SAFETY PERFORMANCE

IN THE WESTERN AUSTRALIAN MINERAL INDUSTRY

ACCIDENT AND INJURY STATISTICS 2013-2014

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

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STATISTICAL SUMMARY

MINING

- There were five fatal accidents in the Western Australian mineral industry during 2013-14. Of these, three were on gold mines (one underground and two on the surface), and two occurred at iron ore operations.
- There were 456 LTIs during 2013-14, 41 less than the previous year (497 injuries in 2012-13).
- There was an average workforce of 107,335 workers in 2013-14, an increase of approximately 1% over the previous year's average of 106,371.
- The overall LTI duration rate deteriorated by 4% during 2013-14, rising from 23.5 to 24.4.
- The overall LTI frequency rate for 2013-14 improved by 8%, falling from 2.5 to 2.3.
- The overall injury index improved by 1.7%, falling from 58 in 2012-13 to 57 in 2013-14.
- Serious LTIs in the mining industry during 2013-14 totalled 386, 25 less than for 2012-13, although the overall serious LTIFR remained unchanged at 2.0.
- The iron ore sector LTIFR deteriorated by 6% during 2013-14, rising from 1.6 to 1.7.
- The bauxite and alumina sector LTIFR improved by 11% during 2013-14, falling from 4.5 to 4.0.
- The gold sector LTIFR deteriorated by 4% during 2013-14, rising from 2.5 to 2.6.
- The nickel sector LTIFR remained unchanged during 2013-14 at 3.0.
- There were 912 RWIs during 2013-14, 9 less than the previous year (921 RWIs reported in 2012-13).
- The overall RWI frequency rate for 2013-14 deteriorated by 2%, rising from 4.6 to 4.7.
- The overall RWI incidence rate fell by 8% during 2013-14, from 9.2 to 8.5.

EXPLORATION

- There were no exploration fatalities in 2013-14.
- There were 6 LTIs reported during 2013-14 (23 less than the previous year).
- There was an average workforce of 2,304 workers, a decrease of 17% from the previous year's average. The overall LTIFR improved by 74% during 2013-14, falling from 5.1 to 1.3.
- There were 30 exploration restricted work injuries reported during 2013-14, resulting in a RWI frequency rate of 6.3, an increase of 9%, and a RWI incidence rate of 13.0, an increase of approximately 9%.

INTRODUCTION

The loss of five lives in work-related accidents in 2013-14 is in stark contrast to the outcome for Western Australian mining operations in 2012-13, which was the State's first year on record with no fatalities — and almost 24 months between fatal accidents. Everyone involved in mining must commit to making a difference if the aspirational goal of "zero harm" is to become an imbedded reality and not achieved only occasionally.

For the first time, the names of the people who lost their lives are included in this report to pay respect and acknowledge their place in the mining workforce.

In early 2014, the Department of Mines and Petroleum released a report that analysed 52 mining fatalities between 2000 and 2012. The report highlighted trends and clusters that appear significant, and reinforced key areas of focus for the regulator and industry to drive safer outcomes for the minerals sector:

- improving hazard awareness and control selection
- promoting the adoption of appropriate risk management strategies
- supporting effective leadership and positive cultural change.

Although Western Australia has an enviable safety record compared to some jurisdictions, there is a commitment across the board for everyone to go home safe from work. However, the safety performance indicators are showing few or no signs of improvement. While there was a decrease in the number of serious injuries, the number of notifiable incidents, which includes potentially serious incidents or "near misses", remains unacceptably high. But for millimetres or seconds, some could have resulted in more serious consequences or even fatalities.

The challenge for everyone is how to achieve the next step-change in safety performance.

As mining operations continue to take more responsibility for the safety of their own workforces, and strive to be resilient, there needs to be a concerted effort to move away from administrative controls, which rely on worker's judgement for implementation, to more effective controls using elimination, substitution and engineering methods.

The suitability of training and inductions, assessments of competency, and appropriateness of risk management tools applied to work tasks should also be reviewed in consultation with the workforce to identify potential improvements. The average employment levels remained above 100,000, with many operations transitioning from the construction to production phase in 2013-14. It is hoped that the increasing experience of the workforce, together with the strategies outlined above, will translate into improved safety outcomes for the Western Australian minerals sector.

Andrew Chaplyn
State Mining Engineer

DEFINITIONS

DURATION RATE

Average number of workdays lost per injury

FATAL INJURY INCIDENCE RATE

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

FREQUENCY RATE (LTIFR)

Number of lost time injuries per million hours worked

INCIDENCE RATE

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

INJURY INDEX

Number of workdays lost per million hours worked

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

MINOR INJURY

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

RESTRICTED WORK INJURY (RWI)

Work injury (not LTI) that results in 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 may be performed or hours restricted

RESTRICTED WORK INJURY FREQUENCY RATE (RWIFR)

Number of restricted work injuries per million hours worked

SERIOUS INJURY

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

SERIOUS INJURY FREQUENCY RATE

The number of serious injuries per million hours worked

METALLIFEROUS MINES

All mines other than coal mines are classed as metalliferous mines

NOC

Not otherwise classified

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
ENV	environment
EXP	exposure
FR	frequency rate
HI PRESS FLUID	high pressure fluid
JOLT/JAR	jolting or jarring
LTI	lost time injury
LTIFR	lost time injury frequency rate
NOC	not otherwise classified
ON/OFF	on or off
PRESS	pressure
RWI	restricted work injury
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

EXPLANATORY NOTES

Introduction

The statistics published in this annual compilation mainly relate to accidents between 1 July 2013 and 30 June 2014 (2013-14) 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 2013-14 has three components:

i) Initial injuries — days lost in 2013-14 from injuries that occurred in 2013-14

ii) Recurrent injuries — days lost in 2013-14 through recurrences of injuries that occurred in 2013-14 and previous years

iii) Carry-over injuries — days lost in 2013-14 by persons continuously off work from injuries that occurred before 1 July 2013.

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.

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

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

Fatal accidents

Work days lost have not been allocated to fatal accidents, nor have fatalities been included in injury incidence, frequency or duration rate calculations except in Tables 8 and 9, which are in accordance with Australian Standard AS 1885.1:1990 *Measurement of occupational health and safety performance – Describing and reporting occupational injuries and disease* (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.

This report has been made using data for 2013-14 received by the end of October 2014. It will not reflect any data received or changed after this date.

During the twelve months covered in this compilation, an average of 374 mines or groups of mines and 251 exploration companies reported to the SRS.

Some of the terms most commonly used to describe 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%).

FATAL ACCIDENTS

Fatal accidents during 2013-14

Kurt Williams, 14 August 2013

Kurt Williams, an electrician, was fatally injured during night shift at an iron ore processing facility. Mr Williams was apparently greasing an electric motor while the tripper conveyor was operating in automatic mode. He was caught between the motor cable termination box and an access ladder fixed to the tripper unit, which moved in an open access area.

Related safety alert

Mines Safety Significant Incident Report No. 186 Crush injuries sustained around moving machinery – fatal accident

Stephen Hampton, 4 December 2013

Stephen Hampton was fatally injured while working with others to install a new 60 m long section of pipe to an existing tailings header. He was tightening bolts on the pipe flange in a shallow access trench at the edge of the tailings dam embankment. A similar trench was being excavated at the free end of the pipe in readiness for the next section. The free end of the pipe slid down the embankment, pinning the Mr Hampton between the pipe and the trench walls.

Related safety alert

Mines Safety Significant Incident Report No. 193 Crush injuries sustained from movement of tailings pipe – fatal accident

Allen Zuvela, 29 December 2013

Allen Zuvela was fatally injured, and another worker seriously injured, in an accident at a heavy equipment maintenance workshop. The fitters were completing the installation of the operator's cab for a surface miner after a rebuild. They were working directly beneath the 2.5 tonne cab, which was suspended from an overhead crane being controlled by one of them using the pendant. There was no spotter and neither could see the crane load indicator or rigging. The rigging apparently failed in overload and the cab descended onto them.

Related safety alert

Mines Safety Significant Incident Report No. 194 Crush injuries sustained from working with a suspended load – fatal accident

Wayne Fowlie, 15 February 2014

A lone worker, Wayne Fowlie, was using an LHD (bogger) to clean-up an underground development heading that had been fired the previous day. After partially bogging the face, it appears Mr Fowlie dismounted from his machine and received fatal injuries when about 6 metres of the hanging wall collapsed onto him. The ore drive had been developed by air-leg mining methods and the installed ground support (spot bolting, friction rock stabilisers) was ineffective.

Related safety alerts

Mines Safety Significant Incident Report No. 200 Fall of ground in underground mine – fatal accident

Mines Safety Bulletin No. 112 Quality control issues when installing friction rock stabilisers with airleg drills

Lance Farber, 26 May 2014

Lance Farber was fatally injured when he was trapped between the mast and frame of a forklift truck. The forklift had bottomed-out and was stuck on the crest of a ramp providing pedestrian access into a process building. He was attempting to lift the front of the forklift with a mobile crane and had positioned himself between the mast and frame of the forklift truck to attach a lifting sling to the mast, instead of the marked slinging points. It appears the control level for the mast's tilt cylinder was inadvertently activated, causing the mast to close and crush Mr Farber.

Related safety alert

Mines Safety Significant Incident Report No. 203 Operator crushed by mast of forklift truck – fatal accident

FATAL ACCIDENTS CONTINUED

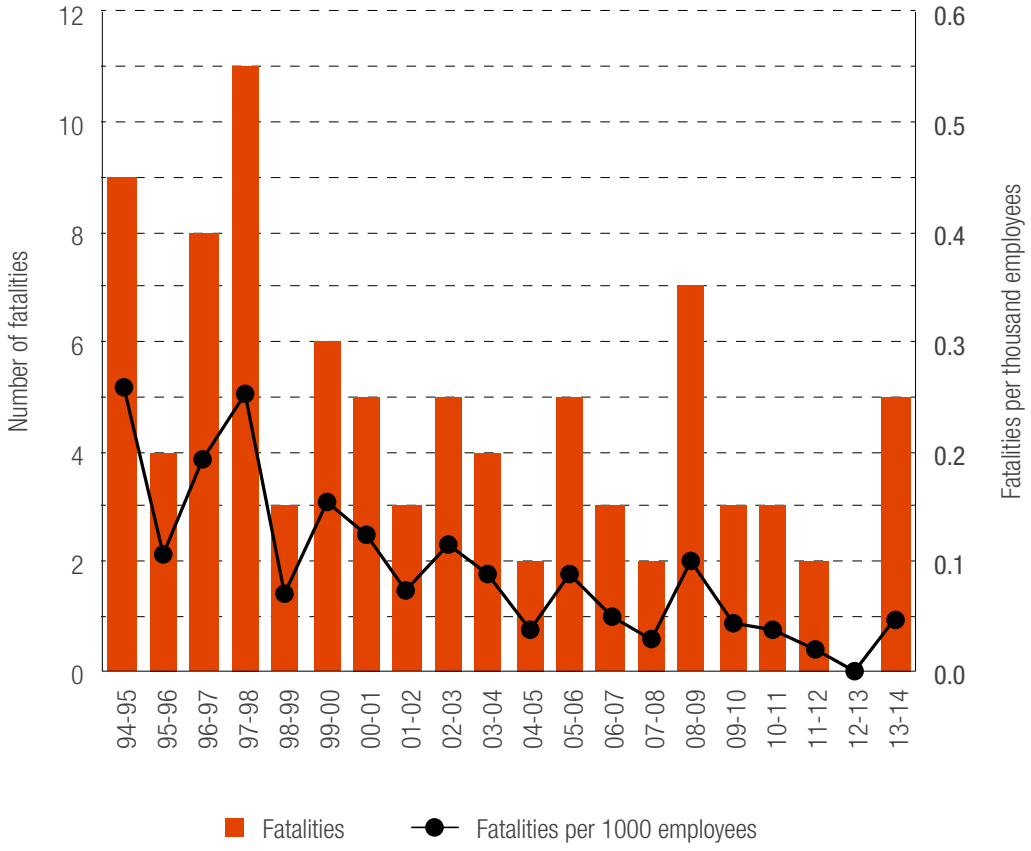
Fatal injury incidence rate 1994-95 to 2013-14

The fatal injury incidence rate for 2013-14 was 0.047. There were no mining fatalities in 2012-13, resulting in a fatal injury incidence rate of zero. The rate for 2011-12 was 0.021.

While there has been an overall decrease in the number of fatalities per thousand employees over the last 20 years (see Figure 1), the rate of improvement has slowed in recent years, with a fatal incidence rate of between zero and 0.1 over the last decade.

Resources Safety maintains the view that no fatal accident is acceptable, and a fatal injury incidence rate of zero is achievable. The zero fatal incidence rate for 2012-13 supports this view.

FIGURE 1 FATAL INJURY INCIDENCE RATE 1994-95 TO 2013-14



FATAL ACCIDENTS CONTINUED

Fatal injury incidence rate by mineral mined 2009-10 to 2013-14

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 was 4.5 times higher than the fatal injury incidence rate for surface operations.

Fatal accidents by type of accident 2009-10 to 2013-14

Table 2 indicates the type of accidents for the 14 fatalities in the mining industry (including exploration) over the past five years, with four underground, nine at surface operations and one in exploration.

The three types of underground fatal accident which occurred during the past five years were fall from height (two fatalities), rockfall (one fatality) and vehicle or mobile equipment rollover (one fatality).

Of the four types of surface fatal accident occurring in the past five years the most common was struck by object (four fatalities).

The exploration fatality was due to exposure to environmental heat.

TABLE 1 FATAL INJURY INCIDENCE RATE BY MINERAL MINED 2009-10 TO 2013-14

Category		Fatalities per thousand employees
Mineral	Gold	0.05
	Iron ore	0.03
	Nickel	0.03
	Bauxite and alumina	0.02
Underground		0.09
Surface		0.02
Exploration		0.07

TABLE 2 NUMBER OF FATALITIES BY TYPE OF ACCIDENT 2009-10 TO 2013-14

Category		Number of fatalities
Underground	Fall from height	2
	Rockfall	1
	Veh/mob rollover	1
Surface	S/by object	4
	Fall from height	2
	S/by veh/mob	2
	C/by between	1
Exploration	Exposure to env heat	1
Total		**14**

SERIOUS INJURIES

Review of serious injuries during 2013-14

There were 386 serious injuries reported in the mining industry during 2013-14 (411 in 2011-12). Of these, 375 were in metalliferous mines and 11 were in coal mines.

Typical serious lost time injuries are described below:

A scraper driver was jolted, injuring his neck, while driving his machine off a stock pile. The scraper's front wheels dropped 600-700 mm off an end of the pile that had been stripped across the base.

An employee, working on the rock lining of a V drain, suffered a lower back strain while attempting with another worker to roll a rock weighing about 60 kg from the bottom of the drain onto the side. The injured person, who was on the first day back at work after a five-day break, was unable to move or stand.

A loader operator suffered a torn tendon while pulling on an 8 m chain so the padlock securing it could be opened to gain access to an orepass.

An employee who had been unloading items, including 23 kg leaf springs and a heavy box, from a plane into her light vehicle developed pain in her left shoulder, which worsened over the next two days.

A rigger, spotting for a truck that was manoeuvring to reverse out after delivering a demountable accommodation unit, fell to the ground while apparently climbing up to the driver's window as the truck was moving forward. His right foot and lower leg were trapped under the right front wheel of the prime mover. He received fractures to his right foot, pelvis and elbow from the fall and crush injuries.

The driver of an MT4400 truck in the bench area of an open pit suffered crush injuries to his legs when his truck collided with the right side of the rear of another MT4400 truck. The tray of the front truck pushed the dash of the rear truck backwards and pinned the operator against the rear of the cabin.

A haul truck driver jarred her right hip, resulting in micro-fractures to head of the right femur, while alighting from the truck's ladder, which was higher than anticipated.

An electrician working in a motor control centre (MCC) cabinet suffered second degree burns to his left hand, left forearm and nose from an arc flash that occurred when a 415 volt wire broke away and contacted the rear of the cabinet. He also suffered flash-like effects to his vision and there was concern over an injury to his left eye.

A drill jumbo operator exiting the cab of the machine dropped and strained his upper arm when the rubber mount on the last rung of the ladder broke away.

The operator of a haul truck was jolted within the cab, hitting her knees on the steering wheel and striking her head on the roof four times, when a large piece of the face fell onto the rear of the truck's tray while it was being loaded. The impact forced the tray up and pushed the truck forwards.

A process worker sprained his ankle when he rolled his foot on a rock while stepping off a conveyor.

A scaffolder, working at ground level as part of a team of five dismantling a scaffold, fractured his leg below the knee when he twisted and fell awkwardly while evading a toppling scaffolding tube that had been leaning against the scaffolding. The injured person had been receiving tubes lowered to him from above and was removing the clips before stacking the tubes in a cradle. As the dismantling was being done faster than the stripping and stacking, a tube waiting to be stripped was positioned with one end on the ground and another against the scaffold. It is believed another tube being lowered may have caused the standing tube to fall.

The operator of a dozer strained his neck when he reversed over a rock, causing the cab to bounce while he was looking over his shoulder.

The driver of a fuel truck suffered tear and fracture injuries to his shoulder when he missed the last step on the truck while climbing down, causing his weight to be taken on his outstretched right arm.

A dozer operator received open compound fractures of both the tibia and fibula of his left leg as well as lacerations and bruising to his chin and head when the wall of a 4 m deep slot in ore that he had been feeding into a bin collapsed. He had been getting ready to climb to the ground. The ore appears to have knocked him onto the track and down in the area between the dozer and the blade. He was temporarily rendered unconscious but managed to crawl back to the cab and raise the alarm.

A leading hand in the heavy vehicle workshop received a fracture and contusions to his ankle when he was struck by a drill jumbo tyre that fell from a forklift. He had seen that the tyre had become unbalanced and had moved a nitrogen gas cylinder out of its way, but did not manage to get clear himself.

SERIOUS INJURIES CONTINUED

A water truck operator lost her footing on the second step while climbing down and fell about a metre backwards, landing on her back and hitting her head, left shoulder and left elbow on the ground. The fall resulted in joint damage and multiple soft tissue injuries, leading to a significant period of restricted work.

A fitter had his left index finger amputated near the outer end of the second finger bone (middle phalanx) when it was caught between a jack stand that he and another worker were attempting to remove from under a dozer and another stand that was supporting the rear of the machine. The fitter had been pushing the stand, while the other worker was pulling it with a sling, when it moved unexpectedly. The fitter lost his balance and his finger was caught between the stands.

A plant operator was struck on the thumb by a rock that fell from a screen feed conveyor 2 or 3 metres above him while he was starting a screening plant.

A charge hand received crush injuries to the fourth and fifth toes of his right foot when the jack leg of a charge up vehicle being parked in a drive lowered onto his foot while he was placing a tamping stick that he had picked up onto the machine.

A trades assistant suffered crush injuries to his left foot when the bucket of a bobcat skid-steer loader fell unexpectedly during attempts to detach it. While changing over bobcat buckets, the securing pins had not released properly, with only the left pin releasing. During efforts to free the pin, the bucket was raised off the ground and the injured person walked over to look at the rear of bucket. As he leant over to see the pin, the bucket released and fell off, striking him on the foot.

While walking on an undulating surface, a trades assistant stepped on a rock, which moved causing a hyperextension of the knee.

An underground cable bolter rolled his ankle and fell, resulting in an ankle sprain, when he stepped onto uneven ground getting out of an integrated tool carrier (IT) basket in the decline.

A drill rig operator twisted his ankle and suffered minor fractures to his heel attempting to maintain his balance after he stepped off a drill platform into a puddle of water that was deeper than he had expected.

An employee, working from the basket of an elevated work platform (EWP), suffered lacerations and fractures to his head, nose, wrist, hand and ribs when the ventilation bag kicked, knocking him from the basket to the ground. He was wearing fall arrest gear but had apparently failed to attach the lanyard.

Serious injury incidence rate by mineral mined 2009-10 to 2013-14

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 (5.8) was 53% higher than that for surface operations (3.8).

Of the major mining sectors, coal had the highest five-year average serious injury incidence rate (16.4) , followed by base metals at 6.7, whereas iron ore had the lowest (at 2.5), followed closely by manganese and salt (at 2.8 and 2.9 respectively). The mining sector referred to as “Other”, with a five-year average serious injury incidence rate of 6.6, contained 3% of the total number of employees spread over 16 commodity groups.

Serious injury frequency rate 2009-10 to 2013-14

Figure 3 shows that the serious injury frequency rate improved slightly for underground metalliferous operations while surface metalliferous remained unchanged. Coal operations improved by almost 20% during 2013-14.

FIGURE 2 SERIOUS INJURY INCIDENCE RATE 2009-10 TO 2013-14

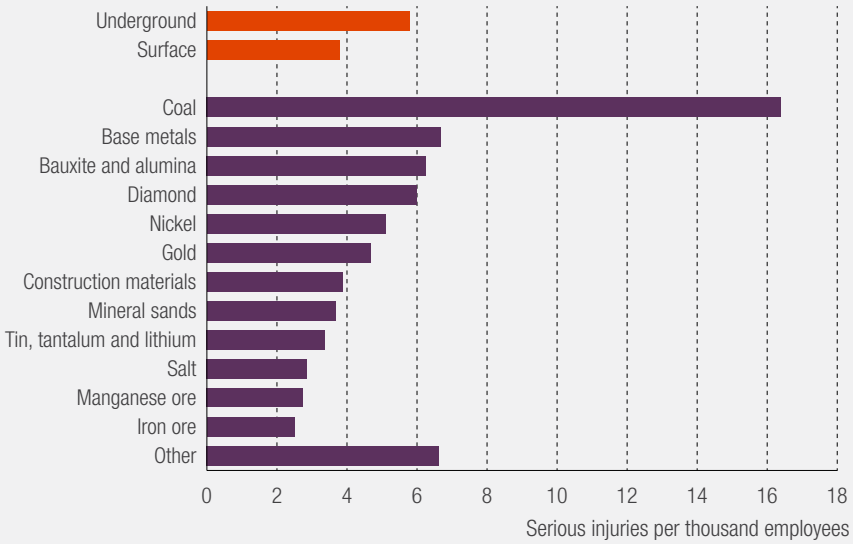
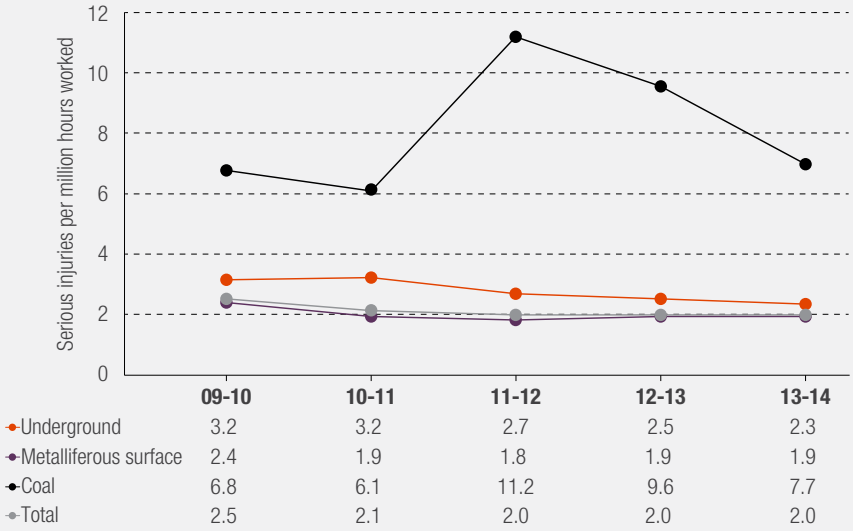


FIGURE 3 SERIOUS INJURY FREQUENCY RATE 2008-09 TO 2012-13



	09-10	10-11	11-12	12-13	13-14
Underground	3.2	3.2	2.7	2.5	2.3
Metalliferous surface	2.4	1.9	1.8	1.9	1.9
Coal	6.8	6.1	11.2	9.6	7.7
Total	2.5	2.1	2.0	2.0	2.0

Serious injury percentage breakdown for 2013-14

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 34%, followed by shoulder injuries at 26%, back injuries at 14%, then foot and toes, hand and multiple injuries, all at approximately 9%. Of the serious leg injuries, 50% were to knees and 17% were to ankles.
- Consistent with the high proportion of knee, ankle, shoulder and back injuries, sprain or strain represented the highest proportion by nature of injury (51%), followed by fracture at 14%.
- The largest proportion of serious injuries underground was in production and development areas (77%), followed by underground crushing areas and workshops, both approximately 9%.
- The most common accident type associated with serious injuries underground was over-exertion or strenuous movements at 29%, followed by stepping at 20%, then struck against object and fall from height, both approximately 9%.

Surface

- Injuries to legs accounted for the largest proportion of serious injuries at 24%, followed by arm injuries at 21%, hand injuries at 20% and back injuries at 16%. Of the serious arm injuries, 51% were to shoulders while 17% were to wrists. Injuries to knees and to ankles accounted for 48% and 29% of serious leg injuries respectively.
- Consistent with the high proportion of knee, ankle, back and shoulder injuries, sprain or strain represented the highest proportion by nature of injury (50%). Fracture was the next highest (17%), followed by crushing at 9%.
- The largest proportion of serious injuries on the surface occurred in treatment plants (32%), followed by open pits at 28% then workshops at 18%.
- The most common accident types associated with serious injuries on the surface were over-exertion or strenuous movements (30%), followed by struck by object, stepping and slip or trip, all approximately 11%.

LOST TIME INJURIES

Review of lost time injuries during 2013-14

In 2013-14, 24441 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 2013-14 (11,122), recurrences of injuries sustained before 2013-14 and in 2013-14 (1,130), and LTIs and recurrences carried over into 2013-14 from accidents before July 2013 (12,189). A breakdown of work days lost in coal and metalliferous mining is given in Table 3.

During 2013-14, there were 456 LTIs in the State's mining industry. Of those, 443 were in metalliferous mines and 13 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 46 recurrences of previous injuries, resulting in 1,130 work days lost during 2013-14. A breakdown of recurrent injuries by calendar year of initial injury is given in Table 6.

One hundred and forty-five people who were still off work from injuries received before July 2013 lost 12,189 work days in 2013-14. A breakdown of these carry-over injuries is given in Table 7.

TABLE 3 TIME LOST THROUGH INJURY DURING 2013-14

Mines	Initial injuries	Recurrent injuries	Carry-over injuries	Total
	Days lost			
Metalliferous	10,776	1,103	11,965	23,844
Coal	346	27	224	597
Total mining	**11,122**	**1,130**	**12,189**	**24,441**

TABLE 4 INITIAL LOST TIME INJURIES DURING 2013-14

Sector	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Metalliferous surface	99,373	402	4.0	2.2	25.3	57	10,157
Metalliferous underground	7,324	41	5.6	2.7	15.1	41	619
Metalliferous total	**106,697**	**443**	**4.2**	**2.3**	**24.3**	**56**	**10,776**
Coal	**638**	**13**	**20.4**	**9.1**	**26.6**	**242**	**346**
Total mining	**107,335**	**456**	**4.2**	**2.3**	**24.4**	**57**	**11,122**
Exploration	**2,304**	**6**	**2.6**	**1.3**	**14.0**	**18**	**84**

TABLE 5 INJURIES BY MINERAL MINED DURING 2013-14

Mineral mined	No. of employees	No. of LTIs	Incidence	Frequency	Duration	Injury index	Days lost
Iron ore	61,737	192	3.1	1.7	30.2	51.8	5792
Gold	18,593	90	4.8	2.6	22.0	56.2	1983
Bauxite and alumina	7,408	58	7.8	4.0	18.7	75.3	1084
Nickel	6,477	37	5.7	3.0	14.3	42.7	530
Base metals	2,649	18	6.8	3.8	33.5	127.5	603
Mineral sands	2302	9	3.9	3.2	18.3	58.7	165
Diamonds	1571	11	7.0	3.6	8.5	30.6	94
Salt	1072	4	3.7	2.2	45.3	98.4	181
Construction materials	1011	6	5.9	3.4	18.0	60.7	108
Sand - silica sand	667	5	7.5	10.2	26.2	267.3	131
Coal	638	13	20.4	9.1	26.6	242.0	346
Manganese ore	564	0	0.0	0.0	0	0.0	0
Tin, tantalum and lithium	389	1	2.6	1.2	3.0	3.6	3
Other	2257	12	5.3	3.4	8.5	28.6	102
Total mining	**107,335**	**456**	**4.2**	**2.3**	**24.4**	**56.9**	**11,122**

Note: Duration in Tables 4 and 5 does not take into consideration time lost after 30 June 2014 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 2013.

TABLE 6 RECURRENT INJURIES DURING 2013-14

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2014*	8	170			8	170
2013	21	688			21	688
2012	7	109	3	27	10	136
2011	3	68			3	68
2010	1	2			1	2
2005	1	15			1	15
2003	1	32			1	32
1998	1	19			1	19
Total	**43**	**1,103**	**3**	**27**	**46**	**1,130**

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 2014*

LOST TIME INJURIES CONTINUED

TABLE 7 CARRY-OVER INJURIES DURING 2013-14

Calendar year	Metalliferous mines		Coal mines		Total mining	
	No. of injuries	Days lost	No. of injuries	Days lost	No. of injuries	Days lost
2013*	87	6,149	4	165	91	6314
2012	43	4817	3	59	46	4876
2011	4	599			4	599
2010	1	14			1	14
2008	1	161			1	161
2006	1	57			1	57
2005	1	168			1	168
Total	**138**	**11,965**	**7**	**224**	**145**	**12,189**

** Covers period from 1 January to 30 June 2013*

Review of lost time injuries during 2013-14 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 Resources Safety's SRS database.

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

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

TABLE 8 INITIAL LOST TIME INJURIES DURING 2013-14 (AS 1885.1:1990)

Sector	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Metalliferous surface	99,373	406	0.41	2.3	27.2	11,037
Metalliferous underground	7,324	42	0.57	2.8	20.0	839
Metalliferous total	**106,697**	**448**	**0.42**	**2.3**	**26.5**	**11,876**
Coal	**638**	**13**	**2.04**	**9.1**	**26.6**	**346**
Total mining	**10,7335**	**461**	**0.43**	**2.4**	**26.5**	**12,222**
Exploration	**2,304**	**6**	**0.26**	**1.3**	**14.0**	**84**

Note: Duration in Tables 8 and 9 does not take into consideration time lost after 30 June 2014 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 2014

TABLE 9 INJURIES BY MINERAL MINED DURING 2013-14 (AS 1885.1:1990)

Mineral mined	No. of employees	No. of LTIs	Injuries per hundred	Frequency rate	Duration rate	Days lost
Iron ore	61,737	194	0.31	1.7	32.1	6,232
Gold	18,593	93	0.50	2.6	28.4	2,643
Bauxite and alumina	7,408	58	0.78	4.0	18.7	1,084
Nickel	6,477	37	0.57	3.0	14.3	530
Base metals	2,649	18	0.68	3.8	33.5	603
Mineral sands	2,302	9	0.39	3.2	18.3	165
Diamonds	1,571	11	0.70	3.6	8.5	94
Salt	1,072	4	0.37	2.2	45.3	181
Construction materials	1,011	6	0.59	3.4	18.0	108
Sand - silica sand	667	5	0.75	10.2	26.2	131
Coal	638	13	2.04	9.1	26.6	346
Manganese ore	564	0	0.00	0.0	-	0
Tin, tantalum and lithium	389	1	0.26	1.2	3.0	3
Other	2,257	12	0.53	3.4	8.5	102
Total mining	**107,335**	**461**	**0.43**	**2.4**	**26.5**	**12,222**

WORKERS' COMPENSATION

Premium rates for the Western Australian mineral industry

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

Figure 4 indicates trends in workers' compensation costs for selected mineral groups for the ten-year period 2004-2005 to 2013-14.

Over this period, the coal mining compensation rate increased, by 8%, to 2.54% of payroll. The compensation rate for surface gold operations decreased, by 60%, to 1.09% of payroll, and that for iron ore operations decreased, by 2%, to 0.79% of payroll. The rate for underground gold operations increased, by 5%, to 4.03% of payroll.

Figure 5 shows premium rates recommended in 2013-14 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 2013-14 for the Western Australian mining industry for 2014-15 was 1.90% of payroll, an 11% decrease on the rate recommended in 2012-13 for 2013-14 (2.13% of payroll).

In 2013-14, apart from underground gold mining and coal, premium rates recommended for mining industry groups compared favourably with other industry groups such as structural steel fabrication and sheet metal product manufacturing, which had premium rates of 4.30% and 2.41% of payroll, respectively.

FIGURE 4 MINE WORKERS' COMPENSATION RATE TRENDS 2005-06 TO 2014-15

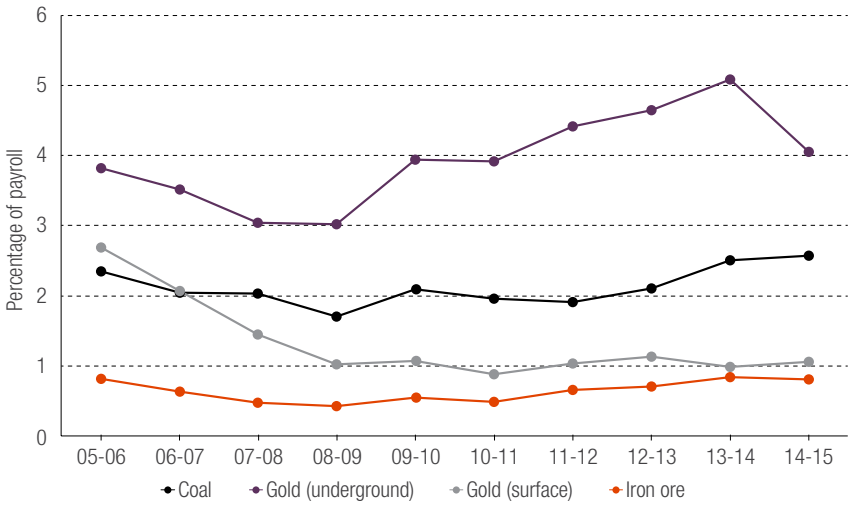
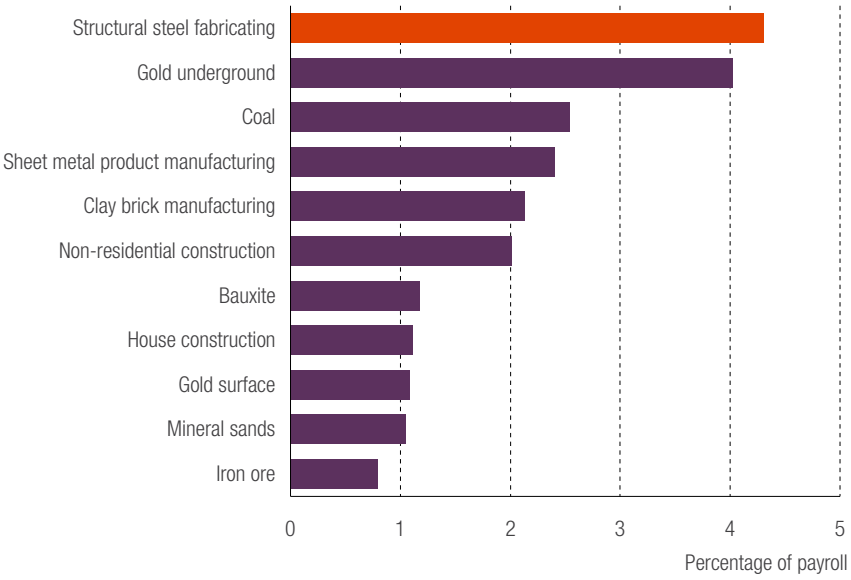


FIGURE 5 RECOMMENDED PREMIUM RATES 2014-15



INJURIES BY COMMODITIES

Metalliferous performance indicators

The performance indicators for the metalliferous mining sector show small changes in the results for 2013-14. Figures 6 to 9 depict the performance indicators of incidence, frequency, duration rates and injury index (see page 2 for definitions).

Performance indicator trends for metalliferous mining in 2013-14 are summarised below.

- The overall incidence rate improved by 13%, falling from 4.8 to 4.2. The surface incidence rate and the underground incidence rate both improved by 13% (from 4.6 to 4.0 for surface and from 6.4 to 5.6 for underground).
- The overall frequency rate improved by 4%, falling from 2.4 to 2.3. The surface frequency rate improved by 4% (from 2.3 to 2.2), while the underground frequency rate improved by 13% (from 3.1 to 2.7).
- The overall duration rate deteriorated by 5%, rising from 24.0 to 25.1. The surface duration rate deteriorated by 13%, rising from 23.2 to 26.1, while the underground duration rate improved significantly by 48% (from 28.9 to 15.1).
- The slight fall in the frequency rate and the small fall in the duration rate resulted in the overall injury index remaining unchanged at 57. The surface injury index deteriorated by 9% (from 54 to 59), and the underground injury index improved significantly by 54% (from 89 to 41).

Metalliferous injury percentage breakdown for 2013-14

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

Injuries by part of body

- Underground: Leg injuries, at 29%, accounted for the largest proportion of underground injuries. Arm injuries, at 22%, accounted for the next largest proportion. All arm injuries were to shoulders. Injuries to knees and ankles contributed 50% and 17% of leg injuries respectively.
- Surface: Leg injuries, at 23%, accounted for the largest proportion of surface injuries, followed by hand injuries (21%), arm injuries (19%) and back injuries (15%). Of the leg injuries, 44% were to knees, and 29% were to ankles. Of the arm injuries, 51% were to shoulders.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 46%, followed by fracture and laceration, both at 12%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 46%, followed by fracture at 15% then laceration and crushing, both at 9%.

Injuries by location

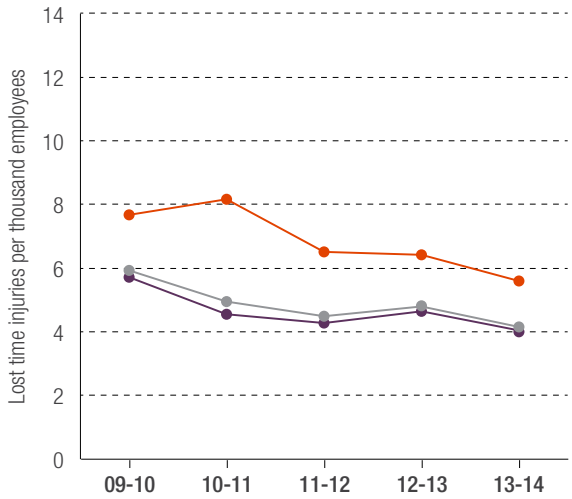
- Underground: The largest proportion of underground injuries occurred in production and development areas (80%), followed by underground crushing areas and underground workshops, both at 7%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (35%), followed by open pits at 24% then workshops at 18%.

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 27%, followed by stepping at 17% and struck against object at 10%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 29%, followed by struck by object and stepping, both at 11%.

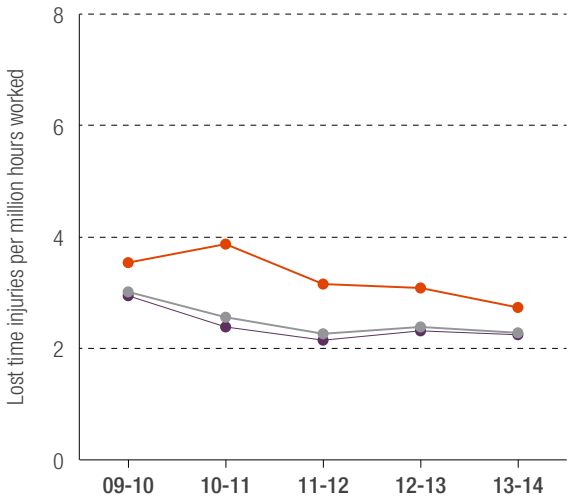
Metalliferous performance indicators 2009-10 to 2013-14

FIGURE 6 INCIDENCE RATE



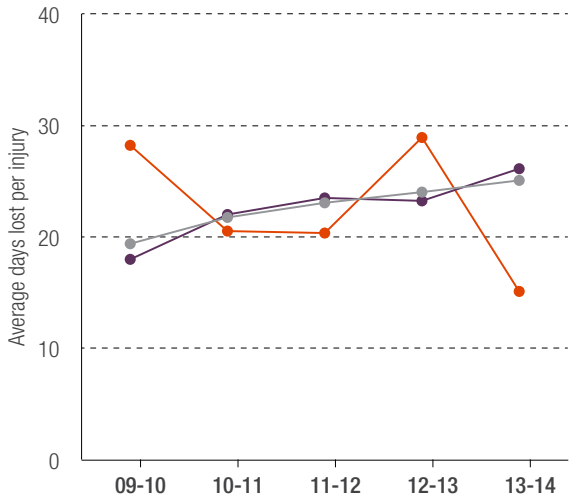
	09-10	10-11	11-12	12-13	13-14
Underground	7.7	8.2	6.5	6.4	5.6
Surface	5.7	4.6	4.3	4.6	4.0
Total	5.9	4.9	4.5	4.8	4.2

FIGURE 7 FREQUENCY RATE



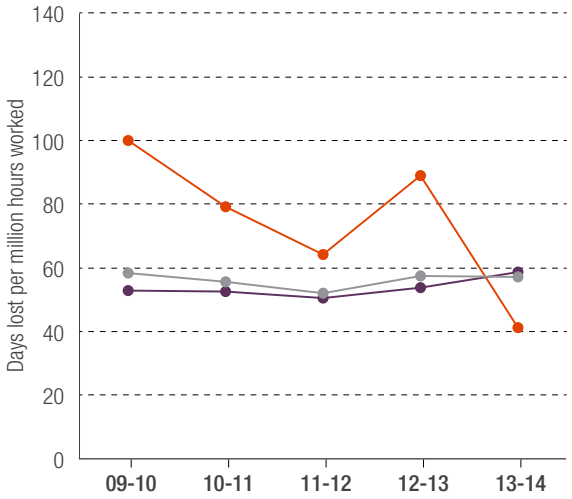
	09-10	10-11	11-12	12-13	13-14
Underground	3.5	3.9	3.2	3.1	2.7
Surface	2.9	2.4	2.1	2.3	2.2
Total	3.0	2.6	2.3	2.4	2.3

FIGURE 8 DURATION RATE



	09-10	10-11	11-12	12-13	13-14
Underground	28.2	20.5	20.3	28.9	15.1
Surface	18.0	22.0	23.5	23.2	26.1
Total	19.4	21.7	23.0	24.0	25.1

FIGURE 9 INJURY INDEX



	09-10	10-11	11-12	12-13	13-14
Underground	100	79	64	89	41
Surface	53	53	51	54	59
Total	58	56	52	57	57

INJURIES BY COMMODITIES CONTINUED

Gold performance indicators

The performance indicators for the gold sector improved during 2013-14. 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 2013-14 are summarised below.

- The overall incidence rate remained unchanged at 4.8. The surface incidence rate deteriorated by 15% (from 4.7 to 5.4), although the underground incidence rate improved by 38% (from 5.2 to 3.2).
- The overall frequency rate deteriorated by 4%, rising from 2.5 to 2.6. The surface frequency rate deteriorated by 25% (from 2.4 to 3.0), while the underground frequency rate improved by 40%, falling from 2.5 to 1.5.
- The overall duration rate improved by 23%, falling from 28.7 to 22.0. The surface duration rate improved by 16%, falling from 25.4 to 21.4, and the underground duration rate improved by 32% (from 36.7 to 25.1).
- The small rise in the frequency rate was less than the fall in duration rate, resulting in a 21% overall improvement in the injury index, falling from 71 to 56. The surface injury index deteriorated slightly by 2% (from 62 to 63), while the underground injury index improved significantly by 59% (from 93 to 38).

Gold injury percentage breakdown for 2013-14

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: Leg injuries, at 33%, accounted for the largest proportion of underground injuries, followed by arm injuries, at 27%, then back and hand injuries, each of which accounted for approximately 13% of injuries. 80% of leg injuries were to knees, while all arm injuries were to shoulders.
- Surface: Arm, hand and leg injuries, each at 20%, were the most common injuries, followed by back injuries at 17%. 47% of arm injuries were to shoulders and 53% of leg injuries were to knees.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 73%, followed by fracture at 13%, then crushing and laceration, both at 7%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 44%, followed by laceration (15%) and fracture (12%).

Injuries by location

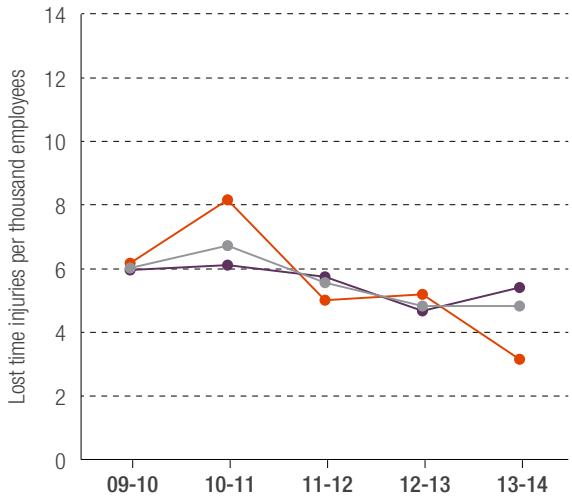
- Underground: The largest proportion of underground injuries occurred in production and development (87%), followed by access and haulage ways and underground workshop, both approximately 7%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (44%), followed by workshops (24%) and open pits (19%).

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 33%, followed by stepping at 27% and then slip or trip at 13%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 31%, followed by struck by object at 13% then slip or trip at 11%.

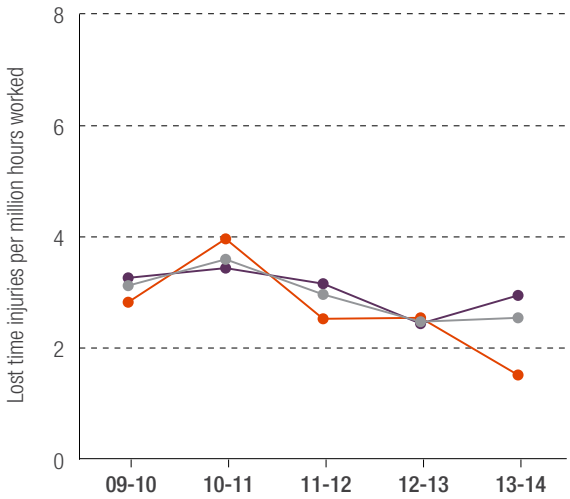
Gold performance indicators 2009-10 to 2013-14

FIGURE 10 INCIDENCE RATE



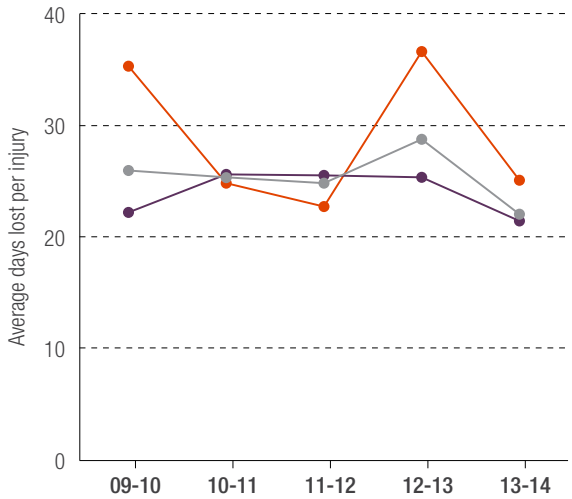
	09-10	10-11	11-12	12-13	13-14
Underground	6.2	8.2	5.0	5.2	3.2
Surface	6.0	6.1	5.8	4.7	5.4
Total	6.0	6.7	5.5	4.8	4.8

FIGURE 11 FREQUENCY RATE



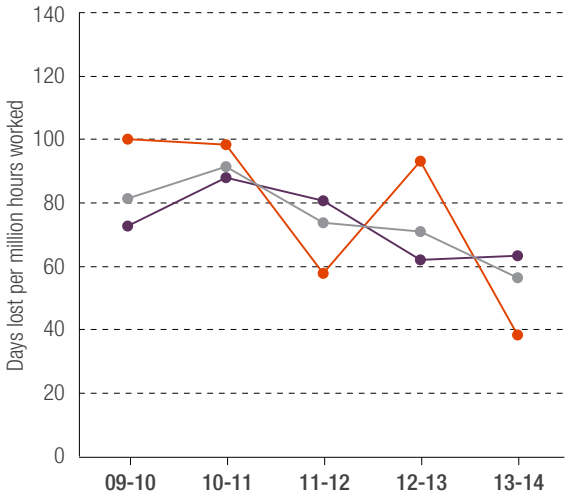
	09-10	10-11	11-12	12-13	13-14
Underground	2.8	4.0	2.5	2.5	1.5
Surface	3.3	3.4	3.2	2.4	3.0
Total	3.1	3.6	3.0	2.5	2.6

FIGURE 12 DURATION RATE



	09-10	10-11	11-12	12-13	13-14
Underground	35.3	24.8	22.7	36.7	25.1
Surface	22.2	25.6	25.5	25.4	21.4
Total	25.9	25.4	24.8	28.7	22.0

FIGURE 13 INJURY INDEX



	09-10	10-11	11-12	12-13	13-14
Underground	100	98	58	93	38
Surface	73	88	81	62	63
Total	81	91	74	71	56

INJURIES BY COMMODITIES CONTINUED

Iron ore performance indicators

The performance indicators for the iron ore sector showed mixed results during 2013-14. 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 2013-14 are summarised below.

- The incidence rate improved by 6%, falling from 3.3 to 3.1.
- The frequency rate deteriorated by 6%, rising from 1.6 to 1.7.
- The duration rate deteriorated by 26%, rising from 23.9 to 30.2.
- The rise in both the frequency rate and the duration rate resulted in a deterioration of 37% in the injury index (from 38 to 52).

Iron ore injury percentage breakdown for 2013-14

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 25%, accounted for the largest proportion of injuries, followed by hand injuries at 23%, arm injuries at 19% and back injuries at 14%.
- Of the leg injuries, 46% were to knees and 29% were to ankles. 54% of arm injuries were to shoulders.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 45%.
- Fracture was the second highest ranking nature of injury at 18%, followed by crushing at 9% and laceration at 8%.

Injuries by location

- The largest proportion of injuries occurred in open pits, which accounted for 37%. The second largest proportion occurred in workshops at 21%, followed by treatment plants at 16%.

Injuries by type of accident

- Over-exertion or strenuous movement was the most common type of accident resulting in injury at 26%.
- Stepping followed, at 15%, then caught by or between objects and struck by object, both at 10%.

Iron ore performance indicators 2009-10 to 2013-14

FIGURE 14 INCIDENCE RATE

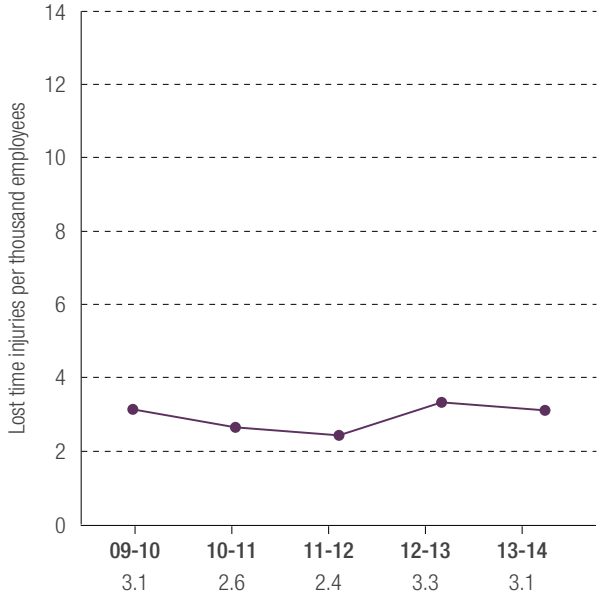


FIGURE 15 FREQUENCY RATE

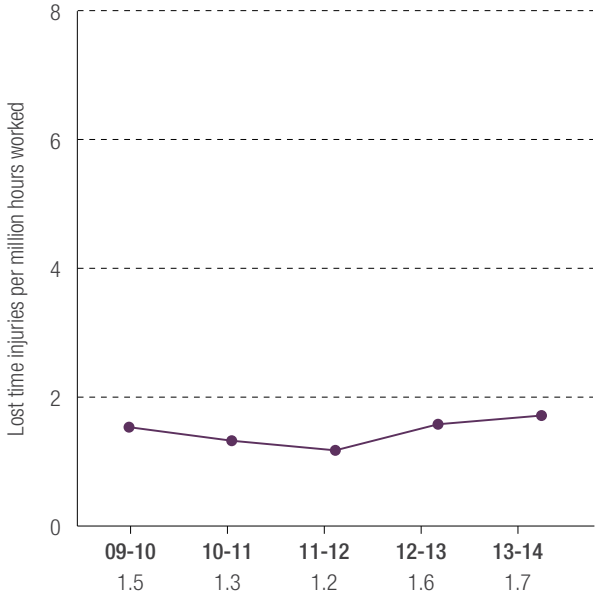


FIGURE 16 DURATION RATE

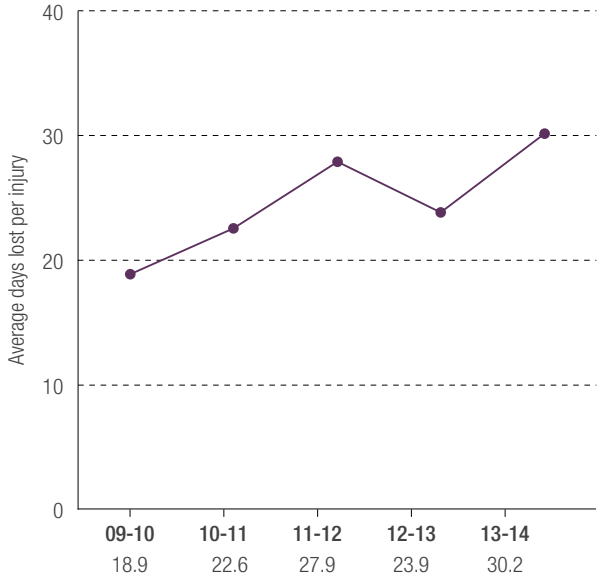
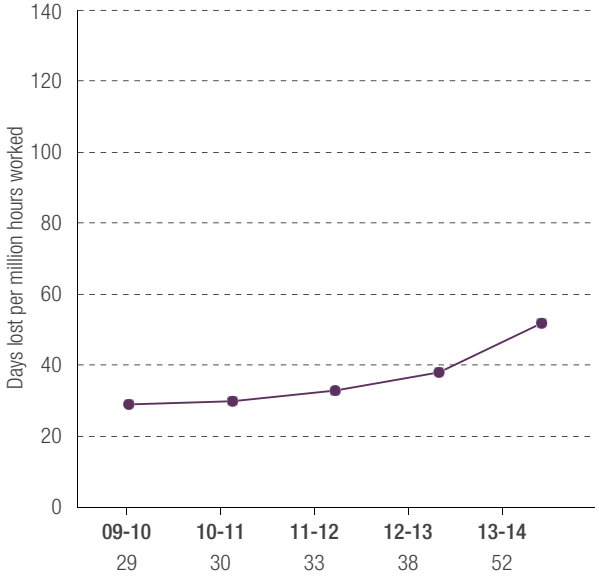


FIGURE 17 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Bauxite and alumina performance indicators

The performance indicators for the bauxite and alumina sector were mixed in 2013-14. 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 2013-14 are summarised below.

- The incidence rate improved by 18%, falling from 9.5 to 7.8.
- The frequency rate improved by 11%, falling from 4.5 to 4.0.
- The duration rate deteriorated by 11%, rising from 16.9 to 18.7.
- The rise in frequency rate was equal to the fall in the duration rate, resulting in the injury index remaining unchanged at 75

Bauxite and alumina injury percentage breakdown for 2013-14

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

- Arm injuries accounted for the largest proportion of injuries at 22%. Of these arm injuries, 46% were to shoulders and 31% to elbow.
- Leg injuries, back injuries and hand injuries, at 21%, 19% and 17% respectively, accounted for the next largest proportions of injuries.

Injuries by nature

- Sprain or strain was the highest ranking nature of injury at 53%.
- Fracture was the second highest ranking nature of injury at 16%, followed by effects of chemicals or fumes at 10%.

Injuries by location

- The largest proportion of injuries occurred in treatment plants, which accounted for 64%.
- The next largest proportion of injuries occurred in open pits and surface general areas, each at 12%.

Injuries by type of accident

- Over-exertion or strenuous movements was the most common type of accident resulting in injury (36%).
- Struck by object and slip or trip, both at 12%, contributed the next highest proportions of injury.

Bauxite and alumina performance indicators 2009-10 to 2013-14

FIGURE 18 INCIDENCE RATE

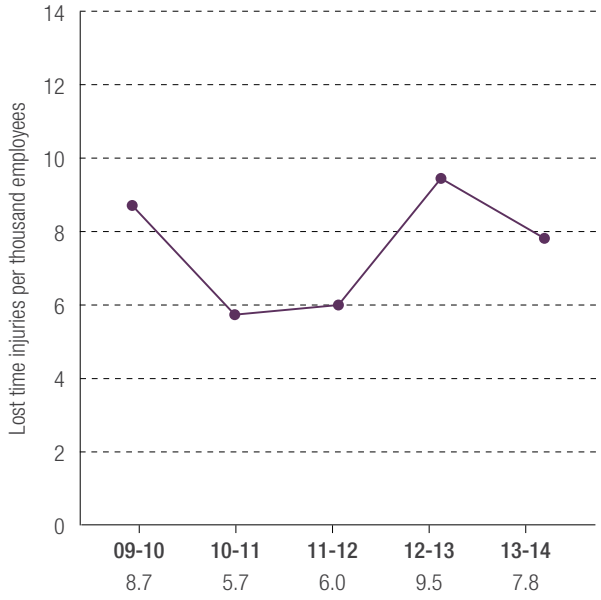


FIGURE 19 FREQUENCY RATE

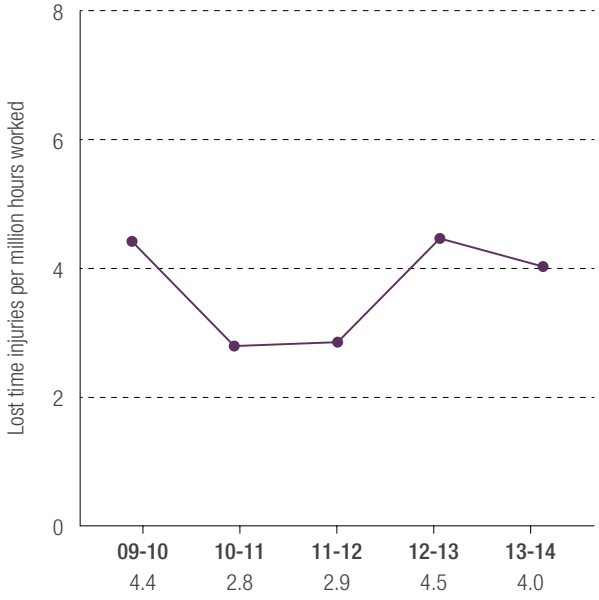


FIGURE 20 DURATION RATE

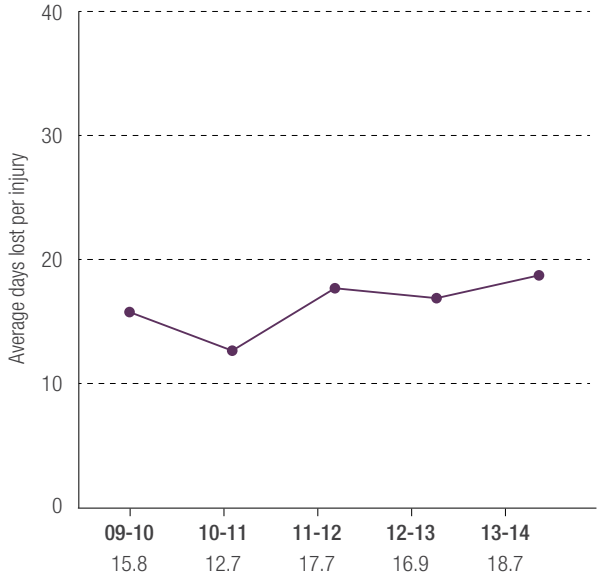
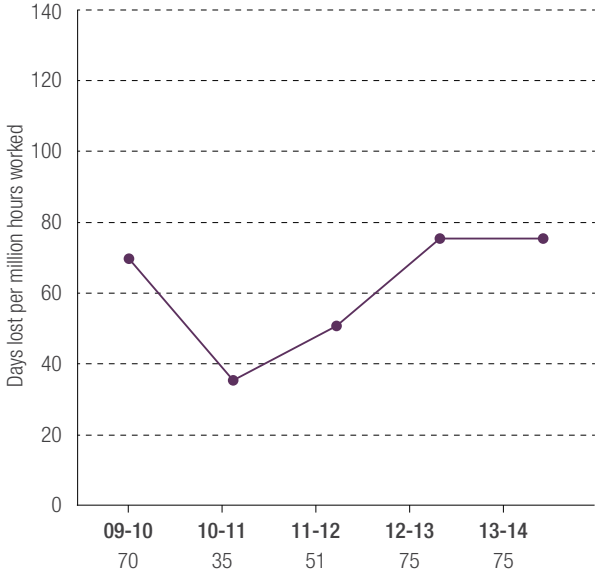


FIGURE 21 INJURY INDEX



INJURIES BY COMMODITIES CONTINUED

Nickel performance indicators

The performance indicators for the nickel sector showed improvement for 2013-14. 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 2013-14 are summarised below.

- The overall incidence rate improved by 5%, falling from 6.0 to 5.7. The surface incidence rate deteriorated by 13%, (from 4.0 to 4.5) whereas the underground incidence rate improved by 18%, (from 13.8 to 11.3).
- The overall frequency rate remained unchanged at 3.0. The surface frequency rate deteriorated by 20% (from 2.0 to 2.4) and the underground frequency rate improved by 14% (from 6.4 to 5.5).
- The overall duration rate improved by 29%, falling from 20.0 to 14.3. The surface duration rate improved by 20% (from 19.8 to 15.9), and the underground duration rate improved by 43% (from 20.1 to 11.4).
- The fall in both duration rate and frequency rate resulted in an improvement of 28% in the injury index, falling from 60 to 43. The surface injury index improved by 5% (from 40 to 38), and the underground injury index improved by 51% (from 128 to 63).

Nickel injury percentage breakdown for 2013-14

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 accounted for the largest proportion of underground injuries at 23%, followed by back injuries, leg injuries and multiple injuries, all at 15%. All the arm injuries sustained underground were to shoulders.
- Surface: Arm injuries, at 21%, accounted for the largest proportion of surface injuries, followed by leg injuries and multiple injuries, each at 17%. Of the arm injuries, 40% were to shoulders. All leg injuries were to knees.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground injuries at 38%, followed by bruise or contusion, laceration and pain, all at 15%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface injuries at 54%, followed by effects of chemicals or fumes at 12% and fracture at 8%.

Injuries by location

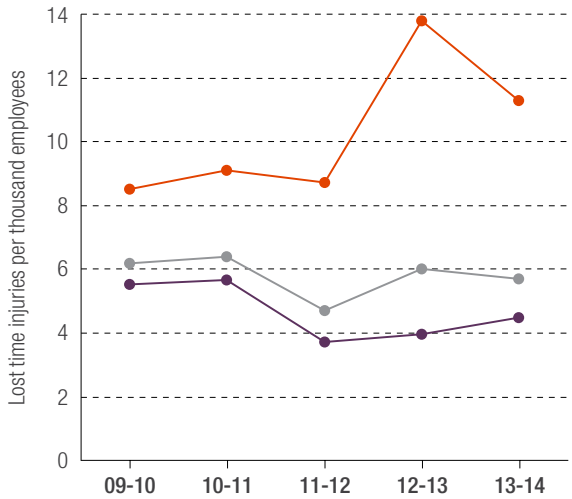
- Underground: The largest proportion of underground injuries occurred in production and development areas (85%), followed by underground workshops at 15%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (54%), followed by open pits and workshops, both at 12%.

Injuries by type of accident

- Underground: Over-exertion or strenuous movements was the most common accident type for underground injuries at 38%, followed by fall getting on or off at 15%.
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 46%, followed by caught by or between objects, contact with chemicals or fumes, and struck by objects, all at 8%.

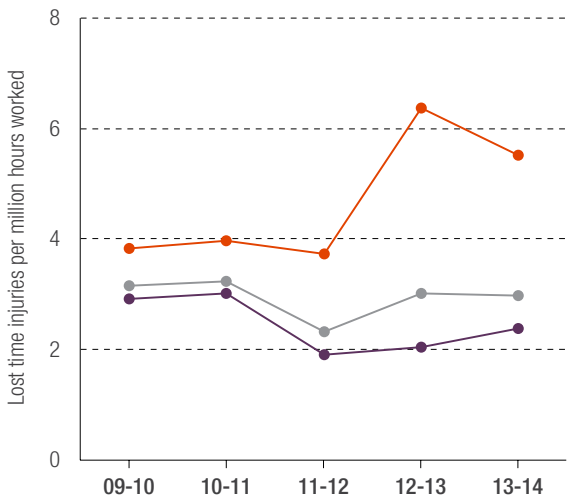
Nickel performance indicators 2009-10 to 2013-14

FIGURE 22 INCIDENCE RATE



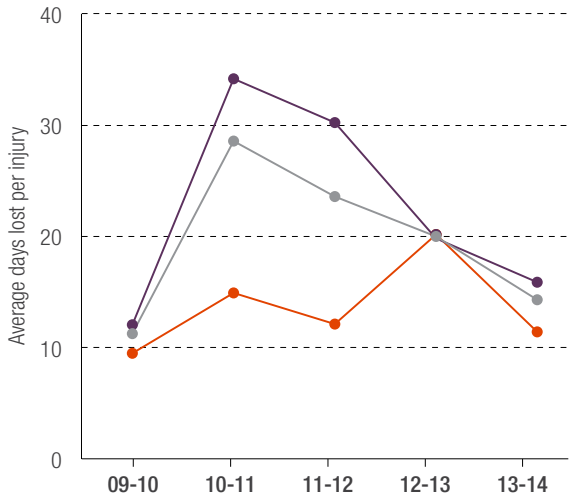
	09-10	10-11	11-12	12-13	13-14
Underground	8.5	9.1	8.7	13.8	11.3
Surface	5.5	5.7	3.7	4.0	4.5
Total	6.2	6.4	4.7	6.0	5.7

FIGURE 23 FREQUENCY RATE



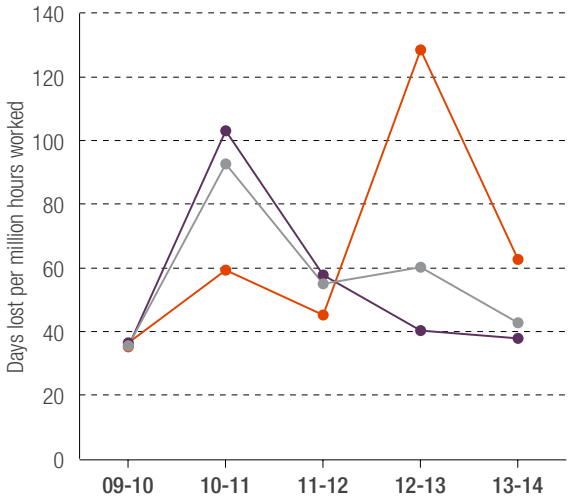
	09-10	10-11	11-12	12-13	13-14
Underground	3.8	4.0	3.7	6.4	5.5
Surface	2.9	3.0	1.9	2.0	2.4
Total	3.2	3.2	2.3	3.0	3.0

FIGURE 24 DURATION RATE



	09-10	10-11	11-12	12-13	13-14
Underground	9.5	14.9	12.1	20.1	11.4
Surface	12.1	34.2	30.2	19.8	15.9
Total	11.3	28.5	23.6	20.0	14.3

FIGURE 25 INJURY INDEX



	09-10	10-11	11-12	12-13	13-14
Underground	36	59	45	128	63
Surface	35	103	58	40	38
Total	36	93	55	60	43

RESTRICTED WORK INJURIES

Review of restricted work injuries during 2013-14

In addition to the 456 mining LTIs in 2013-14, there were 912 restricted work injuries (RWIs) reported (895 in metalliferous mines and 17 in coal mines), bringing the total number of reportable injuries to 1,368. A breakdown of these data with performance indicators is shown in Tables 10 and 11.

Of the restricted work injuries, 682 resulted in the injured person not returning to their regular duties for two weeks or more.

NOTE: Restricted work injury includes circumstances where the injured person:

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

TABLE 10 RESTRICTED WORK INJURIES 2013-14

Sector	No. of employees	Restricted work injuries			Reportable injuries (RWIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Metalliferous surface	99,373	775	7.8	4.3	1,177	11.8	6.6
Metalliferous underground	7324	120	16.4	8.0	161	22.0	10.7
Metalliferous total	**106,697**	**895**	**8.4**	**4.6**	**1,338**	**12.5**	**6.9**
Coal total	**638**	**17**	**26.6**	**11.9**	**30**	**47.0**	**21.0**
Total mining	**107,335**	**912**	**8.5**	**4.7**	**1,368**	**12.7**	**7.0**
Exploration	**2,304**	**30**	**13.0**	**6.3**	**36**	**15.6**	**7.6**

TABLE 11 RESTRICTED WORK INJURIES BY MINERAL MINED 2013-14

Mineral mined	No. of employees	Restricted work injuries			Reportable injuries (RWIs and LTIs)		
		No. of injuries	Incidence	Frequency	No. of injuries	Incidence	Frequency
Iron ore	61,737	388	6.3	3.5	580	9.4	5.2
Gold	18,593	187	10.1	5.3	277	14.9	7.9
Bauxite and alumina	7,408	127	17.1	8.8	185	25.0	12.9
Nickel	6,477	127	19.6	10.2	164	25.3	13.2
Base metals	2,649	19	7.2	4.0	37	14.0	7.8
Mineral sands	2,302	6	2.6	2.1	15	6.5	5.3
Diamonds	1,571	12	7.6	3.9	23	14.6	7.5
Salt	1,072	4	3.7	2.2	8	7.5	4.3
Construction materials	1,011	9	8.9	5.1	15	14.8	8.4
Coal	638	17	26.6	11.9	30	47.0	21.0
Manganese ore	564	4	7.1	3.9	4	7.1	3.9
Tin, tantalum and lithium	389	0	0.0	0.0	1	2.6	1.2
Other	2,924	12	4.1	3.0	29	9.9	7.1
Total mining	**107,335**	**912**	**8.5**	**4.7**	**1,368**	**12.7**	**7.0**

RESTRICTED WORK INJURIES CONTINUED

Restricted work injury performance indicators

The restricted work injury performance indicators for the mining sector improved during 2013-14. Figures 26 to 29 depict the performance indicators of incidence rate, frequency rate, days off per injury and days off per million hours worked.

- The overall incidence rate improved by 8%, falling from 9.2 to 8.5. The surface incidence rate improved by 7% (from 8.5 to 7.9), whereas the underground incidence rate deteriorated by 3% (from 15.9 to 16.4).
- The overall frequency rate deteriorated slightly, by 2%, rising from 4.6 to 4.7. The surface frequency rate deteriorated by 5%, rising from 4.2 to 4.4, while the underground frequency rate deteriorated by 5%, falling from 7.6 to 8.0.
- The average days off per restricted work injury improved by 32%, falling from 37.4 to 25.6. The days off per surface restricted work injury also improved by 32% (from 37.8 to 25.7), and the days off per underground restricted work injury improved by 30% (from 35.4 to 24.8).
- The rise in the frequency rate and the fall in days off per restricted work injury resulted in an improvement of 30% to the overall days off per million hours worked, down from 171 to 119. The days off per surface million hours worked improved by 29% (from 160 to 113), and the days off per million hours worked underground improved by 27% (from 271 to 198).

Restricted work injury percentage breakdown for 2013-14

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

Injuries by part of body

- Underground: Arm injuries accounted for the largest proportion of underground injuries, at 25%, followed by hand injuries at 22%, leg injuries at 19% and back injuries at 12%. The largest proportions of arm injuries were to shoulders (37%) and wrists (27%), while injuries to knees and ankles contributed the largest proportions of leg injuries (at 52% and 39% respectively).
- Surface: Arm injuries accounted for the largest proportion of surface restricted work injuries at 26%, followed by back injuries at 22%, hand injuries at 21% and leg injuries at 20%. Of the arm injuries, 45% were to shoulders, 23% were to elbows and 17% were to wrists. Of the leg injuries, 42% were to knees and 40% were to ankles.

Injuries by nature

- Underground: Sprain or strain was the highest ranking nature of injury for underground restricted work injuries at 54%, followed by laceration at 12% and fracture at 9%.
- Surface: Sprain or strain was the highest ranking nature of injury for surface restricted work injuries at 55%, followed by pain at 13% then fracture and laceration, both at 8%.

Injuries by location

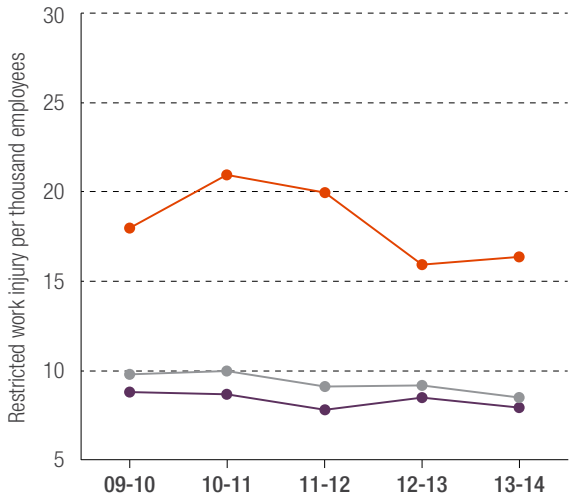
- Underground: The largest proportion of underground injuries occurred in production and development areas (76%), followed by access and haulage ways at 12% then underground workshops, at 5%.
- Surface: The largest proportion of surface injuries occurred in treatment plants (34%) followed by open pits (23%), and workshops (17%).

Injuries by type

- Underground: Over-exertion or strenuous movements at 32% was the most common accident type for underground injuries, followed by stepping at 12%, then caught by or between objects and slip or trip, both at 10%
- Surface: The most common accident type for surface injuries was over-exertion or strenuous movements at 42%, followed by stepping at 11%, caught by or between objects, at 10%, and slip or trip, at 9%.

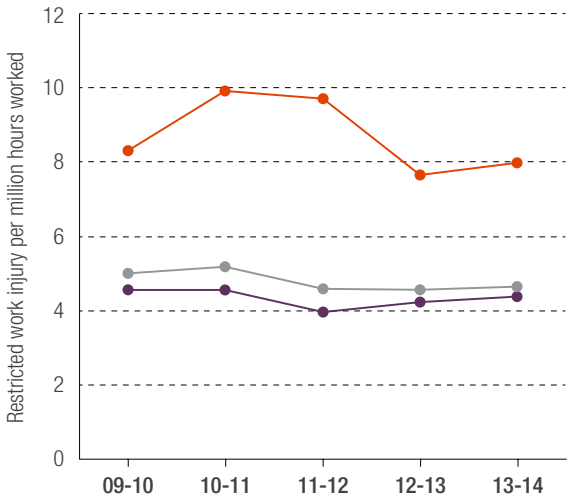
Restricted work injury performance indicators 2009-10 to 2013-14

FIGURE 26 INCIDENCE RATE



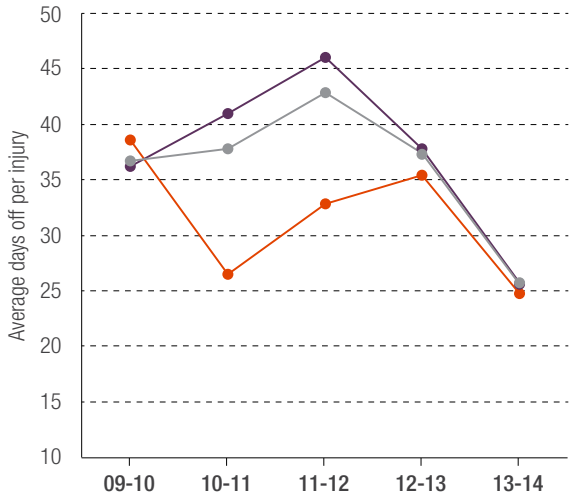
	09-10	10-11	11-12	12-13	13-14
Underground	18.0	20.9	20.0	15.9	16.4
Surface	8.8	8.7	7.8	8.5	7.9
Total	9.8	10.0	9.1	9.2	8.5

FIGURE 27 FREQUENCY RATE



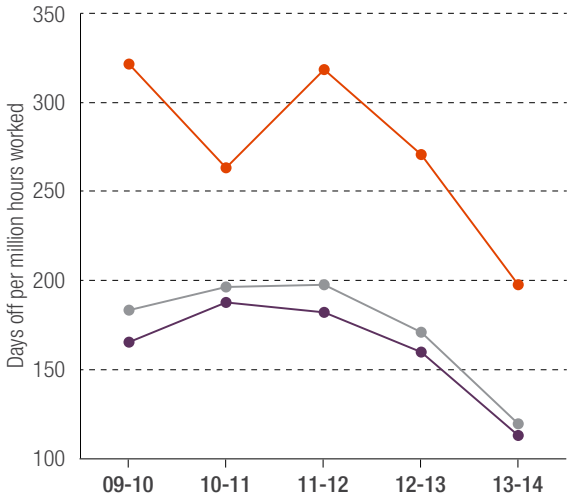
	09-10	10-11	11-12	12-13	13-14
Underground	8.3	9.9	9.7	7.6	8.0
Surface	4.6	4.6	4.0	4.2	4.4
Total	5.0	5.2	4.6	4.6	4.7

FIGURE 28 AVERAGE DAYS OFF PER INJURY



	09-10	10-11	11-12	12-13	13-14
Underground	38.6	26.5	32.8	35.4	24.8
Surface	36.2	41.0	46.0	37.8	25.7
Total	36.7	37.8	42.9	37.4	25.6

FIGURE 29 DAYS OFF PER MILLION HOURS WORKED



	09-10	10-11	11-12	12-13	13-14
Underground	321	263	318	271	198
Surface	165	188	182	160	113
Total	183	196	197	171	119

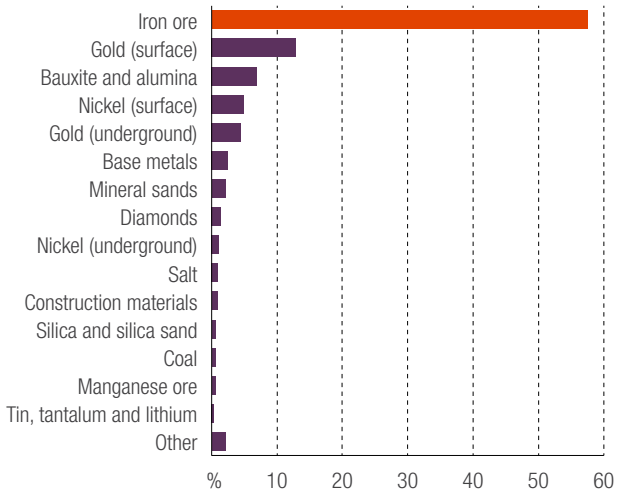
APPENDICES

APPENDIX A

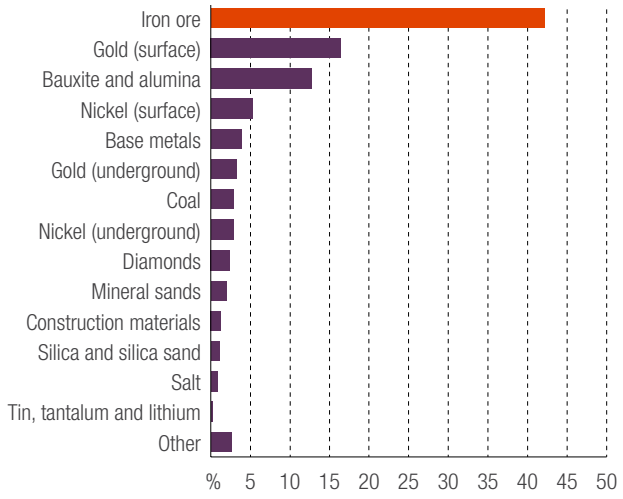
WESTERN AUSTRALIAN MINES 2013-14

456 lost time injuries

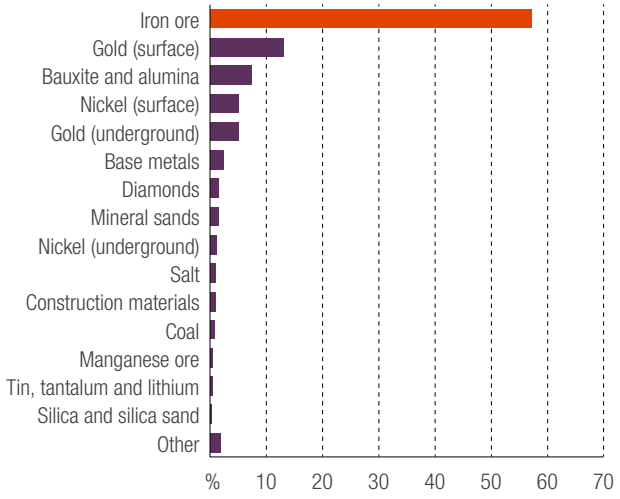
PERCENTAGE OF EMPLOYEES



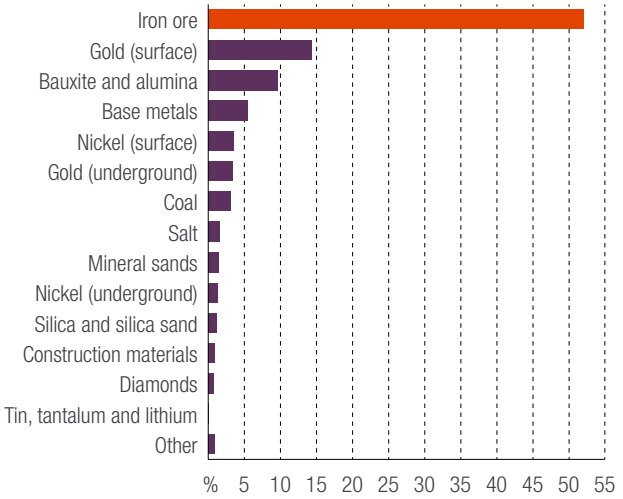
PERCENTAGE OF INJURIES



PERCENTAGE OF MILLION HOURS WORKED



PERCENTAGE OF WORK DAYS LOST

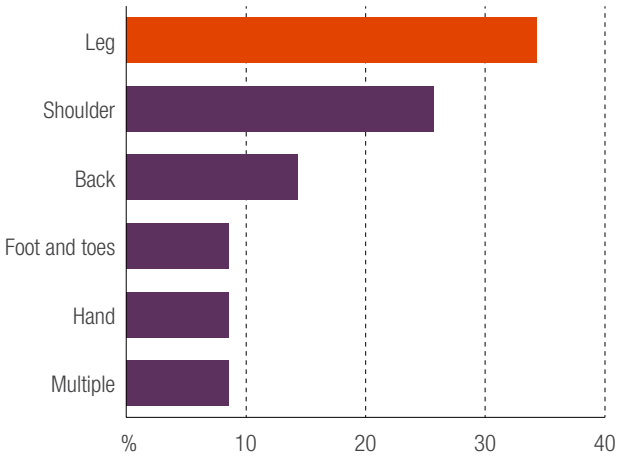


APPENDIX B

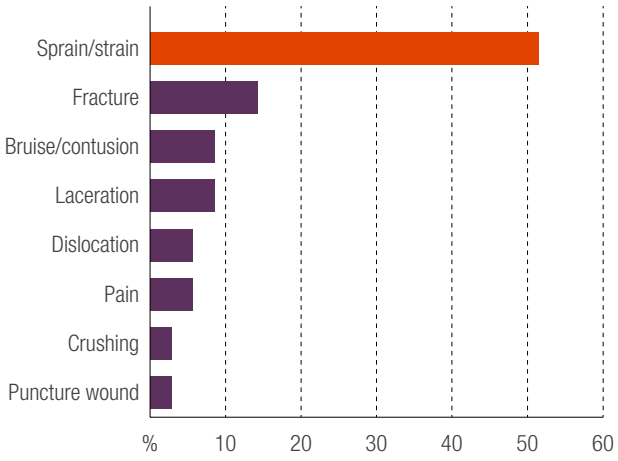
SERIOUS INJURIES UNDERGROUND 2013-14

35 lost time injuries

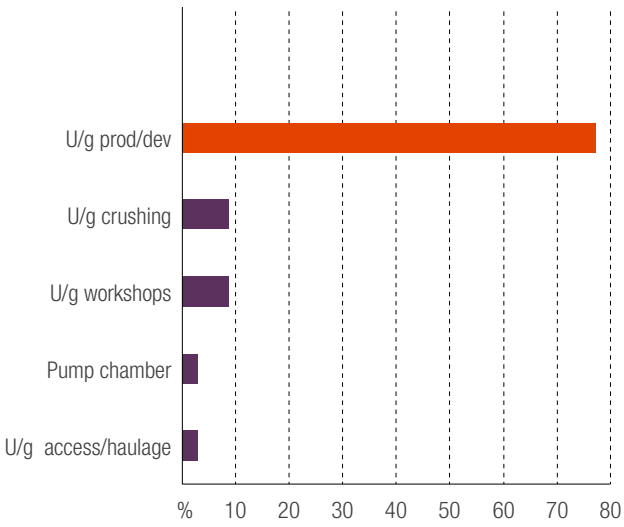
PART OF BODY



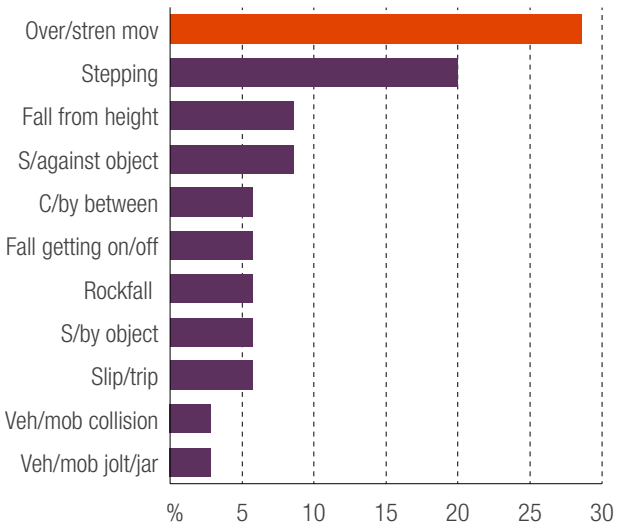
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

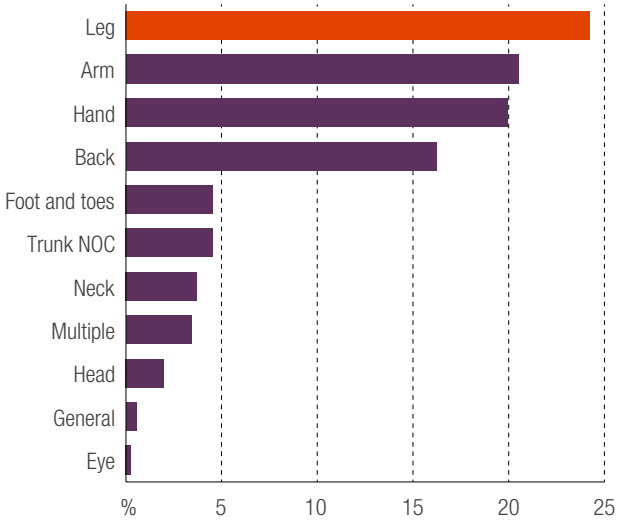


APPENDIX C

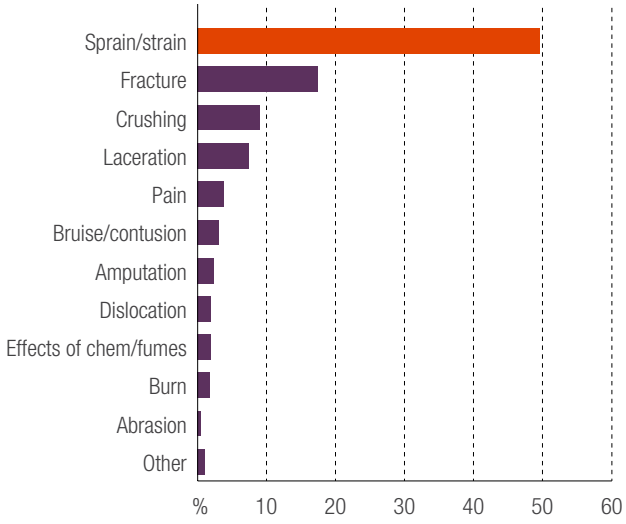
SERIOUS INJURIES SURFACE 2013-14

351 lost time injuries

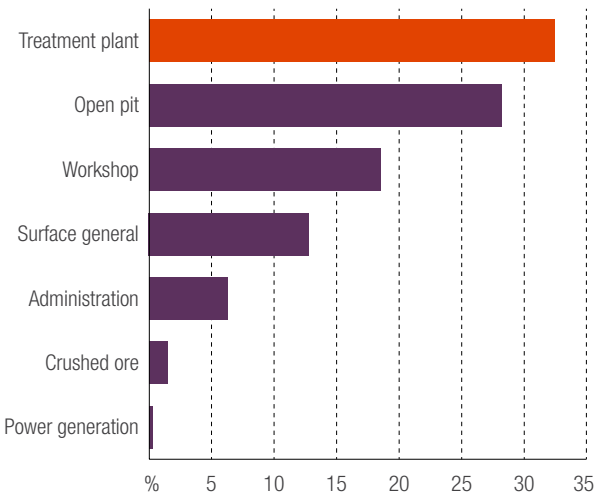
PART OF BODY



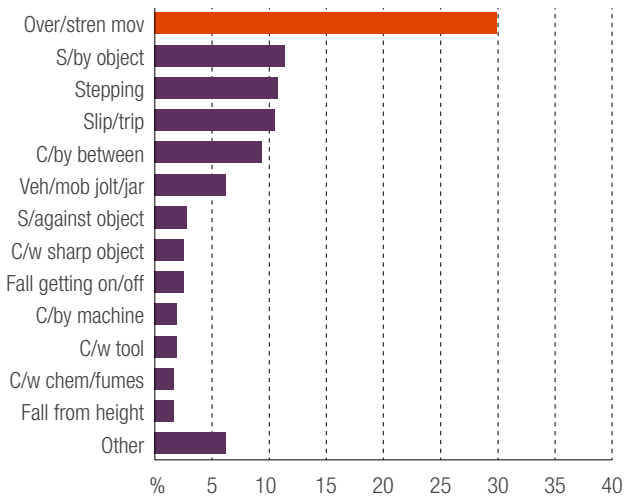
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

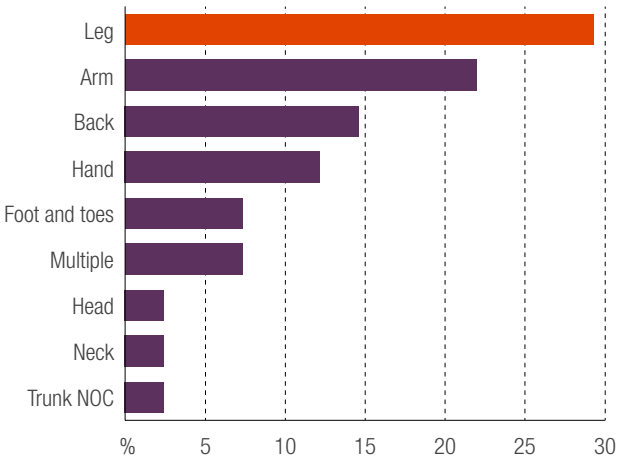


APPENDIX D

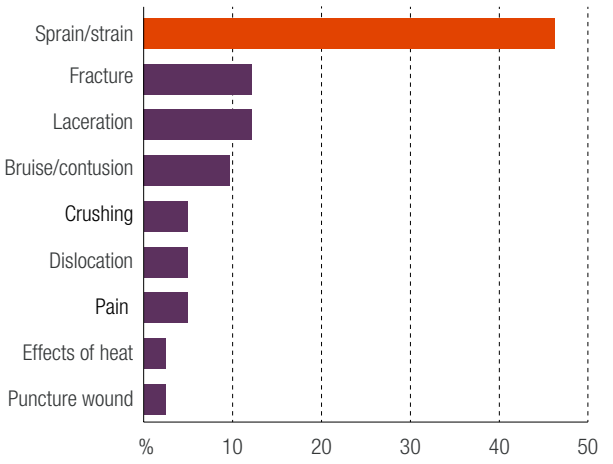
METALLIFEROUS UNDERGROUND INJURIES 2013-14

41 lost time injuries

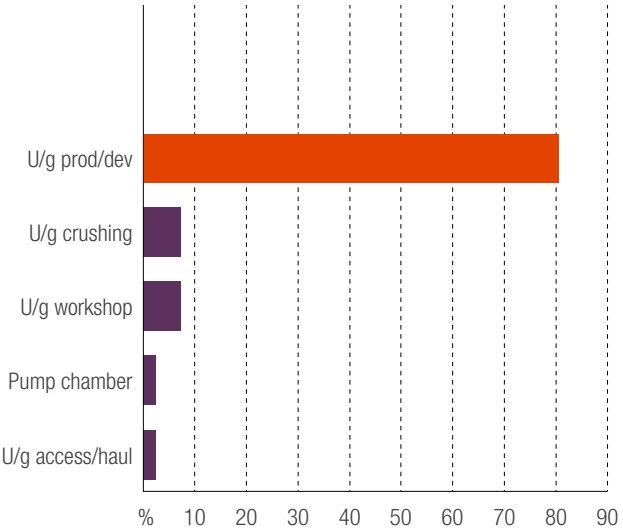
PART OF BODY



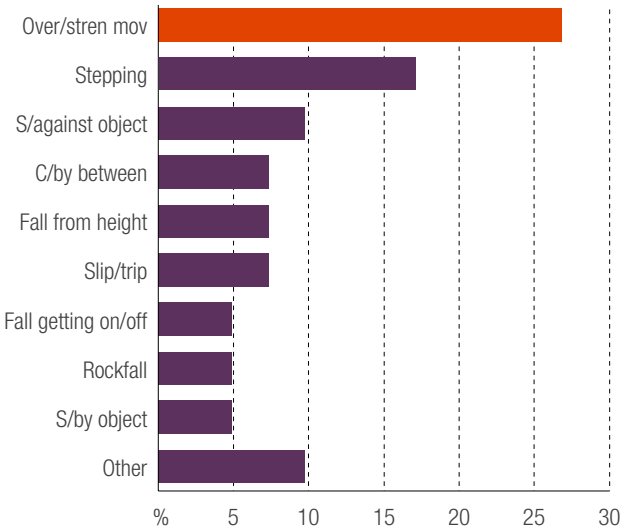
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

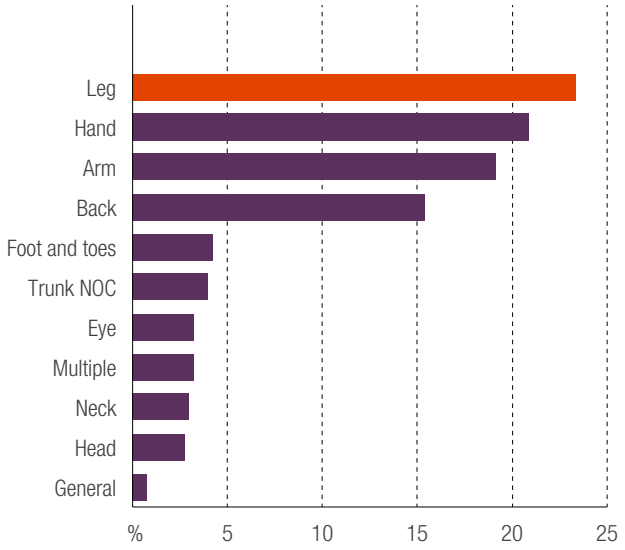


APPENDIX E

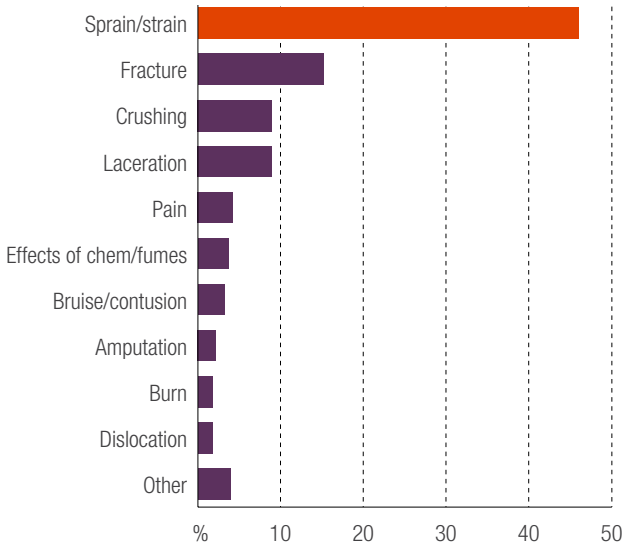
METALLIFEROUS SURFACE INJURIES 2013-14

402 lost time injuries

PART OF BODY



NATURE OF INJURY



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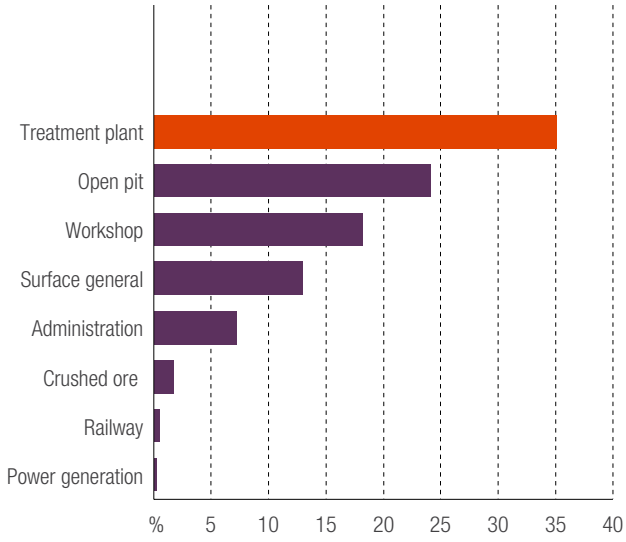
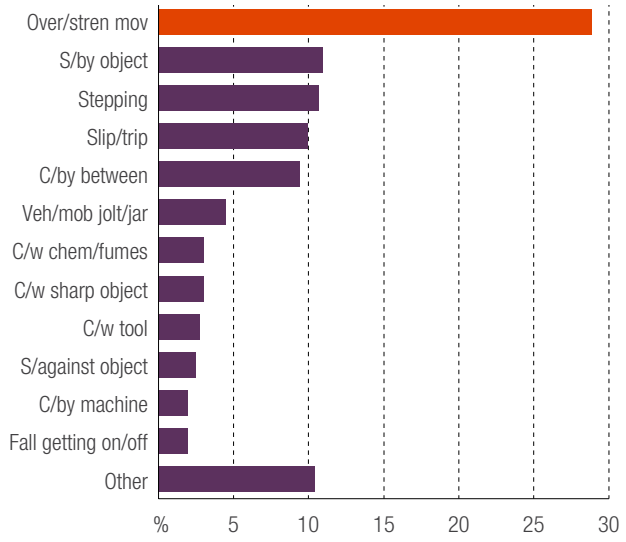


TYPE OF ACCIDENT

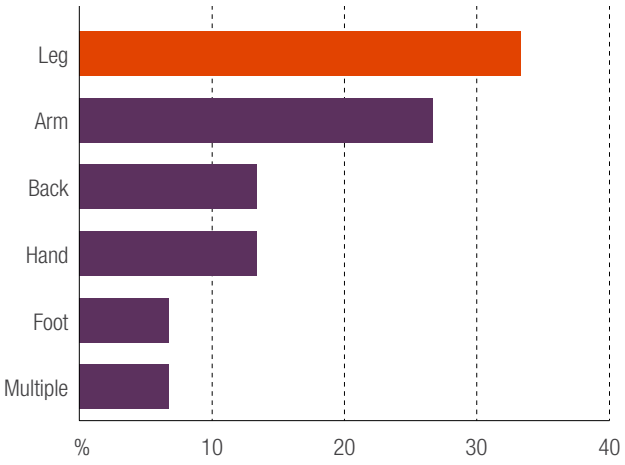


APPENDIX F

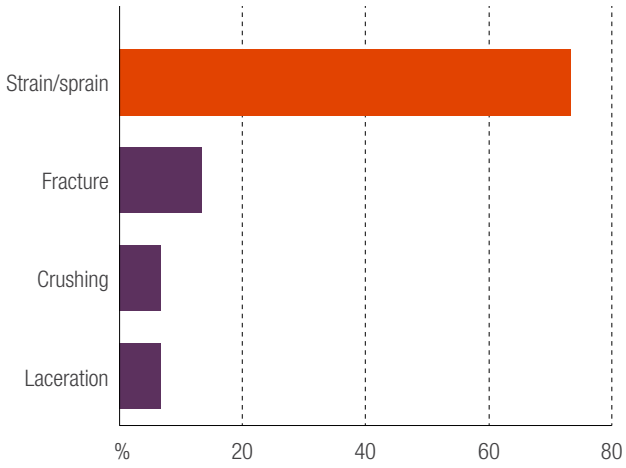
GOLD UNDERGROUND INJURIES 2013-14

15 lost time injuries

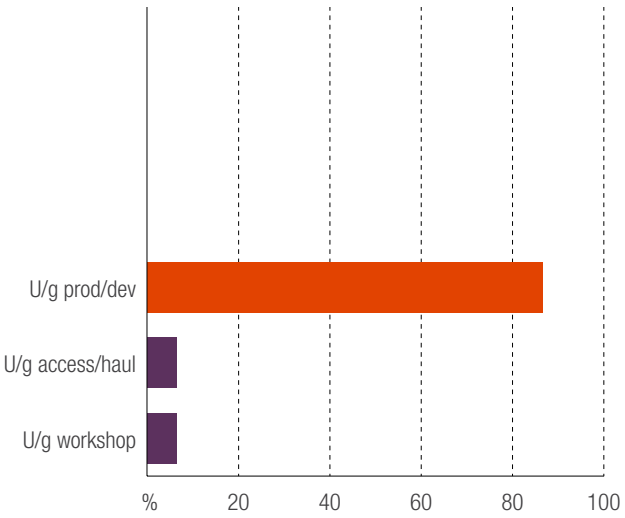
PART OF BODY



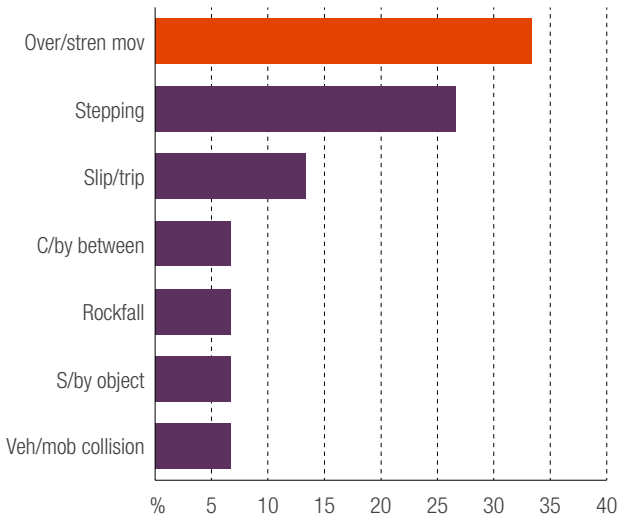
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

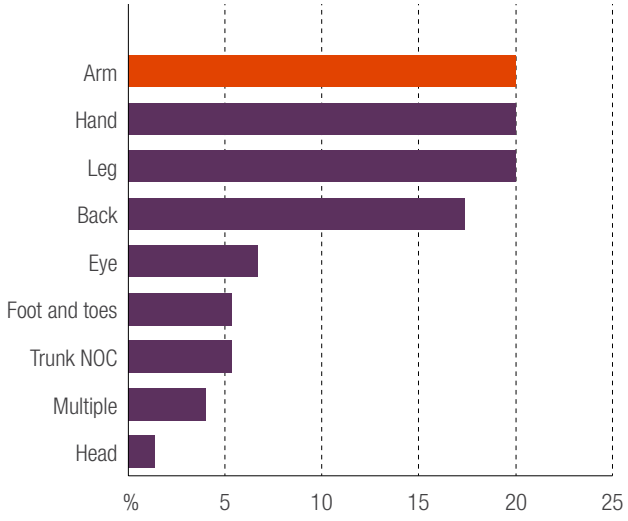


APPENDIX G

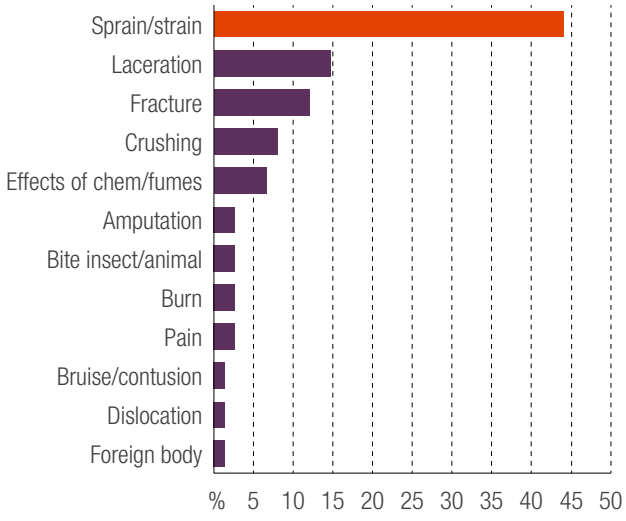
GOLD SURFACE INJURIES 2013-14

75 lost time injuries

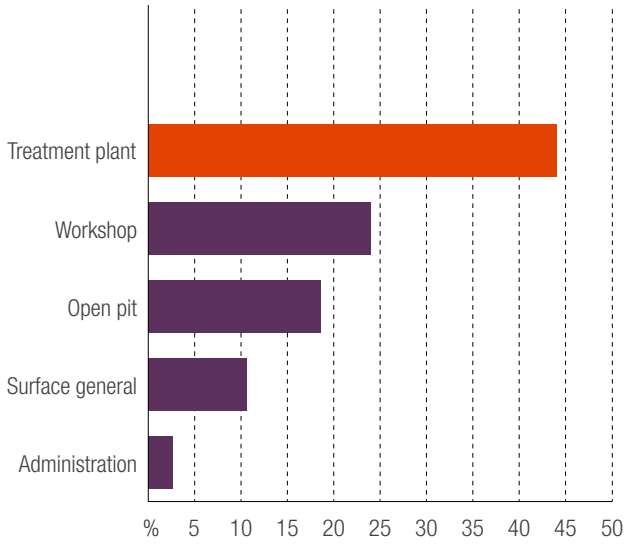
PART OF BODY



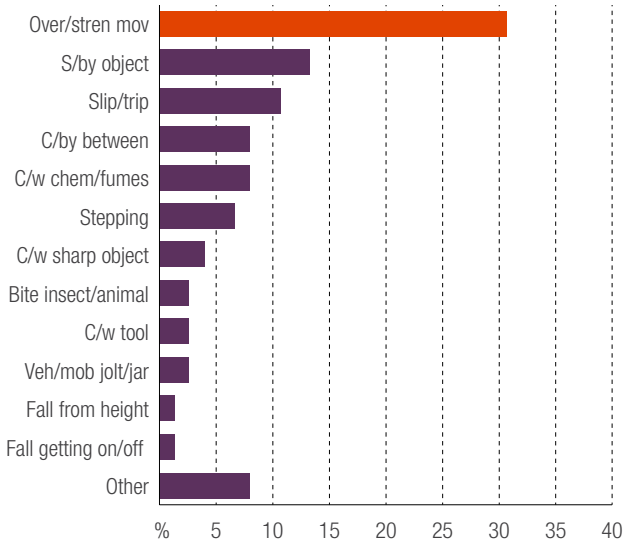
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

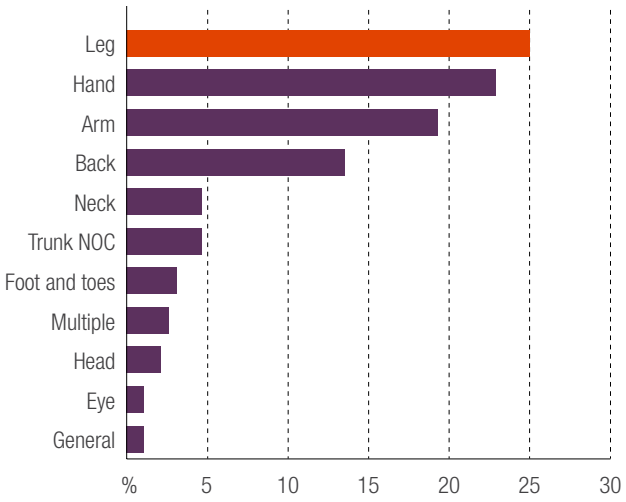


APPENDIX H

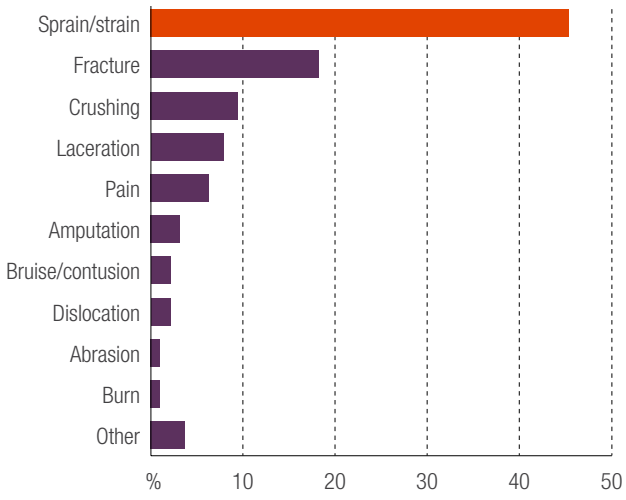
IRON ORE INJURIES 2013-14

192 lost time injuries

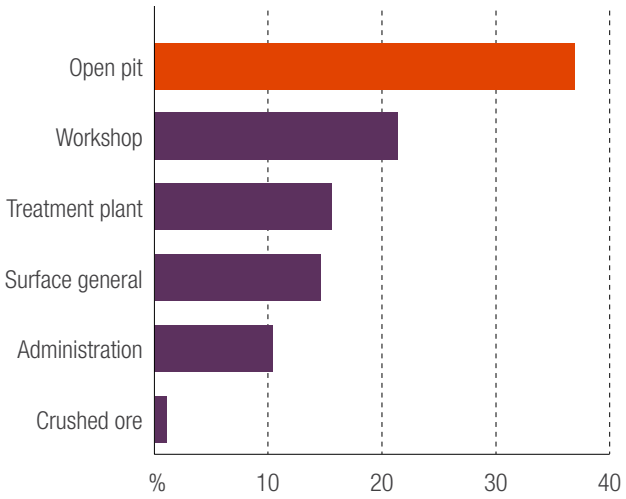
PART OF BODY



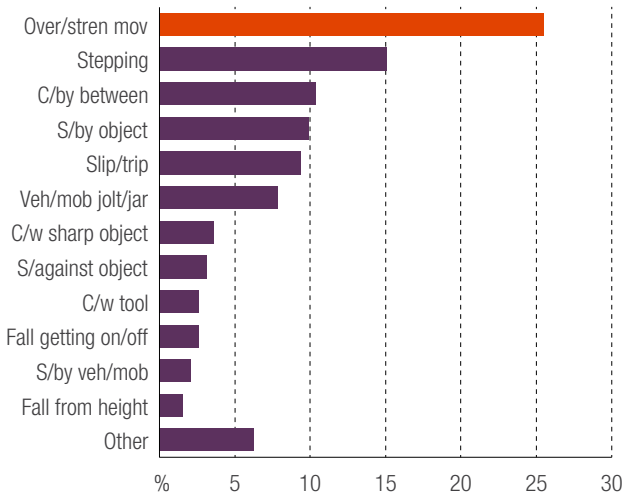
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

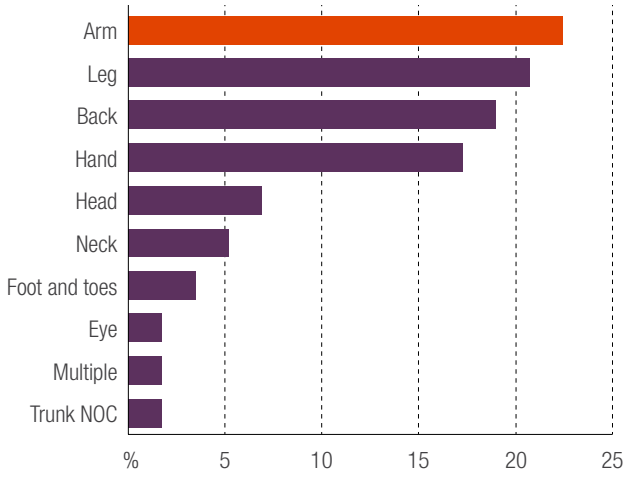


APPENDIX I

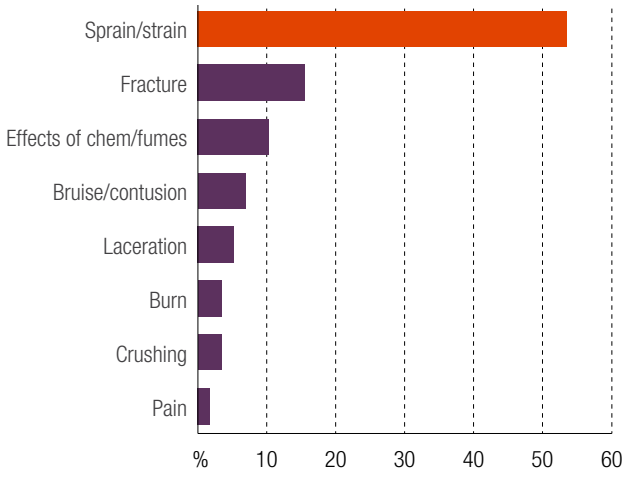
BAUXITE AND ALUMINA INJURIES 2013-14

58 lost time injuries

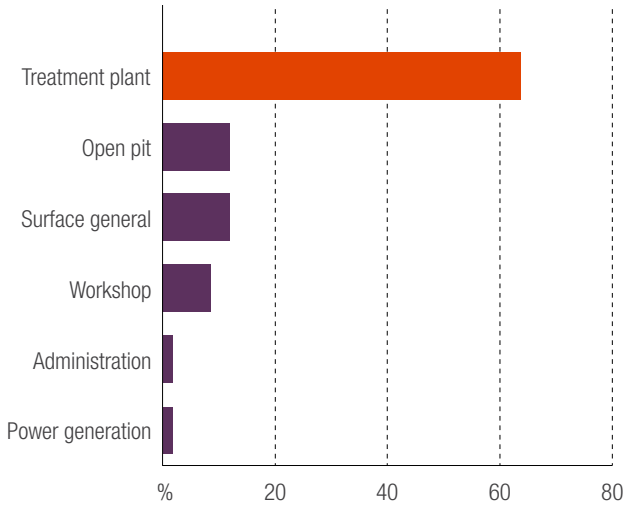
PART OF BODY



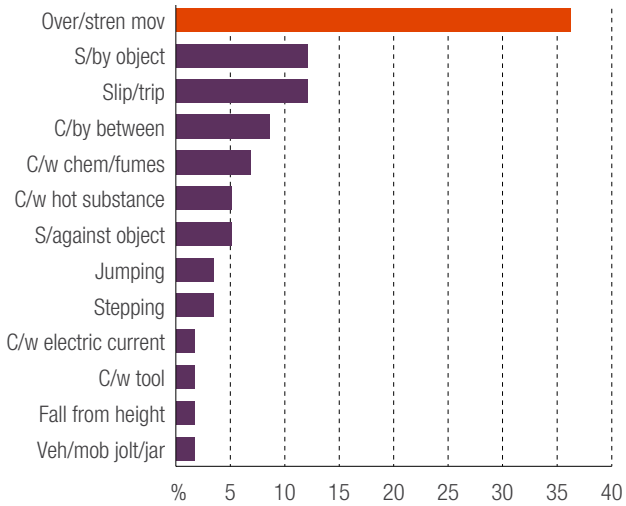
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

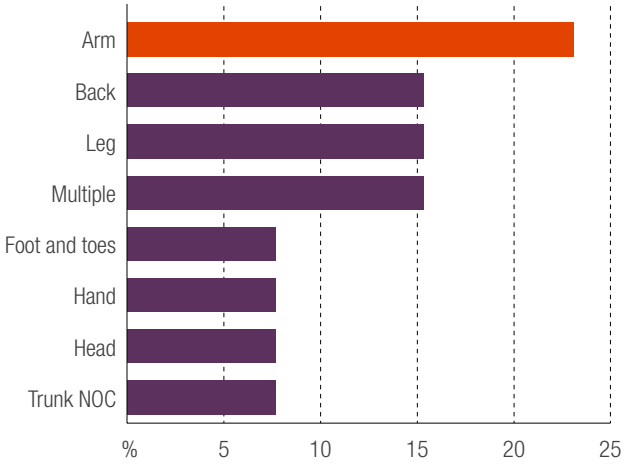


APPENDIX J

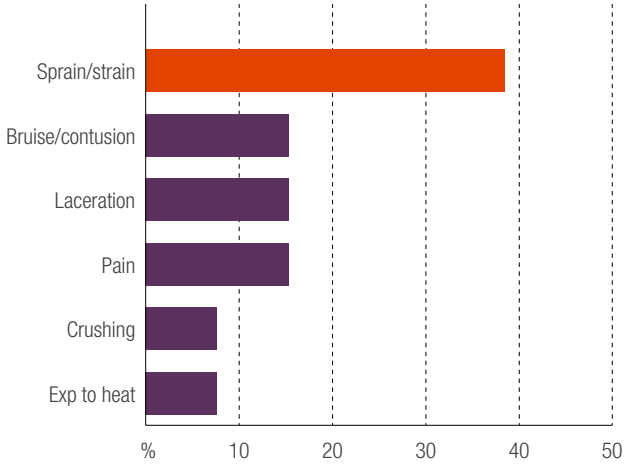
NICKEL UNDERGROUND INJURIES 2013-14

13 lost time injuries

PART OF BODY



NATURE OF INJURY



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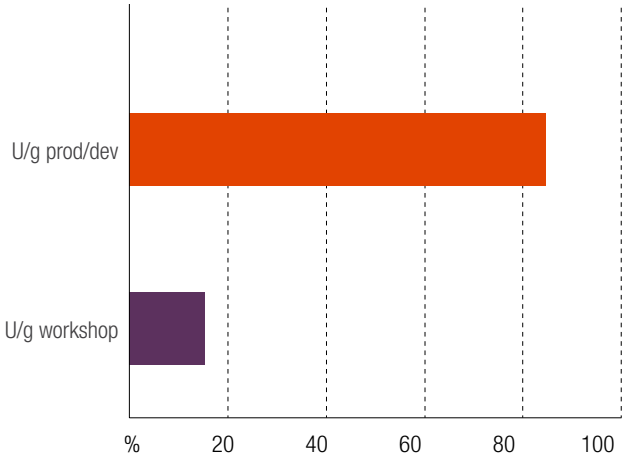
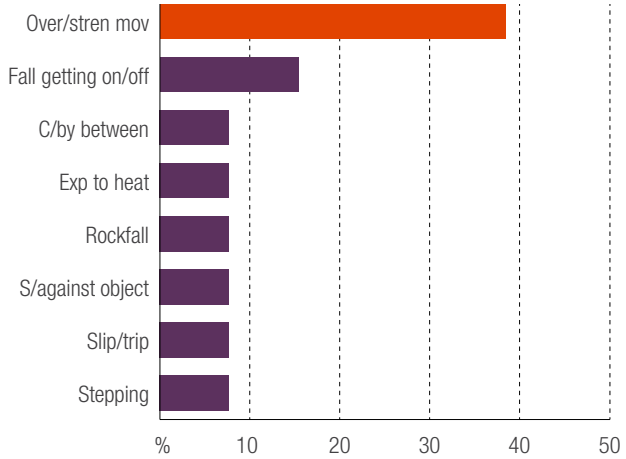


TYPE OF ACCIDENT

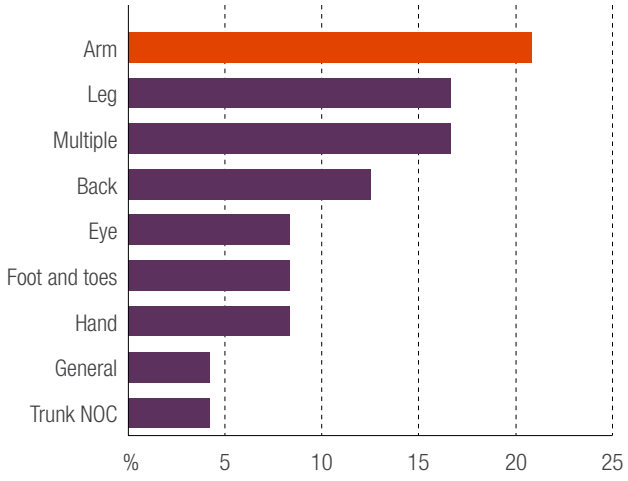


APPENDIX K

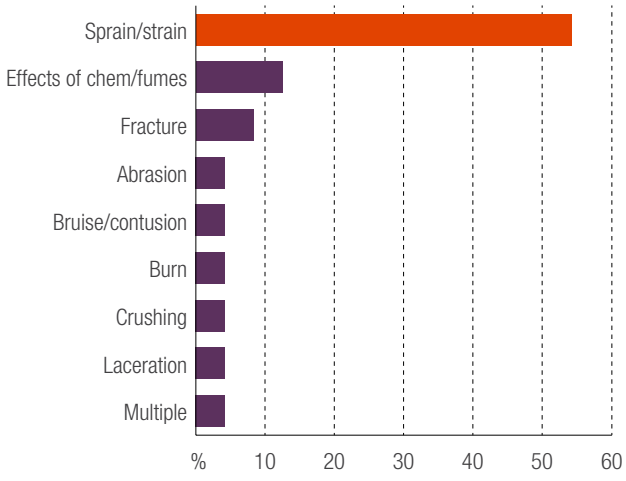
NICKEL SURFACE INJURIES 2013-14

24 lost time injuries

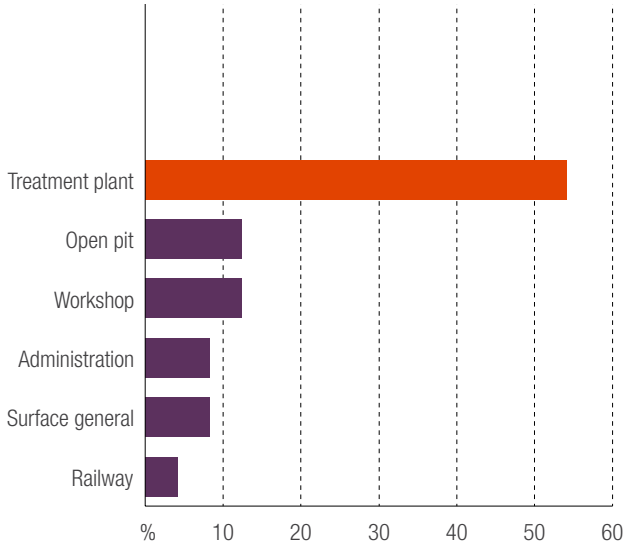
PART OF BODY



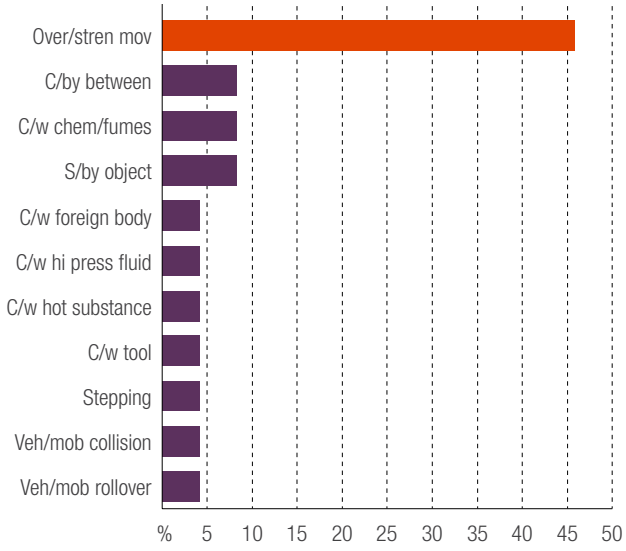
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

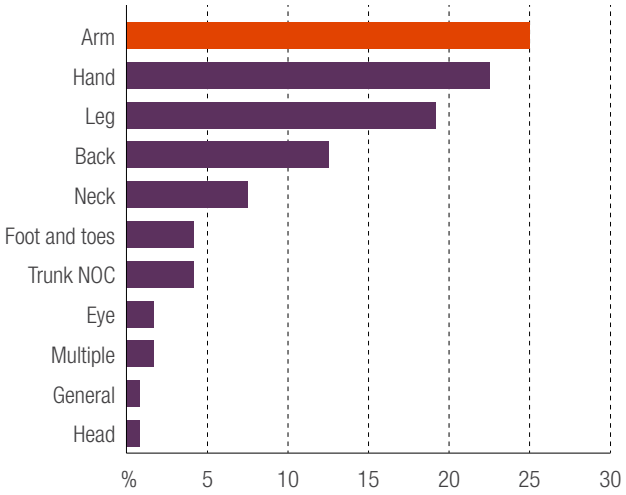


APPENDIX L

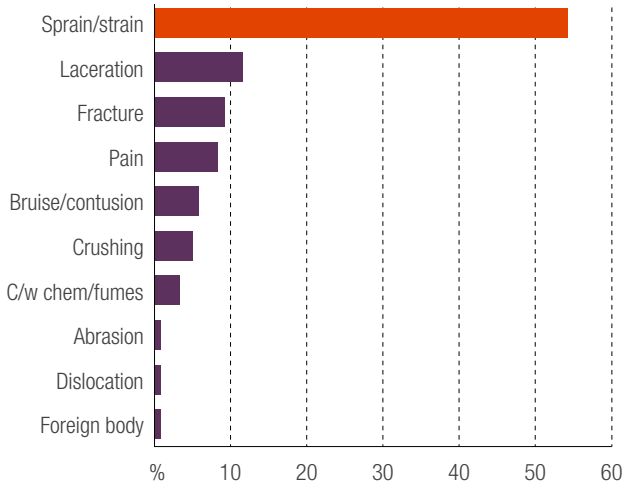
RESTRICTED WORK INJURIES UNDERGROUND 2013-14

120 restricted work injuries

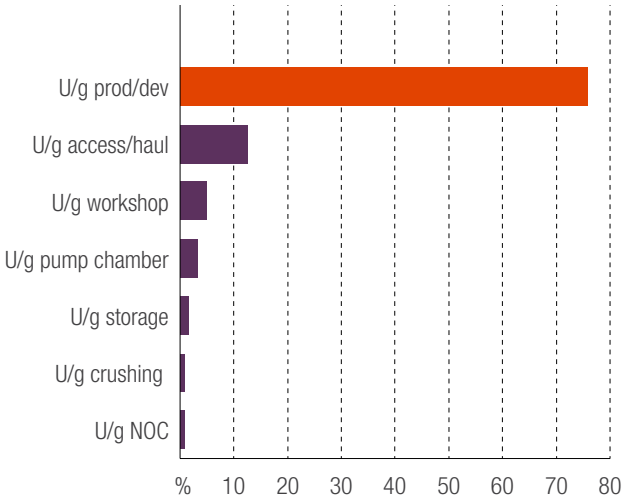
PART OF BODY



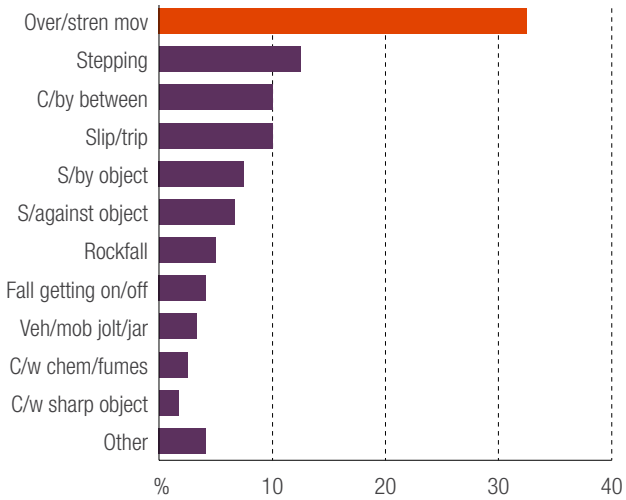
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

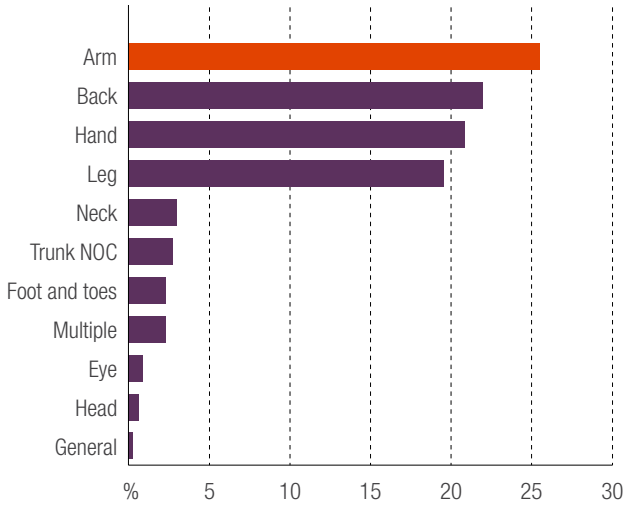


APPENDIX M

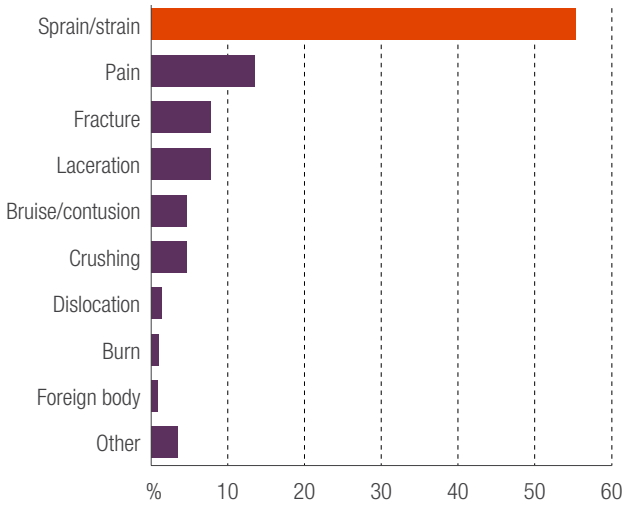
RESTRICTED WORK INJURIES SURFACE 2013-14

792 restricted work injuries

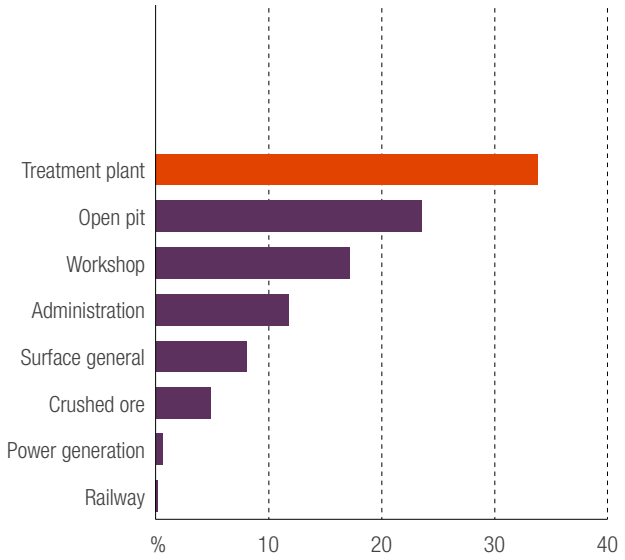
PART OF BODY



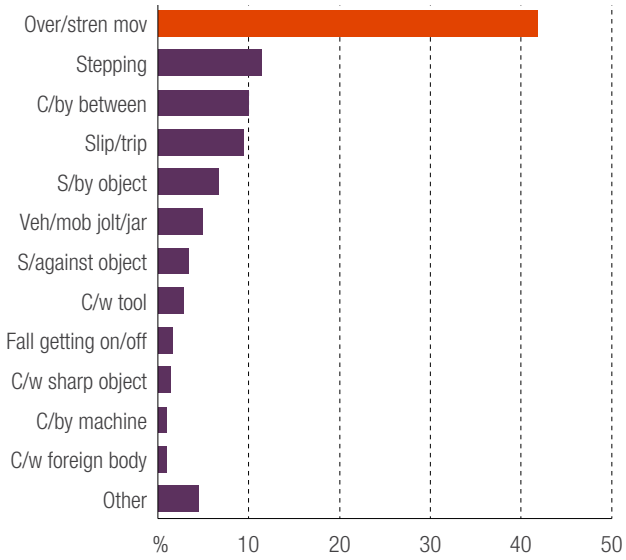
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT

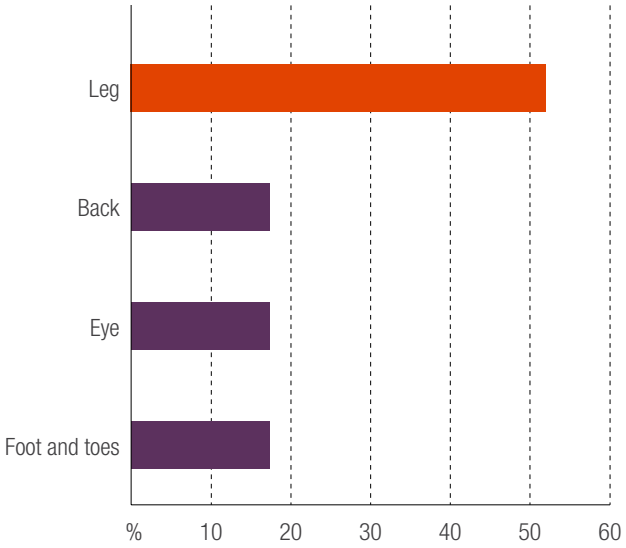


APPENDIX N

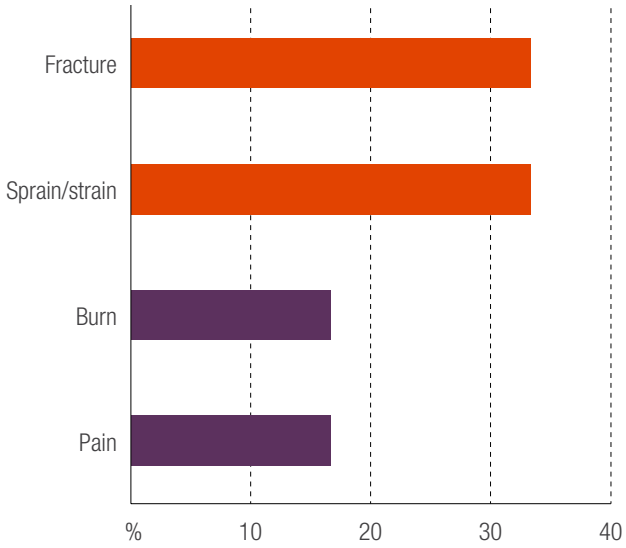
EXPLORATION INJURIES 2013-14

6 lost time injuries

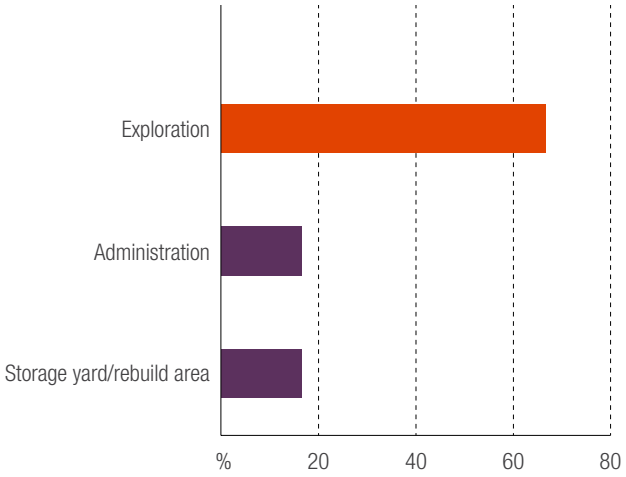
PART OF BODY



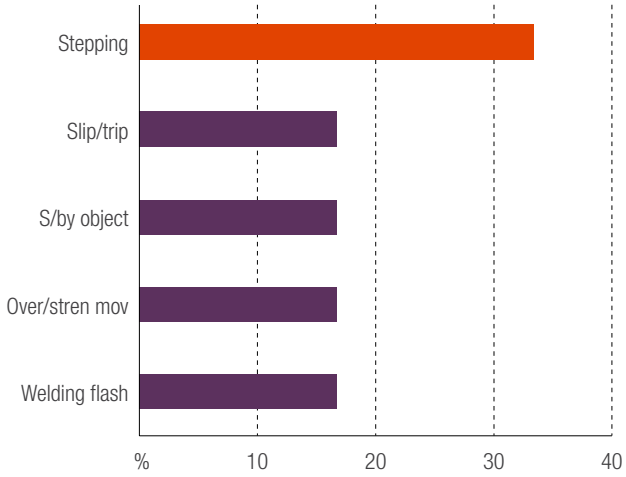
NATURE OF INJURY



LOCATION OF ACCIDENT



TYPE OF ACCIDENT



APPENDIX 0

DESCRIPTIONS OF COMMONLY USED TERMS FOR TYPE OF ACCIDENT

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

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

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

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

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

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

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

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

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

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

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

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

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

Explosion NOC – gas ignition

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

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

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

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

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

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

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

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

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

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

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

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

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

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