Mandated Nurse Staffing Levels
Literature Review

March 2013

Created By:
Kirsten Ehresmann, Research Assistant
HealthEast Research
Executive Summary

Background

The state of California was the first state to pass legislation mandating nurse-to-patient ratios in 1999. The goal of the mandated ratio was to decrease the nurse-patient ratio, improve care and patient safety, and increase nurse retention. The legislation went into effect January 1, 2004 and since 1999 numerous studies have been conducted to assess the impact of the legislation on nurse staffing and skill mix, nurse job satisfaction, patient outcomes, and on hospital finances.

Current Situation

There are a few proposed methods to decrease nurse staffing ratios. Since California’s implementation in 2004 several other states have introduced similar legislation, including mandated reporting of nurse staffing to the public and mandating the processes that hospitals use to determine staffing. A bill was recently introduced in the Minnesota legislature proposing all MN hospitals provide staffing levels that adhere to national standards. The bill (HF 588/ SF 471) was referred to the House Committee on Government Operations on February 25, 2013 from the Committee on Labor, Workplace, and Regulated Industries. The hearing scheduled in Government Operations for March 6, 2013 passed the bill as amended to the Committee on Health and Human Services Policy.

Assessment

Effect on nursing staff

- The literature has consistently shown that hospitals respond to nurse staffing ratios by hiring more registered nurses (RNs) and fewer licensed practical nurses (LPNs), and unlicensed support staff. This has led to an increase in skill mix, but also to an increase in the RN workload of typically “unlicensed tasks.”
- Research finds that nurse workload varies from unit to unit and hospital to hospital to such a degree that standard mandates cannot account for differences in patient acuity, value-added activities, direct care activities, administrative activities, and personal activities (i.e. breaks).
- In the immediate post-implementation period, the staffing ratios improved the work environment for nurses and increased nurse job satisfaction. However, research has not yet determined if these are long-term effects or if staffing ratios improve nurse retention.

Effect on patient outcomes

- The association between nurse staffing levels and patient outcomes is unclear. The literature acknowledges that increased nurse staffing has a positive impact on patient outcomes, but the current evidence is not sufficient to establish nurse staffing levels as an effective independent solution to improving patient safety.
• Typical nursing indicators - failure to rescue, pressure ulcers, restraint use, and falls - have each been examined in relation to increases in nurse staffing and have not consistently been found to be causally related to improvements in patient safety. Some researchers noted a trend in this direction that was likely influenced by other quality improvement efforts implemented by many hospitals in the early 2000s.

Financial effects:

• Many hospitals felt a negative financial impact from the California regulation across their healthcare system. Not only did overall operating margins decrease, finding the resources to hire experienced nurses required for specialty units was difficult for some hospitals. Certain patient services were also reduced in several hospitals to accommodate increased nursing costs (e.g. outpatient clinics).

• Rapidly increasing nurse wages impacted hospitals as well. In fact, some hospitals chose to lay off LPNs and non-nursing support staff (e.g. housekeepers) to accommodate nursing wages.

• Hospitals that felt the greatest impact were those with the highest patient-nurse ratios prior to the regulation and publicly owned hospitals. Conversely, research showed it is possible to offset some of the increased costs by avoiding the costs of adverse events, but as one study noted it is unclear “whether the cost of increased staffing provides adequate returns compared to other quality-improving initiatives” (McHugh et al).

Recommendation

The goal of the proposed MN legislation to improve patient safety through mandating nurse staffing ratios does not have appropriate support from the research literature. According to the research, improvements in patient safety are most likely to be realized in an environment where individual hospitals can examine multiple factors to determine the best approach, including nurse staffing levels, quality improvement initiatives, staff support processes, and the role of LPNs and unlicensed staff.
<table>
<thead>
<tr>
<th>Author</th>
<th>Title/Journal</th>
<th># of subjects</th>
<th>Type of study</th>
<th>General findings</th>
<th>Support staffing mandate</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spetz et al</td>
<td>Using Minimum Nurse Staffing Regulations to Measure the Relationship Between Nursing and Hospital Quality of Care - Medical Care Research and Review</td>
<td>278 hospitals</td>
<td>Cross-sectional secondary data analysis</td>
<td>Of the 6 indicators studied, the incidence of 4 patient safety indicators increased, while the incidence of mortality decreased suggesting there may be some benefit from increased RN surveillance.</td>
<td>Mixed</td>
<td>Researchers suggest policymakers tread with caution because a causal relationship has not been established. Additionally the costs associated with regulation, as well as unintended consequences, have not been identified.</td>
</tr>
<tr>
<td>Cook et al</td>
<td>The Effect of a Hospital Nurse Staffing Mandate on Patient Health Outcomes – Journal of Health Economics</td>
<td>294 hospitals</td>
<td>Cross-sectional secondary data analysis</td>
<td>The regulation did not significantly effect “failure to rescue” rates. Researchers concluded the law is not causally related to improved patient safety.</td>
<td>No</td>
<td>Researchers suggest policymakers sort out all the issues important to improving patient safety before implementing staffing ratios.</td>
</tr>
<tr>
<td>Serratt et al</td>
<td>Are Staffing Changes in California’s Hospitals Sensitive to Individual Hospital Characteristic – Nursing Economics</td>
<td>273 hospitals</td>
<td>Cross-sectional secondary data analysis</td>
<td>Increased nurse staffing has increased the nurse productive hours per day.</td>
<td>No</td>
<td>Not enough research has been conducted to conclusively determine the long-term effects of staffing ratio regulations.</td>
</tr>
<tr>
<td>Upenieks et al</td>
<td>Value-Added Care: A New Way of Assessing Nursing Staffing Ratios and Workload Variability – Journal of Nursing Administration</td>
<td>80 beds</td>
<td>Prospective</td>
<td>Nurses spend various amount of time on direct and indirect patient in the same unit and hospital. The mandate does not account for the ideal mix of staff to handle all nursing activities.</td>
<td>No</td>
<td>Further evaluation on the actions that impact patient outcomes, including direct care activities and value-added activities are needed. Also need to address the role of LPNs and unlicensed support staff.</td>
</tr>
<tr>
<td>Tellez</td>
<td>Work Satisfaction Among California Registered Nurses – Nursing Economics</td>
<td>13,849 nurses</td>
<td>Longitudinal secondary data analysis</td>
<td>Nurse job satisfaction increased in the intermediate implementation of the CA mandate, but long-term effects could not be determined.</td>
<td>Mixed</td>
<td>The researchers suggest more research to discover all the factors that influence nurse job satisfaction since long-term effects could not be determined.</td>
</tr>
<tr>
<td>McHugh</td>
<td>Contradicting Fears, California’s Nurse-</td>
<td>6,000</td>
<td>Cross-sectional</td>
<td>The CA mandate resulted in hospitals hiring more highly</td>
<td>Mixed</td>
<td>The mandate was successful in lowering the patient-to-nurse ratios.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>No. of Hospitals</td>
<td>Methodology</td>
<td>Findings</td>
<td>Conclusion</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>et al, July 2011</td>
<td>Patient Mandate did not Reduce Skill Level of Nursing Workforce–Health Affairs</td>
<td>hospitals</td>
<td>secondary data analysis</td>
<td>skilled registered nurses to meet the staffing ratio.</td>
<td>ratio, but the cost of the mandate and other unintended consequences remain unclear.</td>
<td></td>
</tr>
<tr>
<td>Seago, March 2012</td>
<td>Oregon Nurse Staffing Law: Is It Working? – Journal of Nursing Administration</td>
<td>7 hospitals</td>
<td>Descriptive case study</td>
<td>Hospitals’ acceptance of the Oregon legislation, which mandated staffing committees to determine staffing levels, varied widely. Attitude heavily influenced by each hospital's CNO.</td>
<td>Mixed Success or failure of such legislation is dependent on the culture and people of each hospital.</td>
<td></td>
</tr>
<tr>
<td>Burnes Bolton et al, Nov 2007</td>
<td>Mandated Nurse Staffing Ratios in California – Policy, Politics, and Nursing Practice</td>
<td>67 hospitals, 11,740 patients</td>
<td>Cross-sectional exploratory secondary data analysis</td>
<td>The nurse-patient ratio decreased as a result of the CA mandate, however the results are mixed when examining the mandate's effect on 2 patient outcomes, falls and pressure ulcers.</td>
<td>Mixed There are many interrelated factors influencing patient outcomes and increased access to RNs may be part of the answer.</td>
<td></td>
</tr>
<tr>
<td>Chapman et al, Sept 2009</td>
<td>How Have Mandated Nurse Staffing Ratios Affected Hospitals? – Journal of Healthcare Management</td>
<td>12 hospitals, 23 leaders</td>
<td>Qualitative case study</td>
<td>Hospital leaders did not think improvements in care could be attributed to one single factor, such as the staffing mandate, while nurse reaction was mixed.</td>
<td>No More research is necessary to determine the impacts and costs of staffing ratio mandates to determine whether or not they are the most effective way to improve patient safety and quality care.</td>
<td></td>
</tr>
<tr>
<td>Aiken et al, August 2010</td>
<td>Implications of the California Nurse Staffing Mandate for Other States – Health Services Research</td>
<td>22,336 nurses in CA, PA, NJ</td>
<td>Cross-sectional secondary data analysis</td>
<td>Outcomes for nurses and patients that met CA mandates were better when compared to those who did not meet the mandate.</td>
<td>Yes There are multiple strategies to improve nurse staffing, but the researchers suggest that regardless of the method, it is associated (though not causally) with better outcomes for nurses and patients.</td>
<td></td>
</tr>
<tr>
<td>Reiter et al, June 2012</td>
<td>Minimum Nurse Staffing Legislation and the Financial Performance of California Hospitals – Health Services Research</td>
<td>203 CA hospitals, 407 comparison hospitals (12 states)</td>
<td>Difference-in-difference secondary data analysis</td>
<td>Increased cost burdens on hospitals are associated with the staffing regulation, especially for publicly owned hospitals and those with slightly more reliance on Medicaid reimbursements.</td>
<td>No Policy makers need to address and balance patient safety, quality care, and financial implications of the legislation before moving forward.</td>
<td></td>
</tr>
</tbody>
</table>
Authors: Joanne Spetz, David W. Harless, Carolina-Nicole Herrera and Barbara A Mark.
Title: Using Minimum Nurse Staffing Regulations to Measure the Relationship Between Nursing and Hospital Quality of Care
Journal: Medical Care Research and Review
Date: February 2013

Notes: Secondary data analysis of staffing and outcomes data of 278 hospitals from the California Office of Statewide Health Planning and Development patient discharge data from 1999 to 2006. Researchers initiated the study because there is little data on identifying a causal relationship between nurse staffing levels and patient outcomes. The mandated nurse staffing ratios in California led to staffing changes in most hospitals, yet changes in patient outcomes were mixed. The researchers examined six patient safety indicators and found an overall trend of an “increasing incidence of four PSIs and a decline in mortality following a postoperative complication.” Based on these results there may be some benefit from increased time for patient surveillance, but more research is required. This study concluded there is mixed evidence that the California policy’s goal of improving the quality of patient care was achieved. Additionally, there are unintended consequences linked to this policy (e.g. rapid wage growth, declines in operating margins). Ultimately, policymakers should be cautious when considering staffing regulations because of the effect on the work environment and costs of regulation.

Authors: Andrew Cook, Martin Gaynor, Melvin Stephens Jr., and Lowell Taylor
Title: The Effect of a Hospital Nurse Staffing Mandate on Patient Health Outcomes: Evidence from California’s Minimum Staffing Regulation
Journal: Journal of Health Economics
Date: December 2012

Notes: Secondary data analysis of California’s Office of Statewide Health Planning and Development financial reports and patient discharge database evaluating the impact California Assembly Bill 394 from 2000-2006. This study analyzed two patient safety indicators (PSIs) (ulcers, failure to rescue) in 294 hospitals. Hospitals in the study proportionally increased RN hours more than LPN hours. The main finding of this study was that no there was no causal impact of the patient/nurse ratio on the PSI ‘failure to rescue’ and researchers excluded the PSI ulcer data due to confounding factors. The researchers concluded that staffing regulations may be one of many components in improving patient safety.

Author: Teresa Serratt, Joanne Spetz, Charlene Harrington
Title: Are Staffing Changes in California’s Hospitals Sensitive to Individual Hospital Characteristics?
Journal: Nursing Economics
Date: December 2012

Notes: Secondary data analysis of the Office for Statewide Planning and Development data hospital financial report from 2000 to 2006 of 274 hospitals (pre-post design). Researchers
examined the association between hospital characteristics and changes in the nurse staffing levels in medical-surgical acute care hospitals in California because they hypothesized staffing regulations may have different effects on different hospitals. The variable most associated with nursing staff levels across the hospitals in the study was an increase in nurse productive hours per patient day (HPPD). These results represent an analysis of the early period following the implementation of the new regulation and are unable to determine any long-term effects. The researchers state that there is no consistent association found between staffing levels and patient outcomes and that prior to implementing new regulations, future research needs to clarify the relationship between nurse-patient ratios, patient outcomes, quality, cost, and financial performance.

**Author:** Valda V Upenieks, Jaleh Akhavan, Jenny Kotlerman, Jennifer Esser, and Myha J Ngo.
**Title:** Value-Added Care: A New Way of Assessing Nursing Staffing Ratios and Workload Variability
**Journal:** Journal of Nursing Administration
**Date:** May 2007

**Notes:** Prospective workflow study of 80 telemetry and medical-surgical unit beds in a California hospital. The purpose of the study was to examine the effects of the regulation on nursing units in the same hospital by shadowing eleven nurses per research day to determine the amount of time nurses spend on various activities in different units in the same hospital. The researchers found variability in nursing workload activities between the telemetry and medical-surgical units. Nurses spent different amounts of time on direct patient care and value-added care depending upon the unit. Based on these results staffing ratios cannot create the ideal staffing mix across units. The researchers note that in future research and/or policy development, unlicensed nursing staff need to be factored into the ratios because they engage in direct patient care allowing RNs to engage in value-added care (e.g. teaching, rounding, communicating with care team or family). The researchers suggest examining the actions that impact patient outcomes because concentrating on ratio mandates is insufficient in improving the quality of care.

**Author:** Michelle Tellez
**Title:** Work Satisfaction Among California Registered Nurses: A Longitudinal Comparative Analysis
**Journal:** Nursing Economics
**Date:** April 2012

**Notes:** This study was a longitudinal secondary data analysis of the California Board of Registered Nursing Surveys from 1997, 2004, 2006, and 2008. The purpose of the study was to evaluate the effect the staffing mandate had on nurse job satisfaction and to begin development of nurse retention interventions. The researchers discovered that nurse job satisfaction significantly improved during the mid-term implementation of the mandate, as revealed by the 2006 survey. However, the long-term effects of the law on nurse job satisfaction are unclear. Based on the 2008 data it seems a plateau in satisfaction was reached potentially as the novelty of the initial changes wore off. The researchers suggest that more research is necessary to discover all the factors that influence nurse job satisfaction since it is clear staffing ratios are not the only factor.
Author: Matthew D McHugh, Lesley A. Kelly, Douglas M Sloane, Linda H Aiken
Title: Contradicting Fears, California’s Nurse-to-Patient Mandate did not Reduce the Skill Level of the Nursing Workforce in Hospitals
Journal: Health Affairs
Date: July 2011

Notes: Cross-sectional secondary data analysis using the American Hospital Association Annual Survey data of 6,000 U.S. hospitals from 1997-2008. The study also focused on comparisons between California and Florida, New York, Pennsylvania, and Texas. The purpose of the study was to determine the effect of the California staffing mandate on hospital nurse staffing trends and the skill mix. Many opponents of the policy hypothesized hospitals would hire lower-skilled nursing staff, yet the researchers found that skill mix increased in California hospitals significantly more than in non-California hospitals. More registered nurses were hired than licensed practical nurses, yet the costs associated with this staffing increase remain unclear in this study. Some studies report that operating margins increase, while costs of adverse events are decreased. The researchers conclude that the CA mandate was successful in increasing the number of registered nurses on staff in hospitals.

Author: Jean Ann Seago, Sue Davidson, Diane Waldo
Title: Oregon Nurse Staffing Law: Is It Working?
Journal: Journal of Nursing Administration
Date: March 2012

Notes: Descriptive case study to determine the effectiveness of the Oregon legislation. Interviews and focus groups were conducted in 7 hospitals in Oregon. Of the 7 hospitals, 3 found the legislation positive and 4 found it negative, and no hospital characteristics were consistently associated with either attitude. The researchers concluded that the most significant influence on hospital culture towards the legislation was the attitude of the Chief Nursing Officer.

Author: Linda Burnes Bolton, Carolyn Aydin, Nancy Donaldson, Diane Storer Brown, Meenu Sandhu, Moshe Fridman, Harriet Udin Aronow
Title: Mandated Nurse Staffing Ratios in California: A Comparison of Staffing and Nursing-Sensitive Outcomes Pre and Postregulation
Journal: Policy, Politics, and Nursing Practice
Date: November 2007

Notes: Cross-sectional exploratory study using secondary data to examine 67 hospitals and 11,740 patients in California from 2002-2006. The purpose of the study was to better understand the impact of the CA nurse staffing mandate and explore the associations between patient outcomes and nurse staffing. The nurse-patient ratio decreased and the percentage of care that was provided by registered nurses increased from 2002 to 2006. Similar to findings in other studies, more RNs were hired over this time period and fewer LPNs and unlicensed staff were used in medical-surgical and step-down units. The study identified various trends in the relationship between nurse staffing and falls and pressure ulcers (positive and negative, significant and non-significant) depending upon the unit...
characteristics. Ultimately, the researchers concluded that increasing nursing staff alone did not result in overall reductions in falls and pressure ulcers because many hospitals were engaged in quality improvement initiatives distinct from the nurse staffing mandate. This study highlights the complex characteristics that interact to influence patient outcomes.

Author: Susan Chapman, Joanne Spetz, Jean Ann Seago, Jennifer Kaiser, Catherine Dower, Carolina Herrera
Title: How Have Mandated Nurse Staffing Ratios Affected Hospitals? Perspectives from California Hospital Leaders
Journal: Journal of Healthcare Management
Date: September 2009

Notes: Qualitative case study of 23 hospital leaders from 12 hospitals in California. Participants were interviewed to assess how hospitals responded to the nursing staff ratio mandate. Most hospitals needed to hire more RNs to meet the staffing mandate. Many hospitals reduced LPNs and increased the float nurse pool. The part of the legislation found to be the most difficult to adapt to was the “at all times” language, stipulating that hospitals must have the appropriate staffing ratios at all times, on all units, with no exceptions. In general, hospital leaders did not see a positive impact on patient outcomes as a result of the mandate and nurse satisfaction with the mandate was mixed. Some hospitals reported lower nurse turnover while others reported complaints from nurses over the decrease in autonomy and flexibility during a shift. Hospitals and nurses struggled with meeting the ratio in the ER, during patient transfers, when there were patients in crisis, and when employees called in sick. Of note, the patient satisfaction ratings for most hospitals did not change after implementing the staffing ratios. Ultimately, hospital leaders have worked the staffing ratios into their hospital culture, but do not view them as a way to increase patient safety and care quality.

Author: Linda Aiken, Douglas Sloane, Jeannie Cimiotti, Sean Clarke, Linda Flynn, Jean Seago, Joanne Spetz, Herbert Smith
Title: Implications of the California Nurse Staffing Mandate for Other States
Journal: Health Services Research
Date: August 2010

Notes: Cross-sectional secondary data analysis of 22,336 hospital staff nurses in California, Pennsylvania, and New Jersey using hospital discharge databases and nurse surveys completed in 2006. The purpose of the study was to compare nurse-patient ratios and indicators of quality care across the states to examine the impact of the mandate in CA. Similar to other studies, the mandate successfully reduced the nurse-patient ratio and increased hospital’s use of RNs versus LPNs or unlicensed staff. The researchers noted evidence of improved practice outcomes (e.g. burnout rate, workload, work environment) from the increase in staffing based on the results from the nurse survey. The researchers estimated the effects of staffing on inpatient mortality and failure to rescue for each. Their analysis found that increasing the number of patients per nurse significantly increased the likelihood of mortality and failure to rescue when compared to hospitals that met the mandated ratio. It is noted that causality cannot be established since this is a cross-
sectional study, but the researchers believe improving hospital nurse staffing will lead to improved outcomes for patients and nurses.

**Author:** Kristin Reiter, David Harless, George Pink, Barbara Mark  
**Title:** Minimum Nurse Staffing Legislation and the Financial Performance of California Hospitals  
**Journal:** Health Services Research  
**Date:** June 2012

**Notes:** Difference-in-difference secondary data analysis of 203 California hospitals and 407 hospitals from 12 comparison states. The purpose of the study was to determine the relationship between nurse staffing ratios and the financial performance of hospitals because it is unknown whether the staffing mandate is cost-effective. The researchers found that staffing legislation decreased the operating margin of CA hospitals significantly more than comparison hospitals with no legislation. The financial effects of the legislation affected hospitals differently depending on their characteristics and pre-regulation staffing levels. For example, hospitals weighted toward public ownership felt a greater cost burden associated with the legislation than for-profit hospitals. Additionally, the increased cost burden on hospitals led some to request an increase in reimbursement rates, which could then filter down to consumers. The researchers point out that increasing costs is not a reason to avoid enacting legislation; however they suggest that while such legislation is designed to improve quality it may inadvertently have the opposite effect. Therefore, they urge policymakers to take into account the financial implications associated with the legislation.

---

**From:** Ehresmann, Kirsten  
**Sent:** Thursday, March 14, 2013 8:59 AM  
**To:** Sorenson, Mark  
**Subject:** Nurse staffing update

Hi,

One last quick email with a few more pieces of information I found.

<table>
<thead>
<tr>
<th>State</th>
<th>Nurse Staffing Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Mandates specific minimum nurse-to-patient ratios</td>
</tr>
<tr>
<td>Oregon</td>
<td>Requires hospitals to develop hospital-wide nurse staffing plan with input of direct care nurses</td>
</tr>
<tr>
<td>State</td>
<td>Requirement</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Illinois</td>
<td>Requires hospitals to implement a patient acuity system to determine nurse staffing needs</td>
</tr>
<tr>
<td>Washington</td>
<td>Requires hospitals to convene a nurse staffing committee to develop a staffing plan</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Requires hospitals to convene a staffing committee to develop a nurse staffing plan</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Requires hospitals to submit a staffing plan that delineates the average number and mix of nursing personnel assigned to each unit/shift</td>
</tr>
<tr>
<td>Texas</td>
<td>Requires hospitals to establish a nurse staffing committee to develop a staffing plan (in regulations)</td>
</tr>
<tr>
<td>Ohio</td>
<td>Requires hospitals to convene a nurse staffing committee to develop a staffing plan</td>
</tr>
</tbody>
</table>

*Nurse Staffing For Safety

Laura A. Stokowski, RN, MS

Oct 28, 2009

“Other states haven’t followed California’s lead, most likely for a few reasons. First, mandated ratios can foster rigidity. Legislated nurse-patient ratios perpetuate the myth that “a nurse is a nurse” by failing to account for differences in nurses’ skill levels and expertise as well as hospital resources and other support for nursing care. Second, to meet mandated ratios, many California hospitals are laying off unlicensed healthcare personnel, housekeepers, and other support staff. These layoffs may increase the amount of non-nursing work that RNs must do. At least for now, a doubling of California nurse graduates in the last couple of years has helped reduce the nursing shortage and limited the adverse effects of this decision.”

Seeking staffing solutions

*Issue Date: March 2009 Vol. 3 Num. 3 American Nursing Today*

*Author: Milisa Manjlovich, PhD, RN, CCRN*

**Kirsten Ehresmann, MPH**

Research Assistant, Research Department
HealthEast Care System
Office: 651-232-6927

krehresmann@healtheast.org

Optimal health and well-being