SAFETY PERFORMANCE

IN THE WESTERN AUSTRALIAN MINERAL INDUSTRY

ACCIDENT AND INJURY STATISTICS 2008 - 2009

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

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SUMMARY

Statistics generated from Resources Safety's AXTAT database for the year 2008–09 show a continuing improvement in the overall safety performance of the Western Australian mining industry.

The 70,567 employees in the mining industry in 2008–09 (an increase of 7%) worked a total of 142.92 million hours. The lost time injury frequency rate (LTIFR) for serious injuries in 2008–09 fell to 2.2, which is an improvement of 12%.

For many years, the focus has been on lost time injuries (LTIs) and how they can be managed more effectively, in terms of both the individual employee's welfare and the related issue of workers' compensation. Much has

been achieved in this regard, and it is to the industry's credit that considerable progress has been made in the areas of early return of employees to operational status, on-the-job post-accident rehabilitation and retraining of personnel. However, the number of 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.

Disabling injury (DI) statistics have been collected since the beginning of fiscal 2001–02. This program was initiated with a view to establishing a more effective safety performance indicator than the current LTI-based system. The coverage of DI statistics was expanded in the annual compilation for 2006–07.

Allegations that LTIs are "managed" to provide favourable accident reporting data have been made by various parties in recent times. Disabling injuries are generally not amenable to such manipulation and are more numerous than LTIs. There were 608 disabling injuries (restricted work injuries) recorded for 2008–09, a decrease of 123 on the 2007–08 figure of 731. The disabling injury incidence and frequency rates improved to 8.6 and 4.3, respectively.

Continued effort on the part of all stakeholders is required to maintain the improvements being seen again in the injury performance indicators following a period in which the indicators appeared to have levelled out.

Seven mining industry employees lost their lives during the year, five more than the previous year.

Resources Safety continues to regulate the mining industry by statutory inspections, safety management system and high impact function audits. It plays an important role in providing education, training support and information to industry. During the year, safety meetings, presentations to mine site employees, and briefings to industry safety and health representatives complemented the inspection activities.

Resources Safety continues to participate in and assist with the development of the National Mine Safety Framework, an initiative of the Ministerial Council on Mineral and Petroleum Resources.

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, the *Mines Safety and Inspection Act 1994* was amended in 2008 to clarify provisions that deal with the duties of exploration managers. An exploration manager has duties under the Act, including the requirement to report injuries. Starting with 2008–09, the annual compilations will now include injury statistics for the exploration sector.

STATISTICAL SUMMARY

- There were seven fatal accidents in the Western Australian mineral industry during 2008–09 — six at iron ore operations and one on the surface at a gold mine.
- There were 397 LTIs during 2008–09, 38 less than the previous year (435 injuries in 2007–08).The breakdown of the number of injuries by commodity mined is shown in Table 5 and Appendix A.
- There was an average workforce of 70,567 employees in 2008–09, an increase of 7% over the previous year (66,183 employees in 2007–08). The breakdown of the number of employees by commodity mined is shown in Table 5 and Appendix A.
- The overall LTI duration rate deteriorated by 8% during 2008–09, rising from 20.2 to 21.9.The breakdown of the work days lost for each commodity mined is shown in Table 5 and Appendix A.
- The overall LTIFR improved by 13% during 2008–09, falling from 3.2 to 2.8.
- The overall injury index improved by 6% during 2008–09, down from 65 to 61.
- Serious LTIs in the mining industry during 2008–09 totalled 316, which is 15 less than for 2007–08.
- The overall serious LTIFR improved by 12% during 2008–09, falling from 2.5 to 2.2.
- The iron ore sector LTIFR deteriorated significantly by 39% during 2008–09, rising from 1.8 to 2.5.
- The bauxite and alumina sector LTIFR improved by 26% during 2008–09, falling from 3.8 to 2.8.
- The gold sector LTIFR improved significantly by 41% during 2008–09, falling from 3.2 to 1.9.
- The nickel sector LTIFR deteriorated by 4% during 2008–09, rising from 2.3 to 2.4.
- There were 608 DIs during 2008–09, 123 less than the previous year (731 injuries in 2007–08). The breakdown of the number of injuries by commodity mined is shown in Table 11.
- The overall DI frequency rate improved by 22% during 2008–09, falling from 5.5 to 4.3.

EXPLANATORY NOTES

INTRODUCTION

The statistics published in this annual compilation mainly relate to accidents between 1 July 2008 and 30 June 2009 (2008–09) 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 2008–09 has three components:

i) Initial injuries — days lost in 2008–09 from injuries that occurred in 2008–09

ii) Recurrent injuries — days lost in 2008–09 through recurrences of injuries that occurred in 2008–09 and previous years

iii) Carry-over injuries — days lost in 2008–09 by persons continuously off work from injuries that occurred before 1 July 2008.

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.

METALLIFEROUS MINES

All mines other than coal mines are classed as metalliferous mines.

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 *Workplace Injury and Disease Recording Standard* 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 here, an average of 260 mines or groups of mines and 87 exploration companies reported to the AXTAT system.

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

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
Lost time 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
Lost time 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 1000 employees for a 12 month period

FATAL INJURY INCIDENCE RATE
Number of fatal injuries per 1000 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 2008–09

There were seven fatal accidents in the Western Australian mineral industry during 2008–09.

- An engineering technician conducting maintenance work on a purpose-built scissor-lift at an iron ore rail workshop died when the lift collapsed on him.
- A workshop supervisor at an iron ore mine was changing a dump truck tyre with another employee when he was fatally struck by part of the tyre handler.
- An apprentice heavy duty fitter at an iron ore mine died following a collision between the light vehicle he was driving and a Caterpillar 789C haul truck.
- A haul truck operator at a gold mine died after falling from a Caterpillar 777 haul truck. It is believed that she had been cleaning the truck's windscreen.
- A rail track maintenance worker was fatally injured when struck by a train at a siding on an iron ore railway. It appears that he had been walking between a tamping machine on the second track at the siding and the passing train.
- A scaffolder undertaking construction work at an iron ore mine expansion project was fatally injured when he fell through a grid mesh floor to a floor 7 metres below.
- A fitter at an iron ore mine was fatally injured when a bulldozer belly plate fell on him during maintenance work on the bulldozer at the mine waste dump.

FATAL INJURY INCIDENCE RATE BY MINERAL MINED 2004–05 TO 2008–09

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 is more than five times higher than the fatal injury incidence rate for surface operations.This is reflected in the gold and nickel sectors where most of the State's underground mining occurs.

TABLE 1 Fatal injury incidence rate by mineral mined 2004-05 to 2008-09

Category		Fatalities per thousand employees
Mineral	Gold	0.10
	Iron ore	0.09
	Nickel	0.08
Underground		0.22
Surface		0.04

FATAL ACCIDENTS

CONTINUED

FATAL INJURY INCIDENCE RATE 1999–2000 TO 2008–09

The fatal injury incidence rate for 2008–09 was 0.10, three times greater than the incidence rate for the previous year. There were seven fatal accidents in 2008-09 (two in 2007-08). 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.

FATAL ACCIDENTS BY TYPE OF ACCIDENT 2004–05 TO 2008–09

Table 2 indicates the type of accidents for the 19 fatalities in the mining industry (excluding exploration) over the past five years, with seven underground and 12 at surface operations.

The most common type of underground fatal accident over the past five years was rockfall (two fatalities).

The most common type of surface fatal accident over the past five years was vehicle or mobile equipment collisions (four fatalities).

FIGURE 1 FATAL NJURY INCIDENCE RATE 1999-00 TO 2008-09

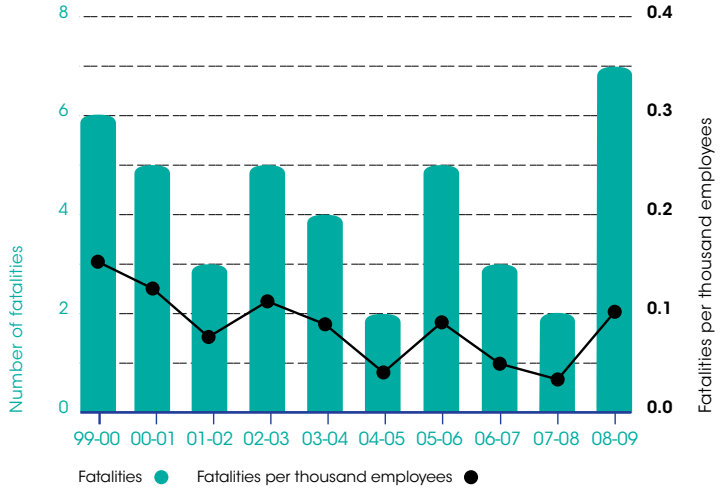


TABLE 2 NUMBER OF FATALITIES 2004–05 TO 2008–09

Category		Number of fatalities
Underground	Rockfall	2
	Veh/mob over edge	1
	Veh/mob collision	1
	Fall from height	1
	Explosives detonation	1
	C/w electricity	1
Surface	Veh/mob collision	4
	S/by object	3
	S/by veh/mob	2
	Fall from height	2
	C/by between	1

SERIOUS INJURIES

REVIEW OF SERIOUS INJURIES DURING 2008–09

There were 316 serious injuries reported in the mining industry during 2008–09 (331 in 2007–08). Of these, 309 were in metalliferous mines and seven were in coal mines.

Typical serious injuries are described below.

A trades assistant using a jack hammer to break up a concrete plinth sustained a fractured foot when the jack hammer slipped off the plinth and struck the top of his foot behind the steel cap of his boot.

A process plant operator's elbow struck a steel pylon while he was hosing debris at a crushing plant. The following day the elbow became swollen and infected.

A fitter repairing an air-powered grout pump in a workshop sustained a crush injury to his finger when it was caught between the piston head and bore of the pump. The air valve had been partially open, which caused the piston to move.

A boilermaker fractured two ribs when he fell 1.5 metres to the ground while attempting to access the feed chute of a semi-autogenous grinding (SAG) mill. As he was stepping from a safety step onto the chute, his foot struck the lip of the chute, causing him to lose his balance and grip from the hand rail.

A boilermaker fractured bones in his hand while carrying out bucket maintenance on an excavator. He was struck by a wear strip that sprung out while it was being gouged off.

A leading hand fitter injured his lower back when he fell 1.6 metres through the handrail of an elevated work platform (EWP) to the ground while driving the EWP to another location.

A trainee miner connecting a vent bag to an underground fan from the basket of an integrated tool carrier (IT) suffered crush injuries and fractures to his fingers when his hand was caught between the handrail of the basket and the fan cowling as the basket was moved.

An underground diamond driller's assistant, feeding a drill rod through the rotation motor, had his middle finger amputated when the driller moved the feed motor catching the assistant's finger between the rod and the ground.

A fitter sustained a high pressure oil injection injury to his hand when a hydraulic oil line failed while he was performing maintenance on a reclaimer.

A process plant operator sustained a crushed and fractured foot when it was caught between the bucket arm and the body of a Bobcat loader.

A fitter standing on top of the drifter of a long-hole drill rig underground received a fractured foot when the driller moved the drifter, crushing the fitter's foot against hoses.

A haul truck operator suffered neck and shoulder pain when a large rock was dropped into the tray during loading.

An equipment transport driver received multiple injuries when he was struck by a tubular section of ducting weighing about 200 kg that fell off his truck while he was undoing the tie-down ratchet strap.

A production superintendent rodding out a port on a screw feeder received multiple lacerations and fractures to both hands when the tool was dragged into the screw, forcing his hand between the tool and the flange of the valve.

A crusher operator cleaning out the secondary crusher with a crowbar strained his shoulder when the bar slipped and struck his shoulder.

A laboratory technician strained her back while picking up a bucket containing a 3 kg sample.

A fitter fractured his wrist when he attempted to break his fall after tripping over a pallet while walking backwards.

A boilermaker/welder sustained a fractured lower leg when it was struck by a chain sling while a liner plate was being lowered. The sling slipped off the liner plate, fell 60 cm to the floor then bounced and struck his leg.

A process plant operator suffered chemical burns to his feet when he walked through a spill of organic solution to close a valve in the solvent extraction plant. The solution had seeped through his boots and, even though he cleaned his feet and changed his socks, his feet developed swelling and blistering within 12 hours.

A water truck driver sustained mild concussion and a jarred neck when the water truck struck a large rock and his head hit the roof of the cab.

An airleg miner installing ladders in an escape rise sustained multiple fractures when he fell 5 metres.

A service technician using a hammer to free levers on a Bobcat bucket sustained a fractured foot when the lever released and the bucket fell onto his foot.

A fitter washing an underground front-end loader (bogger) with a pressure cleaner slipped and fell 1.8 metres from the top of the bogger to the ground, fracturing bones in his wrist and elbow.

SERIOUS INJURIES CONTINUED

An excavator operator suffered soft tissue injuries to his back and knee when he fell from the top of the ladder while dismounting from an excavator.

An underground miner suffered a shoulder Injury when the IT basket he was standing in disengaged and fell forward while it was being lowered. The lock pins had not engaged.

A cable joiner's face was burnt when an arc flash occurred while a live 33 kV cable was being cut with a cable cutter.

A serviceman re-securing the belly plates on an excavator with another employee sustained a neck strain when one of the belly plates fell out of place and struck his safety helmet.

A haul truck operator fractured his ankle when he slipped on gravel while walking towards the production office.

A mechanical fitter received severe burns and was struck by flying debris from an explosion at a char plant.

A dogman aligning a 10 metre length of steel culvert pipe at a creek crossing sustained a fractured foot when he stepped into the path of an excavator and the excavator ran over his foot.

A scraper operator sustained a lower back strain when the scraper he was operating ran over an unseen rock.

A boilermaker attempting to free up a jammed conveyor trough roller with a hammer sustained a crushed and fractured thumb when his hand was pulled in between the roller and conveyor belt.

An equipment transport driver tightening tie-down chains with another employee sustained head and facial injuries when he was struck by a pole that the other employee was using to lever the tie down. The pole had slipped from the employee's hands and recoiled into the face of the truck driver.

An equipment transport driver sustained a compound fracture to his lower leg when he was struck by a drill rod that fell from his truck as the truck was being unloaded with a forklift.

A diesel fitter inflating a light truck tyre in a tyre cage sustained multiple bruising, fractures and lacerations when the tyre exploded under pressure.

An excavator operator sustained a strained neck when the air conditioning unit fell about 40 cm from the ceiling of the excavator cab and struck his head.

A field technician driving an all-terrain vehicle (ATV) back to the accommodation camp sustained two fractured bones in his lower leg when the ATV rolled onto its side after being turned sharply. His leg was trapped between the roll cage and the ground.

An electrician replacing a grid-box blower motor on a haul truck sustained multiple injuries when he fell 5.4 metres from his work position on the truck to the ground, striking the fuel tank on the way down.

A front-end loader operator sprained his ankle when he stepped on a rock on the ground while dismounting from his loader.

SERIOUS INJURY INCIDENCE RATE BY MINERAL MINED 2004–05 TO 2008–09

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 (8.4) was 62% higher than that for surface operations (5.2).

Of the major mining sectors, construction materials had the highest five-year average serious injury incidence rate (12.0) whereas iron ore had the lowest (3.6). The mining sector referred to as "other", with a five-year average serious injury incidence rate of 11.7, contained 3% of the total number of employees spread over 16 commodity groups. Most of the mine sites in this sector had less than 50 employees.

SERIOUS INJURY FREQUENCY RATE 2004–05 TO 2008–09

Figure 3 shows that the serious injury frequency rate continued to fall for underground metalliferous operations, surface metalliferous operations and the coal sector, resulting in a 12% improvement overall during 2008–09.

SERIOUS INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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 arms accounted for the largest proportion of

FIGURE 2 SERIOUS INJURY INCIDENCE RATE 2004-05 TO 2008-09

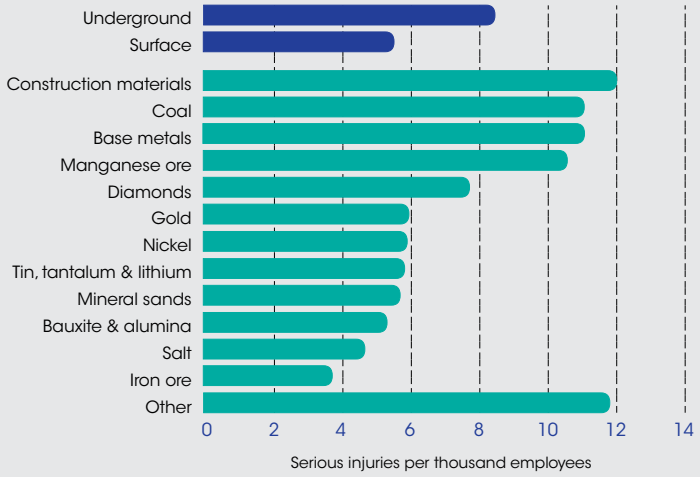
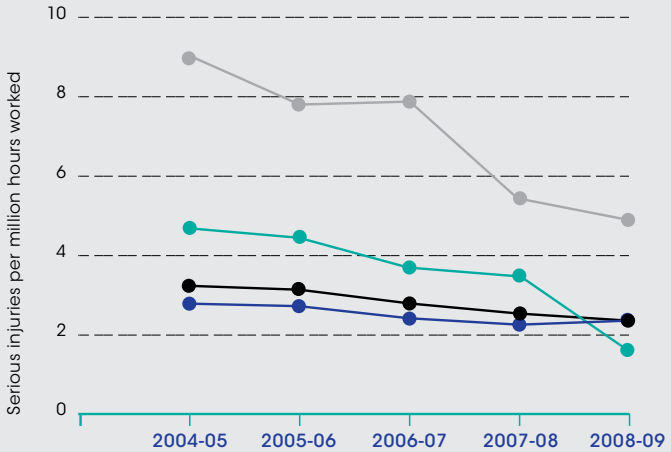


FIGURE 3 SERIOUS INJURY FREQUENCY RATE 2004-05 TO 2008-09



	2004-05	2005-06	2006-07	2007-08	2008-09
Metalliferous u/g	4.7	4.4	3.8	3.6	1.7
Metalliferous surface	2.9	2.9	2.6	2.3	2.2
Coal	9.0	7.9	7.9	5.5	4.9
Total	3.2	3.1	2.8	2.5	2.2

serious injuries at 25%, leg and hand injuries each accounted for 18%, followed by back, and foot and toes injuries both at 14%. Of the serious arm injuries, 71% were to shoulders. Of the serious leg injuries, 40% were to knees and ankles.

- Fracture represented the highest proportion by nature of injury (36%), followed by sprain or strain at 32% consistent with the high proportion of shoulder and back injuries, then crushing at 14%.
- The largest proportion of serious injuries underground was in production and development areas (68%), followed by access and haulage ways at 21% then storage areas (7%).
- The most common accident types associated with serious injuries underground were over-exertion or strenuous movements and slip or trip both at 29%, followed by rockfall and caught by machine both at 14%, then struck by object, caught by or between objects, fall from height and stepping each at 7%.

Surface

- Injuries to legs accounted for the largest proportion of serious injuries at 22%, back and arm injuries accounted for 20% each, followed by injuries to hands at 17%. Of the serious leg injuries, 40% were to knees and ankles. Of the serious arm injuries, 54% were to shoulders while 19% were to elbows and wrists.
- Consistent with the high proportion of knee, ankle, back and shoulder injuries, sprain or strain represented the highest proportion by nature of injury (49%). Fracture was the next highest (17%), followed by crushing at 10%.
- The largest proportion of serious injuries on the surface occurred in treatment plants (33%), followed by open pits at 25% then workshops at 15%.
- The most common accident types associated with serious injuries on the surface were over-exertion or strenuous movements (32%), struck by objects (11%), and slip or trip (10%).

LOST TIME INJURIES

REVIEW OF LOST TIME INJURIES DURING 2008–09

In 2008–09, 20,412 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 2008–09 (8,712), recurrences of injuries sustained before 2008–09 and in 2008–09 (2,340), and LTIs and recurrences carried over into 2008–09 from accidents before July 2008 (9,360). A breakdown of work days lost in coal and metalliferous mining is given in Table 3.

During 2008–09, there were 397 LTIs in the State's mining industry. Of those, 381 were in metalliferous mines and 16 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 65 recurrences of previous injuries, resulting in 2,340 work days lost during 2008–09. A breakdown of recurrent injuries by calendar year of initial injury is given in Table 6.

One hundred and thirteen persons who were still off work from injuries received before July 2008 lost 9,360 work days in 2008–09. A breakdown of these carry-over injuries is given in Table 7.

TABLE 3 TIME LOST THROUGH INJURY DURING 2008-09

Mines	Initial injuries	Recurrent injuries	Carry-over injuries	Total injuries
	Days lost			
Metalliferous	8,353	2,047	9,053	19,453
Coal	359	293	307	959
Total mining	**8,712**	**2,340**	**9,360**	**20,412**

TABLE 4 INITIAL LOST TIME INJURIES DURING 2008-09

Sector	No. of employees	No. of LTIs	Incidence rate	Frequency rate	Duration rate	Injury index	Days lost
Metalliferous surface	62,340	347	5.6	2.8	21.6	60	7,509
Metalliferous underground	7,312	34	4.6	2.1	24.8	51	844
Metalliferous total	69,652	381	5.5	2.7	21.9	59	8,353
Coal total	915	16	17.5	11.1	22.4	249	359
Total mining	**70,567**	**397**	**5.6**	**2.8**	**21.9**	**61**	**8,712**
Exploration	2,350	32	13.6	6.5	26.4	172	844

TABLE 5 INJURIES BY MINERAL MINED DURING 2008-09

Mineral mined	No. of employees	No. of LTIs	Incidence rate	Frequency rate	Duration rate	Injury index	Days lost
Iron ore	25,237	129	5.1	2.5	23.5	59	3,033
Gold	15,572	64	4.1	1.9	26.5	51	1,695
Nickel	10,084	49	4.9	2.4	17.2	41	845
Bauxite and alumina	8,154	45	5.5	2.8	20.6	58	928
Mineral sands	2,464	18	7.3	4.1	20.3	84	365
Base metals	1,927	18	9.3	4.7	40.3	191	726
Diamonds	1,871	13	6.9	2.8	20.4	57	265
Salt	921	7	7.6	4.8	7.7	37	54
Coal	915	16	17.5	11.1	22.4	249	359
Manganese ore	602	2	3.3	1.7	48.5	81	97
Construction materials	601	5	8.3	4.0	8.2	33	41
Tin, tantalum and lithium	366	4	10.9	4.8	16.5	79	66
Other	1,853	27	14.6	9.0	8.8	79	238
Total mining	**70,567**	**397**	**5.6**	**2.8**	**21.9**	**61**	**8,712**

NOTE: Duration in Tables 4 and 5 does not take into consideration time lost after 30 June 2009 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 2008.

TABLE 6 RECURRENT INJURIES DURING 2008-09

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2009*	7	157	1	35	8	192
2008	38	1,628	4	113	42	1,741
2007	2	18	2	108	4	126
2006	3	36	—	—	3	36
2005	—	—	1	34	1	34
2004	1	49	—	—	1	49
Pre-2004	5	159	1	3	6	162
Total	**56**	**2,047**	**9**	**293**	**65**	**2,340**

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 2009 calendar year

LOST TIME INJURIES CONTINUED

TABLE 7 CARRY-OVER INJURIES DURING 2008-09

Calendar year	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
	Metalliferous mines		Coal mines		Total mining	
2008*	67	3,722	3	88	70	3,810
2007	24	2,930	2	219	26	3,149
2006	10	1,369	—	—	10	1,369
2005	4	459	—	—	4	459
2004	2	412	—	—	2	412
Pre-2004	1	161	—	—	1	161
Total	**108**	**9,053**	**5**	**307**	**113**	**9,360**

* Covers period from 1 January to 30 June 2008

REVIEW OF LOST TIME INJURIES DURING 2008–09 IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1885.1:1990

In June 1990, Standards Australia and Worksafe Australia released a joint standard for recording workplace injuries and diseases. The Australian Standard (AS 1885.1:1990 *Workplace Injury and Disease Recording Standard*) 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 AXTAT database.

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

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 2008-09 (AS 1885.1:1990)

Sector	No. of employees	No. of LTIs	Injuries per hundred	Frequency	Duration	Days lost
Metalliferous surface	62,340	354	0.6	2.8	25.6	9,049
Metalliferous underground	7,312	34	0.5	2.1	24.8	844
Metalliferous total	69,652	388	0.6	2.7	25.5	9,893
Coal total	915	16	1.7	11.1	22.4	359
Total mining	**70,567**	**404**	**0.6**	**2.8**	**25.4**	**10,252**
Exploration	2,350	32	1.4	6.5	26.4	844

NOTE: Duration in Tables 8 and 9 does not take into consideration time lost after 30 June 2009 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 2008.

TABLE 9 INJURIES BY MINERAL MINED DURING 2008-09 (AS 1885.1:1990)

Mineral mined	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Iron ore	25,237	135	0.5	2.6	32.2	4,353
Gold	15,572	65	0.4	2.0	29.5	1,915
Nickel	10,084	49	0.5	2.4	17.2	845
Bauxite and alumina	8,154	45	0.6	2.8	20.6	928
Mineral sands	2,464	18	0.7	4.1	20.3	365
Base metals	1,927	18	0.9	4.7	40.3	726
Diamonds	1,871	13	0.7	2.8	20.4	265
Salt	921	7	0.8	4.8	7.7	54
Coal	915	16	1.7	11.1	22.4	359
Manganese ore	602	2	0.3	1.7	48.5	97
Construction materials	601	5	0.8	4.0	8.2	41
Tin, tantalum and lithium	366	4	1.1	4.8	16.5	66
Other	1,853	27	1.5	9.0	8.8	238
Total mining	**70,567**	**404**	**0.6**	**2.8**	**25.4**	**10,252**

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 2000–2001.

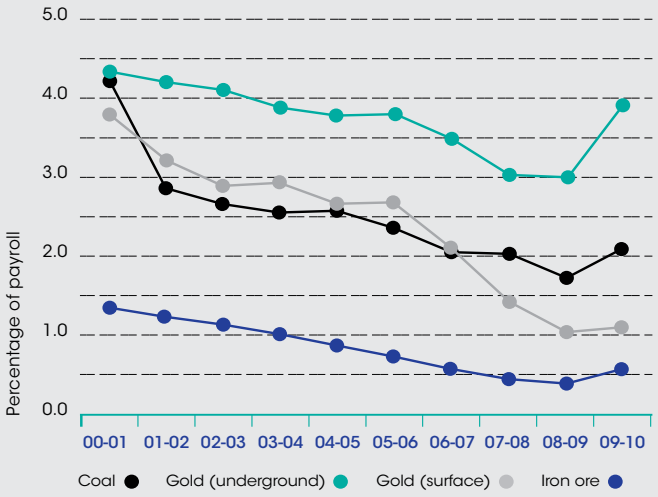
Over this period, the coal mining compensation rate decreased, by 50%, to 2.09% of payroll. The compensation rate for surface gold operations decreased, by 72%, to 1.07% of payroll, and that for iron ore operations decreased, by 61%, to 0.55% of payroll. The rate for underground gold operations decreased, by 9%, to 3.94% of payroll.

The average recommended premium rate for the Western Australian mining industry for 2009–10 is currently 1.73% of payroll, a 22% increase on that for 2008–09 (1.42% of payroll).

Figure 5 shows the current recommended premium rates for 2009–10 for a variety of mineral groups and other industries.

Premium rates for mining industry groups compare favourably with other industry groups such as sheet metal product manufacturing and structural steel fabrication,

FIGURE 4 MINE WORKERS' COMPENSATION RATE TRENDS 2000-01 TO 2009-10

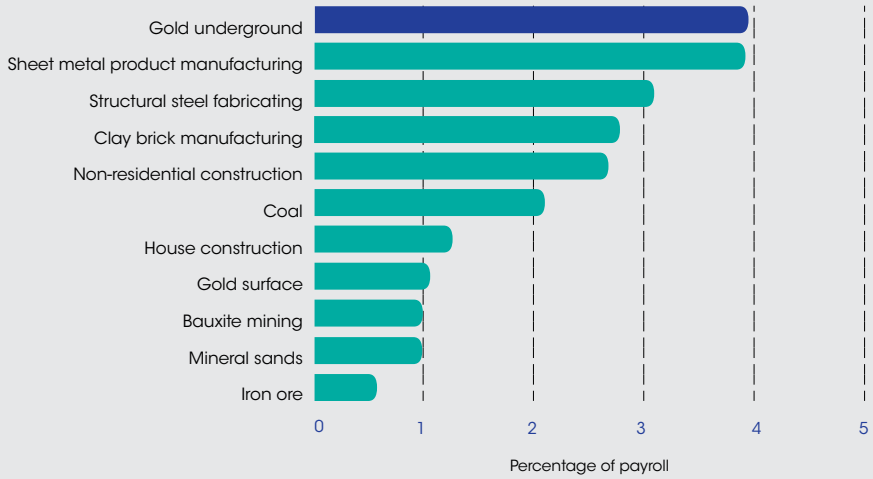


which have current premium rates of 3.89% and 3.10% of payroll, respectively.

The recent trend of the traditionally higher risk mining sectors having lower premium rates than many manufacturing sectors has continued.

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.

FIGURE 5 RECOMMENDED PREMIUM RATES 2009-10



INJURIES BY COMMODITIES

METALLIFEROUS PERFORMANCE INDICATORS

The performance indicators for the metalliferous mining sector show mixed results for 2008–09. Figures 6 to 9 depict the performance indicators of incidence, frequency, duration rates and injury index (see page 3 for definitions).

Some interesting trends noted in the performance indicators for metalliferous mines during 2008–09 include the following.

- The overall incidence rate improved by 15%, falling from 6.5 to 5.5. The surface incidence rate improved by 5% (from 5.9 to 5.6) and the underground incidence rate improved significantly by 56% (from 10.5 to 4.6).
- The overall frequency rate improved by 16%, falling from 3.2 to 2.7. The surface frequency rate improved by 7% (from 3.0 to 2.8) and the underground frequency rate improved significantly by 53% (from 4.5 to 2.1).
- The overall duration rate deteriorated by 7%, rising to 21.9. The surface duration rate deteriorated slightly by 2% (from 21.2 to 21.6) and the underground duration rate deteriorated significantly by 46% (from 17.0 to 24.8). The large increase in the underground duration rate was mainly the result of two serious LTIs, each with over 100 days lost, accumulating a total of 244 days lost time during 2008–09.
- The fall in frequency rate was greater than the rise in duration rate resulting in an overall improvement of 9% to the injury index, down from 65 to 59. The surface injury index improved by 5% (from 63 to 60) and the underground injury index improved by 34% (from 77 to 51).

METALLIFEROUS INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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

- Arm and hand injuries, both at 21%, accounted for the largest proportion of underground injuries. Back and leg injuries, both at 22%, accounted for the largest proportion of surface injuries. Of the underground arm injuries, 71% were to shoulders. Of the surface leg injuries, 83% were to knees and ankles.
- Leg injuries accounted for the next largest proportion of injuries underground at 18%, followed by back, and foot and toes injuries both at 15%. Of the leg injuries, 50% were to knees and ankles.
- Hand injuries accounted for the second largest proportion of surface injuries at 17%, followed by arm injuries at 16%. Of the arm injuries, 72% were to shoulders, elbows and wrists.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury for both underground and surface injuries at 35% and 48%, respectively.
- The second highest ranking nature of underground injury was fracture (32%), followed by crushing at 12%.
- The second highest ranking nature of surface injury was also fracture (15%), followed by crushing at 9%.

Injuries by location of accident

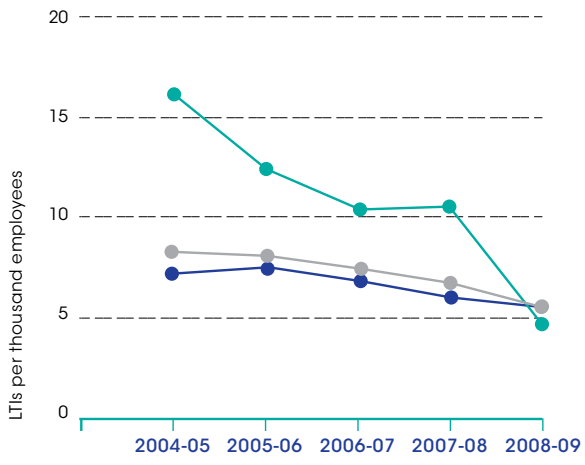
- The largest proportion of underground injuries occurred in production and development areas (74%), followed by access and haulage ways at 18% then storage areas at 6%.
- The largest proportion of surface injuries occurred in treatment plants (36%), followed by open pits at 23% then workshops at 14%.

Injuries by type of accident

- Over-exertion or strenuous movements was the most common accident type for underground injuries at 18%, followed by caught by machine, rockfall and slip or trip, each at 15%, then struck by object and stepping both at 9%.
- The most common accident type for surface injuries was also over-exertion or strenuous movements at 29%, followed by slip or trip at 11%, then caught by or between moving or stationary objects at 10%.

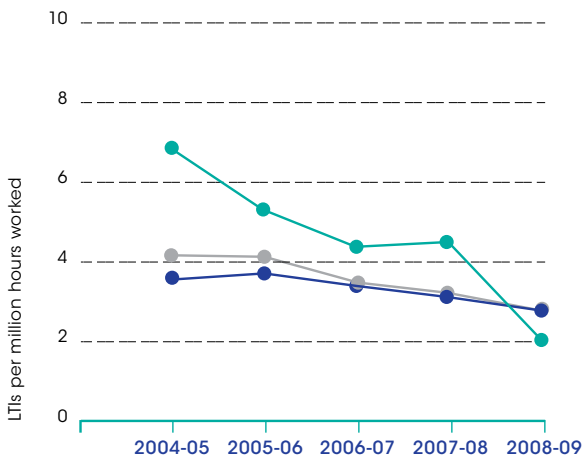
METALLIFEROUS PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 6 INCIDENCE RATE



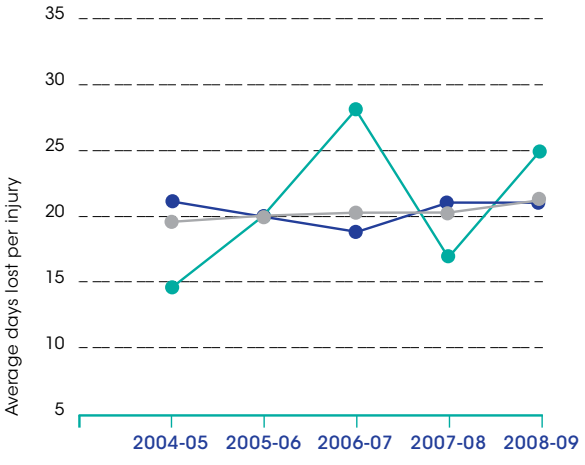
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	16.2	12.6	10.5	10.5	4.6
Surface	7.3	7.6	7.1	5.9	5.6
Total	8.1	8.1	7.5	6.5	5.5

FIGURE 7 FREQUENCY RATE



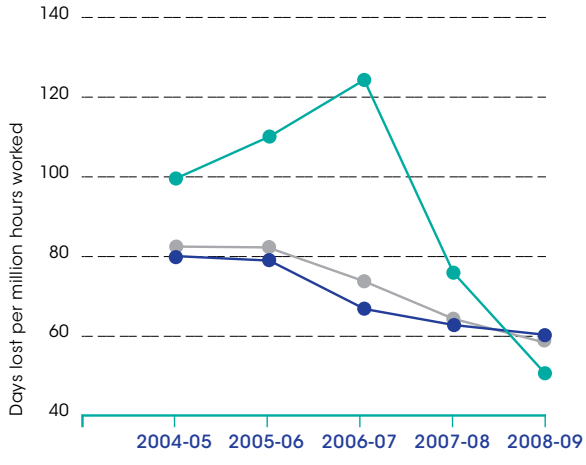
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	6.9	5.4	4.4	4.5	2.1
Surface	3.8	3.9	3.5	3.0	2.8
Total	4.1	4.1	3.6	3.2	2.7

FIGURE 8 DURATION RATE



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	14.4	20.4	28.1	17.0	24.8
Surface	21.1	20.1	19.2	21.2	21.6
Total	19.8	20.2	20.5	20.4	21.9

FIGURE 9 INJURY INDEX



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	99	111	124	77	51
Surface	80	79	67	63	60
Total	82	82	74	65	59

INJURIES BY COMMODITIES CONTINUED

GOLD PERFORMANCE INDICATORS

The performance indicators for the gold sector showed mixed results for 2008–09. Figures 10 to 13 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Some interesting trends noted in the gold sector performance indicators during 2008–09 include the following.

- The overall incidence rate improved significantly by 40%, falling from 6.8 to 4.1. The surface incidence rate improved by 25% (from 5.7 to 4.3) and the underground incidence rate improved significantly by 65% (from 10.2 to 3.6).
- The overall frequency rate improved significantly by 41%, falling from 3.2 to 1.9. The surface frequency rate improved by 29% (from 2.8 to 2.0) and the underground frequency rate improved significantly by 64% (from 4.4 to 1.6).
- The overall duration rate improved slightly by 1%, falling to 26.5. The surface duration rate improved by 12% (from 31.0 to 27.3) whereas the underground duration rate deteriorated by 24% (from 18.9 to 23.4).
- The fall in both frequency and duration rates resulted in a 40% overall significant improvement in the injury index, falling from 85 to 51. The surface injury index improved by 35% (from 86 to 56) and the underground injury index improved significantly by 54% (from 83 to 38).

GOLD INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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

- Hand, and foot and toes both at 21%, accounted equally for the largest proportion of underground injuries. Arm injuries accounted for the largest proportion of surface injuries at 24%. Of the surface arm injuries, 75% were to shoulders and elbows and wrists.
- Leg, arm and back injuries accounted equally for the next largest proportion of injuries underground each at 14%, followed by multiple and trunk NOC injuries both at 12%. Of the leg injuries, 50% were to ankles. All of the arm injuries were to shoulders and wrists.
- Leg injuries accounted for the second largest proportion of surface injuries at 20%, followed by hand injuries at 18%. Of the leg injuries, 80% were to knees and ankles.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury for both underground and surface injuries, both at 36%.
- The second highest ranking nature of underground injury was fracture at 29%, followed by crushing and laceration, both at 14%.
- The second highest ranking nature of surface injury was also fracture at 26%, followed by crushing at 10%.

Injuries by location of accident

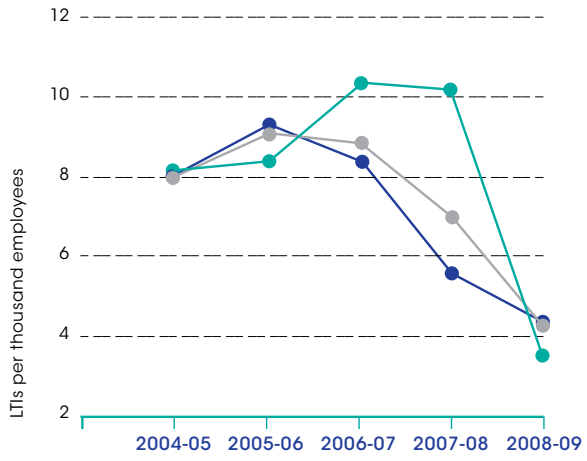
- The largest proportion of underground injuries occurred in production and development (79%) followed by access and haulage ways at 14% then storage areas at 7%.
- The largest proportion of surface injuries occurred in treatment plants (36%), followed by open pits at 28% then surface general at 12%.

Injuries by type of accident

- Over-exertion or strenuous movements, fall from height, caught by machine, rockfall, struck by object and slip or trip were equally the most common accident type for underground injuries each at 14%, followed by caught by or between moving or stationary objects and stepping both at 7%.
- The most common accident type for surface injuries was over-exertion or strenuous movements at 16%, followed by struck by object at 12% then caught by machine at 10%.

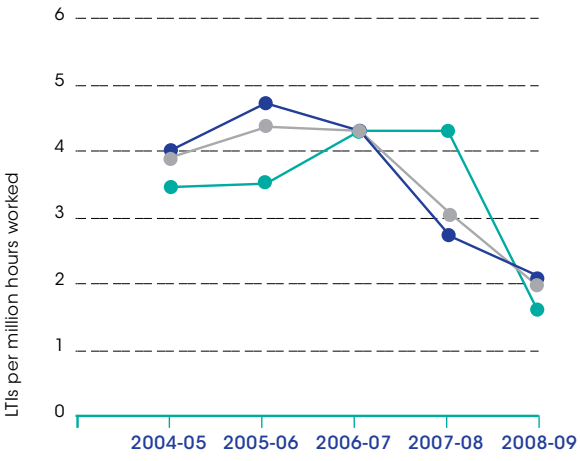
GOLD PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 10 INCIDENCE RATE



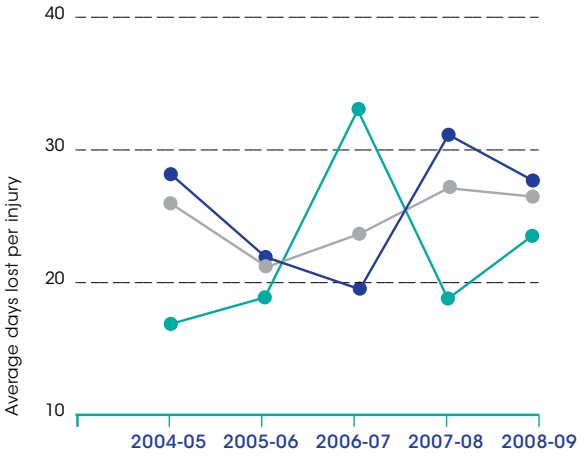
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	8.1	8.5	10.3	10.2	3.6
Surface	8.0	9.2	8.3	5.7	4.3
Total	8.0	9.0	8.8	6.8	4.1

FIGURE 11 FREQUENCY RATE



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	3.5	3.5	4.4	4.4	1.6
Surface	4.0	4.8	4.3	2.8	2.0
Total	3.9	4.4	4.3	3.2	1.9

FIGURE 12 DURATION RATE



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	16.5	19.3	33.1	18.9	23.4
Surface	28.0	21.5	19.4	31.0	27.3
Total	25.4	21.0	23.2	26.7	26.5

FIGURE 13 INJURY INDEX

	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	57	68	144	83	38
Surface	113	102	83	86	56
Total	98	93	100	85	51

INJURIES BY COMMODITIES CONTINUED

IRON ORE PERFORMANCE INDICATORS

The performance indicators for the iron ore sector deteriorated during 2008–09. Figures 14 to 17 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Some interesting trends noted in the iron ore sector performance indicators during 2008–09 include the following.

- The incidence rate deteriorated significantly by 42%, rising from 3.6 to 5.1.
- The frequency rate deteriorated by 39%, rising from 1.8 to 2.5.
- The duration rate deteriorated by 39%, rising from 16.9 to 23.5.
- The rise in both duration rate and frequency rate resulted in a significant deterioration of 97% in injury index (from 30 to 59).

IRON ORE INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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 24%, accounted for the largest proportion of injuries. Of the leg injuries, 87% were to knees and ankles.
- Back injuries accounted for the next largest proportion of injuries at 22%, followed by hand injuries at 14%.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 52%.
- Fracture was the second highest ranking nature of injury at 12%, followed by crushing at 11%.

Injuries by location of accident

- The largest proportion of injuries occurred in open pits, which accounted for 33%.
- The next largest proportion occurred in workshops at 17%, 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 (31%).
- Slip or trip was the second most common type (13%), followed by struck by object at 12%.

IRON ORE PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 14 INCIDENCE RATE

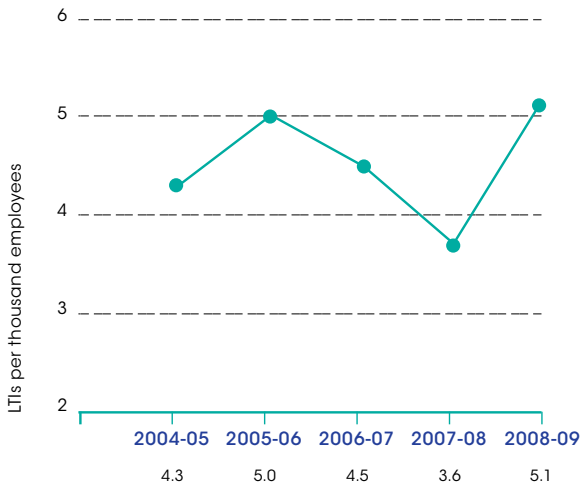


FIGURE 15 FREQUENCY RATE

FIGURE 16 DURATION RATE

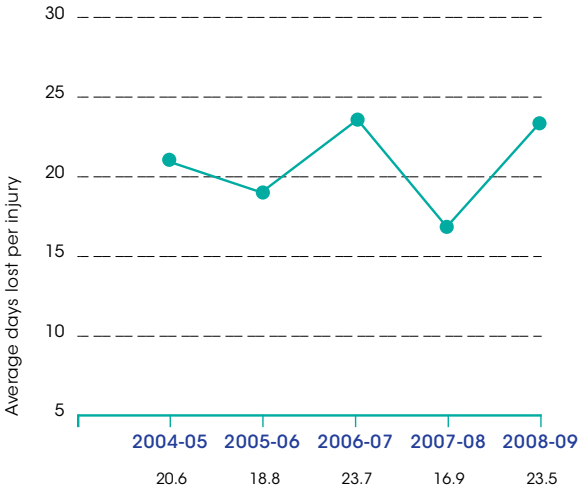
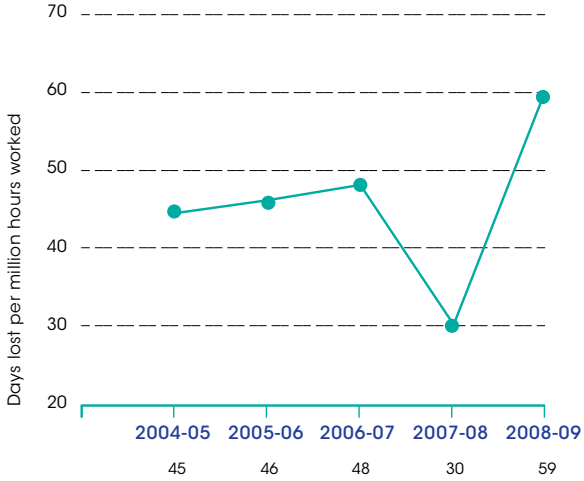


FIGURE 17 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

BAUXITE AND ALUMINA PERFORMANCE INDICATORS

The performance indicators for the bauxite and alumina sector showed mixed results for 2008–09. Figures 18 to 21 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Some interesting trends noted in the bauxite and alumina sector performance indicators during 2008–09 include the following.

- The incidence rate improved by 25%, falling from 7.3 to 5.5.
- The frequency rate improved by 26%, falling from 3.8 to 2.8.
- The duration rate deteriorated by 19%, rising from 17.3 to 20.6.
- The fall in frequency rate was greater than the rise in duration rate and resulted in an improvement of 12% for the injury index, down from 66 to 58.

BAUXITE AND ALUMINA INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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 27%. Of the leg injuries, 67% were to knees and ankles.
- Hand injuries accounted for the second largest proportion of injuries at 22%, followed by back injuries at 18%.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 51%.
- Fracture was the second highest ranking nature of injury at 11%, followed by crushing and laceration both at 9%.

Injuries by location of accident

- The largest proportion of injuries occurred in treatment plants, which accounted for 67%.
- The next largest proportion occurred in open pits at 16%, followed by workshops at 9%.

Injuries by type of accident

- Over-exertion or strenuous movements was the most common type of accident resulting in injury (40%).
- Caught by or between moving or stationary objects was the second most common type (11%), followed by struck by object at 9%.

BAUXITE AND ALUMINA PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 18 INCIDENCE RATE

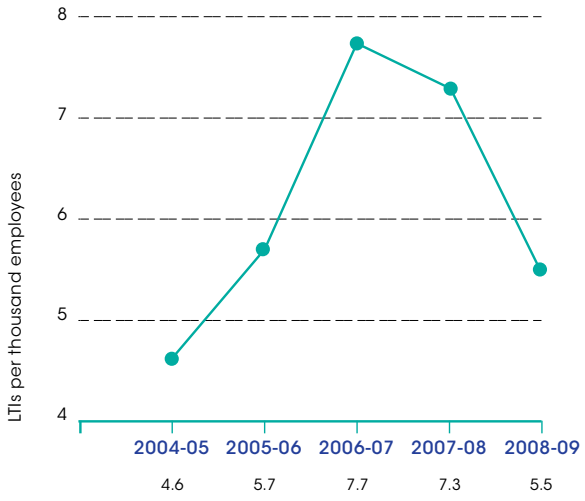


FIGURE 19 FREQUENCY RATE

FIGURE 20 DURATION RATE

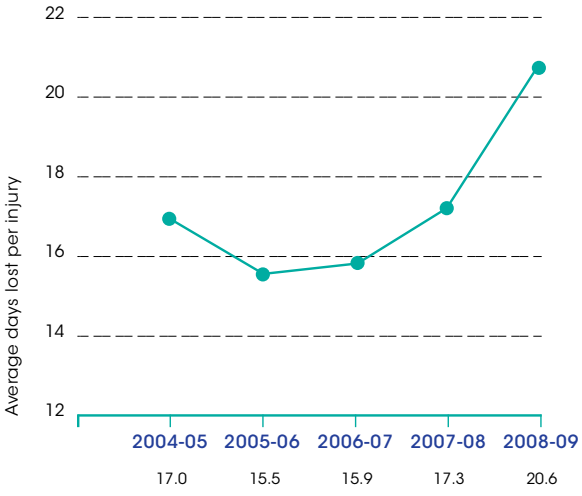
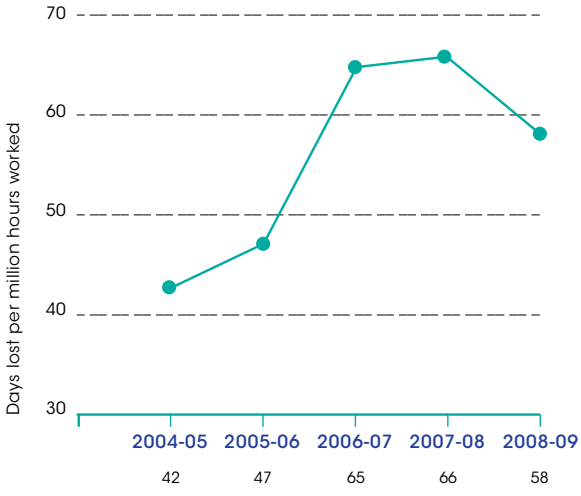


FIGURE 21 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

NICKEL PERFORMANCE INDICATORS

The performance indicators for the nickel sector showed mixed results for 2008–09. Figures 22 to 25 depict the performance indicators of incidence, frequency and duration rates, and injury index.

Some interesting trends noted in the nickel sector performance indicators during 2008–09 include the following.

- The overall incidence rate deteriorated by 9%, rising from 4.5 to 4.9. The surface incidence rate deteriorated by 28% (from 3.6 to 4.6) whereas the underground incidence rate improved by 30% (from 8.2 to 5.7).
- A similar trend was noted in the frequency rate for both surface and underground. The overall frequency rate deteriorated by 4%, rising from 2.3 to 2.4. The surface frequency rate deteriorated by 21% (from 1.9 to 2.3) whereas the underground frequency rate improved by 30% (from 3.7 to 2.6).
- The overall duration rate improved by 7%, falling to 17.2. The surface duration rate improved by 20% (from 22.4 to 17.9) whereas the underground duration rate deteriorated by 39% (from 11.0 to 15.3).
- The fall in duration rate was greater than the rise in frequency rate resulting in an overall slight improvement of 2% in the injury index, falling from 42 to 41. The surface injury index improved by 5% (from 43 to 41) whereas the underground injury index remained unchanged at 40.

NICKEL INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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

- Arm and hand injuries accounted equally for the largest proportion of underground injuries both at 25%. Of the underground arm injuries, 67% were to shoulders. Arm and hand injuries also accounted equally for the largest proportion of surface injuries both at 24%. Of the surface arm injuries, 89% were to shoulders, elbows and wrists.
- Leg injuries and foot and toe injuries, both at 17%, accounted for the next largest proportion of injuries underground, followed by back injuries and head injuries, both at 8%. Of the underground leg injuries, 50% were to knees.
- Back injuries accounted for the next highest proportion of surface injuries at 19%, followed by leg injuries at 14%. All of the surface leg injuries were to knees and ankles.

Injuries by nature

- Sprain or strain and fracture were equally the highest ranking nature of injury for underground at 25%. Sprain or strain was also the highest ranking nature of injury for surface injuries at 46%.
- The next highest ranking nature of underground injury was bruise or contusion and crushing both at 17%, followed by laceration and amputation both at 8%.
- The second highest ranking nature of surface injury was fracture and bruise or contusion both at 16%, followed by crushing and laceration both at 5%.

Injuries by location of accident

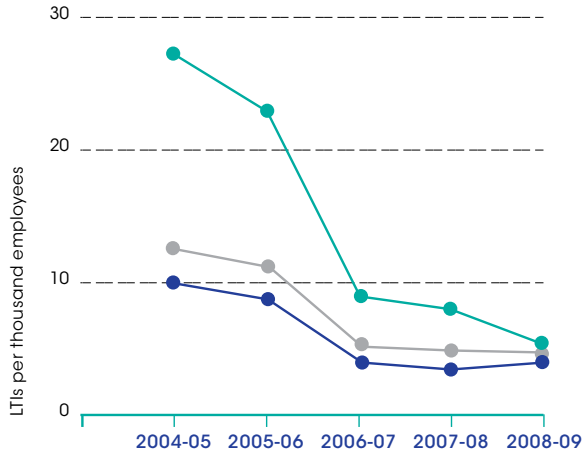
- The largest proportion of underground injuries occurred in production and development areas (83%), followed by access and haulage ways at 17%.
- The largest proportion of surface injuries occurred in treatment plants and workshops both at 30%, followed by surface general areas at 16% then open pits at 14%.

Injuries by type of accident

- Caught by or between operating machine, and rockfall were equally the most common accident type for underground injuries both at 25%, followed by caught by or between moving or stationary objects, over-exertion or strenuous movements, slip or trip, stepping, vehicle or mobile equipment collision, and vehicle or mobile equipment jolting or jarring each at 8%.
- The most common accident type for surface injuries was over-exertion or strenuous movements at 35%, followed by caught by or between moving or stationary objects at 11% then caught by or between operating machine, fall from height, struck by object and slip or trip each at 8%.

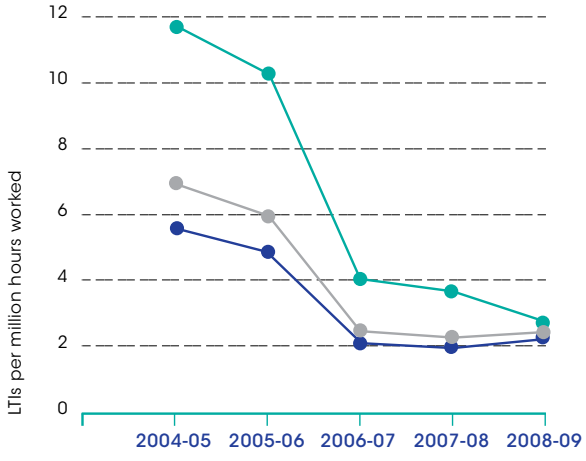
NICKEL PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 22 INCIDENCE RATE



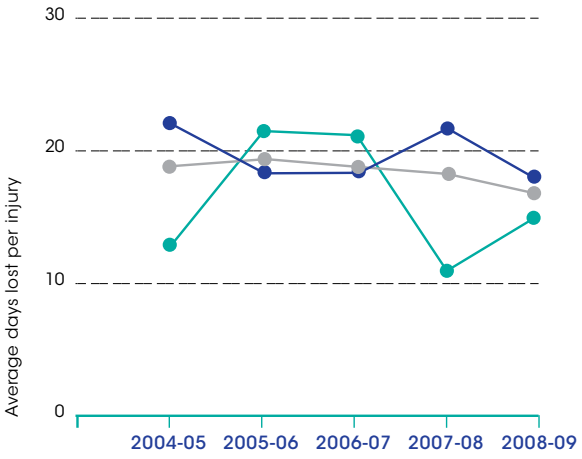
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	26.7	23.2	9.5	8.2	5.7
Surface	10.0	9.0	4.2	3.6	4.6
Total	13.0	11.5	5.1	4.5	4.9

FIGURE 23 FREQUENCY RATE



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	11.7	10.2	4.1	3.7	2.6
Surface	5.6	4.8	2.1	1.9	2.3
Total	7.0	5.9	2.5	2.3	2.4

FIGURE 24 DURATION RATE



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	13.0	21.8	21.1	11.0	15.3
Surface	22.6	18.3	18.4	22.4	17.9
Total	19.0	19.5	19.3	18.4	17.2

FIGURE 25 INJURY INDEX

	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	152	222	87	40	40
Surface	126	88	38	43	41
Total	132	116	48	42	41

DISABLING INJURIES

REVIEW OF DISABLING INJURIES DURING 2008–09

In addition to the 397 LTIs during 2008–09, there were 608 disabling injuries (DIs) reported (584 in metalliferous mines and 24 in coal mines), bringing the total number of reportable injuries to 1,005. A breakdown of these data with performance indicators is shown in Tables 10 and 11.

Of the disabling injuries, 380 were regarded as serious injuries and resulted in the injured person being disabled for two weeks or more.

TABLE 10 DISABLING INJURIES 2008–09

Sector	No. of employees	Disabling injuries			Reportable injuries (DIs and LTIs)		
		No. of injuries	Incidence rate	Frequency rate	No. of injuries	Incidence rate	Frequency rate
Metalliferous surface	62,340	481	7.7	3.8	828	13.3	6.6
Metalliferous underground	7,312	103	14.1	6.2	137	18.7	8.3
Metalliferous total	69,652	584	8.4	4.1	965	13.9	6.8
Coal total	915	24	26.2	16.7	40	43.7	27.8
Total mining	**70,567**	**608**	**8.6**	**4.3**	**1,005**	**14.2**	**7.0**
Exploration	2,350	18	7.7	3.7	50	21.3	10.2

TABLE 11 DISABLING INJURIES 2008–09

Mineral mined	No. of employees	No. of injuries	Incidence rate	Frequency rate	No. of injuries	Incidence rate	Frequency rate
		Disabling injuries			Reportable injuries (DIs and LTIs)		
Iron ore	25,237	151	6.0	2.9	280	11.1	5.5
Gold	15,572	137	8.8	4.1	201	12.9	6.1
Nickel	10,084	128	12.7	6.2	177	17.6	8.6
Bauxite and alumina	8,154	113	13.9	7.1	158	19.4	9.9
Mineral sands	2,464	18	7.3	4.1	36	14.6	8.3
Base metals	1,927	16	8.3	4.2	34	17.6	8.9
Diamonds	1,871	3	1.6	0.6	16	8.6	3.4
Salt	921	2	2.2	1.4	9	9.8	6.1
Coal	915	24	26.2	16.7	40	43.7	27.8
Manganese ore	602	1	1.7	0.8	3	5.0	2.5
Construction materials	601	6	10.0	4.8	11	18.3	8.8
Tin, tantalum and lithium	366	0	0.0	0.0	4	10.9	4.8
Other	1,853	9	4.9	3.0	36	19.4	12.0
Total mining	**70,567**	**608**	**8.6**	**4.3**	**1,005**	**14.2**	**7.0**

NOTE: Disabling injury includes 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 the mining sector show mixed results for 2008–09. Figures 26 to 29 depict the performance indicators of incidence rate, frequency rate, days off per injury and days off per million hours worked.

Some interesting trends noted in the disabling injury performance indicators for all mines during 2008–09 include the following.

- The overall incidence rate improved by 22%, falling from 11.0 to 8.6. The surface incidence rate improved by 11% (from 9.0 to 8.0) and the underground incidence rate improved significantly by 49% (from 27.6 to 14.1).
- A similar trend was noted in the frequency rate for both surface and underground. The overall frequency rate improved by 22%, falling from 5.5 to 4.3. The surface frequency rate improved by 11% (from 4.5 to 4.0) and the underground frequency rate improved significantly by 48% (from 11.9. to 6.2).
- The overall days off per disabling injury deteriorated by 8%, rising to 35.4. The days off per surface disabling injury deteriorated slightly by 2% (from 35.2 to 36.0) and the days off per underground disabling injury deteriorated by 23% (from 26.5 to 32.5).
- The fall in frequency rate was greater than the rise in days off per disabling injury and resulted in an improvement of 16% to the overall days off per million hours worked, down from 179 to 150. The days off per surface million hours worked improved by 9% (from 158 to 144) and the days off per underground million hours worked improved by 36% (from 316 to 203).

DISABLING INJURY PERCENTAGE BREAKDOWN FOR 2008–09

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

- Arm injuries, at 25%, accounted for the largest proportion of underground injuries. Back injuries accounted for the largest proportion of surface injuries at 24%. Of the underground arm injuries, 42% were to shoulders, 31% were to elbows and 12% were to wrists.
- Leg injuries accounted for the next largest proportion of injuries underground at 22%, followed by back and hand injuries both at 18%. Of the leg injuries, 39% were to knees and 30% were to ankles.
- Hand and arm injuries accounted equally for the second largest proportion of surface injuries at 21%, followed by leg injuries at 15%. Of the arm injuries, 50% were to shoulders, 20% were to elbows and 14% were to wrists. Of the leg injuries, 45% were to ankles and 40% were to knees.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury for both underground and surface injuries at 51% and 63%, respectively.
- The second highest ranking nature of underground injury was bruise or contusion (14%), followed by fracture and laceration both at 13%.
- The second highest ranking nature of surface injury was fracture and bruise or contusion, both at 8%, followed by laceration at 7%.

Injuries by location of accident

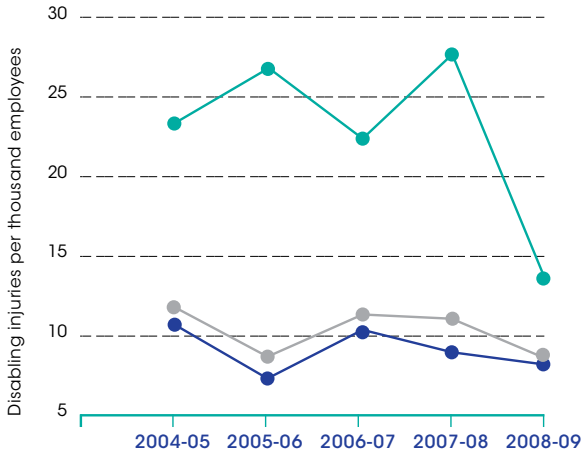
- The largest proportion of underground injuries occurred in production and development areas (76%), followed by access and haulage ways at 16% then workshops at 4%.
- The largest proportion of surface injuries occurred in treatment plants (36%), followed by open pits at 23% then workshops at 16%.

Injuries by type of accident

- Over-exertion or strenuous movements, at 28%, was the most common accident type for underground injuries, followed by slip or trip and stepping both at 11% then caught by or between moving or stationary objects, rockfall and struck by object each at 7%.
- The most common accident type for surface injuries was also over-exertion or strenuous movements at 41%, followed by slip or trip at 10% then struck by object at 9%.

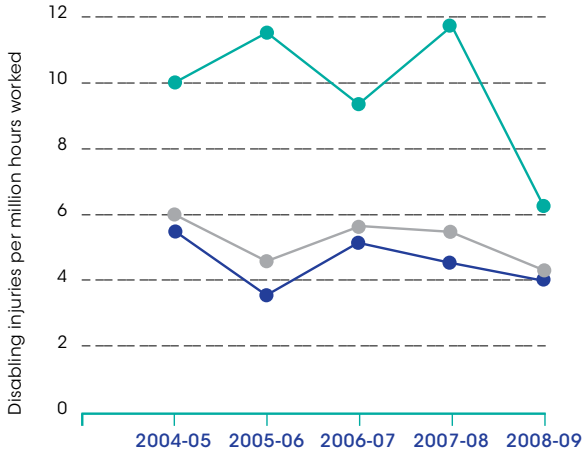
DISABLING INJURY PERFORMANCE INDICATORS 2004–05 TO 2008–09

FIGURE 26 INCIDENCE RATE



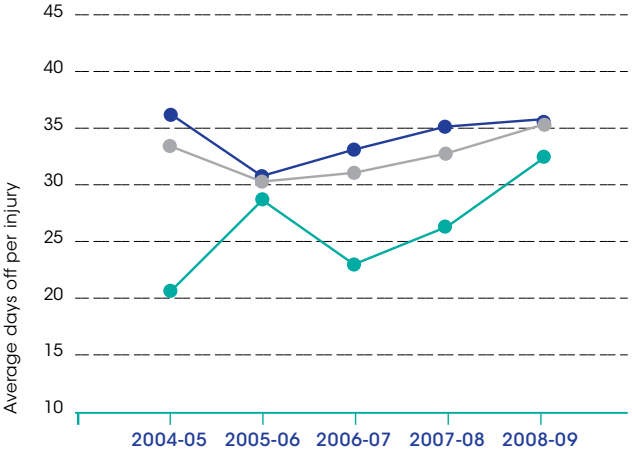
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	23.4	26.8	22.2	27.6	14.1
Surface	10.7	7.1	10.4	9.0	8.0
Total	11.9	9.0	11.6	11.0	8.6

FIGURE 27 FREQUENCY RATE



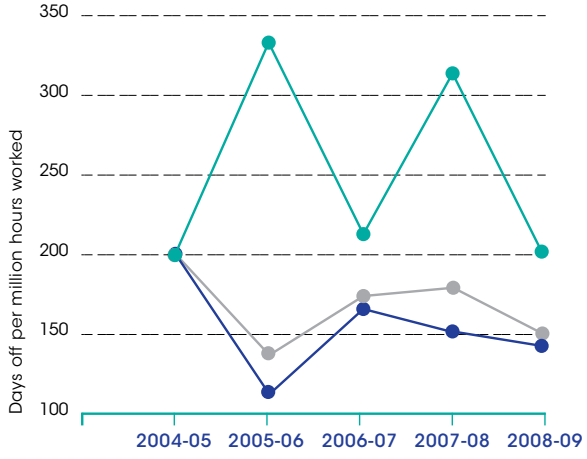
	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	10.0	11.5	9.4	11.9	6.2
Surface	5.6	3.7	5.1	4.5	4.0
Total	6.1	4.5	5.6	5.5	4.3

FIGURE 28 AVERAGE DAYS OFF PER INJURY



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	20.6	28.9	22.8	26.5	32.5
Surface	36.2	30.8	32.9	35.2	36.0
Total	33.3	30.3	30.9	32.8	35.4

FIGURE 29 DAYS OFF PER MILLION HOURS WORKED



	2004-05	2005-06	2006-07	2007-08	2008-09
Underground	205	333	214	316	203
Surface	202	113	168	158	144
Total	202	137	174	179	150

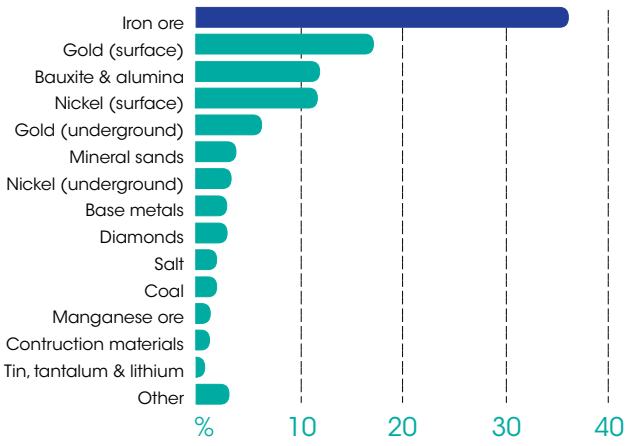
APPENDICES

APPENDIX A

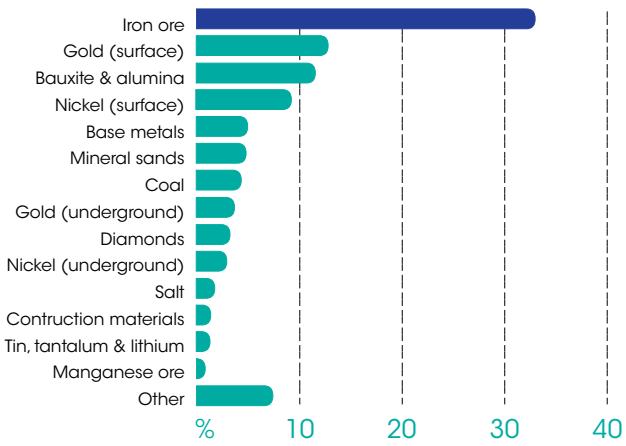
WESTERN AUSTRALIAN MINES 2008-09

397 INJURIES

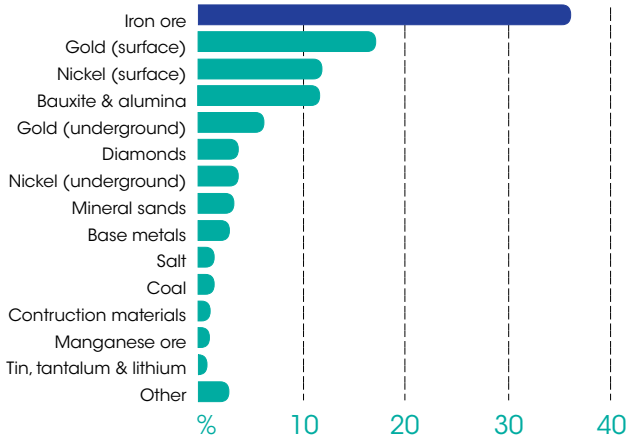
PERCENTAGE OF EMPLOYEES



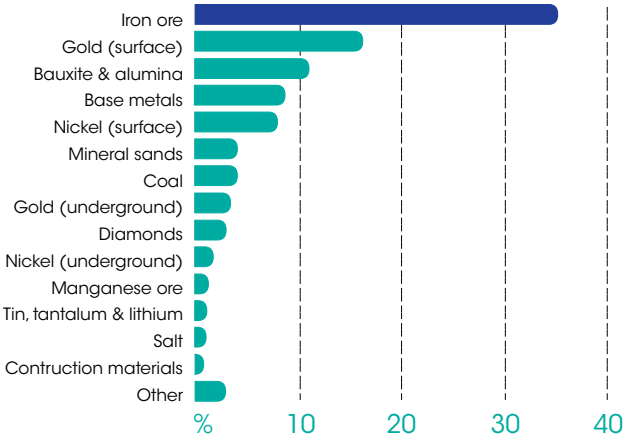
PERCENTAGE OF INJURIES



PERCENTAGE OF MILLION HOURS WORKED



PERCENTAGE OF WORK DAYS LOST

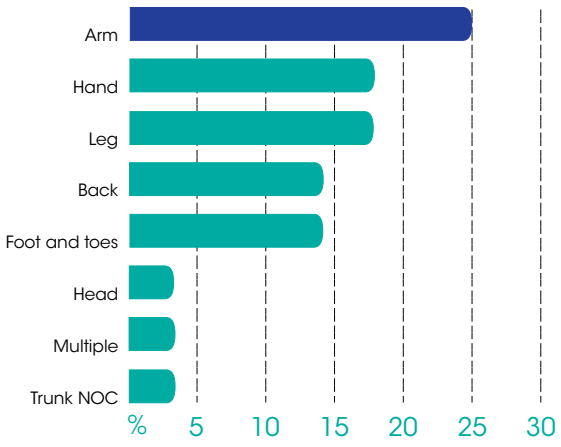


APPENDIX B

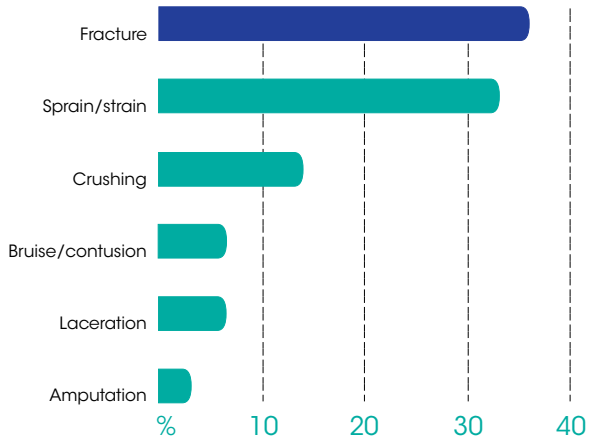
SERIOUS INJURIES UNDERGROUND 2008-09

28 INJURIES

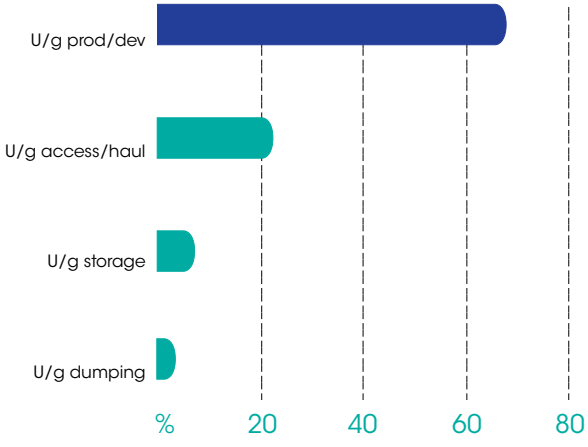
PART OF BODY



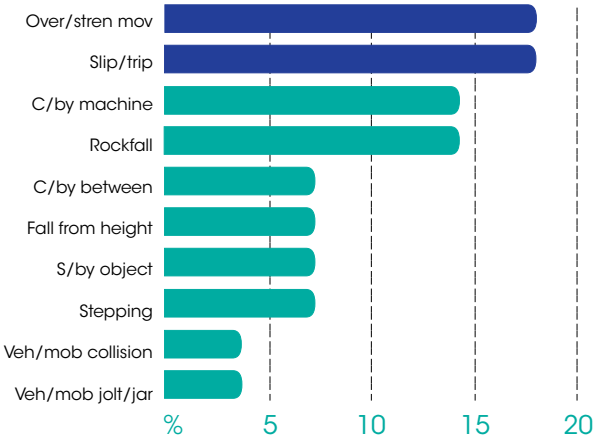
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

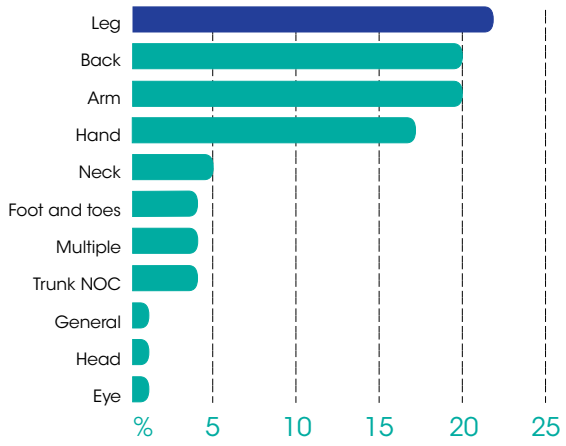


APPENDIX C

SERIOUS INJURIES SURFACE 2008-09

288 INJURIES

PART OF BODY



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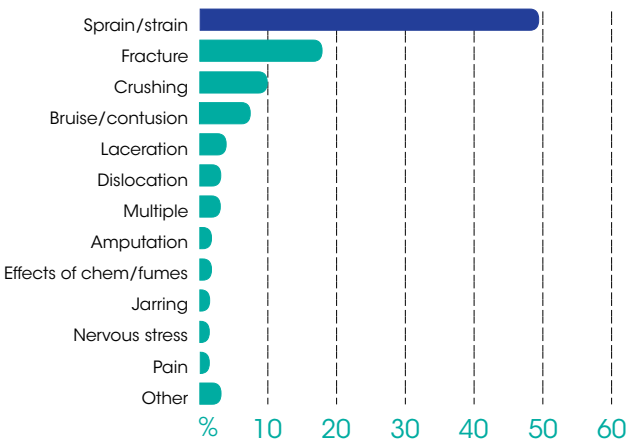

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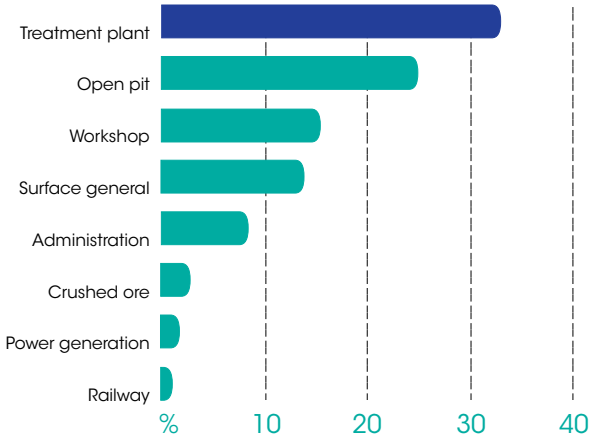
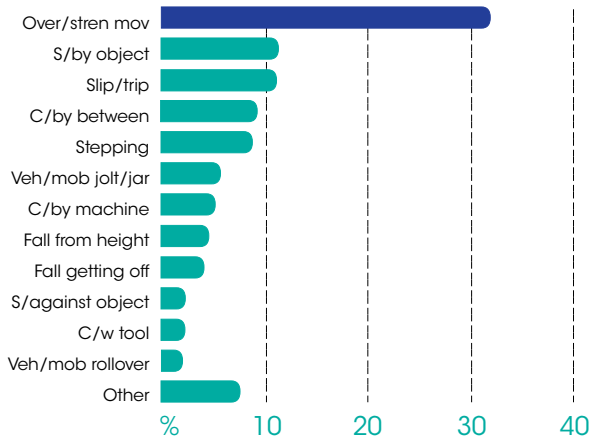


TYPE OF ACCIDENT

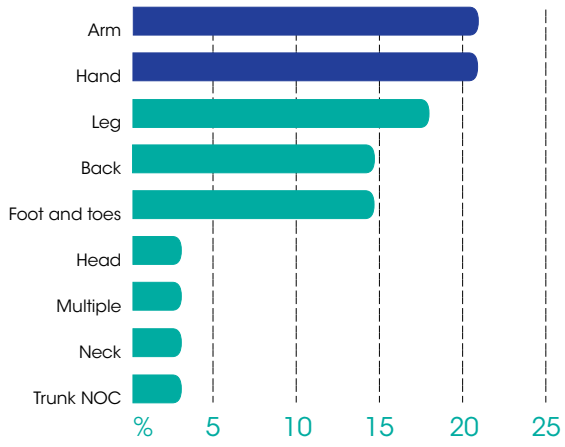


APPENDIX D

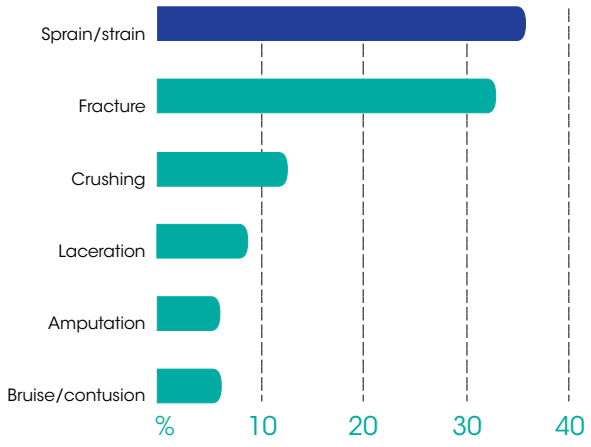
METALLIFEROUS UNDERGROUND INJURIES 2008-09

34 INJURIES

PART OF BODY



NATURE OF INJURY



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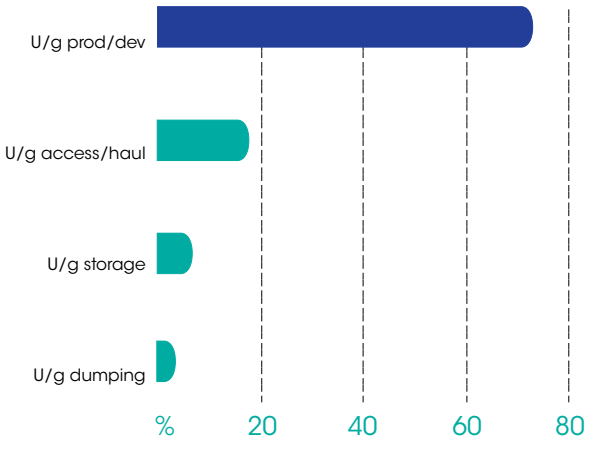
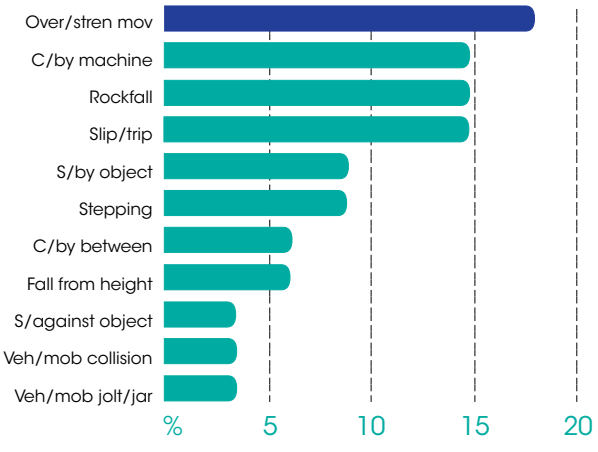


TYPE OF ACCIDENT

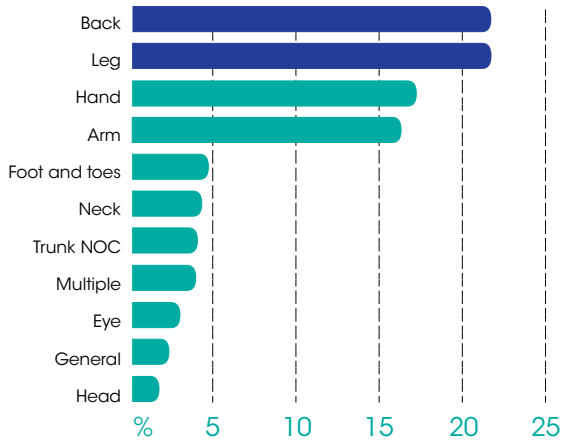


APPENDIX E

METALLIFEROUS SURFACE INJURIES 2008-09

347 INJURIES

PART OF BODY



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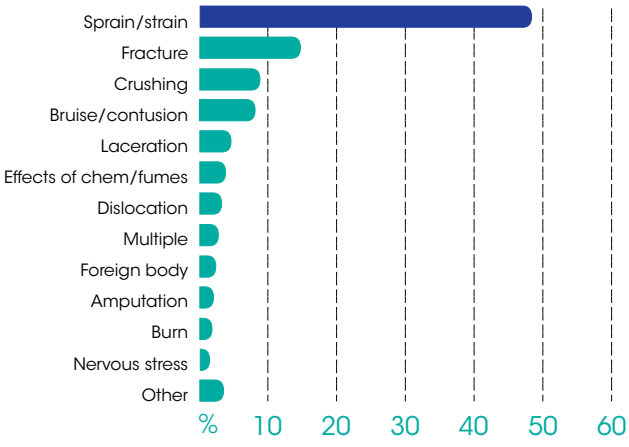

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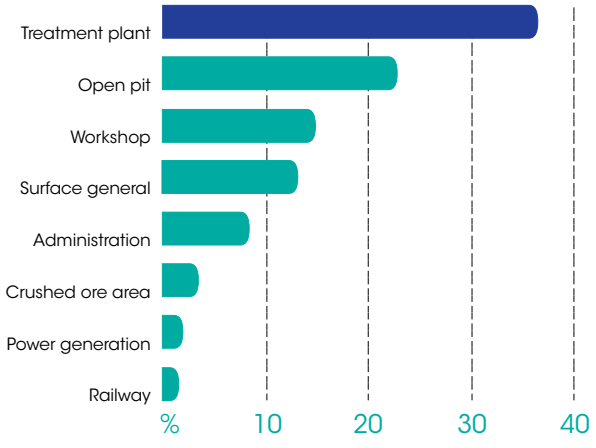

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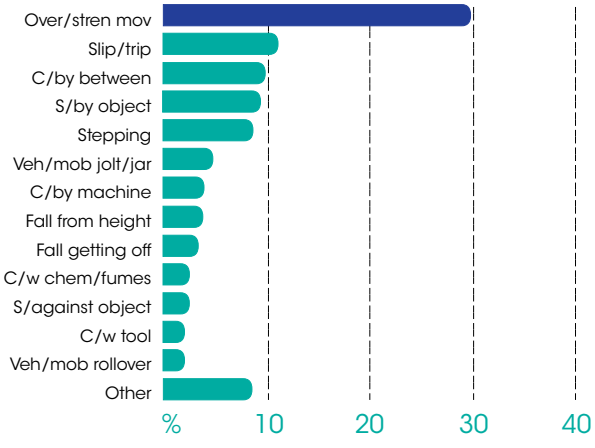
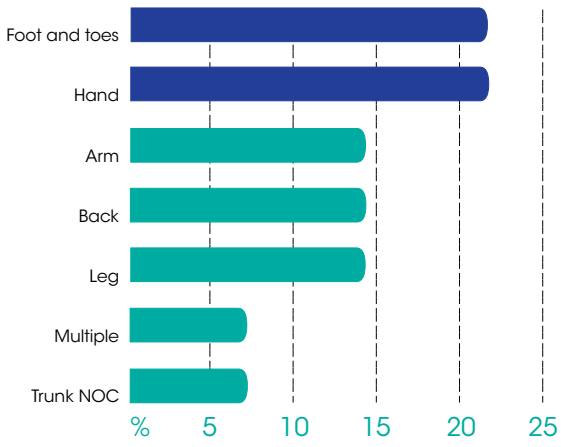


APPENDIX F

GOLD UNDERGROUND INJURIES 2008-09

14 INJURIES

PART OF BODY



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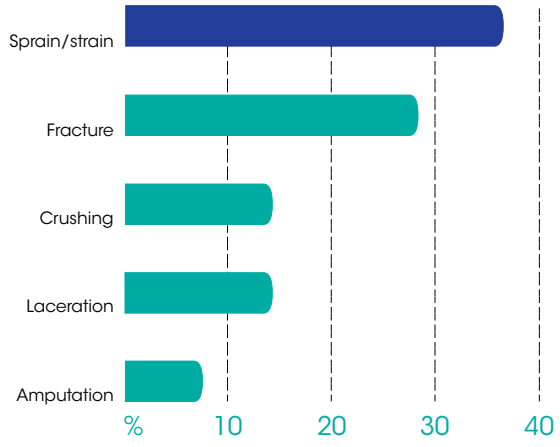

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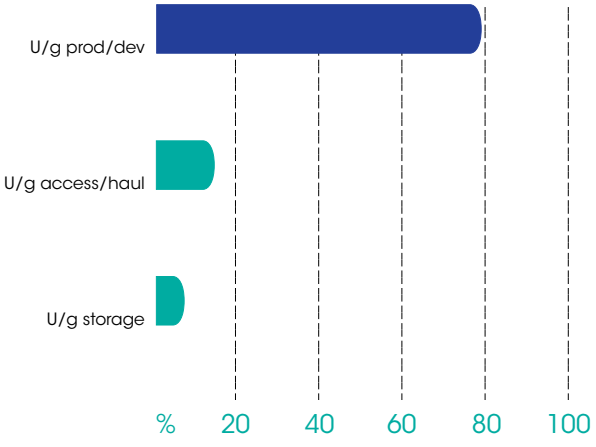

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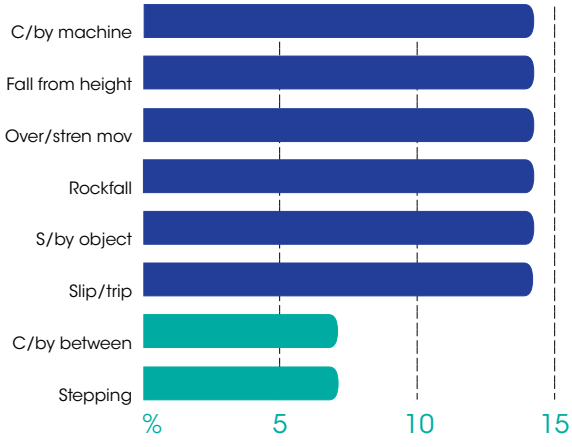
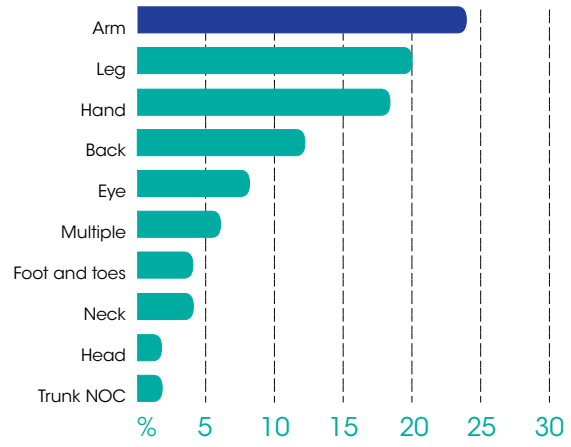


APPENDIX G

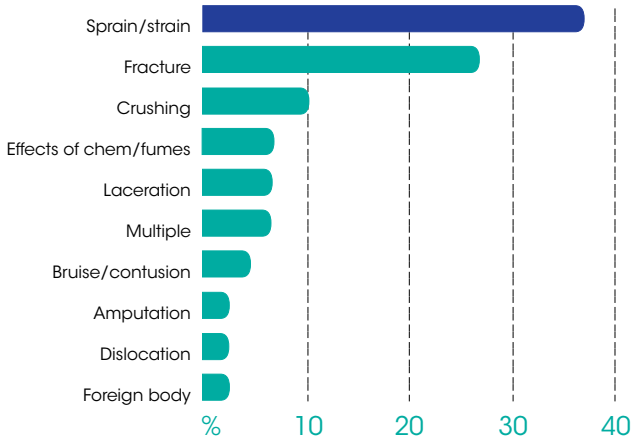
GOLD SURFACE INJURIES 2008-09

50 INJURIES

PART OF BODY



NATURE OF INJURY



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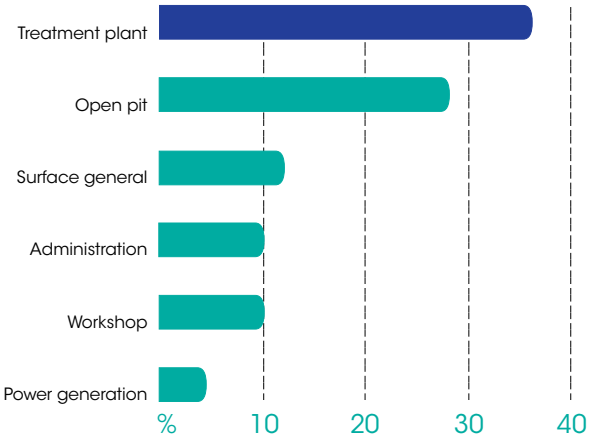

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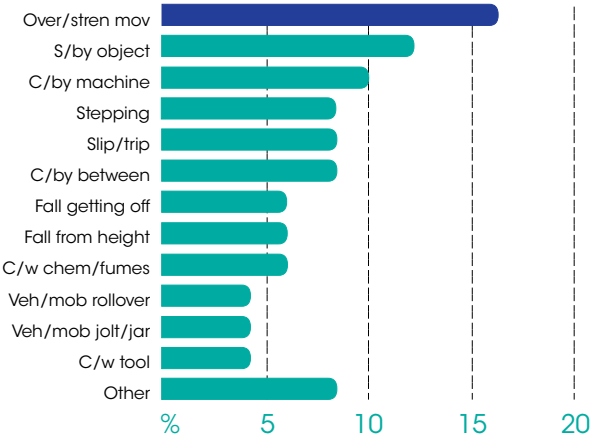
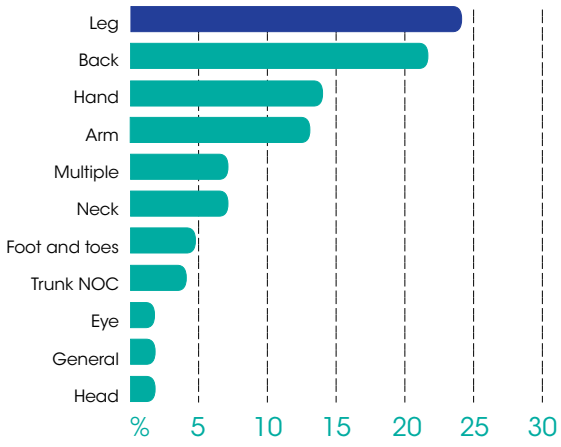


APPENDIX H

IRON ORE INJURIES 2008-09

129 INJURIES

PART OF BODY



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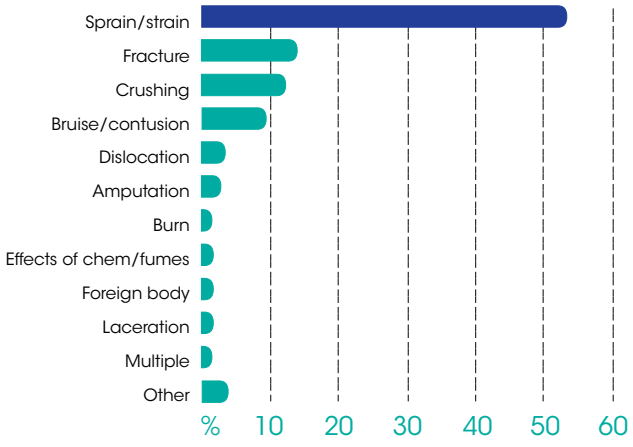

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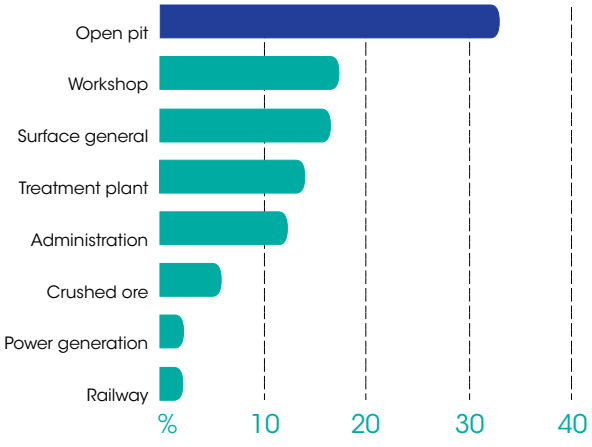

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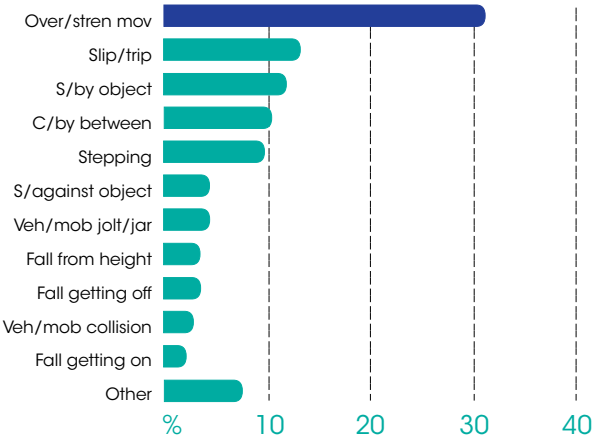
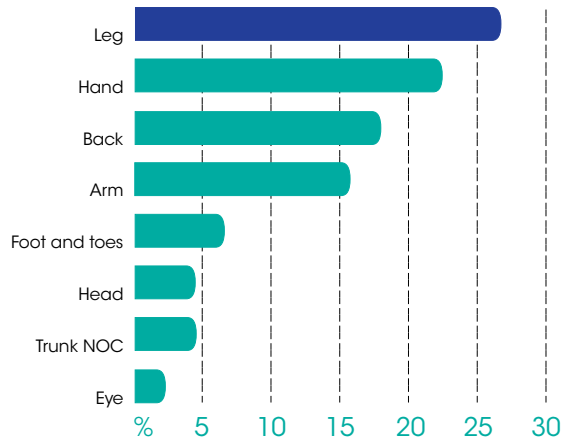


APPENDIX I

BAUXITE AND ALUMINA INJURIES 2008-09

45 INJURIES

PART OF BODY



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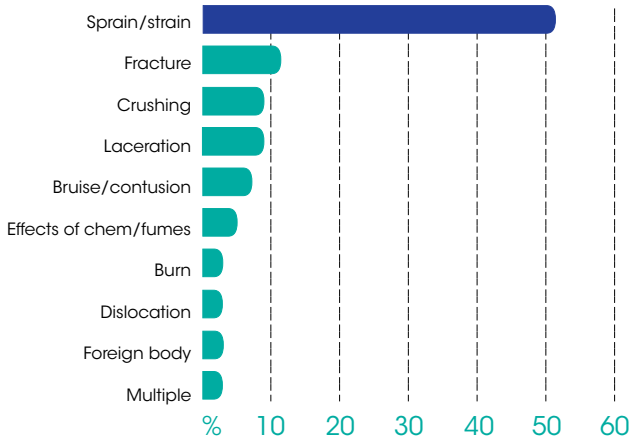
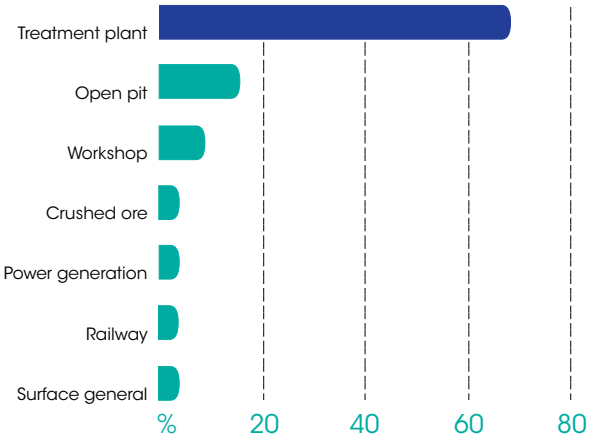
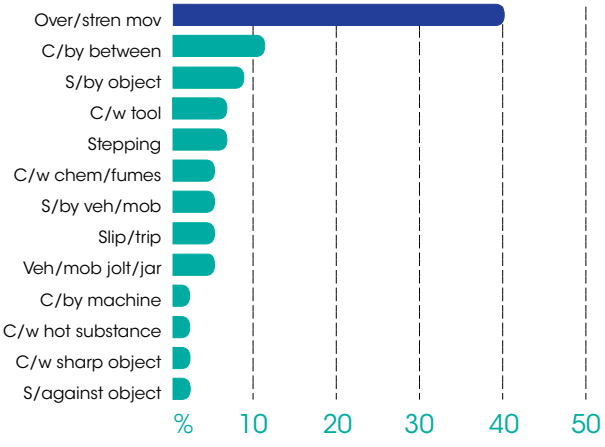


LOCATION OF ACCIDENT



TYPE OF ACCIDENT

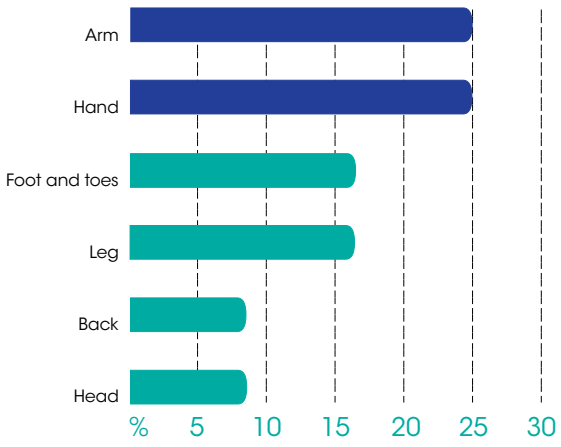


APPENDIX J

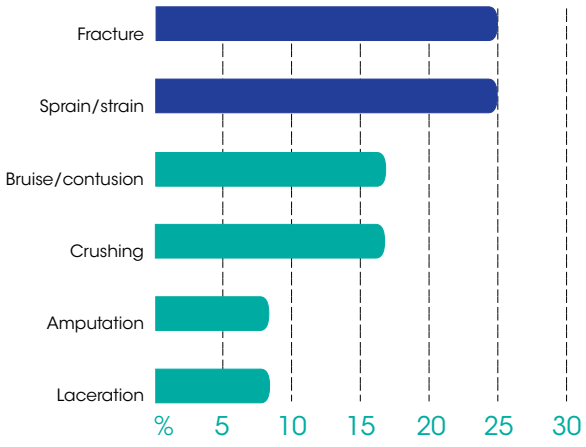
NICKEL UNDERGROUND INJURIES 2008-09

12 INJURIES

PART OF BODY



NATURE OF INJURY



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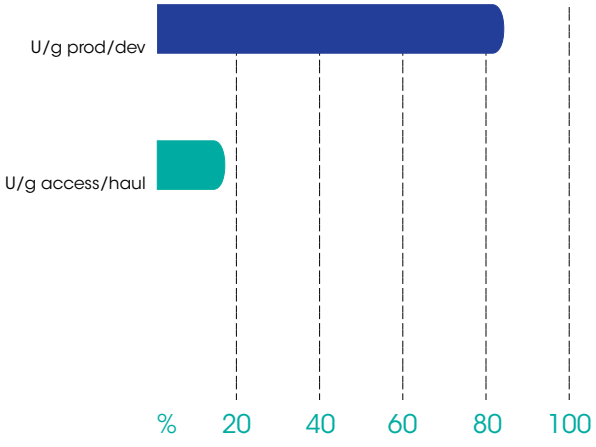
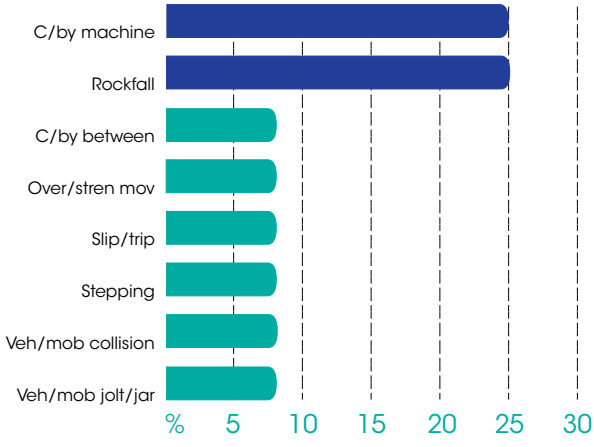


TYPE OF ACCIDENT

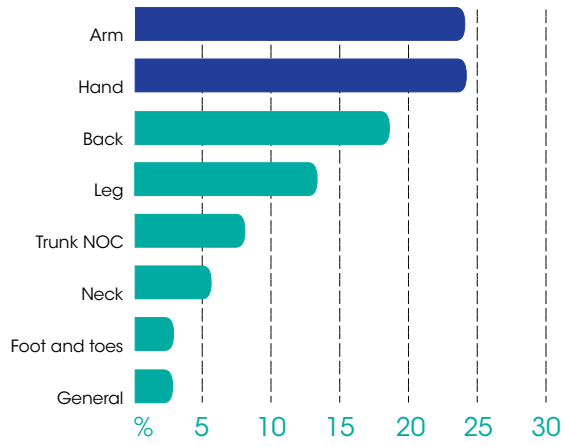


APPENDIX K

NICKEL SURFACE INJURIES 2008-09

37 INJURIES

PART OF BODY



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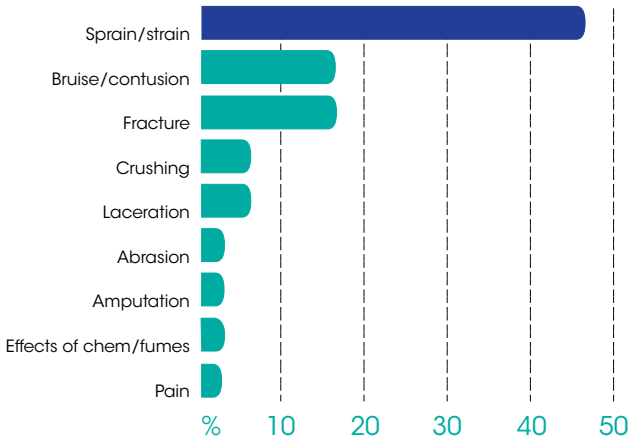

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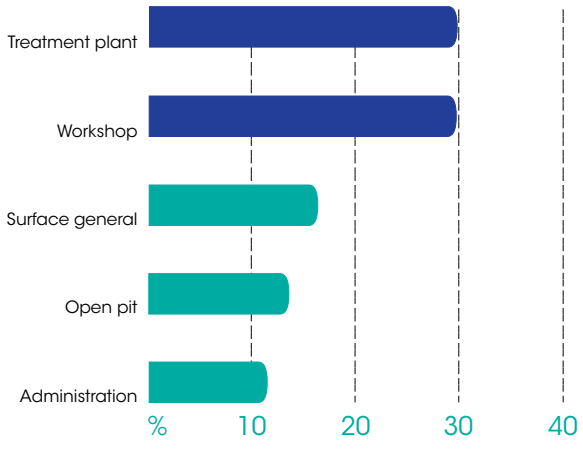
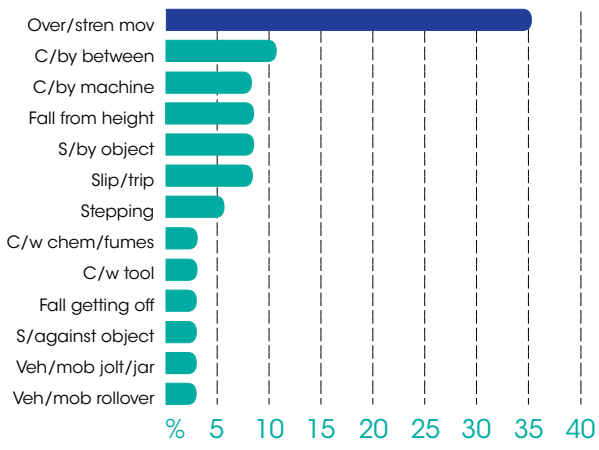


TYPE OF ACCIDENT

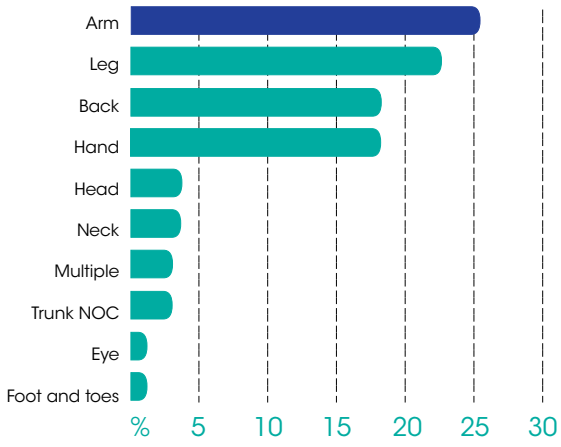


APPENDIX L

DISABLING UNDERGROUND INJURIES 2008-09

103 INJURIES

PART OF BODY



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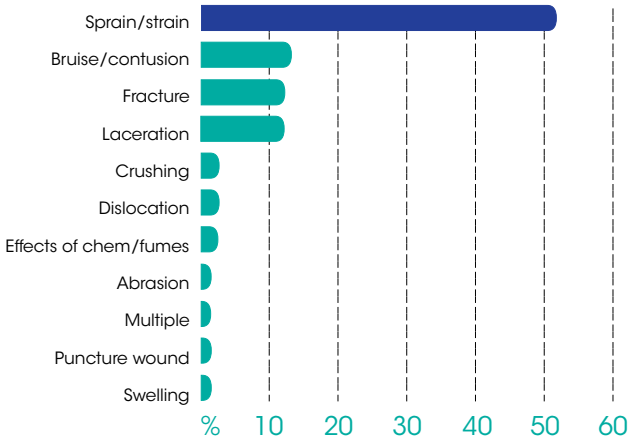

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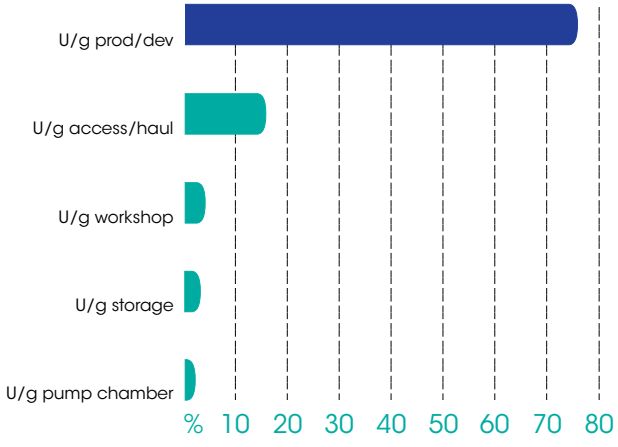
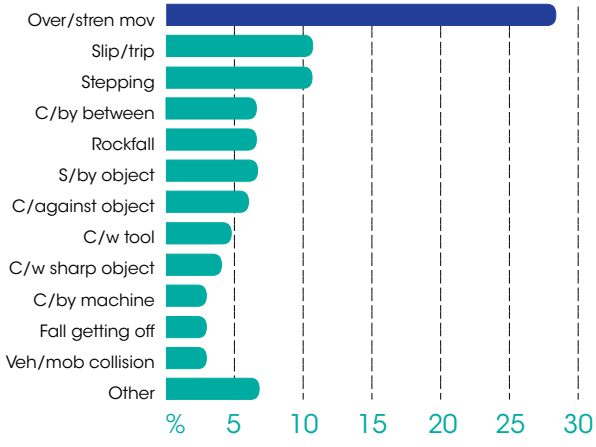


TYPE OF ACCIDENT

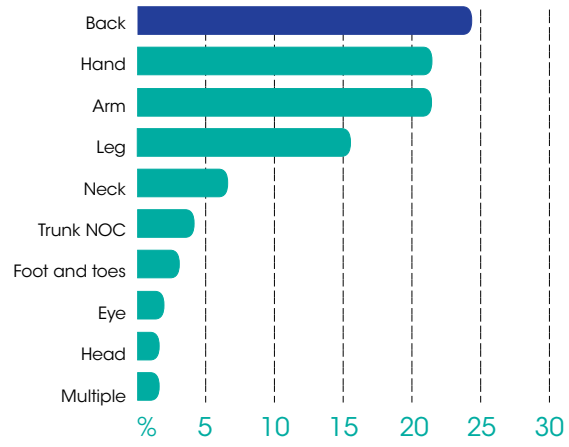


APPENDIX M

DISABLING SURFACE INJURIES 2008-09

505 INJURIES

PART OF BODY



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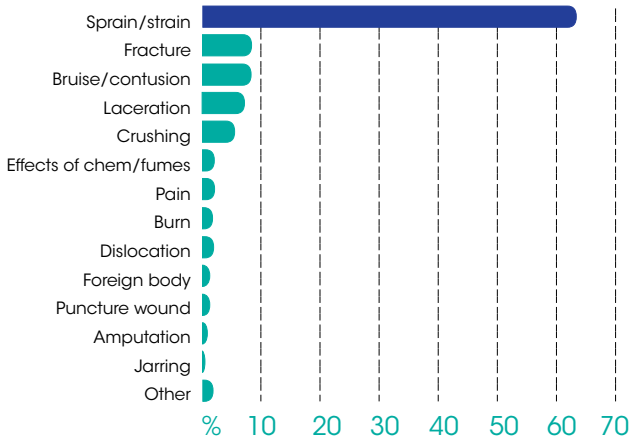
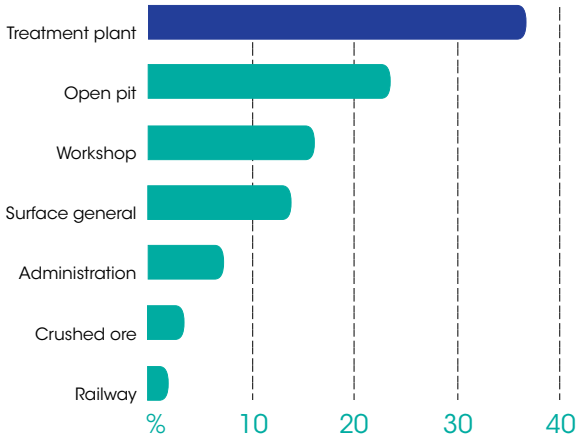
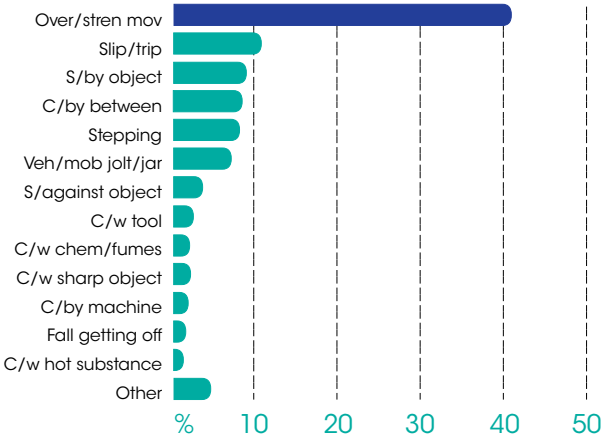


LOCATION OF ACCIDENT



TYPE OF ACCIDENT

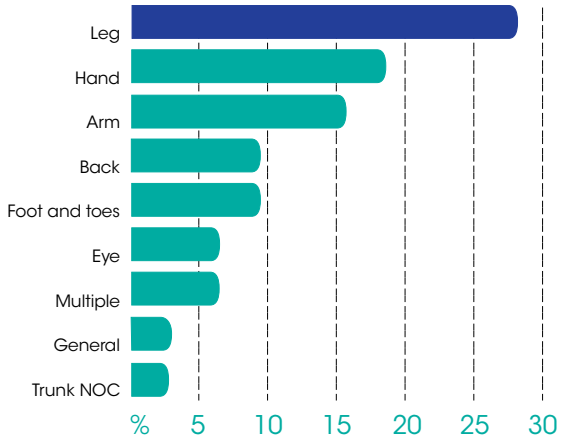


APPENDIX N

EXPLORATION INJURIES 2008-09

32 INJURIES

PART OF BODY



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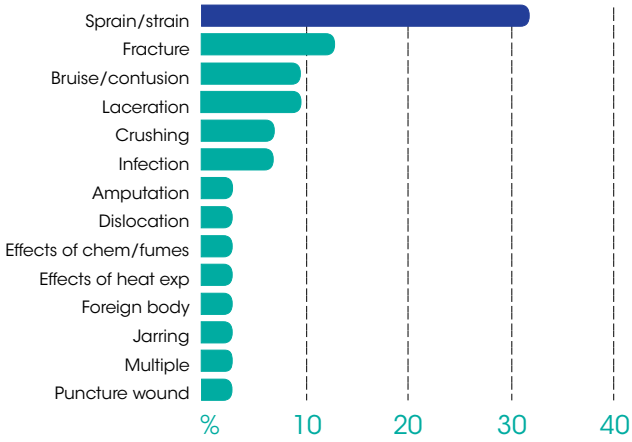
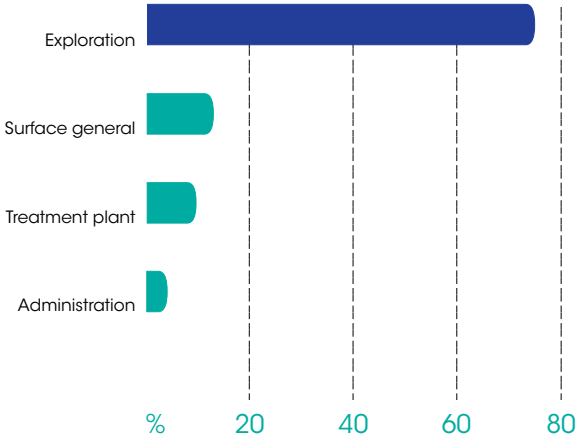
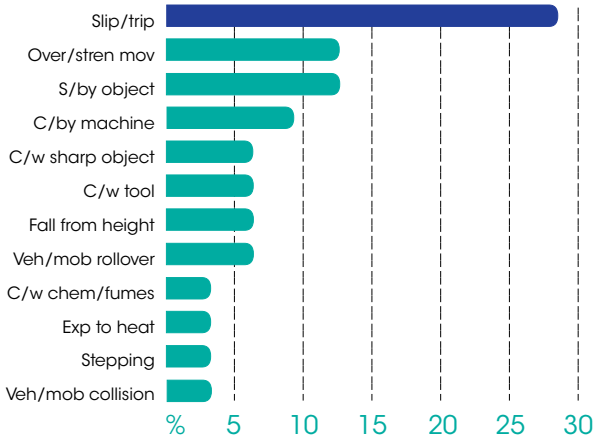


LOCATION OF ACCIDENT



TYPE OF ACCIDENT



APPENDIX O

SELECTED TERMS USED FOR REPORTING ACCIDENT TYPE

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

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 handling 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

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

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

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

S/BY VEH/MOB – struck by a vehicle or mobile equipment

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

VEH/MOB COLLISION – vehicle or mobile equipment collision; includes colliding with stationary objects or walls

VEH/MOB ROLLOVER – vehicle or mobile equipment rollovers; includes partial rollovers

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)

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

OVER/STEN 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

EXP TO HEAT – exposure to environmental heat; usually results in heat stress related injuries.

C/W HOT SUBSTANCE – contact with hot solid, liquid, gas or steam, molten metal or naked flame; usually results in burns.

C/W TOOL – contact with a handheld manual or power tool

C/W SHARP OBJECT – contact with sharp object but does not include objects such as sharp tools or operating machines

C/W CHEM/FUMES – inhalation, absorption or ingestion of chemicals or fumes including smoke, blast fumes, acids, caustic substances and industrial solvents

OTHER – a grouping of accident types that individually contain a smaller proportion of injuries than the smallest individual type shown on a chart (typically less than two per cent)

Note: For clarity, most bar charts in this publication are restricted to 14 or fewer categories.

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