MASSACHUSETTS
HEALTH POLICY COMMISSION

2018 Annual Health Care

COST TRENDS HEARING

OCTOBER 17, 2018

Spotlight on Impact of Nurse Staffing Ratios

Mandated Nurse-to-Patient Staffing Ratios in Massachusetts: Analysis of Potential Cost Impact

Dr. David Auerbach
Director of Research and Cost Trends, Massachusetts Health Policy Commission

Dr. Joanne Spetz
Professor, Institute for Health Policy Studies, University of California, San Francisco (UCSF)

MASSACHUSETTS
HEALTH POLICY COMMISSION

HPC's 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 conducted an objective, data-driven cost impact analysis** of mandated nurse staffing ratios to further inform continuing policy discussions on the matter

- The HPC **presented its research and cost impact analysis** at the HPC's Market Oversight and Transparency Committee Meeting on October 3, 2018

- Today, the HPC is presenting an abridged version of its research and analysis in advance of **Reaction Panel 4: Impact of Nurse Staffing Ratios on Cost, Quality, and Access**

The HPC's full-length presentation on mandated nurse-to-patient staffing ratios is available on the HPC's website[1]

[1] https://www.mass.gov/doc/presentation-analysis-of-potential-cost-impact-of-mandated-nurse-to-patient-staffing-ratios.

Overview of HPC research and cost impact analysis

This 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.

Comparison of CA law and MA proposed initiative

- **California** is the only state with mandated nurse staffing ratios in all hospital units
  - The California legislature passed a law in 1999 that was implemented beginning in 2004
- There are a **number of important differences** between California's law and regulation and the proposed initiative in Massachusetts, including in the following areas:
  - Implementation process/method for determining ratios
  - Scope and level of ratios
  - Substitution of licensed nursing personnel to meet the ratios
  - Consideration of non-RN healthcare workforce
  - Authorization for waivers and scope of exemptions for emergencies
  - Enforcement

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

- Below are **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

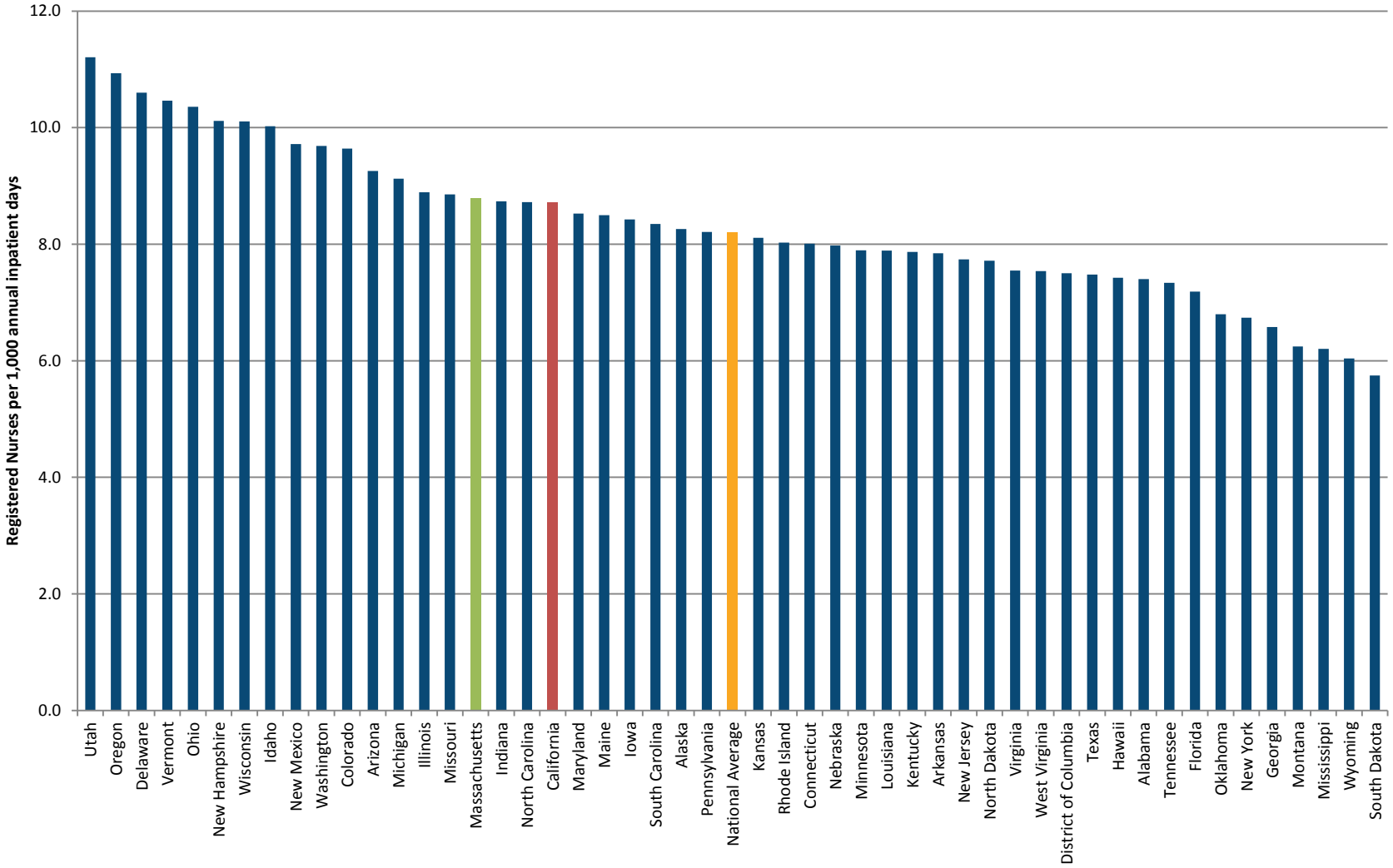
3. There was no systematic improvement in patient outcomes post-implementation of ratios

4. There has been no comprehensive, retrospective analysis of implementation costs

HPC

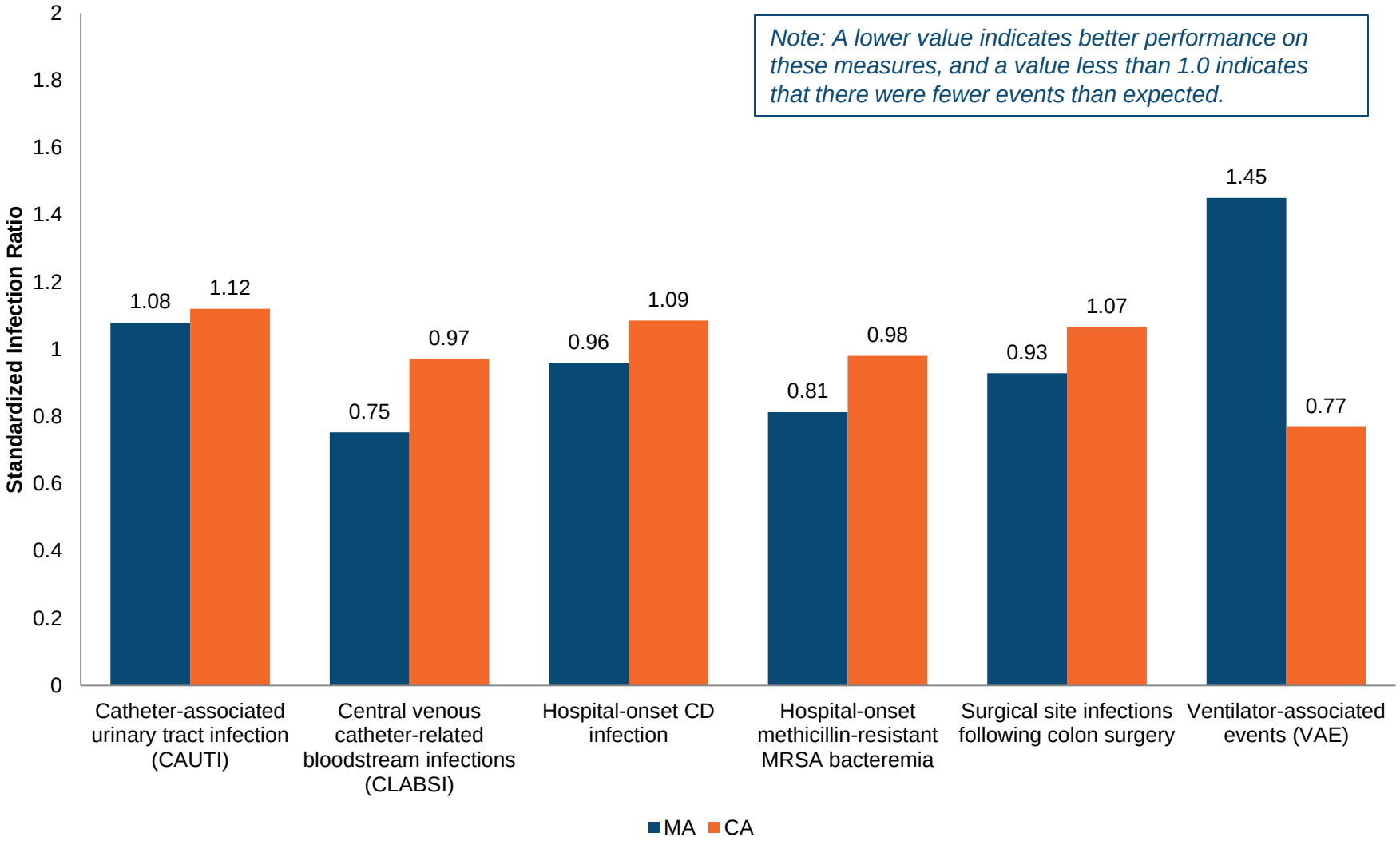
See the HPC's full research presentation for additional information, including literature citations, available here: https://www.mass.gov/doc/presentation-analysis-of-potential-cost-impact-of-mandated-nurse-to-patient-staffing-ratios.

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



American Hospital Association (2016). Data include all non-federal hospitals. Staffing levels include only registered nurses employed at the hospitals included in the sample.

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

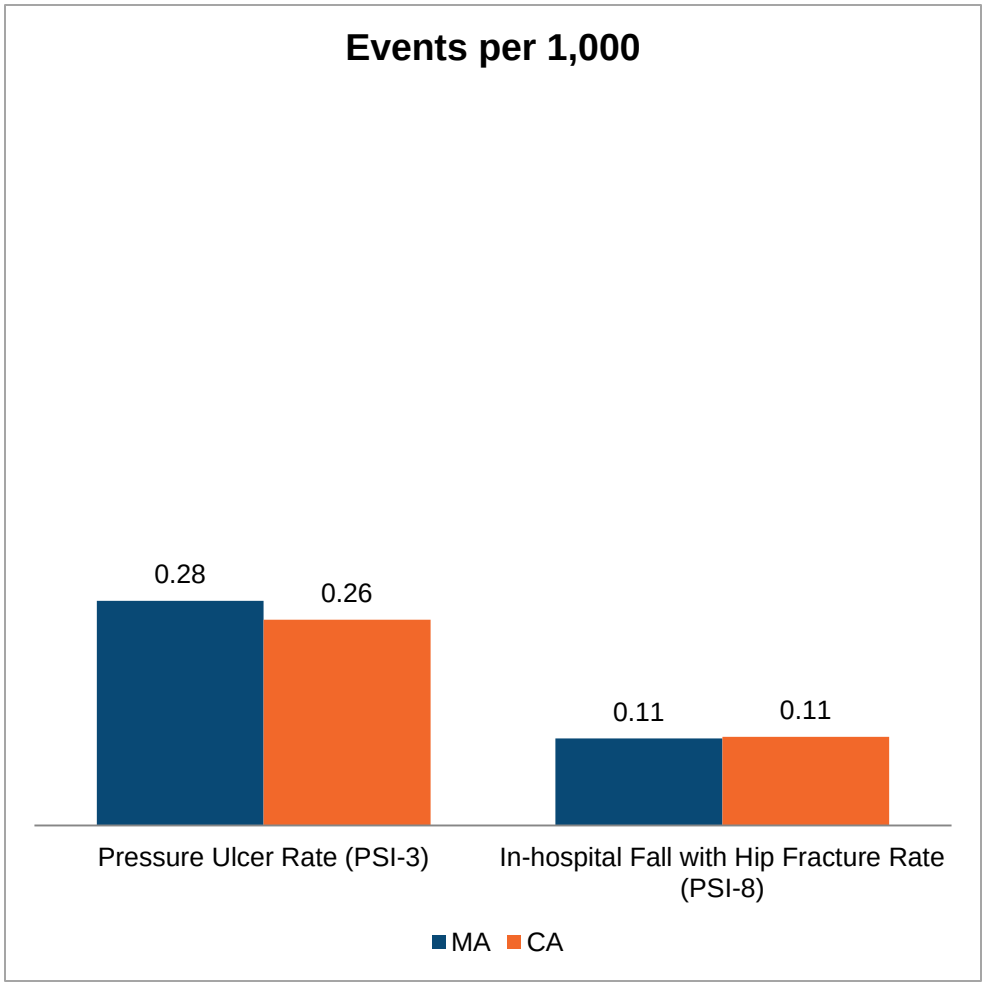


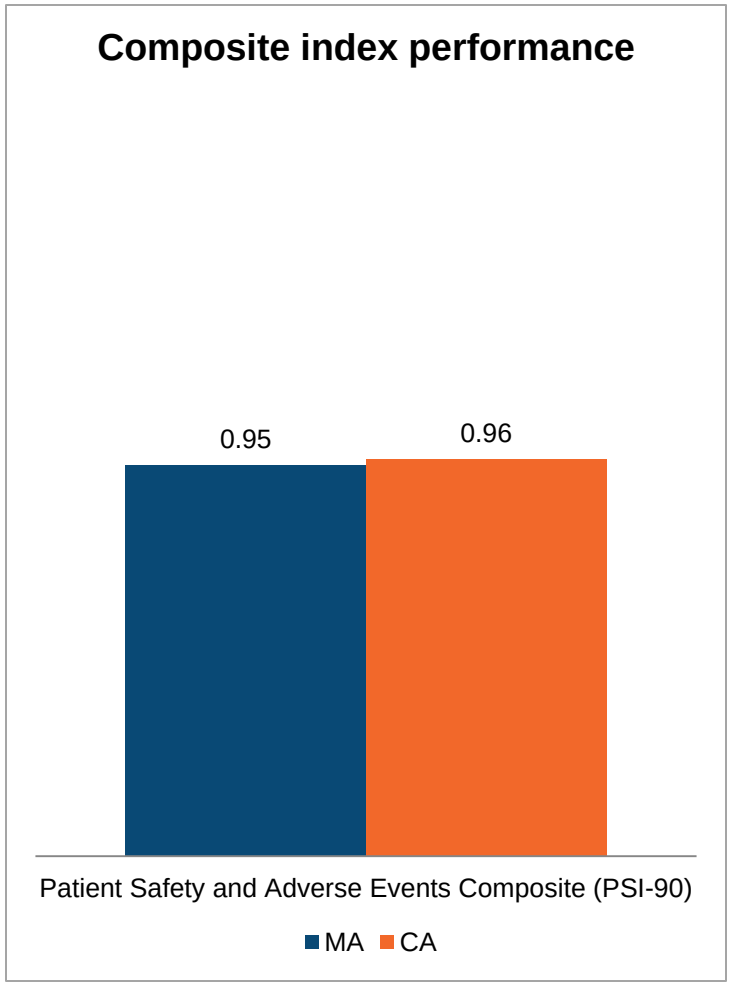
Centers for Disease Control and Prevention/Agency for Healthcare Research and Quality/National Healthcare Safety Network (2015). The "Standardized Infection Ratio" is a measure of observed over expected hospital-acquired infections and adjusts for patient-level factors that contribute to hospital-acquired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

HPC

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.





Centers for Medicare & Medicaid Services, Hospital Compare, 2017. PSI-3 and PSI-8 are expressed as events are per 1,000 patients and are computed as the median value among each state's hospitals. Composite indicator "PSI-90" includes PSI 3, 6, 8-15 and is an index such that values below 1.0 indicate better performance than expected given a hospital's patient mix.

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 data[1]
  - 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 on data limitations and additional costs
- **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[2]
- **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**.

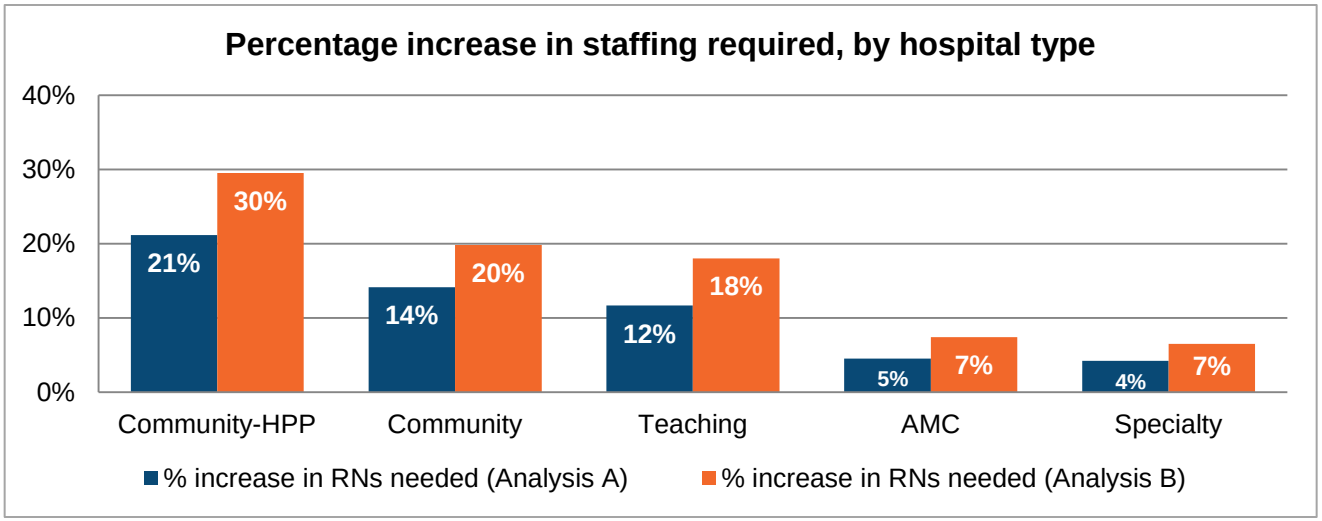
[1]PatientCareLink.org is a joint venture of the Massachusetts Health & Hospital Association (MHA), Organization of Nurse Leaders of MA, RI, NH, CT, VT (ONL), Home Care Alliance of Massachusetts (HCA) and Hospital Association of Rhode Island (HARI). See www.patientcarelink.org. Staffing data for certain units not included in PatientCareLink were made available to the HPC by the Massachusetts Health & Hospital Association.

[2]Accounts 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.

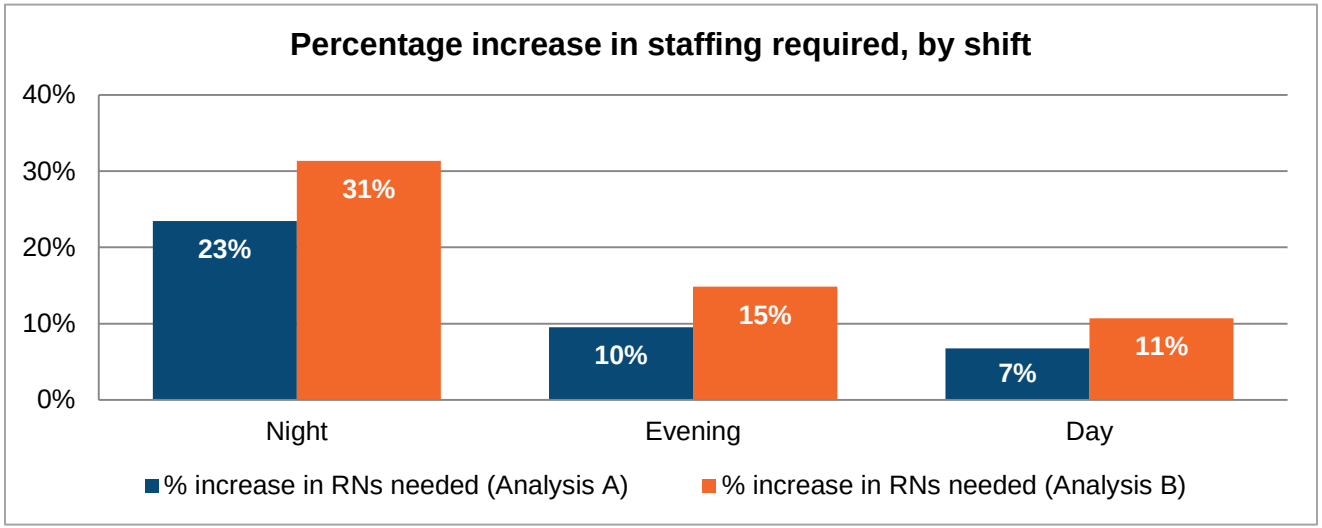
Estimated additional RNs required for compliance with mandated levels

	Difference Between Average Staffing and Proposed Ratios	Analysis A	Analysis B
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)
Additional full-time equivalent RN staff required to meet mandate in psychiatric/substance use disorder hospitals		**477**	**477**
Estimated total additional RNs required		**2,286** (15% more RNs)	**3,101** (20% more RNs)

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



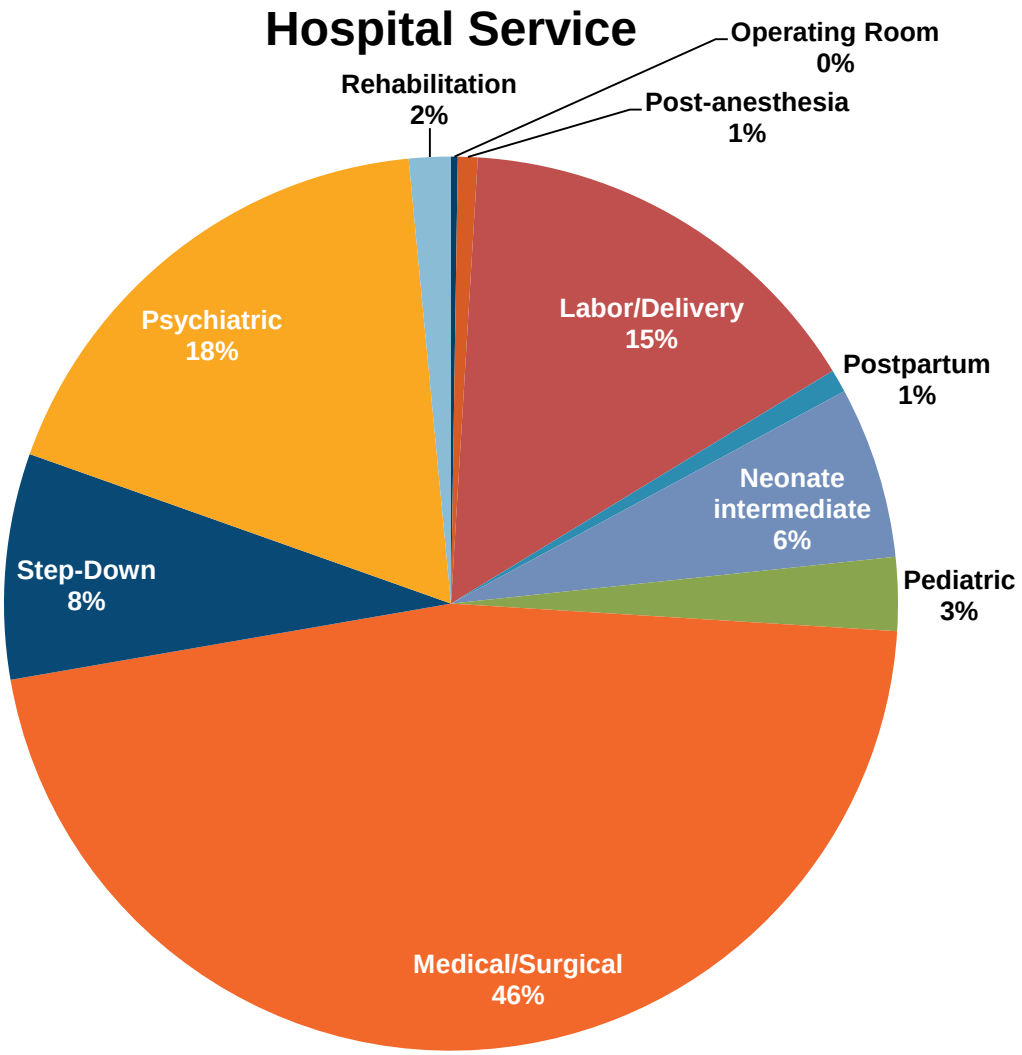
Community – High Public Payer hospitals would be most affected



Night shifts would be most affected

The charts on this slide do not reflect data on additional RNs required in psychiatric/substance use disorder hospitals.

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)*

Supporting figures are from Analysis A; n=1,809 additional RNs needed across all service types. 837 FTE RNs are exactly 46.3% of the workforce deficit overall. This chart does not reflect data on additional RNs required in psychiatric/substance use disorder hospitals.

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)

[1]Mark, Barbara, David W. Harless, and Joanne Spetz. "California's minimum-nurse-staffing legislation and nurses' wages." *Health Affairs* 28.2 (2009): w326-w334; Munnich, Elizabeth L. "The labor market effects of California's minimum nurse staffing law." *Health economics* 23.8 (2014): 935-950.

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
Costs to Hospitals		
Acute Care Hospitals		
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
Psychiatric/Substance Use Disorder Hospitals		
Additional RNs required[1]	$48 million	$51 million
Wage increase for existing RNs	$1 million	$2 million
Costs to Other (Non-Hospital) Providers		
Wage increase for existing RNs	$93 million	$140 million
Costs to the Commonwealth		
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.

[1]The 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.

[2]Hospitals 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 next slide). Figure does not include estimated costs for psychiatric/SUD hospitals.

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

HPC

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 next two slides)
  - 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 previous slide), 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 hospitals[1]
- 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 RN[2]
  - For purposes of illustration, turnover of 1,000 RNs would cost $49.5 million[3]

*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.

[1]Does not include one-time acuity tool costs for psychiatric/SUD hospitals. [2]NSI Nursing Solutions, Inc., 2018 National Health Care Retention & RN Staffing Report (2018), http://www.nsinursingsolutions.com/files/assets/library/retention-institute/nationalhealthcarernretentionreport2018.pdf. [3]Calculated 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** that range from 1:1 to 1:5 based on patient acuity

- The HPC was **unable to include EDs in its cost impact analysis** due to significant data limitations, including the fact that publicly available data on ED staffing lacks information on patient acuity or patient time spent in the ED[1]

- While data limitations preclude the HPC from modeling the anticipated impact on EDs using its established methodology, the HPC has **analyzed the publicly available ED staffing data to the extent possible** and determined the following:

  - Data represent 3,193 FTE RNs working in 77 ED units in acute hospitals

  - The worked hours per patient visit for RNs ranges from 1.38 (10th percentile) to 2.28 (90th percentile)

  - For purposes of illustration, a range of 479-639 additional FTE RNs in Massachusetts EDs (15-20% of 3,193 RNs) would cost $79 million to $110 million[2] annually

[1]These data are publicly available on www.PatientCareLink.org.

[2]The workforce percentages needed used in this example correspond with the average additional workforce percentage needed in Analysis A and Analysis B, see technical appendix in the HPC's full research presentation, available at https://www.mass.gov/doc/presentation-analysis-of-potential-cost-impact-of-mandated-nurse-to-patient-staffing-ratios. Other key parameters (estimated wage, benefits for newly hired RNs, and the wage impact across all existing RNs and new RNs) also correspond directly to figures used in other examples with Analysis A and B.

Additional information about the impact on Massachusetts emergency departments from stakeholders

- **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

- The HPC **solicited additional information from stakeholders** to further inform discussions around the potential impact of mandated ratios in Massachusetts EDs:
  - The Massachusetts Nurses Association provided the HPC with a *Journal of Emergency Nursing* study (2017) that found a relationship between nurse staffing and time to diagnostic evaluation in Massachusetts EDs[1]
  - The Massachusetts Health & Hospital Association provided the HPC with a report published by the Massachusetts College of Emergency Physicians and Emergency Nurses Association (September 2018), which estimated an annual statewide cost for additional nurse staffing needed to comply with the mandate[2]

[1]Shindul-Rothschild, Judith, et al. "Nurse staffing and hospital characteristics predictive of time to diagnostic evaluation for patients in the emergency department." *Journal of Emergency Nursing* 43.2 (2017): 138-144.

[2] http://www.macep.org//Files/NSR%20ED%20Paper.pdf

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 events[1]
  - ~$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

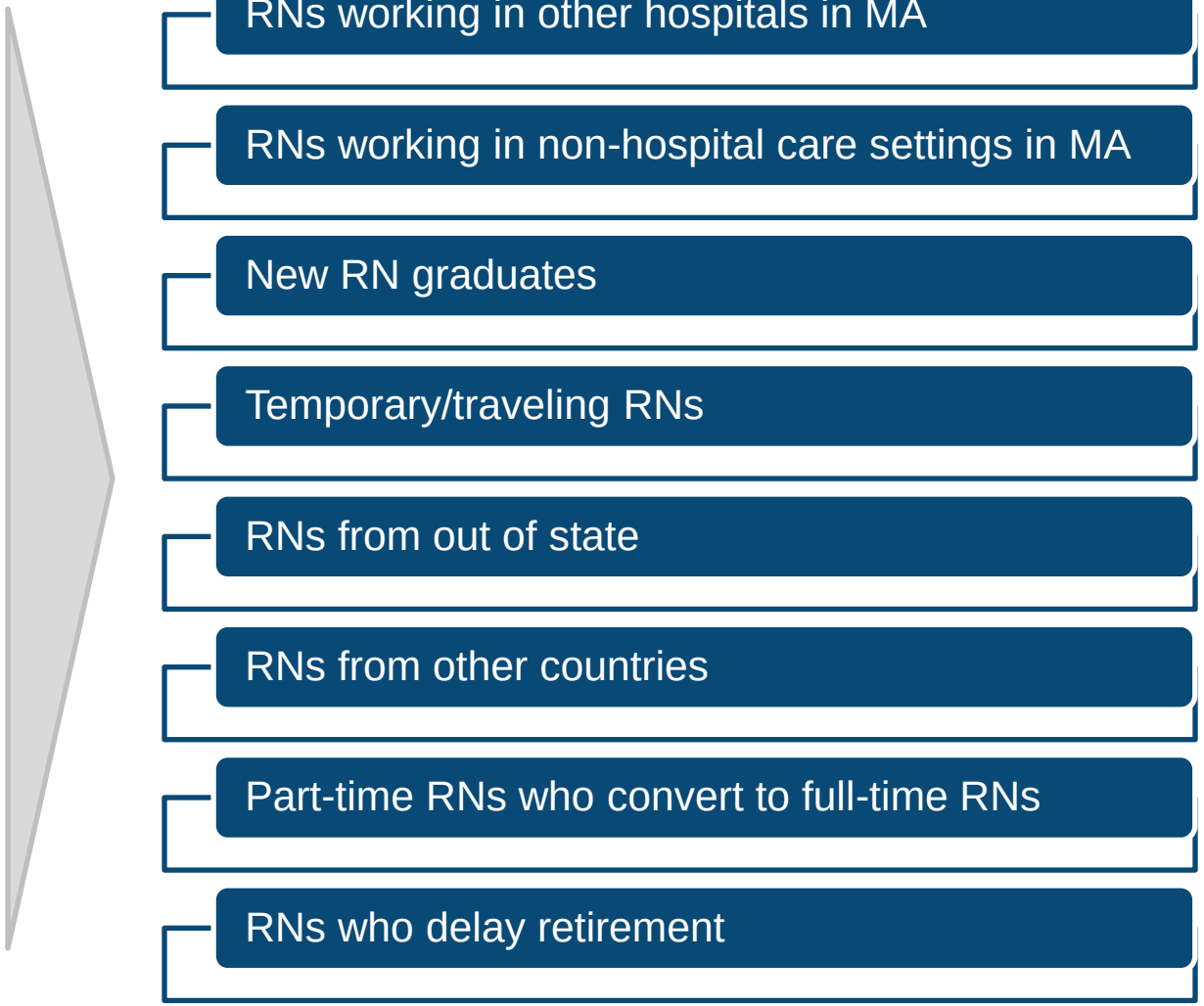
  - However, it is uncertain if RN staffing increases from current MA staffing levels would result in these savings

- Other savings could be realized due to reduced RN turnover[2] and workforce injuries[3]

[1]Needleman, Jack, et al. "Nurse staffing in hospitals: is there a business case for quality?." *Health Affairs* 25.1 (2006): 204-211. 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. [2]See, e.g., Aiken, Linda H., et al. "Implications of the California nurse staffing mandate for other states." *Health services research*45.4 (2010): 904-921; Spetz, Joanne. "Nurse satisfaction and the implementation of minimum nurse staffing regulations." *Policy, Politics, & Nursing Practice* 9.1 (2008): 15-21. [3]Leigh, J. Paul, et al. "California's nurse-to-patient ratio law and occupational injury." *International archives of occupational and environmental health* 88.4 (2015): 477-484.

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

2,286 – 3,101 estimated additional RNs required



HPC

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 assets[1]
  - 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**

[1]Reiter, Kristin L., et al. "Minimum Nurse Staffing Legislation and the Financial Performance of California Hospitals." *Health services research* 47.3pt1 (2012): 1030-1050.

[2]Total 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.

MASSACHUSETTS
HEALTH POLICY COMMISSION

2018 Annual Health Care

COST TRENDS HEARING

OCTOBER 17, 2018

Up Next
Reaction Panel 4: Impact of Nurse Staffing Ratios on Cost, Quality, and Access

Reaction Panel 4: Impact of Nurse Staffing Ratios on Cost, Quality and Access

Panelists

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 VP and Chief Nursing Officer	Boston Medical Center
Dr. Judith Shindul-Rothschild, Associate Professor	Connell School of Nursing, Boston College
Dr. Joanne Spetz, Professor	Institute for Health Policy Studies, University of California, SF

Goals

Building off the preceding expert presentation, the goal of this panel is to discuss the implications of mandated nurse staffing ratios for health care spending in the Commonwealth. Topics will include evidence and experience of implementing hospital nurse staffing ratios in California, and the potential impact on health care cost, quality, and access in Massachusetts.

Thank You!

MASSACHUSETTS
HEALTH POLICY COMMISSION