

MANDATED NURSE-TO-PATIENT STAFFING RATIOS IN MASSACHUSETTS

RESEARCH PRESENTATION:
ANALYSIS OF POTENTIAL
COST IMPACT



HPC oversight authority and role in analyzing mandated nurse staffing ratios

- The HPC was established to oversee the Commonwealth's health care delivery and payment system and monitor growth in health care spending against the cost growth benchmark; it has a **specific statutory responsibility to examine factors that contribute to cost growth** within the Commonwealth's health care system as part of the Annual Cost Trends Hearing
- In 2018 Pre-filed Cost Trends Hearing testimony, a **majority of stakeholders identified proposed mandatory nurse staffing ratios as a top area of concern** regarding the Commonwealth's ability to meet the health care cost growth benchmark
- As an independent agency principally focused on containing health care costs, the **HPC has conducted an objective, data-driven cost impact analysis** of mandated nurse staffing ratios to further inform continuing policy discussions on the matter
- In addition to today's presentation of its cost impact analysis, the HPC will examine the topic of mandated nurse staffing ratios at this year's **Annual Cost Trends Hearing** (October 16-17), including **a panel discussion** on the impact of nurse staffing ratios on cost, quality, and access
- As additional background, the HPC had a central role in implementing the 2014 law mandating nurse staffing **ratios of 1:1 or 1:2 in intensive care units (ICUs)** in acute care hospitals, depending on the stability of the patient as assessed by an acuity tool and staff nurses; the HPC engaged in an extensive **regulatory development process** to implement the law¹

Overview of HPC research and cost impact analysis

HPC's research and analysis includes:

- Summary of the proposed initiative petition and comparison to the California law and regulation
- Summary of California's experience with mandated staffing ratios
- Comparison of CA and MA hospitals on quality measure performance
- Background on the RN workforce in MA
- Methodology and analysis of cost impact, including the breakdown of additional RNs required and the cost impact for hospitals, freestanding psychiatric/SUD hospitals, other providers, and the Commonwealth
- Additional costs not included in the cost impact analysis, including potential impact on emergency departments
- Potential cost savings
- Potential sources for additional RNs required and discussion of MA labor market
- Implications for statewide health care spending

HPC's work was led by nationally-recognized nurse workforce experts

David Auerbach, Ph.D. and Joanne Spetz, Ph.D., led the HPC's research and analysis.



Dr. David Auerbach, Director for Research and Cost Trends at the Health Policy Commission, is a health economist whose work has spanned a number of focus areas, including the health care workforce. Dr. Auerbach has specialized in, and is a nationally-recognized expert on the Registered Nurse workforce including advanced practice nurses.



Dr. Joanne Spetz is a Professor at the Institute for Health Policy Studies at the University of California, San Francisco. Her fields of specialty include economics of the health care workforce, shortages and supply of registered nurses, and organization and quality of the hospital industry. Dr. Spetz is an Honorary Fellow of the American Academy of Nursing. The HPC engaged the University of California, San Francisco in mid-August 2018 in furtherance of its research agenda with respect to health care workforce issues.

Current regulatory requirements and other considerations for nurse staffing in Massachusetts

Regulatory Requirements for Staffing

- State and federal regulations require Massachusetts hospitals to staff nurses at **levels appropriate for patient care** in all care areas, including non-ICU units
- Specifically, state regulations require Massachusetts hospitals to staff at sufficient levels needed to provide nursing care that requires the judgment and specialized skills of a registered nurse to all patients as needed¹
- State regulations also require nursing staff, including staff nurses, to demonstrate competency in skills specific to their care area on a routine basis
- In addition, hospitals may be required by regulation, or may elect, to follow **professional guidelines** for staffing, such as the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) Guidelines for Professional Registered Nurse Staffing for Perinatal Units

Other Considerations for Staffing

- **Collective bargaining agreements** may provide specific staffing requirements
- In general, hospitals create **staffing plans** to address anticipated need, based on historical patient and staff censuses and other hospital-specific factors in each type of unit, and the staffing may be adjusted as needed

Summary of the proposed initiative petition

- On November 6, 2018, Massachusetts voters will vote on **Question 1**, the proposed ***Initiative Petition For a Law Relative to Patient Safety and Hospital Transparency***
- If enacted into law, the proposed initiative (effective date January 1, 2019) would **mandate specific registered nurse-to-patient staffing ratios** (i.e., maximum patient assignment limits) in Massachusetts hospitals, based on unit type, including:
 - In all units with step-down/intermediate care patients, 1 nurse to 3 patients (1:3)
 - In all units with maternal child care patients, there are different patient assignment limits, including:
 - 1:1 for active labor patients, patients with intermittent auscultation for fetal assessment, and patients with medical or obstetrical complications
 - 1:1 for the mother and 1:1 for the baby during birth and for up to 2 hours postpartum (until both are stable and critical elements are met)
 - 1:6 postpartum for uncomplicated mothers or babies, comprised of either six mothers or babies, three couplets (1 mother and 1 baby), or in the case of multiple babies, not more than a total of six patients
 - In all units with medical/surgical patients, 1:4
 - In all units with psychiatric patients, 1:5

Summary of the proposed initiative petition, continued

- The mandated nurse staffing ratios would be in effect **at all times**
- The proposed initiative would **prohibit hospitals from reducing the staffing level of the health care workforce** as a result of implementing the assignment limits
 - Hospitals would be required to submit a **written implementation plan** to the HPC certifying that it will implement the patient assignment limits without diminishing the staffing levels of its health care workforce
- Hospitals would be required to **develop a patient acuity tool** for each unit to be used to determine whether the maximum number of patients that may be assigned should be lower than the assignment limits
- Hospitals would be required to **post a notice** regarding the patient assignment limits in a conspicuous place(s) on the premises, including within each unit, patient room, and waiting area
- The proposed initiative would give the HPC and the Attorney General's Office responsibilities regarding **enforcement**, including written compliance plans and penalties of up to \$25,000 per violation

Comparison of CA law and MA proposed initiative

California is the only state with mandated nurse staffing ratios in all hospital units. The CA legislature passed a law in 1999 that was implemented beginning in 2004. The next two slides summarize key differences between California's law and the proposed initiative in Massachusetts.

	California law & regulation	MA proposed initiative
Determination of ratios	Law mandated CA State Department of Health Services to establish unit-specific minimum staffing levels by regulation.	Specific, numeric ratios are written into the proposed initiative.
Implementation timeline	Implementation in CA took place over several years and in a staggered fashion.	If enacted into law, the act would have an effective date of January 1, 2019.
Scope and level of ratios	Overall, less strict than the proposed initiative in MA (e.g., 1:5 in med/surg; 1:6 in psych units).	Overall, more strict than CA's law (e.g., 1:4 in med/surg; 1:5 in psych units).
Licensed nursing personnel subject to the ratios	Licensed vocational nurses (and in psychiatric units only, psychiatric technicians) may constitute up to 50% of the licenses nurses assigned to patient care on any unit (except where RNs are required).	Patient assignment limits apply to registered nurses only.
Health care workforce staffing	No prohibition on reduction of health care workforce staffing levels as a result of implementation of the minimum staffing ratios.	Prohibition on any reduction in health care workforce staffing levels (including staffing of non-licensed nurses) as a result of implementation of the patient assignment limits.

Comparison of CA law and MA proposed initiative, continued

	California law & regulation	MA proposed initiative
Patient Classification System/Acuity Tool	Patient classification system requirement in place before the law, but the requirements are not prescriptive/specific and certification is not required.	Acuity tool must be developed and certified by the HPC prior to implementation as meeting certain criteria.
Waivers	Department of Health Services is authorized to issue waivers for rural hospitals in response to their special needs.	As written, the proposed initiative prohibits the HPC from considering waivers in its regulatory development process.
Emergencies	If a healthcare emergency (as defined in regulation) causes a change in the number of patients in a unit, hospitals must demonstrate that prompt efforts were made to maintain required staffing levels.	Requirements (and enforcement thereof) shall be suspended during a state or nationally declared public health emergency.
Enforcement	Enforcement relies primarily on reporting of noncompliance.	The proposed initiative explicitly addresses enforcement, including monetary penalties.

Summary of California's experience with mandated staffing ratios

- In the 14 years since mandated nurse staffing ratios in California were implemented, many studies have been published on the impact of the law and subsequent regulation
- The following slides summarize **four key takeaways** from California's experience and the resulting literature following implementation of the mandated staffing ratios:
 - 1 There was a significant increase in nurse staffing in California hospitals post-implementation of ratios
 - 2 There was a moderate effect on RN wages post-implementation of ratios
 - 3 There was no systematic improvement in patient outcomes post-implementation of ratios
 - 4 There has been no comprehensive, retrospective analysis of implementation costs

Summary of California's experience with mandated staffing ratios

1 There was a significant increase in nurse staffing in CA hospitals post-implementation of ratios

- Multiple studies of CA hospitals found annual average numbers of RN productive hours and nurse staffing ratios in medical/surgical units increased markedly after implementation of the regulations
- One study found that statewide average RN hours per patient day increased 16.2% from 1999 through 2006, to an average of 6.9 hours per patient day¹
- A review of all studies conducted through 2012 reported that the average minimum reported growth in hours per patient day was 30 minutes and some studies reported an average increase of up to one hour²
- The growth in licensed nurse staffing was primarily the result of increases in RN staffing; no study reported an increase in LVN staffing³
- One study suggested that the substitution of licensed nurses for unlicensed staff may have occurred; the increase in RN staffing was larger than the overall staffing increase⁴

2 There was a moderate effect on RN wages post-implementation of ratios

- In theory, when the demand for workers rises more rapidly than the supply, an increase in wages is anticipated
- Researchers of the impacts of implementation of mandated nurse staffing ratios in California found wage increases across all RNs that ranged from 0% to 8%⁵

¹Chapman et al (2009). ²Serratt (2013). ³McHugh et al (2011); Serratt (2013). ⁴Bolton et al (2007). ⁵Munnich (2014); Mark et al (2009).
See Appendix for full citations.

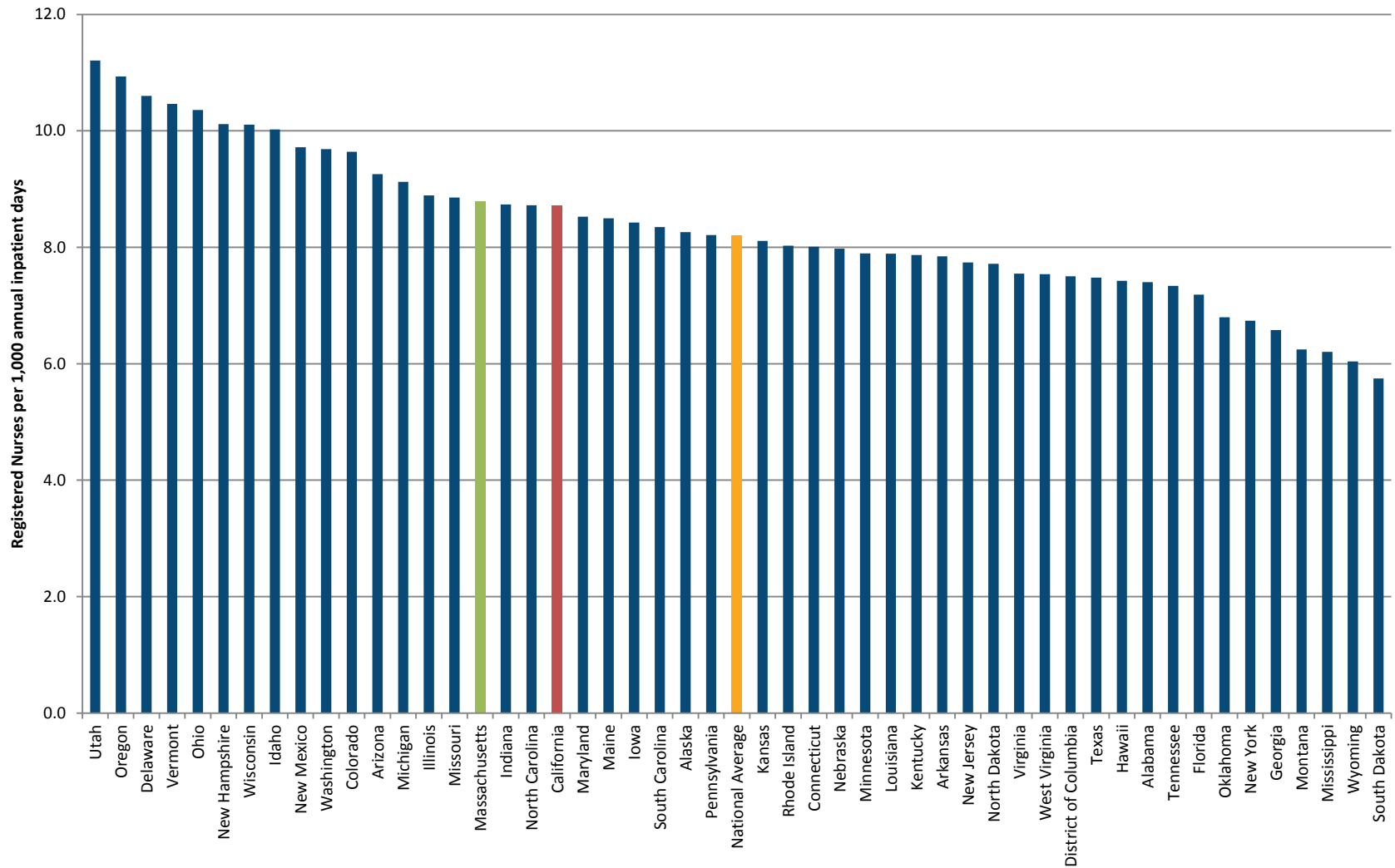
Summary of California's experience, continued

- 3 There was no systematic improvement in patient outcomes post-implementation of ratios**
 - In general, higher levels of nurse staffing have been associated with improvements in certain patient outcomes – for example, shorter hospital stays¹; lower rates of “failure to rescue”²; and fewer pressure ulcers and hospital-acquired infections³
 - There have been a number of studies done on the impact of CA's staffing ratios on patient outcomes, with mixed results
 - The most comprehensive analysis found, in part, that “failure to rescue” following a complication decreased significantly more in some CA hospitals than hospitals in comparison states⁴; for other outcomes, the results were mixed – some worsened, some improved, and some did not change⁵
 - Taken together, the literature indicates that CA's regulations did not systematically improve the quality of patient care

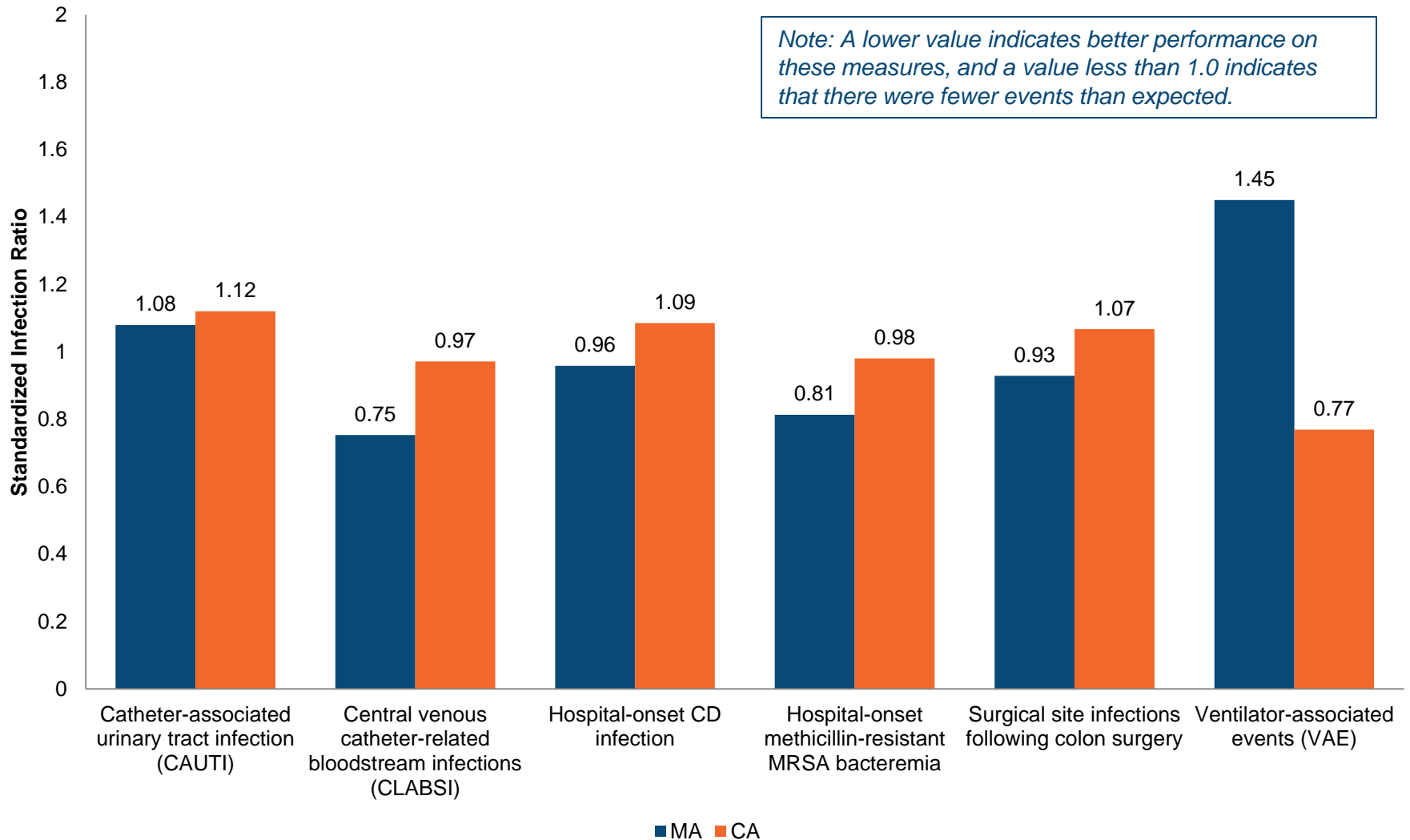
- 4 There has been no comprehensive, retrospective analysis of implementation costs**
 - Following passage of the law but prior to implementation of the ratios (pursuant to Department of Health Services regulations), researchers estimated potential cost impact based on varying ratio proposals (i.e., the California Nurses Association, SEIU, and California Hospital Association proposals)⁶
 - A later (2012) study concluded that implementation of mandated staffing ratios in CA put substantial financial pressures on many hospitals, concentrated among hospitals in the middle two quartiles of pre-regulation staffing levels⁷
 - There has been no comprehensive, retrospective analysis of implementation costs of mandated staffing ratios in California

¹Lang et al (2004). ²Kane et al (2007). ³de Cordova et al (2014). ⁴Mark et al (2013). ⁵Cook et al (2012); Spetz et al (2013). ⁶Spetz et al (2000). Spetz also published revised cost estimates in 2001 and 2002. See also Kravitz et al (2002) . ⁷Reiter et al (2012). See Appendix for full citations.

As of 2016, Massachusetts had higher hospital RN staffing levels (FTEs per 1,000 inpatient days) than California and the U.S.



Massachusetts hospitals performed better than California hospitals on 5 of 6 nursing-sensitive quality measures reviewed

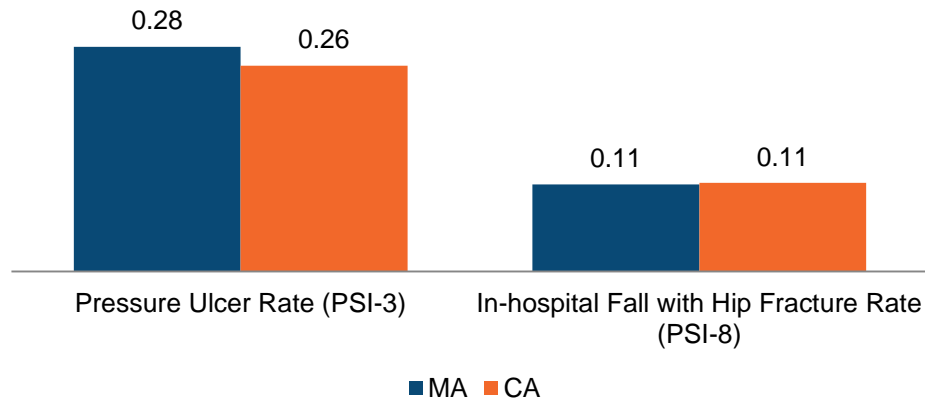


Centers for Disease Control and Prevention/Agency for Healthcare Research and Quality/National Healthcare Safety Network (2015). The “Standardized Infection Ratio” is a measure of observed over expected hospital-acquired infections and adjusts for patient-level factors that contribute to hospital-acquired infection risk. A ratio of less than 1.0 indicates that there were fewer events than expected.

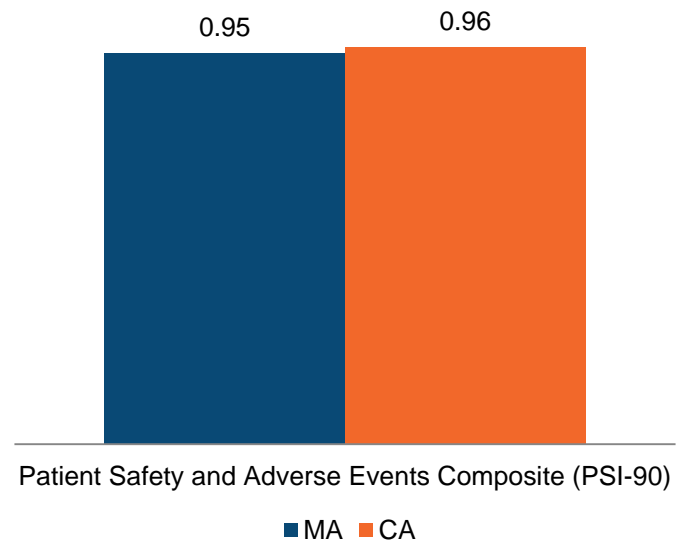
Massachusetts and California perform similarly on 3 additional nursing-sensitive quality measures covering states' Medicare populations

Note: A lower value indicates better performance on these measures.

Events per 1,000



Composite index performance



Massachusetts has more, and higher-earning, RNs than most states

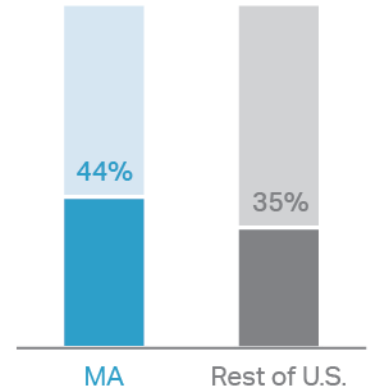


83,543

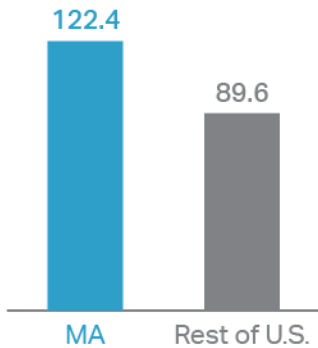
Massachusetts FTE RNs

2,898,834

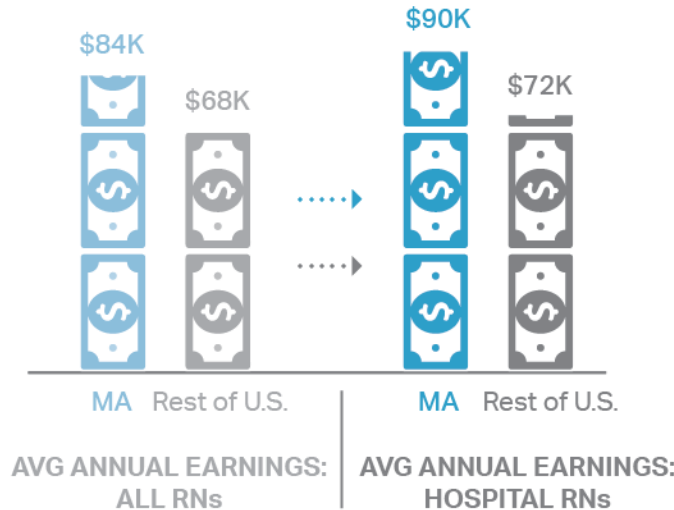
Rest of U.S FTE RNs



AGE 50+



FTE RNs PER 10,000
POPULATION



AVG ANNUAL EARNINGS:
ALL RNs

AVG ANNUAL EARNINGS:
HOSPITAL RNs



68%

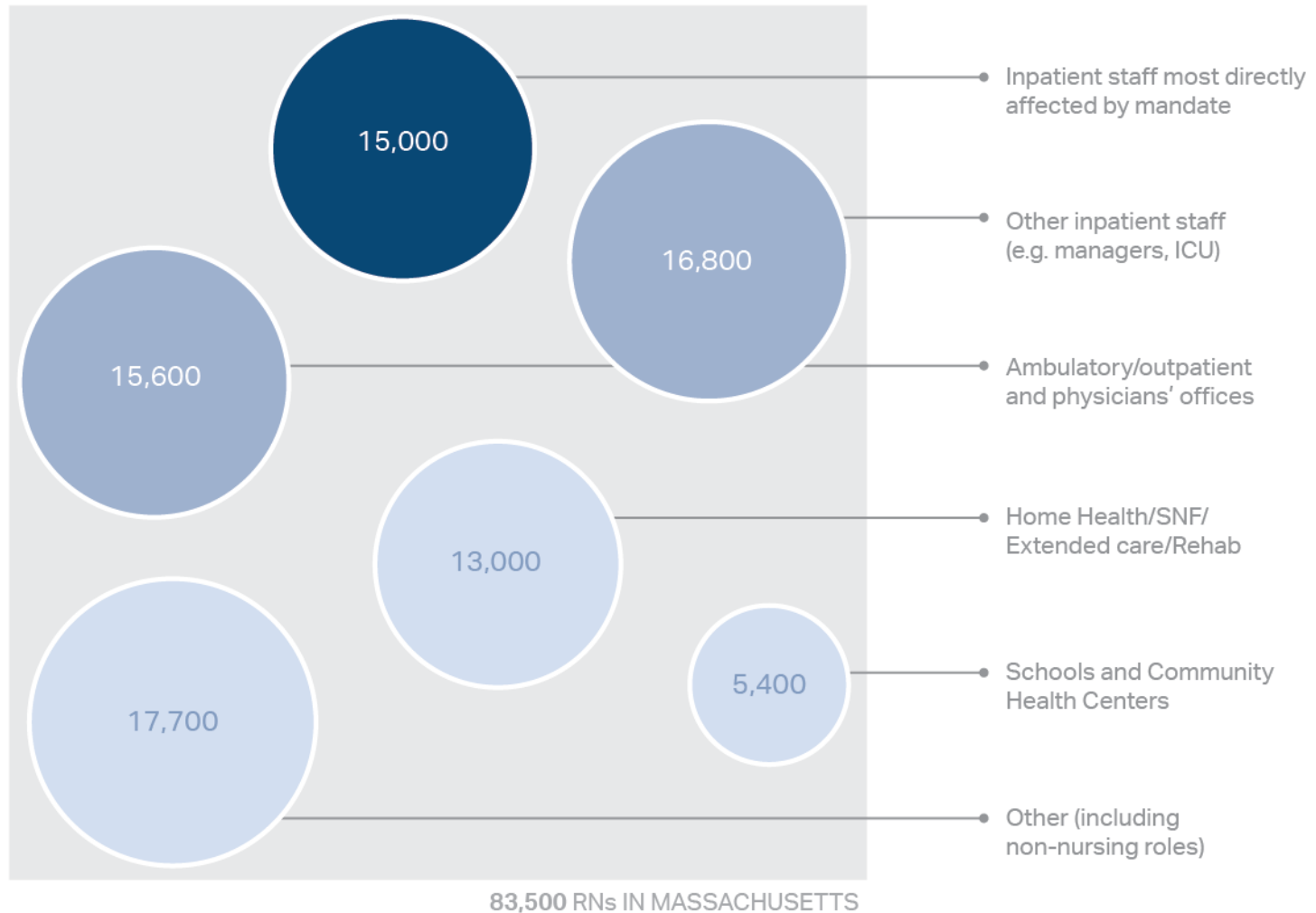
RNs in MA with Bachelor's
degree or higher



63%

RNs in the rest of the U.S. with
Bachelor's degree or higher

RNs in Massachusetts work in a variety of settings



Figures are rounded to the nearest hundred. Inpatient staff most directly affected by mandate represent the RNs identified in PatientCareLink and other supplemental nurse staffing data obtained by the HPC. RNs in the other settings are derived from a combination of data from the Massachusetts Department of Public Health (<https://www.mass.gov/files/documents/2018/07/06/health-professions-data-series-registered-nurses-2014.pdf>) and the American Community Survey.

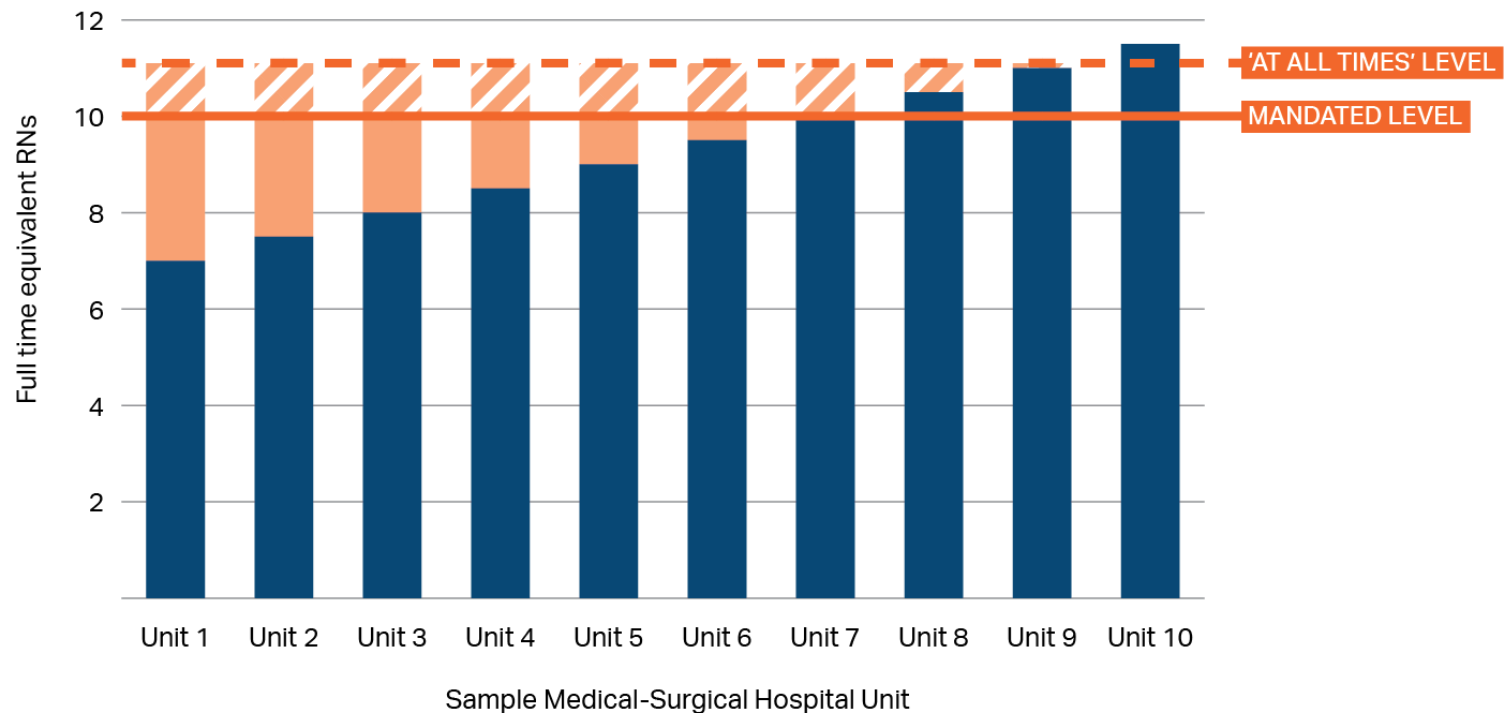
Summary of HPC cost impact analysis methodology

The HPC developed the following methodology for the analysis:

- **Examined FY2017 staffing levels** in MA hospitals, using publicly available PatientCareLink data¹
 - Units included in HPC analysis: medical, surgical, psychiatric/behavioral health, pediatrics, step-down, rehabilitation, neonate intermediate care, labor/delivery, maternal child care, post-anesthesia care, operating room
 - For additional information about units not included, see slide 27
- **Calculated expected number of additional RNs required** to meet the mandated ratios in all units according to the proposed initiative, as follows:
 - Analyzed FY2017 staffing reports by hospital unit, by shift and compared average RN staffing to the ratios in the proposed initiative; and
 - Adjusted estimated number of additional RNs needed to comply with the “at all times” mandate, as described in the following slides
- **Calculated potential impact on psychiatric/SUD hospitals**
- **Estimated impact on RN wages**
- **Considered additional costs** associated with the proposed initiative (e.g., acuity tool costs), as well as **opportunities for cost savings**

As detailed in the following slides, the HPC presents the results of its cost impact analysis as **Analysis A** and **Analysis B**.

Illustration of the analytic approach to quantify additional RNs required to comply with “at all times” requirement



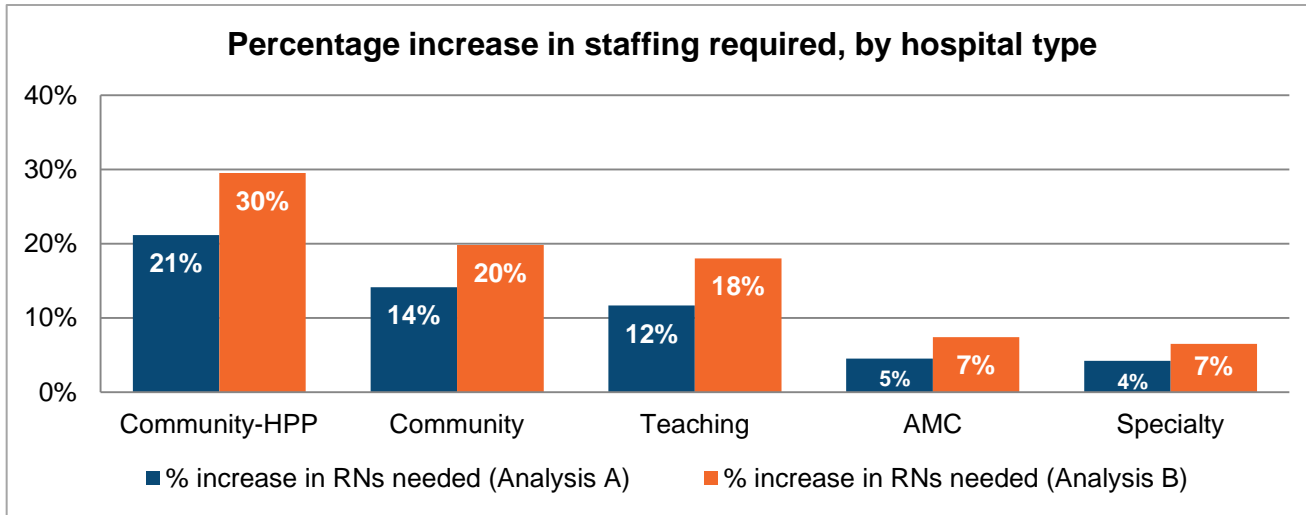
For this illustration, each vertical bar represents a hypothetical medical-surgical unit of an acute care hospital with an average daily census of 40 patients. Current RN staffing per unit, as shown by **solid blue bars**, varies by hospital. To comply with a 1:4 nurse-to-patient ratio with an average daily census of 40 patients, a unit must have (at minimum) 10 RNs (indicated by the **solid orange horizontal line** across all columns). The **stacked solid orange bar** indicates the additional staffing needed to reach the mandated 1:4 ratio. The **dashed orange horizontal line** indicates the staffing level required to meet the “at all times” requirement (shown as the 10% assumption employed in Analysis A). The stacked **partially shaded solid orange bar** indicates the additional staffing needed to reach the “at all times” level. No additional nurses are added where the hospital unit staffing exceeds the “at all times” level (see unit 10).

Estimated additional RNs required for compliance in hospital units examined by the HPC

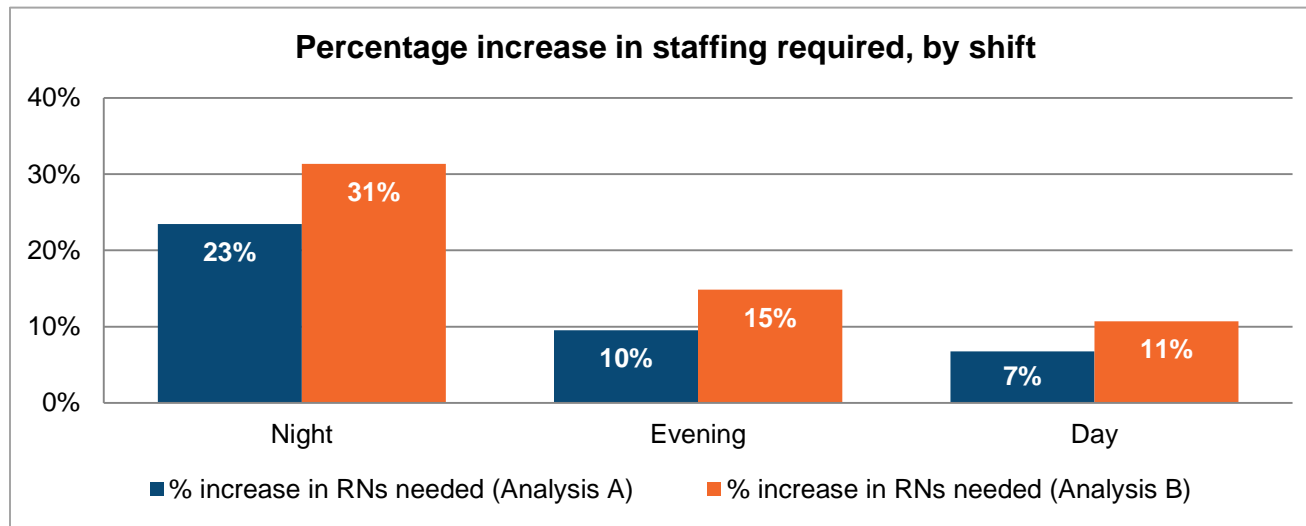
	Difference Between Average Staffing and Proposed Ratios	Analysis A	Analysis B
Key Parameters			
Additional RNs required for compliance with “at all times” requirement in proposed initiative ¹	n/a	10%	20%
Key Results			
Percentage of all shifts that would be required to increase RN staffing to meet mandate	34% (726 of 2,143 shifts)	46% (980 of 2,143 shifts)	54% (1,156 of 2,143 shifts)
Additional full-time equivalent RN staff required to meet mandate (% RN workforce increase)	1,144 (8% more RNs)	1,809 (12% more RNs)	2,624 (17% more RNs)

¹Accounts for RN coverage required in a variety of circumstances, such as federally mandated meal breaks, patient census variability (i.e., surges in patient flow), RN time off the unit, and other instances where coverage is needed to comply with the “at all times” mandate in the proposed initiative.

Increase in RNs required to meet the mandate would be greatest in community hospitals and night shifts

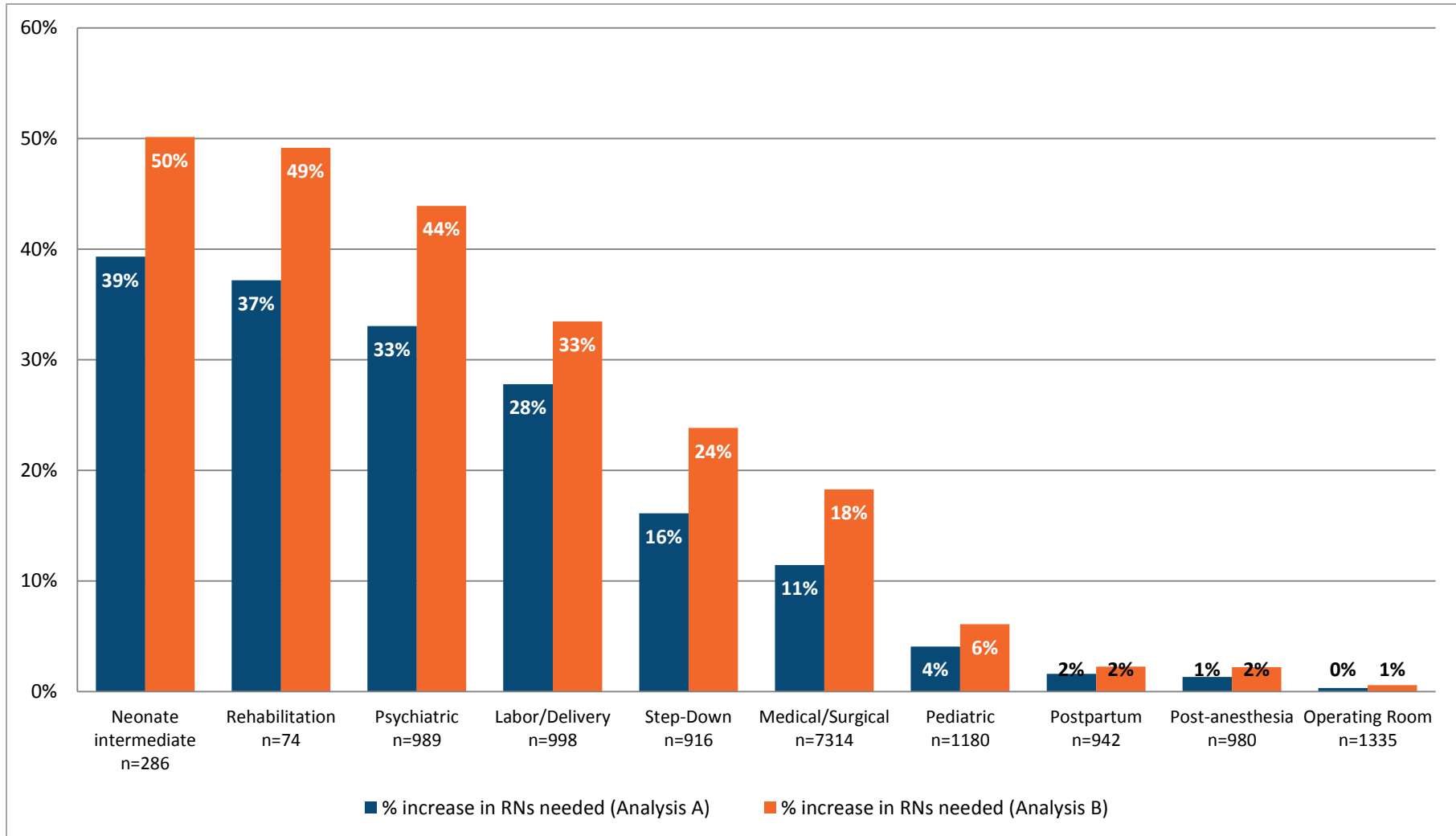


Community – High Public Payer hospitals would be most affected



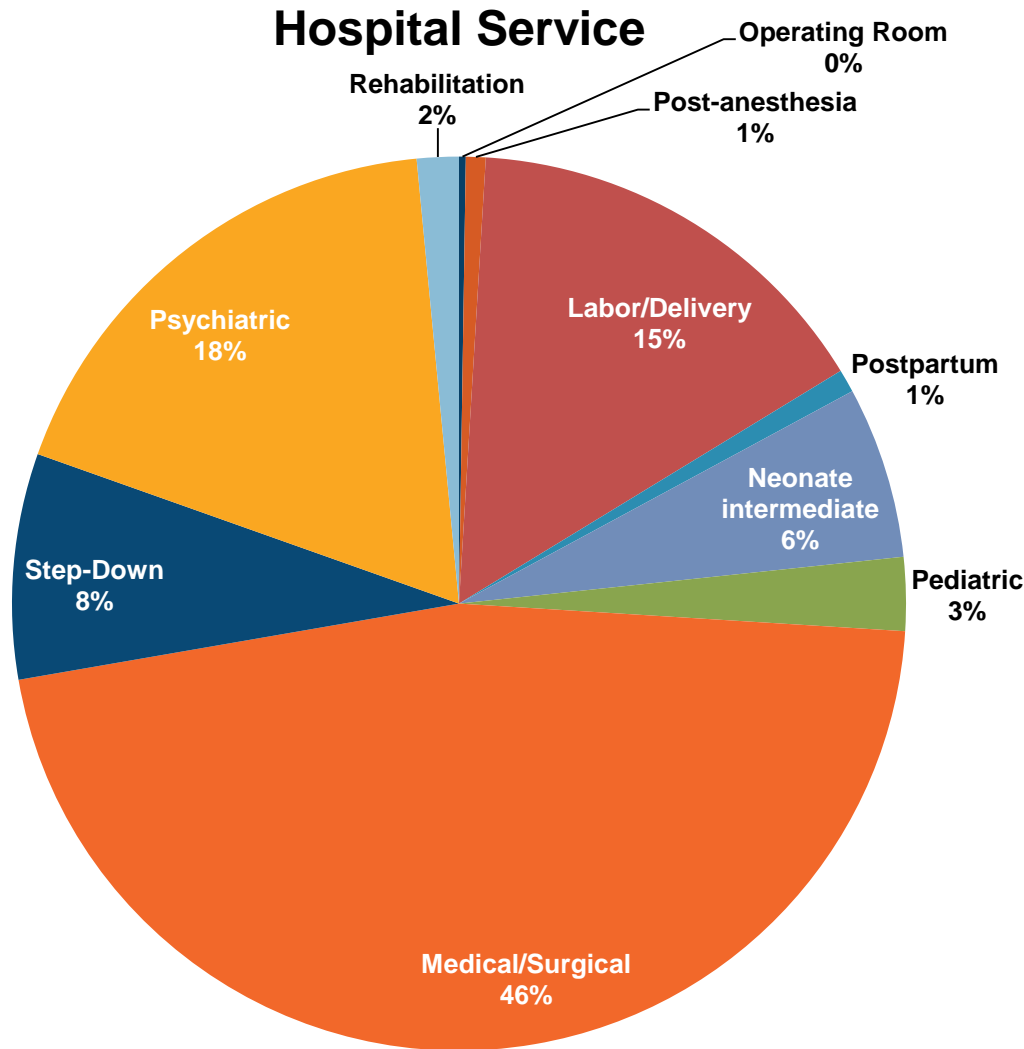
Night shifts would be most affected

Increase in RNs required to meet the mandate would also vary by hospital service



"n = #" beneath each hospital service type indicates the number of RNs included in the analytic sample. For example, there are 286 RNs included in the analytic sample that are categorized as caring for patients in a neonate intermediate care unit (additional note: levels of care for neonates are determined by the American Academy of Pediatrics). See more information here: <http://pediatrics.aappublications.org/content/114/5/1341>.

Number of RNs required to meet the mandate would be greatest in Medical/Surgical units



Medical/surgical units account for the largest additional workforce (an additional 837 FTE RNs) needed for mandate compliance, followed by psychiatric units in acute care hospitals (an additional 327 FTE RNs)

Approach for estimating additional RNs required in psychiatric/SUD hospitals; and overall additional RN workforce estimates

- For psychiatric/SUD hospitals, HPC used an aggregate estimate of RNs needed to meet the 1:5 mandated ratio (n=477)¹
 - The HPC was unable to make any adjustments for “at all times” given the lack of unit and shift-level data for these hospitals
-

Overall additional RN workforce estimates

Analysis A (1,809) + Psychiatric/SUD
Hospitals (477) = **2,286**

Analysis B (2,624) + Psychiatric/SUD
Hospitals (477) = **3,101**



2,286 – 3,101 additional FTE RNs required

Estimated impact on RN wages

- The required increase in RNs hospital staff would likely **increase the demand** for RNs in Massachusetts, leading to an **increase in RN earnings over time**
- Researchers of the impacts of mandated nurse staffing ratios in **California** found that wages for all RNs in the state rose faster during the period of implementation than they did in other states at the same time using 5 separate data sources. The difference **ranged from 0 to 8% and averaged approximately 4%¹**
- The impacts **could be larger in Massachusetts** due to, for example: stricter ratios, monetary penalties, and the prohibition on using other licensed nursing staff to meet the ratios
- Based on California literature, HPC **estimated wage increases for all RNs in MA:**
 - **4%** in Analysis A
 - **6%** in Analysis B
- RN wage increases for existing RNs resulting from mandated nurse staffing ratios **would likely not occur immediately** (e.g., due to pre-existing labor contracts)

The HPC's analysis of mandated nurse staffing ratios estimates \$676 to \$949 million in annual increased costs once fully implemented

Category	Analysis A	Analysis B
<u>Costs to Hospitals</u>		
<i>Acute Care Hospitals</i>		
Additional RNs required ¹	\$256 million	\$379 million
Wage increase for existing RNs	\$184 million	\$276 million
Acuity tools (ongoing costs) ²	\$26 million	\$26 million
<i>Psychiatric/Substance Use Disorder Hospitals</i>		
Additional RNs required ¹	\$48 million	\$51 million
Wage increase for existing RNs	\$1 million	\$2 million
<u>Costs to Other (Non-Hospital) Providers</u>		
Wage increase for existing RNs	\$93 million	\$140 million
<u>Costs to the Commonwealth</u>		
Implementation at state-operated hospitals ³	\$67.8 million	\$74.8 million
TOTAL ESTIMATED ANNUAL COSTS	\$676 million	\$949 million

The estimated costs are likely to be **conservative** as they do not include any costs related to implementation in emergency departments, observation units, and outpatient departments, as well as other one-time costs. See next slide for additional information.

¹The estimated cost for each new nurse is \$133,285 to \$138,765. This includes both the estimated salary (with an estimated wage increase of 4%-6%) and the estimated cost of benefits.

²Hospitals would incur certain costs associated with acuity tools on an ongoing basis (e.g., maintenance), while other costs are likely to be one-time costs (see slide 27). Figure does not include estimated costs for psychiatric/SUD hospitals.

³Secretary of the Commonwealth, Massachusetts Information for Voters, 2018 Ballot Questions, State Election, Tuesday, November 6, 2018.

The estimated costs are likely to be conservative due to data limitations for additional units and other anticipated costs

Ongoing annual costs not included:

- Increased RN staffing costs from hospital units not included in the analysis:
 - Emergency departments (see also slide 28)
 - Outpatient departments
 - Observation units
 - Increased RN staffing costs to non-acute hospitals *
 - State agency implementation costs
 - Penalties for non-compliance
-

One-time costs not included:

- Acuity tool costs
 - In addition to ongoing costs (see slide 26), hospitals would incur costs on a one-time basis (e.g., purchasing, initial development, and implementation costs)
 - HPC estimates \$57.9 million in one-time acuity tool costs for acute care hospitals¹
- Turnover costs
 - Including recruitment, onboarding, and training
 - Recent literature suggests the range of average turnover costs could be \$38,000 to \$61,100 per bedside RN²
 - For purposes of illustration, turnover of 1,000 RNs would cost \$49.5 million³

*Due to ambiguity about the application of the proposed initiative to certain non-acute hospitals (e.g., institutional rehabilitation facilities, long term care hospitals), these units are not included in the HPC's current cost impact analysis.

¹Does not include one-time acuity tool costs for psychiatric/SUD hospitals. ²NSI Nursing Solutions, Inc., 2018 National Health Care Retention & RN Staffing Report (2018), <http://www.nsinursingsolutions.com/files/assets/library/retention-institute/nationalhealthcaremretentionreport2018.pdf>. ³Calculated using the average cost of turnover for a bedside RN of \$49,500, as reported in the National Health Care Retention & RN Staffing Report (see note 2).

The mandate would impact Massachusetts emergency departments

- The proposed initiative includes **mandated ratios in emergency departments (EDs) at all times:**
 - 1:1 for critical care or intensive care patients, or 1:2 if patient is stable
 - 1:2 for urgent non-stable patients
 - 1:3 for urgent stable patients
 - 1:5 for non-urgent stable patients
- The HPC was unable to include EDs in its cost impact analysis due to data limitations
- However, mandated ratios would impact EDs, including but not limited to the potential for significant impacts on:
 - Access to emergency care
 - Wait times
 - Patient flow
 - Boarding
 - Ambulance diversion

Potential cost savings

- Researchers estimate that an increase in RN staffing may be associated with savings from reduced hospital length of stay and reduced adverse events¹
 - ~\$15,000 savings per additional FTE RN hired
- Extrapolating from this research, the HPC calculated a range of **estimated potential savings of \$34 to \$47 million** with the hiring of additional RNs
 - However, it is uncertain if RN staffing increases from current MA staffing levels would result in these savings
- Other savings could be realized due to reduced RN turnover² and workforce injuries³

¹Needleman et al (2006). The authors estimated \$1.72 billion in savings corresponding with a nationwide increase in 114,456 FTE RNs – i.e., if all hospitals increased staffing (if needed) to the level of the 75th percentile of all hospitals at that time. ²See, e.g., Aiken et al (2010); Spetz (2008). ³Leigh et al (2015). See Appendix for full citations.

Hospitals would have to recruit additional RNs to meet the mandate from various sources

2,286 – 3,101
estimated
additional RNs
required

RNs working in other hospitals in MA

RNs working in non-hospital care settings in MA

New RN graduates

Temporary/traveling RNs

RNs from out of state

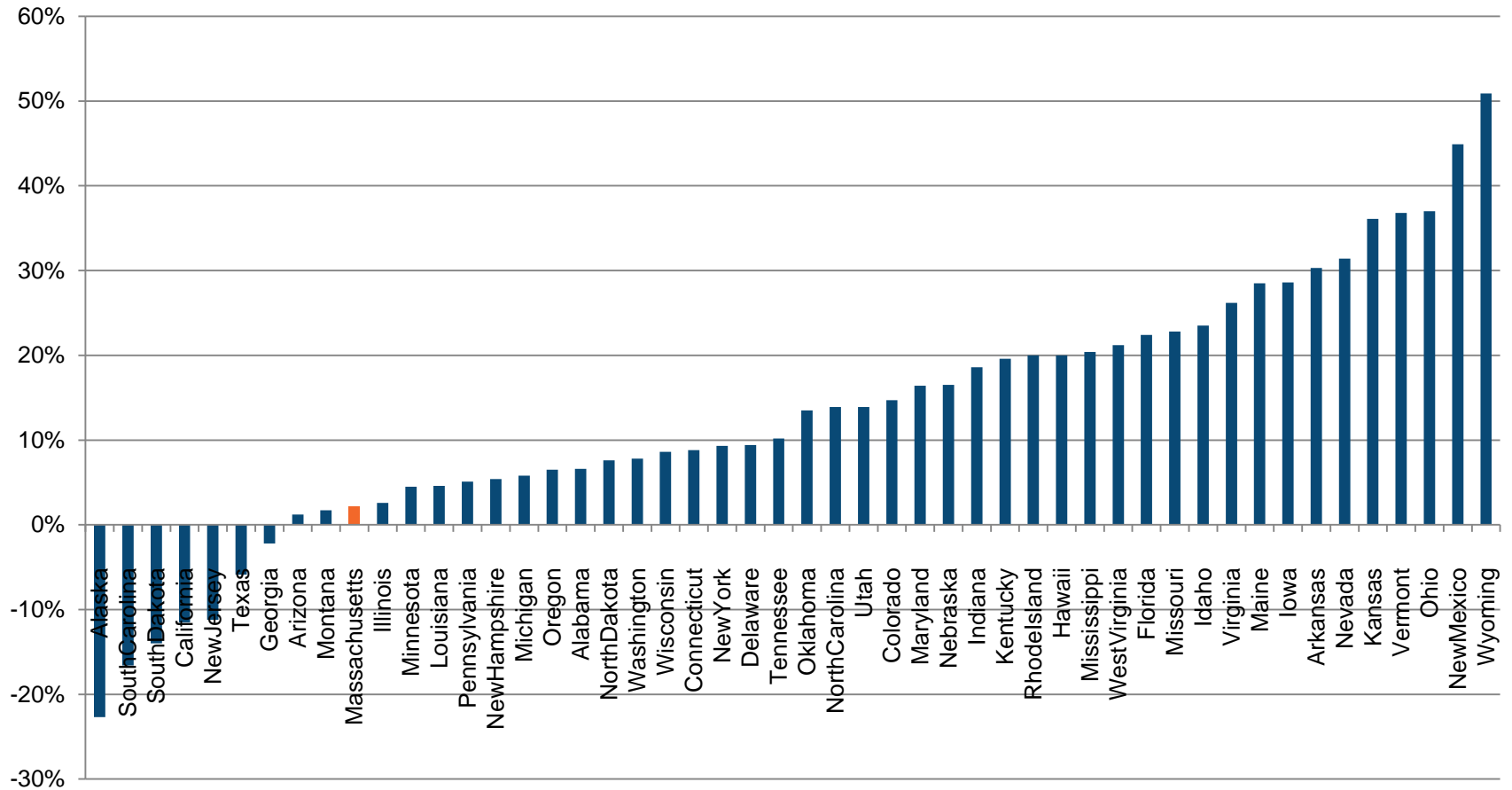
RNs from other countries

Part-time RNs who convert to full-time RNs

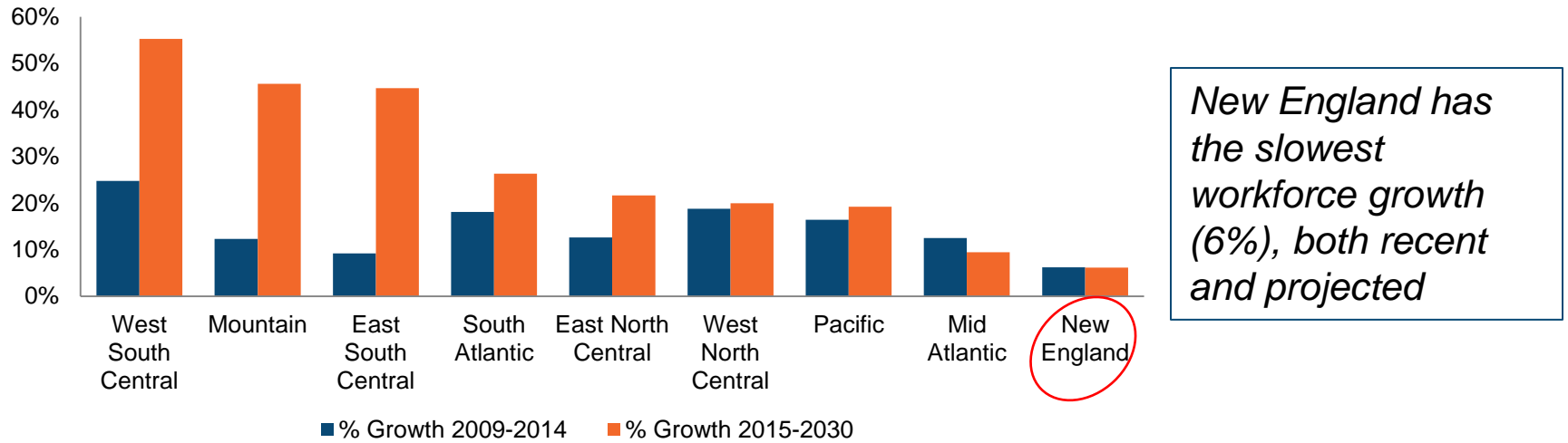
RNs who delay retirement

Massachusetts has a tighter labor market for RNs than most other states

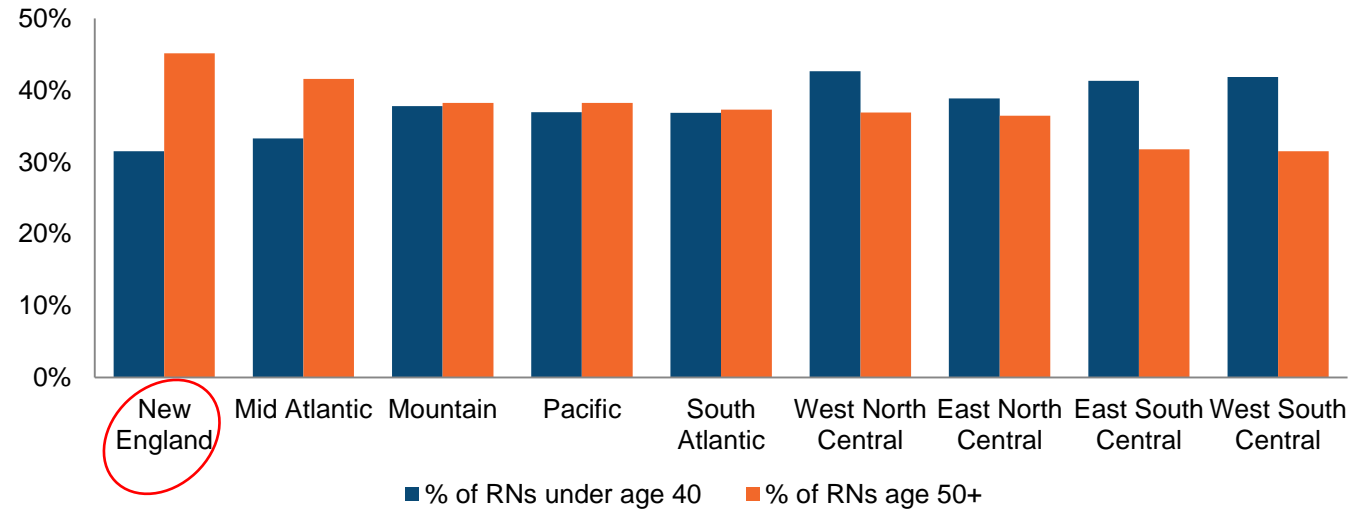
Projected surplus/deficit of RNs (%) in 2030 (HRSA)



New England has the slowest recent and projected growth of RNs (6%), stemming from greater retirements



New England has the lowest % of RNs under age 40 and the highest % of RNs age 50+



Implications for statewide health care spending

- If the proposed initiative becomes law, the increased costs to hospitals may result in impacts such as:
 - Reductions in hospital margins or assets¹
 - Reduced capital investments
 - Closure of unprofitable (and/or other) service lines
 - Reductions in non-health care workforce staffing levels
- These costs could also lead to higher commercial prices for hospital care, potentially leading to higher premiums
- Overall, the higher estimated annual costs of \$676 million to \$949 million represent:²
 - **1.1 to 1.6% of total health care expenditures in Massachusetts in 2017** as measured for the purposes of performance against the health care cost growth benchmark; and
 - **2.4% to 3.5% of total hospital spending**

¹Reiter et al (2012). See Appendix for full citation.

²Total health care spending based on total estimated costs in Analyses A and B divided by total health care expenditures (THCE) as reported by the Center for Health Information and Analysis (CHIA) in CHIA's 2018 Annual Report. Percentage of hospital spending includes acute and psychiatric hospital costs in Analyses A and B divided by total hospital spending as reported in CHIA's 2018 Annual Report.

Health Care Cost Trends Hearing – October 17, 2018

SPOTLIGHT: IMPACT OF NURSE STAFFING RATIOS

- The HPC is dedicating a portion of the upcoming **Health Care Cost Trends Hearing** to the topic of mandated nurse-to-patient staffing ratios. The HPC's findings will be presented at the hearing by **Dr. David Auerbach** and **Dr. Joanne Spetz**.

REACTION PANEL: CONTENT

- The goal of this panel is to discuss the implications of mandated nurse staffing ratios for the Commonwealth.
- Topics will include:
 - Evidence and experience of implementing **hospital nurse staffing ratios in California**
 - The **potential impact in Massachusetts** on health care cost, quality, and access
- Panel will feature participants with **varied perspectives and expertise** on the issue.

REACTION PANEL: MAKEUP

- **Ms. Vicki Bermudez**, Regulatory Policy Specialist, California Nurses Association
- **Ms. Deborah Devaux**, Chief Operating Officer, Blue Cross and Blue Shield of Massachusetts
- **Dr. Nancy Gaden**, Senior Vice President and Chief Nursing Officer, Boston Medical Center
- **Dr. Judith Shindul-Rothschild**, Associate Professor, William F. Connell School of Nursing, Boston College
- **Dr. Joanne Spetz**, Professor, Institute for Health Policy Studies, University of California, San Francisco (UCSF)



MASSACHUSETTS
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APPENDIX

Additional details on HPC methodology

- All staffing data and calculations reported on slide 20 were based on 2017 staffing report data from PatientCareLink by hospital unit, by service line, by shift, supplemented with staffing data obtained from the Massachusetts Health & Hospital Association (MHA) covering maternity care, operating rooms, and post-anesthesia care units. The supplemental data excludes Steward Health Care hospitals. The HPC analysis used reported daily patient census averages combined with reported RN staffing by shift to assess average levels of staffing per shift over the course of a year.
- When comparing these staffing levels to mandated ratios, in instances where units could be categorized in more than one way (e.g., pediatric behavioral health), HPC applied the more restrictive mandated ratio for consistency. For example, in a pediatric behavioral health unit, HPC applied a 1:4 ratio (for a pediatric unit) instead of a 1:5 ratio (for a behavioral unit).
- Given data limitations, for labor/delivery units HPC applied an average ratio of 1:1.3 to account for variation in patient status and classification in such units, including antepartum and active labor.
- For psychiatric/SUD hospitals, HPC used the reported number of budgeted RN positions (n=498.9) and the aggregate estimate of nurses needed (n=477) to meet the 1:5 mandated ratio obtained from the MHA, without additional adjustments. The HPC was unable to make any adjustments for “at all times” given the lack of unit and shift-level data for these hospitals.
- HPC used an average of 37.5 hours (based on data from the American Community Survey) worked per week for RNs to convert hourly staffing counts to full time RNs. HPC staff applied adjustments for the “at all times” requirement as shown on slides 19-20 that assumed hospitals would have to staff shifts at 10% (Analysis A) or 20% (Analysis B) greater than the mandated ratio, on average, to account for meals, breaks, off-unit and non-productive time, and additional patient census variability.
- HPC converted needed FTE RNs in HPC’s shift level analysis, as shown on slide 20, to total costs using average earnings for hospital and non-hospital RNs as estimated from the American Community Survey. HPC accounted for non-wage compensation using data from the Bureau of Labor Statistics (<https://www.bls.gov/news.release/pdf/ecec.pdf>) indicating that wages account for roughly two-thirds of total RN compensation.
- For estimates of wage impacts for RNs not in HPC’s shift level analysis, HPC estimated the number of FTE RNs in Massachusetts by setting (hospital and non-hospital) and average earnings using the American Community Survey. These estimates are on an FTE basis accounting for part-time RNs and exclude Nurse Practitioners and Certified Nurse Anesthetists.
- The acuity tool cost estimate included in slide 26 represents ongoing cost (e.g., licensing, maintenance). The acuity tool estimate included in slide 27 represents a one-time cost (e.g., for initial development, implementation, and training). These estimates were calculated from an internal analysis using stakeholder data to develop a per-unit estimate, which was applied to other hospitals.

Comparison of methodologies for estimating impact of the proposed initiative

		Massachusetts Health Policy Commission	Mass Insight Global Partnerships and BW Research Partnership	Report from Judith Shindul-Rothschild, PhD, MSN, RN
Analytic decisions to study workforce needed for compliance	RN staffing data source(s)	PatientCareLink publicly available staffing report data (2017); Survey data on additional acute facility units at the shift level of a unit	PatientCareLink publicly available staffing report data (2017); Survey data on additional acute facility units at the shift-level of a unit	Low cost estimate: relying on MA/CA personnel comparisons: Proportion of RN FTEs to total hospital personnel FTEs in CA & MA (CA calculated using 2011 AHA Hospital Survey; MA calculated from the 2016 AHA Hospital Survey) High cost estimate: Using publicly available PatientCareLink staffing report data (2016 & 2017)
	Units included in shift-level analyses	Neonate intermediate, Pediatric, Medical/Surgical, Step-Down, Psychiatric, Rehabilitation units of acute hospitals (from PatientCareLink); Operating Room, Post-anesthesia, Labor/Delivery, Postpartum, Maternal Child (from survey data)	Neonate intermediate, Pediatric, Medical/Surgical, Step-Down, Psychiatric, Rehabilitation units of acute and some non-acute hospitals (from PatientCareLink); Operating Room, Post-anesthesia, Labor/Delivery, Postpartum, Maternal Child (from survey data)	Medical-Surgical, Step-down, Psychiatric, Emergency Department (from PatientCareLink)
	Units included in non-shift-level analyses	Psychiatric/SUD hospitals	Emergency Department (aggregate costs estimated from survey completed by hospitals)	Not applicable
	Units excluded from shift-level analysis	Emergency Department, Outpatient, Observation, Intensive Care, Non-acute hospitals	Emergency Department, Outpatient, Observation, Psychiatric/SUD hospitals, Intensive Care	Neonate intermediate, Pediatric, Psychiatric, Rehabilitation, Operating Room, Post-anesthesia, Labor/Delivery, Postpartum, Outpatient, Observation, Psychiatric/SUD hospitals, Intensive Care
	Consideration of "at all times" requirement	10% (Analysis A); 20% (Analysis B) ¹	17.5% - 20% adjustment for non-productive time; + additional adjustment for meal coverage; + additional 2 RNs per unit added on annual budget	Multiplied estimated additional FTE RNs (539) * 3 (multiplier intends to account for additional workforce needed to account for non-productive time and units where staffing data was not available for analysis) to arrive at 'at all times' estimate of 1,617 FTE RNs. Cost estimate does not reflect this workforce estimate, because of lack of hourly wage data.
	Consideration of existing workforce vacancies	Not included	5.3%, or at least 1,200 RNs	Not included
	Additional components of cost impact analysis	Impact on RN workforce wages	4% (Analysis A); 6% (Analysis B) ²	3.5% for existing RNs; 7% for newly hired RNs (based on CA literature and existing labor agreements)
	Cost accounting approach	Not included	Not included	Netted gross cost of estimate against existing reserves for some hospitals
	Turnover costs	Qualitative cost reference: \$38,000-\$61,100 per position (NSI Nursing Solutions, Inc 2018 National Health Care Retention & RN Staffing Report)	Recruitment costs: \$86,162,371 (based on average cost from hospital survey data) Turnover costs: \$249,074,359 (based on average cost from hospital survey data) Training reimbursement: \$45,597,256 (based on average costs from public and private 2- and 4-year universities in MA)	Not included
	Potential savings	Estimated potential savings related to reduction of adverse events \$32-44 million (Needleman, 2006).	Not included	Not included
	Acuity tool costs	Ongoing costs (\$25.8 million) and initial implementation costs (\$57.9 million) (internal analysis based on stakeholder data)	\$58 million (from hospital survey data)	Not included

¹ HPC assumption is based on ~6.5% for meal coverage and additional coverage based on expert judgment to account for 'at all times' mandate over and above staffing adjustments hospitals currently make using float pools, per-diem RNs and RNs from other units.

² HPC staff relied on two papers using a difference-in-differences approach, Munnich (2014) and Mark et al (2009). HPC staff average the independent estimates from each of the five data sources in question. The sources do not identify a separate impact on existing or newly hired RNs. The impact on wages could be higher than that observed in California because of a shorter implementation timeline in Massachusetts, stricter enforcement and stricter ratios. The impact could be lower because California had a nursing shortage at the time of implementation of their staffing law which could have led to a larger wage increase than in comparison states.

Supporting data for HPC analysis

		Current number RNs	Difference between average staffing and proposed ratios	Analysis A	Analysis B
			Additional RNs for compliance [Workforce percentage, %]	Additional RNs for compliance [Workforce percentage, %]	Additional RNs for compliance [Workforce percentage, %]
Acute Hospital Type	AMC	5004	119 [2%]	227 [5%]	371 [7%]
	Community-HPP	4548	640 [14%]	963 [21%]	1342 [30%]
	Community	2236	202 [9%]	316 [14%]	443 [20%]
	Specialty	990	28 [3%]	42 [4%]	64 [7%]
	Teaching	2234	158 [7%]	261 [12%]	403 [18%]
Service Line	Operating Room	1335	3 [0.2%]	4 [0.3%]	8 [0.6%]
	Post-anesthesia	980	8 [0.9%]	13 [1%]	22 [2%]
	Labor/Delivery	998	223 [22%]	277 [28%]	334 [33%]
	Postpartum	942	10 [1%]	15 [2%]	21 [2%]
	Neonate intermediate	286	81 [29%]	112 [39%]	143 [50%]
	Pediatric	1180	29 [2%]	48 [4%]	72 [6%]
	Medical/Surgical	7314	454 [6%]	837 [11%]	1336 [18%]
	Step-Down	916	87 [9%]	148 [16%]	218 [24%]
	Psychiatric	989	232 [23%]	327 [33%]	434 [44%]
	Rehabilitation	74	19 [26%]	27 [37%]	36 [49%]
Shift	Day	6381	253 [4%]	431 [7%]	684 [11%]
	Evening	4641	250 [5%]	442 [10%]	689 [15%]
	Night	3991	646 [16%]	936 [23%]	1251 [31%]
Overall		15012	1148 [8%]	1809 [12%]	2624 [17%]

Community-HPP designates a "High Public Payer Community Hospital." These are community hospitals that are disproportionately reliant upon public revenues by virtue of a public payer mix of 63% or greater. Public payers include Medicare, MassHealth and other government payers including the Health Safety Net. Source: CHIA.

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