ELSEVIER

Hospital Employee Assault Rates Before and After Enactment of the California Hospital Safety and Security Act

CARRI CASTEEL, PHD, CORINNE PEEK-ASA, PHD, MARYALICE NOCERA, MSN, JAMIE B. SMITH, MA, JAMES BLANDO, PHD, SUZI GOLDMACHER, MSN, EMILY O'HAGAN, MPH, DAVID VALIANTE, PHD, AND ROBERT HARRISON, PHD

PURPOSE: This study examines changes in violent event rates to hospital employees before and after enactment of the California Hospital Safety and Security Act in 1995.
METHODS: We compared pre- and post-initiative employee assault rates in California ($n = 116$) emergency departments and psychiatric units with those in New Jersey ($n = 50$), where statewide workplace violence initiatives do not exist. Poisson regression with generalized estimating equations was used to compare assault rates between a 3-year pre-enactment period (1993–1995) and a 6-year post-enactment period (1996–2001) using New Jersey hospitals as a temporal control.
RESULTS: Assault rates among emergency department employees decreased 48% in California post-enactment, compared with emergency department employee assault rates in New Jersey (rate ratio [RR] = 0.52, 95% confidence interval [CI]: 0.31, 0.90). Emergency department employee assault rates decreased in smaller facilities (RR = 0.46, 95% CI: 0.21, 0.96) and for-profit-controlled hospitals (RR = 0.39, 95% CI: 0.19, 0.79) post-enactment. Among psychiatric units, for-profit-controlled hospitals (RR = 0.41, 95% CI: 0.19, 0.85) and hospitals located in smaller communities (RR = 0.44, 95% CI: 0.21, 0.92) experienced decreased assault rates post-enactment.
CONCLUSION: Policy may be an effective method to increase safety to health care workers.
Ann Epidemiol 2009;19:125–133.

KEY WORDS: Violence, Hospitals, Legislation.

INTRODUCTION

Hospital and health care workers are at high risk for work-related assault, particularly those providing emergency and psychiatric care (1–3). Most perpetrators of the violent events are patients (2, 4, 5), and patient care assistants such as aides and orderlies are at greatest risk of physical violence (5, 6).

A growing awareness of the magnitude and severity of violence to in-hospital and community workers, and the lack of security measures to protect workers, resulted in the 1993 release of "Guidelines for Security and Safety of Health Care and Community Service Workers" by the California Occupational Safety and Health Administration (Cal/OSHA) (7). The Guidelines provided recommendations for implementing a comprehensive security plan, including environmental modifications, work practice changes, implementation of policies and practices, training, use of security and law enforcement, management commitment, employee involvement, risk assessments and integration with the security program, and surveillance of violent events. Although the guidelines were recommendations only, California mandated similar requirements through the California Hospital Safety and Security Act (Assembly Bill 508) passed in 1993.

The Hospital Safety and Security Act required acute care and psychiatric facilities to implement a comprehensive security plan by July 1, 1995. The Act states that comprehensive plans should include both prevention and response interventions involving the physical layout, staffing, security personnel availability, personnel policies, employee education and training, and reporting of violent events. It also specifies that facilities consider any guidelines or standards issued by the state, Cal/OSHA, or OSHA in developing their security plans, which include the "Guidelines for Security and Safety of Health Care and Community Service Workers."

Although no formal evaluation of the effectiveness of the California legislation to reduce violence to health care

From the Department of Epidemiology, University of North Carolina at Chapel Hill (C.C.); University of North Carolina Injury Prevention Research Center, Chapel Hill (C.C., M.N., J.B.S.); Department of Occupational and Environmental Health, University of Iowa, Iowa City, IA (C.P.-A.); University of Iowa Injury Prevention Research Center, Iowa City, IA (C.P.-A.); New Jersey Department of Health and Senior Services, Trenton, NJ (J.B., E.O.H., D.V.); and University of California, San Francisco (R.H.).

Address correspondence to: Carri Casteel, PhD, University of North Carolina at Chapel Hill, Department of Epidemiology, 137 E. Franklin Street, Suite 500, CB 7505, Chapel Hill, NC 27599-7505. E-mail: ccasteel@email.unc.edu.

Received April 7, 2008; accepted October 30, 2008.

360 Park Avenue South, New York, NY 10010

1047-2797/09/$–see front matter
doi:10.1016/j.annepidem.2008.10.009

AEP Vol. 19, No. 2
February 2009: 125–133

Selected Abbreviations and Acronyms

Cal/OSHA = California Occupational Safety and Health Administration
CI = Confidence interval
GAC = general acute care
OSHA = Occupational Safety and Health Administration
RR = rate ratio

workers exists, surveys administered to California Emergency Department nurse managers in 1990 ($n = 109$) and in 2000 ($n = 95$) found that most hospitals in the survey conducted in 2000 reported fewer verbal and physical threats, threats with a weapon, and other acts of violence, compared with hospitals in the 1990 survey (8). Nurse managers in the 2000 survey also reported increases in employee training and the use of protective measures, such as security officers, surveillance cameras, and procedures to search and monitor aggressive patients. In two more recent studies, Peek-Asa et al. (9) found that approximately 90% of hospital emergency departments and psychiatric units participating in an on-site survey between 2002 and 2005 had implemented at least some of the security provisions specified in the Guidelines and the legislation, although no hospitals were completely compliant.

Only one other state in the United States has enacted legislation to protect health care workers from violence. In 1999, Washington passed legislation requiring health care facilities, including psychiatric hospitals, to develop and implement programs and policies similar in content to that stated in the 1993 California legislation (10). No study has compared states that have passed legislation to those that have not to fully assess whether such initiatives are effective in reducing violent event rates to hospital employees.

The purpose of this study was to compare pre- and post-enactment employee assault rates in California emergency department and psychiatric units with those in New Jersey, where state-based workplace violence initiatives do not exist and are governed by the federal Occupational Safety and Health Administration only.

METHODS

Study Design

We conducted a 9-year pre-post study assessing the relationship of the Hospital Security Act to subsequent assault rates to general emergency department (i.e., excluding psychiatric emergency department) and psychiatric unit employees. We obtained baseline data for 3 years before the mandate (1993–1995) and 6 years of follow-up data (1996–2001). A 6-month lag period of enactment was incorporated into the post-initiative time period.

Study Population

A list of licensed acute care facilities in California and New Jersey was obtained from the California Office of Statewide Health Planning and Development and the New Jersey Department of Health and Senior Services, Health Care Quality and Oversight, respectively. New Jersey was selected as the comparison state because the distribution of hospital types within urban counties was similar to that of California. In addition, New Jersey did not have a statewide workplace violence prevention initiative for health care workers like the one passed in California; the state's health care sector was governed by Federal OSHA workplace violence prevention guidelines only. The study population is emergency department and psychiatric units of trauma and general acute care hospitals in California and New Jersey counties with at least 250,000 residents. Counties with fewer residents were not included because no comparably small counties exist in New Jersey.

Hospitals were sampled randomly to represent all hospitals in each respective state, by type and location. Hospital types included trauma facilities (levels I–IV), general acute care with less than 300 beds, and general acute care with 300 beds or more. For purposes of this study, we included only trauma level I and II hospitals because New Jersey did not have level III and IV facilities. Hospital locations were classified by urbanicity using county-level rural-urban continuum codes developed by the U.S. Department of Agriculture, Economic Research Service. Hospitals in California were sampled from 25 of 58 counties, representing both urban and rural areas of the state, due to the size of the state. These counties covered approximately 68% of the California population and 65% of the state hospitals. Hospitals in New Jersey were sampled from all counties in the state. A detailed description of the sampling frame is provided in Peek-Asa et al. (9).

The study population included 95 hospitals in California and 46 hospitals in New Jersey. Of all eligible hospitals approached, the participation rate was 93% among California hospitals and 65% among New Jersey hospitals. The California Department of Health Services, which was the agency recruiting hospitals in California, has rights of access into workplaces. This likely resulted in the high participation rate among California hospitals, compared with New Jersey where the state health department does not have similar rights. In both states, eligible hospitals declining participation did not differ from participating hospitals, by hospital type or location.

Study Variables

The exposure variable was the enactment of the Hospital Safety and Security Act on July 1, 1995, represented by California hospitals as the intervention group and New Jersey

hospitals as a temporal control. The outcome variable was the rate of OSHA-recorded violent injuries per 100,000 employee hours per year for the years 1993–2001. The numerator for the rate was the number of reported violent events documented in hospital OSHA Logs or Employers' Reports of Occupational Injury or Illness where the location of injury (emergency department or psychiatric unit) could be identified. Violent events were defined as physical or psychological (e.g., verbal assaults) acts perpetrated against a hospital worker by a patient, visitor, employee, domestic acquaintance, and/or stranger. Because a standard definition for recording violent events in OSHA Logs and Employers' Reports does not exist across hospitals, we collected all events that resulted in physical contact and/or verbal assault of an employee. Violent event data were abstracted from OSHA Logs, Employers' Reports, and supporting documentation (e.g., hospital incident reports, supervisor's reports, security logs) at each participating hospital.

Most assaults abstracted from OSHA Logs and Employers' Reports were physical (90%), the remaining 10% being physical threats and verbal assaults and threats. Therefore, the assaults captured in this study represent the more severe events. This is due to OSHA Log and Employers' Report reporting requirements, where an employee injury is recorded only if he/she misses at least 1 full day of work or receives medical care beyond first aid.

The denominator was the total employee hours for workers employed by the hospital (i.e., contract employees were excluded). Denominator data were obtained electronically from the California Office of Statewide Health Planning and Development and abstracted from New Jersey Department of Health and Senior Services records. We used multiple imputation to impute employee hours data missing completely at random. Variables used to impute the missing data included state, hospital type and hospital location. On average, 13% of psychiatric department employee hour data were imputed from 1993 to 2001 (range = 5%–19%). Similarly, for emergency departments, 13% of the employee hour data were imputed (range = 12%–14%). By state, employee hour data were imputed for an average of 20% of California emergency departments and 23% of California psychiatric units between 1993–2001. For New Jersey hospitals, employee hour data were imputed for none of the emergency departments and for an average of 2% of the psychiatric units between 1993–2001.

Effect-measure modifiers examined in the study included the hospital department (emergency department, psychiatric unit), type of hospital (trauma levels I and II, general acute care with at least 300 beds, general acute care with fewer than 300 beds), hospital control (for profit vs. non-profit), and location of hospitals within metropolitan county (counties in metro areas of greater than or equal to a population of one million and counties in metro areas of a population less than one million). We selected these variables as potential modifiers due to differences in workplace violence security programs observed in the participating hospitals (9, 11).

Analysis

Descriptive analyses were conducted to examine the study samples by state and hospital department (emergency and psychiatric) for the pre and post-enactment periods of the Hospital Safety and Security Act. The pattern of employee assault rates over time was graphed and then analyzed using Poisson regression generalized estimating equations to account for within hospital correlations of violent activity over time. Some hospitals, particularly in the pre-initiative period, did not have OSHA Logs for abstracting violent event data because OSHA only requires hospitals to keep their logs for 3 years. However, 82% of the California hospitals and 76% of the New Jersey hospitals had more than 3 years of OSHA Log data available. Hospitals with and without complete OSHA Log data did not differ by the potential effect-measure modifiers examined in the study, with the exception of hospital control (for profit vs. non-profit) differences in the pre-initiative period (1993–1995). Hospitals included in the analysis had complete violent event data on an annual basis. All analyses were conducted using SAS version 9.1 (SAS Institute, Cary, NC). PROC MI was used for imputing missing employee hours data.

This study was approved by the University of North Carolina Public Health-Nursing Institutional Review Board.

RESULTS

Emergency Departments

In California, assault data from OSHA Logs and Employers' Reports of Occupational Injury and Illness were available for 62 (53%) of the 116 eligible emergency departments during the pre-enactment period and for 93 (80%) of the eligible emergency departments post-enactment (Table 1). In New Jersey, 14 (28%) of the eligible 50 emergency departments had assault data available pre-enactment, and 45 (90%) had data available post-enactment. The majority of emergency departments in both California and New Jersey were in general acute care facilities with fewer than 300 beds, located in metropolitan counties with population less than one million, and non-profit controlled.

Overall, employee assault rates in California hospital emergency departments decreased from 0.68 assaults per 100,000 employee hours per year in the pre-enactment period to 0.60 post-enactment, whereas employee assault rates in New Jersey increased from 0.55 assaults pre-enactment to 0.62 assaults post-enactment (Table 1). Assault rates decreased between the pre- and post-enactment time

TABLE 1. Frequency of assaults to employees in CA and NJ emergency departments in the pre-enactment and post-enactment periods of the California Hospital Safety and Security Act

	Time period											
	Pre-enactment (1993–1995)						Post-enactment (1996–2001)					
	CA			NJ			CA			NJ		
Hospital characteristic	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*
Total hospitals	62	0.43 (80 k)	0.68	14	0.42 (100 k)	0.55	93	0.44 (79 k)	0.60	45	0.61 (122 k)	0.62
Hospital type[†]												
Trauma	11 (17.7)	0.82 (176 k)	0.31	4 (8.3)	0.42 (114 k)	0.38	17 (21.5)	0.74 (164 k)	0.39	9 (20.9)	0.49 (180 k)	0.30
GAC ⩾300 beds	13 (21.0)	0.18 (71 k)	0.21	1 (58.3)	0.00 (117 k)	0.00	20 (18.3)	0.40 (85 k)	0.52	9 (20.9)	0.64 (132 k)	0.49
GAC <300 beds	38 (61.3)	0.41 (55 k)	0.95	7 (33.3)	0.50 (81 k)	0.83	56 (60.2)	0.35 (52 k)	0.69	25 (58.1)	0.64 (95 k)	0.78
Hospital control[‡]												
For profit[§]	19 (32.8)	0.70 (121 k)	0.80	1 (9.1)	0.00 (117 k)	0.00	25 (28.1)	0.78 (103 k)	0.89	2 (4.9)	0.67 (172 k)	0.28
Non-profit[#]	39 (67.2)	0.25 (59 k)	0.58	10 (90.9)	0.52 (92 k)	0.74	64 (71.9)	0.30 (69 k)	0.49	39 (95.1)	0.62 (112 k)	0.66
Metropolitan County population[‡]												
<One million	44 (75.9)	0.41 (86 k)	0.59	6 (54.5)	0.33 (110 k)	0.46	67 (75.3)	0.50 (85 k)	0.63	27 (65.9)	0.69 (123 k)	0.68
One million +	14 (24.1)	0.37 (58 k)	0.83	5 (45.5)	0.63 (75 k)	0.92	22 (24.7)	0.26 (58 k)	0.52	14 (34.1)	0.49 (100 k)	0.56

Avg. = average; CA = California; NJ = New Jersey; GAC = general acute care.
*Assault rates calculated per 100,000 employee hours.
[†]Two hospital systems in NJ are excluded.
[‡]Four pre- and post-enactment hospitals in CA and four post-enactment NJ hospitals have missing data for Hospital Control and Metro County Population variables.
[§]Government non-federal or investor owned.
[#]Non-government owned.

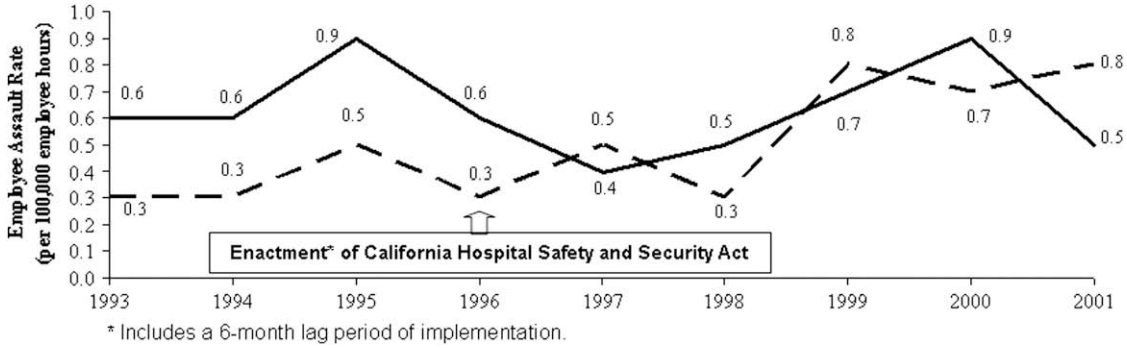

FIGURE 1. "California" is the solid line, "New Jersey" is the dashed line.

periods in the smaller (general acute care with fewer than 300 beds) emergency departments in both California and New Jersey and increased in the larger (general acute care with at least 300 beds) hospitals in both states. California and New Jersey hospital emergency departments located in metropolitan counties of at least one million population had higher employee assault rates pre-enactment than those located in populations with fewer than one million residents, whereas the reverse occurred post-enactment.

Assault rates were consistently higher in California during the pre-enactment period compared with New Jersey, whereas in the post-enactment period, the rates between states became more similar (Fig. 1). A slight decrease in assault rates in California is also observed before and after enactment of the legislation, as is an overall increase in assault rates in New Jersey beginning in 1998 and continuing through 2001. In addition, employee assault rates in the late 1990s began to increase in both states, which coincides with the rise of overcrowding in emergency departments nationally (12).

The employee assault rate in California emergency departments decreased 48% after enactment of the California health care legislation, compared with the employee assault rates in New Jersey emergency departments (rate ratio [RR] = 0.52, 95% confidence interval [CI]: 0.31, 0.90) (Table 2). The largest decrease by hospital type was among emergency departments in general acute care facilities with fewer than 300 beds, where employee assault rates in California decreased between the pre- and post-initiative time periods by 54%, compared with assault rates in New Jersey emergency departments (RR = 0.46, 95% CI: 0.21, 0.96). Post-enactment decreases in employee assault rates in the emergency departments of for-profit hospitals were found in California when compared with New Jersey (RR = 0.39, 95% CI: 0.19, 0.79).

Psychiatric Units

Employee assault data were available for 18 (51%) and 31 (89%) of the eligible 35 hospital psychiatric units in California in the pre- and post-enactment periods, respectively (Table 3). In New Jersey, assault data were available for 7 (20%) and 26 (100%) of the 26 eligible hospital psychiatric units in the pre- and post-enactment periods, respectively. Psychiatric units in both California and New Jersey were distributed fairly equally across hospital type. The majority of psychiatric units in both states were non-profit controlled and located in metropolitan county populations with fewer than one million people.

In both California and New Jersey, employee assault rates increased between the pre-post periods. In California, the assault rate increased from 2.06 assaults (per 100,000 employee hours per year) to 2.31 assaults, whereas in New Jersey, the assault rates increased from 0.42 to 1.09 assaults. Psychiatric units in all hospital types in California and New Jersey experienced an increase in employee assault rates between the pre- and post-enactment periods, with the exception of psychiatric units in California trauma facilities where a decrease from 3.57 assaults (per 100,000 employee hours per year) to 2.75 assaults was found (Table 3). A pre-post enactment decrease was found for psychiatric units in non-profit controlled hospitals in California, although an increase was found in similar New Jersey hospital psychiatric units between the pre- and post-enactment periods. Pre-enactment employee assault rates were higher in hospital psychiatric units located in larger metropolitan counties in both California and New Jersey, whereas post-enactment assault rates were higher among hospital psychiatric units in smaller metropolitan counties.

Throughout the pre- and post-enactment periods, the psychiatric unit employee assault rates were higher in California than in New Jersey, and the pattern over time was similar across states (Fig. 2). Although assault rates among psychiatric unit employees increased in both states between the pre- and post-enactment time periods (Table 3), the increase in California was smaller than in New Jersey. In particular, the pre-post employee assault rates in California psychiatric units decreased 37%, compared with assault rates in New Jersey psychiatric units (RR = 0.63, 95% CI: 0.26,

AEP Vol. 19, No. 2
February 2009: 125–133

TABLE 2. RR and 95% CI of hospital employee assault rates before (1993–1995) and after (1996–2001) enactment of the California Hospital Safety and Security Act

	Emergency Department RR (95% CI)	Psychiatric Unit RR (95% CI)
State*		
CA	0.52 (0.31, 0.90)‡	0.63 (0.26, 1.52)
NJ	Reference	Reference
Hospital type†		
Trauma		
CA	0.97 (0.35, 2.66)	0.89 (0.24, 3.22)
NJ	Reference	Reference
GAC ⩾300 beds		
CA	0.83 (0.24, 2.91)	1.07 (0.33, 3.45)
NJ	Reference	Reference
GAC <300 beds		
CA	0.46 (0.21, 0.96)‡	0.65 (0.15, 2.82)
NJ	Reference	Reference
Hospital control†		
For profit		
CA	0.39 (0.19, 0.79)‡	0.41 (0.19, 0.85)‡
NJ	Reference	Reference
Non-profit		
CA	1.07 (0.43, 2.69)	2.18 (0.46, 10.27)
NJ	Reference	Reference
Metropolitan County population†		
<One million		
CA	0.49 (0.15, 1.34)	0.44 (0.21, 0.92)‡
NJ	Reference	Reference
One million†		
CA	0.56 (0.29, 1.08)	0.69 (0.24, 1.95)
NJ	Reference	Reference

CA = California; CI = confidence interval; GAC = general acute care; NJ = New Jersey; RR = rate ratio.
*Compares post- vs. pre-enactment of AB508 in CA with the post- vs. pre-enactment of AB508 in NJ. Reference is NJ.
†Compares post- vs. pre-enactment of AB508 in CA with the post- vs. pre-enactment of AB508 in NJ for each level of the modifier. Reference is NJ.
‡$p < 0.05$.

1.52) (Table 3). For-profit controlled hospitals in California experienced a 59% decrease in employee assaults in the psychiatric unit, compared with New Jersey psychiatric unit assault rates (RR = 0.41, 95% CI: 0.19, 0.85). A pre-post decrease in employee assault rates in hospital psychiatric units located in smaller metropolitan counties (<one million population) was found in California, compared with New Jersey (RR = 0.44, 95% CI: 0.21, 0.92).

DISCUSSION

If the differences we observed are attributable to the Hospital Safety and Security Act, it appears that the legislation may have had an impact on assault rates among emergency department employees in California, compared with assault rates among emergency department employees in New Jersey where specific statewide legislation does not exist. It would also seem that the legislation had an impact on employee assault rates in smaller general acute care facilities, hospitals located in smaller communities, and for-profit facilities.

Many of the smaller general acute care facilities in this study were for-profit and located in smaller communities. Therefore, the post-enactment decrease in employee assault rates in these facilities may likely be influenced by a combination of these conditions. Smaller hospitals, for example, may have been more sensitive to the California law because they have fewer levels of management between the administration and floor workers than larger hospitals, and are therefore able to implement changes more efficiently and consistently. For-profit hospitals have a vested interest in keeping legal exposure to law suits very low, thereby keeping their profits high. If a worker is assaulted on the job and sufficient policies and procedures are not in place in compliance to the law, then the worker has ample means to sue the hospital.

For approximately 1 and 1.5 years after enactment of the Hospital Safety and Security Act, rates of assault to emergency department employees decreased in California. In 1997, however, assault rates began to increase to pre-legislation levels. This suggests that the law may have a short-term effect on employee assaults and that enforcement of legislation is important to keep assault rates low.

TABLE 3. Frequency of assaults to employees in CA and NJ psychiatric units in the pre-enactment and post-enactment periods of the California Hospital Safety and Security Act

	Time period											
	Pre-enactment (1993–1995)						Post-enactment (1996–2001)					
	CA			NJ			CA			NJ		
Hospital characteristic	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*	No. hospitals (%)	Avg. no. of assaults (employee hr)	Avg. assault rate*
Total hospitals	18	3.24 (100 k)	2.06	7	0.28 (61 k)	0.42	31	2.42 (98 k)	2.31	26	0.65 (62 k)	1.09
Hospital type†												
Trauma	7 (33.3)	6.42 (126 k)	3.57	3 (50.0)	0.33 (81 k)	0.33	12 (38.7)	2.73 (117 k)	2.75	7 (29.2)	0.37 (82 k)	0.42
GAC ⩾300 beds	6 (27.8)	1.11 (83 k)	0.59	1 (16.7)	0.00 (49 k)	0.00	9 (29.0)	1.45 (79 k)	1.70	7 (29.2)	0.39 (50 k)	0.79
GAC <300 beds	5 (38.9)	1.33 (86 k)	1.72	2 (33.3)	0.33 (37 k)	0.71	10 (32.3)	2.92 (92 k)	2.33	10 (38.5)	1.05 (50 k)	1.88
Hospital control‡												
For profit§	6 (33.3)	5.61 (139 k)	1.89	1 (20.0)	0.00 (49 k)	0.00	9 (29.0)	4.67 (135 k)	3.56	2 (8.7)	0.33 (80 k)	0.28
Non-profit#	12 (66.7)	2.06 (81 k)	2.15	4 (80.0)	0.42 (68 k)	0.61	22 (71.0)	1.50 (82 k)	1.80	21 (91.3)	0.72 (58 k)	1.27
Metropolitan County population‡												
<One million	16 (66.7)	3.29 (104 k)	1.87	3 (60.0)	0.00 (57 k)	0.00	27 (87.1)	2.65 (104 k)	2.47	19 (82.6)	0.75 (55 k)	1.31
One million +	2 (33.3)	2.83 (71 k)	3.58	2 (40.0)	0.83 (75 k)	1.21	4 (12.9)	0.83 (59 k)	1.21	4 (17.4)	0.37 (82 k)	0.58

Avg. = average; CA = California; GAC = general acute care; NJ = New Jersey.
*Assault rates calculated per 100,000 employee hours.
†One pre-enactment hospital system in NJ is excluded.
‡Two pre-enactment and three post-enactment NJ hospitals have missing data for Hospital Control and Metro County Population variables.
§Government, non-federal, or investor-owned.
#Non-government owned.

AEP Vol. 19, No. 2
February 2009: 125–133

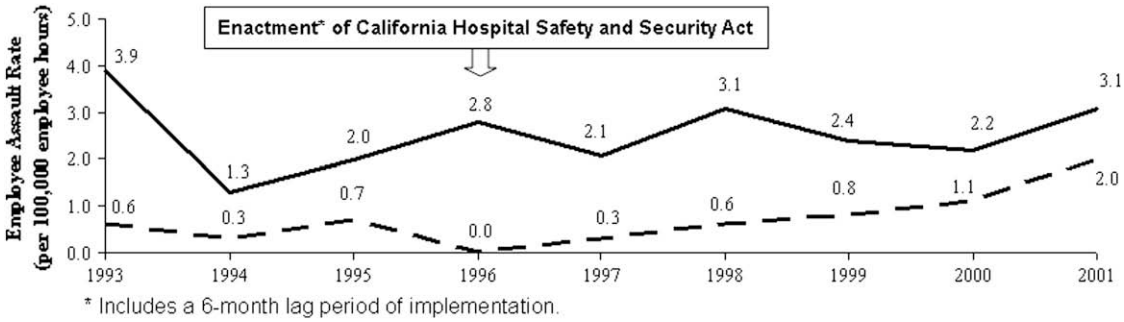

FIGURE 2. "California" is the solid line, "New Jersey" is the dashed line.

In California psychiatric units, pre- and post-enactment assault rates were fairly constant over time. This is likely due to psychiatric units having more violence prevention policies in place, including employee training in the management of aggressive behavior, than emergency departments, and therefore less impact from any changes made.

At the time of this study, Washington was the only other state in the United States to have passed legislation requiring health care facilities to develop and implement programs and policies to protect workers from violence. This legislation, however, has not been evaluated for compliance, impact or the reduction of violence against workers. In addition, few studies have examined the effectiveness of programs even at local levels to reduce violence to hospital employees (13–17). Among these studies, comprehensive programs that include employee training and environmental modifications reduce the incidence of violent events to health care workers in psychiatric facilities and in-hospital departments, similar to the findings shown in this study.

Emergency and psychiatric departments were the units of interest in this study because they have been identified as having the highest rates of employee assault in in-hospital settings (1–3). However, they pose very different environments for which prevention measures may vary. For example, emergency departments are much less controlled environments than locked psychiatric units. We found that only 40.5% of California emergency departments participating in the study used procedures to control entry and exit, such as metal detectors or monitoring by security personnel (9). Regardless, there is considerable variance in emergency department and psychiatric unit environments across hospitals, requiring hospitals to design prevention approaches that meet their specific needs.

We were unable to reliably measure hospital compliance to the legislation. Although we did measure the presence of the components required by the legislation and recommended in the Cal/OSHA Guidelines (9, 11), we collected these data between 2002 and 2005, up to 10 years after enactment of the legislation. Because we did not have baseline data on each hospital's workplace violence prevention programs before passage of the legislation, we were unable to develop a reliable measure of compliance that would reflect changes made as a result of the legislation.

This study has additional limitations that must be considered when interpreting the data. Specifically, the number of violent events to hospital employees was likely underestimated in this study for various reasons. First, over 50% of the staff we interviewed for the impact evaluation of the study (9, 11) did not report verbal or physical assaults to their supervisors. Workers often accept these events as part of their job, where violent acts are believed to be the result of the patient's illness or condition (such as intoxication), not an intentional act against the worker.

Second, we used OSHA Logs and Employers' Reports of Occupational Injury or Illness to identify incidents of violence. These records are strengths because all hospitals are required to keep them. However, they only capture incidents that result in at least 1 full day away from work or medical care beyond first aid. Therefore, the assaults enumerated in this study likely represent more severe events, underestimating assault outcomes resulting from verbal acts of violence. In addition, hospitals are only required to keep OSHA Logs for 3 years, which resulted in limited access to these records, particularly in the pre-enactment time period. OSHA Logs also do not distinguish a contract from a hospital worker. Therefore, if the proportion of contract workers differed between California and New Jersey over time, there may be an artificial inflation of assault rates in one state or the other because the denominator for the rates excluded contract workers. There is no reason to suspect, however, that the proportion of contract workers varied between states over time.

Reporting of violent events may be differential according to implementation of the California measures. This differential reporting would most likely increase violent event reporting in the post-implementation period in California, which would lead these reported results to be underestimates of the true effects.

Despite the limitations, the study was the first to evaluate California policy in reducing violence to in-hospital health care workers and the first to evaluate a statewide policy to prevent violence to health care workers. It also had a significant impact from a policy perspective in developing legislation in New Jersey. In 2006, the New Jersey "Violence Prevention in Health Care Facilities Act" was introduced to the state legislature (18). The bill requires health care facilities to have a written violence prevention program for the purpose of protecting health care workers.

Policy may be an effective method to increase safety to health care workers, particularly in units like emergency departments where workplace violence prevention policies, procedures and training programs may not be as comprehensive as customarily practiced in psychiatric units. Long-term compliance and effectiveness of such policies require research on organizational systems and social approaches to sustainable program adoption and implementation.

This study was funded by a grant from the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention (R01 OH007934). We would like to acknowledge Eddy A. Bresnitz with the New Jersey Department of Health and Senior Services for his efforts on this project.

REFERENCES

1. Gerberich SG, Church TR, McGovern PM, Hansen H, Nachreiner NM, Geisser MS, et al. Risk factors for work-related assaults on nurses. Epidemiology. 2005;16:704–709.
2. National Institute for Occupational Safety and Health. Violence: Occupational Hazards in Hospitals. Washington, DC: Department of Health and Human Services, Centers forDisease Control and Prevention, National Institute for Occupational Safety and Health, 2002. (DHHS (NIOSH) publication no. 2002-101). Available at: www.cdc.gov/niosh/pdfs/2002-101.pdf. Last accessed March 24, 2008.
3. Peek-Asa C, Howard J, Vargas L, Kraus JF. Incidence of non-fatal workplace assault injuries determined from employer's reports in California. J Occup Environ Med. 1997;39:44–50.
4. Richardson S, Windau J. Fatal and nonfatal assaults in the workplace, 1996 to 2000. Clin Occup Environ Med. 2003;3:673–689.
5. Gerberich SG, Church TR, McGovern PM, Hansen HE, Nachreiner NM, Geisser MS, et al. An epidemiological study of the magnitude and consequences of work related violence: the Minnesota Nurses' Study. Occup Environ Med. 2004;61:495–503.
6. Findorff M, McGovern P, Wall M, Gerberich SG, Alexander B. Risk factors for work related violence in a health care organization. Inj Prev. 2004;10:296–302.
7. California Occupational Safety and Health Administration. Guidelines for Security and Safety of Health Care and Community Service Workers. Sacramento, CA: California Department of Industrial Relations, California Occupational Health and Safety Administration Medical Unit; 1993.
8. Peek-Asa C, Cubbin L, Hubbell K. Violent events and security programs in California emergency departments before and after the 1993 Hospital Security Act. J Emerg Nurs. 2002;28:420–426.
9. Peek-Asa C, Casteel C, Allareddy V, Nocera M, Goldmacher S, O'Hagan E, et al. Workplace violence prevention programs in hospital emergency departments. J Occup Environ Med. 2007;49:756–763.
10. Howard J, Barish R. Government approaches to reducing workplace violence. Clin Occup Environ Med. 2004;3:721–732.
11. Peek-Asa C, Casteel C, Allareddy V, Nocera M, Goldmacher S, O'Hagan E, Blando J, Valiante D, Gillen M, Harrison R. Workplace violence prevention programs in psychiatric units and facilities. Arch Psychiatric Nurs. In press.
12. Institute of Medicine. Hospital-Based Emergency Care: At the Breaking Point. Washington, DC: National Academies Press; 2007.
13. Anderson C. Training efforts to reduce reports of workplace violence in a community health care facility. J Prof Nurs. 2006;22:289–295.
14. Bjorkdahl A, Heilig M, Palmstierna T, Hansebo G. Changes in the occurrences of coercive interventions and staff injuries on a psychiatric intensive care unit. Arch Psychiatr Nurs. 2007;21:270–277.
15. Bowers L, Nijman H, Allan T, Simpson A, Warren J, Turner L. Prevention and management of aggression training and violent incidents on U.K. acute psychiatric wards. Psychiatr Serv. 2006;57:1022–1026.
16. Lipscomb J, McPhaul K, Rosen J, Brown JG, Choi M, Soeken K, et al. Violence prevention in the mental health setting: the New York state experience. Can J Nurs Res. 2006;38:96–117.
17. Meehan T, Fjeldsoe K, Stedman T, Duraiappah V. Reducing aggressive behavior and staff injuries: a multi-strategy approach. Aust Health Rev. 2006;30:203–210.
18. State of New Jersey, 212th Legislature. Violence Prevention in Health Care Facilities Act, Assembly Bill 3027. Introduced May 15, 2006. Available at: www.njleg.state.nj.us/2006/Bills/A3500/3027_I1.PDF. Last accessed March 24, 2008.