Economic consequences of accidents to hands and forearms by log splitters and circular saws: Cost of illness study

Eriksson, Martin; Karlsson, Johan; Steen Carlsson, Katarina; Dahlin, Lars; Rosberg, HansE

Published in:
Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery

DOI:
10.3109/2000656X.2010.542654

2011

Economic consequences of accidents to hands and forearms by log splitters and circular saws: Cost of illness study

Original article

Short running title: Cost of accidents when cutting firewood

Martin Eriksson[1], Johan Karlsson[1], Katarina Steen Carlsson[2, 3, 4], Lars B. Dahlin[5] & Hans-Eric Rosberg[6]

[1]Department of Economics, [2]Department of Health Sciences, Lund, [3]Lund University Centre for Health Economics, LUCHE, Lund, [4]the Vårdal Institute, the Swedish Institute for Health Sciences, Lund, [5]Department of Clinical Sciences Malmö, Hand Surgery, Lund University, Malmö, [6]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden

Correspondence: Hans-Eric Rosberg, Department of Hand Surgery, Skåne University Hospital, SE-20502 Malmö, Sweden. Tel: +46 40 332734. Fax: +46 40 928855. E-mail: Hanse.Rosberg@med.lu.se

Abstract

We estimated costs associated with injuries to hands from log splitters and circular saws used to cut up firewood and assessed the value of prevention. The study was carried out as a cost of illness study with an incidence approach based on 57 consecutive patients (median age 51; range 8-81) with injuries to the hand or forearm. Twenty-six of the 57 had an amputation which required microsurgery and 31/57 had various injuries. Median Hand Injury Severity Score (HISS) reflecting the severity of all injuries was 67 [range 6-332]. Median DASH score after 2-7 years was 12.5 [0-73.3]. Total cost (direct costs, costs of lost productivity and lost quality of life) was estimated to roughly EUR 14 million (EUR 2.8 million/year), where the cost of lost quality of life is 82% of the total cost and loss of productivity and direct costs are 9% each. Injuries sustained from log splitters and circular saws account for considerable costs, but first and foremost human suffering.

Key Words: Hand injury, cost of illness, log splitter, circular saw, DASH

Introduction

Production of firewood is relatively cheap in Sweden thanks to large forests. Since energy prices have risen and there has been an increasing awareness of climate change, the use of firewood for heating private homes has experienced a renaissance during the last decades with an eightfold increase in number of log splitters sold each year [1]. The medical consequences of accidents involving such machines have been reported [2-8]. A Danish retrospective study of hand injuries caused by hydraulic log splitters [6] concluded that the severity of hand injuries calls for immediate preventative action including the development of common European safety standards and information to all households that own a wood-fuelled stove or fireplace. In contrast, studies on the costs of injuries caused by such machines in private use are sparse. Accidents among self-employed forest owners have been analysed and report effects on the ability to work and days of sick leave taken. Direct health care costs were calculated to roughly EUR 86 000/year for beneficiaries to one insurance company [9]. Electric saws and other mutilating hand injuries in the US cause a loss of about 64 days off work and lost wages of approximately $US 8700 [10,11]. We have not found studies that estimate the costs to society, or the value of lost quality of life.

National Swedish statistics from the Injury Data Base (IDB) [12] based on questionnaires to hospitals and health-care centres that cover about 6 % of the Swedish population [13] have indicated that 900-1200 accidents/year involve machines for cutting wood and result in hand injuries. These estimates did not distinguish major from minor injuries that have no need for specialist attention. In this study we have classified injuries to the hand and

forearm caused by log splitters and circular saws by the Hand Injury Severity Score (HISS) [11,14] into four different categories (minor, moderate, severe, and major), estimated the costs to society including costs for health-care, lost production, and lost quality of life. Using estimates on sales on the number of such devices and number of potential users we have assessed the results in terms of preventive strategies.

Patients and methods

Patients

A consecutive series of 10 women and 47 men treated at our Department of Hand Surgery between 1999 and 2003 for injuries inflicted by log splitters and circular saws were identified from the operating files. All patients were operated on as emergencies. The department has a catchment area population of 1.7 million (18% of the population of the country). Table I shows clinical and personal details of patients and their injuries.

Methods

Information about patients, injuries and treatments were collected from the hospital notes. The severity of the injury was classified by the Hand Injury Severity Score (HISS) on arrival at our department. At the last follow up, two to seven years after the initial injury, the patients answered a disability of the arm, shoulder, and hand (DASH) questionnaire as a measure of symptoms and disability after the injury.

We estimated the cost of injuries to the hand using the incidence based approach, which was appropriate given our second goal of discussing prevention [15]. Costs included direct health-care costs from the initial episode of treatment and follow-up visits, lost production based on sick-leave and early retirement because of the injury, and a valuation of the reduced quality of life estimated from the DASH questionnaire. All costs were discounted to their present value for the year the injury occurred [16]. The discount rate was 3%. Costs are reported in Euros based on the mean exchange rate of the year 2007 (1 EUR = 9.2481 SEK; the Swedish Central Bank).

Direct costs were calculated using the administrative prices paid by a referring hospital to our department in the year 2006. These were for emergency surgery EUR 27.4/minute, planned surgery EUR 13.7/minute, emergency ward stay EUR 1007/24 hours, ward stay EUR 480/24 hours, outpatient care EUR 179/visit, and rehabilitation visit EUR 72.1/visit. The cost of lost production was calculated as the number of days of sick leave and early retirement multiplied by the mean earnings for the patient's profession (wage statistics from Statistics Sweden) plus the payroll tax (38.97 %) and value added tax (25%), following the human capital approach [17]. In the calculation, lost productivity was considered only until the person would be 65 years old.

The valuation of the lost quality of life was assessed in three ways. First, the patient's reported DASH score was transferred to a corresponding EQ-5D health state code by an experienced hand surgeon based on a qualitative appraisal. The reduction in quality of life associated with the health state was taken from the Danish TTO-tariffs [18] and defined as

the difference between perfect health and the health state value corresponding to the EQ-5D code. Secondly, the reduction was multiplied by the patient's expected remaining years of life to estimate the total number of quality-adjusted life years (QALYs) lost. We assumed a permanent reduction in quality of life as a result of the hand injury based on the DASH score from the questionnaires. Finally, Swedish authorities have not adopted a formal threshold value or range for cost-effectiveness, as for instance the National Institute for Clinical Excellence [19]. However, the Dental and Pharmaceutical Benefits Agency, TLV, rarely grants subsidies to pharmaceuticals with a cost/QALY gained exceeding SEK 600 000–SEK 700 000 (about EUR 64 000–EUR 76 000) [20]. The estimations here were based on a value of a QALY of EUR 65 000.

We put the results from our sample into a national perspective assuming that the costs and number of accidents/capita would be the same in other parts of the country, multiplying costs and number of accidents by a factor 5.1 (own calculations derived from populations statistics in year 2002 at Statistics Sweden).

The results of cost of injury are discussed in relation to the estimated prevalence of injuries from cutting firewood in private use and an estimated technical length of life for log splitters and circular saws [1].

Sensitivity analysis

Costs were discounted using alternative rates 0 and 5% following the Dental and Pharmaceutical Benefits Agency [21] in a sensitivity analysis.

Statistical methods

We compared the costs, days of sick leave, and HISS and DASH scores for patients injured by log splitters and circular saws, respectively, using the non-parametric Mann-Whitney test.

Results

Table II shows the descriptive statistics about treatment characteristics and outcome of the patients treated at our department during 1999-2003. Thirty-four patients were injured by a log splitter and 23 by a circular saw. We found no significant differences in HISS or DASH scores, or in lost QALYs, ward days, visits, or sick days by cause of injury (Table III). Together, the persons treated in our department had 2166 days of sick leave and early retirement in a year as a consequence of the injury (log splitters 920 days; circular saws 1246 days).

More than half of the patients (35/57; 61%) were classified on admission as having severe or major injuries. The reported DASH score after 2-7 years correlated with the HISS score on admission (correlation coefficient 0.38; p=0.01). As shown in Figure 1, people with major injuries also reported no functional limitations at final follow-up and a few with minor injuries reported some limitations. Almost half (26/57) of the patients had part of the hand or forearm amputated and required microsurgical procedures. The rest of the patients (31/57) had various injuries from fractures of the distal phalanx and nailbed injuries to more proximal fractures and tendon injuries (minor n=8) to more complex injuries with

fractures, and injuries to the tendons and nerves (moderate n=8, severe n=9, and major n=6).

Table IV shows the costs of accidents each year and as a total over the whole period. Log splitter injuries accounted for 61% of total costs seen over the whole period and circular saws stood for 39% (figures reported in parentheses by each type of cost and year). The distributions of direct costs, loss of productivity, and loss of life quality were similar between the machines. The highest cost was lost quality of life, corresponding to 82% of the total cost. Loss of productivity amounted to 9% and direct health-care costs to 9% of the total costs. Figure 2 shows an association between severity and total costs (correlation coefficient 0.47; $p<0.01$), but also that the persons with minor injuries may have substantial costs. The direct health-care costs that arose from log splitters were higher than those for circular saws (Mann-Whitney $p=0.03$). The 35 people with injuries classified as major or severe accounted for 79% of total cost; 81% of direct health care cost, 92% of cost of lost productivity and 78% of cost of lost quality of life.

The mean annual cost inflicted to society within the period of time examined was EUR 2.8 million in our region, and it would then correspond to EUR 14.4 million at the national Swedish level (Table V).We had between 6 and 16 injuries/year (median 11), which would correspond to just fewer than 60 similar injuries annually at the national level, assuming the same incidence per capita.

In 2002, about 11 000 log splitters and 1100 circular saws were sold in Sweden, and the age of the current stocks were estimated at 13 and 11 years at the time [1]. Assuming, conservatively, that the mean length of life was also the maximum technical length of life, Sweden would have a stock of around 143 000 log splitters and 12 100 circular saws. The estimate of the stock may be at the lower end considering that 157 500 households use only biofuel for heating and an additional 455 000 households use biofuel combination with oil and electricity [22]. However, households may also buy ready-made firewood, use manual tools, or have joint ownership of equipment with other families. With these caveats and recalculating the national sales figures using a per capita distribution, we assumed that the Southern health care region had a stock of about 28 000 log splitters and 2 400 circular saws. These estimates then corresponded to an incidence of 2.4 injuries/10 000 log splitters and 19/10 000 circular saws. The mean cost of hand injury/machine sold, and equivalent value of successful preventive strategies, would then be about EUR 780 (log splitter) and EUR 5 200 (circular saw). A larger stock of equipment than assumed here would imply that the cost/machine would be lower, and conversely if the stock was smaller.

Sensitivity analysis

The choice of discount rate affected estimates of the cost of the lost productivity and the cost of lost quality of life as these cost accrue over a longer time period. The cost of lost productivity was 3% higher with 0 discount rate and 4% lower with 5% discount rate. The cost of lost quality of life was 54% higher with 0 discount rate and 20% lower with 5% discount rate. For total costs, the corresponding differences were 44% higher and 17% lower.

Discussion

In our region the injuries, which varied between minor injuries and amputations during which microsurgical repair was necessary, were caused by either circular saws (40%) or log splitters (60%): injuries that should be treated by hand surgeons in agreement with national guidelines. The total costs to society of the 57 patients were EUR 14.0 million (mean EUR 2.8 million/year). The main cost was the lost quality of life (82%) with the costs of lost production and direct health care costing 9% each. The discounted life time costs/person were about EUR 247 000, where EUR 21 000 were direct healthcare costs, 23 000 were the costs of lost production, and 203 000 were costs of lost quality of life. In addition to reported costs for hand injuries of various causes [10,23-26], we also added the estimated cost of lost quality of life, which is borne by the injured person and the family. These costs are therefore important to consider when planning and deciding on prevention strategies.

The outcome and the total costs correlated with the severity of the injuries measured by the HISS score, but we noted that minor injuries can also be associated with substantial costs and remaining functional limitations (DASH scores). The median (range) DASH score in this study was 12.5 (0-73.3) which is higher than reported in a previous study, including minor, moderate, severe, and major hand injuries [DASH 5.8 (0-65) at one year follow up; [23]], where severe and major hand injuries had the highest DASH values (20 and 21.7, respectively). Minor injuries were also associated with costs [23].

We transferred responses from the DASH questionnaire to EQ-5D health states. This produced an indirect estimate of the value of the lost quality of life rather than values directly reported by patients. However, the transfers made by hand surgeons for this study seem to correspond well with results of an ongoing prospective study of severe hand injuries at our department, where patients have completed both DASH and EQ-5D questionnaires.

Our results have shown a lower incidence of injuries from log splitters and circular saws than in the national injury data base [13]. The results may differ for three reasons. First, the data from the injury data base contain a wide range of injuries, from small shallow wounds to grave life-threatening conditions, and also included people treated at local health-care centres or hospitals. Only 9 of 57 injuries (16%) were classified as minor. Secondly, the geographical area of our region may not be representative in terms of producing firewood for the country as a whole. Our region contains comparatively more agricultural and urban areas, but also areas where the number of houses heated with wood and other biofuels is among the highest in the country [27,28]. A third source of difference is the data source. We had comprehensive data based on patients administrative records at our department. The injury data base estimated national figures based on questionnaires to local hospitals and health care centres with a catchment area population of roughly 540 000 [13] in various parts of the country and hence only indirectly based on patient administrative individual level data.

Since 1995, all new machines sold in Sweden have to comply with the European Union safety standards for machine use. The standards state that the machines should be used by a single operator, and that wedge type log splitters should feature two-hand controls [28]. In our material, 6/57 (10.5%) of the injured persons reported that two persons had been working together with the machine (a hydraulic log splitter in all cases) at the time of the injury, which is lower than other reports (around 40%) [7]. Representatives for three of the largest providers of small wood machines claim that the most common type of log splitter, a horizontal hydraulic wedge splitter, is safe when the safety instructions are followed. The two-hand controls, or dead-mans grip, has been introduced to preclude the possibility for single operators to adjust the log while the machine is running. Older types of machines that may still be in use, and that are currently marketed internationally, are operated with a pedal, thus leaving both hands free, a feature marketed by some international retailers. Hence, the problem is rather that safety features can be overridden by the user. The lever controlling the hydraulic pressure, which requires two-handed operating, can be stuck in the "on" position, for instance with tape or an adequately sized wooden stick. Such measures would then override the "dead-mans-grip". Other safety instructions for log splitters usually state that the splitter must be placed on a level and stable ground. Precautions include getting a good grip between shoes and ground. Screw splitters, a less common variant nowadays, may impose a higher risk if gloves, watches or long sleeves are pulled in by the rotating cone very quickly [5].

When patients were asked about the cause of accident, 32/57 (56%) stated carelessness as the main reason, 19/57 (33%) claimed technical reasons, and 6/57 (11%) gave no

explanation. A common way in which the injury happened is the operator trying to adjust the log while the ram is moving, keeping the hands in the working area of the machine [6]. This may also happen when children are injured by such machines causing complex injuries [26]. Weariness, after monotonous work for a long period, can be a factor that increases the risk of injury caused by carelessness. The fact that users do not fully comply with safety recommendations and their association with accidents has implications for preventive strategies. Some aspects are clearly related to the activities of, and decisions made by, the user.

So what can be done to reduce the number of injuries and the severity of the injuries? New regulations making further safety attributes essential may have an effect if the new safety functions are less easy to override. Such measures can affect machines sold in the future, but assuming an average length of life/machine of 10 years we expect that the benefits of the increased regulation will not be measurable until later. A “drivers’ licence” for operating the machine based on an education programme has been proposed [29]. The authors claim that there is already a market for education on the use of small-scale equipment and expect the effects of courses in the same spirit for those who chop their own firewood. Since our findings, and assuming that a “drivers’ licence” would reduce the number of accidents by raising people’s awareness of the true risks and the expected costs of injury borne by injured people, a cost-sharing policy for “drivers’ licence” for the machines might be considered between producers and buyers of such machines with potential subsidy from society to raise incentives to improve awareness.

Acknowledgements

The project was supported by grants from the Swedish Research Council (Medicine), Crafoords Fund for Medical Research, Konsul Thure Carlsson Fund for Medical Research, Region Skåne, and Funds from the University Hospital Malmö, Sweden. We thank Tina Folker and Anita Larsson for help with the project. This article is a condensed version of a Bachelor thesis from the Department of Economics, University of Lund, Sweden.

References

[1] Lindroos O, Lidestav G, Nordfjell T. Swedish non-industrial private forest owners: a survey of self-employment and equipment investments. Small-scale forest economics, management and policy 2005;4:409-26.

[2] Justis EJ, Moore SV, LaVelle DG. Woodworking injuries: an epidemiologic survey of injuries sustained using woodworking machinery and hand tools. J Hand Surg 1987;12A:890-5.

[3] Kristiansen TK, Seligson D. Log splitter injuries to the hand. J Occup Med 1981;23:400-2.

[4] Jaxheimer EC, Morain WD, Brown FE. Woodsplitter injuries of the hand. Plast Reconstr Surg 1981;68:83-8.

[5] Hellstrand PH. Injuries caused by firewood splitting machines. Scand J Plast Reconstr Surg Hand Surg 1989;23:51-4.

[6] Holm R. [Hand injuries in the users of hydraulic wood-cutters]. Ugeskr Laeger 1998;160:7255-8.

[7] Trier H, Hovgaard C. [Hand injuries caused by hydraulic wood-splitting machines]. Ugeskr Laeger 1989;151:3080.

[8] Lindqvist A, Gerdin B. Hand injury from powered wood splitters. Scand J Plast Reconstr Surg Hand Surg 2008;42:246-52.

[9] Lindroos O, Burström L. Skadehändelser bland självverksamma privata skogsägare - skaderegisteranalyser (Injuries among private forest owners in non-market forestry

work - Analyses of injury registers). Umeå (in Swedish): Arbetsrapport 183, Sveriges lantbruksuniversitet; 2007.

[10] Hoxie SC, Capo JA, Dennison DG, Shin AY. The economic impact of electric saw injuries to the hand. J Hand Surg 2009;34A:886-9.

[11] Matsuzaki H, Narisawa H, Miwa H, Toishi S. Predicting functional recovery and return to work after mutilating hand injuries: usefulness of Campbell's Hand Injury Severity Score. J Hand Surg 2009;34A:880-5.

[12] Injury Data Base (IDB) Swedish National Board of Health and Welfare; http://www.socialstyrelsen.se/register/halsodataregister/patientregistret/Sidor/idb-skaderegistrering.aspx.

[13] Wänskä T. The National Board of Health and Welfare. Centre for Epidemiology. Personal communication. Stockholm; 2008.

[14] Urso-Baiarda F, Lyons RA, Laing JH, Brophy S, Wareham K, Camp D. A prospective evaluation of the Modified Hand Injury Severity Score in predicting return to work. Int J Surg 2008;6:45-50.

[15] Kobelt G. Health economics: An introduction to economic evaluation. 2nd ed. London, UK: Office of Health Economics; 2002.

[16] Ament A, Evers S. Cost of illness studies in health care: a comparison of two cases. Health Policy 1993;26:29-42.

[17] Sculpher M. The role and estimation of productivity costs in economic evaluation. In: Drummond M, McGuire A, editors. Economic evaluation in health care - merging theory with practice. Oxford: Oxford University Press; 2001.

[18] Szende A, Oppe M, Devlin N. EQ-5D value sets inventory, comparative review and user guide. Dordrecht, The Netherlands: Springer; 2007.

[19] National Institute for Clinical Excellence (NICE). Guide to the methods of technology appraisal: National Institute for Clinical Excellence (NICE); 2004.

[20] TLV. Tandvårds- och läkemedelsförmånsverket TLV (The dental and pharmaceutical benefits agency); 2009.

[21] Pharmaceutical Benefits Board (Läkemedelsförmånsnämnden). Läkemedelsförmånsnämndens allmänna råd och ekonomiska utvärderingar. Läkemedelsförmånsnämndens allmänna råd LFNAR 2003;2.

[22] Statistics Sweden. Bostads- och byggnadsstatistik årsbok 2009 [Yearbook of housing and building stastistics 2009 (in Swedish)]; 2009.

[23] Rosberg HE, Carlsson KS, Dahlin LB. Prospective study of patients with injuries to the hand and forearm: costs, function, and general health. Scand J Plast Reconstr Surg Hand Surg 2005;39:360-9.

[24] Rosberg HE, Carlsson KS, Hojgard S, Lindgren B, Lundborg G, Dahlin LB. Injury to the human median and ulnar nerves in the forearm--analysis of costs for treatment and rehabilitation of 69 patients in southern Sweden. J Hand Surg 2005;30B:35-9.

[25] Rosberg HE, Carlsson KS, Hojgard S, Lindgren B, Lundborg G, Dahlin LB. What determines the costs of repair and rehabilitation of flexor tendon injuries in zone II? A multiple regression analysis of data from southern Sweden. J Hand Surg 2003;28B:106-12.

[26] Ljungberg EM, Carlsson KS, Dahlin LB. Cost per case or total cost? The potential of prevention of hand injuries in young children - retrospective and prospective studies. BMC Pediatr 2008;8:28.

[27] Statistics Sweden. Energistatistik för småhus 2005; 2005.

[28] Lindroos O, Aspman EW, Lidestav G, Neely G. Accidents in family forestry's firewood production. Accid Anal Prev 2008;40:877-86.

[29] Nilsson S, Runemo L. Motverka olycksfall i lantbruket - rapport från Jordbruksverket och Skogsstyrelsen. Jönköping: Jordbruksverkets rapport 2007:8; 2007.

Table I. Descriptive statistics: clinical and personal characteristics.

Variable	Median (range) or Number (%) (n = 57)
Age at the time of injury (years)	51 (8-81)
Men/women	47/10 (82/18)
Employment at the time of injury	
Employed (% white collar)	23 (40)
Employed (% blue collar)	12 (21)
Unemployed	1 (2)
Retired	15 (26)
Student	6 (11)
Injury:	
Log splitter/circular saw	34/23 (60/40)
HISS score [a)]	67 (6-332)

[a)] HISS score is missing for 6 people.

Table II: DASH scores, lost QALYs, days off sick and, time of return to work.

Variable	Median (range) or Number (%) (n = 57)
DASH score [a)]	12.5 (0-73.3)
Lost QALYs [b)]	4.0 (0-29.6)
Days in hospital	
At the time of injury (emergency) (n=55)	6 (2-31)
Other (n=19)	5 (2-21)
Visits	
Physician (n=57)	8 (2-28)
Rehabilitation (n=56)	4 (0-32)
Days off sick	
Total sample [c)] (n=57)	30 (0-884)
People active in the labour market [d)] (n=36)	108 (0-884)
Return to work	
People active in the labour market at injury [e)]	27 (77)
Early retirement [f)]	3 (9)

[a)] Based on 47/57 returned questionnaires. [b)] Health-stated value imputed from DASH score. Calculation assumed that reduction in health-state was permanent. [c)] 28 persons had no days off sick as a consequence of the injury. [d)] 8 people were active in the labour market and had no sick days as a consequence of hand injury. [e)] Based on follow-up information on 33/35 people (94%). [f)] Three people had full early retirement and two persons had worked part time).

Table III. Results by type of injury and test of difference in distribution [median (IQR)] .

	Log splitter	Circular saw	p-value[a]
HISS score	67 (27-150)	67 (26-129.5)	0.70
DASH score	17.5 (10-30.8)	11.7 (2.5-25)	0.32
Lost QALYs	5.7 (0-10.6)	3.8 (0-6.0)	0.16
Days off sick	48 (0-191)	0 (0-113)	0.30
Days in hospital	8 (4-15)	6 (2-10)	0.18
Visits			
Physician	8 (6-11)	8 (6-10)	0.79
Rehabilitation	5 (1-10)	3 (1-5)	0.16

[a]Mann Whitney

Table IV. Costs in EUR of injuries from log splitter machines and circular saws in 57 patients for each year 1999-2003 and for the whole five year period. Percentage of total cost by mechanism of injury within parentheses and mean annual costs in brackets.

	Total cost (log splitter % / circular saw %)					
	1999	**2000**	**2001**	**2002**	**2003**	**Total 1999-2003 [annual mean]**
Direct cost	325 600 (66/34)	274 100 (53/47)	140 800 (84/16)	171 900 (62/38)	295 800 (93/7)	1 208 200 (71/29) [241 640]
Lost productivity	437 300 (54/46)	366 700 (15/85)	85 600 (17/83)	133 700 (50/50)	266 000 (100/0)	1 289 300 (49/51) [257 900]
Sick leave	312 800 (75/25)	170 000 (32/68)	51 800 (27/73)	133 700 (50/50)	266 000 (100/0)	934 300 (68/32)

Early retirement	124 500	196 800	33 800			355 000
	(0/100)	(0/100)	(0/100)			(0/100)
Lost quality of life	3 325 000	1 843 600	305 700	3 172 300	2 906 700	11 553 300
	(41/59)	(35/65)	(100/0)	(55/45)	(100/0)	(60/40)
						[2 310 660]
Total cost	4 087 900	2 484 400	532 100	3 477 900	3 468 600	14 050 700
	(44/56)	(34/66)	(82/18)	(55/45)	(99/1)	(60/40)
						[2 810 10]

Table V. Estimates of mean national annual cost (in EUR) of injuries caused by log splitters and circular saws in Sweden calculated from incidence data from the Southern Health Care Region.

	Log splitter	Circular saw	Total
Direct costs	880 000	350 000	1 230 000
Productivity loss	650 000	670 000	1 320 000
Sick leave	650 000	300 000	950 000
Early retirement	0	360 000	360 000
Life quality loss	7 090 000	4 710 000	11 810 000
Total cost	8 620 000	5 730 000	14 360 000

Figure legends

Figure 1. Distribution of DASH scores at 2-7 years after the injury by HISS categories of severity in 57 patients with hand and forearm injuries caused by log splitters and circular saws. A higher DASH score implies more functional limitation.

Figure 2. Distribution of total costs by HISS categories of severity in 57 patients with hand and forearm injuries caused by log splitters and circular saws.