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Minimum Nurse-To-Patient Ratios In Acute Care Hospitals In California

Evidence is mixed on whether minimum staffing ratios will improve conditions for patients and for nurses.

by Janet M. Coffman, Jean Ann Seago, and Joanne Spetz

PROLOGUE: Will you heal faster if your nurse is caring for you and only two other patients rather than three times that number? California has launched a statewide experiment to improve patient outcomes by mandating minimum nurse-to-patient ratios in acute care hospitals. The costs (both direct and opportunity costs) of this legislation are uncertain because the minimum ratios have not been implemented. The jury is still out on whether higher staffing ratios result in better outcomes for patients. Nurses’ organizations and hospital groups in California argue about the role of registered nurses versus licensed vocational nurses (LVNs), while speculating about whether the new ratios will induce licensed nurses to return to the workforce. Underfunded and overcrowded state nursing schools cannot keep up with existing demand, while some hospitals, already facing serious financial constraints, are experiencing staffing vacancies of up to 20 percent. Critics of mandated ratios counter that increased staffing takes resources away from other areas in need of improvement.

In this examination of California’s experience, Janet Coffman and her colleagues at the University of California, San Francisco (UCSF), recommend that other states considering similar approaches to staffing ratios look closely before they leap. Mandatory minimum staffing ratios may create as many problems as they solve, and they may even miss those they target. Now an Agency for Healthcare Research and Quality predoctoral fellow at the University of California, Berkeley, Coffman holds a master’s degree in public policy from that university. She was a researcher and program manager at the UCSF Center for California Health Workforce Studies from 1995 to 2001. Jean Ann Seago is an assistant professor at the UCSF School of Nursing and research fellow in the UCSF Center for the Health Professions and the Center for California Health Workforce Studies. She holds a doctorate in nursing from UCSF. Joanne Spetz is associate director of the Center for California Health Workforce Studies, assistant adjunct professor at the UCSF School of Nursing, and adjunct fellow at the Public Policy Institute of California. She holds a doctorate in economics from Stanford University.
ABSTRACT: Many registered nurses believe that nurse staffing in acute care hospitals is inadequate. In 1999 California became the first state to mandate minimum nurse-to-patient ratios in hospitals. State officials announced draft ratios in January 2002 and expect to implement the legislation by July 2003. We estimate that the direct costs of compliance will be small. However, mandatory ratios could generate opportunity costs that are not easily measured and that may outweigh their benefits. Policymakers elsewhere should consider other strategies to address nurses’ concerns, because other approaches may be less costly and produce greater benefits to nurses and patients.

Many registered nurses (RNs) maintain that low nurse staffing levels in acute care hospitals are jeopardizing the quality of patient care and leading RNs to leave the profession.¹ In response to these concerns, in 1999 California became the first state to enact legislation mandating minimum nurse-to-patient ratios in acute care hospitals. This paper describes the history of this legislation, Assembly Bill 394, and assesses its potential costs and benefits. We also discuss the prospects for mandatory ratio legislation in other states and present other options for addressing nurses’ concerns about hospital staffing.

Background On A.B. 394

A.B. 394 directs the California Department of Health Services (DHS) to establish “minimum, specific, and numerical licensed nurse-to-patient ratios by license nurse classification and by hospital unit” for inpatient units in acute care hospitals. Licensed nurses include both RNs and licensed vocational nurses (LVNs, called licensed practical nurses, or LPNs, in other states). Draft nurse-to-patient ratios were announced in January 2002 and will undergo an extensive review and comment process required under California law. The regulations are expected to be in force by July 2003.²

The passage of A.B. 394 in 1999 followed several years of intense lobbying by unions representing California nurses. Proposition 216, a ballot proposition that would have established staffing standards for all licensed health care facilities (in addition to creating a statewide health insurance system), was rejected by the voters in 1996. A.B. 695, a bill similar to A.B. 394, was approved by the state legislature in 1998 but vetoed by then Gov. Pete Wilson. The political scales tipped in favor of the nurses’ unions with the election of a new governor, Gray Davis, in November 1998, who was endorsed by unions representing nurses and other workers.³

A.B. 394 extends prior California law regarding nurse staffing in acute care hospitals. Under legislation enacted during the 1976–77 state legislative session, California hospitals must have a minimum ratio of one licensed nurse per two patients in intensive care and coronary care units. This legislation also requires that at least half of licensed nurses working in intensive care and coronary care units be RNs [Title 22, Division 5, Chapter 1, Article 6, Section 70495(e)]. Legislation enacted in the early 1990s requires hospitals to use patient classification systems to determine nurse staffing needs for inpatient units on a shift-by-shift basis and to staff

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“Proponents of A.B. 394 emphasize its potential to improve the quality of care provided to patients in California hospitals.”

accordingly [Title 22, Division 5, Chapter 1, Article 6, Section 70495(e)].

The minimum nurse-to-patient ratios proposed by the California DHS range from one nurse per patient in operating rooms to one nurse per eight infants in newborn nurseries. The DHS proposes that the minimum ratios for medical-surgical and rehabilitation units be phased in. Minimum ratios for these units would be set initially at one nurse (RN or LVN) per six patients and then shift to one nurse per five patients within twelve to eighteen months of enactment. Proposed ratios for other types of inpatient units would not be phased in.4

The proposed minimum ratios generally call for fewer patients per nurse than hospitals recommend and more patients per nurse than unions recommend. The differences in the ratios that major stakeholders have proposed for medical-surgical units are particularly noteworthy, because these units constitute the largest category of inpatient units in California hospitals. Whereas the DHS proposes a final ratio of one nurse per five patients in medical-surgical units, the California Healthcare Association (the state American Hospital Association affiliate) has proposed a ratio of one nurse per ten patients. The union representing the largest number of California nurses, the California Nurses Association (CNA), has recommended a ratio of one RN per three patients. Another large union, Service Employees International Union (SEIU), has recommended a ratio of one nurse per four patients.5 In addition, the California DHS proposal differs greatly from the CNA proposal with regard to the intensity of RN staffing. The California DHS proposal sets forth ratios of licensed nurses (RNs and LVNs) to patients, whereas the CNA proposed ratios of RNs to patients.

Potential Costs And Benefits

Proponents maintain that minimum nurse-to-patient ratios will yield important benefits for patients and nurses. Policymakers need impartial estimates of the likelihood of realizing the potential benefits of the ratios and estimates of the potential costs of these benefits. A lack of systematic quantitative data on critical variables prevents generation of precise estimates. Nevertheless, existing data provide some important insights.

Potential benefits. Proponents of A.B. 394 emphasize the legislation’s potential to improve the quality of care provided to patients in California hospitals. Indeed, a growing body of research associates nurse staffing and outcomes for patients and nurses.6 Proponents argue that nurse staffing levels are now so low as to jeopardize the well-being of hospital patients.7 They maintain that minimum nurse-to-patient ratios assure quality by establishing a minimum standard below which no hospital can fall. They argue that California’s statute requiring use of acuity-based
patient classification systems is inadequate, because it is difficult to determine whether hospitals are complying with this mandate. In their view, simple minimum ratios are needed to enable nurses, patients, and family members to easily identify and report inpatient units with dangerously low staffing levels. Proponents also maintain that staffing ratios will help to alleviate the nursing shortage. They believe that working conditions have a large influence on the number of persons willing to practice nursing in hospitals. In their view, minimum staffing ratios would improve working conditions, which would in turn reduce the numbers of nurses leaving hospital positions and the nursing profession. Better working conditions also may attract more young persons to nursing. Increased attention to nursing and rising salaries are already raising interest levels; the American Association of Colleges of Nursing reports that enrollments in baccalaureate nursing programs increased in 2001, for the first time in six years.

At least one large hospital system has concluded that the potential benefits of minimum nurse-to-patient ratios outweigh the costs. During the summer of 2001 Kaiser Permanente announced that it would implement minimum nurse-to-patient ratios recommended by two of the unions representing nurses at the system’s hospitals, SEIU and United Nurses of California. Kaiser Permanente has pledged to implement these ratios even if they result in richer nurse staffing than the minimum ratios ultimately established under A.B. 394. Kaiser officials have estimated the cost of implementing this pledge at $200 million. They believe that these increased costs for nursing personnel will be offset by improvements in patient outcomes and a reduction in turnover in nursing staff.

Potential costs. To estimate the potential direct costs of the draft nurse-to-patient ratios, we analyzed data published by the California Office of Statewide Health Planning and Development (OSHPD). This agency has collected extensive data on the operations and finances of nonfederal acute care hospitals in California since the 1970s. We derived ratios of licensed nurses to patients from staffing and patient data reported during FY 29 June 1999–30 June 2000, the most recent fiscal year for which data are available. Data on wage rates during this time period were used to estimate the potential increase in hospitals’ spending for nursing personnel.

Nurse-to-patient ratios were derived for each inpatient unit in a hospital by dividing data on the number of productive hours worked by RNs and LVNs assigned to a unit by the number of patient days provided by the unit. These ratios are average annual ratios; some shifts, days, weeks, or months could have better or worse ratios. For hospitals that have multiple units of a single type, we calculated the average for all units of that type. Our estimates of RN and LVN staff include both staff and registry nurses. All newly hired nurses are assumed to be staff LVNs (not staff or registry RNs).

Exhibit 1 shows our estimates of the percentages of hospitals that are not in compliance with the draft nurse-to-patient ratios. We estimate that the majority of California hospitals have average annual nurse-to-patient ratios at or above the
minimum ratios proposed by the California DHS. The percentage of hospitals out of compliance with initial proposed ratios ranges from 15 percent for medical-surgical units and labor and delivery units to 41 percent for definitive observation units. One-third of hospitals are not in compliance with the final ratio for medical-surgical units (1:5) that the California DHS proposes to phase in twelve to eighteen months after implementation of the initial ratios. Half of hospitals are not in compliance with the final ratio for rehabilitation units (also 1:5).

Exhibit 2 shows the predicted increase in nursing expenditures per hospital in California overall and in specific regions of the state. Implementation of the initial ratios proposed by the California DHS is estimated to result in an increase of $143,836, or 1.0 percent, in expenditures for nursing wages per hospital per year. (Spending for employee benefits and employment taxes is not included.) Phasing in minimum ratios for medical-surgical and rehabilitation care units from 1:6 to 1:5 would result in an increase of $217,210, or 1.7 percent per hospital per year. The estimated total annual cost of implementing the ratios at California’s 400 acute care hospitals is approximately $87 million.

The estimated cost per hospital varies considerably across regions of California, ranging from $309,797 per hospital in the Los Angeles consolidated metropolitan statistical area to $19,909 per hospital in the rural Sierra Nevada region for the initial ratios. This variation reflects regional differences in average hospital size, prevailing wage rates, and current staffing patterns. Hospitals in Los Angeles and
EXHIBIT 2
Predicted Per Hospital Increases In Nursing Expenditures Caused By Staffing Mandates, 1999–2000

<table>
<thead>
<tr>
<th>Region</th>
<th>Initial ratios*</th>
<th>Final ratios*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dollar increase</td>
<td>Percent increase</td>
</tr>
<tr>
<td>All hospitals</td>
<td>$143,836</td>
<td>1.0%</td>
</tr>
<tr>
<td>Los Angeles CMSA</td>
<td>196,049</td>
<td>1.2%</td>
</tr>
<tr>
<td>Sacramento CMSA</td>
<td>146,236</td>
<td>0.3%</td>
</tr>
<tr>
<td>San Francisco CMSA</td>
<td>131,282</td>
<td>0.7%</td>
</tr>
<tr>
<td>San Diego</td>
<td>114,865</td>
<td>0.2%</td>
</tr>
<tr>
<td>Central Valley</td>
<td>122,948</td>
<td>1.8%</td>
</tr>
<tr>
<td>Central Coast</td>
<td>87,656</td>
<td>1.8%</td>
</tr>
<tr>
<td>N. Sacramento Valley</td>
<td>24,142</td>
<td>0.3%</td>
</tr>
<tr>
<td>Northern Mountains</td>
<td>12,336</td>
<td>0.4%</td>
</tr>
<tr>
<td>Sierra Nevada</td>
<td>7,317</td>
<td>0.6%</td>
</tr>
</tbody>
</table>


NOTES: CMSA is consolidated metropolitan statistical area. All additional nursing personnel are assumed to be licensed vocational nurses (LVNs).

* “Initial ratios” are the minimum nurse-to-patient ratios with which California hospitals must comply when the legislation is implemented. (Current plans call for implementation in July 2003.) “Final ratios” are modifications to the minimum ratios that the DHS proposes to phase in within twelve to eighteen months of the effective date of the legislation.

other large cities are much larger than hospitals in rural areas of California and generally pay nurses higher wages. In addition, hospitals in Los Angeles generally have lower nurse staffing levels (more patients per nurse) than is true in hospitals in other metropolitan areas in the state. 12

Our estimates assume that the use of registry and traveling nurses by hospitals would remain at its current level. Proponents of minimum ratios argue that the ratios will not increase hospital costs, because they believe that minimum ratios will increase the number of nurses willing to work in hospital staff positions. Hospitals would be able to hire more staff nurses, which would reduce their expenditures for registry and traveling nurses. They believe that the additional money spent on nursing salaries to comply with the minimum ratios would be fully offset by reduced spending on temporary personnel. Without a better understanding of the overall effect of minimum ratios on nurse supply, it is reasonable to assume that use of temporary personnel will remain at the current level.

Some California hospitals rely heavily on registry and traveling nurses, particularly in medical-surgical and rehabilitation units. If we exclude registry and traveling RNs and LVNs from our estimates of current nurse staffing levels, the percentage of hospitals not in compliance with the proposed final ratio for medical-surgical units (1:5) would increase from 36 percent to 47 percent. The percentage not in compliance with the proposed final ratio for rehabilitation units would increase from 54 percent to 62 percent. 13
Implications For California

At first blush, California’s minimum nurse-to-patient ratios appear to be a relatively low-cost means for improving outcomes for patients and for nurses. However, both potential costs and benefits should be interpreted with caution, because existing data do not permit precise estimation of either costs or benefits.

With regard to patient outcomes, previous studies that have found an association between nurse staffing and outcomes for patients and nurses do not provide direct evidence that mandatory minimum nurse-to-patient ratios will improve patient outcomes. Establishing minimum ratios implies the existence of threshold ratios of nurses to patients above which good outcomes for patients and nurses are achieved. Previous studies do not provide strong evidence as to what these threshold ratios may be for specific inpatient units. In many of these studies, the unit of analysis is the whole hospital, not individual inpatient units.14 Many studies also do not calculate threshold ratios.

In addition, one of the most recent and most rigorous studies of nurse staffing and patient outcomes suggests that increasing LVN staffing does not improve outcomes.15 This finding is particularly noteworthy because California hospitals could comply with the minimum ratios by hiring additional LVNs rather than RNs. The wage differential between LVNs and RNs may lead some hospitals to hire additional LVNs to comply with the mandate. Where this occurs, the impact of minimum ratios on patient outcomes may be negligible.

Furthermore, the quality of hospital care is associated with a complex array of organizational and patient characteristics. For example, Linda Aiken’s work suggests that hospitals with the best patient outcomes have organizational cultures that give RNs an important role in organizational decision making.16 Minimum nurse-to-patient ratios could lead hospitals to focus too narrowly on staffing at the expense of other factors that contribute to the quality of care.

Minimum nurse-to-patient ratios may increase nurse staffing in some California hospitals. However, they also create perverse incentives for hospitals that have staffing ratios above the proposed minimum ratios to reduce their staffing to the minimum level required.17 Reductions in RN staffing and nursing skill mix (that is, the percentage of nursing personnel who are RNs) seem plausible in California, because many hospitals are experiencing financial crises and are having difficulty recruiting and retaining RNs.18 Proponents of the minimum ratios maintain that hospitals will not reduce staffing because the Title 22 requirement for use of acuity-based patient classification systems will remain in place. Yet these same organizations have argued that patient classification systems do not protect patients. It is unclear why such systems would provide a safeguard after the implementation of minimum ratios. This potential problem could be solved by establishing more explicit and more stringent requirements for the use of patient classification systems.

Whether minimum staffing ratios will improve working conditions enough to
"Increasing the amount of nonnursing work performed by RNs in inpatient units could make inpatient jobs even less attractive."

Increase nurse supply is unknown. The experience of hospitals in Victoria, Australia, one of the few jurisdictions to implement minimum nurse-to-patient ratios in hospitals, is instructive. Large numbers of nurses returned to the nursing profession after the minimum ratios were established. However, hospitals continued to face a shortage of nurses, because there were not enough returning nurses to meet demand. Some hospitals have been forced to close hospital beds. 19

In addition, minimum staffing ratios address only one aspect of nurses’ dissatisfaction with hospital nursing. Prior research on RN job satisfaction indicates that although staffing is a major concern of many RNs, they are also dissatisfied with other aspects of their work, including low salaries, lack of control over work schedules, lack of opportunities for advancement, lack of support from nursing administrators, lack of input into policy and management decisions, and inadequate support staff to perform nonnursing tasks. 20

Economic theory suggests that some hospitals may cope with increases in costs for nursing personnel by cutting spending for other personnel. Hospitals are most likely to reduce the numbers of unlicensed caregivers, housekeepers, transporters, ward clerks, and other support staff, because many of their tasks could be performed by RNs and LVNs. Increasing the amount of nonnursing work performed by RNs in inpatient units could make inpatient jobs even less attractive relative to nursing positions in other health care settings.

Thus, minimum nurse-to-patient ratios may not yield great benefits for patients and nurses. In addition, our cost estimates may understate the actual cost of implementing the proposed minimum nurse-to-patient ratios. The OSHPD data do not permit precise estimation of direct costs. For example, for purposes of this analysis, patient days are assumed to be equal in length (twenty-four hours), when in fact some patients are discharged in less than twenty-four hours. The reported number of patient days also may not reflect patient loads because some patients are discharged before the midnight census typically used to record numbers of patient days. A hospital also might have richer nurse staffing than the proposed ratios during day shifts but fail to meet the ratios at night. For example, responses to a survey conducted in 2000 suggest that approximately 70 percent of California hospitals are not in compliance with the proposed ratios during the night shift, even if LVN staff and registry nurses are taken into account. 21

Our assumption that all new hires will be LVNs is conservative. The scope of practice for LVNs in California is more limited than that of their counterparts in many other states. Some hospitals may decide to hire additional RNs instead of LVNs because RNs can practice more independently and perform a wider range of tasks. Such decisions would increase the cost of compliance for these hospitals be-
cause RNs earn much higher wages than LVNs earn. Our estimates of wage rates are also conservative because economic theory suggests that wages are likely to rise in response to an increase in hospitals' demand for nurses.

Moreover, this analysis only considers the added financial costs that hospitals would face for nursing personnel. It does not take into account the opportunity costs associated with minimum nurse-to-patient ratios. Such ratios discourage innovation in the deployment of other types of health professionals by hospitals and in the amounts and combinations of labor and capital. For example, higher personnel costs may also compel hospitals to defer investments in medical technology and facilities that could improve the quality of care. Some of these investments, such as electronic medical records and medical equipment with state-of-the-art safety features, can greatly reduce human errors in care delivery. They can also ease the demands placed on nurses, perhaps even more so than increases in nurse-to-patient ratios can.

**Actions Of Other States**

Regardless of the merits of minimum nurse-to-patient ratios, the growing power of nurses’ unions suggests that staffing ratios will remain on the policy agenda at state and federal levels. In 2001 state affiliates of the American Nurses Association (ANA) in Maine and Massachusetts severed their ties with the ANA, in large part because they disagreed with the ANA’s opposition to minimum nurse-to-patient ratios. In February 2002 leaders of unions representing nurses in California, Maine, Massachusetts, Missouri, and Pennsylvania joined to establish a new national association, the American Association of Registered Nurses. The unions will collaborate on national projects and support one another’s state legislative, collective bargaining, and organizing campaigns.

Further research is needed to ascertain the number of states in which nurses’ unions have sufficient political power to enact minimum nurse-to-patient ratios. In the short term, the number of states is likely to be small. California’s rate of unionization among nurses, approximately 25 percent, is much higher than that of most states. In addition, ANA affiliates are more powerful in other states than in California. Proactive ANA affiliates may be able to persuade policymakers to implement other reforms that address nurses’ concerns about hospital staffing. Other important variables include the political influence of state AHA affiliates and elected officials’ ties to organized labor.

Although California is the only state to enact minimum nurse staffing ratios for hospitals, over the past four years at least eighteen other states have considered legislation regarding nurse staffing in hospitals (Exhibit 3). Twelve states have considered bills that would mandate minimum nurse-to-patient ratios in hospitals. Fourteen states have considered legislation that attempts to address nurses’ concerns about staffing through other means, such as requiring hospitals to develop staffing plans based on patient acuity, mandating disclosure of nurse staff-
ing ratios, and establishing a task force to study and monitor nurse staffing. One state, Oregon, has enacted legislation that requires acuity-based staffing plans.

Policymakers in other states may wish to consider a well-designed acuity-based ratio system as an alternative to minimum nurse-to-patient ratios. Many states have regulations that require hospitals to use patient classification systems to determine nurse staffing, but these regulations face much criticism, as discussed above. Although many of these regulatory systems do not function well today, they could form the basis for strong but flexible staffing regulations in the future. States could mandate particular patient classification systems, develop methods of ensuring that staff and patients are aware of the required staffing during every shift, and establish effective enforcement mechanisms. Alternatively, states could require that hospitals submit information relevant to their staffing needs every quarter and could mandate a ratio for that quarter based on an analysis of patients’ needs, availability of support staff, and other factors.27

Texas is pursuing an approach that is more tailored to the unique circumstances of individual hospitals. Under regulations issued 24 March 2002, hospitals are required to establish committees to develop nurse staffing plans and to use

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**EXHIBIT 3**

**Bills Regarding Nurse Staffing In Hospitals Introduced In State Legislatures, By Staffing Issue, 1999–2002**

<table>
<thead>
<tr>
<th>State</th>
<th>Nurse-to-patient ratios</th>
<th>Nurse staffing plans</th>
<th>Mandatory report of nurse-to-patient ratios</th>
<th>Task force to study nurse staffing</th>
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**Sources:** Carolyn Lauer, Service Employees International Union, personal communication, 28 February 2002; and Stephanie Norris, National Conference of State Legislatures, personal communication, 13 February 2002.
data on nurse-sensitive patient outcomes to assess and adjust staffing plans.\textsuperscript{28} At least one-third of the members of these committees must be RNs engaged primarily in direct patient care.

Approaches that base nurse staffing on patient acuity or nurse-sensitive outcomes respond to nurses’ justifiable concerns about hospital staffing without imposing rigid mandates. These flexible approaches seem more appropriate than ratios, given the complexity and rapid pace of change in the delivery of hospital care. These approaches also provide opportunities for hospital nurses to play a more direct role in staffing decisions. These approaches also provide opportunities for hospital nurses to play a more direct role in staffing decisions, which may enhance these nurses’ job satisfaction and retention.

This research was funded by the California HealthCare Foundation; the Agency for Healthcare Research and Quality Predoctoral Fellowship Program; and the National Center for Health Workforce Information and Analysis, Bureau of Health Professions, Health Resources and Services Administration (Grant no. 5 U76 MB 10001-02). The authors thank Alexia Green, Tim Henderson, Carolyn Lauer, and Stephanie Norris for their assistance in obtaining pertinent information. They also thank Michael Lin and two anonymous reviewers for helpful comments on an earlier version of this manuscript.

NOTES


3. J. Spetz et al., \textit{Minimum Nurse Staffing Ratios in California Acute Care Hospitals} (San Francisco: University of California, San Francisco, Center for the Health Professions, December 2000).


9. CNA, “California Sets Nation’s First Safe Nursing Standards”; and SEIU Nurse Alliance, \textit{The Shortage of Care}.


13. Data are available from the authors on request. Send e-mail to Janet Coffman, janetmc@uclink4.berkeley.edu.
15. Needleman et al., “Nurse Staffing Levels.”
27. Seago, *Nurse Staffing*.