



# Costs of Occupational Injury and Illness in California and the U.S.

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## **Objectives**

- To estimate costs of occupational injuries and illnesses for California and the nation.

## **Uses of estimates**

- Costs estimates for occupational injury and illness can be compared to cost estimates for other diseases such as cancer, circulatory, COPD, Alzheimer's.
- Develop cost-effective interventions.
- Information about on-the-job risks. Many forms: back injury, carpal tunnel syndrome, fracture, burn, gunshot wound, death.
- Adding costs for disparate injuries and illnesses way to sum the risks.
- Useful summary because costs combine incidence with severity; people understand costs.
- Costs data increases public understanding about job-risks and may result in “market forces” that improve working conditions.

## Method

### Deaths.

- Deaths estimated by multiplying population attributable risk percentages (PARs) for job-related deaths times the number of deaths for given age ranges.
- Equation 1: 
$$PAR = \frac{P \times (RR-1)}{1 + [P \times (RR-1)]}$$
- Where P is the proportion in the population exposed to a given agent (e.g. smoking, grain dust for agricultural worker);
- RR is the relative risk of the disease or death for exposed persons compared to persons not-exposed.
- Limitations for PAR methodology.
- Some causes of diseases act synergistically.
- Smoking and grain dust together may increase the risk of COPD by much more than either one separately.
- PARs may sum to more than 100%.
- Nevertheless, PAR methodology is used throughout medical research.
- Our PARs drawn from review of 110 studies.

## Costs.

- Direct costs include payments for hospital, physician, and allied health services, rehabilitation, nursing home care, home health care, medical equipment, insurance administration.
- Indirect costs refer to: productivity losses which include wage losses and household production losses; as well as employer productivity losses for recruiting and training replacements for injured workers.
- The costs for injuries and acute diseases (e.g. dermatitis) were incidence based and included all costs of an injury or illness over the victim's lifespan.
- Whenever costs extend more than a year, we applied a discount rate of 2.5% to compute present value.
- Costs for fatal diseases were prevalence based.



# Results for California

## Injury

- 660 injury deaths (1992)
- 740, 430 disabling injuries (1992)

**Table 1**

## Diseases and Costs, 1999, California Only

<b>Disease</b>	<b>ICD-9 Codes</b>	<b>PAR</b>	<b>Estimated Job Related Deaths</b>	<b>Estimated Job Related Costs (Billions\$ 1999)</b>
1 Cancer	140-209	8%	5,181	\$1.627
2 Circulatory disease (heart and stroke) <b>(age 65)</b>	410-414, 430-438, 440	7.5%	926	\$0.499
3 Chronic obstructive pulmonary disease and asthma	490-496	10%	1307	\$0.608
4. Pneumoconioses	500- 505	100%	140	\$0.038
5. Nervous system disorders	323.7, 331, 332, 349.82, 356, 357.7, 359.4	2%	112	\$0.027
6. Renal disease	580-589	2%	63	\$0.023
7. Osteoarthritis	715	8%	0	\$1.034
<b>TOTAL</b>			<b>7729</b>	<b>\$3.856</b>

**Table 2****Total Cost for Illnesses in California (\$ Billions) 1999**

	<b>Diseases</b>	<b>Selected percentages</b>
I. Direct costs	\$2.198	57% <sup>a</sup>
A. Medical only	\$1.824	83% <sup>b</sup>
B. Medical administration	\$0.264	12% <sup>b</sup>
C. Indemnity administration	\$0.1099	5% <sup>b</sup>
II. Indirect costs	\$1.658	43% <sup>a</sup>
A. Lost earnings	\$1.210	73% <sup>c</sup>
B. Fringe benefits	\$0.282	17% <sup>c</sup>
C. Home production	\$0.121	10% <sup>c</sup>
D. Workplace training, restaffing, disruption	0	0% <sup>c</sup>
<b>III. Grand total</b>	<b>\$3.856</b>	<b>100%<sup>d</sup></b>

a Percentage of illness total costs.

b Percentage of illness direct costs.

c Percentage of illness indirect costs.

d California's total 13.3% of the U.S. total (20.670/155.5).

**Table 3****Disease Deaths Covered by Workers' Compensation and PAR****California Study by Vargas, Prather, and Mar for years 1992 and 1993**


		<b>Workers' Comp Deaths</b>	<b>Workers Comp Percent</b>	<b>PAR Deaths</b>
1.	Ischemic heart disease including heart attack and other circulatory diseases	101	43%	926
2.	malignant neoplasms and tumors	58	25%	5,181
3.	asbestosis	44	19%	app. 80
4.	respiratory diseases	23	10%	1,307
5.	infectious and parasitic diseases	7	3%	
Total for 1992 and 1993		223		
Estimate for 1999 (WC accounting for growth, and divide (1992 + 1993) by 2)		124		7,729

## Results for U.S.

**Table 4**

Number and Costs of Injuries and Illnesses in 1992

Category	Number	Costs (in \$billions)		
		Total	Direct	Indirect
Injuries	13,343,000	\$132.8	\$38.4	\$ 94.3
Deaths	6,371	\$3.9	\$0.2	\$3.7
Nonfatal	13,337,000	\$128.9	\$38.2	\$90.6
Illnesses		\$ 22.8	\$13.4	\$ 9.4
Deaths	60,290	\$15.1	\$8.8	\$6.3
Morbidity	1,184,000	\$7.7	\$4.6	\$3.1

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- These costs are large when compared to those for other diseases. The costs are roughly three times costs for Alzheimer's disease, nearly as great as costs for cancer, roughly 82 percent of the costs of all circulatory (heart and stroke) diseases.
  - Workers' compensation covered roughly 27 percent of all costs. Taxpayers paid approximately 18 percent of these costs through contributions to Medicare, Medicaid, and Social Security.
  - The Annual Survey of the Bureau of Labor Statistics (BLS) provides the most reliable and comprehensive data on nonfatal injuries. However, it misses roughly 53 percent of job-related injuries. This omission, in part, is due to the exclusion of government employees and the self-employed and also, in part, due to illegal underreporting by private firms.
  - Contrary to Annual Survey data, we find small firms have exceptionally high injury rates.
  - Any of the major sources of data, such as the Bureau of Labor Statistics, National Institute for Occupational Safety and Health, workers' compensation systems, or National Health Interview Survey, by themselves underestimate the numbers of injuries and illnesses.

## Occupations and Industries, U.S.

- In 1986, operators and laborers is the broad occupation category that contributes both the highest total and average cost. Specific occupations that contributed the most to total costs include heavy truck drivers, non-construction laborers, machine operators (not specified), occupations not classified, janitors, nursing orderlies, construction laborers, assemblers, retail sales workers (not elsewhere specified), miscellaneous machine operators, and carpenters. Occupations high on the average cost list include not-specified mechanics, general and construction laborers, welders, stone cutters, and warehouse workers.
- In 1993, The following industries were at the top of the list for average costs (cost-per-worker): taxicabs, bituminous coal and lignite mining, logging, crushed stone, oil field services, water transportation services, sand and gravel, and trucking. Industries high on the total costs list were: trucking, eating and drinking places, hospitals, grocery stores, nursing homes, motor vehicles, and department stores. Industries at the bottom of the cost-per-worker list included legal services, security brokers, mortgage bankers, security exchanges, and labor union offices.

## What Might Help?

- Place death and cost statistics on all job application forms. Prospective workers may turn down dangerous jobs, thus providing an incentive for employers to improve job safety.
- Tax industries based upon contribution to occupational diseases. Tax could be designed after the Black Lung Trust which taxes coal companies per ton of coal extracted. Funds are used to pay for costs of treating pneumoconiosis.

## Future Research

- Some estimates are now 5 to 7 years old. Most are 12 years old. All cost estimates need to be updated.