

Cost of Accidents and Ill-Health at Work – Towards an EU-28 Estimate

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Estimating the cost of work-related injury and illness to the Australian economy



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Background

- Industry Commission, *Work, Health and Safety*, September 1995
 - 75% of the costs of work-related incidents were indirect (lost productivity, lost income and quality of life).
- NOHSC (a predecessor to Safe Work) revisited the estimation process in 2004, enhancing the methodology by including additional estimates for indirect costs that were identified but not included in the Industry Commission study,
- Further estimates from the methodology have been released in 2008 (2005-06 financial year) and 2012 (2008-9 financial year),
- The methodology has been refined through the process



Methodological steps

Steps to derive a cost estimate

1. Define key differentiators in the model (economic agents, type of cases);
2. Identify and define the major categories of economic costs borne by economic agents (workers, employers and the community);
3. Define the levels of severity of injury and disease to differentiate between incidents with different cost structures;
4. Identify correspondence between cost items and severity categories;
5. Determine the number of incidents in each severity category;
6. Calculate the average cost of a typical incident in each severity category;
7. Calculate the total cost of all work-related incidents by combining the typical cost of an incident with the estimates of the number of incidents.



Key methodological points

- *Human cost*: Costs associated with actual injuries or illnesses are included in the cost estimate;
- *Incidence approach*: Estimate the number of people entering the compensation (or medical) systems during a particular year as a result of work-related accident or illness and the costs (both current and expected future costs) associated with those cases;
- Since only new cases are measured under the incidence approach, the expected future cost of new cases over the lifetime of a case is used to proxy the cost in the reference year of cases that were already in the system at the start of the current reference year;

Key methodological points

- The *lifetime cost* approach makes the assumption that the level and structure of current costs will accurately reflect ongoing costs into the future. A discount rate approach is used to dollar values into equivalent reference year monetary values;
- *Ex-post* approach; costs are attributed to incidents after they occur and as a direct result of the incident. The “ex-post” view of costs is generally associated with the incidence approach to measuring total cases.

Methodology continued

- The number of total (non-fatal) incidents are estimated by combining workers' compensation claims with Australian Bureau of Statistics (ABS) Work Related-Injuries survey estimates of work-related injury and illness,
- Total fatalities are estimated using a combination of compensated fatalities, estimates of traumatic injury fatalities and estimates of disease fatalities which can be attributed to workplace exposure (through population attributed fractions)



Methodology continued

- Five severity categories are defined,
- Incidents are dimensioned by injury and disease cases, and between compensated and uncompensated cases,
- A distinction is made between economic agents – workers, employers and the community.



Conceptual cost categories

- Production disturbance costs – costs incurred in the short term until production is returned to pre-incident levels
- Human capital costs – long run costs, such as loss of potential output, occurring after a restoration of pre-incident production levels
- Medical costs – costs incurred by workers and the community through medical treatment of workers injured in work-related incidents
- Administrative costs – costs incurred in administering compensation schemes, investigating incidents and legal costs
- Transfer costs – deadweight losses associated with the administration of taxation and welfare payments, and
- Other costs – includes costs not classified in other areas, such as the cost of carers and aids and modifications.



Conceptual cost categories

Conceptual group	Total (T)	Employer (E)	Worker (W)	Society (S)
Production disturbance costs	Value of production (inc. overtime)	Overtime premium	Loss of income prior to RPR ² , net of compensation, welfare and tax	Compensation and welfare payments transferred to worker for temporary loss of wage; tax losses prior to RPR;
		Employer excess payments		
	Staff turnover costs	Sick leave Staff turnover costs		
Human capital costs	Present value of earnings before incident minus earnings after incident		Loss of income after RPR, net of compensation, welfare and tax	Compensation and welfare payments for lost income earning capacity; tax losses after RPR
Medical costs	Medical and rehabilitation costs incurred as a result of the injury	Threshold medical payments	Gap payments	Compensation medical payments
			Private health insurance payments	Public health system payments
Administrative costs	Legal costs	Real legal costs incurred plus fines and penalties	Real legal costs incurred	Real legal costs incurred
				Deadweight costs of enforcement minus fines and penalties credit
	Investigation costs	Employer investigation costs	Zero/negligible	Real costs of running the compensation system (including investigation of claims)
	Travel costs		Travel costs net of compensation & concessions	Compensation for travel costs
				Travel concession
	Cost of funeral today minus present value of future cost	Zero	Net costs of bringing forward funeral	Compensation for funeral costs
Transfer costs	Real deadweight costs of transfer payments (welfare and tax)		Zero (accounted for in netting other items)	Deadweight costs of welfare payments (DSP, SA, Mobility Allowance, Rent Assistance)
				Deadweight costs of tax losses
Other	Carers		Carer costs net of carer payment/allowance	Payments to carers plus deadweight cost
	Aids, equipment and modifications		Aids etc (net cost after reimbursements)	Reimbursements for aids etc plus deadweight cost

Source: Access Economics P/L 2004 Report on 'The Costs of Work-related Injury and Illness'
²a RPR time to return or permanent replacement of injured worker



Severity categories

Category	Description
Less than 5 days off work	A minor work-related injury or illness, involving less than 5 days absence from normal duties, where the worker was able to resume full duties.
Five days or more off work and return to work on full duties	A minor worker-related injury or illness, involving 5 or more days and less than 6 months off work, where the worker was able to resume full duties.
Five days or more off work and return to work on reduced duties or lower income	A work-related injury or illness, which results in the worker return to work on reduced duties, more than 6 months after first leaving work and over time resuming normal duties.
Permanently incapacitated with no return to work	A work-related injury or disease, which results in the individual being permanently unable to return to work.
Fatality	A work-related injury or disease, which results in death.

Severity and cost categories

Indirect Cost Item	Severity Category				
	Short absence	Long absence	Partial incapacity	Full incapacity	Fatality
Value of production	✓	✓	✓	✓	✓
Overtime and over-employment	✓	✓	✓	✓	✓
Employer excess costs	✓	✓	✓	✓	✓
Staff turnover and training/retraining costs			✓	✓	✓
Loss of future earnings (Human capital costs)			✓	✓	✓
Medical and rehabilitation costs	✓	✓	✓	✓	✓
Legal Costs ^a				✓	✓
Investigation costs ^a	✓	✓	✓	✓	✓
Travel costs	✓	✓	✓	✓	✓
Social welfare payments		✓	✓	✓	✓
Loss of government revenue		✓	✓	✓	✓
Carers and modifications and aids				✓	

^a These indirect cost items are estimated in aggregate across all applicable severity categories

Key parameters

- Discount rate (opportunity cost of not saving)
- Inflation rate
- Productivity rate (productivity improvements over time)
- Human capital loss for permanent cases and fatalities
- Rate of disputation for prosecutions
- Private health cover take up
- Average weekly earnings
- Average duration of absence by severity category
- Average age at incident by severity category
- Average medical, investigation and travel costs per incident by severity category



Key parameters

Item	Description	Estimate
Average earnings	Proxy for productivity, ABS Employee Earnings and Hours survey (ABS Cat. No. 6306.0), May 2010. Average weekly total earnings, persons, all employees.	\$1 313 pw \$1 370 pw + overtime
Discount rate	Opportunity cost of money: Average of rates of return for private and government saving instruments and RBA target for January 1990 to June 2009 (RBA table F2).	6.00% p.a.
Inflation rate	Average of annual weighted ABS Consumer Price Index (CPI, ABS Catalogue 6401.0), March 1993 to June 2009.	2.60% p.a.
Productivity rate	Annual increase in workers' productivity. Commonwealth Government Intergenerational Report.	1.75% p.a.
Bulk-billing rate	Proportion of consultations that are bulk-billed (source: DoHA Medicare statistics).	74.0% of cases
Private Health Insurance take-up	Private Health Insurance Administration Commission (PHIAC) estimates of coverage of health insurance, September 2007.	43.0% of cases
Reduced life expectancy for long term cases	AIHW Healthy Life Expectancy (HALE) (Source: AIHW Mortality, Life Expectancy, www.aihw.gov.au/mortality/data/life_expectancy.html).	73 years
Retirement age	Median retirement age of older Australians (Source: ABS Retirement and Retirement Intentions, December 2009, ABS Catalogue 6238.0).	64 years
Average time to settlement of claims	Average of weighted average of expected term to settlement (Workers' compensation jurisdiction annual reports, 2000–01).	3 years
Average overtime pay rate	Difference between average weekly ordinary time earnings and average weekly earnings (Source: ABS Employee Earnings and Hours, May 2010, ABS Catalogue 6306.0).	4.5%
Medical costs ^a	Total medical costs per claim: 72% of goods and services payments per claim, by severity and nature (NDS).	Dependent on severity category (Table A2)
Travel costs ^a	Total travel expenses per claim: 6% of non-compensation payments per claim, by severity and nature (NDS).	Dependent on severity category (Table A2)

Estimation process

- The average cost of a work-related incident is estimated by aggregating the estimated average cost associated with each relevant indirect cost item,
- Relevant items are determined by the severity category and the economic agent,
- The total cost of work-related injury and disease is calculated by combining the number of work-related incidents and the average cost of an incident by severity category.

Summary of economic cost estimates

Estimation period	Economic agent	Estimated economic cost (\$b)	GDP (\$b) ^a	Economic cost as % of GDP	Australian Workforce ('millions) ^b
2000-01	Total	\$34.3	\$689.3	5.0%	9.09
	Employer	7%			
	Workers	44%			
	Community	53%			
2005-06	Total	\$57.5	\$967.5	5.9%	10.20
	Employer	3%			
	Workers	49%			
	Community	47%			
2008-09	Total	\$60.6	\$1 253.1	4.9%	10.93
	Employer	5%			
	Workers	74%			
	Community	21%			

a ABS Catalogue 5204.0, Australian System of National Accounts, 2008-09.

b ABS Catalogue 6202.0, Labour Force Australia, May 2011.

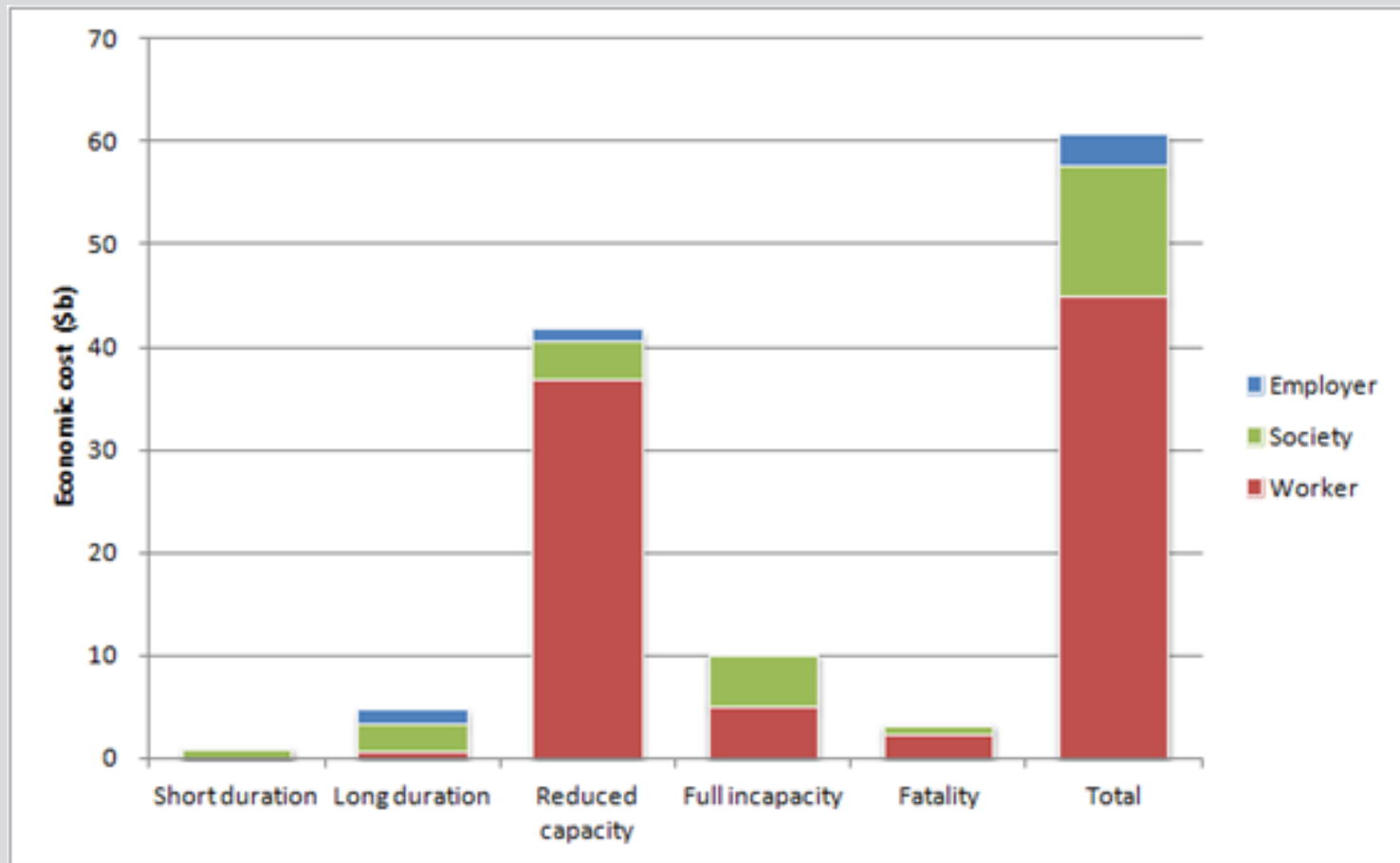
Examples of presentation of results 2008-09 Estimate



Economic cost estimate

Agent	Type	Short absence	Long absence	Partial incapacity	Full incapacity	Fatality	Overall cost
Employer	Injury	200	900	600	0*	0*	1 700
	Disease	0*	700	600	0*	100	1 400
	Total						3 200
Worker	Injury	0*	400	16 000	3 400	500	20 300
	Disease	0*	200	20 900	1 600	1 800	24 500
	Total						44 900
Community	Injury	600	2 000	2 100	3 700	300	8 700
	Disease	100	700	1 600	1 100	500	4 000
	Total						12 700
All	Injury	800	3 300	18 700	7 100	800	30 700
	Disease	100	1 600	23 100	2 800	2 400	29 900
	Total	900	4 900	41 800	9 800	3 200	60 600

Distribution of total costs (\$b)



Economic cost estimate

Type of incident	%	Short absence	Long absence	Partial incapacity	Full incapacity	Fatality	Overall cost
Injury	Incidents	65%	27%	8%	1%	0%	100%
	Costs	3%	11%	61%	23%	3%	100%
Disease	Incidents	30%	40%	27%	1%	1%	100%
	Costs	0%	5%	77%	9%	8%	100%
Total	Incidents	55%	30%	13%	1%	0%	100%
	Costs	1%	8%	69%	16%	5%	100%

Economic agent	Short absence	Long absence	Partial incapacity	Full incapacity	Fatality	Overall cost
Employer	22%	33%	3%	0%	3%	5%
Worker	0%	12%	88%	52%	72%	74%
Community	78%	55%	9%	48%	25%	21%

Economic cost estimate

Industry division	Injury cost	Disease cost	Total cost	% of costs	% of incidents	% of workforce	Unit cost
Manufacturing	4 400	4 200	8 600	14%	16%	9%	85 900
Health & Community Services	3 300	3 700	7 000	11%	12%	11%	97 700
Construction	3 400	3 000	6 400	11%	9%	9%	110 600
Retail Trade	2 200	3 100	5 300	9%	8%	11%	115 200
Transport & Storage	2 500	2 200	4 700	8%	7%	5%	105 800
Property & Business Services	2 400	2 300	4 700	8%	11%	9%	71 700
Education	1 700	2 400	4 100	7%	6%	8%	103 700
Government Administration & Defence	1 600	1 800	3 400	6%	7%	10%	80 400
Personal & Other Services	1 400	1 500	2 900	5%	5%	4%	104 600
Wholesale Trade	1 700	900	2 600	4%	5%	4%	93 600
Accommodation, Cafes & Restaurants	1 300	1 100	2 400	4%	4%	7%	98 600
Agriculture, Forestry & Fishing	1 200	900	2 100	3%	3%	3%	126 100
Mining	1 100	700	1 800	3%	2%	2%	170 000
Cultural & Recreational Services	800	600	1 400	2%	2%	2%	106 100
Finance & Insurance	600	700	1 300	2%	1%	4%	157 100
Communication Services	500	600	1 100	2%	1%	2%	175 200
Electricity, Gas & Water Supply	600	400	1 000	2%	1%	1%	147 400
Australia	30 700	29 900	60 600	100%	100%	100%	99 100



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