Occupational injury and illness rates, 1992–96: why they fell

A decline in occupational injury and illness rates in the early to mid-1990s is attributable to legislative reforms motivated by increases in workers' compensation payments and a growing awareness of workplace hazards by unions, employers, and the insurance industry

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Between 1992 and 1996, the rate of reported occupational injuries and illnesses per 100 full-time workers declined from 8.9 to 7.4. Following passage of the Occupational Safety and Health Act in the early 1970s, the rate had declined from 11.0 in 1973 to 7.6 in 1983. Thereafter, the rate increased for the most part, reaching 8.9 in 1992. Then, beginning in 1993 and every year following, it fell. (See table 1.) Because the occupational injury and illness rate is such an important measure of employee well-being, the causes of the latter decline are of considerable interest. This article identifies the factors that have contributed to the rate decline and assesses their importance regarding future changes in the rate. Of particular interest is whether the decline will continue, flatten, or reverse itself and conform to a cyclical pattern.

The recent decrease is especially dramatic in light of the expected pattern of increased injuries and illnesses during economic expansions. The temporary drop in the rates in the early 1980s has been attributed to the concurrent effects of the recession. For example, Peter Dorman concludes that

> there is clearly a "cyclical" component to safety: it rises during periods of economic hardship, and falls during periods of growth. This may be due either to the speedup in the pace of work when orders pile up (this is implicit in Okun's law, according to which fluctuations in output exceed fluctuations in employment), or to the influx of new, inexperienced workers when hiring expands.[1]

In addition, the "records inspection" policy of the Occupational Safety and Health Administration (OSHA) from 1982 to 1986 (forgoing further investigation if an employer's records indicated safe workplace conditions) has been suspected of having been an incentive to underreport violations during that period; the policy was subsequently changed in the face of high-profile, large-penalty cases for recordkeeping violations.

The disaggregation of data by State reveals significant differences among States in the degree of the recent decline. Notably, the data indicate that the reductions in the national statistics cannot be attributed primarily to reductions in States with above-average rates. In fact, no significant correlation was found between the injury and illness rates in 1994 and the reductions achieved from 1994 to 1996. (See chart 1.)

Table 2 shows total and lost-workday injury and illness incidence rates by industry sector for 1992, 1994, and 1996, with the percent change in rates for 1992–96 and 1994–96. Viewed in this detail, the data reveal that on a national basis, many industry sectors have achieved reductions in injury and illness rates of 20 percent to 30 percent or more in recent years.

Several explanations have been given for the decline: the well-known shift in employment out of traditionally highly hazardous manufacturing

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industry jobs and into relatively less hazardous service industry employment; an increase in underreporting of workplace injuries and illnesses; a growing emphasis on cost control among employers and insurers in response to rising worker compensation costs; increased efforts on the part of employers and unions to identify and eliminate workplace hazards; and more effective OSHA enforcement and consultation activities.

The analysis that follows identifies recent reforms in workers' compensation programs at the State level and industry initiatives in implementing workplace safety and health programs as being primarily responsible for the rate reduction. The various reforms and initiatives were triggered by sharp increases in workers' compensation costs over the previous decade. Efforts to identify the nature of these costs and to reduce them resulted in many diverse approaches and changes, including an increased emphasis on risk reduction.

Employment shift from high-hazard industries

One possible explanation for the decline in occupational injury and illness rates is that there has been a decline in employment in traditionally high-hazard industries, accompanied by growth in low-hazard industries. For example, in the high-hazard manufacturing industry, a long-term decline in employment continued into the 1990s. Manufacturing employment declined by more than 600,000 between 1990 and 1996 (from 19,076,000 to 18,457,000). (The reference year 1990 was selected rather than 1992 in order to avoid the business cycle effect of the 1992 recession.) In contrast, employment in the relatively low-hazard service industries continued to show strong long-term growth, increasing from 27,934,000 in 1990 to 34,377,000 in 1996.

Table 1. Occupational injury and illness rates per 100 full-time workers, 1973–96

Year	Total	Lost-workday rate
1973	11.0	3.4
1974	10.4	3.5
1975	9.1	3.3
1976	9.2	3.5
1977	9.3	3.8
1978	9.4	4.1
1979	9.5	4.3
1980	8.7	4.0
1981	8.3	3.8
1982	7.7	3.5
1983	7.6	3.4
1984	8.0	3.7
1985	7.9	3.6
1986	7.9	3.6
1987	8.3	3.8
1988	8.6	4.0
1989	8.6	4.0
1990	8.8	4.1
1991	8.4	3.9
1992	8.9	3.9
1993	8.5	3.8
1994	8.4	3.8
1995	8.1	3.6
1996	7.4	3.4

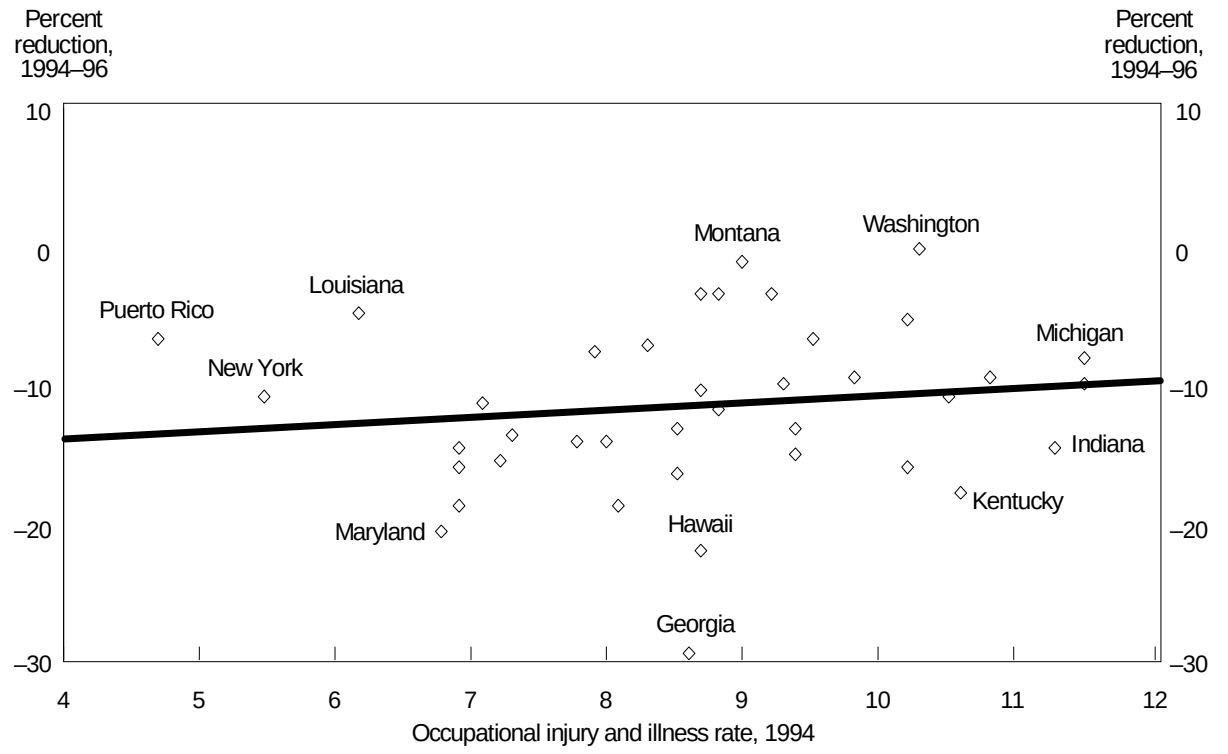
SOURCE: Bureau of Labor Statistics.

But the employment shift explanation for the decline appears problematic, for a number of reasons. First, when attention is focused on disaggregated industry employment details, it becomes clear that not all high-hazard industries in fact experienced a decline in employment during the period in question. In high-hazard construction, for instance, employment increased by 280,000 (from 5,120,000 to 5,400,000) between 1990 and 1996. Indeed, in a 1992 annual report, the Bureau of Labor Statistics identified and compiled a list of 36 detailed (that is, at the four-digit SIC level) manufacturing industries with the highest rates of nonfatal occupational injuries and illnesses.[2] Data from this list were matched against employment data on 20 of these high-incidence industries from the BLS State Current Employment Statistics program. (No employment data on the remaining 16 industries were found in the program.) The results of analyses carried out on these 20 industries are presented in table 3.

Employment in the 20 high-hazard industries increased from 1,813,200 to 2,009,500 over the period 1990–96. (Employment in these industries dipped to 1,805,900 during the 1992 recession.) Thus, the supposition that there has been an employment shift out of traditionally high-hazard industry sectors is not supported by these data. Further, while declines in occupational injury and illness rates were found in 18 of the 20 industries listed (the greatest reductions were in primary aluminum, –32.0 percent, and meatpacking plants, –31.8 percent), there were no concomitant declines in employment that might help to explain the reduction in the injury and illness rates found in manufacturing in recent years. The second reason the employment shift explanation fails is that the assumption that the decline in injury and illness rates is related to employment *growth* in low-hazard service industry occupations also appears suspect. Employment growth in many service sector jobs has led to an increase in attention on them and to a better appreciation of the hazards inherent in the jobs being created. At the three-digit level of industry detail, 10 service industry sectors had injury and illness rates equal to (job training and related services) or exceeding (hotels and motels, miscellaneous equipment rental and leasing, miscellaneous repair shops, commercial sports, miscellaneous amusement and recreational services, nursing and personal care facilities, hospitals, home health care services, and residential care) the total private-industry average rate of 7.4 percent.[3]

As an alternative explanation of why high-hazard industries are reducing their injury and illness rates, it has been

Chart 1. Occupational injury and illness rates, 1994, versus percent reduction, 1994–96, 38 States and Puerto Rico



suggested that automating high-hazard jobs may play a role. After automation of these jobs, the jobs that remain are inherently less dangerous, it is said, and thus the rates decline. To test this hypothesis, the share of production worker employment as a percent of total industry employment was analyzed using available BLS data. If the share were found to be declining, a case could be made for an employment shift out of high-hazard occupations and into clerical or supervisory jobs. The data, however, did not support the hypothesis: the production worker share of employment had increased in the majority of high-hazard industries between 1990 and 1996 (on average, from 78.6 percent to 80.5 percent).

In sum, the explanation that the recent decline in occupational injury and illness rates has been caused by an employment shift out of high-hazard industries and into low-hazard industries is not supported by the data.

Underreporting of injuries and illnesses

Companies, often unintentionally, perpetuate a variety of policies and management practices that may lead to poor recordkeeping. Among such practices and policies identified to date are the following:[4]

- Sheer neglect for the records, no training for the recordkeeper, no emphasis on maintaining records properly, downgrading recordkeeping to a collateral duty of a clerical or support staff person.
- Poor communications between different departments within the company, with the record keeper kept uninformed of injuries and illnesses, even when employees have reported them to their supervisors.
- Management bonuses and opportunities for promotion tied negatively to injury and illness rates.
- Employee group awards or bonuses if no injuries are reported by anyone in the group.
- Employees denied overtime or promotion opportunities for reporting an injury or for staying away from work.
- Subjection of employees who report injuries or illnesses to overly aggressive and personal accident investigations, including investigations of employees' personal lifestyles (for example, drug testing).

These disincentives to report occupational injuries and illnesses are difficult to address because they often reflect psychological factors and attitudes among people in the organization. Anything in the work environment that makes an employee uncomfortable with reporting an injury or illness to the company, or that makes the company unwilling or reluctant to record cases of injury or illness, could be seen as a disincentive. The result is that company injuries and illnesses will be chronically underreported.

Table 2. Total and lost-workday injury and illness rates, by industry, 1992, 1994, 1996, and percent change, 1992–96 and 1994–96

SIC code	Industry	Average employment, 1996 (thousands)	Total injury and illness rate					Lost-workday injury and illness rate				
			1992	1994	1996	Percent change		1992	1994	1996	Percent change	
						1992–96	1994–96				1992–96	1994–96
	Private sector	98,772.9	8.9	8.4	7.4	–16.9	–11.9	3.9	3.8	3.4	–12.8	–10.5
	Agriculture, forestry, fishing	1,717.4	11.6	10.0	8.7	–25.0	–13.0	5.4	4.7	3.9	–27.8	–17.0
	Mining	578.3	7.3	6.3	5.4	–26.0	–14.3	4.1	3.9	3.2	–22.0	–17.9
	Construction	5,359.7	13.1	11.8	9.9	–24.4	–16.1	5.8	5.5	4.5	–22.4	–18.2
15	General building contractors	1,256.1	12.2	10.9	9.0	–26.2	–17.4	5.4	5.1	4.0	–25.9	–21.6
16	Heavy construction, except building	770.7	12.1	10.2	9.0	–25.6	–11.8	5.4	5.0	4.3	–20.4	–14.0
17	Special trade contractors	3,332.9	13.8	12.5	10.4	–24.6	–16.8	6.1	5.8	4.8	–21.3	–17.2
	Manufacturing	18,460.5	12.5	12.2	10.6	–15.2	–13.1	5.4	5.5	4.9	–9.3	–10.9
	Durable goods manufacturing	10,774.4	13.4	13.5	11.6	–13.4	–14.1	5.5	5.7	5.1	–7.3	–10.5
	Nondurable goods manufacturing	7,686.0	11.3	10.5	9.2	–18.6	–12.4	5.3	5.1	4.6	–13.2	–9.8
20	Food and kindred products	1,690.0	18.8	17.1	15.0	–20.2	–12.3	9.5	9.2	8.0	–15.8	–13.0
21	Tobacco products	40.6	6.0	5.3	6.7	11.7	26.4	2.4	2.4	2.8	16.7	16.7
22	Textile mill products	627.6	9.9	8.7	7.8	–21.2	–10.3	4.2	4.0	3.6	–14.3	–10.0
23	Apparel and other textile products	866.1	9.5	8.9	7.4	–22.1	–16.9	4.0	3.9	3.3	–17.5	–15.4
24	Lumber and wood products	777.9	16.3	15.7	14.2	–12.9	–9.6	7.6	7.7	6.8	–10.5	–11.7
25	Furniture and fixtures	503.6	14.8	15.0	12.2	–17.6	–18.7	6.6	7.0	5.4	–18.2	–22.9
26	Paper and allied products	681.9	11.0	9.6	7.9	–28.2	–17.7	5.0	4.5	3.8	–24.0	–15.6
27	Printing and publishing	1,533.1	7.3	6.7	6.0	–17.8	–10.4	3.2	3.0	2.8	–12.5	–6.7
28	Chemicals and allied products	1,029.8	6.0	5.7	4.8	–20.0	–15.8	2.8	2.8	2.4	–14.3	–14.3
29	Petroleum and coal products	141.3	5.9	4.7	4.6	–22.0	–2.1	2.8	2.3	2.5	–10.7	8.7
30	Rubber and miscellaneous plastics products	979.9	14.5	14.0	12.3	–15.2	–12.1	6.8	6.7	6.3	–7.4	–6.0
31	Leather and leather products	95.7	12.1	12.0	10.7	–11.6	–10.8	5.4	5.3	4.5	–16.7	–15.1
32	Stone, clay, and glass products	544.1	13.6	13.2	12.4	–8.8	–6.1	6.1	6.5	6.0	–1.6	–7.7
33	Primary metal industries	709.6	17.5	16.8	15.0	–14.3	–10.7	7.1	7.2	6.8	–4.2	–5.6
34	Fabricated metal products	1,447.1	16.8	16.4	14.4	–14.3	–12.2	6.6	6.7	6.2	–6.1	–7.5
35	Industrial machinery and equipment	2,108.4	11.1	11.6	9.9	–10.8	–14.7	4.2	4.4	4.0	–4.8	–9.1
36	Electronic and other electrical equipment	1,655.4	8.4	8.3	6.8	–19.0	–18.1	3.6	3.6	3.1	–13.9	–13.9
37	Transportation equipment	1,785.2	18.7	19.6	16.3	–12.8	–16.8	7.1	7.8	7.0	–1.4	–10.3
38	Instruments and related products	853.3	5.9	5.9	5.1	–13.6	–13.6	2.7	2.7	2.3	–14.8	–14.8
39	Miscellaneous manufacturing industries	389.9	10.7	9.9	9.5	–11.2	–4.0	5.0	4.5	4.4	–12.0	–2.2
	Transportation and utilities	5,989.0	9.1	9.3	8.7	–4.4	–6.5	5.1	5.5	5.1	.0	–7.3
40	Railroad transportation	–	6.6	5.1	3.5	–47.0	–31.4	5.1	3.8	–2.7	–47.1	–28.9
41	Local and interurban passenger transit	416.3	11.0	9.6	10.3	–6.4	7.3	5.9	5.1	5.4	–8.5	5.9
42	Trucking and warehousing	1,622.7	13.4	14.8	10.4	–22.4	–29.7	7.9	9.2	5.9	–25.3	–35.9
43	U.S. Postal Service	–	–	–	–	–	–	–	–	–	–	–
	Water transportation	176.5	11.5	9.5	9.8	–14.8	3.2	5.5	5.1	5.2	–5.5	2.0
45	Transportation by air	1,119.2	13.8	13.3	17.9	29.7	34.6	7.6	8.0	11.8	55.3	47.5
46	Pipelines, except natural gas	14.5	3.1	2.4	2.0	–35.5	–16.7	1.6	1.4	.8	–50.0	–42.9
47	Transportation services	414.7	3.9	4.2	3.5	–10.3	–16.7	2.2	2.2	1.6	–27.3	–27.3
48	Communications	1,345.2	3.4	3.3	3.5	2.9	6.1	1.8	1.7	1.9	5.6	11.8
49	Electric, gas, and sanitary services	878.9	7.6	7.3	6.9	–9.2	–5.5	3.6	3.5	3.6	.0	2.9
	Wholesale and retail trade	28,027.1	8.4	7.9	6.8	–19.0	–13.9	3.5	3.4	2.9	–17.1	–14.7
	Wholesale trade	6,471.7	7.6	7.7	6.6	–13.2	–14.3	3.6	3.8	3.4	–5.6	–10.5
50	Durable goods wholesale trade	3,802.9	6.8	7.0	6.2	–8.8	–11.4	3.0	3.2	3.0	.0	–6.3
51	Nondurable goods wholesale trade	2,668.8	8.6	8.7	7.3	–15.1	–16.1	4.6	4.6	4.0	–13.0	–13.0
	Retail trade	21,555.3	8.7	–	6.9	–20.7	–	3.4	–	2.8	–17.6	–

In 1987, the Bureau of Labor Statistics conducted a pilot project to test the feasibility of a case-by-case comparison of OSHA employer injury and illness records with medical records, workers' compensation reports, and other related workplace records. The project involved visits by OSHA compliance officers to 200 randomly selected manufacturing establishments with more than 10 employees. Half of the establishments were in Massachusetts and half in Missouri. While this pilot project was not designed to provide statistical results for the Nation, the 200 sites that were visited did afford records of about 4,000 injury and illness cases reported in 1986.

The pilot survey uncovered evidence of both underreporting and overreporting. While virtually all overreporting involved cases with no lost work time, underreported cases were split between those with and without lost work time.[5] The project found that total injuries and illnesses were underrecorded by about 10 percent. (Two establishments were responsible for most of the undercount.) Lost-workday injury and illness cases were underrecorded by about 25 percent in the establishments visited.[6]

Table 2. Continued—Total and lost-workday injury and illness rates, by industry, 1992, 1994, 1996, and percent change, 1992–96 and 1994–96

SIC code	Industry	Average employment, 1996 (thousands)	Total injury and illness rate					Lost-workday injury and illness rate				
			1992	1994	1996	Percent change		1992	1994	1996	Percent change	
						1992–96	1994–96				1992–96	1994–96
52	Building materials and garden supplies	883.9	11.1	10.3	9.6	–13.5	–6.8	5.0	4.9	4.5	–10.0	–8.2
53	General merchandise stores	2,679.0	10.4	10.8	9.7	–6.7	–10.2	4.8	5.4	4.8	0.0	–11.1
54	Food stores	3,425.6	11.9	10.5	9.4	–21.0	–10.5	4.8	4.4	3.9	–18.8	–11.4
55	Auto dealers and service stations	2,261.0	8.0	7.4	6.8	–15.0	–8.1	2.9	2.8	2.5	–13.8	–10.7
56	Apparel and accessory stores	1,113.3	4.3	4.1	3.7	–14.0	–9.8	1.6	1.6	1.5	–6.3	–6.3
57	Furniture and home-furnishings stores	967.8	5.8	5.7	4.7	–19.0	–17.5	2.6	2.8	2.2	–15.4	–21.4
58	Eating and drinking places	7,516.7	9.1	7.7	6.2	–31.9	–19.5	3.1	2.6	1.9	–38.7	–26.9
59	Miscellaneous retail trade	2,708.0	5.0	4.5	4.1	–18.0	–8.9	2.1	2.0	1.9	–9.5	–5.0
	Finance, insurance, and real estate	6,746.2	2.9	2.7	2.4	–17.2	–11.1	1.2	1.1	.9	–25.0	–18.2
60	Depository institutions	2,014.9	2.1	2.1	1.8	–14.3	–14.3	.8	.8	.6	–25.0	–25.0
61	Nondepository institutions	512.2	1.0	1.5	1.1	10.0	–26.7	.4	.6	.4	.0	–33.3
62	Security and commodity brokers	551.5	.7	.7	.6	–14.3	–14.3	.3	.3	.2	–33.3	–33.3
63	Insurance carriers	1,376.9	–	2.6	2.1	–	–19.2	–	.9	.7	–	–22.2
64	Insurance agents, brokers, and services	707.0	1.4	1.4	1.4	.0	.0	.5	.5	.4	–20.0	–20.0
65	Real estate	1,372.0	6.8	5.7	5.4	–20.6	–5.3	3.1	2.7	2.4	–22.6	–11.1
67	Holding and other investment offices	211.7	2.7	1.9	2.8	3.7	47.4	1.3	.8	1.3	.0	62.5
	Services	31,894.7	7.1	6.5	6.0	–15.5	–7.7	3.0	2.8	2.6	–13.3	–7.1
70	Hotels and other lodging places	1,699.0	11.2	10.1	9.0	–19.6	–10.9	4.9	4.7	4.5	–8.2	–4.3
72	Personal services	1,181.5	5.1	4.1	3.8	–25.5	–7.3	2.3	1.9	1.8	–21.7	–5.3
73	Business services	7,336.3	5.4	4.9	3.9	–27.8	–20.4	2.6	2.4	1.7	–34.6	–29.2
75	Auto repair, services, and parking	1,081.0	7.8	6.9	5.9	–24.4	–14.5	3.3	2.9	2.5	–24.2	–13.8
76	Miscellaneous repair services	374.2	8.7	7.7	6.3	–27.6	–18.2	3.9	3.6	3.0	–23.1	–16.7
78	Motion pictures	–	–	3.0	–	–	–	–	1.0	–	–	–
79	Amusement and recreation services	1,524.8	10.1	9.0	9.5	–5.9	5.6	4.4	3.8	4.4	.0	15.8
80	Health services	9,439.2	10.2	9.4	9.1	–10.8	–3.2	4.1	3.9	3.7	–9.8	–5.1
81	Legal services	930.3	1.2	1.1	1.1	–8.3	.0	.5	.4	.4	–20.0	.0
82	Educational services	1,472.8	5.6	4.2	3.4	–39.3	–19.0	1.6	1.5	1.3	–18.8	–13.3
83	Social services	2,347.3	8.0	7.5	7.2	–10.0	–4.0	3.4	3.4	3.1	–8.8	–8.8
84	Museums, botanical gardens, and zoos	–	7.8	7.1	–	–	–	3.2	2.9	–	–	–
86	Membership organizations	975.4	–	–	3.5	–	–	–	–	1.3	–	–
87	Engineering and management services	2,865.5	2.4	2.6	2.0	–16.7	–23.1	1.0	1.1	.8	–20.0	–27.3
88	Private households	–	–	–	–	–	–	–	–	–	–	–
89	Services, not elsewhere classified	–	2.7	–	–	–	–	1.0	–	–	–	–

NOTE: Dash indicates data not available or (for percent change) calculation could not be made.
SOURCE: Bureau of Labor Statistics.

Table 3. Total injury and illness rates, 1992 and 1996, and total employment and production workers in high-hazard industries,1990 and 1996

SIC code	Industry	Total injury and illness rate		Percent change, 1992–96	1990		1996	
		1992	1996		Total employment (thousands)	Production workers (percent of total employment)	Total employment (thousands)	Production workers (percent of total employment)
	Total	[1]26.8	[1]21.3	–17.8	1813.2	78.6	2009.5	80.5
2011	Meatpacking plants	44.4	30.3	–31.8	139.5	84.4	138.3	83.6
3731	Ship building and repairing	37.8	27.4	–27.5	129.5	72.8	98.2	73.1
3711	Motor vehicles and car bodies	32.3	26.1	–19.2	310.8	72.3	354.3	76.8
3321	Gray and ductile iron foundries	31.6	25.8	–18.4	81.8	81.3	80.3	82.8
3465	Automotive stampings	29.2	23.2	–20.5	99.7	83.2	118.3	83.8
3715	Truck trailers	25.0	19.4	–22.4	27.4	78.1	31.6	79.7
3325	Steel foundries, n.e.c.[2]	24.4	26.4	8.2	28.0	77.9	25.8	81.4
2015	Poultry slaughtering and processing	23.2	17.8	–23.3	194.1	90.2	233.1	89.1
2451	Mobile homes	23.0	26.2	13.9	43.4	80.6	64.4	83.9
3633	Household laundry equipment	22.6	16.7	–26.1	21.0	79.5	15.9	81.8
3713	Truck and bus bodies	22.3	21.0	–5.8	41.2	77.9	38.3	80.4
3462	Iron and steel forgings	21.1	19.4	–8.1	31.9	76.5	30.6	76.5
2013	Sausages and other prepared meats	21.0	16.3	–22.4	84.6	74.6	93.2	77.7
3792	Travel trailers and campers	20.5	19.7	–3.9	18.0	77.2	22.2	84.2
3322	Malleable iron foundries	20.3	16.7	–17.7	8.7	74.7	4.1	78.0
3365	Aluminum foundries	20.1	17.1	–14.9	23.7	78.9	24.9	82.3
3334	Primary aluminum	20.0	13.6	–32.0	25.5	76.1	22.5	79.6
3441	Fabricated structural metal	19.5	16.7	–14.4	77.0	71.7	76.5	73.5
3317	Steel pipes and tubes	19.2	13.9	–27.6	24.7	74.5	27.1	75.3
3714	Motor vehicle parts and accessories	19.2	16.9	–12.0	402.7	78.9	509.9	80.2

[1]Weighted average.
[2]n.e.c. = not elsewhere classified.
SOURCES: *Occupational Injuries and Illnesses: Counts, Rates, and Characteristics, 1992*, Bulletin 2455 (Bureau of Labor Statistics, April 1995), p. 5; *Employment and Earnings*, March 1991, table B-2; March 1997, table B-12.

In 1996, as part of a major OSHA data collection initiative, about 80,000 establishments were asked to submit information on injuries and illnesses reported that year, together with the number of workers employed and the hours they worked. A follow-on data-quality audit program was designed to check the accuracy of the data submitted to the Agency, as well as overall injury and illness recordkeeping practices. This audit, directed by the Office of Management and Budget, was designed with the following aims in mind:

- Comparing the information submitted to OSHA with the employers' 1996 OSHA form 200, "Log and Summary of Injuries and Illnesses," and with the employers' records of employment and hours worked.
- Identifying recordable injury and illness cases and determining whether the establishment recorded them properly, underrecorded them, or overrecorded them.
- Interviewing the establishment's recordkeeper about the OSHA recordkeeping requirements and the establishment's recordkeeping practices.

In 1997, OSHA contracted with Eastern Research Group, Inc., of Lexington, Massachusetts, to conduct the follow-on pilot study of data collection quality and verification of employer injury and illness records. The eventual study design encompassed a statistical sample of more than 250 establishments nationwide. The sample frame included establishments with more than 60 employees and excluded establishments in the construction industry. OSHA compliance officers were part of each site visit team. The completion of more than 250 audits in 1998 produced results that were markedly similar to the 1987 pilot test results. While underreporting of recordable cases remained a persistent problem, there was no apparent increase in the size of the problem over the 10-year period between the studies.[7] Preliminary results of the audit included the following:

- Total injury and illness cases were underreported by 11 percent (10 percent in 1986).
- Lost-workday cases were underreported by 22 to 23 percent (25 percent in 1986).

In addition, no data were identified that would support the hypothesis of a sudden and dramatic increase in underreporting in the period studied. Decreases in rates were observed across many industries and States, but the degree of the reductions varied widely. Also, the greatest reductions were *not* concentrated in States or industries with higher initial rates.

Consequently, the findings of the audit and the characteristics of the injury and illness data suggest that the recent decline in occupational injury and illness rates is not *due to an increase in underreporting.*

Workers' compensation reforms

Market forces for change. By 1992, social welfare expenditures on workers' compensation claims had reached $45.7 billion, more than twice the $22.3 billion spent in 1985. Within the insurance industry and among a growing number of employers, concern with rising premium rates was increasing. Workers' compensation premium levels among States were being compared. States with high premium levels believed that they were losing jobs as industry moved out of State.[8] Action took the form of changes in State workers' compensation legislation, including increased penalties for fraudulent claims, limitations on benefits paid, medical and case management initiatives, improved efficiency in the structure and administration of the insurance market, the introduction of large-deductible insurance options for employers, and requirements or incentives for the implementation of safety and health programs.

The level of workers' compensation costs reached in the early 1990s spurred cost control efforts and created profitable business opportunities for reducing costs; the discovery and scope of such opportunities fundamentally altered approaches to safety and health. Previously, safety and health issues were often relegated to a minor management concern; the extent of effort devoted to safety and health protection could be measured by the limited resources devoted to that function. Injury rates, and especially medical and other costs resulting from an injury, were considered largely uncontrollable. Significantly elevated insurance costs increased both the urgency and profitability of cost reduction efforts. In turn, the pursuit of such efforts resulted in new realizations regarding the nature of the costs involved and new opportunities for improvements. Workplace accidents are gradually evolving from a budget item to a commitment to change the way work is carried out.

While many reforms in State workers' compensation law have focused on program cost reduction first and accident prevention second, changes in perspective and attitude appear to have led to a greater commitment to reduce risk, as opposed to viewing safety as a cost add-on. Reforms have affected hazard assessment, training, claims management, rehabilitation and return-to-work programs, safety incentives for employees, and entrepreneurial opportunities by specialist consultants. In the next section, reforms that focus on hazard reduction (workplace safety and health programs and medical cost deductibles) are presented first, followed by reforms designed to reduce the number of claims filed (programs designed to detect and more effectively prosecute insurance fraud) and then reforms aimed at cost reduction (return-to-work and program administration reforms).

State workers' compensation legislative reforms

1. Workplace safety and health programs. At a minimum, typical components of workplace safety and health programs would include hazard identification and control and safety and health training. Recent reforms in many State workers' compensation programs have made such programs mandatory, either for all employers or for targeted employers with high injury and illness rates. Voluntary programs have also been encouraged through statutory language. These workers' compensation legislative reforms have supplemented comparable programs mandated under State occupational safety and health authority. (Generally, the two kinds of programs do not overlap; that is, mandatory safety and health programs are not usually found simultaneously under a State's occupational safety and health program and its workers' compensation program. Exceptions are California, Minnesota, and North Carolina.) In addition, many employers in States that have not introduced such programs through legislation are voluntarily adopting and implementing safety and health programs in an effort to reduce workplace hazards and the related costs of accidents.

The unique influence and effect of these programs in reducing occupational injury and illness rates is the subject of debate. According to the Insurance Industry Institute,

> while it is difficult to separate the impact of safety measures from other factors that could cause claims to decline, results for Texas and Oregon, two [S]tates in the vanguard of the accident prevention movement, suggest that reforms have had a significant impact. Accident rate per 100 private sector employees dropped 11.4 percent in three years in Texas, from 8.0 in 1990 to 7.1 in 1993. In Oregon the recordable accident rate per 100 employees in the private sector has fallen from 11.1 in 1988 to 8.7 in 1994, a reduction of 21.6 percent.[9]

Significantly, mandatory legislation to implement safety and health programs affects less than 1 percent of employers in Texas. (In Oregon, an estimated 20 percent to 25 percent of all business establishments and 80 percent of employees are affected by mandatory State occupational safety and health program requirements.) The recorded change in occupational injury and illness rates in Texas appears broadly based and not limited only to firms affected by legislation.

Between 1990 and 1996, the incidence of lost-workday cases nationwide declined 20 percent, from 4.1 to 3.4 cases per 100 full-time workers.[10] Table 4 presents occupational injury and illness rate changes derived from BLS data for 38 States and Puerto Rico and from data on insurance lost-time claims provided to OSHA by the National Council on Compensation Insurance and covering 36 States and the District of Columbia. The correlation between changes in the Council's State data on lost-time claims counts and changes in the BLS State data on lost-workday injury and illness rates for 1994–96 was statistically significant at the 0.05 level, with a Pearson correlation coefficient of 0.458. The two data sets permitted a statistical construction of injury and illness rates for seven States and the District of Columbia.[11] However, no data are

available for five States: North Dakota, Ohio, Pennsylvania, West Virginia, and Wyoming. Also shown in table 4 are data from the National Council on Compensation Insurance on the "frequency per constant worker," a standardized measure of risk used in the insurance industry.

In table 4, the State data are banked to show States with mandatory safety and health programs and those without statutory requirements. Table 5 presents the mean and median injury and illness rates for 1996 and recent rate declines among four categories of State occupational safety and health programs: statutory under workers' compensation, statutory under the State Occupational Safety and Health Administration or under some other State statute, voluntary under workers' compensation, and no comprehensive safety and health program requirements.

All States experienced declines in injury and illness rates, and no statistically significant differences were found among the four groups of States. Nevertheless, the observed variations in 1996 rate levels and relative rate declines among the four invite commentary. Given the higher average rates among States with mandatory programs, these States may have opted for that approach because of their more serious accident records. Post-1996 legislative changes in workers' compensation laws in New York, endorsing mandatory safety and health programs for employers with poor safety records, indicate that this approach retains its appeal.[12]

But it takes time for safety and health programs to have an effect. Four States with voluntary programs implemented prior to 1992—Alabama, Colorado, Oklahoma, and Oregon (Oklahoma and Oregon also have mandatory programs affecting some employers)—continued to have total injury and illness rates above the national average in 1996. Relatively greater rate declines in States with voluntary occupational safety and health programs may be explained by those States' experimentation with more inventive, site-specific safety and health program reforms. Firms in States with such voluntary programs appear to be responding to market forces, especially cost containment of workers' compensation.

2. Medical care costs. Medical care cost reforms have been introduced that strongly encourage employers to assign a higher priority to safety. About one-quarter of the States allow a rate credit or discount (schedule rating) for high-quality safety programs. In some States, safety committees are required in workplaces with poor claims histories.

In a majority of States, optional medical deductibles are now included in workers' compensation insurance policies. Legislative changes in recent years have raised allowable deductible limits. The perception has grown that deductibles encourage greater safety consciousness among employers who must pay the deductible amount.[13] According to the Insurance Industry Institute, many States now allow insurers to use State-set fee schedules, to review treatment plans, and to "permit or mandate the use of managed care, an approach used by health care insurers but until recently not always encouraged, and sometimes prohibited, under workers' compensation laws."[14]

Lower medical costs through managed care and reductions in medical care expenses have been documented in several States, including New Jersey,[15] New York, and Florida. Under the new Florida law, approved managed care plans must show evidence that they utilize case management techniques and have procedures for aggressive medical care coordination that encourage a prompt return to work.[16]

3. Insurance fraud. Since 1992, more than half the States have passed laws that make it easier to detect and prosecute insurance fraud. Past perpetrators have included medical care providers, workers who filed claims for non-work-related injuries, and employers who submitted false figures for their payroll and misrepresented the tasks workers were performing in order to reduce their workers' compensation premium. In 1995, there were 100 convictions for workers' compensation fraud in California. In New York, reforms to reduce fraud included creating a new workers' compensation inspector general with broad investigative powers and making workers' compensation fraud a felony punishable by jail time.

4. Return to work. Several States passed return-to-work reforms to promote injured workers' reentry into the workforce, thus reducing the time required for them to receive lost-income benefits. Laws in this category target both employees (for refusing appropriate work) and employers (for refusing to take injured workers back). Surveys of employers suggest that early return-to-work programs are among the most effective cost-containment initiatives.

One company, RTW, Inc., specializes in managing return-to-work programs for other companies through job modification and accommodation. Since its start in 1992, this company has produced a 45-percent average annual return on equity and was among the 15 best performing small companies listed in *Forbes*. Special attention to managing claims and getting people back to work has saved employers an average of 50 percent on workers' compensation insurance.[17]

The increasing adoption of return-to-work programs and other types of case management techniques are reflected in BLS occupational injury and illness statistics. The proportion of lost-workday injuries and illnesses that involved days away from work dropped from 76.9 percent in 1992 to 64.7 percent in 1996. (The lost-workday rate also includes those on restricted duty or reassignment following a workplace accident with no time spent away from work.) Reductions in the rates of injuries and illnesses involving days away from work have been more dramatic than reductions in total injury and illness

Table 4. Injury and illness rates, 1994–96, and workers' compensation claims, 1992, 1994, and 1996, by jurisdiction and safety and health program requirement category

Jurisdiction	Nonfarm employment (thousands)	OSHA Inspections (Federal and State)			Inspections per 10,000 employees, FY1996	Bureau of Labor Statistics					
						1994 injury and illness rate		1996 injury and illness rate		Percent change, 1994–96	
		FY1992	FY1996	Percent change		Total	Lost-workday rate	Total	Lost-workday rate	Total	Lost-workday rate
With mandatory safety and health programs under workers' compensation											
Arkansas[1]	1,089.0	798	567	–28.9	5.2	9.4	4.3	8.2	3.5	–12.8	–18.6
California[2]	12,888.3	15,480	10,689	–30.9	8.3	8.1	4.0	6.6	3.4	–18.5	–15.0
Connecticut[3]	1,592.5	1,605	1,066	–33.6	6.7	8.5	4.1	7.4	3.6	–12.9	–12.2
Louisiana[4]	1,824.2	1,044	735	–29.6	4.0	6.2	2.9	5.9	2.8	–4.8	–3.4
Maine[5]	541.0	660	389	–41.1	7.2	10.5	5.6	9.4	4.8	–10.5	–14.3
Minnesota[6]	2,441.6	3,248	2,345	–27.8	9.6	8.7	3.8	8.4	3.7	–3.4	–2.6
Montana[7]	360.8	391	351	–10.2	9.7	9.0	3.2	8.9	3.3	–1.1	3.1
Nebraska[8]	839.2	295	141	–52.2	1.7	10.2	4.3	9.7	3.8	–4.9	–11.6
New Hampshire[9]	565.9	425	302	–28.9	5.3						
North Carolina[10]	3,599.5	2,156	4,313	100.0	12.0	7.8	3.5	6.7	3.0	–14.1	–14.3
Oklahoma[11]	1,368.6	1,102	744	–32.5	5.4	8.8	4.1	7.8	4.1	–11.4	.0
Pennsylvania[12]	5,345.0	3,197	2,508	–21.6	4.7						
Tennessee[13]	2,542.1	2,795	2,711	–3.0	10.7	9.4	4.3	8.0	3.8	–14.9	–11.6
Texas[14]	8,319.0	5,698	2,981	–47.7	3.6	7.1	3.5	6.3	3.1	–11.3	–11.4
Utah[15]	965.3	705	1,184	67.9	12.3	9.5	3.8	8.9	3.3	–6.3	–13.2
West Virginia[16]	700.7	546	481	–11.9	6.9	–	–	–	–	–	–
With mandatory safety and health programs under State OSHA or other State statute[17]											
Alaska[18]	262.9	1,215	408	–66.4	15.5	8.8	4.3	8.5	4.1	–3.4	–4.7
Florida[19]	6,237.6	2,433	1,399	–42.5	2.2	8.0	3.3	6.9	3.2	–13.8	–3.0
Hawaii[20]	529.2	1,802	910	–49.5	17.2	8.7	4.9	6.8	3.6	–21.8	–26.5
Michigan[21]	4,369.8	12,036	7,914	–34.2	18.1	11.5	5.2	10.6	4.9	–7.8	–5.8
Nevada[22]	859.3	2,160	1,262	–41.6	14.7	9.3	4.2	8.4	3.4	–9.7	–19.0
Oregon[23]	1,491.7	6,241	5,693	–8.8	38.2	8.7	4.2	7.8	3.8	–10.3	–9.5
Washington[24]	2,434.9	8,452	7,705	–8.8	31.6	10.3	4.2	10.3	3.9	.0	–7.1
With voluntary safety and health programs under workers' compensation[25]											
Alabama	1,831.0	1,342	548	–59.2	3.0	9.2	4.1	8.9	4.0	–3.3	–2.4
Colorado	1,913.2	1,263	1,023	–19.0	5.3	–	–	–	–	–	–
Kansas	1,242.4	518	197	–62.0	1.6	9.8	4.2	8.9	4.0	–9.2	–4.8
Massachusetts	3,064.7	2,223	1,582	–28.8	5.2	7.2	3.5	6.1	3.1	–15.3	–11.4
Missouri	2,579.5	1,854	515	–72.2	2.0	10.2	4.1	8.6	3.6	–15.7	–12.2
New Mexico	696.4	553	688	24.4	9.9	7.9	3.4	7.3	3.2	–7.6	–5.9
North Dakota	310.3	299	169	–43.5	5.4	–	–	–	–	–	–
Ohio	5,316.5	3,430	1,952	–43.1	3.7	–	–	–	–	–	–
Rhode Island	444.2	461	208	–54.9	4.7	8.5	4.1	7.1	3.6	–16.5	–12.2
South Carolina	1,678.6	2,800	1,815	–35.2	10.8	6.9	2.9	5.9	2.5	–14.5	–13.8
Without comprehensive safety and health program requirements											
Arizona	1,926.3	2,547	1,342	–47.3	7.0	8.3	3.6	7.7	3.3	–7.2	–8.3
Delaware	379.3	160	183	14.4	4.8	6.9	3.4	5.6	2.5	–18.8	–26.5
Georgia	3,546.4	1,761	779	–55.8	2.2	8.6	3.8	6.1	2.7	–29.1	–28.9
Idaho	497.7	491	221	–55.0	4.4	–	–	–	–	–	–
Illinois	5,694.9	3,017	1,764	–41.5	3.1	–	–	–	–	–	–

Table 4. Continued—Injury and illness rates, 1994–96, and workers' compensation claims, 1992, 1994, and 1996, by jurisdiction and safety and health program requirement category

Jurisdiction	Nonfarm employment (thousands)	OSHA Inspections (Federal and State)			Inspections per 10,000 employees, FY1996	Bureau of Labor Statistics					
						1994 injury and illness rate		1996 Injury and illness rate		Percent change, 1994–96	
		FY1992	FY1996	Percent change		Total	Lost-workday rate	Total	Lost-workday rate	Total	Lost-workday rate
Indiana	2,826.9	4,762	3,208	–32.6	11.3	11.3	4.9	9.7	4.2	–14.2	–14.3
Iowa	1,383.6	948	648	–31.6	4.7	10.8	4.8	9.8	4.4	–9.3	–8.3
Kentucky	1,679.6	1,503	1,400	–6.9	8.3	10.6	5.0	8.7	4.1	–17.9	–18.0
Maryland	2,215.7	2,222	1,795	–19.2	8.1	6.8	3.4	5.4	2.6	–20.6	–23.5
Mississippi	1,094.8	742	469	–36.8	4.3	–	–	–	–	–	–
New Jersey	3,660.8	3,180	1,397	–56.1	3.8	6.9	3.2	5.8	2.6	–15.9	–18.8
New York	7,952.0	9,730	5,641	–42.0	7.1	5.5	2.8	4.9	2.4	–10.9	–14.3
South Dakota	350.2	175	87	–50.3	2.5	–	–	–	–	–	–
Vermont	276.2	646	529	–18.1	19.2	–	–	–	–	–	–
Virginia	3,159.3	2,579	2,222	–13.8	7.0	7.3	3.3	6.3	2.8	–13.7	–15.2
Wisconsin	2,620.8	1,935	829	–57.2	3.2	11.5	5.1	10.4	4.6	–9.6	–9.8
Wyoming	222.7	744	359	–51.7	16.1	–	–	–	–	–	–
Puerto Rico	–	1,450	1,604	10.6	–	4.7	3.9	4.4	3.5	–6.4	–10.3
District of Columbia	619.7	328	261	–20.4	4.2	–	–	–	–	–	–

	National Council on Compensation Insurance									
	1992		1994		1996		Percent change, 1992–96		Percent change, 1994–96	
	Lost-time claims (number)	Frequency per constant worker	Lost-time claims (number)	Frequency per constant worker	Lost-time claims (number)	Frequency per constant worker	Lost-time claims	Frequency per constant worker	Lost-time claims	Frequency per constant worker
With mandatory safety and health programs under workers' compensation										
Arkansas[1]	11,584	67.3	7,922	61.4	6,171	47.6	–46.7	–29.3	–22.1	–22.5
California[2]	–	–	–	–	–	–	–	–	–	–
Connecticut[3]	22,464	48.8	16,315	44.2	14,291	36.8	–36.4	–24.6	–12.4	–16.7
Louisiana[4]	6,440	42.9	5,631	30.8	5,738	29.7	–10.9	–30.8	1.9	–3.6
Maine[5]	9,581	35.5	7,688	32.8	6,523	33.4	–31.9	–5.9	–15.2	1.8
Minnesota[6]	–	–	–	–	–	–	–	–	–	–
Montana[7]	1,024	27.3	1,454	28.5	1,882	23.8	83.8	–12.8	29.4	–16.5
Nebraska[8]	8,949	61.6	7,571	60.3	6,405	51.1	–28.4	–17.0	–15.4	–15.3
New Hampshire[9]	7,963	47.9	6,110	40.0	5,200	36.3	–34.7	–24.2	–14.9	–9.3
North Carolina[10]	25,027	40.8	14,403	42.1	11,712	33.4	–53.2	–18.1	–18.7	–20.7
Oklahoma[11]	9,751	43.8	7,705	42.3	7,879	39.8	–19.2	–9.1	2.3	–5.9
Pennsylvania[12]										
Tennessee[13]	23,818	41.2	16,496	39.1	11,157	30.7	–53.2	–25.5	–32.4	–21.5
Texas[14]										
Utah[15]	5,064	63.3	3,848	49.2	3,953	43.4	–21.9	–31.4	2.7	–11.8
West Virginia[16]	–	–	–	–	–	–	–	–	–	–
With mandatory safety and health programs under State OSHA or other State statute[17]										
Alaska[18]										
Florida[19]	5,793	35.4	5,381	29.5	4,141	24.7	–28.5	–30.2	–23.0	–16.3
Hawaii[20]	20,759	26.1	9,973	21.7	11,465	21.4	–44.8	–18.0	15.0	–1.4
Michigan[21]	16,373	71.1	14,527	58.0	6,552	38.7	–60.0	–45.6	–54.9	–33.3
Nevada[22]	38,155	38.6	31,596	36.4	26,737	31.5	–29.9	–18.4	–15.4	–13.5
Oregon[23]	–	–	–	–	–	–	–	–	–	–
Washington[24]	27,473	59.1	28,000	53.7	24,841	45.2	–9.6	–23.5	–11.3	–15.8
	–	–	–	–	–	–	–	–	–	–

Table 4. Continued—Injury and illness rates, 1994–96, and workers' compensation claims, 1992, 1994, and 1996, by jurisdiction and safety and health program requirement category

Jurisdiction	National Council on Compensation Insurance									
	1992		1994		1996		Percent change, 1992–96		Percent change, 1994–96	
	Lost-time claims (number)	Frequency per constant worker	Lost-time claims (number)	Frequency per constant worker	Lost-time claims (number)	Frequency per constant worker	Lost-time claims	Frequency per constant worker	Lost-time claims	Frequency per constant worker
With voluntary safety and health programs under workers' compensation[25]										
Alabama	14,809	48.3	6,773	39.0	4,261	43.1	–71.2	–10.8	–37.1	10.5
Colorado	22,506	44.9	20,378	37.9	17,234	33.8	–23.4	–24.7	–15.4	–10.8
Kansas	4,006	64.4	10,405	64.7	8,491	54.8	–39.4	–14.9	–18.4	–15.3
Massachusetts	–	–	–	–	–	–	–	–	–	–
Missouri	41,472	61.9	27,728	58.3	15,546	40.4	–62.5	–34.7	–43.9	–30.7
New Mexico	6,432	30.5	3,829	21.7	4,468	23.3	–30.5	–23.6	16.7	7.4
North Dakota	–	–	–	–	–	–	–	–	–	–
Ohio	–	–	–	–	–	–	–	–	–	–
Rhode Island	4,816	31.3	3,319	29.9	4,285	34.3	–11.0	9.6	29.1	14.7
South Carolina	12,576	65.5	9,561	65.8	8,857	52.6	–29.6	–19.7	–7.4	–20.1
Without comprehensive safety and health program requirements										
Arizona	10,681	32.1	11,118	30.9	9,331	24.7	–12.6	–23.1	–16.1	–20.1
Delaware	–	–	–	–	–	–	–	–	–	–
Georgia	24,525	45.2	13,633	42.2	11,470	33.3	–53.2	–26.3	–15.9	–21.1
Idaho	8,234	36.7	8,684	36.7	6,904	28.9	–16.2	–21.3	–20.5	–21.3
Illinois	66,086	35.6	57,283	33.8	47,163	28.5	–28.6	–19.9	–17.7	–15.7
Indiana	29,112	49.7	25,755	46.4	22,161	40.7	–23.9	–18.1	–14.0	–12.3
Iowa	20,668	61.4	17,272	60.5	14,819	50.8	–28.3	–17.3	–14.2	–16.0
Kentucky	14,000	66.3	10,070	68.3	5,504	42.9	–60.7	–35.3	–45.3	–37.2
Maryland	17,964	57.0	14,343	57.4	12,902	45.7	–28.2	–19.8	–10.0	–20.4
Mississippi	8,823	60.0	4,974	58.2	4,385	45.8	–50.3	–23.7	–11.8	–21.3
New Jersey	–	–	–	–	–	–	–	–	–	–
New York	–	–	–	–	–	–	–	–	–	–
South Dakota	3,827	49.0	3,204	50.2	2,778	40.2	–27.4	–18.0	–13.3	–19.9
Vermont	4,503	55.1	3,865	58.2	3,199	45.4	–29.0	–17.6	–17.2	–22.0
Virginia	20,116	44.2	15,805	42.9	12,321	31.7	–38.8	–28.3	–22.0	–26.1
Wisconsin	65,386	57.4	56,550	47.4	47,615	41.9	–27.2	–27.0	–15.8	–11.6
Wyoming	–	–	–	–	–	–	–	–	–	–
Puerto Rico	–	–	–	–	–	–	–	–	–	–
District of Columbia	2,810	33.1	2,254	34.5	1,689	28.1	–39.9	–15.1	–25.1	–18.6

NOTE: Dash indicates data not available.

[1]Employers with above-average injury and illness rate.

[2]Employers with above-average injury and illness rate; programs also implemented by State OSHA.

[3]Employers with above-average injury and illness rate.

[4]Employers with more than 15 employees; 15 percent of establishments, more than 75 percent of employees.

[5]Employers with injury and illness rate at least twice the average.

[6]Employers with more than 25 employees; programs also implemented without size limitation through State OSHA.

[7]Employers with more than 5 employees; 35 percent of establishments, 85 percent of employees.

[8]All employers.

[9]Employers with more than 10 employees; 20 percent of establishments, 80 percent of employees.

[10]Employers with injury and illness rates 1.5 times the average; programs also implemented through State OSHA.

[11]Employers with injury and illness rates 1.25 times the average; voluntary program coexists.

[12]Self-insured employers; voluntary program coexists.

[13]Employers with above-average injury and illness rate.

[14]Employers with "extrahazardous" workplaces; affects less than 1 percent of establishments.

[15]Employers with above-average injury and illness rate.

[16]Employers with above-average injury and illness rate.

[17]Excluding California, Minnesota, and North Carolina, which have mandatory programs under workers' compensation.

[18]All employers.

[19]Employers with more than 10 employees and employers with high rates; 20 percent of establishments, 80 percent of employees (limited State enforcement).

[20]All employers.

[21]Construction industry only.

[22]Employers with more than 10 employees; 25 percent of establishments, 85 percent of employees.

[23]Employers with more than 10 employees and employers with high rates; 20 percent of establishments, 80 percent of employees.

[24]All employers.

[25]Excludes Oklahoma and Pennsylvania, which also have mandatory programs under workers' compensation, and Oregon, which also has a mandatory program under a State OSHA.

rates. Between 1994 and 1996, the national days-away-from-work rate dropped by more than 21 percent, to 2.2, the lowest rate ever recorded. Table 6 presents the rates and the degrees of reduction for 38 States and Puerto Rico.

5. Program administration. In many States, reforms have addressed the amount of time and resources used to resolve disputes over benefits. Mechanisms to facilitate settlement, such as mandatory arbitration or mediation, are now being encouraged. They result in cost savings by getting the injured worker back to the workplace faster and reducing attorneys' fees.

Improvements in the administration of workers' compensation systems have been recorded in Hawaii with the creation of a special unit in the State labor department to improve the administration of claims filed.[18] In New York, legislative reform mandates the reduction of excessive paperwork in the claims process.

The introduction of cost-reducing incentives and reforms (competition and accountability, for example) has affected the administration of the insurance market. In Hawaii, a nonprofit insurance corporation to cover small businesses facing high premiums has been established. Administrative improvements have reduced the size of the residual market. In Massachusetts, following legislative reforms, the assigned risk pool for workers' compensation insurance, as a percentage of total market premiums, dropped from 66 percent in 1992 to 20 percent in 1996.[19] In 1995, Virginia's assigned risk market represented 24.3 percent of the total market. By 1996, the share had fallen to 15.7 percent, a 35-percent reduction; the number of employers in the assigned risk market decreased by 9 percent.[20]

Effects of reforms. Relying on data from the National Council on Compensation Insurance, the Insurance Industry Institute has documented the fact that States which passed comprehensive workers' reforms have experienced significant reductions in their premium rates in recent years. For example, employers in Montana experienced a rate drop of 14.6 percent in 1996, following legislative changes enacted in 1993 and 1995 that targeted fraud, workplace safety, and managed health care. In a number of States, after a period of chronically high and escalating rates in the 1980s, a succession of rate cuts followed workers' compensation reforms in the 1990s. Continuing declines were experienced in 1996 in Maine (a 10.9-percent reduction), Kansas (11.5 percent), Massachusetts (12.2 percent), Minnesota (24 percent), Michigan (15.7 percent), North Carolina (15.3 percent), and Illinois (13 percent).

In Oregon, following the implementation of a 1990 law promoting workplace safety programs, tightening compensation requirements, and revamping disputed settlement procedures, the State has experienced a rate reduction each year since 1991. In Mississippi, an antifraud emphasis, an increased attention to workplace safety, and reforms affecting the assigned risk pool led to rate declines that were expected to save $25.5 million during 1996–97. And in California, it was estimated that legislative changes in the State's workers' compensation program which took place in 1993 would result in a premium savings of almost $2 billion by 1995. Deregulation affecting the rates charged by the State's more than 300 insurers was also credited with contributing to savings.

Finally, the Insurance Industry Institute, again citing data from the National Council on Compensation Insurance, reported that claim costs between 1980 and 1990 increased 11 percent each year, on average, compared with an average annual increase of less than 2 percent for the 1991–95 period. The Institute identified successful employer efforts to prevent accidents as a reason for the decline.[21]

The broad decline in occupational injury and illness rates between 1992 and 1996 was a phenomenon that affected virtually all States for which data exist. Among 37 jurisdictions (36 States and the District of Columbia) for which the National Council on Compensation Insurance maintains data, 36 recorded reductions in the number of lost-work-time claims filed between 1992 and 1996 (the lone exception was Mon-

Table 5. Mean and median injury and illness rates, 1996, and percent change in rates, by State safety and health program requirement category, 1994–96

Safety and health program requirement category	Mean injury and illness rate, weighted by employment, 1996	Mean percent change in injury and illness rate, weighted by employment, 1994–96	Median injury and illness rate, 1996	Median percent change in injury and illness rate, 1994–96
States with mandatory safety and health programs under workers' compensation	7.0	–13.2	8.0	–11.3
States with mandatory safety and health programs under State OSHA[1]	8.6	–9.6	8.4	–9.7
States with voluntary safety and health programs under workers' compensation[2]	7.5	–12.3	7.3	–14.5
States without comprehensive safety and health program requirements	6.8	–14.9	6.2	–14.0

[1]Excluding California, Minnesota, and North Carolina, which are included in the first category .

[2]Excluding Oklahoma and Pennsylvania, which are included in the first category, and Oregon, which is included in the second.

tana); and 33 jurisdictions posted reductions in the value of claims paid. (See table 7.) All 39 jurisdictions (38 States plus Puerto Rico) for which the Bureau of Labor Statistics has publishable data had declines in either total rates, lost-workday rates, or both between 1994 and 1996. The impact of mandatory, as opposed to voluntary, State occupational safety and health program requirements was not significantly correlated with the rate declines. (See table 5.) Occupational safety and health programs were being implemented by establishments in all States for a variety of motives, not the least of which was cost containment.

During the period 1992–96, the average value of lost-worktime claims rose in 34 of the 37 jurisdictions for which the National Council on Compensation Insurance has data. (See table 7.) (In three States—Maine, New Mexico, and Rhode Island—the average value of claims paid declined.) This statistic reflects the impact of higher deductible amounts for medical costs under workers' compensation programs, which have resulted in a sharp drop in the number of minor lost-time claims recorded by insurance companies. Eliminating many minor cost claims has greatly reduced the number of claims in the National Council's reporting system, while simultaneously increasing the average cost of those claims which remain. The deductible amount, however, does not absolve an employer from recording an incident on OSHA reports collected by the Bureau of Labor Statistics. Increases in deductibles have contributed to a rise in the rate of lost-workday cases involving restricted work activity only. The rate for such restricted workday cases rose from 0.7 case per 100 workers in 1990 to 1.1 cases in 1996.[22]

Accordingly, the various reform initiatives brought about by State workers' compensation legislation, including the implementation of safety and health programs and reforms having to with medical care costs, insurance fraud, and administrative procedures, are seen as causal factors in explaining the decline in the occupational injury and illness rate in the 1990s. Accident cost containment is held to be the primary motive behind a nationwide industry adoption of safety and health programs (mandatory and voluntary, as well as statutory and nonstatutory) that contributed to injury and illness rate reductions during this period.

Table 6. Rates of injuries and illnesses involving days away from work in 38 States and Puerto Rico, 1994 and 1996

Jurisdiction	1994	1996	Percent change
United States	2.8	2.2	–21.4
Alabama	3.0	2.5	–16.7
Alaska	3.8	3.6	–5.3
Arizona	2.8	2.0	–28.6
Arkansas	2.7	2.1	–22.2
California	2.7	2.1	–22.2
Connecticut	2.9	2.5	–13.8
Delaware	2.3	1.9	–17.4
Florida	2.5	2.0	–20.0
Georgia	2.5	1.7	–32.0
Hawaii	4.6	3.3	–28.3
Indiana	3.4	2.6	–23.5
Iowa	3.1	2.4	–22.6
Kansas	2.7	2.2	–18.5
Kentucky	3.7	2.4	–35.1
Louisiana	2.2	2.1	–4.5
Maine	3.3	2.5	–24.2
Maryland	2.8	2.1	–25.0
Massachusetts	2.5	2.3	–8.0
Michigan	3.0	2.4	–20.0
Minnesota	2.4	2.2	–8.3
Missouri	2.8	2.1	–25.0
Montana	2.8	2.7	–3.6
Nebraska	3.0	2.4	–20.0
Nevada	3.3	2.3	–30.3
New Jersey	2.9	2.1	–27.6
New Mexico	2.7	2.3	–14.8
New York	2.6	2.2	–15.4
North Carolina	2.4	1.9	–20.8
Oklahoma	3.3	3.0	–9.1
Oregon	3.0	2.6	–13.3
Puerto Rico	3.9	3.5	–10.3
Rhode Island	3.1	2.7	–12.9
South Carolina	2.1	1.6	–23.8
Tennessee	3.0	2.4	–20.0
Texas	2.4	2.0	–16.7
Utah	2.7	2.2	–18.5
Virginia	2.5	1.9	–24.0
Washington	3.5	3.1	–11.4
Wisconsin	3.7	3.0	–18.9

SOURCE: Bureau of Labor Statistics.

Industry recognition of hazards

In addition to legislative and administrative changes in State workers' compensation programs, industry interest in greater risk management, reduction in the number of accidents, and prevention of injuries in the workplace increased during the period under review. According to research carried out by the insurance industry, there was an upsurge of interest in process redesign, safety training, the enforcement of safety rules, and improved housekeeping: "Taking Massachusetts as an example, the Boston-based Workers Compensation Research Institute estimates that in that [S]tate about half of the cost reductions stemmed from legislative and administrative improvements, and as much as 30 percent was due to the actions of employers and insurers, independent of reform measures."[23] Within the insurance industry, Chubb Insurance Company published a guide for developing and maintaining a safety program for businesses.[24]

During the 1990s, Internet accessibility and advertising have facilitated the promotion of workplace safety and health programs. The National Council on Compensation Insurance, Inc., has taken a leadership role in this campaign. Headquartered in Boca Raton, Florida, the Council is the Nation's largest corporation providing information about workers' com-

pensation and health care. The company provides database products, software, publications, and consultation services to State funding agencies, self-insureds, independent bureaus, agents, regulatory authorities, legislatures, and more than 700 other insurance companies. Industry outreach and educational campaigns typically feature the financial benefits to be gained by reducing work-related accidents and injuries.

The National Council's message has received dramatically increased attention through Internet advertising. A recent search using the Internet search engine "Webcrawler" and the keywords "OSHA inspections" produced a listing of almost 5,000 sites, a large proportion of which were consulting firms offering employers their services to conduct onsite safety inspections designed to identify and eliminate workplace hazards. Apparently, the advance in information technology in the 1990s has facilitated the promotion of safety and health reform in U.S. workplaces and has contributed to the decline in injury and illness rates.

The results of a survey conducted in June 1995 by the Insurance Research Council, Inc., in cooperation with the National Federation of Independent Business Education Foundation, provides documentation showing that there has been an increase in awareness of the problem of workplace injuries and illnesses among medium-sized and small businesses.[25] This survey of about 3,200 owners of such businesses found that 45 percent of the firms that were sampled considered workplace safety a significant problem or one of the most serious problems facing management. Most business owners sampled (73 percent) believed that their employees had a strong or somewhat strong commitment to workplace safety.

The sampled firms averaged more than five different actions taken to increase workplace safety in the 5 years preced-

Table 7. Number and value of workers' compensation claims paid in 36 States and the District of Columbia, 1992, 1994, and 1996

[Value in millions of dollars]

Jurisdiction	1992		1994		1996		Percent change, 1992–96		Percent change, 1994–96		Average value of claims paid		
	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	1992	1994	1996
Alabama	14,809	$241.2	6,773	$128.9	4,261	$99.9	–71.2	–58.6	–37.1	–22.5	$16,288	$19,034	$23,434
Alaska	5,793	111.8	5,381	103.1	4,141	97.1	–28.5	–13.2	–23.0	–5.8	19,299	19,157	23,444
Arizona	10,681	189.8	11,118	192.8	9,331	190.5	–12.6	.4	–16.1	–1.2	17,769	17,339	20,418
Arkansas	11,584	142.5	7,922	97.3	6,171	84.9	–46.7	–40.5	–22.1	–12.8	12,305	12,287	13,754
Colorado	22,506	494.1	20,378	505.0	17,234	491.7	–23.4	–.5	–15.4	–2.6	21,954	24,782	28,531
Connecticut	22,464	350.1	16,315	300.4	14,291	234.3	–36.4	–33.1	–12.4	–22.0	15,586	18,409	16,397
District of Columbia	2,810	64.5	2,254	57.5	1,689	43.8	–39.9	–32.0	–25.1	–23.8	22,945	25,512	25,960
Florida	20,759	670.5	9,973	396.4	11,465	487.8	–44.8	–27.3	15.0	23.1	32,300	39,746	42,544
Georgia	24,525	511.6	13,633	315.1	11,470	271.1	–53.2	–47.0	–15.9	–14.0	20,861	23,112	23,635
Hawaii	16,373	305.8	14,527	246.1	6,552	127.0	–60.0	–58.5	–54.9	–48.4	18,675	16,940	19,388
Idaho	8,234	113.6	8,684	125.2	6,904	119.3	–16.2	5.0	–20.5	–4.7	13,795	14,415	17,275
Illinois	66,086	1,095.4	57,283	983.9	47,163	902.3	–28.6	–17.6	–17.7	–8.3	16,576	17,176	19,132
Indiana	29,112	314.4	25,755	308.8	22,161	289.6	–23.9	–7.9	–14.0	–6.2	10,800	11,990	13,066
Iowa	20,668	191.6	17,272	180.9	14,819	178.6	–28.3	–6.8	–14.2	–1.3	9,269	10,473	12,050
Kansas	14,006	169.8	10,405	147.5	8,491	135.2	–39.4	–20.4	–18.4	–8.4	12,125	14,178	15,918
Kentucky	14,000	206.4	10,070	165.0	5,504	101.4	–60.7	–50.9	–45.3	–38.5	14,741	16,384	18,421
Louisiana	6,440	181.1	5,631	174.1	5,738	146.9	–10.9	–18.9	1.9	–15.6	28,116	30,911	25,601
Maine	9,581	149.2	7,688	106.5	6,523	91.3	–31.9	–38.8	–15.2	–14.3	15,575	13,847	13,994
Maryland	17,964	290.0	14,343	264.2	12,902	253.5	–28.2	–12.6	–10.0	–4.0	16,141	18,419	19,648
Michigan	38,155	701.1	31,596	640.2	26,737	630.6	–29.9	–10.1	–15.4	–1.5	18,376	20,263	23,587
Mississippi	8,823	127.8	4,974	84.9	4,385	83.1	–50.3	–35.0	–11.8	–2.1	14,488	17,076	18,953
Missouri	41,472	468.2	27,728	368.6	15,546	262.5	–62.5	–43.9	–43.9	–28.8	11,289	13,292	16,886
Montana	1,024	22.0	1,454	31.9	1,882	55.3	83.8	151.4	29.4	73.2	21,469	21,948	29,366
Nebraska	8,949	125.5	7,571	115.1	6,405	111.2	–28.4	–11.4	–15.4	–3.4	14,019	15,200	17,363
New Hampshire	7,963	125.6	6,110	117.2	5,200	105.7	–34.7	–15.9	–14.9	–9.8	15,779	19,179	20,329
New Mexico	6,432	105.6	3,829	66.5	4,468	59.5	–30.5	–43.6	16.7	–10.4	16,425	17,365	13,328
North Carolina	25,027	458.2	14,403	286.9	11,712	266.2	–53.2	–41.9	–18.7	–7.2	18,310	19,922	22,725
Oklahoma	9,751	180.6	7,705	153.0	7,879	220.8	–19.2	22.3	2.3	44.3	18,521	19,858	28,023
Oregon	27,473	447.6	28,000	473.2	24,841	434.3	–9.6	–3.0	–11.3	–8.2	16,293	16,902	17,484
Rhode Island	4,816	84.1	3,319	54.2	4,285	59.9	–11.0	–28.7	29.1	10.6	17,456	16,331	13,986
South Carolina	12,576	172.8	9,561	141.6	8,857	139.9	–29.6	–19.0	–7.4	–1.2	13,742	14,808	15,800
South Dakota	3,827	55.6	3,204	53.1	2,778	54.4	–27.4	–2.1	–13.3	2.4	14,524	16,588	19,597
Tennessee	23,818	411.9	16,496	317.2	11,157	225.2	–53.2	–45.3	–32.4	–29.0	17,295	19,228	20,181
Utah	5,064	59.1	3,848	44.7	3,953	57.0	–21.9	–3.5	2.7	27.7	11,668	11,605	14,431
Vermont	4,503	72.4	3,865	63.8	3,199	56.1	–29.0	–22.5	–17.2	–12.1	16,075	16,514	17,529
Virginia	20,116	429.6	15,805	367.1	12,321	339.9	–38.8	–20.9	–22.0	–7.4	21,354	23,227	27,586
Wisconsin	65,386	576.8	56,550	576.2	47,615	560.3	–27.2	–2.9	–15.8	–2.7	8,821	10,189	11,768

SOURCE: National Council on Compensation Insurance.

ing the survey. The six most common actions, each undertaken by a majority of the firms, were as follows:

- provided personal safety equipment
- provided safety-related training
- installed safety controls or other devices on equipment
- conducted an indepth inspection for hazards
- adopted written safety rules
- purchased safer equipment.

The business owners identified providing safety-related training, providing protective equipment, and having a safety committee (one of the less common actions adopted) as the most effective actions taken to increase workplace safety.

According to respondents of the survey, the cost of workers' compensation insurance and the "right thing to do" were the two most important motivations for taking action to increase safety. Also important were long-term profitability, complying with Federal and State safety regulations, having had too many accidents, and employee morale. Anomalously, the survey found that a large proportion of small-business owners were not aware of the impact of workers' compensation experience ratings on their insurance costs. Had they been, the survey might have documented an even stronger embrace of safety reforms and programmatic initiatives.

Hazard identification and reform efforts have been high on the agendas of several industrial and building trades unions. The most active unions seeking reform include the United Automobile Workers; Steelworkers; Oil, Chemical, and Atomic Workers; Service Workers; State, County and Municipal Workers; Textile and Amalgamated Clothing Workers; Rubber Workers; United Food and Commercial Workers; United Paper Workers International; International Association of Machinists; Teamsters; Office and Professional Employees International; and Building Trades Unions, especially the Laborers International, International Brotherhood of Electrical Workers, International Union of Operating Engineers, Sheet Metal Workers International Association, and International Brotherhood of Painters and Allied Trades.

Unions have pursued their objective of safer workplaces through lobbying efforts in Washington, DC, or at the bargaining table. In a recent survey of major collective bargaining agreements, clauses requiring local-level labor-management safety and health committees were found in 29.4 percent of all contracts reviewed, a figure that was up from 26.5 percent 20 years earlier.[26]

Results of hazard assessments conducted as part of a comprehensive safety and health program, together with complementary activities of unions and insurance companies, have drawn attention to hazards that historically have not been the focus of traditional safety standards. OSHA standards such as those addressing machine guarding, electrical safety, fire prevention, equipment design, and flammable and pressurized materials continue to be important in the prevention of injuries. However, partly due to the general acceptance and widespread adoption of these standards, a growing proportion of injuries and illnesses currently occurring, such as those associated with lifting, repetitive stress, trips and slips, and violence, are not specifically addressed by the standards. Site-specific comprehensive safety and health programs, together with further information and compliance assistance support activities, may be better suited to developing solutions to some types of hazards.

A growing awareness of workplace hazards among all affected parties, including unions, employers, and the insurance industry, apparently has translated into a will to take corrective action to address and reduce hazards. The effort to promote that awareness was facilitated by emerging Internet information technology. Combined with the will to change and a greater accessibility to expert guidance and recommendations for appropriate corrective workplace changes, this awareness has contributed to the recent reduction in workplace injury and illness rates.

OSHA measures to increase compliance

The level of OSHA field inspection activity has changed significantly over the past 10 years. While the number of compliance officers has remained relatively constant during the period, the number of inspections of establishments has declined, and compliance assistance services have increased. The shift in emphasis from inspections to compliance assistance began in the mid-1990s as a result of "reinvention" initiatives and congressional language attached to OSHA's appropriations. (See tables 8 and 9.)

Federal OSHA enforcement. In 1995, OSHA conducted 29,113 Federal inspections, compared with 42,377 in 1994, a 31-percent drop. The decline came about primarily from a change in focus in the construction sector that resulted in 9,703 fewer inspections. In part, the change was in response to critical congressional oversight and review.[27] During this period, consultation funds for States rose again to more than 10 percent

Table 8. Compliance assistance, fiscal years 1994–98

[Funding in thousands of dollars]

Fiscal year	Federal funding	Authorized staff	State funding	Total
1994	$12,992	93	$30,982	$43,974
1995	13,410	91	31,564	44,974
1996	34,822	266	32,479	67,301
1997	37,351	285	34,477	71,828
1998	43,927	285	35,373	79,300

Table 9. OSHA inspections and authorized compliance officers, fiscal years 1988–97

Fiscal year	Federal inspections			State plan 18(b) inspections	
	Total	Construction	Officers authorized	Total	Construction
1988	58,549	31,051	1,245	57,601	28,357
1989	54,679	28,837	1,277	57,481	26,240
1990	45,511	24,279	1,268	75,652	35,391
1991	42,113	22,336	1,290	82,484	36,200
1992	42,431	22,563	1,264	71,786	30,308
1993	39,536	20,298	1,220	62,199	24,585
1994	42,377	22,704	1,226	60,600	24,464
1995	29,113	13,001	1,234	60,573	23,926
1996	24,024	11,399	1,169	57,199	23,279
1997	34,264	18,280	1,235	56,623	22,582

of the OSHA annual budget, regaining their pre-1989 percentage share. (See table 10.)

In addition to the increasing contribution to funding for State consultation programs, Federal money for compliance assistance to States reached $35.4 million in fiscal year 1998, up from $31.0 million budgeted in fiscal year 1994. Direct Federal funding for compliance assistance increased substantially after fiscal year 1994 in response to the Presidential directive to "reward results, not red tape." In OSHA's case, that directive was implemented via programs such as the Voluntary Protection Program, focused inspections, waived penalties for "quick fix" violations, and reductions in penalties for "good faith" employer efforts. The programs represented an Agency effort to extend worker protection beyond the minimum required by OSHA standards. Employers were given a choice of partnership or traditional enforcement and were encouraged to implement comprehensive safety and health programs.

Three categories of Voluntary Protection Program were designed, to (1) recognize the outstanding achievement of those who had successfully incorporated comprehensive safety and health programs into total management systems, (2) motivate others to achieve excellent safety and health results in the same way, and (3) establish a relationship among employers, employees, and OSHA based on cooperation rather than coercion. In 1995, more than 200 sites participated in Federal and State Voluntary Protection Programs.

Participating sites do not have a schedule of inspections. Instead, highly qualified volunteers from the safety and health field conduct site inspections for OSHA. (Any employee complaints, serious accidents, or significant chemical releases that occur are handled according to routine enforcement procedures.) OSHA data indicate that firms which participate in the Voluntary Protection Program experience lost-workday rates that are generally 60 percent to 80 percent below industry averages.[28]

Beginning in 1994, OSHA began to experiment with a number of other reforms that affected compliance and inspection activity in the field. That year, under a focused-inspections program, OSHA encouraged employers in the construction industry to implement comprehensive safety and health programs. Where OSHA compliance officers found an effective program on-site, the Agency conducted an abbreviated inspection limited to the top four hazards that kill workers in the construction industry: falls from heights, electrocution, crushing (suffered, for example, during a cave-in of a trench), and being struck by material or equipment. Conversely, where a safety and health program did not exist or was ineffective, OSHA conducted a complete site inspection. The "choose your OSHA inspection" strategy received a positive reaction from construction industry employers and labor unions.

OSHA expanded its focused-inspections program in 1995 to target industry hazards outside of construction. Industries were chosen on the basis of their accident and illness rates and other historical data. OSHA worked with the targeted industries both to identify the most serious hazards in those industries, in order to focus attention upon them during inspections, and to encourage the industries to adopt effective safety and health programs. Effective programs were identified by reductions in accident rates.

Also in 1994–95, as part of its "reinvention" effort, OSHA began to recognize employers who demonstrated a high level of effective self-enforcement of safety and health requirements. For these employers, OSHA offered penalty reductions of up to 100 percent for violations. While the Agency's traditional policies already allowed reductions in penalties, the new program explicitly related such reductions to effective safety and health program reforms.

If OSHA determined, during the course of a workplace inspection, that an employer had implemented a superior safety and health program, it granted substantial reductions in the penalties that would otherwise be assessed for any violations found. Penalties were eliminated entirely for violations that did not involve significant safety or health threats to workers,

Table 10. OSHA budget and State consultation funding, fiscal years1988–98

[In thousands of dollars]

Fiscal year	Budget	Consultation	Percent of budget accounted for by consultation
1988	$235,474	$23,995	10.2
1989	247,746	24,181	9.8
1990	267,147	24,891	9.3
1991	285,190	25,354	8.9
1992	296,540	26,597	9.0
1993	288,251	28,541	9.9
1994	296,428	30,982	10.5
1995	311,660	31,564	10.1
1996	303,810	32,479	10.7
1997	324,955	34,477	10.6
1998	336,480	35,373	10.5

Table 11. Changes in injury and illness rates, 1994–96, lost-time claims, 1992–96, and inspections, 1992–96 and 1994–96, by State, ranked by 1996 total injury and illness rate

State	Nonfarm employment (thousands)	Bureau of Labor Statistics				National Council on Compensation Insurance	Federal and State OSHA inspections					Inspections per 10,000 employees, FY1996
		1996 injury and illness rate		Percent change, 1994–96		Percent change in lost-time claims, 1992–96	FY1992	FY1994	FY1996	Percent change		
		Total	Lost-workday rate	Total	Lost-workday rate					1992–96	1994–96	
New York	7,952.0	4.9	2.4	–10.9	–14.3	–	9,730	7,970	5,641	–42.0	–29.2	7.1
Maryland	2,215.7	5.4	2.6	–20.6	–23.5	–10.0	2,222	1,960	1,795	–19.2	–8.4	8.1
Delaware	379.3	5.6	2.5	–18.8	–26.5	–	160	122	183	14.4	50.0	4.8
New Jersey	3,660.8	5.8	2.6	–15.9	–18.8	–	3,180	2,594	1,397	–56.1	–46.1	3.8
South Carolina	1,678.6	5.9	2.5	–14.5	–13.8	–7.4	2,800	2,265	1,815	–35.2	–19.9	10.8
Louisiana	1,824.2	5.9	2.8	–4.8	–3.4	1.9	1,044	955	735	–29.6	–23.0	4.0
Georgia	3,546.4	6.1	2.7	–29.1	–28.9	–15.9	1,761	1,726	779	–55.8	–54.9	2.2
Massachusetts	3,064.7	6.1	3.1	–15.3	–11.4	–	2,223	2,198	1,582	–28.8	–28.0	5.2
Texas	8,319.0	6.3	3.1	–11.3	–11.4	–	5,698	6,144	2,981	–47.7	–51.5	3.6
Virginia	3,159.3	6.3	2.8	–13.7	–15.2	–22.0	2,579	3,324	2,222	–13.8	–33.2	7.0
California	12,888.3	6.6	3.4	–18.5	–15.0	–	15,480	12,645	10,689	–30.9	–15.5	8.3
North Carolina	3,599.5	6.7	3.0	–14.1	–14.3	–18.7	2,156	3,795	4,313	100.0	13.6	12.0
Hawaii	529.2	6.8	3.6	–21.8	–26.5	–54.9	1,802	755	910	–49.5	20.5	17.2
Florida	6,237.6	6.9	3.2	–13.8	–3.0	15.0	2,433	2,681	1,399	–42.5	–47.8	2.2
Rhode Island	444.2	7.1	3.6	–16.5	–12.2	29.1	461	467	208	–54.9	–55.5	4.7
New Mexico	696.4	7.3	3.2	–7.6	–5.9	16.7	553	833	688	24.4	–17.4	9.9
Connecticut	1,592.5	7.4	3.6	–12.9	–12.2	–12.4	1,605	1,380	1,066	–33.6	–22.8	6.7
Arizona	1,926.3	7.7	3.3	–7.2	–8.3	–16.1	2,547	2,436	1,342	–47.3	–44.9	7.0
Oklahoma	1,368.6	7.8	4.1	–11.4	.0	2.3	1,102	953	744	–32.5	–21.9	5.4
Oregon	1,491.7	7.8	3.8	–10.3	–9.5	–11.3	6,241	5,562	5,693	–8.8	2.4	38.2
Tennessee	2,542.1	8.0	3.8	–14.9	–11.6	–32.4	2,795	2,832	2,711	–3.0	–4.3	10.7
Arkansas	1,089.0	8.2	3.5	–12.8	–18.6	–22.1	798	846	567	–28.9	–33.0	5.2
Minnesota	2,441.6	8.4	3.7	–3.4	–2.6	–	–3,248	2,902	2,345	–27.8	–19.2	9.6
Nevada	859.3	8.4	3.4	–9.7	–19.0	–	2,160	1,505	1,262	–41.6	–16.1	14.7
Alaska	262.9	8.5	4.1	–3.4	–4.7	–23.0	1,215	714	408	–66.4	–42.9	15.5
Missouri	2,579.5	8.6	3.6	–15.7	–12.2	–43.9	1,854	1,667	515	–72.2	–69.1	2.0
Kentucky	1,679.6	8.7	4.1	–17.9	–18.0	–45.3	1,503	1,382	1,400	–6.9	1.3	8.3
Montana	360.8	8.9	3.3	–1.1	3.1	29.4	391	405	351	–10.2	–13.3	9.7
Utah	965.3	8.9	3.3	–6.3	–13.2	2.7	705	1,140	1,184	67.9	3.9	12.3
Kansas	1,242.4	8.9	4.0	–9.2	–4.8	–18.4	518	892	197	–62.0	–77.9	1.6
Alabama	1,831.0	8.9	4.0	–3.3	–2.4	–37.1	1,342	1,207	548	–59.2	–54.6	3.0
Maine	541.0	9.4	4.8	–10.5	–14.3	–15.2	660	583	389	–41.1	–33.3	7.2
Nebraska	839.2	9.7	3.8	–4.9	–11.6	–15.4	295	357	141	–52.2	–60.5	1.7
Indiana	2,826.9	9.7	4.2	–14.2	–14.3	–14.0	4,762	3,442	3,208	–32.6	–6.8	11.3
Iowa	1,383.6	9.8	4.4	–9.3	–8.3	–14.2	948	785	648	–31.6	–17.5	4.7
Washington	2,434.9	10.3	3.9	.0	–7.1	–	8,452	5,790	7,705	–8.8	33.1	31.6
Wisconsin	2,620.8	10.4	4.6	–9.6	–9.8	–15.8	1,935	2,006	829	–57.2	–58.7	3.2
Michigan	4,369.8	10.6	4.9	–7.8	–5.8	–15.4	12,036	8,408	7,914	–34.2	–5.9	18.1
New Hampshire	565.9	–	–	–	–	–14.9	425	426	302	–28.9	–29.1	5.3
South Dakota	350.2	–	–	–	–	–13.3	175	120	87	–50.3	–27.5	2.5
Mississippi	1,094.8	–	–	–	–	–11.8	742	872	469	–36.8	–46.2	4.3
Pennsylvania	5,345.0	–	–	–	–	–	3,197	3,542	2,508	–21.6	–29.2	4.7
Illinois	5,694.9	–	–	–	–	–17.7	3,017	2,974	1,764	–41.5	–40.7	3.1
Colorado	1,913.2	–	–	–	–	–15.4	1,263	956	1,023	–19.0	7.0	5.3
Vermont	276.2	–	–	–	–	–17.2	646	765	529	–18.1	–30.8	19.2
Idaho	497.7	–	–	–	–	–20.5	491	415	221	–55.0	–46.7	4.4
Wyoming	222.7	–	–	–	–	–	744	386	359	–51.7	–7.0	16.1
North Dakota	310.3	–	–	–	–	–	299	245	169	–43.5	–31.0	5.4
Ohio	5,316.5	–	–	–	–	–	3,430	3,369	1,952	–43.1	–42.1	3.7
West Virginia	700.7	–	–	–	–	–	546	784	481	–11.9	–38.6	6.9

NOTE: Dash indicates data not available or (for percent change) calculation could not be made.

SOURCE: Bureau of Labor Statistics, National Council on Compensation Insurance, and Occupational Safety and Health Administration.

and citations were not issued for any such violations that were corrected during the course of the inspection. For employers who had less effective programs in place, but who were making good-faith efforts to comply with OSHA regulations, the Agency introduced a sliding scale of incentives.

Recognized elements of an effective safety and health program included a commitment to the program by management, meaningful employee involvement in the development and implementation of the program, training for workers and supervisors, diligent efforts to identify potential hazards in the workplace, and effective measures to prevent or control such hazards. The program had to be effective in practice and not just on paper. As evidence of the program's effectiveness, OSHA expected to find that the workplace had a verifiable low injury and illness rate, that the workplace had not been cited in the past 3 years for the gravest types of violations (willful, repeat, failure-to-abate, and high-gravity, serious violations), that there was documentation of an ongoing program to identify hazards, and that those hazards which were identified were corrected in a timely fashion.

The decline in the number of Federal field inspections reflected a major refocusing of OSHA's efforts to reduce workplace accidents. The extent to which the decline in injury and illness rates was influenced by this change in direction is difficult to quantify. As noted above, the audit of 1996 OSHA safety and health records found no increase in the extent of underreporting of accidents and illnesses over the 1986 level. If a significant increase in underreporting had been found, the decline in the number of inspections could have been viewed as a contributing factor to poor recordkeeping, and the rate decline might have been dismissed as illusory.

In sum, the increase in OSHA consultation and compliance assistance services during the period the occupational injury and illness rates declined, in combination with the focused inspections, indicates that the compliance assistance approach has been effective. But the unique influence of voluntary workplace safety and health programs on reducing injury and illness rates is very difficult to measure, given the concurrent activity in worker compensation reform. Nevertheless, a case can be made that the compliance assistance approach and the more selective compliance inspection approach introduced by OSHA during the 1994–96 period did contribute positively to the reduction in accident rates.

State OSHA enforcement. Inspection activity among the 23 State OSHA agencies during the 1994–96 period was similar to the Federal pattern, declining from 71,786 inspections in fiscal year 1992 to 57,199 in fiscal year 1996. Following the Federal OSHA example, States cut back substantially on construction inspections, which fell from 30,308 in fiscal year 1992 to 23,279 in fiscal year 1996. Table 11 shows the number of inspections by State, ranked by the 1996 total injury and illness rate.

Between fiscal years 1992 and 1996, the number of safety and health inspections declined in all States except Delaware (where the number increased from 160 inspections in 1992 to 183 in 1996), North Carolina (from 2,156 to 4,313), New Mexico (from 553 to 688), and Utah (from 705 to 1,184). Inspections in Puerto Rico also increased, from 1,450 in 1992 to 1,604 in 1996. By the latter year, the number of inspections in Puerto Rico exceeded the cumulative number of inspections conducted that same year in eight States: South Dakota (87), Nebraska (141), North Dakota (169), Delaware (183), Kansas (197), Rhode Island (208), Idaho (221), and New Hampshire (302). In 1996, only two States had inspection rates that exceeded 30 per 10,000 employees: Oregon (38.2) and Washington (31.6). No other State reached a rate of 20. (See table 11.)

The redirection in effort from compliance inspections with traditional regulatory enforcement to compliance assistance and consultation was clearly reflected in the general decline in the number of State inspections over the period 1992–96. The decline was not accompanied by an increase in occupational injury and illness rates. Instead, rates declined largely in response to legislative changes in State workers' compensation programs and the implementation of workplace safety and health programs, which the redirection of Federal and State OSHA efforts helped to promote.

OSHA reform efforts during this period (made, in part, in response to criticisms from the Congress and encouragement from the White House) affected the Agency's inspection strategy and resulted in a renewed emphasis on outreach, partnering, and working cooperatively with employers to address workplace hazards. The change in approach complemented market influences affecting industry, namely, escalating costs for workers' compensation programs and the dawning realization that corrective action was needed to reduce workplace accidents. The OSHA reforms reinforced and supported industry initiatives and contributed to the decline in occupational injury and illness rates. □

Footnotes

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[1] Peter Dorman, *Markets and Mortality* (Cambridge, U.K., Cambridge University Press, 1996), p. 15.

[2] *Occupational Injuries and Illnesses: Counts, Rates, and Characteristics, 1992*, Bulletin 2455 (Bureau of Labor Statistics, April 1995).

[3] Compare Joseph R. Meisenheimer II, "The services industry in the 'good' versus 'bad' jobs debate," *Monthly Labor Review*, February 1998, pp. 22–47.

[4] Memorandum from Jim Maddux, Office of Statistics, Occupational Safety and Health Administration, Apr. 1, 1998.

[5] William M. Eisenberg and Helen McDonald, "Evaluating workplace injury and illness records; testing a procedure," *Monthly Labor Review*, April 1988, pp. 58–60; see especially p. 59.

[6] *Norwood Plans BLS Action to Improve Occupational Safety and Health Data*, News Release USDL-87-444 (Bureau of Labor Statistics, Oct. 16, 1987).

[7] Interview with David Schmidt, Office of Statistics, Occupational Safety and Health Administration, May 28, 1998.

[8] Commonwealth of Pennsylvania, "Workers' Compensation Reform: The Bottom Line Is Jobs," on the Internet at **http://www.state.pa.us/PA_Exec/Governor/wcleg3.html** (visited Aug. 15, 1996).

[9] Insurance Industry Institute, "Workers Compensation," May 1998; an updated version is on the Internet at **http://www.iii.org/media/issues/workers.html.**

[10] *Lost-Worktime Injuries and Illnesses: Characteristics and Resulting Time Away from Work, 1996*, News Release USDL 98-157 (Bureau of Labor Statistics, Apr. 23, 1998).

[11] Results of this analysis may be obtained from the authors.

[12] State Insurance Fund, New York, Mar. 17, 1998. Workers' compensation rates were reduced an average of 26.2 percent from 1996 to 1997 as a result of legislative reforms passed in 1996. Changes included requirements for employers with poor safety records (an experience rating above 1.2) to adopt safety programs or face tough new sanctions, the creation of a new Workers' Compensation Inspector General with broad investigative powers, making workers' compensation fraud a felony punishable by time in jail, expanded use of managed care to treat workplace injuries, and the reduction of excessive paperwork in the claims process.

[13] Insurance Industry Institute, "Workers Compensation."

[14] *Ibid.*

[15] News release, Office of Governor, Trenton, New Jersey, Oct. 16, 1997. Workers' compensation insurance premiums will be reduced for the third consecutive year; beginning January 1998, rates will be reduced by an average of 9.3 percent. Contributing factors to the reductions that were cited in the news release were stepped-up workplace safety efforts by employers to reduce the number and severity of work-related injuries and a decline in the cost of providing medical services by insurers through the use of quality managed care. The 9.3-percent reduction for 1998 follows reductions of 11.2 percent in 1997 and 3.6 percent in 1996.

[16] Announcement by National Council on Compensation Insurance, Inc., Feb. 19, 1997.

[17] Nina Munk, "Can't lift boxes? Then sweep the floors," *Forbes*, Nov. 4, 1996, on the Internet at **http//www.forbes.com/forbes/110496/5811167a.htm**.

[18] *Honolulu Star-Bulletin*, Honolulu, Hawaii, Oct. 3, 1997. Workers' compensation rates were reduced by 10.5 percent beginning Nov. 1, 1997; this figure follows a reduction of 27 percent last year. Legislative reforms since 1995 credited with the reductions are the formation of a nonprofit insurance corporation to cover small businesses facing high premiums, the creation of the aforementioned special unit in the State labor department, and the creation of incentives for employers who set up prevention programs.

[19] Massachusetts Department of Industrial Accidents, Feb. 13, 1998. Workers' compensation legislative reforms were enacted in 1991, and costs are expected to drop even further as the reforms continue to work. Rates charged to employers for workers' compensation insurance will decrease by 21.1 percent in 1998, the fourth year in a row with a reduction and the largest reduction yet. The number of claims filed has been reduced from more than 40,000 to 22,000.

[20] National Council on Compensation Insurance, Inc., July 1, 1997, announcement of changes in Virginia workers' compensation.

[21] Insurance Industry Institute, "Workers Compensation."

[22] *Workplace Injuries and Illnesses in 1996*, News Release USDL 97-453 (Bureau of Labor Statistics, Dec. 17, 1997), p. 3.

[23] Insurance Industry Institute, "Workers Compensation."

[24] "Small Business Best Practices for Workplace Safety," in *The Rewards of Managing Risk: A Guide for Entrepreneurs and Managers* (Warren, NJ, Chubb Group, 1997), also on the Internet at **http://www.chubb.com.businesses/entguide.html**.

[25] Insurance Research Council, in cooperation with the National Federation of Independent Business Education Foundation, *Motivating Safety in the Workplace*, survey carried out June 1995; available from the Insurance Research Council, Inc., 211 S. Wheaton Ave., Suite 410, Wheaton, IL 60187.

[26] George R. Gray, Donald W. Myers, and Phyllis S. Myers, "Collective bargaining agreements: safety and health provisions," *Monthly Labor Review*, May 1998, pp. 13–35.

[27] *OSHA Potential to Reform Regulatory Enforcement Efforts*, GAO/T-HEHS-96-42 (General Accounting Office, Oct. 17, 1995).

[28] *OSHA Inspections*, revised edition, OSHA 2098 (Occupational Safety and Health Administration, 1996), p. 14.

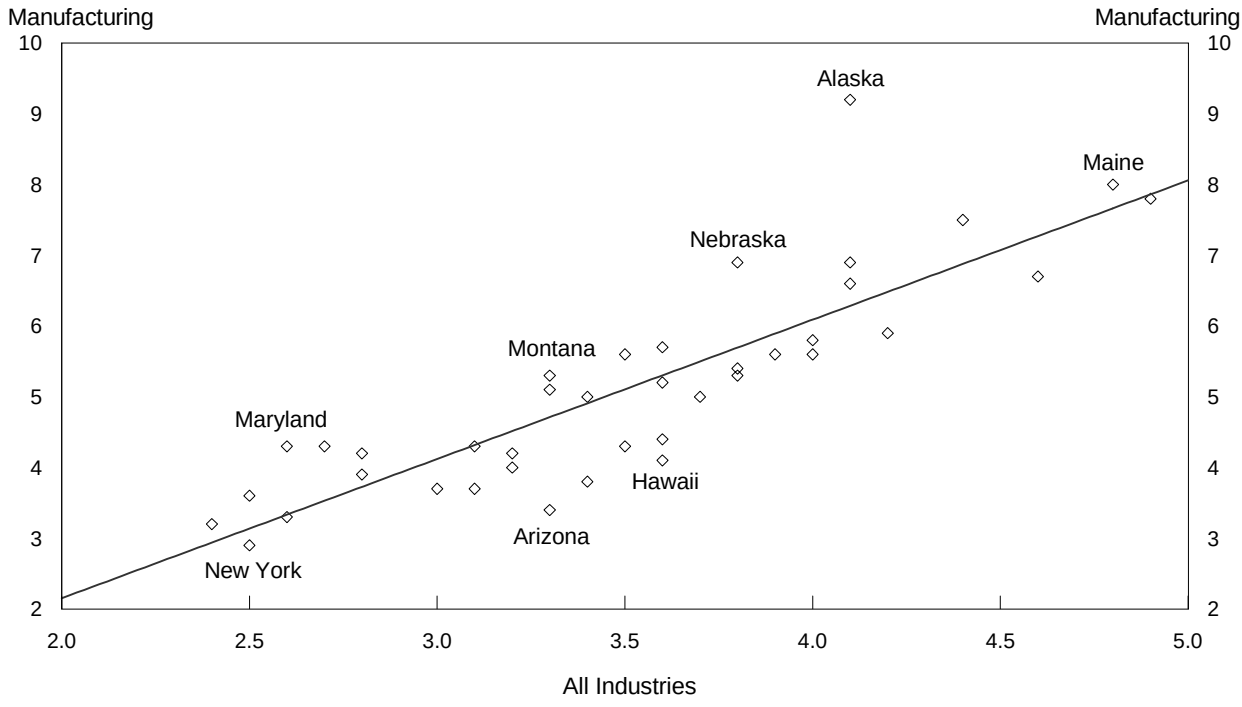
APPENDIX: Data analysis

In addition to relying on data from the BLS annual publication *Occupational Injuries and Illnesses: Counts, Rates, and Characteristics*, the analysis in this article was based on previously unpublished data from the following sources:

- Bureau of Labor Statistics, occupational injury and illness rates, by industry, for 38 States and Puerto Rico, 1994–96.
- Office of Statistics, U.S. Occupational Safety and Health Administration, four-digit level of industrial detail, occupational injury and illness rates, 1989–96.
- Office of Statistics, OSHA, preliminary results from the Eastern Research Group/OSHA compliance audits of 1996 recorded injury and illness cases in 250 establishments.
- National Council on Compensation Insurance, lost-time claim counts, average cost per claim, and frequency per constant worker, for 36 States and the District of Columbia, 1992–96.
- OSHA, Integrated Management Information System Internet file, total establishment inspections, by State, for fiscal years 1992 and 1996.

BLS State-level data were reviewed to determine the importance of industry rate changes on data at that level. Chart A-1 compares the relationships between lost-workday injury and illness rates in manufacturing and construction with the all-industry rate, by State, for 1996. In general, the match was closer for manufacturing than for construction. A comparison of the percent reductions in the manufacturing and construction rates between 1994 and 1996 reveals that neither industry division consistently followed State all-industry rate changes, although the changes were similar in scope and direction for the industry divisions. (See chart A-2.)

Chart A–1. **Lost-workday injury and illness rates, all industries versus manufacturing and construction, 1996, 38 States and Puerto Rico**



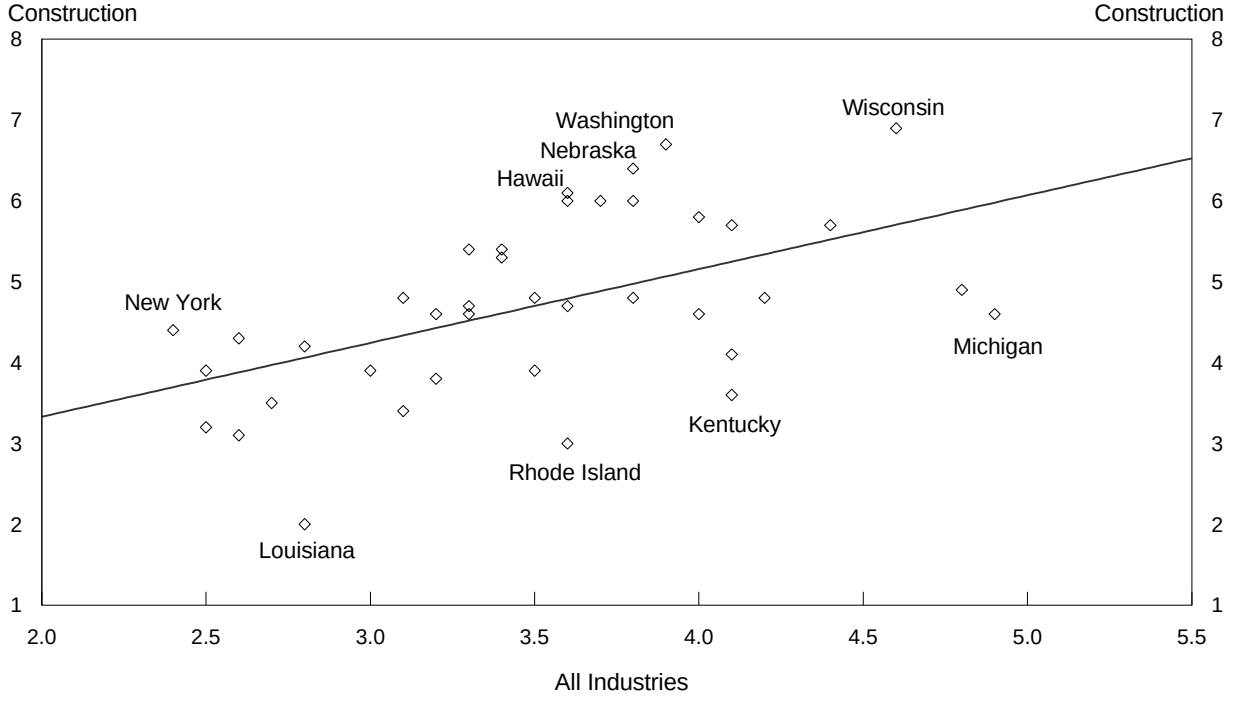
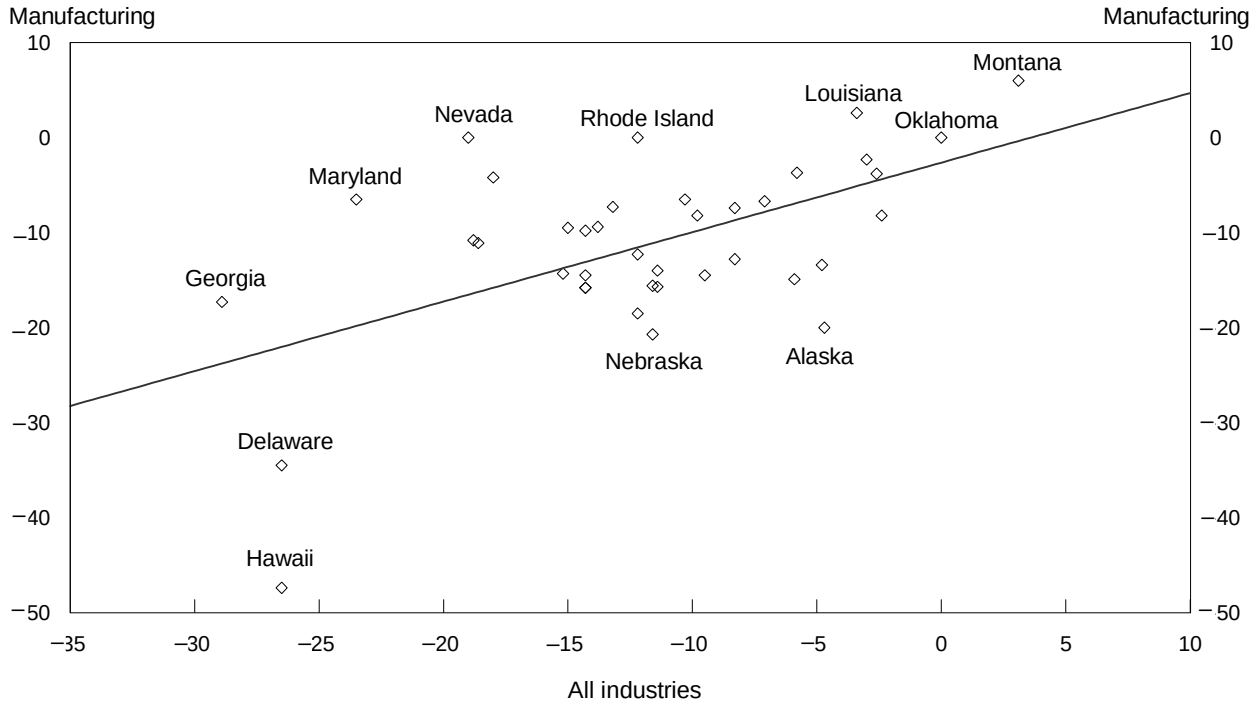


Chart A–2. **Percent reduction in lost-workday injury and illness rates, all industries versus manufacturing and construction, 1994–96, 38 States and Puerto Rico**



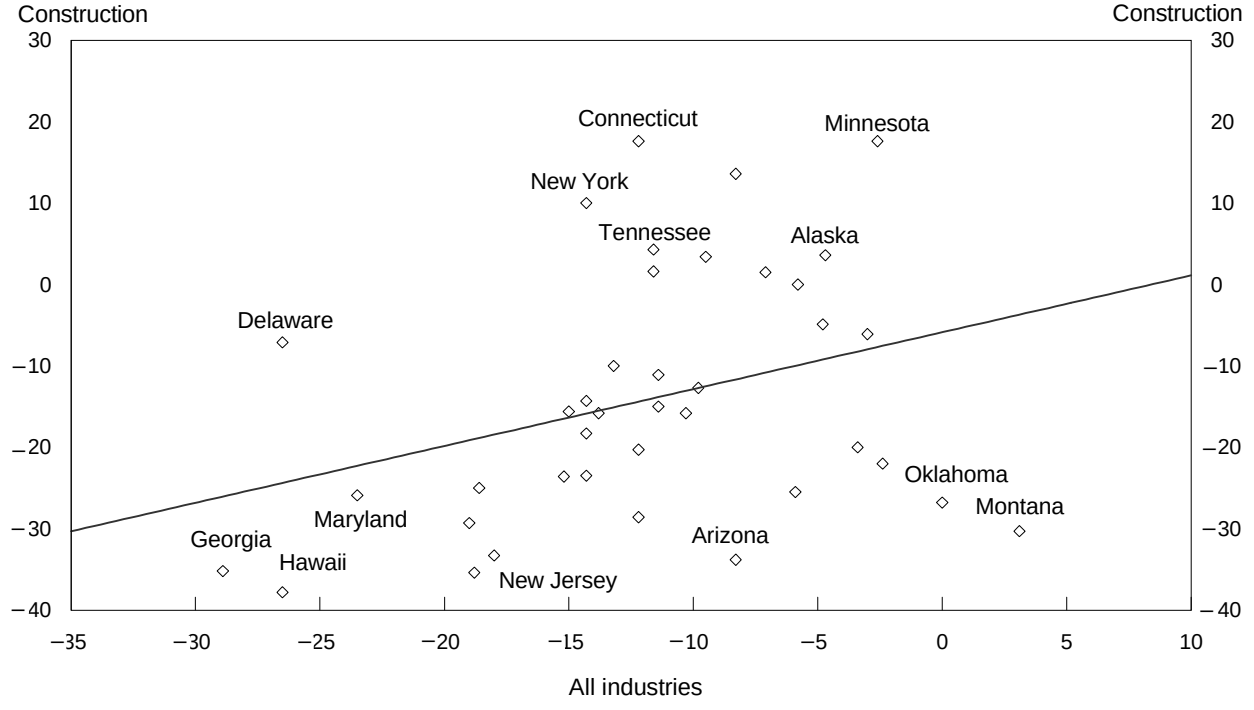


Chart A–3. **Lost-workday injury and illness rates, all industries, 1994, and percent reduction, 1994–96, 38 States and Puerto Rico**

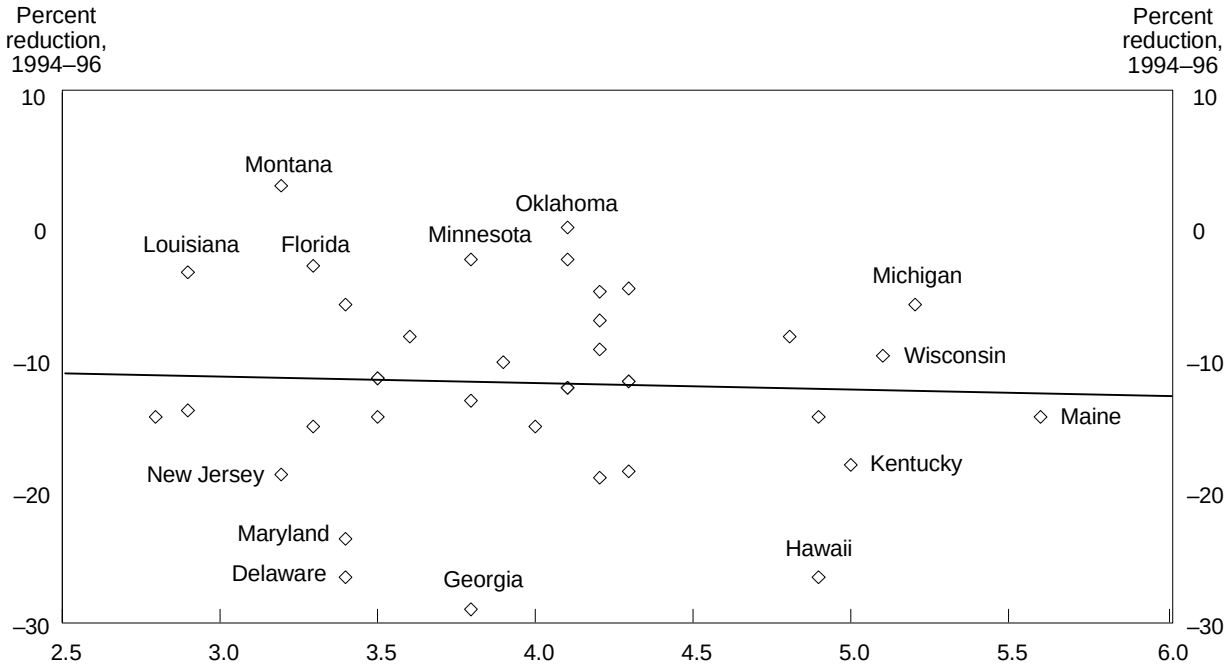


Chart A–4. **Percent change in lost-time claims rate and in frequency per constant worker, 1992–96, 36 States and District of Columbia**

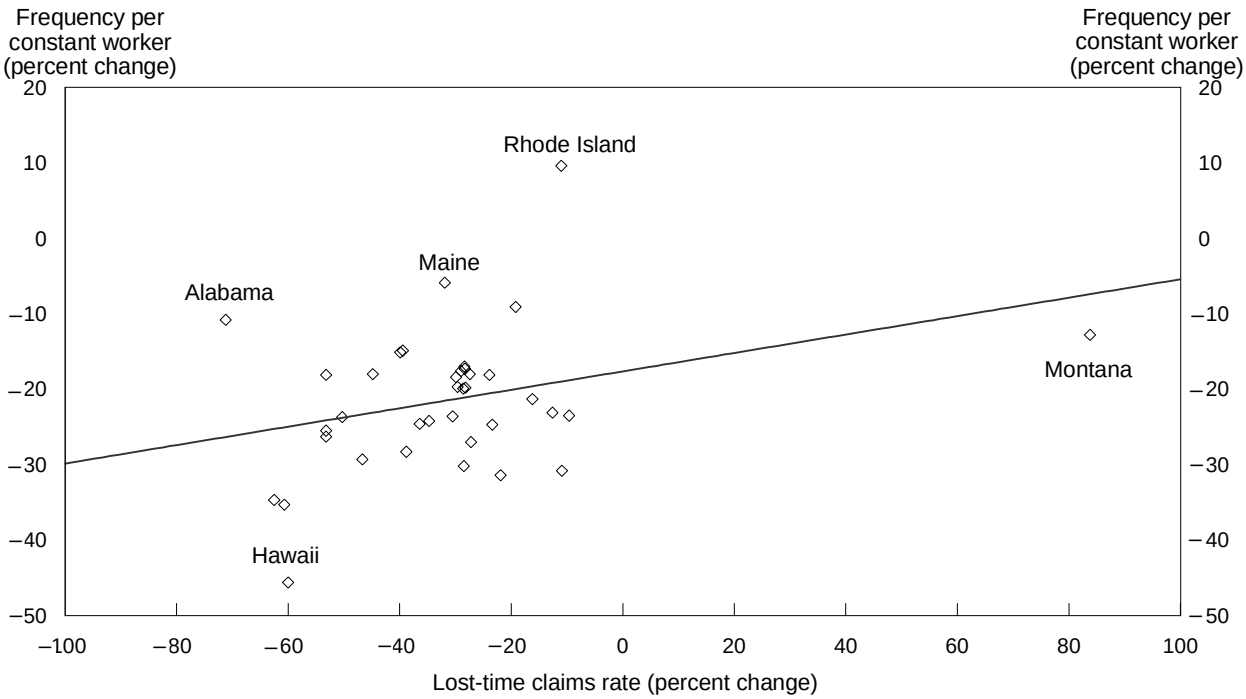
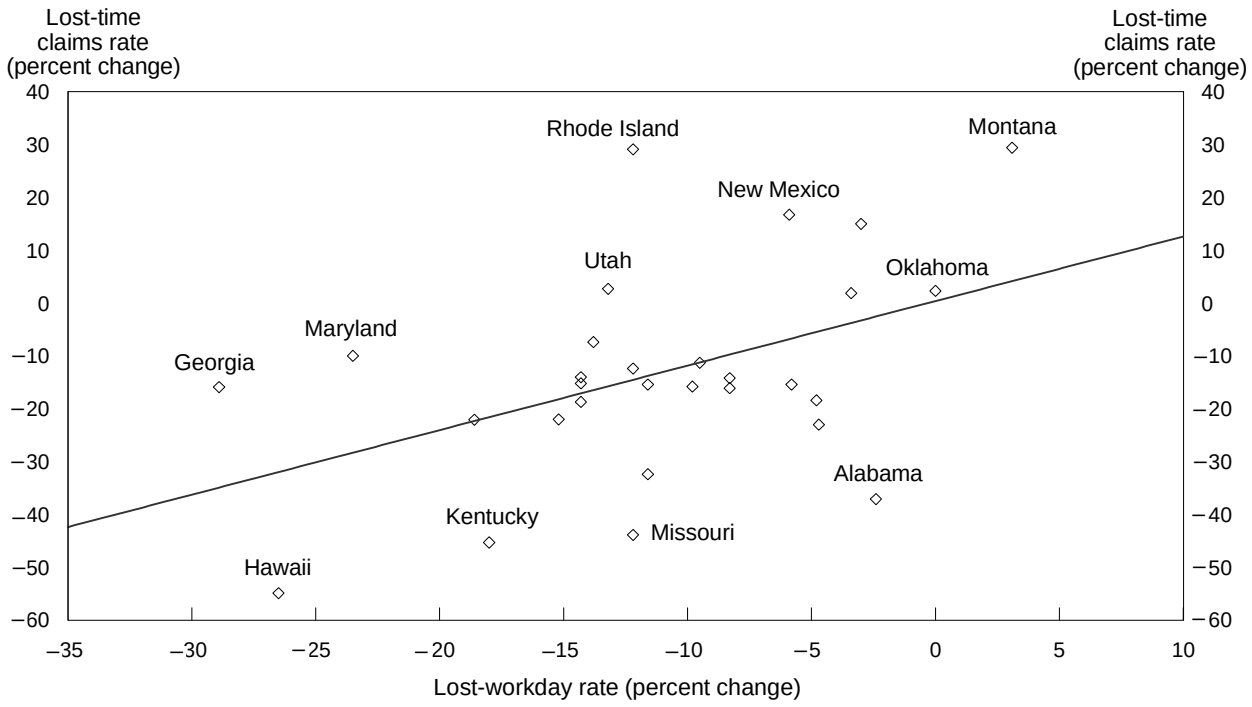


Chart A–5. Percent change in BLS lost-workday rate and in National Council on Compensation Insurance lost-time claims rate, 1994–96, 29 States



An interesting finding was the absence of a relationship between the 1994–96 State rate declines and the level of States' 1994 lost-workday injury and illness rates. The presumption that States with higher rates were likely to experience greater rate reductions than States with lower rates was not borne out by the analysis: rate reductions of 10 percent to 20 percent were as likely to have been registered in a State with a low injury and illness rate as in a State with a high rate. (See chart A-3.)

In comparing the internal consistency between lost-time claims count data and data on the frequency per constant worker, both data sets from the National Council on Compensation Insurance (see chart A-4), the relationship was generally seen to be consistent and reflected the sharp drop in National Council claims after 1992. A comparison of BLS lost-workday injury and illness rate changes from 1994 to 1996 tracked reasonably well with the percent change in the lost-time claims from the Council over the same years. (See chart A-5.) Given the large decline in those claims and the increase in popularity of higher medical deductibles, a close fit between the two rate changes was not expected. The relationship was found to be statistically significant at the 0.05 level with a Pearson correlation coefficient of 0.458.

The significant reduction in the number of lost-time claims reflected in the National Council State data, together with the increase in the average value of claims paid (see table 7), made it appear that minor lost-workday injuries and illnesses were decreasing and that the remaining cases were more serious and of longer duration and higher cost. BLS data for 1992 and 1996, however, did not support this inference. Median days away from work decreased between those years, from 6 to 5, for occupational injuries and illnesses involving days away from work.[1] The proportion of cases of short duration (under 3 days) increased from 28.6 percent to 29.8 percent; the reverse was found (a decrease from 26.1 percent to 24.7 percent) for cases involving 21 days or more away from work. Apparently, the BLS data indicate that not only is the incidence of lost-workday injuries and illnesses declining, but the severity of the remaining cases is also declining. This statistic should be closely monitored in subsequent BLS annual reports.

Footnote to the appendix

[1] *Lost-Worktime Injuries and Illnesses: Characteristics and Resulting Time Away from Work, 1996*, News Release USDL 98-157 (Bureau of Labor Statistics, Apr. 23, 1998), table 10.