Effects of Statutory Nurse-to-Patient Staffing Requirements on Bed Availability, Access and Cost

ABSTRACT

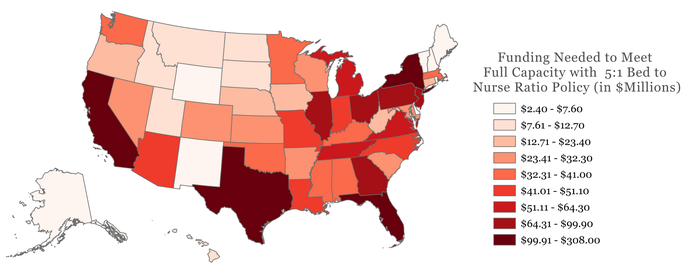
Given the constraints presented by nurse-to-patient staffing requirement policies, the objective of this study is to examine accessibility to medical surgical hospital beds in a hypothetical scenario of a national nurse-to-patient staffing policy. In addition, this study aims to estimate the increased costs associated with increasing nurse staff at each hospital to meet staffing requirements in the US.

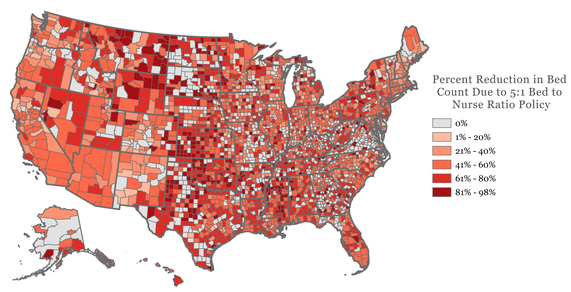
INTRODUCTION

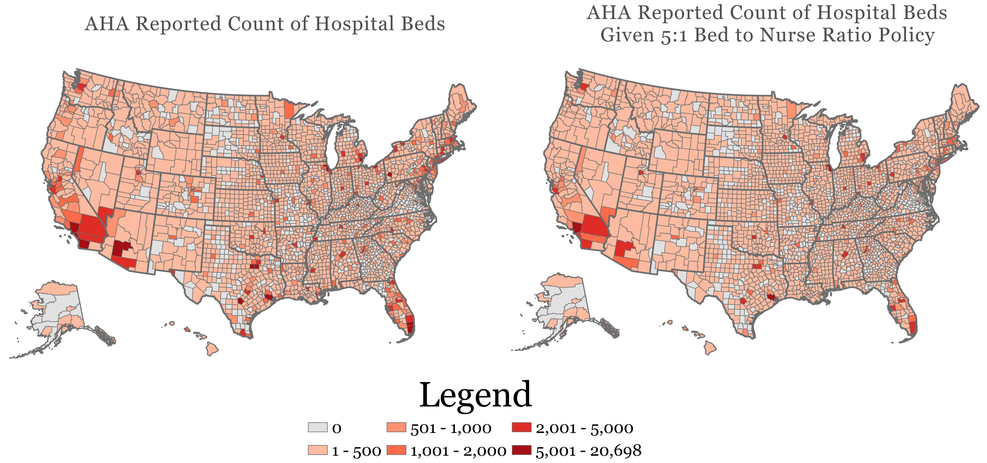
Previous studies have highlighted that some regions in the US have challenges maintaining adequate nurse staffing. Twenty years ago, the California Nurses Association successfully sponsored and lobbied the California Legislature to pass A.B. 394, which was designed to improve nurse staffing. This state law was the first in the US to require healthcare facilities to implement minimum nurse-to-patient staffing ratios to reduce the odds of nurse burnout and improve quality of care outcomes. Findings from the literature suggest that minimum nurse-to-patient staffing requirements are associated with lower inpatient mortality and improved employee retention among nursing staff.

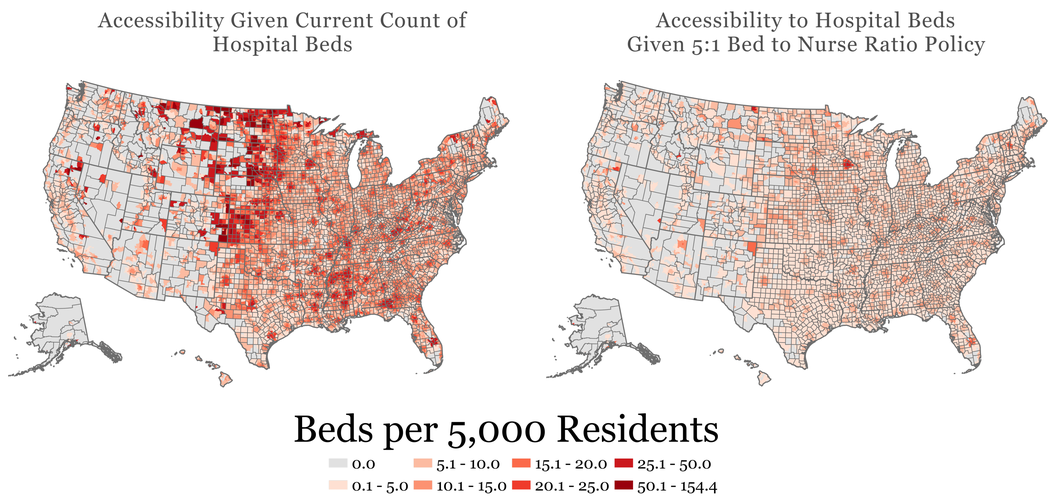
METHODS

- Bed counts and nurse staffing come from the American Hospital Association (AHA). Population counts and additional characteristics came from the US Census Bureau American Community Survey's 5-year estimates.
- Cost estimates come from the US Bureau of Labor Statistics (USBLS). Average nursing working hours come from a 2019 study of newly licensed nurses published in the *Journal of Advanced Nursing.*
- In a hypothetical national policy, a nurse would not be able to oversee more than 5 beds at a given time, resulting in a 5:1 ratio. Values used were 39.4 hours per week for full-time nurses and 27.58 hours for part-time nurses. Each bed requires 168 work hours to be maintained.
- Enhanced Two-Step Floating Catchment Approach (E2SFCA) was used to measure accessibility to hospital beds and travel times were estimated using ArcGIS Pro © and StreetMap Premium ©.
- Cost of Quality Metrics (CoQ) was found using projected quality improvements in a 2014 study from *The Lancet*, which found a 7% reduction in inpatient mortality when medical surgical nurses had one less patient to attend to.









RESULTS

Median Change (Δ) between Registered Nurse (RN) to Patient (PT) Ratio			
	1RN-7Δ6PT	1RN-6Δ5PT	1RN-5Δ7PT
Median State Cost Increase	20.1%	18.3%	34.8%
Median State Total Cost	$ 4,741,133.04	$ 5,616,857.40	$ 10,275,752.76
Median State Cost Per Bed	$ 4,444.26	$ 5,265.15	$ 9,632.31
Median Total Cost by Selected State			
	1RN-7Δ6PT	1RN-6Δ5PT	1RN-5Δ7PT
Alabama	$ 5,233,623.36	$ 6,273,960.00	$ 11,507,583.36
California	$ 30,431,766.96	$ 35,286,496.56	$ 65,718,263.52
New York	$ 21,401,845.92	$ 25,663,834.56	$ 47,065,680.48
Texas	$ 23,772,524.16	$ 25,991,038.08	$ 49,763,562.24
Wyoming	$ 612,554.88	$ 643,440.00	$ 1,255,994.88

CONCLUSIONS/SIGNIFICANCE

The results from this study indicate that the cost from reducing the Nurse-to-Patient Ratio from 1-7 to 1-5 across all AHA reported hospitals has a median state cost of $10.3 Million. Juxtaposing *Aiken et al.* quality results on these cost figures indicated that a meager median annual investment of $9,632 per bed in improved registered nurse staffing could reduce mortality by up 14% (7% per one less patient per nurse). However, implementing these policies without proper investment would likely cause staffing and bed availability shortages

Medical-Surgical nurses play a critical role in the viability of our healthcare system, and given reported shortages in the US nurse workforce, an examination of this policy and its implication on healthcare access is imperative. Given this consideration, we hope that our analyses facilitate productive data-driven dialogue on the practicality of a nationwide adoption of this topic.

REFERENCES

Aiken, Linda H, et al. "Nurse Staffing and Education and Hospital Mortality in Nine European Countries: A Retrospective Observational Study." *The Lancet*, vol. 383, no. 9931, 2014, pp. 1824–1830., https://doi.org/10.1016/s0140-6736(13)62631-8.

Dall, Timothy M., et al. "The Economic Value of Professional Nursing." *Medical Care*, vol. 47, no. 1, 2009, pp. 97–104., https://doi.org/10.1097/mlr.0b013e3181844da8.

McHugh, Matthew D, et al. "Effects of Nurse-to-Patient Ratio Legislation on Nurse Staffing and Patient Mortality, Readmissions, and Length of Stay: A Prospective Study in a Panel of Hospitals." *The Lancet*, vol. 397, no. 10288, 2021, pp. 1905–1913., https://doi.org/10.1016/s0140-6736(21)00768-6.

A. Donahue "Ratios: Learning from the California Experience." *National Nurses United*, 11 May 2021, https://www.nationalnursesunited.org/ratios-california-experience.