Short communication

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What do employers spend to protect the health of workers?

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Objective This study aimed to estimate firm-level expenditures on occupational health and safety (OHS) for a representative sample of Canadian employers.

Methods A cross-sectional survey of 334 employers with ≥20 employees in 18 economic sectors in the Ontario economy. Participants provided information on five dimensions of OHS expenditures: (i) organizational management and supervision; (ii) staff training in health and safety; (iii) personal protective equipment; (iv) professional services and, (v) estimates of the share of new capital investment that could be attributed to improved OHS performance. Expenditures for each of the five dimensions were summed for each organization and divided by the number of employees, resulting in an estimate of OHS expenditure per employee per year.

Results The average OHS expenditure per worker per year was Can$1303 [95% confidence interval (CI) Can$1167–1454]. Expenditures were three times higher in the goods-producing sectors (Can$2417, 95% CI Can$2026–2809) relative to the service sectors (Can$847, 95% CI Can$777–915). The proportion of expenditures allocated to each of the five dimensions was generally consistent across economic sectors: 58% to organizational management and supervision, 22% to staff training in health and safety and 14% to personal protective equipment. On average, <5% of OHS expenditures per worker per year were allocated to professional services or estimated as the share of new capital investment attributed to OHS.

Conclusions Employer expenditures on OHS are substantial. The results of this study are consistent with recent European estimates and strengthen understanding of the scale of employer financial expenditures to protect the health of workers.

Key terms Canada; health and safety expenditure; enterprise; injury prevention.

Work-related injury and illness are preventable (1). While the direct and indirect costs of a work-related injury or illness borne by employers can be substantial, the great majority of the costs of work-related injury and illness are borne by workers and society (2). In this context, when a very substantial share of the true costs of a work-related injury or illness are external to the workplace, there is a clear argument for a role of government in influencing employer expenditures on prevention programs. There are three primary means by which public policy can influence employers' investments in occupational health and safety (OHS): establishing regulatory standards for minimum workplace practices, obligating insurance coverage and providing information to guide employers in the adoption of effective OHS practices. Regulatory standards and the enforcement of those standards can raise employer OHS investments (3). Work disability insurance premiums can clarify the precise costs of preventable work-related injuries and illness and may provide incentives for organizations to invest in OHS (4). And information and consultation services provided by prevention authorities, OHS product vendors and consultants can increase workplace knowledge of effective OHS policies and practices.

While the costs of work-related injury and illness are well known, there is limited information on what a typical employer spends to control or eliminate the causes of work-related injury and illness. With the participation of a broadly representative sample of >300 employers in the province of Ontario, Canada, this study estimates

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the scale of employer expenditures to protect the health and safety of their workers.

Methods

We recruited Ontario employers with ≥20 employees from 17 economic sectors, with the number of employers recruited from each sector proportional to the percentage of the Ontario labor force working in that sector. We sought a primary contact person within each organization who was most knowledgeable about OHS practices. We collected information through an interview- or self-administered workbook on the organization's employment count, economic sector, proportion of employees covered by collective agreements and information on OHS expenditures on five dimensions.

OHS dimensions

Organizational management and supervision. We requested information on the proportion of time (share of a full-time equivalent) the most senior person responsible for OHS devoted to this responsibility and the number of staff who supported the most senior person. In Ontario, employers with ≥20 employees are required to establish a Joint Health & Safety Committee (JHSC) with representation from management and non-management workers. We requested information about the JHSC: the number of members, the frequency and duration of meetings and the number of hours per year that committee members spent on workplace inspections. Finally, information was requested on the number of supervisors in the organization, and an estimate of the annual percent of time each supervisor devotes to monitoring compliance with the organization's OHS policies.

Staff training in health and safety. Respondents were asked for information on the investment of time and resources to provide OHS training to new staff and to regular staff, which included an estimated count of trainees each year, the number of hours of OHS orientation and training provided and an estimate of the per-person cost of training.

Expenditures on personal protective equipment. Information was requested on the numbers of units and estimated unit cost of personal protective equipment purchased in a typical year by type of equipment.

Expenditures on professional services provided by external organizations. Survey respondents were asked to indicate if their organization had procured external consulting services in the past five years to advise or audit aspects of the organization's OHS policies and procedures. For those organizations that reported retaining external professional services, we requested an estimate of the annual cost of external consulting services.

Estimates of the share of new capital investment attributed to improved OHS performance. Survey respondents were asked to indicate if the organization had invested in new or renovated facilities, acquired new vehicles or purchased significant capital equipment in the past five years. For respondents who reported capital investments, we requested information on the approximate capital cost, the estimated life of the new facilities or equipment and an estimate of the share of this capital investment that would be attributed to improvements in worker health protection.

Calculation of OHS expenditure

Average hourly wage estimates in each sector were obtained from Statistics Canada and used to convert hours into wage/salary expenditures. Organization expenditure estimates for each of the five OHS dimensions were summed and divided by the number of employees to produce an estimate of OHS expenditure per employee per year. For each of 17 economic sectors, we estimated average expenditures per employee per year for each of the five dimensions and in total. Average expenditure estimates were also calculated for two broad classifications of employers: (i) organizations in the goods-producing sector (comprised of mining, construction, utilities, manufacturing, agriculture and forestry) and (ii) organizations in the service sector.

Results

We report the results for 334 organizations participating in this study. The incidence rate of lost-time and no lost-time workers' compensation claims among participating organizations was not statistically different from the population of all employers in their sector.

Table 1 presents the estimated annual OHS expenditure per worker for each of the 17 sectors, ordered from highest (mining: Can$4433) to lowest (arts, entertainment and recreation: Can$584). The overall average expenditure was Can$1303. Annual OHS expenditure per worker per year in the mining sector was eight times higher than average expenditure in the arts, entertainment and recreation sector. Table 1 also shows estimates for two clusters: the goods-producing sectors and the services sectors. Expenditures were three times higher in the goods-producing sectors (Can$2417) relative to the service sectors (Can$847).

Table 1. Average employer [a] expenditure on health and safety per worker per year for 17 sectors, Ontario 2017. [SD=standard deviation.]

Sector [b]	N	Average expenditure per worker/year Can$	SD Can$
Mining, quarrying, and oil and gas extraction (21)	5	4433	1470
Construction (23)	30	3626	432
Utilities (22)	7	3335	654
Manufacturing (31-33)	50	1515	101
Agriculture, forestry, fishing and hunting (11)	5	890	144
Goods-producing sectors	97	2417	200
Transportation and warehousing (48-49)	17	1326	187
Healthcare and social assistance (62)	37	1021	79
Public administration (92)	20	996	130
Other services (except public administration) (81)	7	936	270
Management / administration of enterprises (55-56)	12	903	193
Professional, scientific, and technical services (54)	24	858	109
Finance and insurance, real estate (52-53)	17	819	164
Accommodation and food services (72)	19	733	124
Wholesale trade (42)	18	720	77
Retail trade (44-45)	47	636	46
Educational services (61)	12	631	116
Arts, entertainment, and recreation (71)	7	584	80
Service sectors	237	847	35
Total all sectors	334	1303	74

[a] Employers with ≥20 employees.
[b] NAICS classification in parentheses.

Table 2. Average annual employer [a] expenditure on occupational health and safety (OHS) per worker by expenditure component. All participating companies, companies in the goods producing sector and companies in the service sector, Ontario 2017.

Expenditure component	Expenditure per worker per year					
	All participating companies (N=334)		Goods-producing sector (N=97)		Service sector (N=237)	
	$	%	$	%	$	%
Organizational management and supervision	765	58	1330	55	533	62
Staff OHS training	297	22	635	26	159	18
Personal protective equipment	184	14	370	15	107	12
OHS professional services	25	2	50	2	15	2
OHS share of capital investments	52	4	65	3	47	6
Total	1303	100	2417	100	847	100

[a] Employers with ≥20 employees.

Across all sectors, the largest share of annual per worker OHS expenditure was attributed to the dimension of "organizational management and supervision" and was generally similar for employers in the goods-producing sectors (55%, Can$1330 per worker per year) and for the service sectors (62%, Can$533 per worker per year) (table 2).

The dimension of "staff training in health and safety" was attributed the second largest share of annual OHS expenditure per worker. The average across all sectors was Can$297 per worker per year, representing 22% of total OHS expenditures. Compared to employers in the service sectors, employers in the goods producing sectors invested a larger share of total OHS expenditures on staff training (26% compared to 18%).

The average share of total OHS expenditures attributed to personal protective equipment was 14% (Can$184 per worker per year) and was generally in the goods producing sectors and the service sectors (15% compared to 12%).

In both the goods-producing sectors and the service sectors, the share of total expenditures attributed to OHS professional services and the health and safety component of new capital investments were modest. Employers reported approximately 2% of total OHS expenditures attributed to external OHS professional services and approximately 4% of total OHS expenditures attributed to the health and safety share of new capital investments.

Discussion

Over the past two decades, the incidence of work-related injury and illness in the province of Ontario has declined substantially. One study observing an eight-year period (2004–2011) found that the incidence of occupational injury presenting to emergency departments for treatment declined by >30% (1). This same study found that the percentage of all injuries among working age adults that are attributed to work exposures has declined from 20.0% in 2004 to 15.2% in 2011. These reductions in work-related traumatic injury and non-traumatic musculoskeletal disorders are important and have been observed in many developed country settings (5). There are a range of factors contributing to this substantial reduction in injury and illness attributed to occupational exposures, including growth in service sector employment relative to employment in goods-producing sectors, the substitution of technology for human labor and strengthened regulatory standards pertaining to worker health protection.

The findings of this study suggest a prominent factor contributing to the reduction in work-related injury and illness may be the scale of employer expenditures to protect the health of workers. We estimate an average OHS expenditure per worker per year of approximately Can$1300, with expenditures three times larger in the more hazardous goods-producing compared to the ser-

vice sectors. Applying the estimates obtained in this study to the sectoral distribution of Ontario employers suggests that human and financial resources in the range of Can$5 billion per year are committed to protect the health and safety of workers. The aggregate OHS expenditure estimate for employers in the Ontario economy is greater than the annual benefit payments of Can$2.7 billion provided by the Ontario Workplace Safety & Insurance Board in 2016 to workers who have experienced a work-related injury or illness (6).

The findings of this study are broadly similar to estimates provided by a recent study conducted by the International Social Security Association, which estimated an annual expenditure per employee per year of more than €1200 (Can$1800) among a sample of predominantly European employers (7). The two studies applied broadly similar methods. The concordance of the expenditure estimates in these two settings gives insights into the degree to which employer policies and practices in the area of worker health protection are harmonized in the developed economies.

This study has documented substantial employer expenditures on worker health protection in many sectors. Accurate information on employer expenditures and investments in OHS can help understand the progress made over recent decades in the protection of the health of workers. Results from this study provide information on the expenditures per employee in high-hazard sectors, such as construction and mining and provides important context for OHS policy aimed at influencing employer investment in occupational health and safety. Accurate information on employer expenditures and investments in OHS can help stakeholders better understand the significant progress made over the past decade in workplace injury prevention.

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