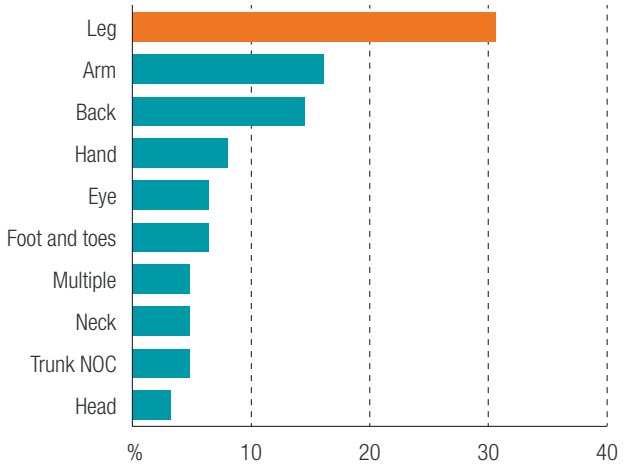


APPENDIX I

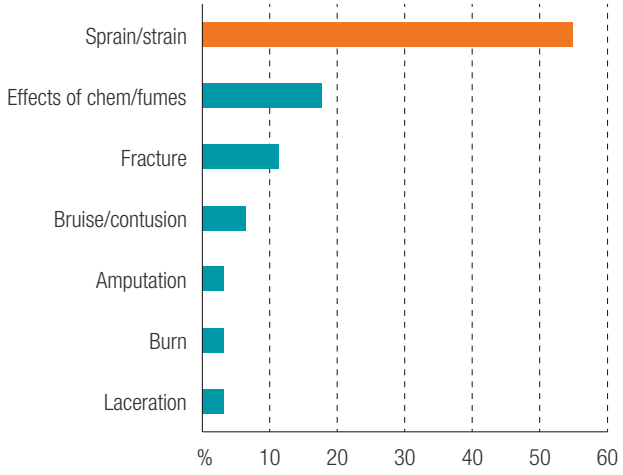
BAUXITE AND ALUMINA INJURIES 2010-11

62 lost time injuries

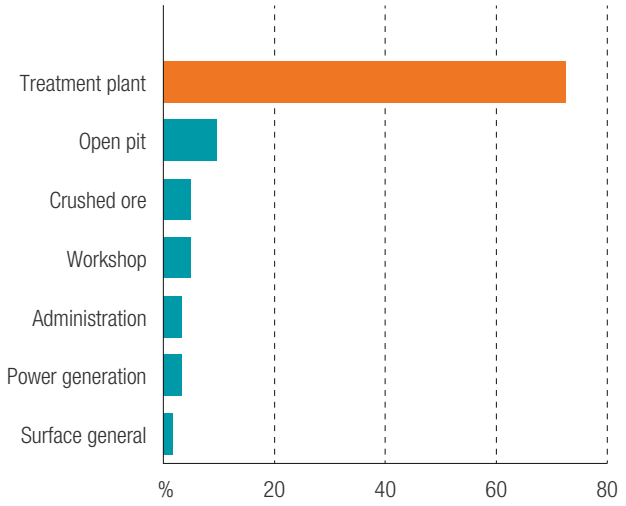
PART OF BODY



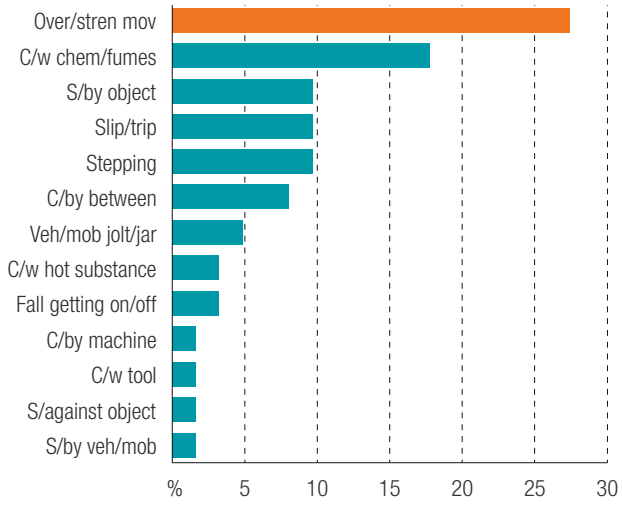
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

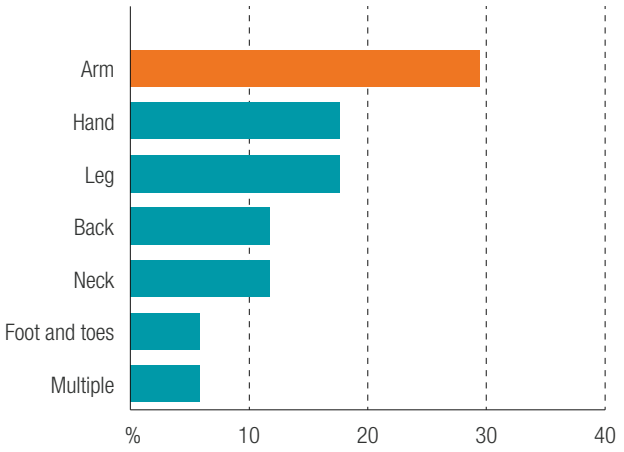


APPENDIX J

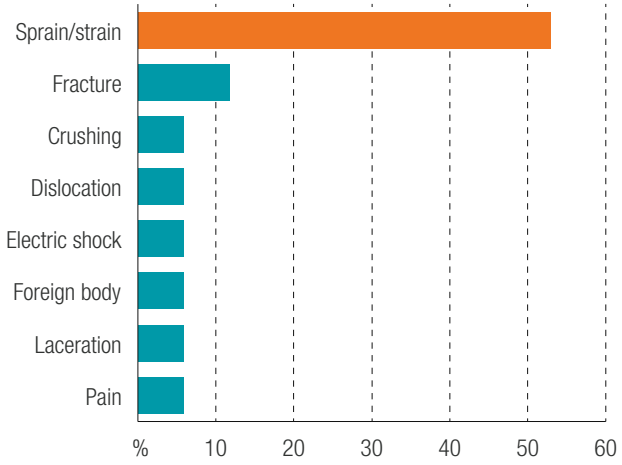
NICKEL UNDERGROUND INJURIES 2010-11

17 lost time injuries

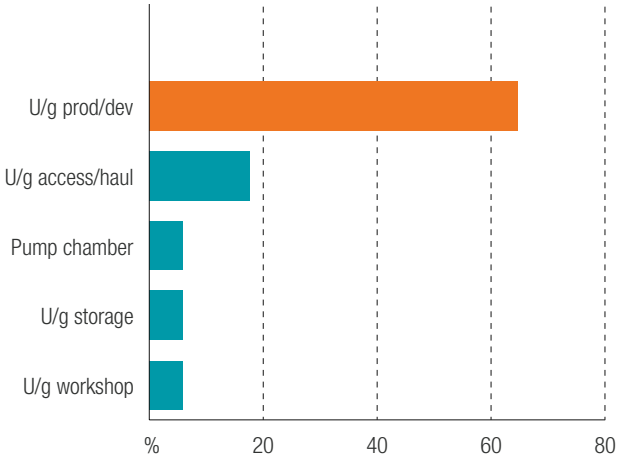
PART OF BODY



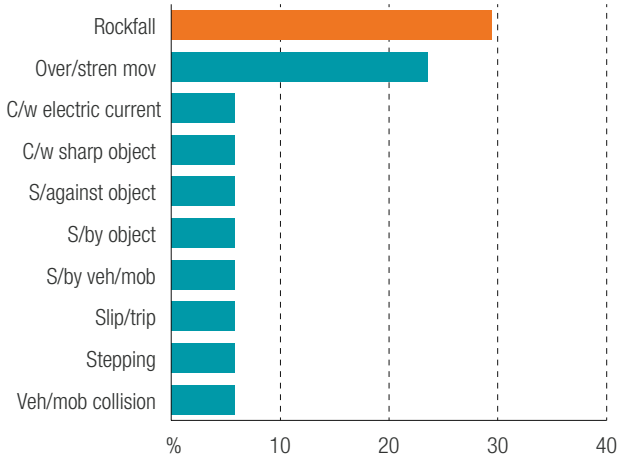
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

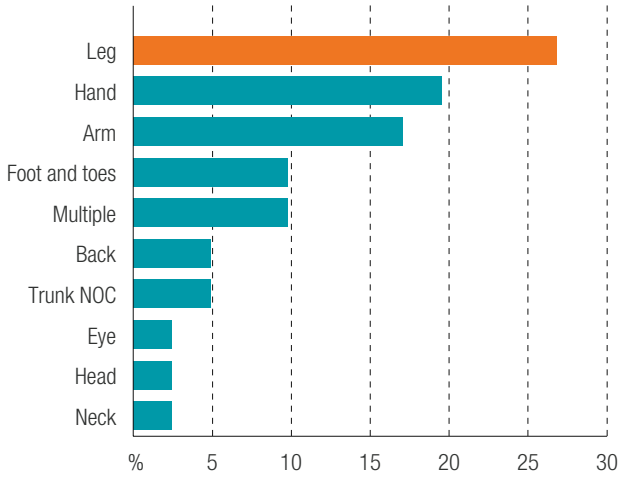


APPENDIX K

NICKEL SURFACE INJURIES 2010-11

41 lost time injuries

PART OF BODY



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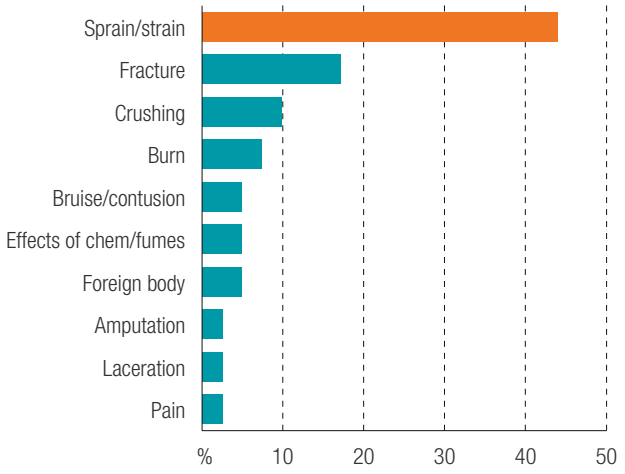
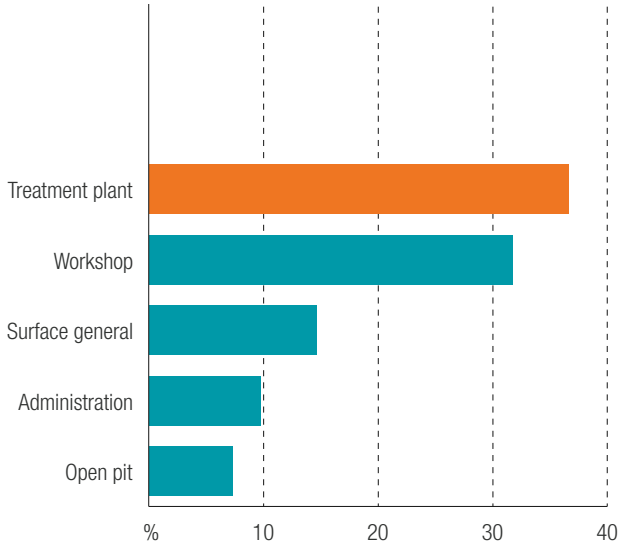
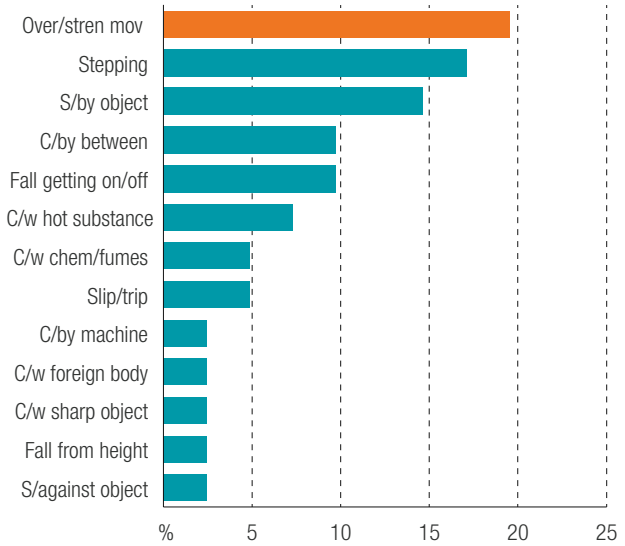


LOCATION OF ACCIDENT



TYPE OF ACCIDENT

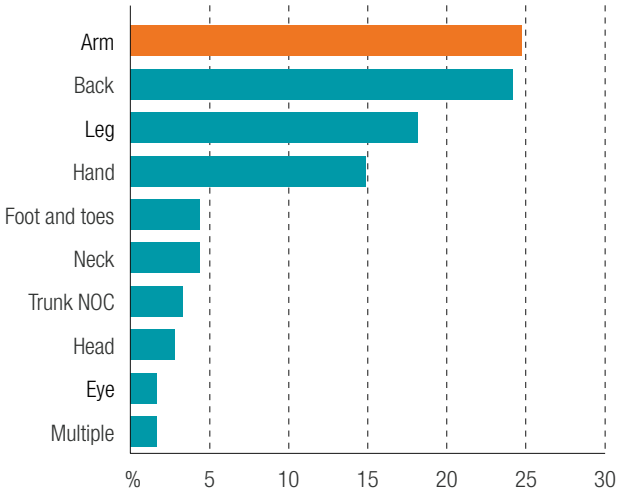


APPENDIX L

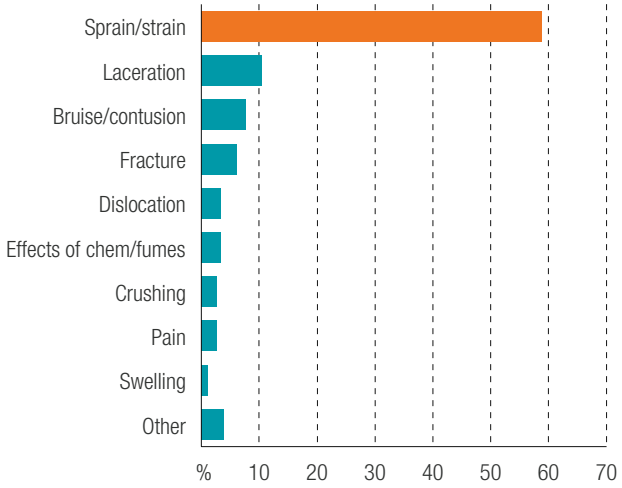
DISABLING INJURIES UNDERGROUND 2010-11

182 disabling injuries

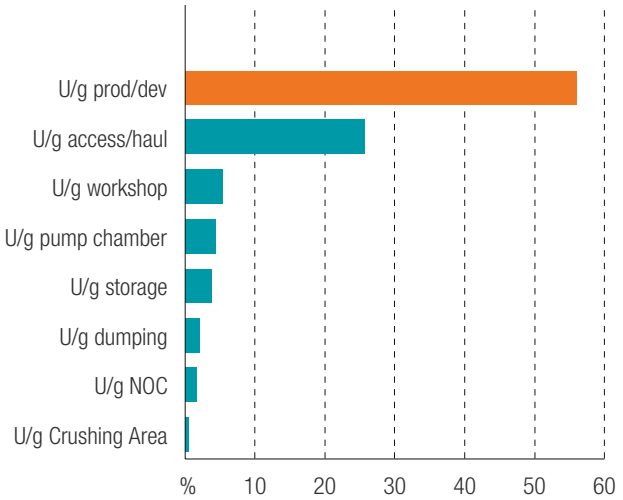
PART OF BODY



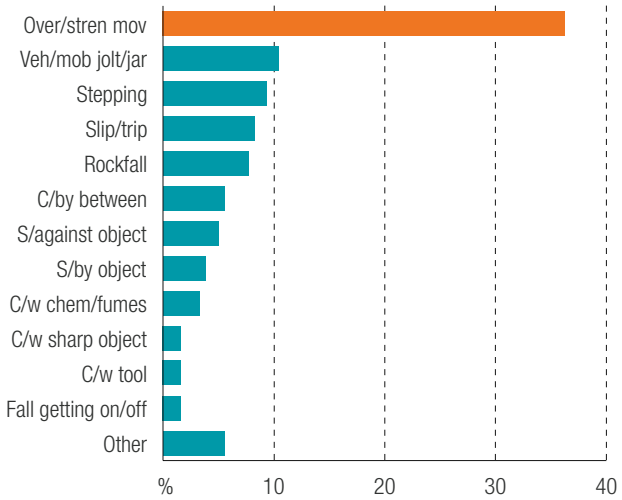
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

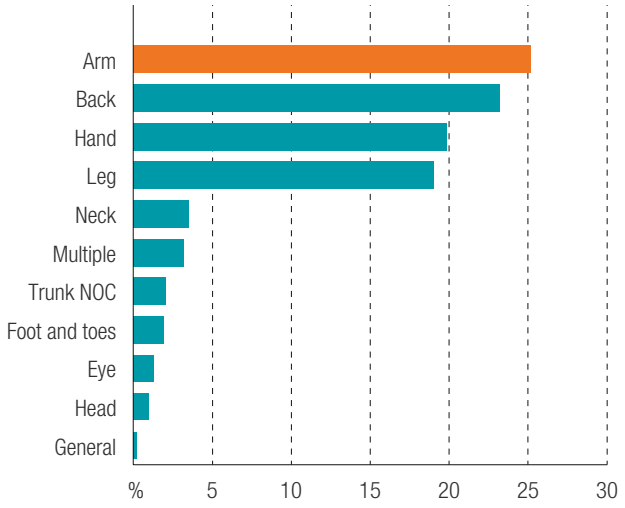


APPENDIX M

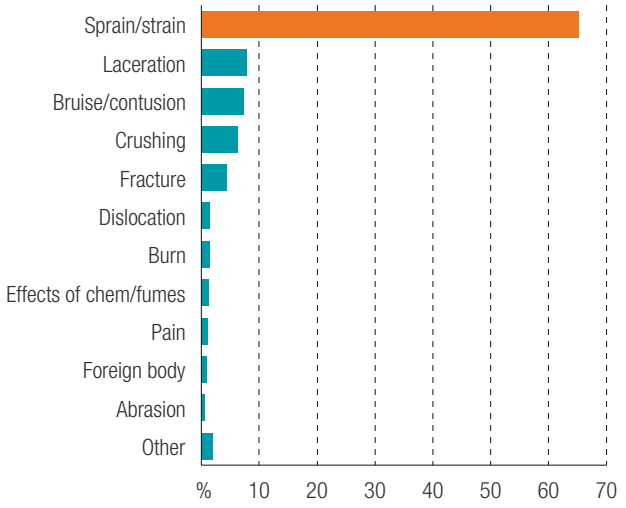
DISABLING INJURIES SURFACE 2010-11

636 disabling injuries

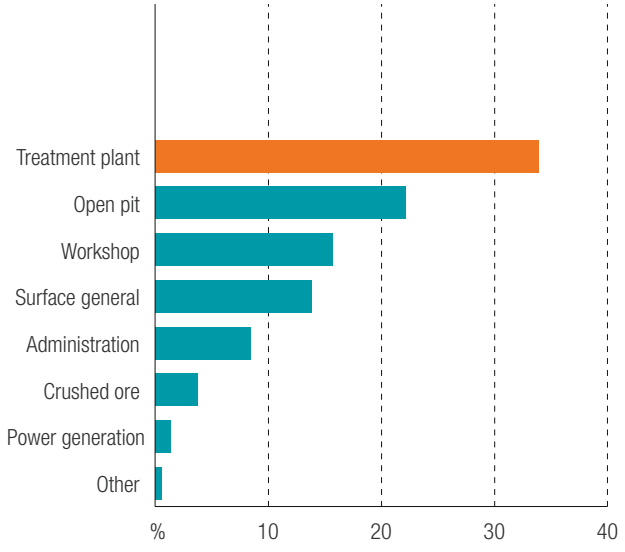
PART OF BODY



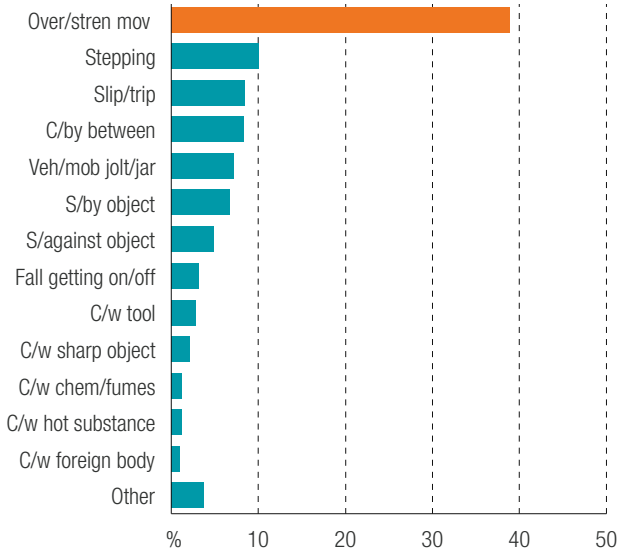
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

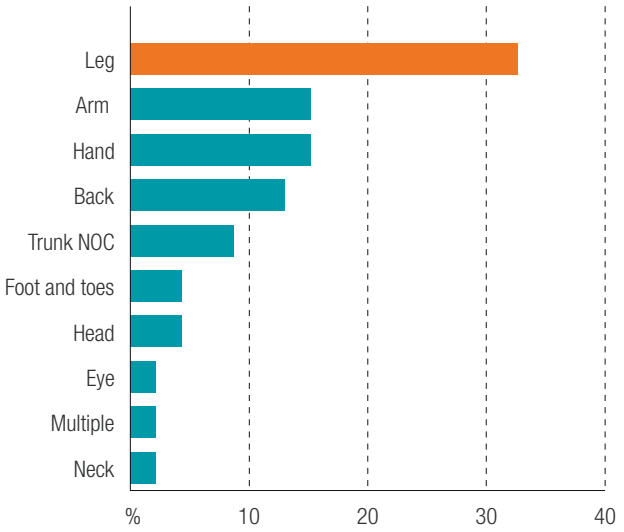


APPENDIX N

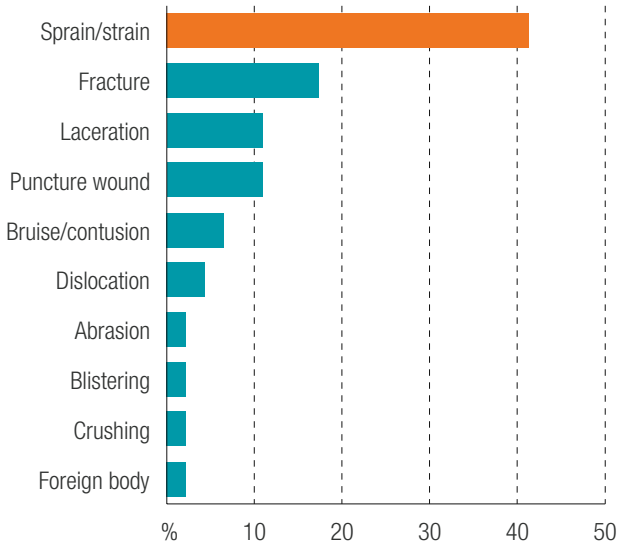
EXPLORATION INJURIES 2010-11

46 lost time injuries

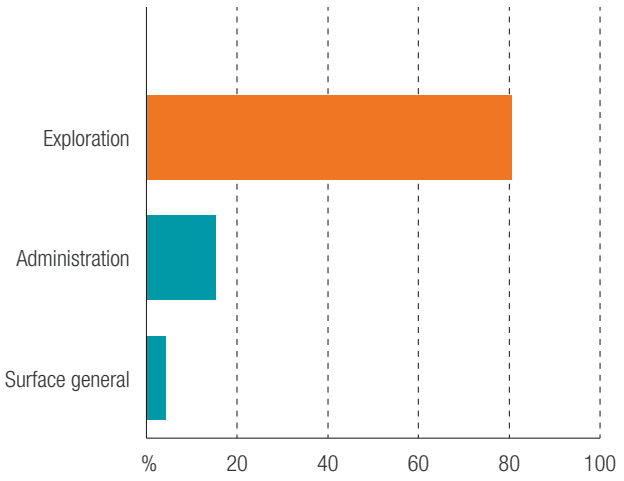
PART OF BODY



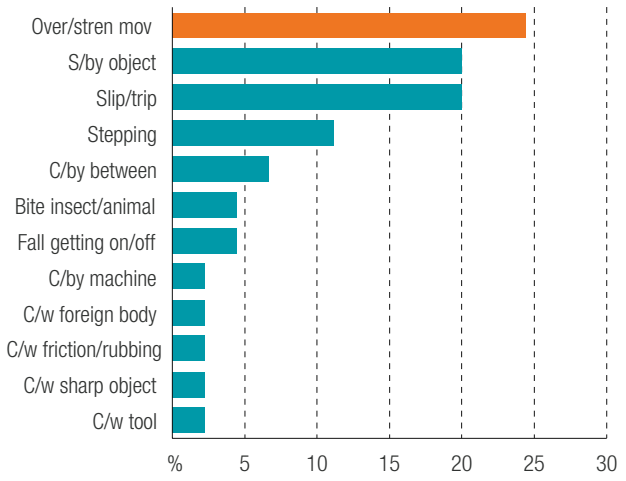
NATURE OF INJURY



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 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

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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