

Statement of
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September 8, 2018

Thank you for this opportunity to present a report on the estimated cost of increasing registered nurse staffing in Massachusetts hospitals in accordance with the Ballot Question 1 entitled, “Safe Patient Limits” hereafter referred to as “Question 1”. I am a registered nurse who has practiced for over 40 years in the Commonwealth. I am employed as an associate professor at the William F. Connell School of Nursing at Boston College. The views expressed in this report are solely those of the researcher, Dr. Shindul-Rothschild and not those of Boston College

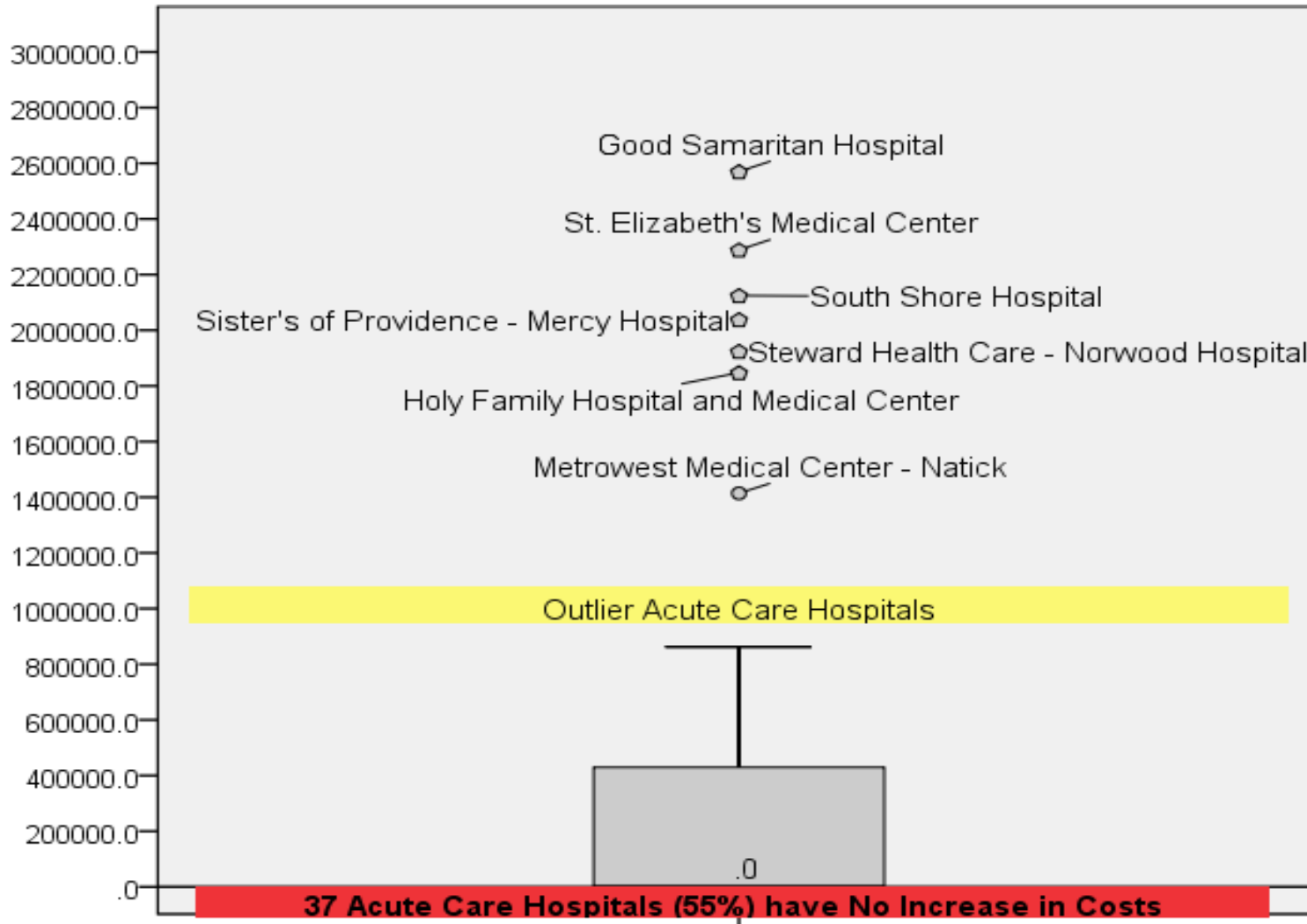
Executive Summary

✚ My analysis estimates the cost of implementing Question 1 ranges from a moderate cost of **\$35,070,376** with a starting average RN hourly wage to a high cost of **\$46,830,087.08** with an average RN hourly wage. If there is a reallocation of the proportion of RNs to total hospital personnel by 3% to match the proportion in California, costs to implement Question 1 would decline to **\$23,618,869.33**. Based on my calculations, Question 1 would add **128 RNs per day** or between **539** and **1,617** full-time RNs annually to the 24,544 full-time RNs currently employed in the 67 Massachusetts acute-care hospitals cited in this report. This represents an increase in RNs employed in Massachusetts hospitals ranging from 2% - 7% (see Appendix A).

Ballot Question 1: Low Cost Estimate with California Benchmark

✚ This cost estimate was derived by calculating a proportion of RNs to total Massachusetts hospital personnel equivalent to California where RN to patient limits have been in effect since January 1, 2004. The proportion of RN full-time equivalents to total full time equivalent hospital personnel in California is 30% compared to the average in Massachusetts of 27% (AHA, 2016). The total annual estimated cost of RNs on medical-surgical, stepdown, behavioral health and emergency departments was subtracted from this sum (see Figures 1 & 3). Based upon this formula, thirty-seven Massachusetts hospitals (55%) would have no increase in costs if they increased the proportion of RNs to all hospital personnel by 3%. Using California as a benchmark for the hospital personnel resources allocated to RNs, the estimated cost to 67 acute care Massachusetts hospitals for implementing the Question 1 is **\$23,618,869.33**.

Figure 1. Low estimated annual Massachusetts acute care hospital costs of Question 1 with the proportion of RNs to total Massachusetts hospital personnel equivalent to California hospitals



Mean = \$352,520.44, SD± 636263.0, Median = .0000, Sum = \$23,618,869.33 N = 67

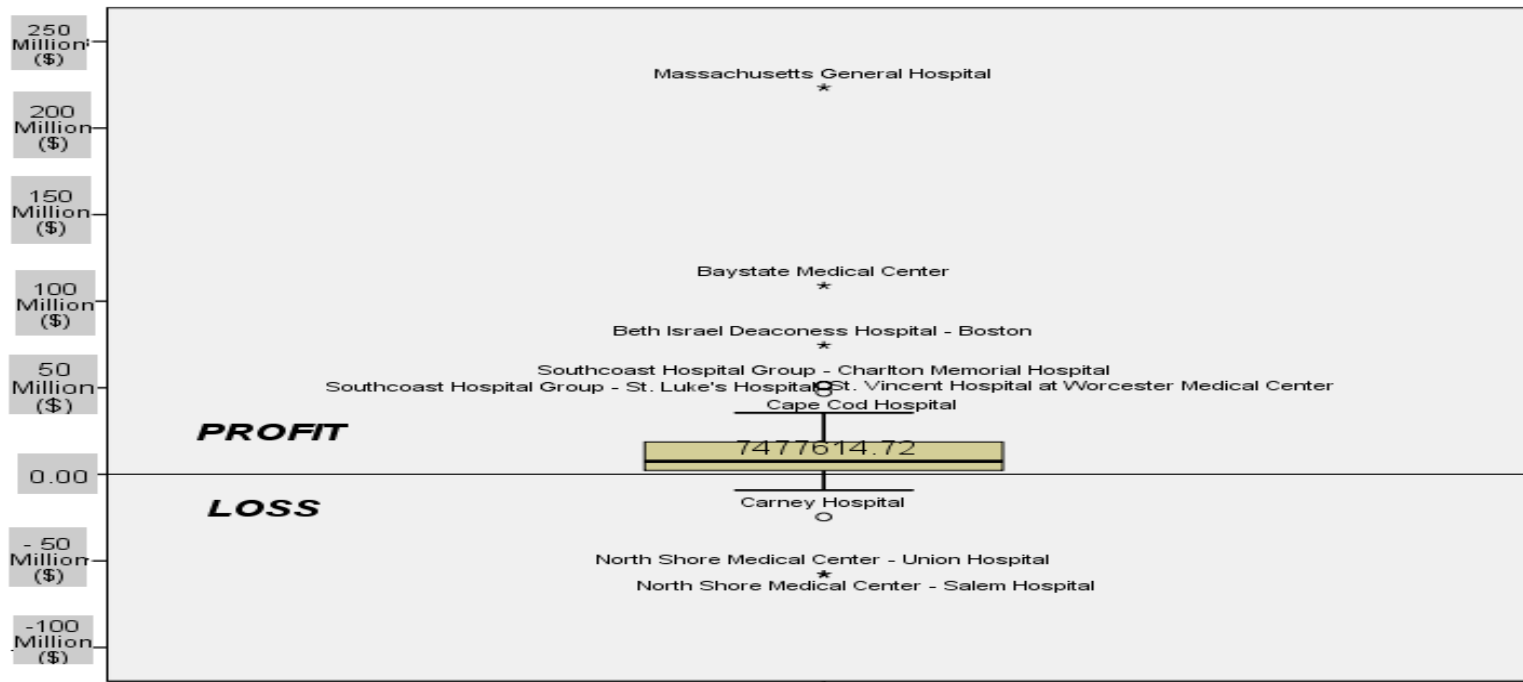
95% Confidence Interval for Mean, Lower bound = 197323.70, Upper bound = 507717.18

Footnote: Proportion of RN Full-time Equivalents to Total Personnel Full-Time Equivalents from AHA (2016) *Annual Survey of Hospitals*.

Ballot Question 1: Estimated Impact on Massachusetts Acute Care Hospital Profit or Loss

The annual hospital costs of Question 1 with the proportion of RNs to total hospital personnel equivalent to California, was subtracted from the profit or loss Massachusetts hospitals reported for FY 2017 (CHIA, May 2018). Based on this calculation, the mean profit of Massachusetts hospitals is estimated to be **\$15,463,897.47** (See Figure 2). The 54 Massachusetts hospitals (81%) who reported a profit in FY17 will maintain profitable status. Thirteen Massachusetts hospitals (19%) reported a financial loss in FY17. In four of the hospitals reporting a financial loss, Question 1 will have no impact (Franklin, Nashoba, Northshore Medical Centers). The remaining nine hospitals (Carney, Wing, Clinton, Noble, Morton, Mass Eye & Ear, Metrowest Medical Centers, Nantucket), reporting a financial loss will incur a mean additional loss of (-\$477,091) with a range from (-\$55,670) to (-\$1,414,242).

Figure 2. Estimated impact of Question 1 on total Massachusetts acute care hospital profit or loss, FY17



Mean = \$15,463,897.47 SD± 35,377,857.28 Median = \$7,477,614.72 Sum = \$1,036,081,131.00 N = 67

95% Confidence Interval for Mean, Lower bound = \$6,834,560.04 Upper bound = \$24,093,234.90

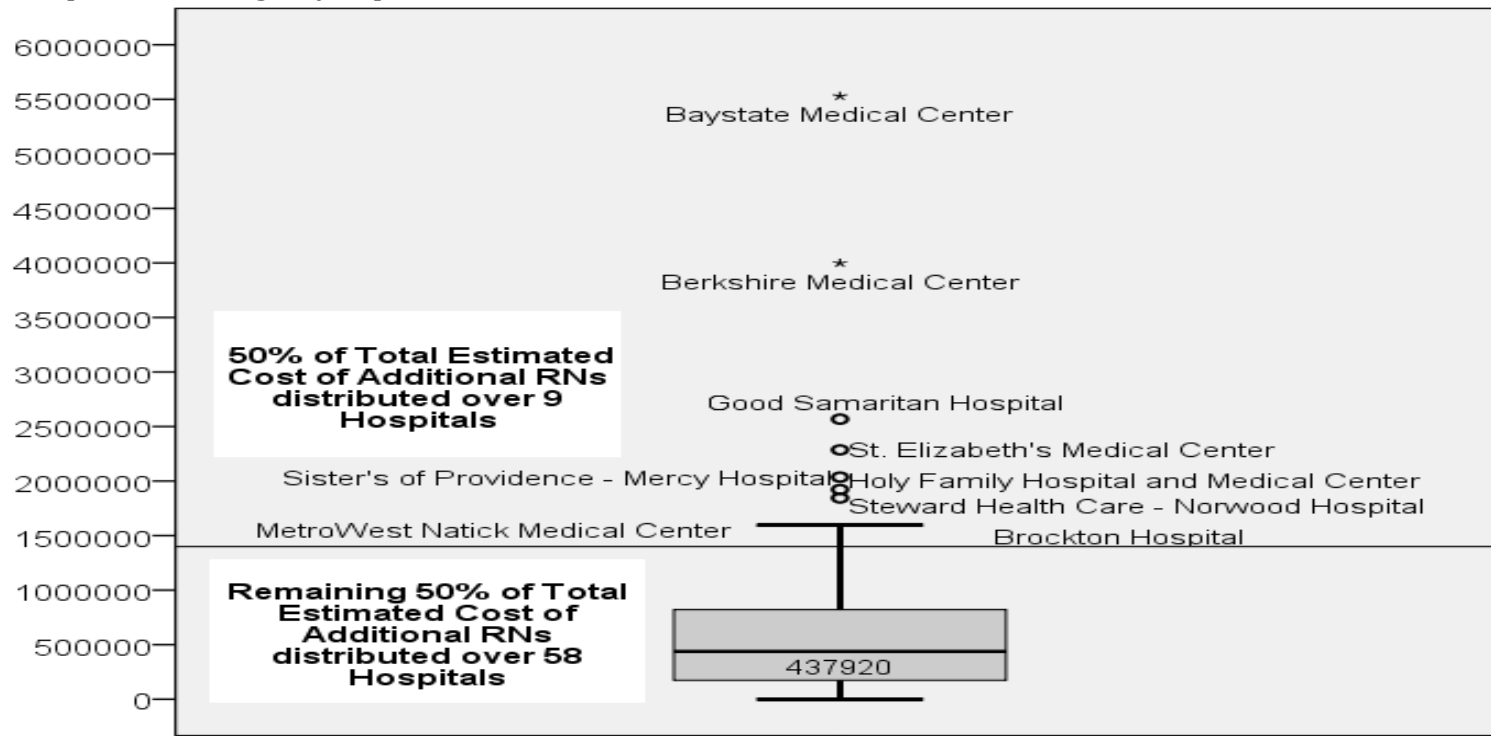
Footnote: Data on Massachusetts hospital financial performance from the Center for Health Information and Analysis (August 2018). *Massachusetts Acute Hospital and Health System Financial Performance: FY 2017*. Pub.No. 18-214-CHIA-01. Retrieved from

<http://archives.lib.state.ma.us/bitstream/handle/2452/792887/ocn994684730-FY2017.pdf?sequence=1&isAllowed=y>

Ballot Question 1: High Estimate for Total Annual Costs of Additional RNs

✚ The high estimated total annual costs of Question 1 with an average RN hourly wage on medical-surgical, stepdown, emergency department and behavioral health units for 67 Massachusetts acute care hospitals is **\$46,830,087.08**. (See Figure 3.). Nine hospitals account for almost half (\$23,049,317.42) of the estimated increase in costs of Question 1. A detailed analysis of costs by hospital is shown in Appendix B, “Question 1 Estimated Annual Massachusetts Acute Care Hospital Costs for RNs with Average Hourly Wage”

Figure 3. High estimated annual Massachusetts acute care hospital costs of with average RN hourly wage on medical-surgical, stepdown, emergency department and behavioral health units



Mean = \$698,956.52, SD± \$931,522.91, Median = \$437,919.93, Sum = \$46,830,087.08 N = 67

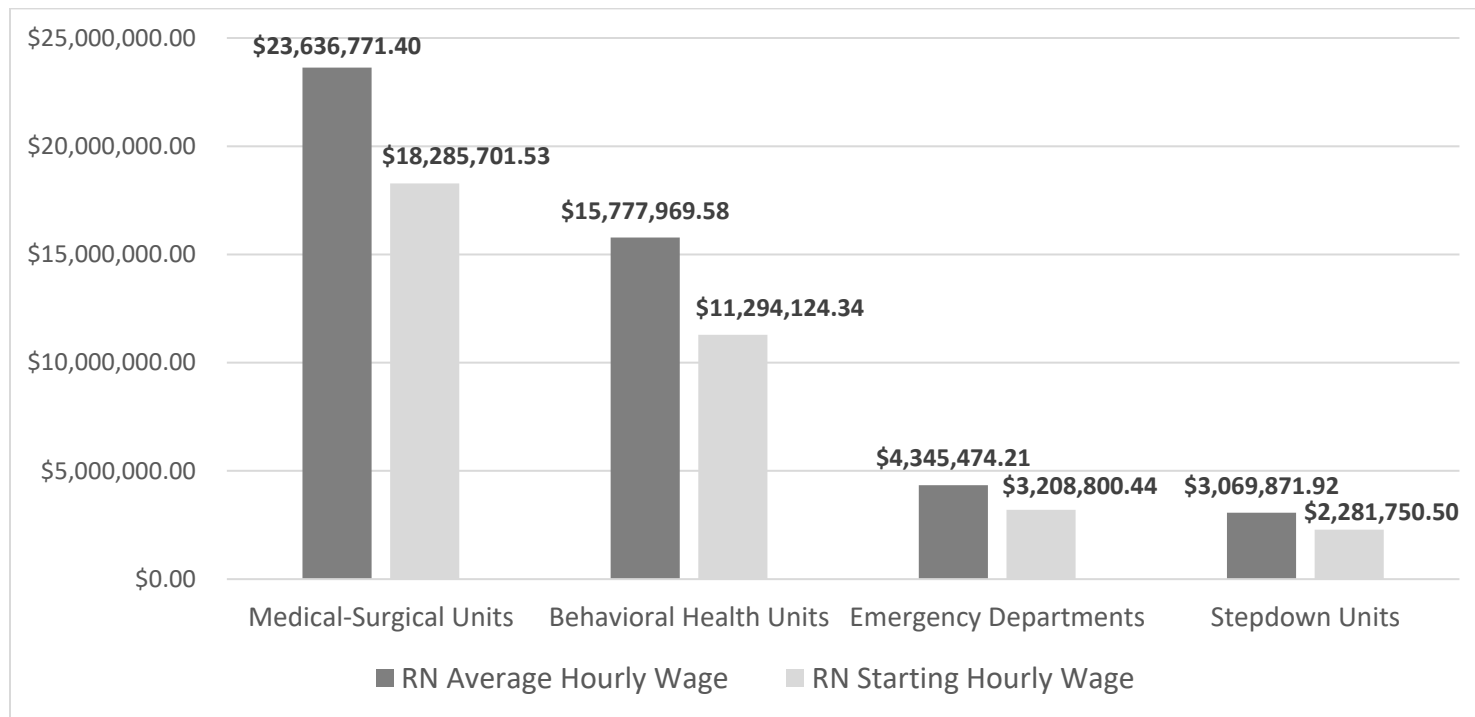
95% Confidence Interval for Mean, Lower bound = \$471,740.23, Upper bound = \$926,172.81

Footnote: RN average hourly wage data from MNA union contracts effective 2015 - 2018 (or) Nonunion hospitals by Department of Labor (May 2017) RN average hourly wage by Massachusetts MSA or NonMSA. RN staffing data was calculated from MHA (2016 & 2017)PatientCareLink.

Ballot Question 1: Moderate to High Estimate of Total Annual Costs for Additional RNs

The total annual cost for implementing on Question 1 medical-surgical, behavioral health, emergency departments and stepdown units in acute care hospitals ranges from a high estimate of **\$46,830,087.08** with an average RN hourly wage to a moderate estimate of **\$35,070,376** with an RN starting hourly wage (See Figure 4). Labor costs were calculated using RN average hourly wage data from MNA union contracts effective from 2015 to 2018 (or) in nonunion hospitals by Bureau of Labor Statistics (May 2017) RN average hourly wage by Massachusetts MSA or NonMSA. Nonunion hospital starting RN hourly wage data was calculated with zipcode match, MSA or NonMSA zipcode match with MNA contract hospitals. RN staffing data was calculated from Massachusetts Hospital Association (2017 & 2016) PatientCareLink publically available data on nurse staffing.

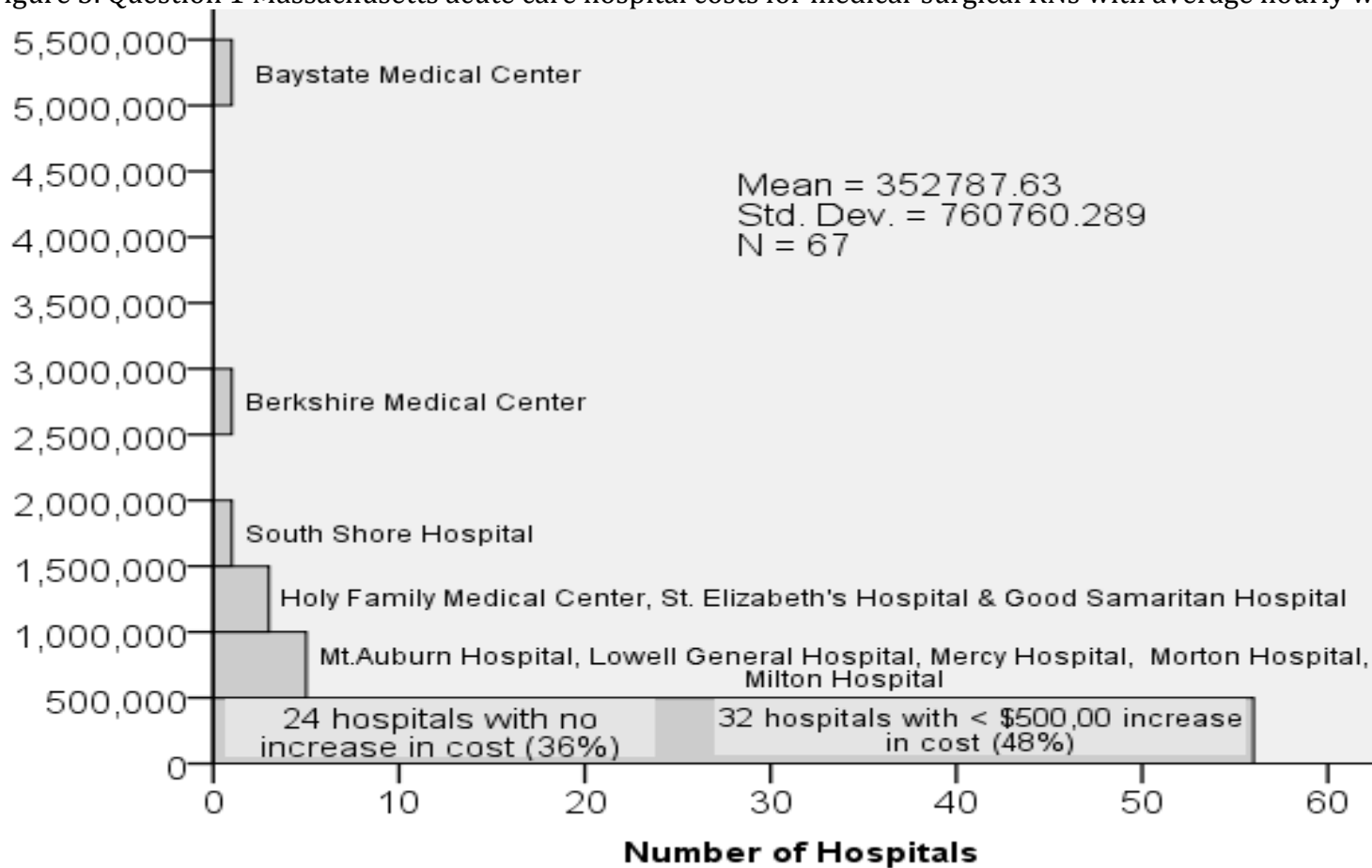
Figure 4. Moderate to high estimated annual cost of Question 1 on medical-surgical, behavioral health, stepdown units and emergency departments in Massachusetts acute care hospitals with average and starting RN hourly wage



Ballot Question 1: High Estimate of Annual Cost for Additional Medical-Surgical RNs

✚ The average hospital cost for implementing Question 1 on **medical-surgical units** with an average RN hourly wage is **\$352,787.63**. Twenty-four Massachusetts hospitals (36%) who meet the Question 1 standard of 4 patients per RN have no increase in costs. Thirty-two hospitals (48%) have an annual increase in cost of less than \$500,000. Medical-surgical units in pediatric specialty hospitals and post-acute hospitals were not included in this analysis. A detailed analysis of costs by acute care hospital is in Appendix C, “Question 1 Massachusetts acute care hospital costs for medical-surgical RNs”.

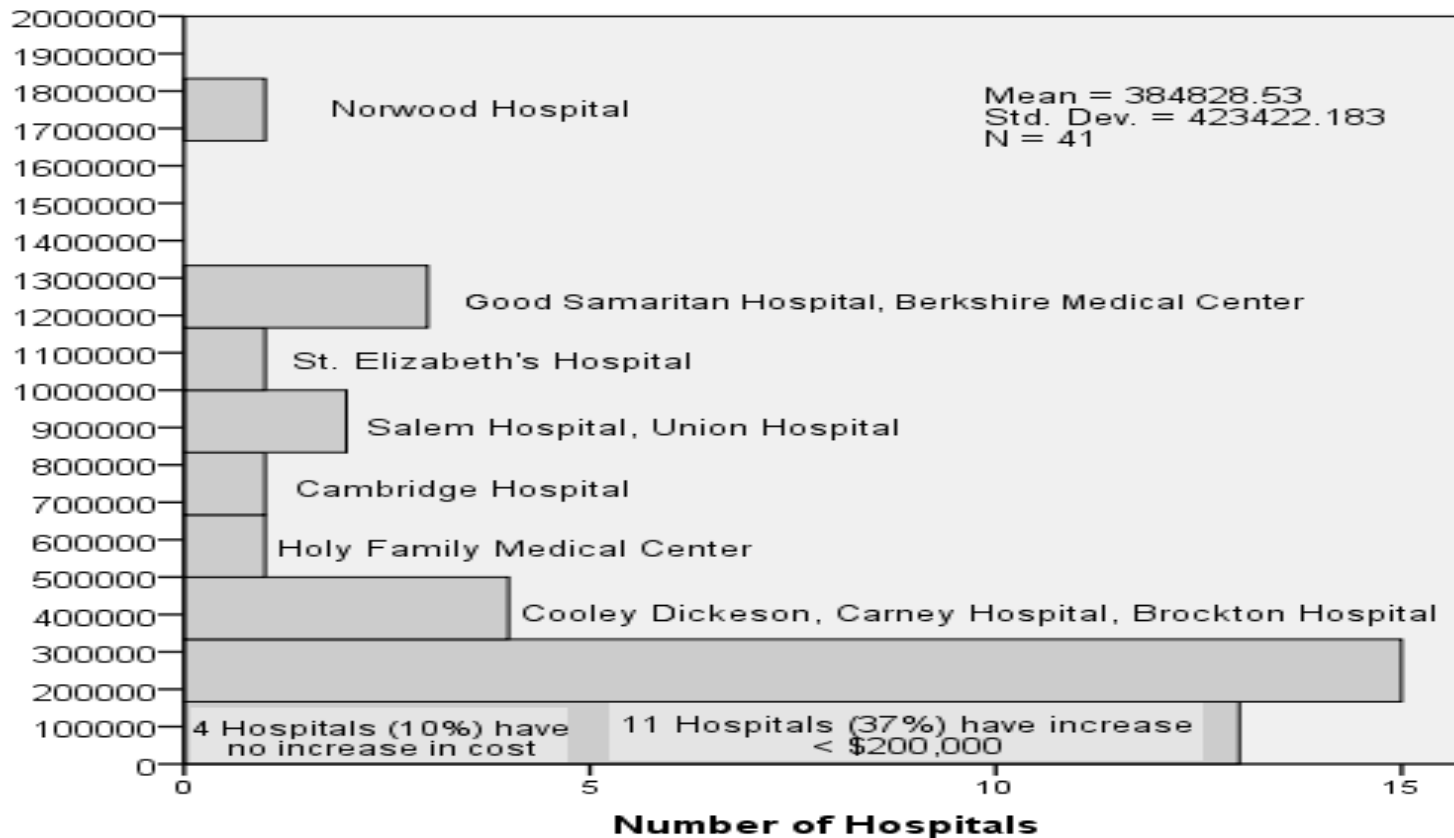
Figure 5. Question 1 Massachusetts acute care hospital costs for medical-surgical RNs with average hourly wage, 2017



Ballot Question 1: High Estimate of Annual Cost for Additional Behavioral Health RNs

✚ The average hospital cost for implementing Question 1 on **behavioral health units** with an average RN hourly wage is **\$384,828.53**. Four Massachusetts hospitals (10%) meet the MNA ballot standard of 5 patients have no increase in costs. Eleven hospitals (37%) have an annual increase in cost of less than \$200,000. Behavioral health units included geriatric, adult, adolescent, child psychiatric units and substance use units in acute care hospitals. Sixteen free standing Massachusetts psychiatric hospitals were not included in this analysis. An analysis of costs by acute care hospital is shown in Appendix D, “Question 1 Massachusetts acute care hospital costs for behavioral health RNs”.

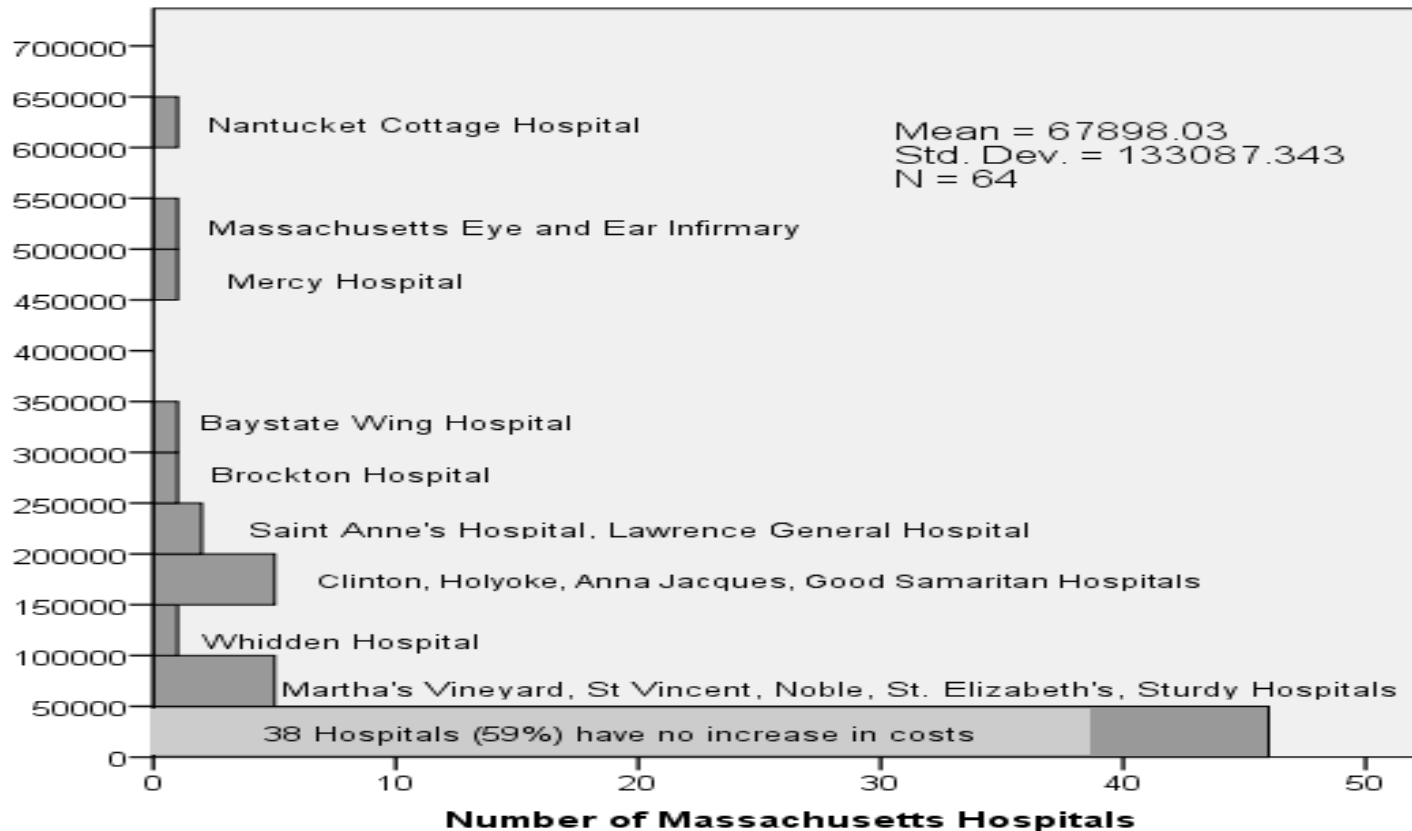
Figure 6. Question 1 Massachusetts acute care hospital cost for behavioral health RNs with average hourly wage, 2017



Ballot Question 1: High Estimate of Annual Cost for Additional Emergency Department RNs

✚ The average acute care hospital cost for implementing Question 1 in **emergency departments** with an average RN hourly wage is **\$67,898**. Thirty-eight Massachusetts hospitals (59%) who meet the MNA ballot standard of 5 stable patients have no increase in costs. Eleven hospitals (37%) have an annual increase in cost of less than \$200,000. Cost estimates were not calculated for non-stable patients in the emergency department because of the wide variation in patient acuity in trauma and non-trauma emergency departments. A detailed analysis of costs by acute care hospital is shown in Appendix E, “Question 1 Massachusetts acute care hospital costs for emergency department RNs”.

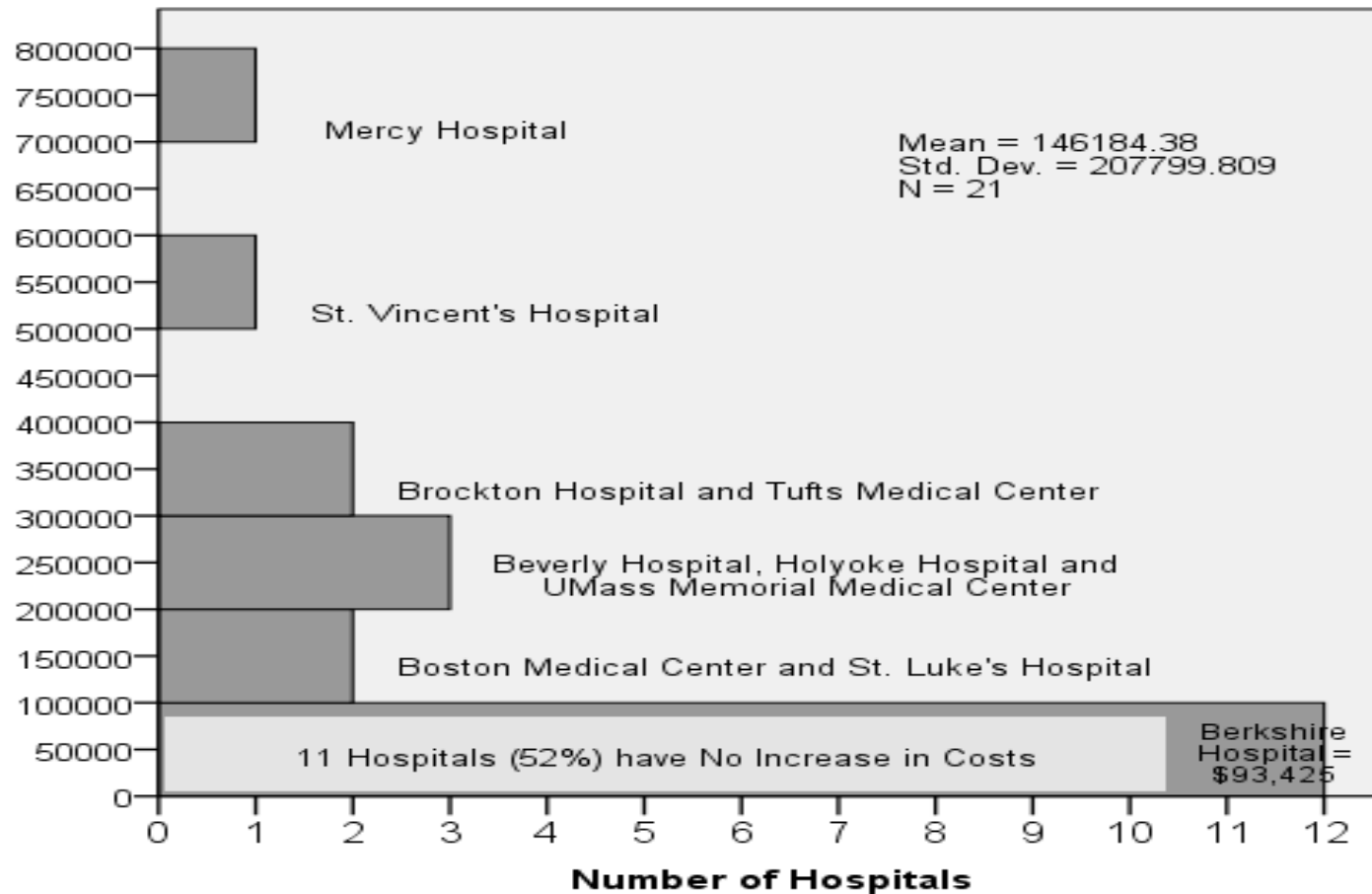
Figure 7. Question 1 Massachusetts acute care hospital cost for emergency department RNs with average hourly wage, 2016



Ballot Question 1: High Estimate of Annual Cost for Additional Stepdown RNs

✚ The average acute care hospital cost for implementing Question 1 on **stepdown** units with an average RN hourly wage is **\$146,184.38**. Eleven Massachusetts hospitals (52%) who meet the MNA ballot standard of 3 patients have no increase in costs. A detailed analysis of costs by acute care hospital is shown in Appendix F, “Question 1 Massachusetts acute care hospital costs for stepdown RNs”.

Figure 8. Question 1 Massachusetts acute care hospital cost for Stepdown RNs with average hourly wage, 2016



Limitations

The cost estimates described in this report are based upon the Massachusetts Hospital Association's (2016 & 2017) publically available staffing plans for medical-surgical, stepdown, behavioral health and emergency departments in acute care hospitals. RN staffing in post-acute hospitals, free standing psychiatric hospitals, three pediatric specialty hospitals, as well as maternity units and operating rooms in acute care hospitals, are not publically reported and were not included in this analysis. Boston Children's Hospital met the standards in Question 1 and given other pediatric specialty hospitals were excluded, Boston Children's Hospital was not included in a summary of findings. Massachusetts Chapter 155 regulates RN to patient limits in intensive care units, critical care units, and NICUs therefore these hospital units were not included in the cost analysis.

Summary

Multiple studies have found strong evidence of a positive relationship between patient outcomes and the adequacy of registered nurse staffing. In this cost analysis of Question 1, statistically significant differences in the number of patients cared for by RNs were found between Massachusetts acute care hospitals with no additional costs, and those with high costs on medical-surgical ($p < .001$), behavioral health ($p = .003$), intensive care ($p = .005$), and emergency departments ($p = .013$) (see Appendix G). My research publications describe data-based evidence of the relationship between nurse staffing and patient outcomes in Massachusetts and California hospitals. Associations between specific RN to patient ratios in Massachusetts acute care hospitals and patient outcomes is detailed in testimony I have provided to Massachusetts legislators and regulatory agencies in the Commonwealth. Based on my research findings, in my opinion, limits on the number of patients cared for by RNs improves the quality of nursing care and patient outcomes, especially in hospitals that assign RNs more patients than peer institutions. Studies have also reported lower rates of occupational injury and turnover of registered nurses in California hospitals after laws were enacted limiting on the number of patients assigned to RNs.

All too commonly, when hospitals face financial challenges, one of the first responses is to cut labor costs by cutting the numbers of RNs available to care for patients or replacing RNs with unlicensed personnel. Throughout my career, and in testimony over several decades in the Commonwealth, I have emphasized that to sustain quality and access to care in Massachusetts hospitals it is vital that we assure there are adequate numbers of registered nurses at the bedside. Given the findings of my research, I believe more strongly now, than I did decades ago, that there must be limits to the numbers of patients cared for by registered nurses to assure every patient, on every unit, in every Massachusetts hospital, receives safe, quality nursing care.

Summary of Abstracts from Publications examining RN staffing and patient outcomes in California and Massachusetts Hospitals

1. Stamp, K. D., Flanagan, J. M., Gregas, M. & Shindul-Rothschild, J. (2014). Predictors of excess heart failure readmissions: Implications for nursing practice. *Journal of Nursing Care Quality*, 29(2), 115-123.

Abstract: In this study of California, Massachusetts and New York hospitals, 6 factors predicted 27.6% of readmissions for heart failure (HF) patients. We found higher admissions per bed, teaching hospitals, and poor nurse-patient communication increased HF readmissions. Conversely, the HF readmissions were lower when nurse staffing was greater, more patients reported receiving discharge information and for hospitals in California. The implications for nursing practice in the delivery of care to HF patients are discussed.

2. Flanagan, J., Stamp, K., Gregas, M. & Shindul-Rothschild, J. (2016). Predictors of 30 day readmission for pneumonia. *Journal of Nursing Administration*, 46(2), 69-74

Abstract: Objective: This study examined data from 4 sources: number of hospital-acquired conditions, patient perception of care, quality outcome measures and demographic data to explain variances associated with 30 day pneumonia readmission rates.

Background: Patients readmitted within 30 days for pneumonia increases the length of hospital stay by 7 to 9 days, increases crude mortality rate 30 to 70%, and costs of \$40,000 or greater per patient.

Methods: Variances in outcomes measures associated with 30 day pneumonia readmissions from 577 nonfederal general hospitals in Massachusetts, California and New York were analyzed using datasets from Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), Centers of Medicare and Medicaid Services (CMS), Agency for Healthcare Research and Quality (AHRQ) and American Hospital Association (AHA).

Results: Three factors increased pneumonia readmission rates: poor nurse-patient communication, poor staff responsiveness to patient needs, and iatrogenic pneumothorax. Conversely, factors lowering pneumonia readmission rates included patients hospitalized in California, higher registered nurse staffing, and higher proportions of nursing staff to total hospital personnel.

Conclusions: Findings suggest lower nurse staffing, poor nurse-patient communication and nurse responsiveness to patient needs contribute to increased pneumonia readmission rates.

3. Shindul-Rothschild, J., Flanagan, J. M., Stamp, K. D., & Read, C. E. (2017). Beyond the pain scale: provider communication and staffing predictive of patients' satisfaction with pain control. *Pain Management Nursing*, 18 (6), 401-409. Doi: <http://dx.doi.org/10.1016/j.pmn.2017.05.003>

Abstract: Purpose: The aim of this study was to examine hospital characteristics, staffing and nursing care associated with patient self-report of pain control measured in the Hospital Consumer Assessment of Health Care Providers Systems (HCAHPS). Design: This cross-sectional study analyzed factors associated with patients' self-report of pain control in 464 non-federal hospitals in California, Massachusetts and New York. Methods: Twenty-one factors correlated with patients' reports of pain control were included in the stepwise linear regression analysis. Analysis of variance examined the relationship between staffing and patients' perception of pain control. Findings: Patients' perception of pain control significantly improved with higher numbers of registered nurses ($p = .045$), nursing staff ($p = .005$) and hospitalists ($p = .035$) and worsened with higher numbers of residents or interns ($p = .010$). Six predictors explained 79% of the variance in patients' self-reports of pain control. Pain was poorly controlled when patients did not receive help as soon as they wanted ($p < .001$), with poor nurse communication ($p < .001$), poor medication education ($p < .001$), and in teaching hospitals ($p < .001$). Pain control improved with higher numbers of nursing staff ($p = .001$) and in non-profit hospitals ($p = .001$). Conclusion: Nurse staffing and nurse communication are predictive of patients' perception of pain management. In teaching hospitals, with rotating intern/resident assignments, patients reported less satisfaction with pain management. Clinical Relevance: This study provides new evidence for the importance of adequate nurse staffing, provider-patient communication and interdisciplinary collaboration in controlling pain of hospitalized patients.

Summary of Abstracts from Publications examining RN staffing and patient outcomes in Massachusetts Hospitals

4. Shindul-Rothschild, J., Read, C., Stamp, K. D., & Flanagan, J. M. (2017). Nurse staffing and hospital characteristics predictive of time to diagnostic evaluation for patients in the emergency department. *Journal of Emergency Nursing, 43*(2), 138–144. <http://doi.org/10.1016/j.jen.2016.07.003>

Abstract: Introduction: In the 2014 Emergency Department Benchmarking Alliance Summit, for the first time, participants recommended tracking nursing and advanced practice nurse hours. Performance data from the Centers for Medicare and Medicaid Services provides an opportunity to analyze factors associated with delays in emergency care. The purpose of this study was to investigate hospital characteristics associated with time to a diagnostic evaluation in 67 Massachusetts emergency departments from 2013 to 2014. Methods: Covariates significantly correlated with time to diagnostic evaluation and factors associated with timely care in emergency departments were included in the stepwise linear regression analysis. Differences in nurse staffing and performance measures in trauma and non-trauma emergency departments was examined with analysis of variance and t-tests. Results: Two predictors explained 38% of the variance in time a diagnostic evaluation: (1) nurse staffing ($p < .001$) and (2) trauma centers ($p < .001$). In trauma centers, the time to a diagnostic evaluation significantly increased ($p = .042$) from 30.2 minutes when a nurse cared for fewer than 11.32 patients in 24 hours, to 61.4 minutes when a nurse cared for 14.85 or more patients in 24

hours. Discussion: Efforts to improve patient flow often focus on process interventions such as improved utilization of observation beds or transfers of patients to inpatient units. In this study, time to diagnostic evaluation significantly increased when emergency nurses care for higher numbers of patients. The findings present new evidence identifying the relationship of specific nurse to patient ratios on wait time in emergency departments.

5. Read, C. E., Shindul-Rothschild, J., Flanagan, J. M., & Stamp, K. D. (2018). Factors Associated with Removal of Urinary Catheters after Surgery. *Journal of Nursing Care Quality, 33*(1), 9-37. doi: 10.1097/NCQ.0000000000000287 .
Abstract: Publicly available data from the Centers for Medicaid & Medicare Services were used to analyze factors associated with removal of the urinary catheter within 48 hours after surgery in 59 Massachusetts hospitals. Three factors explained 36% of the variance in postoperative urinary catheter removal: fewer falls per 1000 discharges, better nurse-patient communication, and higher percent of Medicare patients. Timely urinary catheter removal was significantly greater in hospitals with more licensed nursing hours per patient day.

Disclosures:

The research by Dr. Shindul-Rothschild used in this report was solely supported by Boston College.

Disclaimer:

The views expressed in this report are solely that of the researcher, Dr. Shindul-Rothschild, and not those of Boston College.

Further Information on Measures Referenced in this Testimony:

American Hospital Association (2016). *AHA Annual Survey Database*. AHA: Chicago.

Center for Health Information and Analysis (August 2018). *Massachusetts Acute Hospital and Health System Financial Performance: FY 2017*.

Pub.No. 18-214-CHIA-01. Retrieved from <http://archives.lib.state.ma.us/bitstream/handle/2452/792887/ocn994684730-FY2017.pdf?sequence=1&isAllowed=>

Massachusetts Hospital Association (2016 & 2017). *Staffing Plans and Reports*. Retrieved from: <http://patientcarelink.org/healthcare-provider-data/hospital-data/staffing-plans-reports/>

Massachusetts Nurses Association (2017). *MNA Wages Division of Membership Annual Report*. Acute care hospitals. By permission of author.

U.S. Department of Labor (May 2017). *Registered Nurse Salaries in Metropolitan and Nonmetropolitan Areas, Massachusetts*. Retrieved from: <https://www.bls.gov/oes/current/oessrcma.htm>

Recent Testimony in Massachusetts:

Shindul-Rothschild, J. (October 20, 2015). Testimony on behalf of the Massachusetts Nurses Association in support of S.1206/H.1958, *An Act Relative to Patient Safety* to the Joint Senate House Committee on Public Health. Oral testimony available at: <https://www.youtube.com/watch?v=YNecgx7rFT0>

Shindul-Rothschild, J. (March 25, 2015). *Nurse Staffing Quality Measures*. Comment on behalf of the Massachusetts Nurses Association to the Health Policy Commission hearing on ICU Nurse Staffing Law, MGL c. 111, sec. 231. Available at: <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/nurse-staffing/20150325-mna-judith-shindul-rothschild.pdf>

Shindul-Rothschild, J. (December 23, 2014). *Nurse Staffing Quality Measures*. Comment on behalf of the Massachusetts Nurses Association to the Committee on Patient Protection and Quality Improvement, Health Policy Commission hearing on ICU Nurse Staffing Law, MGL c. 111, sec. 231. Available at: <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/nurse-staffing/quality-measures-mna.pdf>

Shindul-Rothschild, J. (October 29, 2014). *ICU Nurse Staffing Regulations*. Public Testimony to the Committee on Patient Protection and Quality Improvement, Health Policy Commission hearing on ICU Nurse Staffing Law, MGL c. 111, sec. 231. Available at: <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/nurse-staffing/20141029-public-testimony-mna-judith-shindul-rothschild.pdf>

Shindul-Rothschild, J. (March 24, 2014). Testimony on behalf of the Massachusetts Nurses Association in support of S. 557 and H. 1008, *An Act Relative to Patient Safety* to the Joint Senate House Committee on Health Care Financing. Oral testimony available at: https://www.youtube.com/watch?v=wTx_0PXFxn4

Shindul-Rothschild, J. (March 20, 2010). Health care cost trends: Cost drivers. Massachusetts Office of Health and Human Services. Retrieved on November, 2011 from: <http://www.mass.gov/chia/docs/cost-trend-docs/oral-testimony/oral-testimony-shindul-rothschild.pdf>

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Appendix A - Question 1 estimated additional RNs per day and full time RNs annually

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, Connell School of Nursing, Boston College

	16 Total Additional Stepdown RN/Day (Additional Stepdown Patient/3 per MNA ballot)	17 Total Additional Medical- Surgical RN/Day (Additional Medical Surgical Patients/4 per MNA ballot)	16 Total additional Emergency Department RN/Day (Additional Patients per day/5 per MNA ballot)	17 Total Hospital Additional Psychiatric RN/Day (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)	Sum of Additional RN/Day per MNA Ballot
Health Alliance Hospitals - UMass Memorial Leominster		0.00	0.00		0
Mount Auburn Hospital	0.00	1.26	0.00	0.07	1.33
Sturdy Memorial Hospital		0.00	0.27		0.27
Lawrence General Hospital		0.00	0.66		0.66
Cambridge Health Alliance Hospital- Cambridge Hospital		0.00	0.00	1.84	1.84
Cambridge Health Alliance - Whidden		0.15	0.33	0.12	0.60
Cape Cod Hospital		0.99	0.58	0.78	2.35
Cooley Dickenson Hospital	0.00	0.00	0.00	1.16	1.16
Baystate Franklin Medical Center		0.00	0.00	0.00	0.00
Carney Hospital		1.26	0.10	1.12	2.47
Harrington Memorial Hospital		0.50	0.00	0.75	1.25
Saint Anne's Hospital		1.35	0.74	0.20	2.29
Holyoke Medical Center	0.81	0.51	0.54	0.83	2.69
Anna Jacques Hospital		0.00	0.41	0.76	1.16
Baystate Wing Memorial Hospital		1.32	1.02	0.31	2.65
Boston Medical Center	0.36	0.00	0.00		0.36

	16 Total Additional Stepdown RN/Day (Additional Stepdown Patient/3 per MNA ballot)	17 Total Additional Medical- Surgical RN/Day (Additional Medical Surgical Patients/4 per MNA ballot)	16 Total additional Emergency Department RN/Day (Additional Patients per day/5 per MNA ballot)	17 Total Hospital Additional Psychiatric RN/Day (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)	Sum of Additional RN/Day per MNA Ballot
Northeast Health Sysgtem - Addison Gilbert Hospital)		0.14	0.00	0.80	0.95
Northeast Health System - Beverly Hospital	0.61	1.10	0.00	0.30	2.01
North Shore Medical Center - Salem Hospital		0.18	0.00	2.40	2.58
North Shore Medical Center - Union Hospital		0.00	0.00	2.54	2.54
St. Elizabeth's Medical Center		2.70	0.15	2.57	5.42
Berkshire Medical Center	0.27	7.56	0.00	3.73	11.56
UMass Memorial - Marlborough Hospital		0.20	0.00	0.30	0.5
Signature Healthcare - Brockton Hospital	1.00	1.26	0.73	1.00	3.99
Clinton Hospital		0.00	0.48	0.60	1.08
Beth Israel Hospital - Plymouth (formerly Jordan Hospital)		0.99	0.00	0.00	0.99
Lowell General Hospital	0.00	2.14	0.00		2.14
Baystate - Noble Hospital		0.00	0.18	0.84	1.02
Sister's of Providence - Mercy Hospital	1.90	2.34	1.26		5.50
Hallmark Health System - Lawrence Memorial Hospital		0.11	0.00	0.67	0.78
Hallmark Health System - Melrose Wakefield Hospital		0.81	0.00	0.72	1.53
Massachusetts General Hospital		0.00	0.00	0.00	0
Morton Hospital and Medical Center		2.48	0.00	0.05	2.53
Southcoast Hospital Group - Tobey Hospital		0.23	0.15		0.37

	16 Total Additional Stepdown RN/Day (Additional Stepdown Patient/3 per MNA ballot)	17 Total Additional Medical- Surgical RN/Day (Additional Medical Surgical Patients/4 per MNA ballot)	16 Total additional Emergency Department RN/Day (Additional Patients per day/5 per MNA ballot)	17 Total Hospital Additional Psychiatric RN/Day (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)	Sum of Additional RN/Day per MNA Ballot
Southcoast Hospital Group - Charlton Memorial Hospital	0.00	0.00	0.04		0.04
Southcoast Hospital Group - St. Luke's Hospital	0.30	0.50	0.00		0.80
Massachusetts Eye and Ear Infirmary	0.00	0.00	1.27		1.27
Baystate Medical Center	0.00	16.38	0.00	0.60	16.98
Holy Family Hospital and Medical Center		3.33	0.00	1.66	4.99
Beth Israel Deaconess - Needham		0.11	0.00		0.11
Emerson Hospital		0.00	0.05	0.85	0.90
Beth Israel Deaconess Hospital - Boston	0.00	0.54	0.00	0.16	0.70
New England Baptist Hospital		0.27			0.27
Milford Regional Medical Center	0.00	0.00	0.00		0
Heywood Hospital		0.52	0.09	0.46	1.07
Nashoba Valley Medical Center		0.64	0.00		0.64
South Shore Hospital		3.90	0.00		3.9
Newton-Wellesley Hospital		0.82	0.00	0.00	0.82
Winchester Hospital		0.64	0.09		0.73
Beth Israel Deaconess - Milton Hospital		1.23	0.10		1.33
Brigham and Women's Hospital	0.00	0.00	0.00		0
Good Samaritan Hospital		3.02	0.44	3.55	7.01

	16 Total Additional Stepdown RNs/Day (Additional Stepdown Patient/3 per MNA ballot)	17 Total Additional Medical-Surgical RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)	16 Total additional Emergency Department RNs per day (Additional Patients per day/5 per MNA ballot)	17 Total Hospital Additional Psychiatric RNs (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)	Sum of Additional RNs/Day per MNA Ballot
Tufts Medical Center	1.00	0.86	0.00	0.27	2.13
Brigham and Women's - Faulkner Hospital		0.90	0.00	0.60	1.50
Steward Health Care - Norwood Hospital		0.50	0.05	4.66	5.21
Falmouth Hospital		0.15	0.00		0.15
Dana Farber Hospital		0.00			0
UMass Memorial Medical Center	0.55	0.00	0.00	0.55	1.10
Lahey Clinic Hospital		0.00	0.00		0
Holy Family at Merrimack Valley Hospital		0.83		0.61	1.44
Metrowest Medical Center - Framingham	0.00	0.40	0.00		0.4
Metrowest Medical Center - Natick		0.40	0.00	3.36	3.76
St. Vincent Hospital at Worcester Medical Center	1.57	0.00	0.14	0.60	2.31
Nantucket Cottage Hospital		0.00	1.61		1.61
Martha's Vineyard Hospital		0.40	0.24		0.64
Fairview Hospital		0.00	0.00		0
Athol Memorial Hospital		0.00	0.00		0
Total RNs per day	8.37	65.91	11.73	42.40	128.383

Low estimate additional Medical-Surgical, Stepdown, ED, Psychiatric full time RNs/year = 538.86
 High estimate 128.38 RNs X 3 (24 hours day X 365 days in year)/2087 Full time hours in year 1,617.00

Appendix B: Question 1 Estimated Massachusetts Acute Care Hospital Costs for RNs with Average Hourly Wage
 Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing, Boston College, September 8, 2018

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot
Massachusetts Acute Care Hospitals - Excluding Specialty Psychiatric, Rehabilitation and Children's Hospitals.					
Health Alliance Hospitals - UMass Memorial Leominster	0 .		0 .		0
Mount Auburn Hospital	515455.92	0	0	29454.62	544910.54
Sturdy Memorial Hospital	0 .		90610.81 .		90610.81
Lawrence General Hospital	0 .		233576.64 .		233576.64
Cambridge Hospital	0 .		0	745785.4	745785.4
Cambridge Health Alliance - Whidden	64937.88 .		142863.34	51950.3	259751.52
Cape Cod Hospital	333800.68 .		196908.68	262994.47	793703.83
Cooley Dickenson Hospital	0	0	0	437919.93	437919.93
Baystate Franklin Medical Center	0 .		0	0	0
Carney Hospital	485985.53 .		37027.47	430444.32	953457.32
Harrington Memorial Hospital	175572.74 .		0	266019.3	441592.04

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot
Saint Anne's Hospital	453054.06 .		248340.74	68461.5	769856.3
Holyoke Medical Center	166060.69	263743.45	175177.75	271558.07	876539.96
Anna Jacques Hospital	0 .		152647.56	284240.28	436887.84
Baystate Wing Memorial Hospital	429804.14 .		331470.17	101590.07	862864.38
Boston Medical Center	0	153990.29	0 .		153990.29
Northeast Health Sysgtem - Addison Gilbert Hospital	51355.06 .		0	289750.67	341105.73
Northeast Health System - Beverly Hospital	397326.01	219835.7	0	108115.92	725277.63
North Shore Medical Center - Salem Hospital	65058.77 .		0	867450.24	932509.01
North Shore Medical Center - Union Hospital	0 .		0	914594.46	914594.46
St. Elizabeth's Medical Center	1139316.84 .		63295.38	1083616.91	2286229.13
Berkshire Medical Center	2615911.2	93425.4	0	1289270.52	3998607.12
UMass Memorial - Marlborough Hospital	77537.17 .		0	114869.88	192407.05

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot
Signature Healthcare - Brockton Hospital	457729.27	363277.2	265918.91	364003.75	1450929.13
Clinton Hospital	0 .		181309.22	227584.8	408894.02
Beth Israel Hospital - Plymouth	360338.22 .		0	0	360338.22
Lowell General Hospital	711531	0	0 .		711531
Baystate - Noble Hospital	0 .		63538.73	290068.13	353606.86
Sister's of Providence - Mercy Hospital	865852.42	703042.56	466968.27 .		2035863.25
Lawrence Memorial Hospital	46022.85 .		0	274909.82	320932.67
Melrose Wakefield Hospital	331364.52 .		0	294546.24	625910.76
Massachusetts General Hospital	0 .		0	0	0
Morton Hospital and Medical Center	829515.06 .		0	18098.51	847613.57
Southcoast Hospital Group - Tobey Hospital	75154.23 .		49434.78 .		124589.01
Southcoast Hospital Group - Charlton Memorial Hospital	0	0	14696.83 .		14696.83

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot
Southcoast Hospital Group - St. Luke's Hospital	165339.31	100205.64	0 .	265544.95	
Massachusetts Eye and Ear Infirmary	0	0	517910.47 .	517910.47	
Baystate Medical Center	5333478.7	0	0	195365.52	5528844.22
Holy Family Hospital and Medical Center	1232174.59 .		0	612757.09	1844931.68
Beth Israel Deaconess - Needham	46022.85 .		0 .	46022.85	
Emerson Hospital	0 .		21272.78	348546.38	369819.16
Beth Israel Deaconess Hospital - Boston	220909.68	0	0	63818.35	284728.03
New England Baptist Hospital	110454.84 .	.	.	110454.84	
Milford Regional Medical Center	0	0	0 .	0	
Heywood Hospital	219865.05 .		39087.12	193736.16	452688.33
Nashoba Valley Medical Center	212713.61 .		0 .	212713.61	
South Shore Hospital	1595458.8 .		0 .	1595458.8	

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot	
Newton-Wellesley Hospital	335766.42 .			0	0	335766.42
Winchester Hospital	260796.15 .			38454.65 .		299250.8
Beth Israel Deaconess - Milton Hospital	503183.16 .			41727.38 .		544910.54
Brigham and Women's Hospital	0	0	0 .			0
Good Samaritan Hospital	1104524.75 .			161923.69	1301251.05	2567699.49
Tufts Medical Center	313099.92	363014.4		0	98013.89	774128.21
Brigham and Women's - Faulkner Hospital	337592.88 .			0	225061.92	562654.8
Steward Health Care - Norwood Hospital	182640.74 .			19186.5	1720143.73	1921970.97
Falmouth Hospital	50575.86 .			0 .		50575.86
Dana Farber Hospital	0 .					0
UMass Memorial Medical Center	0	222350.7		0	223159.25	445509.95
Lahey Clinic Hospital	0 .			0 .		0

	Annual Hospital Costs Average Hourly Wage ^a Additional Medical-Surgical RNs 2017 ^b per MNA ballot (RN ratio ≤ 4= 0) N = 67	Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 ^c per MNA ballot (RN ratio ≤ 3= 0) N = 21	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 ^c per MNA ballot (RN ratio ≤ 5= 0) N = 64	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 ^b per MNA ballot (RN ratio ≤ 5= 0) N = 41	Sum of Annual Hospital Costs Average Hourly Wage Additional RNs per MNA Ballot
Holy Family at Merrimack Valley Hospital	302501.2 .	.	.	222379.26	524880.46
Metrowest Medical Center - Framingham	152129.66	0	0 .		152129.66
Metrowest Medical Center - Natick	152129.66 .			0 1262112.77	1414242.43
St. Vincent Hospital at Worcester Medical Center	0	586986.58	50847.24	224326.08	862159.9
Nantucket Cottage Hospital	0 .		646650.06 .		646650.06
Martha's Vineyard Hospital	156729.32 .		94629.02 .		251358.34
Fairview Hospital	0 .			0 .	0
Athol Memorial Hospital	0 .			0 .	0
Total	Mean 352787.63 Sum 23636771.4	146184.38 3069871.92	67898.03 4345474.21	384828.53 15777969.58	698956.52 46830087.11

Footnote: ^aRN Average Hourly Wage data from MNA Union contracts effective 2015 - 2018 (or) Nonunion Hospitals by Department of Labor May 2017 release RN average hourly wage by Massachusetts MSA or NonMSA Zipcode match. ^b2017 MHA PatientCareLink. ^c2016 MHA PatientCareLink

Appendix C - Question 1 Estimated Massachusetts Acute Care Hospital Costs for Medical-Surgical RNs, 2017

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing, Boston College

September 8,
2018

Massachusetts Hospitals	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0)	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Health Alliance Hopsitals - UMass Memorial Leominster	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mount Auburn Hospital	515455.92	361812.53	0.28	0.84	6.00	5.04	1.26
Sturdy Memorial Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawrence General Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cambridge Health Alliance Hospital- Cambridge Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Cambridge Health Alliance - Whidden	64937.88	45070.2	0.10	0.30	2.00	0.60	0.15
Cape Cod Hospital	333800.68	244128.06	0.22	0.66	6.00	3.96	0.99
Cooley Dickenson Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baystate Franklin Medical Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carney Hospital	485985.53	328589.35	0.84	2.52	2.00	5.04	1.26
Harrington Memorial Hospital	175572.74	129739.10	0.66	1.98	1.00	1.98	0.50
Saint Anne's Hospital	453054.06	321312.42	0.36	1.08	5.00	5.40	1.35
Holyoke Medical Center	166060.69	149083.81	0.68	2.04	1.00	2.04	0.51
Anna Jacques Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baystate Wing Memorial Hospital	429804.14	385863.98	1.76	5.28	1.00	5.28	1.32
Boston Medical Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Northeast Health Sysgtem - Addison Gilbert Hospital)	51355.06	36100.84	0.19	0.57	1.00	0.57	0.14
Northeast Health System - Beverly Hospital	397326.01	279306.47	0.49	1.47	3.00	4.41	1.10
North Shore Medical Center - Salem Hospital	65058.77	44781.12	0.04	0.12	6.00	0.72	0.18
North Shore Medical Center - Union Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St. Elizabeth's Medical Center	1139316.84	746930.16	0.90	2.70	4.00	10.80	2.70
Berkshire Medical Center	2615911.20	2298690.58	1.26	3.78	8.00	30.24	7.56
UMass Memorial - Marlborough Hospital	77537.17	57101.84	0.27	0.81	1.00	0.81	0.20
Signature Healthcare - Brockton Hospital	457729.27	325498.82	0.56	1.68	3.00	5.04	1.26
Clinton Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beth Israel Hospital - Plymouth (formerly Jordan Hospital)	360338.22	244648.40	0.33	0.99	4.00	3.96	0.99
Lowell General Hospital	711531.00	592068.69	0.57	1.71	5.00	8.55	2.14

	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Baystate - Noble Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sister's of Providence - Mercy Hospital	865852.42	684031.61	0.78	2.34	4.00	9.36	2.34
Hallmark Health System - Lawrence Memorial Hospital	46022.85	31161.51	0.15	0.45	1.00	0.45	0.11
Hallmark Health System - Melrose Wakefield Hospital	331364.52	224362.87	0.27	0.81	4.00	3.24	0.81
Massachusetts General Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Morton Hospital and Medical Center	829515.06	589072.77	1.10	3.30	3.00	9.90	2.48
Southcoast Hospital Group - Tobey Hospital	75154.23	53552.07	0.15	0.45	2.00	0.90	0.23
Southcoast Hospital Group - Charlton Memorial Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southcoast Hospital Group - St. Luke's Hospital	165339.31	117814.55	0.11	0.33	6.00	1.98	0.50
Massachusetts Eye and Ear Infirmary	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baystate Medical Center	5333478.70	4788221.26	1.82	5.46	12.00	65.52	16.38

	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Holy Family Hospital and Medical Center	1232174.59	888250.86	1.11	3.33	4.00	13.32	3.33
Beth Israel Deaconess - Needham	46022.85	31161.51	0.15	0.45	1.00	0.45	0.11
Emerson Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beth Israel Deaconess Hospital - Boston	220909.68	149575.25	0.08	0.24	9.00	2.16	0.54
New England Baptist Hospital	110454.84	74787.62	0.09	0.27	4.00	1.08	0.27
Milford Regional Medical Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heywood Hospital	219865.05	160433.49	0.69	2.07	1.00	2.07	0.52
Nashoba Valley Medical Center	212713.61	161950.50	0.85	2.55	1.00	2.55	0.64
South Shore Hospital	1595458.80	1080265.68	0.65	1.95	8.00	15.60	3.90
Newton-Wellesley Hospital	335766.42	219483.99	0.22	0.66	5.00	3.30	0.82
Winchester Hospital	260796.15	176581.89	0.17	0.51	5.00	2.55	0.64

	Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Beth Israel Deaconess - Milton Hospital	503183.16	340699.18	0.82	2.46	2.00	4.92	1.23
Brigham and Women's Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Good Samaritan Hospital	1104524.75	758007.18	0.67	2.01	6.00	12.06	3.02
Tufts Medical Center	313099.92	236184.93	0.23	0.69	5.00	3.45	0.86
Brigham and Women's - Faulkner Hospital	243300.24	243300.24	0.30	0.90	4.00	3.60	0.90
Steward Health Care - Norwood Hospital	182640.74	122367.56	0.66	1.98	1.00	1.98	0.50
Falmouth Hospital	50575.86	36989.10	0.05	0.15	4.00	0.60	0.15
Dana Farber Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UMass Memorial Medical Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lahey Clinic Hospital	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Holy Family at Merrimack Valley Hospital	302501.20	216811.97	1.11	3.33	1.00	3.33	0.83

		Annual Hospital Additional Cost Medical-Surgical RNs with Avg Hourly Wage 2017 ^a	Annual Hospital Additional Cost Medical-Surgical RNs with Starting Hourly Wage 2017 ^b	Med-Surg RN ratio minus 4 MNA ballot per 7 hour shift (actual RN ratio \leq 4 = 0) ^c	Additional Med-Surg Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot)	Total Adult Medical Surgical Units in Hospitals with RN ratio above 4 Patient MNA ballot limit (excluded combined ICU or Pedi units)	Total Additional Med-Surg Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional RNs/Day (Additional Medical Surgical Patients/4 per MNA ballot)
Metrowest Medical Center - Framingham		152129.66	102495.94	0.18	0.54	3.00	1.62	0.40
Metrowest Medical Center - Natick		152129.66	102495.94	0.27	0.81	2.00	1.62	0.40
St. Vincent Hospital at Worcester Medical Center		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nantucket Cottage Hospital		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Martha's Vineyard Hospital		156729.32	104915.67	0.53	1.59	1.00	1.59	0.40
Fairview Hospital		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Athol Memorial Hospital		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Mean	352787.6328	272920.9183	0.3391	1.0173	3.6744	3.9349	0.9837
	Sum	23636771.40	18285701.53	22.72	68.16	158.00	263.64	65.91

Footnote: ^aRN Average Hourly Wage data from MNA Union contracts effective 2015 - 2018 (or) Nonunion Hospitals by Department of Labor May 2017 release RN average hourly wage by Massachusetts MSA or NonMSA Zipcode match. ^bRN Starting Hourly Wage data from MNA Union contracts 2015-2018 (or) Nonunion Hospitals calculated by Zipcode match with MNA unionized hospital contracts. ^c2017 MHA PatientCareLink

Appendix D - Question 1 Massachusetts Acute Care Hospital Costs for Behavioral Health RNs, 2017

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing, Boston College

September 8, 2018

	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Psychiatric Dept RNs 2017 per MNA ballot ^b	Psychiatric unit additional Patients per day X 3 (RN Ratio ≤5 = 0) ^c	Total Psychiatric Units including Geriatric, Substance Abuse, Adolescent and Child	Psychiatric unit additional Patients per day X Hospital Psychiatric Units	Total Hospital Additional Psychiatric RNs (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)
Massachusetts Hospital						
Mount Auburn Hospital	29454.62	20675	0.36	1	0.36	0.07
Cambridge Hospital	745785.4	527212.54	3.06	3	9.18	1.84
Whidden Hospital	51950.3	36056.16	0.3	2	0.6	0.12
Cape Cod Hospital	262994.47	192343.32	3.9	1	3.9	0.78
Cooley Dickenson Hospital	437919.93	330494.13	5.79	1	5.79	1.16
Baystate Franklin Medical Center	0	0	0	1	0	0
Carney Hospital	430444.32	291036.28	1.86	3	5.58	1.12
Harrington Memorial Hospital	266019.3	196574.4	3.75	1	3.75	0.75
Saint Anne's Hospital	68461.5	48553.88	0.51	2	1.02	0.2
Holyoke Medical Center	271558.07	243795.88	4.17	1	4.17	0.83

	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Psychiatric Dept RNs 2017 per MNA ballot ^b	Psychiatric unit additional Patients per day X 3 (RN Ratio ≤5 = 0) ^c	Total Psychiatric Units including Geriatric, Substance Abuse, Adolescent and Child	Psychiatric unit additional Patients per day X Hospital Psychiatric Units	Total Hospital Additional Psychiatric RNs (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)
Anna Jacques Hospital	284240.28	200994.7	3.78	1	3.78	0.76
Baystate Wing Memorial Hospital	101590.07	91204.21	0.78	2	1.56	0.31
Northeast Health Sysgtem - Addison Gilbert Hospital	289750.67	203684.72	4.02	1	4.02	0.8
Northeast Health System - Beverly Hospital	108115.92	76001.76	1.5	1	1.5	0.3
North Shore Medical Center - Salem Hospital	867450.24	597081.6	12	1	12	2.4
North Shore Medical Center - Union Hospital	914594.46	632906.5	6.36	2	12.72	2.54
St. Elizabeth's Medical Center	1083616.9	710413.57	3.21	4	12.84	2.57
Berkshire Medical Center	1289270.5	1132926.1	6.21	3	18.63	3.73
UMass Memorial - Marlborough Hospital	114869.88	84595.32	1.5	1	1.5	0.3
Signature Healthcare - Brockton Hospital	364003.75	258849.06	5.01	1	5.01	1
Clinton Hospital	227584.8	168875.28	3	1	3	0.6

	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Psychiatric Dept RNs 2017 per MNA ballot ^b	Psychiatric unit additional Patients per day X 3 (RN Ratio ≤5 = 0) ^c	Total Psychiatric Units including Geriatric, Substance Abuse, Adolescent and Child	Psychiatric unit additional Patients per day X Hospital Psychiatric Units	Total Hospital Additional Psychiatric RNs (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)
Beth Israel Hospital - Plymouth	0	0	0	1	0	0
Baystate - Noble Hospital	290068.13	220752	4.2	1	4.2	0.84
Hallmark Health System - Lawrence Memorial Hospital	274909.82	186138.09	1.68	2	3.36	0.67
Hallmark Health System - Melrose Wakefield Hospital	294546.24	199433.66	3.6	1	3.6	0.72
Massachusetts General Hospital	0	0	0	1	0	0
Morton Hospital and Medical Center	18098.51	12852.5	0.27	1	0.27	0.05
Baystate Medical Center	195365.52	175392.72	3	1	3	0.6
Holy Family Hospital and Medical Center	612757.09	441724.75	4.14	2	8.28	1.66
Emerson Hospital	348546.38	235996.5	4.26	1	4.26	0.85
Beth Israel Deaconess Hospital - Boston	63818.35	43210.63	0.78	1	0.78	0.16
Heywood Hospital	193736.16	141367.48	1.14	2	2.28	0.46

	Annual Hospital Costs Average Hourly Wage Additional Psychiatric RNs 2017 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Psychiatric Dept RNs 2017 per MNA ballot ^b	Psychiatric unit additional Patients per day X 3 (RN Ratio ≤5 = 0) ^c	Total Psychiatric Units including Geriatric, Substance Abuse, Adolescent and Child	Psychiatric unit additional Patients per day X Hospital Psychiatric Units	Total Hospital Additional Psychiatric RNs (Total Hospital Psychiatric Patients per day/MNA Ballot = 5)	
Newton-Wellesley Hospital	0	0	0	1	0	0	
Good Samaritan Hospital	1301251.1	893015.42	8.88	2	17.76	3.55	
Tufts Medical Center	98013.89	73936.15	1.35	1	1.35	0.27	
Brigham and Women's - Faulkner Hospital	225061.92	162200.16	3	1	3	0.6	
Steward Health Care - Norwood Hospital	1720143.7	1152480	7.77	3	23.31	4.66	
UMass Memorial Medical Center	223159.25	148257.04	1.38	2	2.76	0.55	
Holy Family at Merrimack Valley Hospital	222379.26	159386.1	1.53	2	3.06	0.61	
Metrowest Medical Center - Natick	1262112.8	850336.7	4.2	4	16.8	3.36	
St. Vincent Hospital at Worcester Medical Center	224326.08	153370.08	3	1	3	0.6	
Total	Mean	384828.53	275466.45	3.0549	1.5854	5.1702	1.034
	Sum	15777970	11294124	125.25	65	211.98	42.4

Appendix E: Question 1 Massachusetts acute care hospital costs for Emergency Department RNs, 2016

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing, Boston College, September 8, 2018

	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot ^b	Emergency Department ratio minus 5 MNA ballot per 7 hour shift (actual RN ratio < 5 = 0) ^c	Emergency Department additional patients assigned to RN per day (Additional Patients/shift X 3)	Total additional Emergency Department RNs per day (Additional Patients per day/5 per MNA ballot)
Massachusetts Hospital					
Health Alliance Hospitals - UMass Memorial Leominster	0	0	0	0	0
Mount Auburn Hospital	0	0	0	0	0
Sturdy Memorial Hospital	90610.81	64262.48	0.45	1.35	0.27
Lawrence General Hospital	233576.64	164197.44	1.1	3.3	0.66
Cambridge Health Alliance Hospital- Cambridge Hospital	0	0	0	0	0
Cambridge Health Alliance - Whidden	142863.34	99154.44	0.55	1.65	0.33
Cape Cod Hospital	196908.68	144010.9	0.97	2.92	0.58
Cooley Dickenson Hospital	0	0	0	0	0
Baystate Franklin Medical Center	0	0	0	0	0
Carney Hospital	37027.47	25035.38	0.16	0.48	0.1
Harrington Memorial Hospital	0	0	0	0	0
Saint Anne's Hospital	248340.74	176126.81	1.23	3.7	0.74
Holyoke Medical Center	175177.75	157268.81	0.9	2.69	0.54
Anna Jacques Hospital	152647.56	107941.6	0.68	2.03	0.41
Baystate Wing Memorial Hospital	331470.17	297582.98	1.7	5.09	1.02
Boston Medical Center	0	0	0	0	0
Northeast Health Sysgtem - Addison Gilbert Hospital)	0	0	0	0	0
Northeast Health System - Beverly Hospital	0	0	0	0	0
North Shore Medical Center - Salem Hospital	0	0	0	0	0
North Shore Medical Center - Union Hospital	0	0	0	0	0
St. Elizabeth's Medical Center	63295.38	41496.12	0.25	0.75	0.15
Berkshire Medical Center	0	0	0	0	0

	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot	Annual Hospital Costs Start Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot	Emergency Department ratio minus 5 MNA ballot per 7 hour shift (actual RN ratio < 5 = 0)	Emergency Department additional patients assigned to RN per day (Additional Patients/shift X 3)	Total additional Emergency Department RNs per day (Additional Patients per day/5 per MNA ballot)
UMass Memorial - Marlborough Hospital	0	0	0	0	0
Signature Healthcare - Brockton Hospital	265918.91	189099.32	1.22	3.66	0.73
Clinton Hospital	181309.22	134537.31	0.8	2.39	0.48
Beth Israel Hospital - Plymouth (formerly Jordan Hospital)	0	0	0	0	0
Lowell General Hospital	0	0	0	0	0
Baystate - Noble Hospital	63538.73	48355.2	0.31	0.92	0.18
Sister's of Providence - Mercy Hospital	466968.27	368909.35	2.1	6.31	1.26
Hallmark Health System - Lawrence Memorial Hospital	0	0	0	0	0
Hallmark Health System - Melrose Wakefield Hospital	0	0	0	0	0
Massachusetts General Hospital	0	0	0	0	0
Morton Hospital and Medical Center	0	0	0	0	0
Southcoast Hospital Group - Tobey Hospital	49434.78	35225.36	0.25	0.74	0.15
Southcoast Hospital Group - Charlton Memorial Hospital	14696.83	10472.4	0.07	0.22	0.04
Southcoast Hospital Group - St. Luke's Hospital	0	0	0	0	0
Massachusetts Eye and Ear Infirmary	517910.47	350670.86	2.11	6.33	1.27
Baystate Medical Center	0	0	0	0	0
Holy Family Hospital and Medical Center	0	0	0	0	0
Beth Israel Deaconess - Needham	0	0	0	0	0
Emerson Hospital	21272.78	14403.54	0.09	0.26	0.05
Beth Israel Deaconess Hospital - Boston	0	0	0	0	0
Milford Regional Medical Center	0	0	0	0	0
Heywood Hospital	39087.12	28521.51	0.15	0.46	0.09
Nashoba Valley Medical Center	0	0	0	0	0
South Shore Hospital	0	0	0	0	0

	Annual Hospital Costs Average Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot	Annual Hospital Costs Start Hourly Wage Additional Emergency Dept RNs 2016 per MNA ballot	Emergency Department ratio minus 5 MNA ballot per 7 hour shift (actual RN ratio < 5 = 0)	Emergency Department additional patients assigned to RN per day (Additional Patients/shift X 3)	Total additional Emergency Department RNs per day (Additional Patients per day/5 per MNA ballot)	
Newton-Wellesley Hospital	0	0	0	0	0	
Winchester Hospital	38454.65	26037.17	0.16	0.47	0.09	
Beth Israel Deaconess - Milton Hospital	41727.38	28253.1	0.17	0.51	0.1	
Brigham and Women's Hospital	0	0	0	0	0	
Good Samaritan Hospital	161923.69	111124.1	0.74	2.21	0.44	
Tufts Medical Center	0	0	0	0	0	
Brigham and Women's - Faulkner Hospital	0	0	0	0	0	
Steward Health Care - Norwood Hospital	19186.5	12854.77	0.09	0.26	0.05	
Falmouth Hospital	0	0	0	0	0	
UMass Memorial Medical Center	0	0	0	0	0	
Lahey Clinic Hospital	0	0	0	0	0	
Metrowest Medical Center - Framingham	0	0	0	0	0	
Metrowest Medical Center - Natick	0	0	0	0	0	
St. Vincent Hospital at Worcester Medical Center	50847.24	34763.88	0.23	0.68	0.14	
Nantucket Cottage Hospital	646650.06	475150.28	2.68	8.05	1.61	
Martha's Vineyard Hospital	94629.02	63345.31	0.4	1.2	0.24	
Fairview Hospital	0	0	0	0	0	
Athol Memorial Hospital	0	0	0	0	0	
Total	Mean	67898.0346	50137.5069	0.3054	0.9161	0.1832
	Sum	4345474.21	3208800.44	19.54	58.63	11.73

Footnote: ^aRN Average Hourly Wage data from MNA Union contracts effective 2015 - 2018 (or) Nonunion Hospitals by Department of Labor May 2017 release RN average hourly wage by Massachusetts MSA or NonMSA Zipcode match. ^bRN Starting Hourly Wage data from MNA Union contracts 2015-2018 (or) Nonunion Hospitals calculated by Zipcode match with MNA unionized hospital contracts. ^c2016 MHA PatientCareLink

Appendix F - Question 1 Massachusetts acute care hospital costs for stepdown RNs, 2016

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing, Boston College
September 8, 2018

		Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^b	Additional Stepdown Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot) ^c	Total Adult Stepdown Units in Hospitals with RN ratio above 3 Patient MNA ballot limit (included combined med-surg units if RN ratio > 4)	Total Additional Stepdown Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional Stepdown RNs/Day (Additional Stepdown Patient/3 per MNA ballot)
Massachusetts Hospital		.	.	.	.	.	.
Health Alliance Hospitals - UMass Memorial Leominster	no unit	.	.	.	.	.	.
Health Alliance Hospital UMass Memorial - Burbank	no unit	.	.	.	.	.	.
Mount Auburn Hospital		0	0	0	0	0	0
Sturdy Memorial Hospital	no unit	.	.	.	.	.	.
Lawrence General Hospital	no unit	.	.	.	.	.	.
Cambridge Health Alliance Hospital- Cambridge Hospital	no unit	.	.	.	.	.	.
Cambridge Health Alliance - Whidden	no unit	.	.	.	.	.	.
Cape Cod Hospital	no unit	.	.	.	.	.	.
Cooley Dickenson Hospital		0	0	0	0	0	0
Baystate Franklin Medical Center	no unit	.	.	.	.	.	.
Carney Hospital	no unit	.	.	.	.	.	.
Harrington Memorial Hospital	no unit	.	.	.	.	.	.
Saint Anne's Hospital	no unit	.	.	.	.	.	.
Holyoke Medical Center		263743.45	236780.17	2.43	1	2.43	0.81
Anna Jacques Hospital	no unit	.	.	.	.	.	.
Baystate Wing Memorial Hospital	no unit	.	.	.	.	.	.

		Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^b	Additional Stepdown Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot) ^c	Total Adult Stepdown Units in Hospitals with RN ratio above 3 Patient MNA ballot limit (included combined med-surg units if RN ratio > 4)	Total Additional Stepdown Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional Stepdown RNs/Day (Additional Stepdown Patient/3 per MNA ballot)
Boston Medical Center		153990.29	100316.02	0.54	2	1.08	0.36
Northeast Health System - Addison Gilbert Hospital)	no unit	.	.	.	.	.	.
Northeast Health System - Beverly Hospital		219835.7	154536.91	1.83	1	1.83	0.61
North Shore Medical Center - Salem Hospital	no unit	.	.	.	.	.	.
North Shore Medical Center - Union Hospital	no unit	.	.	.	.	.	.
St. Elizabeth's Medical Center	no unit	.	.	.	.	.	.
Berkshire Medical Center		93425.4	82096.09	0.81	1	0.81	0.27
UMass Memorial - Marlborough Hospital	no unit	.	.	.	.	.	.
Baystate - Mary Lane Hospital (closed inpt 2016)	no unit	.	.	.	.	.	.
North Adams Regional Hospital (closed 2014)	no unit	.	.	.	.	.	.
Signature Healthcare - Brockton Hospital		363277.2	258332.4	3	1	3	1
Clinton Hospital	no unit	.	.	.	.	.	.
Beth Israel Hospital - Plymouth	no unit	.	.	.	.	.	.
Lowell General Hospital		0	0	0	0	0	0
Baystate - Noble Hospital	no unit	.	.	.	.	.	.
Sister's of Providence - Mercy Hospital		703042.56	555410.28	5.7	1	5.7	1.9
Quincy Medical Center (closed 2014)	no unit	.	.	.	.	.	.
Hallmark Health System - Lawrence Memorial Hospital	no unit	.	.	.	.	.	.
Hallmark Health System - Melrose Wakefield Hospital	no unit	.	.	.	.	.	.

		Annual Hospital Costs Average Hourly Wage Additional Stepdown RN's 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Stepdown RN's 2016 per MNA ballot ^b	Additional Stepdown Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot) ^c	Total Adult Stepdown Units in Hospitals with RN ratio above 3 Patient MNA ballot limit (included combined med-surg units if RN ratio > 4)	Total Additional Stepdown Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional Stepdown RN's/Day (Additional Stepdown Patient/3 per MNA ballot)
Massachusetts General Hospital	no unit	.	.	.	.	.	.
Morton Hospital and Medical Center	no unit	.	.	.	.	.	.
Southcoast Hospital Group - Tobey Hospital	no unit	.	.	.	.	.	.
Southcoast Hospital Group - Charlton Memorial Hospital		0	0	0	0	0	0
Southcoast Hospital Group - St. Luke's Hospital		100205.64	71402.76	0.9	1	0.9	0.3
Massachusetts Eye and Ear Infirmary		0	0	0	0	0	0
Baystate Medical Center		0	0	0	0	0	0
Holy Family Hospital and Medical Center	no unit	.	.	.	.	.	.
Saints Medical Center (merged Lowell General 2012)		0	0	0	0	0	0
Beth Israel Deaconess - Needham	no unit	.	.	.	.	.	.
Emerson Hospital	no unit	.	.	.	.	.	.
Beth Israel Deaconess Hospital - Boston		0	0	0	0	0	0
New England Baptist Hospital	no unit	.	.	.	.	.	.
Milford Regional Medical Center		0	0	0	0	0	0
Heywood Hospital	no unit	.	.	.	.	.	.
Nashoba Valley Medical Center	no unit	.	.	.	.	.	.
South Shore Hospital	no unit	.	.	.	.	.	.
Newton-Wellesley Hospital	no unit	.	.	.	.	.	.
Winchester Hospital	no unit	.	.	.	.	.	.

		Annual Hospital Costs Average Hourly Wage Additional Stepdown RN's 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Stepdown RN's 2016 per MNA ballot ^b	Additional Stepdown Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot) ^c	Total Adult Stepdown Units in Hospitals with RN ratio above 3 Patient MNA ballot limit (included combined med-surg units if RN ratio > 4)	Total Additional Stepdown Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional Stepdown RN's/Day (Additional Stepdown Patient/3 per MNA ballot)
Beth Israel Deaconess - Milton Hospital	no unit	.	.	.	.	.	.
Brigham and Women's Hospital		0	0	0	0	0	0
Good Samaritan Hospital	no unit	.	.	.	.	.	.
Tufts Medical Center		363014.4	273837.6	1.5	2	3	1
Brigham and Women's - Faulkner Hospital	no unit	.	.	.	.	.	.
Steward Health Care - Norwood Hospital	no unit	.	.	.	.	.	.
Falmouth Hospital	no unit	.	.	.	.	.	.
Dana Farber Hospital	no unit	.	.	.	.	.	.
UMass Memorial Medical Center		222350.7	147719.88	1.65	1	1.65	0.55
Lahey Clinic Hospital	no unit	.	.	.	.	.	.
Holy Family at Merrimack Valley Hospital	no unit	.	.	.	.	.	.
Metrowest Medical Center - Framingham		0	0	0	0	0	0
Metrowest Medical Center - Natick	no unit	.	.	.	.	.	.
St. Vincent Hospital at Worcester Medical Center		586986.58	401318.38	4.71	1	4.71	1.57
Nantucket Cottage Hospital	no unit	.	.	.	.	.	.
Martha's Vineyard Hospital	no unit	.	.	.	.	.	.
Fairview Hospital	no unit	.	.	.	.	.	.
Athol Memorial Hospital	no unit	.	.	.	.	.	.
Boston Children's Hospital	no unit	.	.	.	.	.	.

		Annual Hospital Costs Average Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^a	Annual Hospital Costs Start Hourly Wage Additional Stepdown RNs 2016 per MNA ballot ^b	Additional Stepdown Patients for one hospital unit per day per MNA ballot (3 shifts/day X Additional Patients per MNA Ballot) ^c	Total Adult Stepdown Units in Hospitals with RN ratio above 3 Patient MNA ballot limit (included combined med-surg units if RN ratio > 4)	Total Additional Stepdown Patients (Hospital Units X Additional Patients/Day per MNA ballot)	Total Additional Stepdown RNs/Day (Additional Stepdown Patient/3 per MNA ballot)
Total	Mean	146184.377	108654.79	1.0986	0.5714	1.1957	0.3986
	Sum	3069871.92	2281750.5	23.07	12	25.11	8.37

Footnote: ^aRN Average Hourly Wage data from MNA Union contracts effective 2015 - 2018 (or) Nonunion Hospitals by Department of Labor May 2017 release RN average hourly wage by Massachusetts MSA or NonMSA Zipcode match. ^bRN Starting Hourly Wage data from MNA Union contracts 2015-2018 (or) Nonunion Hospitals calculated by Zipcode match with MNA unionized hospital contracts. ^c2016 MHA PatientCareLink

Shindul-Rothschild - Appendix G Question 1 Massachusetts Acute Care Hospitals No Cost Hi Cost RN Patient Ratios 9-8-18

Appendix G- Question 1 RN to patient ratios in no cost and high cost Massachusetts acute care hospitals

Prepared by Judith Shindul-Rothschild, PhD, RN, Associate Professor, William F. Connell School of Nursing

		2016 Stepdown Patients assigned to RN avg. 24hrs/wk	2017 Medical Surgical Patients assigned to RN avg. 24 hrs/wk	2017 ICU/CCU Patients assigned to RN avg 24 hrs/week	2016 Emergency Department patients assigned to RN avg 24hrs/wk	2017 Psychiatric Patients assigned to RN avg 24 hrs/wk (including Geriatric, Substance Abuse, Adult, Adolescent and Child)
Total Annual Hospital Costs with Avg Hrly Wage for MNA ballot (No Cost & Highest Cost)	No Cost MNA	1 UMassMem	3.35	1.48	4.42	
	Ballot = 0	2 Franklin	3.88	1.18	4.47	4.90
	(UMass	3 MGH	2.76	1.12	2.44	4.00
	Memorial,	4 Milford	2.67	2.97	1.45	4.28
	Baystate	5 BWH	2.44	2.96	1.19	2.51
	Franklin, MGH,	6 Dana		2.80		
	Milford	7 Lahey		3.66	1.48	4.23
	Regional,	8 Fairview		2.72	0.62	4.24
	BWH, Dana	9 Athol		3.78		3.71
	Farber, Lahey, Fairview & Athol)	Total N	2	9	7	8	2
	Mean	2.5550	3.2089	1.2171	3.7875	4.4500
	Sum	5.11	28.88	8.52	30.30	8.90
Hi Cost MNA Ballot =1 (St. Elizabeth's, Berkshire, Brockton, Mercy, Baystate, Holy Family, Good Samaritan, Norwood, MW Natick)	1 St E's		4.90	1.40	5.25	6.07
	2 Berkshire	3.27	5.26	1.50	4.94	7.07
	3 Brockton	4.00	4.56	1.71	6.22	6.67
	4 Mercy	4.90	4.78	2.36	7.10	
	5 Baystate	2.80	5.82	1.64	3.73	6.00
	6 Holy Fam		5.11	1.99	4.65	6.38
	7 Good Sam		4.67	2.00	5.74	7.96
	8 Norwood		4.66	1.50	5.09	7.59
	9 MWNatick		4.27	1.54	3.68	6.40
		Total N	4	9	9	9	8
	Mean	3.7425	4.8922	1.7378	5.1556	6.7675
	Sum	14.9700	44.0300	15.6400	46.4000	54.1400
	<i>t</i>	-1.719	-7.765	-3.319	-2.84	-4.164
	p	0.161	<.001	0.005	0.013	0.003
	<i>df</i>	4	16	14	15	8
Total	N	6	18	16	17	10
	Mean	3.3467	4.0506	1.5100	4.5118	6.3040
	Sum	20.08	72.91	24.16	76.70	63.04