Cost of work-related injuries in insured workplaces in Lebanon

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Objective To estimate the medical and compensation costs of work-related injuries in insured workplaces in Lebanon and to examine cost distributions by worker and injury characteristics.

Methods A total of 3748 claims for work injuries processed in 1998 by five major insurance companies in Lebanon were reviewed. Medical costs (related to emergency room fees, physician consultations, tests, and medications) and wage and indemnity compensation costs were identified from the claims.

Findings The median cost per injury was US$ 83 (mean, US$ 198; range, US$ 0–16 401). The overall cost for all 3748 injuries was US$ 742 100 (76% of this was medical costs). Extrapolated to all injuries within insured workplaces, the overall cost was US$4.5 million a year; this increased to US$ 10 million–13 million when human value cost (pain and suffering) was accounted for. Fatal injuries (three, 0.1%) and those that caused permanent disabilities (nine, 0.2%) accounted for 10.4% of the overall costs and hospitalized injuries (245, 6.5%) for 45%. Cost per injury was highest among older workers and for injuries that involved falls and vehicle incidents. Medical, but not compensation, costs were higher among female workers.

Conclusion The computed costs of work injuries — a fraction of the real burden of occupational injuries in Lebanon — represent a considerable economic loss. This calls for a national policy to prevent work injuries, with a focus on preventing the most serious injuries. Options for intervention and research are discussed.

Keywords Wounds and injuries/economics; Workplace; Accidents, Occupational/economics; Cost of illness; Insurance, Accident/economics; Workers' compensation; Disability evaluation; Insurance claim review; Costs and cost analysis; Lebanon (*source: MeSH, NLM*).

Mots clés Plaies et traumatismes/économie; Poste travail; Accident travail/économie; Coût maladie; Assurance accident/économie; Indemnité travailleurs; Evaluation incapacité; Contrôle compagnie assurance; Coût et analyse coût; Liban (*source: MeSH, BIREME*).

Palabras clave Heridas y lesiones/economía; Lugar de trabajo; Accidentes de trabajo/economía; Costo de la enfermedad; Seguro por accidentes/economía; Indemnización para trabajadores; Evaluación de la incapacidad; Revisión de utilización de seguros; Costos y análisis de costo; Líbano (*fuente: DeCS, BIREME*).

الكلمات المفتاحية: الجروح والإصابات، اقتصاد الجروح والإصابات، مكان العمل، الحوادث، الاقتصاد المهني، تكاليف المرض، التأمين، اقتصاد الحوادث، تعويضات للعاملين، تقييم العجز، مراجعة مطالبات التأمين، التكاليف، تحليل التكاليف، لبنان (*المصدر: رؤوس الموضوعات الطبية، المكتب الإقليمي شرق المتوسط*).

Bulletin of the World Health Organization 2003;81:509-516.

Voir page 514 le résumé en français. En la página 515 figura un resumen en español. يمكن الاطلاع على الملخص بالعربية على الصفحة ٥١٥ .

Introduction

The economic burden of work-related injuries is a useful tool to convince workers and employers of the cost-benefit of work safety and the effectiveness of preventative interventions. It also guides employers and policy-makers on how to allocate resources effectively (*1, 2*). Takala reported a higher incidence of fatal work-related injuries in developing countries than in established market economies (11–23 vs 5.4 per 100 000 workers, respectively) (*3*). Such injuries produce a major economic and social burden in developed and developing countries (*2–10*).

Lebanon — a small Arab country with an area of 10 452 km^2, a population of 4 million, and a service-oriented economy — had a GDP of US$ 16.7 billion in 2001 (*11*). The 15-year civil war (1975–90) and regional instability have resulted in an ongoing challenge to the Lebanese economy, which has an unemployment rate of $\geqslant$ 14% (*12*). Occupational health and safety in Lebanon has been given little significance, surveillance systems for occupational injury were never established, and an unknown but low proportion of employers insured their workplaces and workers against accidents (*13*).

The Lebanese workers' compensation law requires employers to provide workers injured at work with full medical care, 75% of their daily salary starting from the day of the injury, and compensation for permanent disabilities and death. Some employers purchase work-accident insurance policies from private insurance companies, but most employers elect to pay out-of-pocket at the time of injury. Insurance policies are issued for the worksite as a whole, not in the name of individual workers.

These facts have limited the opportunity to examine the magnitude of work-related injuries at a national level and might

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Ref. No. **02-0200**

explain the absolute absence of studies on the topic. This study aimed to outline the magnitude of the problem and identify areas for potential research and interventions. Specifically, we estimate the overall cost of work-related injuries in insured workplaces in Lebanon and examine cost distribution by worker and injury characteristics.

Methods

Study population

The target population was workers employed in all insured workplaces in Lebanon in 1998. The attainable population was those employed in workplaces insured by 11 private insurance companies whose portfolios were managed by MedNet-Liban — a third-party administrator. These insurance companies represented approximately 30% of the market for work-related injury insurance in 1998 (*14*). MedNet-Liban processed the claims of injured workers who presented for medical care in participating hospitals. A pre-authorization "visa form" was issued for each visit, and one or more visa forms could be issued for a single injury. MedNet-Liban computerized selected information from these forms and sent the original hard copies to the insurance companies.

Study sample

In 1998, MedNet-Liban issued 8432 work-related injury visa forms for the 11 insurance companies. At the time of the audit, six companies were excluded: three had each processed less than 30 forms annually, one was out of business, and two refused to participate. The five participating companies were responsible for 7329 out of the total 8432 visa forms (86.9%). Of these, 4186 (57.1%) forms, which corresponded to 3748 cases of injury, were available for review. The remaining 3143 forms were not accessible for a variety of administrative reasons.

Data collection and management

Raw unprocessed data (age, sex, industry type, occupation, income, and "injury event narrative") were extracted from the insurance claims and the related medical and financial reports. Claims were grouped into four categories according to age (10–19, 20–29, 30–39, and $\geqslant$ 40 years). Industries and occupations were classified with the North American Industrial Classification System of 1997 (*15*) and the Standard Occupational Classification of 1999 (*16*), respectively. The cause of the injury, the agent involved and the injury's type and location on the body were extracted from the injury event narrative and the medical report. The type of injury was missing in 284 (7.6%) of cases, while 7533 (20.1%) of cases were recorded as "trauma", which is a non-exclusive diagnosis. "Missing" and "trauma" were both treated as independent categories. Injuries were classified by severity, which was linked to the number of workdays lost (<3, 3–30, and >30), permanent disability, and death (*17*). Hospitalization was used as another indicator of severity.

The medical and compensation costs for each injury were collated from all the visa forms related to a single injury. Medical costs included medical services (emergency service fees, consultations, and hospitalization, etc.) and drugs, and compensation costs included lost earnings and disability expenses (indemnity for permanent disability or death). Less than 10% of the total compensation payments were out-of-pocket medical expenses incurred by injured workers.

Data analysis

Injured workers whose cases were reviewed could not be compared with those who were not reviewed because MedNet-Liban's files did not link visa forms to individual injured workers. Instead, and because 3143 original visa forms were inaccessible, the representativeness of the study sample was evaluated by comparing reviewed and unreviewed visa forms with information from MedNet-Liban's computerized files.

Our analysis was limited to the 3748 injured workers. Their demographic and work characteristics were identified. The medical, compensation, and overall costs of injuries were reported by age, sex, industry, occupation, type and location on body of injury, cause and agent of injury, and severity of injury. Analysis by occupation was not reported because it was similar to analysis by industry. The lack of normal distribution in the cost data means that we report the means, medians, and ninetieth percentiles. We used the non-parametric test of Kruskal–Wallis to test for statistical significance ($P<0.05$). We used SPSS software (version 9) for data entry and analysis.

Cost computations

We used the human capital/cost of illness method, which is the method most frequently used for cost estimations for public health and legal purposes (*2*). This method computes all direct costs (medical and administrative expenses) and indirect costs (lost earnings and disability compensation, fringe benefits, home production (costs of non-paid labour, such as home cleaning), workplace training, restaffing, disruption, and time delays) that result from an injury (*2, 4*). In this study, the human capital cost was limited to medical costs, lost earnings, and disability expenses.

Details of medical and compensation costs were missing for 478 (13%) and 416 (11%) injury cases, respectively. Computed overall costs (medical plus compensation) were missing in 491 (13.1%) injury cases. The subtotal and overall costs, however, were computed by multiplying the cost per single injury by the total number of injuries. In other words, injuries with missing financial data were assumed to have the same mean medical and compensation costs as those with available financial data. This was justifiable, because cases of injury with data missing on overall costs were slightly more severe than cases with data available for overall costs.

The human capital method does not account for less measurable costs, such as pain, suffering, and diminished quality of life (*18*). This is addressed by the human value cost, which is assumed to be four times the calculated human capital cost in cases of severe injuries but only 90% of the human capital cost for minor injuries (*19*). In this study, severe injuries were defined conservatively by limiting them to fatal injuries and injuries resulting in permanent disability and less conservatively by also including injuries resulting in more than 30 days being taken off work.

The cost of occupational injuries in all insured workplaces in Lebanon was extrapolated with a set of assumptions. First, we assumed that the reviewed visa forms accounted for 50% of all MedNet-Liban's visa forms in 1998 (4186 out of 8432). Second, we assumed that the characteristics of the reviewed and unreviewed visa forms were similar. Third, we assumed that MedNet-Liban shares one-third, instead of 30%, of the market for work-related injury insurance. In other words, the national cost of work injuries in insured workplaces

in Lebanon was assumed to be at least six times the cost of the reviewed sample in this study: study sample costs × 2 (to account for all MedNet-Liban claims) × 3 (to account for all insurance companies).

Results

Study sample

The 3748 injured workers were predominantly young, male, Lebanese, and employed in the construction (43.7%) and manufacturing sectors (36.9%) (Table 1). Salaries ranged between US$ 4 and US$ 175 a day, with 1595 (62.7%) of the 2541 workers with known salaries receiving US$ 10–19 a day.

Overall cost

Table 2 presents the breakdown of medical costs, paid compensation, and overall costs per work injury. Medical costs averaged US$ 150, with a minimum of US$ 0 and a maximum of US$ 12 450 per injury. Payments for work compensation ranged between US$ 0 and US$ 6575 per injury, with 60% of cases not paid any compensation. The overall cost per injury was computable in 3257 (86.8%) cases. Total cost per injury ranged between US$ 0 and US$ 16 401 (average, US$ 198). On the basis of the assumption that work injuries with missing financial data were as costly as those with available financial data, the medical, compensation, and overall costs for the 3748 work injuries in 1998 were at least US$ 560 000, US$ 180 000, and US$ 740 000, respectively.

Cost by worker, work, and injury characteristics

Table 3 gives the distributions of the medical and compensation costs by worker, work, and injury characteristics. Medical costs and compensation costs both exhibited a skewed distribution. The ratio of compensation costs:medical costs varied by category, but it was mostly <0.3.

The mean medical cost per injury was higher for women than men, but the compensation cost was higher for men (Table 3). The medical cost per injury was almost twice as high among older workers (those aged ⩾50 years) (US$ 348.70 per injury) than for those in any other age group, and the cost of compensation gradually increased with age. Work injuries that resulted from "vehicle incidents" resulted in higher medical and compensation costs than all other causes of injury. The medical cost per injury was less variable by agent of injury.

Fractures and multiple injuries were the most expensive types of injury (Table 3). Injuries of the pelvic and hip region were the most expensive in terms of both medical costs and compensation costs. Costs of injuries sharply increased with the severity of the injury. Three (0.1%) fatal injuries consumed 3.8% of the overall costs, and injuries with disabilities plus severe non-fatal injuries (2.9%) accounted for 27%. Injuries that resulted in hospitalization cost 12 times as much per injury as those that did not.

Estimation of cost of work injuries in insured workplaces in Lebanon

The projected national overall cost of work injuries in all insured workplaces was approximately US$ 4.5 million (6 × US$ 745 000). The human value cost (pain and suffering) would range between US$ 5.3 million and US$ 8.2 million depending on severity. The overall cost (human capital plus human value) would range between US$ 9.8 million and US$ 12.7 million.

Table 1. **Characteristics of 3748 workers injured in insured workplaces in Lebanon in 1998**

Characteristic	No. (%)
Age (years)[a]	
10–19	455 (12.1)
20–29	1772 (47.3)
30–39	919 (24.5)
⩾40	512 (13.7)
Missing	90 (2.4)
Sex	
Male	3684 (98.3)
Female	64 (1.7)
Nationality	
Lebanese	1997 (53.3)
Syrian	1221 (32.6)
Other	492 (13.1)
Missing	38 (1.0)
Industry	
Construction	1637 (43.7)
Manufacturing	1384 (36.9)
Arts, entertainment, and recreation	120 (3.2)
Accommodation and food services	151 (4.0)
Other industries[b]	265 (7.1)
Missing	191 (5.1)
Occupation	
Construction and extraction	1610 (43.0)
Production	1012 (27.0)
Installation, maintenance, and repair	128 (3.4)
Food preparation and serving	137 (3.7)
Transportation and material moving	350 (9.3)
Other occupations	176 (4.7)
Missing	335 (8.9)
Daily income (US$[c])[d]	
<10	234 (6.2)
10–19	1595 (42.6)
20–29	574 (15.3)
⩾30	138 (3.7)
Missing	1207 (32.2)

[a] Mean (SD) age = 29.3 (9.4) years.
[b] Agriculture, forestry, fishing, and hunting; sales; other services; transportation and warehousing.
[c] US$ 1 =1500 Lebanese pounds.
[d] Mean (SD) income = US$ 16.2 (8.4).

Discussion

This study was limited to workplaces insured by private insurance companies and, therefore, the results cannot be generalized to self-insured and non-insured workplaces. Nevertheless, the study's strength lies in its use of well-documented financial data to estimate the direct and indirect costs per injury by different worker, work, and injury characteristics. Such comparisons are less sensitive to the number of workers within an occupation (*20*).

Our study confirms previous findings that a small number of work injuries consume a high proportion of the overall costs of workers' compensation claims (*21, 22*). Medical and compensation costs accounted for 76% and 24% of the overall costs, respectively, which is contrary to the US experience, in which indirect costs — mostly indemnity costs — accounted for 50–70% of all costs (*2, 4, 9*). This difference can be attributed to the fact that salaries are low in relation to

Table 2. **Medical, compensation, and overall costs per work injury in insured workplaces, Lebanon, 1998**

Cost (US$)[a]	No. (%)
Medical cost per injury	
–99[b]	2328 (71.2)
100–999[b]	862 (26.4)
⩾1000[b]	80 (2.4)
Total[b]	3270 (100.0)[d]
Mean[c]	150.0 (456.4) [0–12 450]
Median	72.0
Paid compensation per injury	
0[b]	2000 (60.0)
<100[b]	1006 (30.2)
100–999[b]	306 (9.2)
⩾1000[b]	20 (0.6)
Total[b]	3332 (100.0)[e]
Mean[c]	48.7 (240.5) [0–6575]
Median	0
Overall cost per injury[f]	
<100[b]	1982 (60.9)
100–999[b]	1174 (36.1)
⩾1000[b]	101 (3.1)
Total[b]	3257 (100.0)[g]
Mean[c]	198.0 (624.6) [0–16 401]
Median	83.3

[a] US$ 1 =1500 Lebanese pounds.
[b] Values in parentheses are percentages.
[c] Values in parentheses are standard deviations; values in brackets are ranges.
[d] Medical costs missing in 478 cases.
[e] Compensation costs missing in 416 cases.
[f] Overall cost = medical cost + paid compensation.
[g] Overall cost not computable in 491 cases.

the high cost of medical care in Lebanon, as well as the possibility that some cases are managed medically but are not appropriately compensated yet. The small number of workers who received compensation (<40%) may be due to workers' lack of awareness of their rights, the high proportion of daily workers (66%), and the passing of some indemnity costs to the employers (*23*) or even the workers.

The ratio of compensation to medical cost was not consistent among all categories. The highest medical and compensation costs per injury were associated with older workers, for example. These high compensation costs might reflect the fact that salaries are higher among older and more experienced workers or that such workers have longer delays before they return to work. Female workers' injuries were more expensive medically than men's, but they received smaller compensation payments. This is difficult to interpret because only 64 injured women workers were included in the study sample, but it may indicate that more women work in lower-paying occupations, that a discrepancy exists between women's and men's salaries for similar jobs, or that a sex differential exists in compensation payments made by insurance companies.

Work injuries that involved falls and vehicle incidents were the most expensive; this can be attributed mainly to the high proportion of fractures, multiple injuries, and involvement of lower extremities from such incidents. The agents that resulted in the most expensive work injuries were "elevation" and "equipment, tools, and machinery". Injuries from "elevation" were associated with the highest proportion of fractures involving the pelvis, hips, and lower extremities: 18% compared with 8% among all injuries. The hands were involved in 52% of the injuries caused by "equipment, tools, and machinery" — twice the rate from other agents.

Overall cost estimation

Cost computations in this study were limited to short-term measurable economic expenses rather than the long-term comprehensive measures, such as disability-adjusted life years (DALYs), used in burden of disease and injury studies. Our overall cost projection of US$ 10 million–13 million presents a fraction of the overall burden of work injuries in Lebanon and might be an underestimate of the real short-term expenses for several reasons. The human capital method yields lower estimates than approaches that use market measures or market proxies to estimate cost (*24*). The assumptions used in cost calculations erred on the conservative side. Cost estimates were limited to one calendar year and paid-to-date costs; this excluded open non-settled claims, which might be more complex and expensive. The estimated costs excluded administrative and hidden indirect costs, such as fringe benefits, home production, and staff training. Lost wages might not be paid to workers unaware of their legal rights. MedNet-Liban misses about 10% of injuries that present to emergency services (personal communication with MedNet-Liban, 2001). Injuries that could be classified as cumulative trauma disorders, such as back injuries, are not covered by the workers' compensation law. Out-of-pocket costs incurred by the employer or the worker because of liability limits set by insurance companies were not captured in this study.

The single argument for an overestimate of the overall cost is the possibility of fraud, where non-work-related injuries are reported as work-related. This practice may be limited because of fear of retribution or increases in insurance premiums.

The estimated annual cost of US$ 10 million–US$ 13 million is a considerable amount for Lebanon and is particularly worrisome at a time of economic recession and high unemployment. The estimated cost represents 5.8–7.5% of the total budget of the Ministry of Public Health in 1998, and it surpasses the estimated public health costs of mobile sources of air pollution, a leading environmental problem, in Greater Beirut (*25*). To compare this amount with the GDP might not be appropriate, because it was limited to medical care and compensation. For example, the cost of traffic accidents in Jordan — a neighbouring country — was estimated at US$ 146 million in 1996 (*26*), but this included costs of damage to physical property, lifelong loss of production, and indirect losses of community and family. Hospitalization and medical care accounted for less than US$ 11 million, similar to that found in our study. The lack of previous cost studies in Lebanon and the region on work injuries or other diseases precluded any attempt at comparisons over time and across countries.

Limitations

This study is limited in its generalizability. Most employers do not insure their workplaces, and this reflects the characteristics of the workplace and its managers. Insurance companies estimate that >80% of all construction sites are insured, a smaller proportion of manufacturing industries, and an even

Table 3. **Medical, compensation, and overall cost per work injury and for all 3748 work injuries by age, sex, type of industry, cause, agent, type, body location, severity and hospitalization of injury in Lebanon, 1998**

Variable	No. of injuries[c]	Overall cost of all injuries[b] (US$ x 10^3)[c]	Cost per injury (US$)[a]						Compensation/ medical ratio
			Medical cost			Compensation costs			
			Percentile			Percentile			
			Mean	50th	90th	Mean	50th	90th	
Sex									
Male	3684 (98.3)	729.8 (98.0)	149.2	72.0	187.5	48.9[d]	0	96.8	0.33
Female	64 (1.7)	15.3 (2.0)	202.0	71.4	365.9	37.4	0	72.6	0.19
Age (years)									
10–19	455 (12.1)	92.7 (12.5)	167.7	71.0	208.2	36.0	0	75.0	0.21
20–29	1772 (47.3)	286.9 (38.7)	126.8	70.4	174.8	35.1	0	75.0	0.28
30–39	919 (24.5)	176.6 (23.8)	141.8	72.0	194.3	50.4	0	105.0	0.36
40–49	359 (9.6)	98.0 (13.2)	180.3	72.5	247.7	92.6	0	173.1	0.51
50+	153 (4.1)	74.2 (10.0)	348.7	80.0	342.5	136.4	0	273.1	0.39
Data missing	90 (2.4)	13.8 (1.9)	124.8	82.5	213.6	29.0	0	135.8	0.23
Industry									
Construction	1637 (43.7)	308.6 (41.6)	144.4[e]	66.9	182.3	44.1[e]	0	91.1	0.31
Manufacturing	1384 (36.9)	244.5 (32.9)	123.4	76.0	174.9	53.3	0	110.0	0.43
Arts, entertainment, and recreation	120 (3.2)	42.8 (5.8)	281.8	87.3	370.0	75.0	0	0	0.27
Accommodation and food services	151 (4.0)	28.0 (3.8)	166.7	76.9	201.0	18.7	0	0	0.11
Other industries[f]	265 (7.1)	71.2 (9.6)	229.0	70.5	229.4	39.7	0	42.0	0.17
Data missing	191 (5.1)	47.5 (6.4)	175.5	80.4	292.5	73.1	0	177.2	0.42
Cause of injury									
Falls	985 (26.3)	262.2 (35.3)	193.9[e]	74.0	276.8	72.3[e]	0	150.4	0.37
Contact									
Struck by an object	1481 (39.5)	251.6 (33.9)	132.3	72.5	160.0	37.6	0	76.4	0.28
Hitting objects	272 (7.3)	36.1 (4.9)	101.7	54.7	160.0	31.2	0	61.6	0.31
Caught in/compressed by	71 (1.9)	17.8 (2.4)	154.7	94.1	405.0	96.0	24.9	287.6	0.62
Not specified	344 (9.2)	60.6 (8.2)	128.0	67.0	177.0	48.1	0	93.6	0.38
Vehicle incident	53 (1.4)	32.0 (4.3)	470.2	122.6	1751.5	134.3	0	351.4	0.29
Exposure to hazardous agents	77 (2.1)	12.9 (1.7)	147.9	65.3	394.2	19.6	0	60.0	0.13
Other (including muscular stress)	45 (1.2)	8.6 (1.2)	163.1	60.0	626.9	28.8	0	93.8	0.18
Data missing	420 (11.2)	61.2 (8.2)	114.2	72.0	173.1	31.3	0	77.4	0.27
Agent involved									
Hard objects	1199 (32.0)	223.3 (29.9)	136.2[e]	69.5	170.8	50.0[e]	0	94.9	0.37
Equipment, tools, and machinery	533 (14.2)	150.6 (20.2)	201.3	79.5	382.2	81.3	0	180.0	0.40
Flying objects/particles	416 (11.1)	36.4 (4.9)	79.4	74.0	96.0	8.2	0	22.6	0.10
Elevation	384 (10.2)	120.9 (16.2)	232.9	76.8	282.4	81.9	0	194.2	0.35
Chemicals	40 (1.1)	6.2 (0.8)	133.1	86.0	363.1	22.3	0	67.0	0.17
Other agents	125 (3.3)	36.2 (4.9)	247.9	74.5	422.0	41.7	0	97.5	0.17
Data missing	1051 (28.0)	172.7 (23.1)	127.9	71.0	189.9	36.4	0	80.0	0.28
Type of injury									
Foreign body	559 (14.9)	48.7 (6.4)	80.5[e]	74.0	97.6	6.6[e]	0	20.5	0.08
Trauma	753 (20.1)	91.4 (12.1)	95.6	67.4	147.3	25.8	0	70.0	0.27
Fracture	255 (6.8)	183.6 (24.2)	482.3	163.8	1232.8	237.5	90.0	566.0	0.49
Wounds and lacerations	961 (25.6)	139.7 (18.4)	114.5	69.5	174.2	30.9	0	73.1	0.27
Contusion	475 (12.7)	51.7 (6.8)	88.1	6.5	102.4	20.8	0	46.5	0.24
Strain	89 (2.4)	11.3 (1.5)	89.7	73.0	147.8	37.3	0	121.6	0.42
Burn	56 (1.5)	5.5 (0.7)	76.3	50.0	178.6	21.6	0	73.8	0.28
Multiple injury	197 (5.3)	114.8 (15.2)	438.3	119.7	914.6	144.7	11.0	350.0	0.33
Other types	119 (3.2)	46.3 (6.1)	309.9	132.0	946.9	78.7	0	176.0	0.25
Data missing	284 (7.6)	64.4 (8.5)	152.4	63.2	171.5	74.3	0	81.9	0.49
Body location of injury									
Head, face, and neck	260 (7.0)	56.6 (7.5)	187.9[e]	95.2	282.3	29.0[e]	0	41.6	0.15
Eyes	564 (15.0)	48.2 (6.4)	79.8	73.5	90.0	5.7	0	19.8	0.07
Upper extremity/shoulder	245 (6.5)	42.2 (5.6)	137.1	71.0	194.3	35.3	0	69.0	0.26
Hands	1046 (27.9)	204.8 (27.2)	139.5	70.6	226.0	56.3	0	138.6	0.40
Trunk	273 (7.3)	34.1 (4.5)	94.4	73.3	154.0	30.3	0	82.6	0.32
Pelvic and hip region	36 (1.0)	27.3 (3.6)	534.4	74.8	2043.3	225.6	0	683.8	0.42
Lower extremity	291 (7.8)	76.6 (10.2)	202.7	70.5	268.7	60.5	0	178.0	0.30
Feet	588 (15.7)	86.7 (11.5)	98.3	66.9	153.7	49.1	0	149.5	0.50
Multiple parts	149 (4.0)	70.6 (9.4)	416.4	112.5	584.8	57.1	0	152.0	0.14
Data missing	295 (7.9)	105.8 (14.1)	237.9	80.8	412.4	120.9	0	125.4	0.51

(Table 3, cont.)

Variable	No. of injuries[c]	Overall cost of all injuries[b] (US$ x 10^3)[c]	Cost per injury (US$)[a]						Compensation/ medical ratio
			Medical cost			Compensation costs			
			Mean	Percentile 50th	Percentile 90th	Mean	Percentile 50th	Percentile 90th	
Severity of injury[g]									
<3 days	1880 (50.2)	162.7 (21.5)	83.8[e]	64.0	136.6	2.8[e]	0	11.0	0.03
3–30 days	1706 (45.5)	317.2 (41.9)	136.0	79.3	214.8	49.9	22.0	142.1	0.37
>30 days	101 (2.7)	155.9 (20.6)	1106.5	659.6	2810.9	436.6	364.4	987.6	0.39
Permanent disability	9 (0.2)	50.3 (6.6)	3157.6	1907.4	12449.9	2434.7	1914.0	5783.6	0.77
Death	3 (0.1)	28.5 (3.8)	4127.0	4127.0	8184.8	5354.2	5354.2	6575.0	1.30
Data missing	49 (1.3)	42.7 (5.6)	583.0	177.3	1299.2	288.4	118.3	1004.8	0.49
Hospitalization									
Hospitalized	245 (6.5)	338.0 (44.8)	1056.9[e]	639.0	2261.0	322.6[e]	0	818.1	0.31
Not hospitalized	3494 (93.2)	415.4 (55.1)	89.0	69.5	153.6	29.9	0	77.5	0.34
Data missing	9 (0.2)	0.5 (0.1)	49.8	53.3	54.0	10.9	0	32.7	0.22

[a] Calculated from injury claims with cost data.
[b] Overall cost = (medical cost + compensation costs) × (no. of workers in the category). Injuries with missing cost data were assigned the mean cost of known work injuries for the category.
[c] Values in parentheses are percentages.
[d] $P<0.05$ (Kruskal–Wallis non-parametric test).
[e] $P<0.01$ (Kruskal–Wallis non-parametric test).
[f] Agriculture, forestry, fishing, and hunting; sales; other services; transportation and warehousing.

smaller proportion of other establishments (personal communication with Bankers Assurance, 2001). In this study, the educational, health, and social care sectors combined reported only 10 work injuries. This might indicate that these sectors, which employ more than 12% of the labour force (*27*), are either self-insured or use regular medical insurance plans to treat work-related injuries.

Implications

Employers and insurers have a vested interest in reducing injuries as a whole and the most expensive and severe injuries in particular (*23, 28*). Most workplace incidents and injuries are preventable (*29*), and basic safety measures, education, and training are proven cost-effective interventions that reduce the overall incidence of work injuries (*30*). The public health system should play a leading role in training people on, raising awareness of, and establishing surveillance systems for work-related injuries. This is quite challenging in Lebanon, however, where health care delivery is mostly private and market-driven.

Our study findings highlighted several challenging issues for research. First, the proportion and characteristics of insured, self-insured, and uninsured establishments should be determined. Second, the process of claim filing and processing should be assessed and scrutinized to identify any discrepancies or discrimination by age, sex, or nationality. Third, the hidden costs of injuries — including less apparent direct and indirect costs within the establishment and social and medical costs incurred by injured workers and their families — should be evaluated. These elements pave the way for future evaluation of the burden of work injuries in Lebanon. ■

Acknowledgements

We are grateful to managers and department heads of MedNet-Liban and the participating insurance companies.

Funding: This study was partly funded by the WHO Regional Office for the Eastern Mediterranean and was supported by the office of WHO in Lebanon. Grant sponsors were WHO (WHO TSA 00/6) and American University of Beirut-University Research Board (AUB-URB 179960-75602).

Conflicts of interest: none declared.

Résumé

Coût des accidents du travail sur les lieux de travail assurés au Liban

Objectif Estimer le coût total des frais médicaux et des indemnités engendrés par des accidents du travail sur les lieux de travail assurés et étudier la répartition des coûts par travailleur et par sinistre.

Méthodes Les auteurs ont examiné un total de 3748 sinistres concernant des accidents du travail qui ont été traités par cinq grandes compagnies d'assurance libanaises en 1998. Ils ont recensé les frais médicaux (frais hospitaliers, honoraires de consultation de médecins, examens et médicaments) et le coût des indemnités versées pour manque à gagner.

Résultats Le coût médian par sinistre était de US $83 (coût moyen US $198 ; fourchette US $0-16401). Le coût total pour les 3748 sinistres s'est élevé à US $742 100 (76 % de cette somme étant constitués par les frais médicaux). Extrapolé à tous les sinistres sur les lieux de travail assurés, le coût total était de US $4,5 millions par an, ce montant pouvant même aller jusqu'à 10-13 millions si l'on prend en considération le coût humain (sous l'angle de la douleur et de la souffrance). Les accidents mortels (3 cas ; 0,1 % des sinistres) et ceux qui ont entraîné une incapacité permanente (9 cas ; 0,2 % des sinistres) ont représenté 10,4 % du total des coûts et les accidents ayant donné lieu à une hospitalisation (245 cas, 6,5 % des sinistres) une proportion de 45 %. Le coût le plus élevé par sinistre a été enregistré chez les travailleurs les plus

âgés (chutes et accidents de véhicules). Le coût représenté par les frais médicaux uniquement était plus élevé chez les travailleuses.
Conclusion Les coûts des accidents du travail – qui ne sont qu'une fraction de la charge réelle des accidents du travail au Liban – grèvent lourdement l'économie. D'où la nécessité d'une politique nationale de prévention des accidents du travail axée sur la prévention des accidents les plus graves. Les différentes possibilités d'intervention et de recherche sont examinées.

Resumen

Costo de las lesiones laborales en lugares de trabajo asegurados en el Líbano

Objetivo Calcular los costos médicos y de indemnización de las lesiones laborales en lugares de trabajo asegurados en el Líbano y estudiar la distribución de los costos en función de las características de los trabajadores y de las lesiones.
Métodos Se examinaron 3748 reclamaciones por lesiones laborales procesadas en 1998 por cinco grandes compañías de seguros del Líbano. Los costos médicos (relacionados con los honorarios del servicio de urgencias, las consultas médicas, las pruebas complementarias y la medicación) y los costos de salarios e indemnizaciones se identificaron a partir de las reclamaciones.
Resultados El costo mediano por lesión fue de US$ 83 (media: US$ 198; intervalo: US$ 0-16 401). El costo global de las 3748 lesiones fue de US$ 742 100 (el 76% de ese monto correspondió a los costos médicos). Extrapolando estos datos a todas las lesiones sufridas en lugares de trabajo asegurados, el costo global fue de US$ 4,5 millones al año, y aumentó hasta US$ 10 a 13 millones al tener en cuenta el costo en valor humano (dolor y sufrimiento). Las lesiones mortales (tres; 0,1%) y las que causaron incapacidades permanentes (nueve; 0,2%) representaron el 10,4% de los costos globales, y las que necesitaron hospitalización (245, 6,5%) el 45%. El costo por lesión fue más elevado en los trabajadores de más edad y en las lesiones relacionadas con caídas y accidentes con vehículos. Los costos médicos, pero no los de indemnización, fueron más elevados entre los trabajadores del sexo femenino.
Conclusión Los costos computados de las lesiones laborales, que constituyen sólo una parte de la carga real de lesiones laborales en el Líbano, representan una pérdida económica considerable que requiere una política nacional de prevención de las lesiones laborales centrada en la prevención de las lesiones más graves. Se analizan las opciones de intervención e investigación.

ملخص

تكاليف الإصابات المتعلقة بالعمل في أماكن العمل المؤمَّن عليها في لبنان

الهدف: تقدير التكاليف الطبية والتعويضية للإصابات المتعلقة بالعمل في أماكن العمل المؤمَّن عليها في لبنان، ولدراسة توزيع التكاليف وفق العاملين ووفق صفات الإصابات.
الطريقة: تمت معالجة ومراجعة ٣٧٤٨ مطالبة بتعويض إصابات العمل قدمت عام ١٩٩٨ لخمس من شركات التأمين الكبرى في لبنان، وتم التعرُّف على التكاليف الطبية (التي تتعلق بأجور غرف الطوارئ واستشارات الأطباء والاختبارات والأدوية) وعلى تكاليف التعويضات عن الرواتب وعن الأجور والتأمينات من المطالبات.
الموجودات: لقد تبين أن وسطي التكلفة لكل إصابة ٨٣ دولار أمريكي (والمتوسط ١٩٨ دولار أمريكي ويتراوح بين ١٠ و١٦٤٠١ دولار أمريكي). فقد كانت التكاليف الإجمالية لجميع الإصابات التي يبلغ تعدادها ٣٧٤٨ إصابة قد بلغت ٧٤٢ ١٠٠ دولاراً أمريكياً (وكان ٧٦٪ منها قد أنفق على التكاليف الطبية)، وعند حساب جميع الإصابات التي حدثت ضمن أماكن العمل المؤمَّن عليها كانت التكاليف الإجمالية ٤,٥ مليون دولار أمريكي كل عام، وستزداد هذه التكاليف لتصبح ١٠–١٣ مليون دولار أمريكي عند حساب قيمة التكاليف البشرية (الألم والمعاناة). وقد كانت الإصابات المميتة وهي ثلاث حالات وتعادل ٠,١٪ والإصابات التي تسبب حالات عجز دائمة وهي تسع حالات وتعادل ٠,٣٪ قد سببت ١٠,٤٪ من مجمل التكاليف، فيما سببت الحالات التي احتاجت للإدخال في المستشفيات وعددها ٢٤٥ حالة وتعادل ٦,٥٪ من الحالات ٤٥٪ من التكاليف. وكانت التكاليف المقدَّرة لكل حالة أعلى ما تكون لدى العاملين الأكبر سناً وفي الإصابات التي تتضمن السقوط وحوادث السيارات، وكانت التكاليف الطبية، وليست التعويضات الطبية هي الأعلى بين العاملات.
الاستنتاج: تمثِّل التكاليف المحسوبة لإصابات العمل، والجزء الناجم عن العبء الحقيقي للإصابات المهنية في لبنان، جزءاً هاماً من الضياع الاقتصادي، للحيلولة دون حدوث هذا الضياع ينبغي وضع سياسة وطنية لاتِّقاء إصابات العمل، مع التركيز على الوقاية من الإصابات الأكثر خطراً. وقد تمت مناقشة الاختيارات المتاحة للـمُداخلات والبحوث.

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