

ANALYSIS OF LOST TIME ACCIDENTS - 1995

LOGGING

(Accident Reporting Scheme Statistics)

Richard Parker

INTRODUCTION

This is the eleventh year of data collection by the Accident Reporting Scheme (ARS). Major differences from last year include: a decrease in the number of reported lost time injuries, a greater proportion of lost time injuries occurring in hauler operations and a decline in the proportion of injuries inflicted by the chainsaw. However chainsaw lacerations of the feet are still the single most frequent injury in logging.

Table 1 - Accidents recorded by the Scheme for 1994 and 1995

	1994	1995
Fatal accidents	10	9
Lost time accidents	288	202
Minor accidents	107	101
Near miss incidents	154	122

The following definitions are used by the Scheme:

lost time - the injury causes the injured person to miss the next full day's scheduled work

minor - first aid or medical treatment required, but lost time as defined above does not apply

near miss - first aid or medical treatment not required but the incident could have caused injury.

ANALYSIS OF 1995 LOST TIME ACCIDENTS

Lost Time Per Accident

The average number of days lost per accident was 9.2, which is not significantly less than the 10.1 days lost per accident in 1994. The number of days lost ranged from one to 100 days. The median number of days lost was five days. The number of days lost is frequently estimated, so caution must be used when interpreting "number of days lost" information.

In 1995, there was a greater proportion of injuries resulting in six to 10 and 11 to 15 days off work than in 1994 (Figure 1). Half of all lost time injuries resulted in one to five days off work. These injuries are not recorded by the Accident Rehabilitation and Compensation Insurance Corporation (ACC) Integrated Information System database which

records information on injuries resulting in more than five days off work.

A total of 1790 work days were lost in 1995. At 235 working days per year, this equates to 7.6 years of lost time. This compares with 11.1 years lost in 1994. The fewer number of days lost in 1995 is due to a small decrease in the severity of injuries and a large decrease in the number of accidents reported.

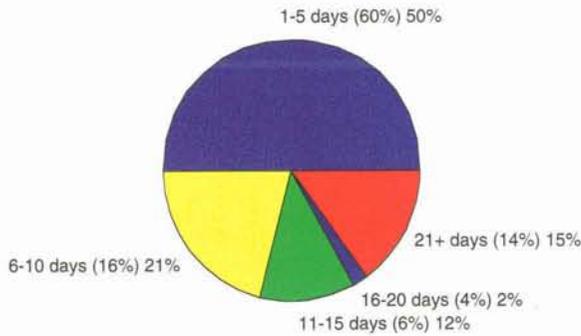


Figure 1 - Distribution of lost time per accident (1994 equivalent in brackets)

Time of Day of Lost Time Accidents

As in previous years, the greatest proportion of the injuries occurred early in the day (Figure 2). The first run of the day is the longest continuous work period (700 hours to 1000 hours) so all loggers will be working and exposed to hazards. Later in the day, crews break for smoko so fewer loggers will be working during any particular hour. Also in the morning loggers may be suffering from fatigue due to a poor breakfast (low in energy) and do not recharge their energy level until after smoko (Kirk, 1996a). The increase in injuries later in the day may be due to fatigue and dehydration.

Optimum physical and mental performance of the worker may be ensured by maintaining an adequate intake of fluid and food throughout the day (Kirk, Sullman & Parker, 1996).

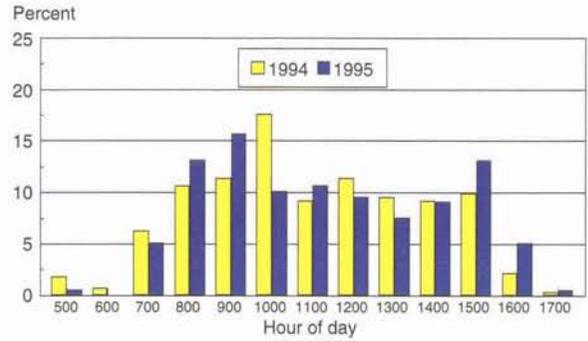


Figure 2 - Lost time accidents by time of day

Type of Operation

The proportion of lost time injuries in clearfell has remained the same since 1994 (Figure 3). There were 25 lost time injuries reported in thinnings operations in 1994 compared with 24 reported in 1995. Injury severity in thinnings has decreased from an average of nine days off work to seven days (Table 2). There were a total of 1456 and 158 days lost for clearfell and thinning respectively.

The category "other" includes incomplete injury reports which did not state the harvesting activity taking place. For example "hit by water drum" and "strained back while loading ute".

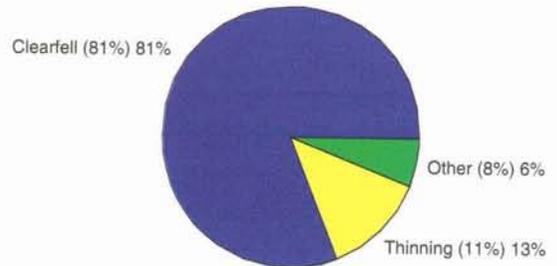


Figure 3 - Lost time accidents by type of operation (1994 equivalent in brackets)

As in previous years the greatest proportion of lost time injuries, 43% (46%) occurred in skidder extraction operations. Hauler operations continue to account for a growing proportion of lost

time injuries with 37% compared with 32% in 1994 and 18% in 1993. This reflects the increasing number of hauler operations in the New Zealand forest industry.

Expressed as a proportion of all lost time accidents, tractor operations are unchanged from last year, 20% (19%).

Logging Task

There has been little change in the proportion of lost time injuries occurring during the felling, trimming and skidwork phases. They accounted for 23% (21%), 23% (22%) and 22% (22%) of lost time injuries respectively. There was a small but non-significant increase in the proportion of lost time injuries sustained during breaking out in hauler, skidder and tractor operations - 17% (14%).

The 42 felling injuries resulted in a total of 236 days lost. These were: hauler, seven injuries, total of 31 days lost; skidder, 19 injuries, total of 93 days lost; tractor, 11 injuries, total of 26 days lost and five injuries where the extraction method was not reported. The most common reasons given for injury during felling were being hit by material falling from trees (17 injuries, total of 91 days lost) and hit by slabbed tension wood (six injuries, total of 73 days lost). The next most common reasons for injury were slipping and tripping accidents (five injuries, total of 24 days lost) and injury while wedging (four injuries, total of five days lost).

Forty-five lost time injuries occurred while trimming on the cutover and accounted for 45 lost time injuries and a total of 380 days lost. Chainsaw lacerations accounted for 49% of these injuries. The main causes of chainsaw injury were: "saw pushed into body by wood under tension" (five injuries), "lost footing and slipped" (four injuries), "kickback" (three injuries), "chain broke" (three injuries) and five injuries where the report simply stated "cut foot with saw". Other common injuries sustained during trimming were bruises resulting from being hit by limbs moved by the skidder tyre (two injuries), hit by sailers (two injuries), falling from the stem (two injuries) and cutting off a sloven which dropped on to the chainsaw operator's foot (one injury). There were seven strain injuries reported, five to the back and two to the leg.

Of the 34 breaking out injuries, 21 were in hauler operations, seven in skidder and six in tractor operations. These breaking out injuries resulted in a total loss of 168, 69 and 146 days respectively for hauler, skidder and tractor operations. One breaking out injury in a tractor operation resulted in 100 days lost time, "multiple fractures - crushed by arch against log when tractor moved". The most common causes of injury during breaking out were: "hit by a strop" (four injuries), "hit by drag" (four injuries), "slipped over" (nine injuries), "hit by rope" (three injuries) and "cut hand on sprag" (four injuries).

Table 2 - Accident Severity - Clearfell versus Thinning (Days Lost)

Type of operation	Number of injuries (1995)*	Severity (average days lost per accident)	
		1994	1995
Clearfell	156	10	10
Thinning	24	9	7
All Lost Time Accidents	194	10	9

* The number of observations does not correspond with the data in Table 1 due to missing information about the amount of time lost. This follows in all analyses involving lost time.

There were 43 lost time injuries in skid work with 18, 13 and five in hauler, skidder and tractor operations respectively. Six injury reports did not state the type of extraction. The most frequent injuries were bruises (18 injuries, total of 67 lost days), lacerations (11 injuries, total of 82 lost days) and fractures (seven injuries, total of 297 lost days).

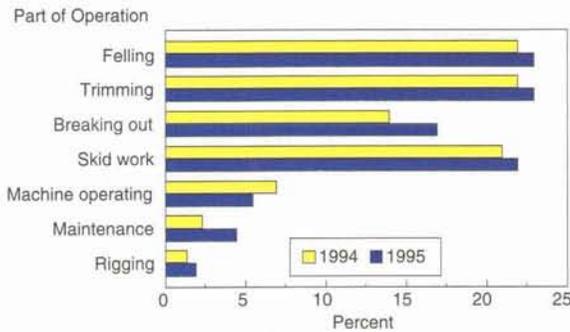


Figure 4 - Lost time accidents by part of operation

There were 11 injuries and 77 days lost in machine operating. The most severe injury was “loader window swung shut on hand when hit bump” - fractured right hand, 30 days lost.

During maintenance there were nine injuries and 52 days lost. The most severe injury was “lifting part off hauler, put back out” - 25 days lost.

During rigging operations there were four injuries and 43 days lost. The most severe injury was “winding in guy rope, handle slipped, hit on hand” - cut left hand, 20 days lost.

Part of Body Injured

There has been a decrease in the proportion of injuries to the head, upper torso, upper leg, feet and multiple injuries (Figure 5). The proportion of lost time injuries to the eyes, arms and lower torso remains unchanged from 1994. However, the proportion of injuries to the hands and lower legs has increased since 1994.

There were 26 injuries to the hands resulting in a total of 217 days lost. The single most common cause of injury was from handling wire rope with three lacerations from sprags (total of 27 days lost). The proportion of hand injuries due to chainsaw laceration has declined since 1991 (68, 54, 39, 39 and 15% for 1991, 1992, 1993, 1994 and 1995 respectively). Of the four chainsaw lacerations to the hands in 1995, two were inflicted while sharpening the chain (down from five injuries in 1994), one injury while removing a jammed chain and one injury when “tension wood forced the operator’s left hand on to the chain”. The report does not state if a chainsaw mitt was used.

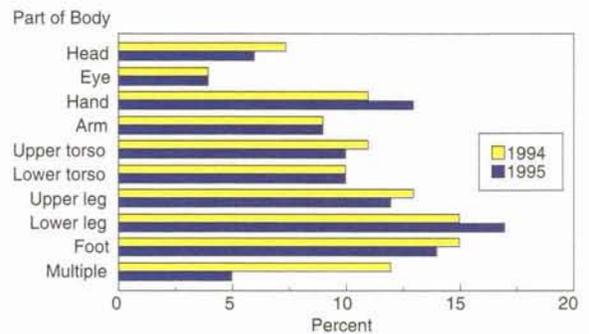


Figure 5 - Lost time accidents by part of body

There was a small increase in the proportion of injuries to the lower legs (Figure 5). The most frequent injuries were severe bruises (11 injuries, total of 35 days lost), fractures (seven injuries, total of 337 days lost) and lacerations (seven injuries, total of 27 days lost). Six of the seven laceration injuries to the lower legs were inflicted by the chainsaw. Chainsaw cut resistant legwear is not an absolute barrier to the saw; it is designed to reduce the severity of injury. The legwear should be replaced after damage and research (Sullman, 1996) shows that the protective qualities of chainsaw cut resistant legwear degrade over time.

Injured Body Part by Logging Task

There was a pattern of injuries which varied with the logging task (Figure 6). During felling the upper torso (shoulders and upper back) and hand were the most frequently injured. There were nine upper torso injuries. Six were the result of being hit by sailers (total of 25 days lost). Hand injuries during felling resulted from slipping over (three injuries, total of seven days lost), hit by sailer (two injuries, total of seven days lost), one when freeing a jammed chain (six days lost), wedging (three days lost) and an infection from a stick poke (one day lost).

The feet continue to be the most frequently injured part of the body during trimming on the cutover. There were 10 chainsaw inflicted lacerations to loggers' feet. All were to the left foot and resulted in a total of 147 days lost.

The lower legs were the most frequently injured part of the body during breaking out. All nine lower leg injuries occurred in hauler operations and comprised: five injuries from slipping over (total of 36 days lost), two injuries resulting from being hit by material coming down the slope (total of 63 days lost), one injury when hit by strops (two days lost) and one injury when a breaker out's legs were caught by the mainrope which was entangled by a moving truck (two days lost).

During skidwork the lower legs (15 injuries) and feet (10 injuries) were the most frequently injured parts of the body. Ten of the lower leg injuries were the result of being hit by moving logs. In 70% of the injuries, the logs were inadvertently moved by a machine working on the landing.

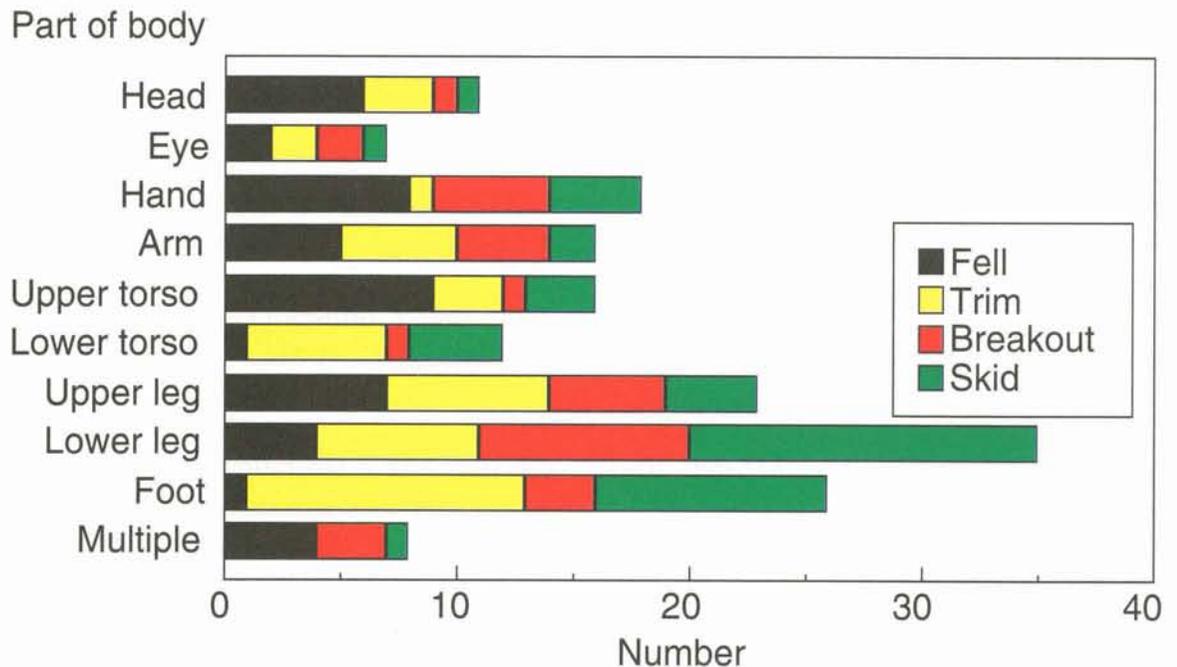


Figure 6 - Part of body injured in felling, trimming, breaking out and skid work

Table 3 - Chainsaw inflicted injuries to the hands, legs and feet

Part of Body	Total number of injuries	Chainsaw inflicted injuries	
		Number	Days lost
Hands	26	5	40
Upper Leg	24	4	27
Lower Leg	35	6	24
Feet	28	15	201

Chainsaw laceration of the left foot was the most common foot injury during skidwork resulting in five injuries and a total of 54 days lost. The next most common causes of foot injury were being run over by a machine (two injuries, total of 80 days lost) and being hit by a stem which had been hit by a machine (one injury, 10 days lost).

DISCUSSION AND CONCLUSION

The total number of work days lost in 1995 was considerably less than in 1994. This was due to a small decrease in the average severity of injuries and a large decrease in the number of injuries reported.

Although loggers wear high visibility clothing, there were 18 situations where injury resulted from being hit by a machine or being hit by material moved by a machine on the landing. The industry needs to investigate new strategies in technology and landing organisation to safeguard the logger working in close proximity to heavy mobile machinery.

Twenty-three injuries resulted from slipping or tripping. However, the introduction of spiked soled boots has almost eliminated this as a cause of injury in the logging operations of the Forestry Corporation of New Zealand Limited, Kaingaroa Forest (Adams, pers comm.). In the year from July 1994 to June 1995, the Forestry Corporation reported that 19% of lost time injuries were attributed to slipping over. The wearing of spiked boots was made compulsory in April 1995

and in the year July 1995 to June 1996 only 6% of lost time injuries were attributed to slipping.

The single most common injury in New Zealand logging operations was chainsaw laceration of the feet. In 1995 there were 15 of these injuries which resulted in a total of 201 days lost. LIRO strongly recommends the use of chainsaw cut resistant footwear.

The industry must continue to report lost time and minor injuries and near miss incidents so that the ARS can continue to focus research, development and training efforts in logging safety. Recent examples of ARS information being used to guide research include work on fatigue awareness, dehydration, high visibility clothing, spiked boots, eye protection and chainsaw cut resistant legwear.

REFERENCES

- Kirk, P.M. (1996) : "Reducing the Impacts of Fatigue on Forest Workers". LIRO Report Vol. 21 No. 3.
- Kirk, P.M., Sullman, M.J.M., Parker, R.J. (1996) : "Fatigue levels in motor-manual tree felling and delimiting operations". LIRO Report Vol. 21 No. 18.
- Sullman, M.J.M. (1996) : "The Effective Life of Chainsaw Chaps - A pilot Study". LIRO Report, Vol. 21 No. 4.

For further information, contact:
LOGGING INDUSTRY RESEARCH ORGANISATION
P.O. Box 2244,
ROTORUA, NEW ZEALAND.
Fax: 0 7 346-2886 Telephone: 0 7 348-7168