Study of Nurse Caregiver Minimum Staffing Levels and Other Staffing Enhancement Strategies and Patient Quality Improvement Initiatives

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Executive Summary

The State Fiscal Year (SFY) 2019-20 Enacted Budget included legislation directing the New York State Department of Health (Department) to conduct a study to examine how staffing enhancements and other initiatives could be used to improve patient safety and the quality of healthcare service delivery in hospitals and nursing homes subject to Article 28 of the Public Health Law. The study focuses on registered nurses (RNs), licensed practical nurses (LPNs) and certified nurse aides (CNAs), and specifically considers nurse minimum staffing levels, other nurse staffing enhancement strategies, and patient quality improvement initiatives and analyzes the potential fiscal and economic impact of these strategies.

To carry out this study, the Department reviewed public reports, academic literature and news publications that covered the topics of nurse-to-patient staffing ratios, other nurse staffing enhancement strategies, and patient quality improvement initiatives. The Department also reviewed initiatives implemented or proposed in other states to identify what strategies have been put in place or considered and included a review of studies that evaluated the impact/outcome of policies that have been implemented in other states, mainly in California and Massachusetts.

The Department also solicited stakeholder input through one-on-one meetings and public forums. Public testimony and comments were both in support and in opposition to mandated minimum staffing ratios and also suggested approaches to ensure a sufficient highly trained workforce. Additionally, the Department conducted an analysis of projected workforce needs and engaged the Schools of Human Ecology and Industrial and Labor Relations at Cornell University for fiscal and economic analyses to assist. Cornell researchers used nurse-to-patient ratios proposed in the 2019 “Safe Staffing for Quality Care Act” to create projections of nurse workforce needs and costs.

Published studies and stakeholder input suggest that there are opportunities to enhance the nursing workforce to produce positive patient outcomes and a safe working environment for nurses, as well as to optimize patient and nurse satisfaction. Some stakeholders suggested that other outcomes such as potential savings to the healthcare system resulting from reductions in re-admissions, errors, and nurse turnover could be achieved.

However, opinion and published studies differ as to whether mandating specific, statewide nurse-to-patient ratios is the most effective approach to achieving those goals. While some studies find a correlation between nurse-to-patient ratios and patient outcomes, others found little to no correlation, especially in California, which is the only state that currently mandates minimum ratios. In addition, issues such as nurse workforce availability, cost, and limits on flexibility of the workforce exist that may challenge strategies that establish minimum nurse staffing levels.

Cornell University’s analysis projects a need across the State of 24,779 nurse Full Time Equivalents (FTEs), mostly RNs (24,059 FTE RNs and 720 FTE LPNs), to meet the proposed nurse-to-patient ratios in hospitals included in the 2019 Safe Staffing for Quality Care Act. In nursing homes that projection is 45,158 FTE (10,181 FTE RNs, 15,007 FTE LPNs and 19,970 FTE Nursing Assistants and Other Aides [NAOAs]). Even under current staffing levels, third party research study projections of available nursing workforce differ as to whether there will be

enough nurse staff to fill available positions in the future. A significant challenge to our analysis is the limited data available on the nurse workforce in New York State.

To achieve the ratios required in the "Safe Staffing for Quality Care Act", Cornell estimates filling the required workforce need would cost an additional $1.8 to $2.4 billion dollars for hospitals and between $1.9 and $2.3 billion dollars for nursing homes. This reflects an increase in nurse wage costs of between 40 and 53 percent for hospitals, and between 79 and 96 percent for nursing homes. The additional estimated costs would be a significant increase.

Some stakeholders voiced concern that a "one-size fits all" approach of mandating statewide, nurse-to-patient ratios does not take into consideration the differences in types of hospitals, patient populations, and care practices. These stakeholders advocate that staffing decisions be made at the facility level. In addition, the dynamic evolution of clinical care and higher acuity of patients, both in hospitals and nursing homes, suggests that providers need flexibility to identify and implement nurse and other direct care staffing plans that best meet the needs of their patients and residents.

In addition, some research suggests that New York State will continue to experience a nursing shortage through the next decade, which could make meeting any mandated minimum staffing levels unachievable for some providers.

All of these factors suggest the need for a comprehensive approach to ensure that New York State has a highly trained, skilled nursing workforce that will continue to meet the needs of patients and residents in a safe work environment. A workforce development approach should include strategies to ensure:

- nursing continues to be an attractive career;
- enough capacity exists to educate and train the workforce of the future;
- nurses have training opportunities to advance their careers;
- programs exist to support work-life balance for nurses;
- a safe work environment that minimizes the stressors that nurses experience;
- New York State has the necessary data to conduct nurse workforce research that informs future workforce planning; and
- State workforce policy provides flexibility to allow providers to align workforce capacity with patient and resident needs in a dynamic, continually evolving delivery system.

Introduction: Study Purpose and Approach

The State Fiscal Year (SFY) 2019-20 Enacted Budget included language directing the New York State Department of Health (Department) to conduct a study to examine how staffing enhancements and other initiatives could be used to improve patient safety and the quality of healthcare service delivery in hospitals and nursing homes subject to Article 28 of the Public Health Law). The study focuses on registered nurses, licensed practical nurses and certified nurse aides, and considers nurse minimum staffing levels, other nurse staffing enhancement strategies, and patient quality improvement initiatives and analyzes the potential fiscal and economic impact of these strategies.

I. Background

The following subsections provide background on current rules and regulations pertaining to nurse staffing in New York State, and provide data for consideration when reviewing study findings.

A. Categories of Nurse Caregivers

The New York State Education Department (NYSED) is the licensing authority for professional nursing services in New York State, and licenses Licensed Practical Nurses (LPNs) and Registered Nurses (RNs).[1] Both RNs and LPNs provide direct care to patients by performing skilled nursing tasks and procedures and dispensing medication. Both are required to have graduated from a NYSED-approved nursing education program and receive a passing score on their respective National Council Licensure Exams (NCLEX). RNs have an expanded scope of practice compared to LPNs – performing health assessments, making nursing diagnoses, teaching and counseling patients about their health, as well as coordinating and supervising LPNs and other members of the care team.

The Department sets the training and examination requirements for Certified Nurse Aides (CNAs).[2] CNAs are responsible for assisting patients with activities of daily living, which include eating, bathing, dressing, toileting and transporting, and must complete a state approved training program and pass the New York State Home Nurse Aide Competency Examination in order to practice.

Each category of nurse caregiver has its own responsibilities and works in conjunction with other caregiving staff. Level of nursing care is an important consideration regarding minimum staffing levels or other staffing enhancements.

[1] New York State Education Department. “Office of the Professions: Nursing.” www.op.nysed.gov/prof/nurse/. Accessed November 2019.
[2] Subsection 415.26(d), Title 10 New York Codes Rules and Regulations.

B. Regulatory Requirements for Nurse Staffing in Hospitals

Federal requirements regarding nurse staffing in hospital facilities create a minimum standard for nursing care coverage, but do not specify minimum staffing levels or ratios by hospital unit. Title 42 of the Code of Federal Regulations (CFR), Section 482.23, Conditions of Participation, Nursing Services, requires that a hospital must have an organized nursing service that provides 24-hour nursing services, and that these services must be supervised by a RN and have a LPN or RN on duty at all times, except in rural hospitals that have received a waiver exempting them from 24-hour care. Further, it sets the minimum standard that the nursing service has "adequate numbers" of RN, LPN and other personnel to provide nursing care to all patients as needed but permits individual facilities to determine this requisite.

New York State regulations elaborate on this standard in Section 405.5 of Title 10, New York Codes Rules and Regulations (NYCRR), requiring that facilities have a governing body that ensures "that the hospital has an organized nursing service that provides 24-hour services and that meets the care needs of all patients in accordance with standards of nursing practice. The nursing services for all patients shall be provided or supervised by a registered professional nurse who is on duty and available at all times" and requiring a "written nursing service plan of administrative authority and delineation of responsibilities". Section 405.5 of Title 10 NYCRR also requires that the director of the nursing service "be a licensed registered professional nurse who is qualified by training and experience for such position," and identifies the director of the nursing service as the entity responsible for "developing a plan for determining the types and numbers of nursing personnel and staff necessary to provide nursing care for all areas of the hospital." Similar to federal regulations, New York State permits individual facilities to determine adequate nursing coverage.

C. Regulatory Requirements for Nurse Staffing in Nursing Homes

The Nursing Home Reform Act of 1987 set federal quality standards for nursing home care in Skilled Nursing Facilities (SNF) and Nursing Facilities (NF). Title 42 CFR, Section 483.35, Nursing Services, requires nursing homes to have "sufficient staff" to meet the needs of residents, specifically requiring facilities to provide 24-hour care by licensed nurses and other nursing personnel, a designated RN Director of Nursing on a full-time basis, and a RN for at least eight consecutive hours a day, seven days a week, among other provisions. This section also establishes reporting requirements, mandating that facilities post in a prominent area of the facility that's readily accessible to residents and visitors, information pertaining to actual hours worked by RNs, LPNs and CNAs along with a resident census. States are responsible for certifying compliance, except in the case of State-operated facilities, and for conducting regular surveys of facilities.

Section 6106 of the Affordable Care Act requires long term care facilities, such as nursing homes, to electronically submit direct care staffing information to the federal government, including employed, agency and contract staff, based on payroll data and other verifiable and auditable data. In order to support this requirement, the Centers for Medicare and Medicaid Services (CMS) developed the Payroll-Based Journal (PBJ) system to collect this information. CMS uses staffing information to inform the Nursing Home Five Star Quality Rating System. The CMS Nursing Home Compare website displays the quality rating system to rank

each nursing home on a scale of 1 to 5, with 5 describing those facilities with above average quality and 1 describing those with quality much below average. There is one overall rating for each facility and separate ratings for health inspections, staffing, and quality measures. The staffing rating reflects the hours of care provided to each resident each day by licensed nurses in total, LPNs and RNs respectively, by CNAs, and also by physical therapists. The rating system accounts for the differences in acuity of the residents in each nursing home.

D. Additional Requirements Regarding Nurse Staffing in Hospitals and Nursing Homes

While New York State does not mandate specific nurse staffing levels or ratios in hospitals and nursing homes, it does limit mandatory overtime through Labor Law, Section 167, Restrictions on Consecutive Hours of Work. This law prohibits healthcare employers from mandating overtime for nurses, and stipulates conditions for exceptions to this rule, but does not place restrictions on voluntary overtime.

New York State specifies reporting requirements for hospitals and nursing homes. Public Health Law Section 2805-T, Disclosure of Nursing Quality Indicators, requires that all licensed hospitals and nursing homes make available to the public, information regarding nurse staffing and patient outcomes. Facilities are to collect data on the number of RNs, LPNs, and unlicensed personnel providing direct patient care; the incidence of adverse patient care; methods used to determine and adjust staffing levels; and complaint data. Regulations in Section 400.25 of Title 10 NYCRR, Disclosure of Nursing Quality Indicators, specifies that hospitals and nursing homes must disclose acuity, case mix, fall metrics, fall injuries, healthcare associated infections, and nurse staffing indicators such as the average RN and LPN to patient ratio for each unit on each shift, among other measures, when requested.

E. “Safe Staffing for Quality Care Act”

As proposed by A2954/S1032 in the 2019-20 legislative session, the “Safe Staffing for Quality Care Act” (Safe Staffing Act) to nurse staffing that has been under consideration in the New York State legislature for several years. The Safe Staffing Act would require specific minimum nurse-to-patient ratios in New York hospitals and set minimum RN, LPN and CNA daily care hours for residents of nursing homes.

Under the most recent 2019 proposal, nurse-to-patient ratios would be set by State law by unit (please see *Table 1: 2019 Safe Staffing for Quality Care Act Hospital Unit Ratios)*. Ratios would serve as the maximum number of patients assigned to any licensed nurse at all times during a shift (not an average), and hospitals would be prohibited from exceeding these ratios and assigning more patients to each nurse. Although the proposal creates a maximum number of patients assigned to an RN at all times during their work shift, hospitals could assign fewer patients to each RN, as needed, based on patient acuity and necessary level of nursing care. The proposal would require that nurses assigned to each unit have demonstrated competence in that specific clinical area and receive an orientation for that clinical practice. Assistive personnel would not count toward the RN-to-patient ratios, LPN patient assignments

would be included within the RN patient assignment since the RNs are supervising the LPNs, and hospitals would be required to publicly disclose staffing levels.

Table 1: 2019 Safe Staffing for Quality Care Act Hospital Unit Ratios

RN to Patients	Type of Care
1:1	Trauma emergency Operating room Labor – 2nd and 3rd stage
1:2	Labor – 1st stage All critical care (including emergency) All intensive care Post anesthesia care
1:3	Antepartum Emergency department Pediatrics Step-down and telemetry Newborn nursery Intermediate care nursery Post-partum mother/baby couplets (1:6 patients)
1:4	Non-critical antepartum Post-partum mother-only Medical-surgical Acute care psychiatric
1:5	Rehabilitation units Sub-acute patients
1:6	Well-baby nursery units

As proposed by A2954/S1032 in the SFY2019 legislative session.

Nursing homes would be required to provide 0.75 hours of RN care, 1.3 hours of LPN care, and 2.8 hours of CNA care to each resident per 24-hour day, 7 days a week. Since the care hours do not need to be given continuously, there is room for flexibility for nurse scheduling.

The proposed legislation would make it a requirement of all hospitals and nursing homes to submit a documented staffing plan to the Department on an annual basis, and upon application for an operating certificate. The proposal would require that the Commissioner of Health appoint an Acute Care Facility Council to advise on the development of nurse staffing regulations, including RN-to-patient staffing requirements and non-nursing direct-care staff-to-patient ratios that are not specified in the proposed legislation. The Acute Care Facility Council would also review the efficacy of acuity systems submitted for approval, the development of an assessment tool used to evaluate the efficacy of acuity systems, and review and make recommendations on the approval of staffing plans prior to the granting of an operating certificate.

F. "BSN in 10"

In 2017, New York State enacted the "BSN in 10" law, requiring that nurses obtain a baccalaureate degree or higher in nursing (a Bachelor of Science in Nursing [BSN], a Master of Science in Nursing [MSN], or a doctoral level degree) within ten years of receiving their initial RN license, or risk having their license suspended in order to ensure that patients receive the highest quality care and that nurses have every available opportunity to advance in their career Currently in New York State, RNs may have an associate's or a bachelor's degree or complete a hospital-based training program and receive a diploma to be eligible for licensure. The "BSN in 10" law will go into effect June 18, 2020. Nurses currently practicing, as well as those currently enrolled in a nursing program at the time of enactment, are not subject to the requirement.

G. New York State Workforce Data and Considerations

When discussing minimum staffing levels and other patient quality improvement initiatives, it is important to consider the current New York State nurse workforce, and the potential impacts of policy changes or new mandates on nurse recruitment and retention.

The Department has limited data on the nursing workforce across the state. While the Department has a statewide view of overall numbers, there is a need for additional data collection and study, particularly at the provider and regional level. The Center for Health Workforce Studies (CHWS), an academic research center based at the School of Public Health at the University at Albany, State University of New York (SUNY), utilizes data from several sources, including data from the American Community Survey, the U.S. Bureau of Labor Statistics Occupation Employment Survey, and data obtained from NYSED and the New York State Department of Labor (DOL), as well as data collected through primary research surveys. Nurses are presented with a survey when renewing registration information with NYSED every three years; the response rate has been low, which limits the usefulness of the data. Data from the American Community Survey provides useful insight into state-level trends, and to some extent regional trends. There is an established need for enhanced data on nurse demographics, education levels, and practice characteristics.

The New York State Department of Labor (DOL) website indicates that there are 307,392 active RN licenses and 69,285 active LPN licenses in New York State as of July 1, 2018, and 87,729 active certificates for CNAs.[3] However, being actively registered does not necessarily mean that nurses and nurse aides are actively practicing, either full-time or part-time.

Data from NYSED show a steady increase in the number of RN graduates obtaining licensure (please see *Table 2, Licenses Issued, Past 5 Calendar Years*).

[3] New York State Department of Labor. "Labor Statistics, Registered Professional Nurse." www.labor.ny.gov/stats/olcny/registered-professional-nurse.shtm; "Labor Statistics, Licensed Practical Nurse." https://www.labor.ny.gov/stats/olcny/licensed-practical-nurse.shtm; and "Labor Statistics, Certified Nurse Aide." https://labor.ny.gov/stats/olcny/certified-nurse-aide.shtm. Accessed November 2019.

Table 2, Licenses Issued, Past 5 Calendar Years.[4]

Profession Title	2014	2015	2016	2017	2018
Registered Professional Nurse	14,376	15,425	15,892	17,215	18,607
Licensed Practical Nurse	3616	3,537	3,170	3,132	3,163
Nurse Practitioner	1,678	1,761	2,016	2,132	2,583

While the number of RN graduates overall has been increasing in recent years, the number of graduates with a BSN is declining.[5] The new "BSN in Ten" requirement is expected to reverse this decline.

Having insight into regional and local trends is critical to targeting nurse recruitment and retention efforts. For example, the U.S. Department of Health and Human Services released a report in 2017, *Supply and Demand Projections of the Nursing Workforce: 2014-2030.* The report projects excess supply of RNs in New York State by 2030 of 18,200 full-time equivalents (FTE).[6] However, while statewide numbers may suggest that the supply of nurses is sufficient to meet current demand and will continue to be sufficient, a more localized analysis reveals disparities in the distribution of nurses, with many nurses gravitating toward urban centers. The 2016 CHWS report *A Profile of Registered Nurses in New York State* identified about 186,700 active RNs statewide, with the 86.4 percent (161,318) in urban areas, versus 13.6 percent (25,423) in rural areas.[7]

Another important factor to consider is the age of New York's nursing workforce. CHWS's 2016 report also indicates that the percentage of RNs over 55 is growing, with a six percent increase in RNs over 55 between 2010 and 2014, with most of the growth occurring in urban settings.[8] As nurses retire, it is imperative that there are entrants into the nursing workforce to take their place.

The American Association of Colleges of Nursing (AACN) reports that U.S. nursing schools turned away over 75,000 qualified applicants from baccalaureate and graduate nursing programs in 2018 due to resource constraints such as insufficient faculty, clinical training sites, classroom space, and clinical preceptors. AACN reports a national nurse faculty vacancy rate of 7.9 percent, the vast majority of which are faculty positions requiring at least a master's

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[4] https://www.npr.org/sections/health-shots/2020/03/10/814099444/new-york-creates-containment-area-around-cluster-in-new-rochelle

[5] Center for Health Workforce Studies. *Testimony at September 20th Forum on Nurse. Staffing.* https://www.health.ny.gov/events/webcasts/archive/.

[6] U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis (2017). *National and Regional Supply and Demand Projections of the Nursing Workforce: 2014-2030.* Rockville, Maryland. https://bhw.hrsa.gov/sites/default/files/bhw/nchwa/projections/NCHWA_HRSA_Nursing_Report.pdf.

[7] Harun N., Martiniano R., Rodat C., and Moore J. (2016). *A Profile of Registered Nurses in New York State*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany. www.chwsny.org/wp-content/uploads/2016/10/RN-Profile-NY-2016_-1.pdf.

[8] Harun N, et. al. (2016).

degree, and generally a doctoral degree.[9] New York State does not have data on how many candidates are turned away from nursing programs due to resource constraints.

NYSED reports the total number of RN graduates and the percentage that pass the NCLEX on their first attempt, enabling them to be licensed as an RN in New York. New York State has 67 approved associate degree nursing programs, 50 approved baccalaureate degree programs, and one approved hospital diploma program that combined, in 2018 produced 9,879 RN graduates, 87.5 percent of which (8,589) passed the NCLEX exam on their first try.[10] This is building on an upward trend from the five previous years of RN graduates passing the exam on their first try (76.8 percent in 2013 to 85 percent in 2017), although the overall number of graduates remains consistent (between 9393 and 9835).[11]

Although more RN graduates are entering the workforce each year, New York State hospitals that participated in a 2017 study on workforce trends reported difficulty recruiting and retaining RNs, both experienced (more than two years) and newly licensed.[12] Nursing homes also reported difficulty recruiting RNs, both experienced and newly licensed, but noted that CNAs were the most difficult to retain.[13] The CHWS in 2016 projected that, if RN graduation and retirement trends remain the same, the supply of RN FTEs would grow by five to nine percent between 2015 and 2025, largely keeping pace with demand.[14] Other projections, such as those published more recently in the American Journal of Medical Quality, indicate a shortage of over 39,000 RNs in New York State by 2030, based on supply and demand models designed to reflect changes in population and age.[15]

H. New York State Workforce Cost Considerations

When discussing nursing workforce costs, it is important to consider variation across different workplace settings, areas of the state, as well as degrees obtained by RNs. Most nurses in New York State work in hospital settings, and hospital wages generally are higher than nursing home or other provider settings. The 2016 CHWS report *A Profile of Registered Nurses in New York State* reported that the average annual salary for an RN across all settings

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[9] American Association of Colleges of Nursing (2019). *Fact Sheet: Nursing Faculty Shortage*. www.aacnnursing.org/Portals/42/News/Factsheets/Faculty-Shortage-Factsheet.pdf.

[10] New York State Education Department. "New York State RN NCLEX Results: 2018-2022." www.op.nysed.gov/prof/nurse/nclexrn2018-2022.htm. Accessed November 2019.

[11] New York State Education Department. "New York State RN NCLEX Results: 2013-2017." www.op.nysed.gov/prof/nurse/nurseprogs-nclexrn2013-17.htm#OverallSummary. Accessed November 2019.

[12] Martiniano R., Krohmal R., Boyd L., Liu Y., Harun N., Harasta E., Wang S., Moore J. (2018). *The Health Care Workforce in New York: Trends in the Supply of and Demand for Health Workers.* Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany; March 2018. http://nyachnyc.org/wp-content/uploads/2018/04/CHWS-The-HC-Workforce-in-NY-2018.pdf.

[13] Ibid.

[14] Armstrong D., Moore J. (2016). *The Future of the Registered Nursing Workforce in New York: State-Level Projections, 2015-2025*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany. http://nyachnyc.org/wp-content/uploads/2016/04/CHWS-Future-of-the-RN-Workforce-in-NY.pdf.

[15] Juraschek S., Zhang X., Ranganathan, V.,and Lin V. (2019). "United States Registered Nurse Workforce Report Card and Shortage Forecast." *American Journal of Medical Quality*. Vol 34(5), 473-481. https://journals.sagepub.com/doi/pdf/10.1177/1062860619873217.

in 2015 was $80,090. However an analysis of average annual salary by region demonstrates significant variation, with New York City registered nurses at the high end earning $90,460, followed by Long Island ($85,030), the Hudson Valley ($82,120), and Southern Tier region nurses at the low end with $60,710, with all other regions falling between $61,000 and $69,000.[16] Cost of living and supply and demand naturally play a role in the variation, but other factors such as highest degree obtained also impact compensation and are not adequately reflected when looking at regional or state averages. While not all facilities pay BSN-prepared RNs a higher wage, the AACN reports that BSN-educated RNs generally earn more and have potential for pursuing additional education and training to achieve a higher level of clinical certification and earning potential.[17] As more RNs with a bachelor's degree enter the NYS workforce it is possible that there will be an upward impact on overall salary costs.

Based on the estimated number of active RNs and available wage/salary information, the Cornell University Schools of Human Ecology and Industrial and Labor Relations estimate that total nursing staff wage/salary costs in hospitals across the state total approximately $4.5 billion, and that nursing staff wage/salary costs in nursing homes total approximately $2.7 billion.[18] Not all nursing workforce costs are driven by salary, however. There is also the cost of recruitment and retention activities, which are important investments to consider. In *KPMG's 2011 U.S. Hospital Nursing Labor Costs Study,* KMPG estimates that "fully loaded payroll" (base wages, overtime pay and benefits) account for 76 to 78 percent of overall costs, with the remainder of costs attributed to nonproductivity costs (11-12 percent), insurance (8 – 9 percent), recruiting costs (1-2 percent) and other costs (1 percent).[19] Despite the recruitment cost estimate, the more difficult costs to capture are the cost of attrition and time and effort required to fill an RN position, especially given that many hospitals will make use of traveling/per diem/agency nurses in the interim.

II. New York State Information Collection and Analysis

To carry out this study, the Department started with an extensive review of public reports, academic literature and news publications that covered the topics of minimum nurse staffing levels and other nurse staffing enhancement strategies and patient quality improvement initiatives, paying particular attention to insights gleaned from other state models. The Department also solicited stakeholder input through one-on-one meetings and two public forums. Additionally, the Department engaged the Cornell University Schools of Human Ecology and Industrial and Labor Relations for a projection of workforce needs and fiscal and economic analyses.

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[16] Harun N. et. al. (2016).

[17] American Association of Colleges of Nursing. *Your Nursing Career: A Look at the Facts*. www.aacnnursing.org/Students/Your-Nursing-Career-A-Look-at-the-Facts. Accessed November 2019.

[18] Fitzpatrick M., Avgar A., Bjelland, M., Enayati, H., and Strom P. (2019). *A Report on Potential Effects of New York State's Proposed Minimum Nurse Staffing Legislation.* Cornell University Schools of Human Ecology and Industrial and Labor Relations.

[19] KPMG Healthcare and Pharmaceutical Institute (2011). *KPMG's 2011 U.S. Hospital Nursing Labor Costs Study.* www.natho.org/pdfs/KPMG_2011_Nursing_LaborCostStudy.pdf.

A. Existing State Models

The following provides a high-level overview of two state models that are often discussed in the literature on minimum nurse staffing levels and provides an overview of what other states are requiring to address nurse staffing levels without the use of mandated nurse staffing ratios.

California

California is currently the only state that mandates specific nurse-to-patient staffing ratios throughout hospitals and has served as a national testing ground for the impact that mandated nurse staffing ratios can have on patient quality and healthcare costs. California's mandatory ratios listed in *Table 3, California's Minimum Nurse-To-Patient Staffing Ratios*, have been in effect since 2004. Legislation passed in 1999 establishing the nurse-to-patient ratios for acute care, psychiatric and specialty hospitals throughout the state and provided a five-year implementation period for facilities to reach these mandated ratios. The law also specifies that a licensed nurse, defined as a RN, licensed vocational nurse, LVN, (equivalent to an LPN in New York State), or a psychiatric technician, must have demonstrated competence in providing care in a given unit or clinical area before being assigned to serve in that unit, and must receive appropriate orientation, but leaves it to individual hospital discretion to determine orientation criteria.

From 2008 to 2017 the California Department of Public Health (CDPH) reports 634 violations of the mandated nurse-to-patient staffing ratios, and in October of 2019 the California Governor signed legislation increasing enforcement of mandated ratios by authorizing CDPH to conduct unannounced inspection visits to hospitals and significantly increasing fines.[20] Currently there are 420 General Acute Care hospitals and 127 Acute Psychiatric hospitals across California.[21]

[20] Office of California State Senator Connie M. Leyva. *SB 227 Empowers CDPH to Enforce Nurse Staffing Ratio Requirements*. Press Release: October 13, 2019. https://sd20.senate.ca.gov/news/2019-10-13-leyva-bill-protecting-hospital-patients-signed-law.

[21] California Department of Public Health. Cal Health Find Database. https://www.cdph.ca.gov/Programs/CHCQ/LCP/CalHealthFind/Pages/Home.aspx. Accessed November 2019.

Table 3: California's Minimum Nurse-To-Patient Staffing Ratios

Type of Care	RN to Patients
Operating Room	1:1
Trauma Patients in the ER	1:1
Intensive/Critical Care	1:2
Neo-natal Intensive Care	1:2
Post-anesthesia Recovery	1:2
Labor and Delivery	1:2
Antepartum	1:4
Postpartum couplets	1:4
Postpartum women only	1:6
Pediatrics	1:4
Emergency Room	1:4
ICU Patients in the ER	1:2
Step Down, Initial	1:4
Step Down, 2008-onward	1:3
Telemetry, Initial	1:5
Telemetry, 2008-onward	1:4
Medical/Surgical, Initial	1:6
Medical/Surgical, 2008-onward	1:5
Other Specialty Care, Initial	1:5
Other Specialty Care, 2008-onward	1:4
Psychiatric	1:6

As provided under Title 22 of the California Code of Regulations, Section 70217(a): The above represents initial ratios as well as ratio modifications that took effect in 2008. Ratios represent the maximum number of patients that can be assigned to an RN during one shift.

Numerous studies have explored the impact of the California nurse-to-patient staffing ratios since they were first implemented in 2004. Results are mixed, with some studies finding higher levels of nurse staffing associated with improved patient outcomes such as lower mortality rates and reduced falls, hospital-acquired infections and pressure ulcers, among other outcomes measures, but other studies showing weaker relationships or no relationship at all, potentially due to differences in methodology.[22] As discussed in the Massachusetts Health Policy Commission report cited below, there is limited data on the cost of implementing the nurse-to-patient staffing ratios, although there is evidence to suggest that the mandated ratios put financial pressure on hospitals .[23] Nurse wages are reported to have increased by as much as twelve percent in the first five years, with other reports showing more modest growth at eight percent, and

[22] Spetz, J., Donaldson, N., Aydin, C., and Brown, D. (2008). *How Many Nurses per Patient? Measurements of Nurse Staffing in Health Services Research.* US National Library of Medicine – National Institutes of Health. www.ncbi.nlm.nih.gov/pmc/articles/PMC2653880.

[23] Auerbach, D. and Spetz, J (2018). *Mandated Nurse-To-Patient Staffing Ratios in Massachusetts (Research Presentation: Analysis of Potential Cost Impact).* Massachusetts Health Policy Commission. www.mass.gov/files/documents/2018/10/16/NSR%20Cost%20Impact%20Analysis_final%202.pdf.

there is some evidence that the implementation of mandated nurse-to-patient staffing ratios was a significant contributor to this wage growth.[24]

Massachusetts

Massachusetts passed a law in 2014 that established nurse-to-patient staffing ratios for registered nurses in hospital intensive care units (ICU). The law stated that, "in all intensive care units the patient assignment for the registered nurse shall be 1:1 or 1:2 depending on the stability of the patient as assessed by the acuity tool and by the staff nurses in the unit, including the nurse manager or the nurse manager's designee when needed to resolve a disagreement".[25] The final regulation stemming from this legislation identifies criteria for acuity tools that are utilized for assessing patient status and making ICU staffing decisions. It also mandates the formation of a hospital advisory committee composed of at least 50 percent ICU nurses, to make recommendations on the development or selection and use of the acuity tool, as well as mandating written policies and procedures for the implementation of the acuity tool.[26] The Massachusetts Department of Public Health (DPH) has the authority to certify acuity tools, and DPH identified guidelines for doing so.[27] While the regulation indicates that no more than two patients can be assigned to an ICU nurse, it does not prohibit fewer patients per ICU nurse.[28]

It was hypothesized that the ICU nurse-to-patient ratio would decrease complications and mortality for critically ill patients, but research shows that mortality and complications such as central line-associated bloodstream infections, catheter-associated urinary tract infections, hospital-acquired pressure ulcers, and patient falls have been stable from pre- and post-ratio change, rather than improved.[29]

Massachusetts unsuccessfully proposed mandated nurse-to-patient staffing ratios through a ballot referendum in November 2018, and the measure was not approved (please see *Table 4: 2018 Massachusetts Nurse Staffing Referendum Ratios* for proposed ratios). Had it passed, the Massachusetts Health Policy Commission estimated that the nurse-to-patient staffing ratios would have cost the health care system between $676 million and $949 million annually.[30] The costs were based in part on

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[24] Mark, B., Harless, D. W., and Spetz, J. (2009). "California's Minimum-Nurse-Staffing Legislation and Nurses' Wages. *Health Affairs.* Vol 28(1). www.healthaffairs.org/doi/full/10.1377/hlthaff.28.2.w326; and Munnich, E.L. (2014) "The labor market effects of California's minimum nurse staffing law." *Health Economics,* Vol 23(8), 935-50. https://doi.org/10.1002/hec.2966.

[25] M.G.L. c. 111, sec. 231.

[26] 985 CMR 8.00-8.13.

[27] Massachusetts Department of Public Health (2016). *16-9-661 UPDATED Guidelines for Certification of Acuity Tools 9/30/2016*. https://www.mass.gov/doc/16-9-661-updated-guidelines-for-certification-of-acuity-tools-9302016.

[28] 985 CMR 8.00-8.13.

[29] Law A. C., Stevens J. P., Hohmann S., Walkey A. J. (2018). Patient Outcomes After the Introduction of Statewide ICU Nurse Staffing Regulations. *Critical Care Medicine*. Vol 46(10), 1563-1569. www.ncbi.nlm.nih.gov/pubmed/30179886.

[30] Auerbach, et. al. (2018).

projections of needing to add between 2,286 and 3,101 full-time RNs to the hospital workforce, and RNs earning between four percent and six percent salary increases due to provider competition for RN staff. [31]

Table 4: 2018 Massachusetts Nurse Staffing Referendum Ratios

RN to Patients	Type of Care
1:1	• caring for a patient under anesthesia • in critical care or intensive care units (two patients in stable condition) • caring for active labor patients, patients with intermittent auscultation for fetal assessment, and patients with medical or obstetrical complications • caring for a patient during birth and up to two hours after birth • caring for a baby during birth and up to two hours after birth
1:2	• caring for post-anesthesia patients • caring for urgent non-stable patients • caring for babies in intermediate care or continuing care units
1:3	• in step-down or intermediate care units • caring for urgent stable patients
1:4	• caring for pediatric patients • in medical, surgical, and telemetry units • in observational and outpatient units • in units not otherwise listed above
1:5	• caring for non-urgent stable patients • caring for psychiatric patients • in rehabilitation units
1:6	• caring for uncomplicated mothers or babies postpartum; • caring for well-baby patients

As proposed in 2018 Referendum, Initiative 17-07.

Other States

Several states have legislation or regulation concerning nurse staffing that do not involve mandated nurse-to-patient staffing ratios. For example, seven states require hospitals to have nurse staffing committees that are responsible for developing and monitoring nurse staffing plans and staffing policies – please refer to the following *Table 5, Comparison of States with Nurse Staffing Committee Requirements*. While similar in intent, the exact language used regarding nurse staffing committees and nurse staffing plans varies between states. For example, the language and parameters identified for acuity models or tools, and how staffing plans need to be documented (e.g. numbers, ratios, levels), varies between states. Each state listed requires nurse staffing committees in hospitals to consist of at least 50 percent direct care nursing staff, but how these nurse representatives are selected varies.

[31] Ibid.

A few states that require nurse staffing committees explicitly mention that nurse staffing committees and nurse staffing plans are not meant to supersede collective bargaining agreements. Some of these states also reflect resource constraints within their rules and regulations concerning nurse staffing plans. For example, Washington State explicitly mentions that "hospital finances and resources must be taken into account in the development of the nurse staffing plan, and that this section is not intended to create unreasonable burdens on critical access hospitals", and further specifies that critical access hospitals "may develop flexible approaches to accomplish the requirements of this section that may include but are not limited to having nurse staffing committees work by telephone or email."[32] Nevada's nurse staffing committees and staffing plan requirements are limited to hospitals located in counties of 100,000 residents or more that have more than 70 beds.[33]

In addition to the nurse staffing committee and staffing plan requirements, Connecticut requires that the state's Department of Public Health maintain a report card system for hospitals that tracks the relationship between nurse staffing and quality of acute care, long-term care and home care, including patient outcomes.[34] Other states also require public reporting of nurse staffing levels however Connecticut's requirement strives to identify a correlation with quality of care.

[32] Revised Code of Washington, Title 70, Chapter 70.41, Section 70.41.420.
[33] Nevada Revised Statute, Section 449.242.
[34] General Statutes of Connecticut, Chapter 368a, Sec. 19a-89d.

Table 5: Comparison of States with Nurse Staffing Committee Requirements

	Connecticut	Illinois	Nevada	Ohio	Oregon	Texas	Washington
Governing Legislation or Regulation	Chapter 368a, Sec. 19a-89e	210 ILCS 85/10.10	NV Rev. Stat. Sec. 449.242	ORC Title 37, Chapter 3727.51-7	ORS 441.154 and OAR-333-510	Title 4, Sub B, Chapter 257	RCW 70.41.420
Implementation Year	2009	2008	2013	2008	2015	2009	2008
Staffing committee (SC) meeting schedule	Not specified	Not specified	Quarterly	Not specified	Quarterly	Quarterly	Semi-annual
SC reporting schedule	Annual	Semi-annual	Annual	Biennial	Annual	Annual	Annual
Require at least 50 percent of SC consist of direct-care nurses	Yes	Yes	Yes	Yes	Yes	Yes – 60 percent	Yes
Require election of SC nurse representatives by direct care peers	No	No	Yes	No	No – collective bargaining unit selects	Yes	Yes***
Mandated implementation of nurse staffing plan (NSP)	Yes	Yes	Yes**	Yes	Yes	Yes	Yes
Mandated reporting of NSP to state entity	Yes – CTDPH	Not explicitly specified	Yes - Legislature	Yes - DOH	Yes – OHA, upon request	Yes - DOH	Yes - DOH
Public posting of written NSP	Not specified*	Yes	Yes	Yes	Yes	Yes	Yes
Require policies and procedures for internal review of NSP and input from direct-care staff	Yes	Implied, but not specified	Yes	Yes	Yes	Yes	Yes
Enforcement of NSP (e.g. inspections, rating, fines, etc.)	Not specified	Not specified	Yes	Not specified	Yes	Not specified	Not specified
Specifies that SC and NSP requirements do not interfere with collective bargaining	Not specified	Yes	Not specified	Yes	Yes	Not specified	Yes

* Public reporting occurs by way of Connecticut's report card system.

** Hospitals located in a county whose population is 100,000 or more and is licensed to have more than 70 beds.

*** Unless a collective bargaining agreement exists, in which case representation is determined by the collective bargaining unit.

Table 5: Comparison of States with Nurse Staffing Committee Requirements (Continued)

	Connecticut	Illinois	Nevada	Ohio	Oregon	Texas	Washington
Require NSP include:							
• **An acuity model or tool factoring in complexity of patient care, level of nursing care required, skill mix, etc.**	Yes (skill mix)	Yes	Yes	Yes	Yes	Yes	Yes
• **Evidence-based standards and guidelines (e.g. from government, accreditation, or professional nursing specialty organizations, etc.)**	Not specified	Not specified	Not specified	Yes – accreditation /government	Yes – professional nursing specialty organization	Yes	Yes
• **Number of RN/LPN/"assistive personnel" and ratio to patients by unit**	Yes	Yes – by licensed nurse class-ification	Yes - number	Yes – "minimum staffing levels"	Yes – number	Yes – "minimum staffing levels"	Yes – by "level of experience and specialty certification or training"
• **Level of administrative staffing in each unit (to ensure direct care staff are not utilized for administrative functions)**	Yes	Not specified	Not specified	Not specified	Yes – "must consider"	Not specified	Yes
• **If using temp/traveling nurses**	Yes	Not specified	Not specified	Not specified	Not specified	Not specified	Not specified
• **A description of any differences between the staffing levels described and actual staffing levels for each unit/how this will be evaluated and differences addressed (e.g. identification of additional RNs, plans to limit or divert patients, etc.)**	Yes	Routine assess-ment and back-up plan when patient needs exceed available staff	Yes	Yes	Yes	Yes	Not specified

A few other states require the development of nurse staffing plans, but without requiring a nurse staffing committee. For example, Minnesota requires a Chief Nursing Officer or designee to develop a "core staffing plan" with stakeholder input, requires the identification and use of a patient acuity tool, and requires that core staffing plans specify the FTE for each patient care unit for each 24-hour period.[35] Unlike other states with a nurse staffing plan requirement, Minnesota requires that plans be submitted to the Minnesota Hospital Association, rather than to Minnesota's Department of Health.[36] Rhode Island also requires a "core-staffing plan" that specifies the number of direct-care RNs, LPNs, CNAs for each patient care unit and each shift, as well as the average number of patients, but does not specify how the plan should be developed.[37]

Eighteen states, including New York, have passed legislation or established regulations prohibiting or significantly limiting employer's ability to require mandatory overtime for nurses.[38] Multiple states are considering legislation related to nurse staffing such as minimum nurse staffing ratios and staffing committees and nurse staffing plans.

New York (through the requirements in PHL section 2805-T) is among four other states that require some form of disclosure and/or public reporting (Illinois, New Jersey, Rhode Island, and Vermont).[39]

With regard to nursing homes, numerous states have either implemented nursing home staffing standards that go beyond the federal standards or have considered such legislation or regulation.[40]

[35] Minnesota Statute, Chapter 144, Section 144.7055.
[36] Ibid.
[37] Rhode Island General Laws, Title 23, Chapter 23-17.17, Section 23-17.17-8.
[38] Wheatley, C. (2017). "Nursing Overtime: Should It Be Regulated?" *Nursing Economics.* Vol. 35(4):213-217. https://www.nursingeconomics.net/necfiles/2017/JA17/213.pdf.
[39] Cordova, P. B.; Pogorzelska-Maziarz, M.; Eckenhoff, M. E.; McHugh, M. D. (2019). "Public Reporting of Nurse Staffing in the United States." *Journal of Nursing Regulation.* Vol. 10(3): 14-20. https://www.journalofnursingregulation.com/article/S2155-8256(19)30143-7/pdf.
[40] Black, K.; Ormond, B. and Tilly, J. (2003). *State-Initiated Nursing Home Nurse Staffing Ratios: Annotated Review of the Literature.* Urban Institute report funded by U.S. Department of Health and Human Services. https://aspe.hhs.gov/basic-report/state-initiated-nursing-home-nurse-staffing-ratios-annotated-review-literature.

B. Literature Review

There is a growing body of literature related to the topic of nurse staffing levels and their impact on patient safety and outcomes, quality of care, nurse and patient satisfaction, and overall cost of care. Research in this area is important because of concerns including 1) poorer outcomes mean increased costs, 2) poorer nurse satisfaction and retention result in higher turnover, leading to increased costs for recruitment and retention, and 3) providers with higher nurse staffing ratios have a lower chance of being penalized for medical errors and adverse patient events than providers with lower staffing levels.

Various studies and proposals seek to address four major topics:

(1) Demonstrating a correlation between staffing levels and patient outcomes, with higher staffing levels associated with improved patient outcomes;

(2) Demonstrating a correlation between staffing levels and patient experience as measured through patient satisfaction, with higher staffing levels associated with improved patient satisfaction;

(3) Demonstrating a correlation between staffing levels and nurse work satisfaction, safety, and retention, with higher staffing levels associated with improved nurse work satisfaction, safety, and retention; and

(4) Justifying costs and making a case for return on investment through reductions in readmissions and errors.

Published research is mixed regarding the correlation between specific nurse staffing ratios and various outcomes. Some studies suggest a correlation between staffing levels and outcome; others found little or no relationship. Cornell conducted an extensive review of published studies as part of its evaluation of the impact of mandated statewide nurse-to-patient ratios.

C. Stakeholder Discussions

The Department held two public forums, one on September 20, 2019, in Albany, New York, and the second on October 22, 2019, in New York, New York. These meetings were webcast and recordings and transcripts are archived on the Department's website (https://www.health.ny.gov/events/webcasts/archive/).

Stakeholders in Support of Minimum Staffing Levels

Stakeholder comments largely focused on mandated nurse-to-patient ratios. Comments in support of minimum staffing levels were consistent with the themes identified in the literature but provided additional insight and personal experience. In particular, labor unions, individual nurses, and patient advocates provided comments

discussing the challenges faced by nurses when hospital units are understaffed, and the negative impact understaffing can have on quality of care and patient outcomes.

Despite the state's prohibition on mandated overtime, labor unions and individuals reported nurses working unplanned overtime and even pre-scheduled overtime due to staffing inadequacies. Working long shifts without breaks was also reported.

Labor unions noted the relationship between understaffing and staff injuries and decreased job satisfaction. CNAs were identified as the most dangerous nursing profession for staff injuries.

Many stakeholders noted that health care transformation efforts have successfully moved many lower acuity patients out of hospital inpatient settings and into community-based outpatient settings, leaving hospitals with higher acuity patients that require a higher intensity of nursing care. They noted, however, that hospital staffing models have not made concomitant changes to support this shift. Higher acuity patients require more nursing time, which becomes a challenge when hospital units are understaffed.

Stakeholders also noted a trend in hospitals and nursing homes of using contract-based, temporary nurse staff, also referred to as agency nurses. Labor unions and individuals noted that agency nurses, particularly in nursing homes, do not build relationships with residents, enabling them to identify subtle changes in health status earlier. Agency staff also tend to not build relationships and communication with permanent nursing staff, which can negatively impact the quality of care, decrease morale among the permanent nursing staff, and cost more in the long run. Stakeholders noted that float nurses, however, play an important role in covering nurse breaks and covering for nurses when they are off the floor assisting with patient transfers and other work-related duties.

Stakeholders in support of minimum nurse-to-patient ratios acknowledged some of the arguments against such a requirement. For example, the cost of increased nurse staffing levels. Labor unions challenged the argument that hospital budgets could not absorb the cost of increased nurse staff and encouraged cost calculations to also factor in anticipated savings due to reductions in re-admissions, errors, and nurse turnover. Stakeholders noted the significant investments in hospitals and hospital systems, particularly following mergers, and challenged why similar investments could not be made in nursing staff infrastructure.

Stakeholders made a case for how mandated nurse-to-patient ratios would also be helpful for leveling the playing field among hospitals and nursing homes. For example, facilities would not be able to use staffing reductions to reduce costs and create a competitive cost advantage compared to other facilities. It would also create efficiencies in collective bargaining agreements and reduce grievance arbitration related to nurse staffing levels. Anticipated reductions in re-admissions, errors and nurse turnover would be expected also bring cost savings across the board. It was suggested by some that in order to make mandated nurse-to-patient ratios impactful, that waivers should not be granted or only be granted on a very limited basis.

Some stakeholders framed arguments in favor of minimum nurse-to-patient ratios in contrast to other alternatives, such as nurse staffing committees and nurse staffing plans, or "grids". For example, making the argument that hospitals develop nurse staffing plans based on their budget, rather than developing nurse staffing plans based on expected patient census, acuity, and best practices and then using the nurse staffing plan to determine budget. Further, it was noted that nurse staffing plans are only useful if enforceable and if reviewed on an annual basis to see how actual nurse staffing compares to initial plans.

Some stakeholders refuted the notion that there are not enough nurses to meet demand, while others acknowledged this as a challenge to implementation that could be addressed through investments in nurse education such as scholarships and loan forgiveness, as well as waiving tuition costs for BSN degrees at SUNY institutions. There were general calls for more competitive wages. Stakeholders also noted other barriers to nurse workforce entry such as child care costs.

Stakeholders Opposed to Minimum Staffing Levels

Stakeholders in opposition to mandated nurse-to-patient ratios voiced concerns related to flexibility and quality of care, unintended consequences of mandated ratios, and costs.

Hospital and nursing home associations voiced that mandated nurse-to-patient ratios create a one-size-fits-all approach that may not meet the needs of patients and residents, noting the dynamic nature of hospitals and the unique needs of nursing homes that necessitate staffing flexibility. It was noted that CMS has rejected mandated staffing ratios in the past because of the lack of flexibility, preferring to require nursing homes to adhere to competency-based staffing standards. Hospital associations noted that Chief Nursing Officers and other nursing leadership at facilities manage nurse schedules and should be responsible for addressing staffing concerns.

Hospital associations argued the case that rigid staffing requirements do not necessarily increase quality, noting studies of the California ratios that have not established a clear relationship between ratios and increased quality. Further, hospital and nursing home associations noted the challenges to creating an evidence-based standard that can be translated to all hospitals and nursing homes and stressed that hospitals and nursing homes currently comply with federal and state regulations related to staffing and quality and are reviewed on a regular basis through the survey process.

Nursing home associations discussed differences between hospitals and nursing homes, noting that while there are multiple acuity tools/models for use in hospitals, there is no generally accepted tool or model for nursing homes. Some nursing homes have been known to offer sign-on bonuses to nurses as an incentive to work in a nursing home rather than a hospital; with increased competition for nurses, some stakeholders wondered what this would do to facility budgets.

Hospital and nursing home associations also discussed unintended consequences of mandated nurse-to-patient ratios. For example, reductions in non-licensed staff (aides/techs in hospitals, administrative staff/unit secretaries, therapists, etc.) that may inadvertently increase nurse workloads with tasks that formerly were delegated. Also, the use of agency nurses, which could potentially have consequences for quality of care since relationships may not be built between agency nurses and permanent staff and patients. It was noted that many California nursing homes have not met the standards in the law and that many California hospitals requested waivers. Stakeholders also noted concerns regarding increased wait times for inpatient admission if there are insufficient nursing staff available to meet mandated requirements.

The argument that there are sufficient nurses to meet the increased demand under mandated nurse-to-patient ratio was challenged.

The cost of implementing mandated nurse-to-patient ratios was weaved throughout testimony. The Healthcare Association of New York State (HANYS) and the Greater New York Hospital Association estimated that an additional $2 billion will be needed to cover the cost of the nurses that will be needed to meet mandated ratios in hospitals. HANYS and LeadingAge New York testified that mandated ratios in nursing homes will require over $1 billion to implement. Several stakeholders argued that facility budgets did not have room for the increased costs of additional nurses, noting the challenges that currently exist to reinvesting in services and capital improvements. Some noted that reimbursement rates are insufficient to cover the costs of providing care and identified a need for additional financial resources if mandated ratios are implemented. The worst scenario would be facility closures.

Alternatives to Minimum Staffing Levels

The Department received several stakeholder comments that suggest ways to increase the supply and support for/retention of nurses without mandating ratios. These include:

- Making greater investments in nurse education such as increasing funding for and expanding scholarships, loan repayment opportunities, and nurse residency programs;
- Providing funding for health care provider nurse recruitment and retention programs, such as paid release time to pursue advanced nursing education;
- Aligning nurse education programs with practice and expanding pre-graduation clinical placements and transition-to-practice programs; and
- Supporting statutory changes to ensure sufficient training opportunities. A federal rule prohibits nursing homes from training CNA students for two years if the facility has been assessed fines above a certain level on its annual survey. Some stakeholders requested NYS support of a federal proposal, the Nursing Home Workforce Quality Act, that would permit nursing homes to reinstate their training programs earlier if they can demonstrate that they have addressed the core issue for which they were fined. This would minimize the adverse impact of the loss of nurse aide training opportunities;
- Promoting the effective use of facility-level staffing enhancements to maximize RN time for more advanced tasks consistent with their license. Suggestions include nursing home

patient support teams comprised of unit clerks, patient care technicians, feeding assistants, and other support staff; float pools and rapid response teams;

- Examine regulatory requirements and make revisions where appropriate to minimize the administrative burden on RNs and allow nurses to practice to the full extent of their licenses.
- Convene a Nursing Home Quality Commission, tasked with setting clear goals for quality across New York nursing homes, creating a framework for public accountability. Further, it was suggested that nursing homes should be required to spend a fixed percentage of their revenue on resident care and that Medicaid nursing home rates be re-examined and increased to support staff increases.

The use of value-based payment as a mechanism to incentivize increased staffing and improved quality was also discussed at a high level, with stakeholders recommending an increase in the share of reimbursement dollars tied to quality outcomes and employing a scoring methodology that includes metrics specific to staff training, consistent assignment, reduced use of agency staff, and decreased turnover.

Stakeholders noted the recent collective bargaining negotiations with New York City hospitals that addressed nurse-to-patient staffing ratios, noting that ratios can be established that meet the needs of nurses, hospitals and patients without a legislative mandate. The use of labor management councils was promoted to set specific staffing requirements and make staffing information available publicly.

Finally, stakeholders discussed the importance of having nurse-led staffing committees that would include over 50 percent direct-care nurse representation and design nurse staffing plans that take into account patient needs and the education and competency of nursing staff. Nurse staffing plans would need to have flexibility to meet changing patient needs and consider interdisciplinary support systems that impact the delivery of nursing care. In addition to developing nurse staffing plans, nurse staffing committees would be responsible for continually evaluating plans and reporting quality and performance metrics.

D. Fiscal/Economic Impact Analysis – Excerpts from the Cornell University Study

For purposes of this study, the Department contracted with the Cornell University Schools of Human Ecology and Industrial and Labor Relations to conduct the following work ("Cornell Study") The goals of the Cornell Study were as follows:

- Assess the economic impacts on the health care sector of one or more mandated staffing ratio proposals, including effects on the wages of the nursing workforce in New York State (RNs, LPNs, CNAs, and orderlies) providing direct care in hospital and nursing home settings; overall economic impacts in the health care sector, and impacts on the costs of health care services. Also, discuss other potential measures beyond staffing changes that could be used to improve quality of care in hospitals and nursing homes.
- Describe the existing nursing workforce in New York State (RNs, LPNs, CNAs, and orderlies) providing direct care in hospital and nursing home settings;

- Describe the pool of nurses and related workers that might be drawn into the workforce in New York State and discuss potential effects of proposed staffing mandates on the overall nursing workforce; and
- Assess potential sources for the future supply of nurses.

To create projections for RN need and costs for hospitals and nursing homes, Cornell used the proposed minimum staffing levels included in the "Safe Staffing for Quality Care Act" introduced in the 2018-19 legislative session. The proposed legislation identifies minimum staffing levels for RNs in hospitals, as well as minimum hours of care per resident per day for RNs, LPNs and CNAs in nursing homes.

The following are excerpts from the Cornell Study entitled *"A Report on Potential Effects of New York State's Proposed Minimum Nurse Staffing Legislation".* The full report may be found in Appendix 3.[41]

> To describe existing nurse staffing, we use data on nurse staffing of hospitals and nursing homes provided to us by the Department of Health. These data, and the process we followed to compute the numbers discussed in this section, are described in Appendix 3. To calculate existing nurse staffing levels, we standardized both patient hours and nursing hours to be in full-time-equivalent units so that we could estimate the expected need and report it in terms of full-time-equivalent (FTE) nursing staff. Throughout our main analysis, we define FTE as three 12-hour shifts per week, with 1.5 hours of break time per shift, and two weeks of vacation time per year. Therefore, each FTE nurse provides 31.5 hours of direct patient care per week for 50 weeks per year and 36 hours of paid work per week for 52 weeks per year. (We provide estimates under an alternative FTE definition of 40-hour weeks with 37.5 hours of direct patient care per week in Appendix Tables 1 and 2.)
>
> *Current Levels and Projected Need in Hospitals*
>
> First, we review the nurse staffing levels in hospitals. In Table 1, we present information on the reporting hospitals in the survey, including the number of nursing staff and patient FTEs. The table contains information for the entire state, as well as for each of 11 regions within the state (refer to Appendix Table 3 for list of counties comprising each region). Across the hospitals in the state there were 71,386 FTE RNs and 1,583 FTE LPNs. There were 245,744 FTE patients.
>
> ***Table 1. Annual Hospital Nurse and Patient FTEs, by Region***

Region	Reporters	Certified beds	RNs	LPNs	Patients
Capital Region	12	2,556	5,333	108	12,077
Central NY	14	2,942	3,941	197	11,017
Finger Lakes	17	3,123	4,960	199	16,394
Long Island	23	7,263	9,454	89	31,378
Mid-Hudson	31	6,332	7,334	109	29,585
Mohawk Valley	7	487	709	116	3,781
New York City	57	23,837	31,828	476	114,658
North Country	7	887	990	20	2,774
Southern Tier	9	1,075	1,152	34	4,073
Tug Hill Seaway	9	675	724	75	2,366
Western NY	26	4,091	4,961	160	17,639

[41] Cornell's source material is cited in their full report, located in Appendix 3

Total	212	53,268	71,386	1,583	245,744

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

The numbers on existing patient FTEs in each service unit can be used with the proposed ratios to calculate the proposed minimum staffing levels. In turn, these minimum staffing levels can be used to project the additional amount of nursing staff, in FTEs, that will be required under the proposed law.

In Table 2, we present our projections of the additional amount of nursing staff that will be required to meet the proposed minimum nurse staffing mandates, summed across each service unit in hospitals in which the minimum is not being met. Across the state, 24,779 FTEs of new nursing staff will be needed in hospitals. Based on the current mix of RNs and LPNs, the vast majority (24,059) of these are registered nurses; 720 are LPNs. Because New York City has the largest population of hospitals, and about half the state's beds and patients, it will require the largest share – about half – of the new nursing staff.

Table 2. Additional Hospital FTE Nursing Staff Needed Under Proposed Minimum Staffing Mandates, by Region

	Additional need		
Region	Total	RNs	LPNs
Capital Region	1,238	1,217	21
Central NY	644	618	27
Finger Lakes	2,052	1,925	126
Long Island	3,014	2,986	28
Mid-Hudson	3,560	3,471	89
Mohawk Valley	320	172	148
New York City	12,011	11,793	218
North Country	114	113	1
Southern Tier	372	356	16
Tug Hill Seaway	112	102	11
Western NY	1,341	1,306	35
Total	24,779	24,059	720

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Needs are calculated for each hospital in each service unit, then summed across service units in each hospital and across hospitals in each region.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

The proposed legislation would impose different minimum levels of staffing across different types of service units in hospitals. In Table 3, we present information on current levels of staffing and projected need for the 33 different service units in the survey of hospitals affected by the minimum staffing mandates. In this analysis, we have assumed that nursing staff cannot be directly shared across units within a hospital. We have also assumed that hospitals will not reallocate staff away from units where staffing is above the minimum mandated levels. These two assumptions may not be true. To the extent that nursing staff is mobile in these two ways, our projected need estimates are over-estimates. We return to a discussion of labor mobility in Section 4, The Impacts of Mandates Staffing Ratios on Healthcare Costs and Outcomes.

Table 3. Annual Hospital Nurse and Patient FTEs and Additional FTE Needs Under Minimum Staffing Mandates, by Service Unit

Service unit	Max patients per nurse	Current staff and patient FTEs		Additional RN/LPN needs
		RN/LPNs	Patients	
Operating Room, Adult	1	3,412	13,771	10,416
Operating Room, Pediatric	1	52	82	45
Critical Care, Adult	2	11,354	15,346	115
Critical Care, Pediatric	2	1,070	1,340	3
Level III/IV, Neo-Natal Critical Care	2	2,520	4,956	122
Emergency Department	3	10,209	41,248	5,704
Level I, Neo-Natal Continuing Care	3	45	63	2
Level II, Neo-Natal Intermediate	3	410	444	0
Medical, Pediatric	3	308	621	1
Medical/Surgical Combined, Pediatric	3	1,213	3,315	80
Mixed Acuity, Adult	3	2,697	8,661	405
Mixed Acuity, Pediatric	3	380	784	10
Neo-Natal Mixed Acuity	3	621	1,164	15
Obstetrics	3	7,627	14,017	168
Step Down and Telemetry, Adult	3	4,757	16,014	913
Step Down and Telemetry, Pediatric	3	46	161	13
Adolescent Psych	4	169	648	28
Adult Psych	4	3,045	17,867	1,605
Behavioral Health/Chemical Psych	4	732	6,352	874
Child Psych	4	51	146	7
Child/Adolescent Psych	4	177	654	27
Geropsych	4	215	1,448	147
Medical, Adult	4	7,639	33,135	1,188
Medical/Surgical Combined, Adult	4	11,290	46,365	1,611
Multiple Unit Types Psych	4	221	0	0
Other Psychiatric	4	144	424	26
Specialty Psych	4	15	77	4
Rehabilitation, Adult	5	1,079	4,819	97
Rehabilitation, Adult Mixed Acuity	5	343	3,017	290
Rehabilitation, Pediatric	5	106	493	0
Rehabilitation, Pediatric Mixed Acuity	5	0	3	1
Skilled Nursing, Adult	5	556	6,549	852
Well Baby Nursery	6	467	1,761	12
Total		72,969	245,744	24,779

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Needs are calculated for each hospital in each service unit, then summed across all hospitals for each service unit.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

The proposed minimum nurse staffing mandates would require the most new nurses in Adult Operating Room Units. This is likely because the proposed minimum staffing ratios are the lowest, at

1 nurse per patient, and those units have a sizeable number of patient FTEs. Significant numbers of new nursing staff will also be needed in Emergency Departments as a result of the proposed minimum nurse staffing levels.

Current Levels and Projected Need in Nursing Homes

Second, we review the staffing levels in nursing homes. Unlike with the proposed make-up of nursing staff in hospitals, the proposed levels for nursing homes specify a minimum level of staffing for certified nurse assistants, so we include NAOAs in our calculations. (For more details on our calculations, see Appendix 3.)

In Table 4, we present information on the reported number of existing nursing staff and the projected need of nursing staff of each type in nursing homes by region of the state. Overall, we project that the state will need 10,181 FTE additional registered nurses, 15,007 FTE additional LPNs, and 19,970 FTE additional NAOAs, for a combined additional 45,158 FTE nursing staff, if the proposed legislation is implemented. Almost half of these new workers will be required for staffing nursing homes in New York City, and the rest at nursing homes across the state.

Table 4. Annual Nursing Home FTE Nursing Staff and Additional Needs, by Region

		Current			Additional Needs		
Region	Facilities	RNs	LPNs	NAOAs	RNs	LPNs	NAOAs
Capital Region	34	335	1,009	2,314	495	434	837
Central NY	45	358	1,192	3,052	739	712	1,087
Finger Lakes	62	456	1,564	3,976	908	816	1,159
Long Island	77	1,370	2,255	6,668	1,192	2,011	2,560
Mid-Hudson	86	958	1,874	5,302	1,187	1,593	2,201
Mohawk Valley	14	122	324	772	182	203	362
New York City	169	3,154	4,744	17,167	3,976	7,529	9,164
North Country	17	123	250	671	141	208	314
Southern Tier	25	158	535	1,380	338	320	488
Tug Hill Seaway	9	82	178	576	120	172	179
Western NY	73	725	1,874	4,567	903	1,010	1,619
Total	611	7,841	15,799	46,446	10,181	15,007	19,970

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. NAOAs=Unlicensed assistive personnel, which correspond in this case to nurse aides, orderlies, and assistants.
Source: Authors' calculations using data from the Nursing Home Cost Report 2017.

Combined Nurse Staffing Projected Need

Summing across hospitals and nursing homes in the state, meeting the proposed minimum staffing standards would require an additional 34,239 FTE RNs, 15,727 FTE LPNs, and 19,970 FTE NAOAs. The combined total of existing FTEs in these groups are 79,226 RNs, 17,382 LPNs, and 74,157 NAOAs. Therefore, the projected additional needed nursing staff are 43, 90, and 27 percent of the RNs, LPNs, and NAOAs, respectively.

Given that the proposed legislation requires minimum nurse staffing ratios that are not currently being met in all New York State hospitals and nursing homes, the introduction of mandated minimum nurse staffing ratios will create gaps in the availability of frontline healthcare workers. The size of these gaps will vary across different occupational groups (RNs, LPNs, NAOAs), types of facilities (hospitals, nursing homes), and geographic regions.

It is worth noting that our analyses are based on the assumption that facilities will adhere strictly to the mandated minimum nurse staffing ratios but will not replace their existing staff in units that met the minimum staffing requirements before the law's introduction. This may or may not be true in practice. On the one hand, although mandated minimum nurse staffing ratios would serve as a minimum standard, labor and management could agree to levels that went beyond those set forth in the proposed legislation. On the other, evidence from mandated minimum nurse staffing legislation in California indicates that the highest-staffed hospitals actually decreased their nurse staffing post-mandate to align more closely with the legislated ratios rather than exceeding them.

4. The Impacts of Mandated Staffing Ratios on Healthcare Outcomes & Costs

The second key question our report addresses is how mandated staffing impacts the quality of care and healthcare costs. In this section, we discuss the connection between mandated ratios and patient outcomes. We then address the effect of staffing ratios on nurse wages; how this translates to costs of health care services for consumers (patients); and potential consequences for facility operating margins and overall financial viability. Additionally, we explore several possible facility cost minimization strategies. We use three sources to speak to these questions: i) our analyses of various data (described in Appendices 3-5), ii) evidence from the effects of nursing-related staffing ratios introduced by California in 2004, and iii) evidence from elsewhere in the literature.

Relationship between Staffing Ratios & Quality of Care

The proposal to implement mandated staffing ratios in New York State is motivated by the overarching goal of advancing patient care while at the same time improving the working conditions of nursing staff. In considering the potential patient care effects of mandated staffing ratios in New York State it is important to distinguish between three categories of evidence regarding staffing ratios.

First, there is a body of literature that provides empirical support for the association between *non-mandated* staffing level increases and improvements to a variety of quality of care outcomes. Thus, for example, in a 2007 meta-analysis of twenty eight studies, Kane and colleagues documented evidence for an association between increased RN staffing levels and lower odds of patient mortality and other negative patient outcomes. Aiken and colleagues documented an

association between increased number of patients per nurse and increased likelihood of mortality of thirty days after admission and increased odds of failure to rescue. These and other studies provide a foundation for the policy argument in support of staffing ratio adjustments as a central mechanism through which to drive improvements to quality of care. Nevertheless, this evidence is based non-mandated staffing ratio differences across healthcare organizations and not on state policies requiring specific staffing levels. It is possible that where ratios are mandated these the effects on patient care outcomes might differ.

A second category of potential evidence relates to states that have experimented with a variety of models through which to limit patient to nurse ratios short of comprehensive mandated staffing ratios. Some 14 states have tackled the issue of staffing ratios using a number of different methods including required disclosures and staffing committees. Unfortunately, given the varied nature of these efforts and the documented enforcement challenges, there is limited evidence on their actual effect on patient care.

The final category of evidence comes from the two states that have mandated staffing rations—California, which implemented comprehensive mandated RN staffing ratios in 2004 and Massachusetts, which implemented a mandate for maximum patient-nurse ratios assisted by a patient acuity tool in intensive care units in 2014. Existing evidence on the Massachusetts mandate does not support actual improvements to actual nurse staffing levels or to patient care outcomes.[i] Empirical evidence regarding California's mandated staffing ratios has been mixed, with mostly limited support for improved patient care outcomes. A 2010 review of the literature on the California mandate concludes that while staffing levels increased in acute care hospitals there is no evidence for significant patient care impact.

Effect on Wages

Before discussing the potential effects of the proposed minimum staffing regulations on the wages of nursing staff in New York State, it is useful to first understand current wage levels. …

RNs working in hospitals in New York State command a relatively high wage, earning $37.07 per hour on average compared to $36.53 and $33.03 for RNs in surrounding states and other states, respectively [as reported by workers in the 2017 5-year American Community Survey (ACS) which covers the years 2013-2017]. The wages of RNs working in skilled nursing facilities and other settings in New York State fall below the wages of comparable RNs in surrounding states but above the wages of RNs in other states. Wages for LPNs across all three industries follow a similar pattern with New York State wages falling between wages in surrounding states and other states. NAOAs in New York State and its surrounding states consistently earn wages higher than NAOAs in other states.

RNs working in hospital settings earn the highest wages across all settings and nursing occupational groups. Among RNs working in hospitals, the variation in wages is significant with Long Island earning $40.71 per hour compared to $31.65 in Mohawk Valley. The wage distribution across the state for LPNs also reveals that those working in Long Island have the highest earnings with those in the Capital District or the Mid-Hudson Valley near the top of the distribution. Similarly, NAOAs in Long Island have the highest wages across all settings.

To estimate the possible total wage costs of the proposed legislation, we need both the information on current wages … and an estimate for how a large increase in the demand for nursing staff will affect wages of nursing staff. One possibility for predicting how wages will

shift with increased staffing levels would be to examine the relationship between current staffing levels and wages. Such an estimate would give information on how, in the current environment, costs increase as staffing levels increase. However, the environment under the proposed legislation would be quite different than the current environment because all hospitals and nursing homes would need to meet these higher staffing levels, not just the ones that now choose to have those levels currently. This large shift in demand will lead to much larger pressure on wages as providers compete for nursing staff. This would make the environment of the proposed legislation so different from anything seen today, that it is not useful to conduct the exercise using existing staffing levels and wages.

Instead, we make use of the closest environment to that of the proposed legislation: the introduction of minimum nurse staffing regulations in California. Although there are some differences in the California regulations and the general setting of the industry in California, it is the only place where demand for nursing staff suddenly and dramatically changed because of state legislation. Therefore, it is useful for projecting possible effects in New York. Estimates of the effects of the minimum staffing level regulations in California on wages range between 0 and 9 percent statewide, and up to 12 percent for nurses in metropolitan areas. However, the California setting was different from this one in ways that likely led the wage effects to be lower than might be seen in New York.[ii] Based on this, we create two projections of increased wage costs. In one, we apply a 5 percent increase in wages, which is chosen as close to, but just slightly higher than the average wage increases in California. In the other, we apply a 15 percent increase in wages, which is chosen as just above the high end of the California estimates. In this way, we provide a range of cost estimates, which is appropriate given that it is hard to precisely predict the complex reaction of the nurse labor market to these changes.

Specifically, in Tables 15 and 16, we present estimates of the possible wage increases in hospitals and nursing homes of the proposed minimum nursing staffing levels regulation in the state of New York. To calculate these estimates, we used our estimates of the existing nurse staffing levels in hospitals and nursing homes using the DOH data. We also use wage average wage information by occupation, industry of employment, and region of the state from the ACS. We estimate two levels of wage costs, a lower-bound using a 5 percent increase in wages and an upper bound using a 15 percent increase in wages. We assume that all workers in either hospitals or nursing home experience the wage increase. Therefore, total costs for a group are the sum of the 5 (or 15) percent increase for current nursing staff and the additional costs for new nursing staff (either 105 or 115 percent of current wages). It is important to note that, although wages for nursing staff in other industries may also rise, we have not taken that into account in our calculations. In that way, our estimates are likely an underestimate of the true wage costs in the health care industry.

Table 15. Projected Wage Costs in Hospitals of Proposed Minimum Staffing Legislation, in Millions of 2019 Dollars

	Wage Increases for Existing Nurses		Wages for New Nurses		Total Additional Wage Costs	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	16.8	50.5	80.5	88.2	97.3	138.7
Central NY	12.1	36.2	39.6	43.3	51.7	79.6
Finger Lakes	15.3	45.8	126.3	138.3	141.5	184.1
Long Island	29.5	88.6	195.9	214.6	225.5	303.2
Mid-Hudson	25.0	74.9	249.8	273.6	274.8	348.5
Mohawk Valley	2.5	7.4	17.1	18.7	19.6	26.1
New York City	95.1	285.3	741.6	812.2	836.7	1,097.6
North Country	3.0	9.0	7.1	7.8	10.1	16.8
Southern Tier	4.4	13.2	28.8	31.5	33.2	44.7
Tug Hill Seaway	2.8	8.4	8.3	9.1	11.1	17.5
Western NY	19.3	58.0	106.5	116.6	125.8	174.6
Total	225.8	677.4	1,601.5	1,754.0	1,827.3	2,431.5

Note: Lower bound wage calculations assume a 5% increase in wages for nursing staff. Upper bound calculations assume a 15% increase in wages for nursing staff. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region are multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.

Source: Authors' calculations using data from the American Community Survey 5-year 2017 and DOH's Hospital Survey for CY 2018.

Table 16. Projected Wage Costs in Nursing Homes of Proposed Minimum Staffing Legislation, in Millions of 2019 Dollars

	Wage Increases for Existing Nurses		Wages for New Nurses		Total Additional Wage Costs	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	6.3	18.8	69.9	76.6	76.2	95.4
Central NY	7.8	23.3	101.3	111.0	109.1	134.3
Finger Lakes	10.0	30.1	123.3	135.1	133.4	165.2
Long Island	16.6	49.7	212.8	233.0	229.3	282.7
Mid-Hudson	14.6	43.7	198.2	217.1	212.8	260.8
Mohawk Valley	1.9	5.6	25.5	27.9	27.3	33.5
New York City	39.2	117.5	766.3	839.3	805.5	956.9
North Country	1.9	5.6	26.7	29.3	28.6	34.9
Southern Tier	4.0	12.0	54.0	59.1	58.0	71.1
Tug Hill Seaway	1.7	5.0	22.9	25.1	24.6	30.1
Western NY	15.7	47.0	178.1	195.1	193.8	242.1
Total	119.5	358.4	1,779.2	1,948.6	1,898.6	2,307.0

Note: Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.
Source: Authors' calculations using data from the American Community Survey 5-year 2017 and the Nursing Home Cost Report 2017.

In hospitals, the estimated total wage costs are between $1.8 and $2.4 billion dollars. Most of the increase in cost is due to the cost of hiring new RNs, since the current staffing of hospitals is more heavily reliant on RNs than it is on LPNs. In nursing homes, the total wage costs are potentially between $1.9 and $2.3 billion. In both hospitals and nursing homes, the majority of new wage costs will come from hiring additional staff. The projected costs from wage increases for existing staff range from $226 to $677 million in hospitals and between $119 and $358 million in nursing homes.

These increased wage costs are large relative to the existing costs of nursing staff in these industries. Current wage costs of nursing staff in hospitals are on the order of $4.5 billion, which is about twice the projected new wage costs. Current wages costs of nursing staff in nursing homes are about $2.4 billion, only $100 million more than the upper bound of projected new wage costs. Therefore, it can be expected that providers will have to respond to these significantly increased operating costs. In what follows, we detail possible responses providers might take to the increased wage costs drawing on relevant research evidence where possible.

Other Potential Costs

There are additional costs of the minimum nurse staffing requirements not included in the above analysis of the added costs of RNs, LPNs, and NAOAs in hospitals and nursing homes. First, as discussed in the previous section, the increased demand for nursing staff in hospitals and nursing homes will drive up demand for nursing staff in ways that increase wages in those industries as well as in other related industries employing nursing staff. Second, there will be costs to providers and to the state of implementing the minimum nurse staffing requirements, as well as of overseeing compliance with the mandate. Third, there will be increased costs due to the recruitment, onboarding and training of new workers, as well as due to any changes in work design, working conditions, and skill development implemented. These last costs may be offset by improvements in employee satisfaction and decreases in employee turnover.

Costs for Patients & Insurance Providers

The increase in costs to providers of nursing staff induced by the proposed minimum nurse staffing ratios may lead hospitals and nursing homes to increase the prices of their services. Since many consumers pay for their health care through health insurance, this could lead to increases in health insurance premiums in order to cover the increase in cost of care. Consumers without health insurance will face higher prices, which could lead to less utilization of hospital and nursing home care. However, if the quality of care improves with the increase in nurse staffing, consumers may be more willing to pay for the health care.

Cost Minimization Strategies & their Implications

Based on the experiences of other states that have mandated staffing ratios, facilities may adopt a variety of strategies to limit the financial costs of compliance. Cost management approaches may include cutting *non-nursing staff* to recoup increased nursing-related costs, *reclassifying staff* or *altering staff responsibilities*, and restricting service provision. We examine the evidence for each of these as well as their potential consequences for delivery of care.

Limiting unlicensed personnel hours: One oft-discussed facility strategy to limit costs in the face of minimum nurse staffing mandates is cutting care provided by staff not covered by mandated requirements. Evidence from California on the prevalence of this practice is mixed and suggests that restriction of non-nursing staff was stratified by facilities' pre-mandate staffing levels. Hospitals with the patient to nurse ratios (PNRs) less than 4 prior to the mandate tended to increase orderly and aide hours (though they likely were not experiencing the same cost increase pressures given that nurse hiring could remain stable or even decrease), while hospitals with the worst ratios (PNR>6) cut orderly and aide hours. Overall, evidence across California suggests that the facilities minimizing unlicensed personnel hours to compensate for higher costs of nurse staffing outweighed the facilities increasing unlicensed personnel hours.

This approach may be problematic for patient care and efficient allocation of nurse supply. Licensed nurses in these settings may be unable to delegate appropriate tasks and may spend more time performing duties below their scope of practice, effectively constituting the substitution of licensed nurses for unlicensed staff.

Reclassification of staff or staff responsibilities: Another frequently raised concern in the conversation around minimum nurse staffing mandate effectiveness is that facilities will reclassify staff to meet the demands of the mandate at the lowest possible labor cost. Substitution of LPNs for RNs constitutes the most commonly-cited approach to this, since the two are grouped together under mandate requirements.

However, evidence from California and Texas suggests that hospitals largely did not use increases in LPN staffing to meet ratio requirements. In fact, increases in RN staffing as a proportion of the total increased staffing suggests that RNs may be substituting for LPNs, rather than the reverse. As in New York State, more severe LPN shortages (compared to RN shortages) and declining LPN graduation rates likely underlie the limited use of this substitution strategy; if New York State is successful in increasing the pool of available LPNs, it is possible that organizations may turn to this approach.

Another possible reclassification strategy is overreliance on cheaper temporary nurses (also known as registry or agency nurses). In California, temporary nurse hours per patient day increased by .5 to 1.5 hours, and 43% of nurses reported their hospitals were using these nurses in lieu of hiring more permanent staff to meet required ratios. The use of these temporary employees raises concerns for continuity of care as well as employee satisfaction and turnover.

Finally, there is some evidence that hospitals may shift responsibilities of current nursing staff to ensure that ratios are met. The California experience highlights that this responsibility reclassification affects two key nursing populations: floating nurses and nurse managers. Although regulations around floating nurses were specified in the mandate, almost a third of California nurses reported increased use of floating staff from other units; the lack of formal documentation of this practice suggests it may be occurring in an informal manner, in which nurses 'pick up slack' in one unit (potentially in the form of non-nursing tasks) while formally assigned to another. Functionally, this allows facilities to evade the mandate's requirements of adequate PNRs while meeting them on paper.

California hospitals also reclassified nurses working in management positions as RNs to meet patient ratios, accounting for 14-21% of the annual growth in RN staffing. It is unclear whether these reclassified nurses' work responsibilities actually changed from administration to direct provision of care. With this strategy, if management duties are not reassigned, then reclassification impedes the mandate's goal of ensuring sufficient staff to meet patient needs. If duties are reassigned, the loss of nurse managers may negatively affect efficiency and quality of care by reducing oversight and supervision.

Service cuts: The final cost-cutting strategy facilities may adopt in light of the minimum nurse staffing mandate is to reduce their provision of care to the detriment of the populations they serve. Facilities with lower pre-mandate staffing may be particularly vulnerable to the cost pressures of the mandate and thus more prone to this approach.

Although the evidence from California is not conclusive, there are suggestions that the minimum nurse staffing mandate may have led to service cuts. Post-staffing mandate, the probability of Emergency Department (ED) closure doubled for hospitals with higher nurse staffing pre-mandate and increased by 3.5 times for hospitals with low nurse staffing pre-mandate. Similarly, hospitals with low nurse staffing pre-mandate were 15% more likely to reduce patient volume for mental health services by at least 70% compared to hospitals with higher staffing.lv In addition to cutting departments and patient volume, hospitals may increase wait times prior to admittance to avoid factoring patients into their ratios.

Consequences for Facility Viability

If the increased wage costs of the proposed legislation cannot be borne by providers by either shifting resources or passing it through to customers, it may threaten provider viability. If profit margins for providers fall too low, it may force some providers to close entirely. For example, research suggests that the California mandate may have negatively impacted operating margins, particularly for hospitals in the middle quartiles of pre-mandate staffing levels, with margins approximately 6-12% lower than comparison states. [i] In turn, there was an increase in hospital closures. Estimates suggest that there were approximately 7 percent fewer hospitals in California relative to other states after the mandate was introduced. Provider closure could have an important impact on community vitality and on access to care, particularly in rural areas with limited hospital and nursing home service.

IV. COVID-19 Update

In the course of the initial release of this report, the unprecedented event of the COVID-19 pandemic occurred. This pandemic is ongoing and has had a major impact on New York State's health system. Below is a brief summary of the current crisis and a discussion on how it would affect nurse staffing ratios.

A. COVID-19 Timeline in New York State 2020

The first reported COVID-19 case occurred in the State of New York occurred on March 1, 2020.[42] By March 5, 2020 statewide cases doubled overnight from 11 to 22[43] and again doubled overnight to 45 cases.[44] On March 10, 2020 New York ordered the nation's first coronavirus containment zone in New Rochelle, Westchester County.[45] The first three COVID-19 deaths were reported on March 15, 2020.[46] On March 20, 2020 New York issued an Executive Order in relation to New York State on PAUSE, which included the closure of all but essential businesses.[47] On March 22, 2020 Executive Order 202.25 was ordered to suspend all elective surgeries in New York State.[48]

On April 12, 2020 COVID-19 Hospitalizations peaked at 18,825[49] and on April14, 2020 New COVID-19 cases in New York peaked at 11,571.[50] On April 16, 2020 the COVID-19 daily death count peaked at 837.[51]

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[42] https://www.governor.ny.gov/news/five-months-first-confirmed-covid-19-case-new-york-governor-uomo-announces-highest-number

[43] https://abcnews.go.com/US/News/timeline-100-days-york-gov-andrew-cuomos-covid/story?id=71292880

[44] https://abcnews.go.com/US/News/timeline-100-days-york-gov-andrew-cuomos-covid/story?id=71292880

[45] https://www.npr.org/sections/health-shots/2020/03/10/814099444/new-york-creates-containment-area-around-cluster-in-new-rochelle

[46] https://www.statista.com/statistics/1109713/new-york-state-covid-cumulative-deaths-us/

[47] https://www.governor.ny.gov/news/governor-cuomo-signs-new-york-state-pause-executive-order

[48] https://www.governor.ny.gov/news/no-20225-continuing-temporary-suspension-and-modification-laws-relating-disaster-emergency

[49] https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/NYForwardReopeningGuide.pdf

[50] https://covid19.cheme.cornell.edu/

[51] https://www.npr.org/sections/health-shots/2020/04/07/825479416/new-yorks-coronavirus-deaths-may-level-off-soon-when-might-your-state-s-peak)

By May, the tide of the crisis was beginning to turn in New York. On May 2, 2020 daily new hospitalizations dropped below 10,000 daily for the first time.[52] On May 13, 2020 elective surgeries and other procedures were allowed to resume in 47 counties.[53]

June and July and August showed further improvement. On June 8, 2020 New York announced the resumption of elective surgery in New York City.[54] On June 25, 2020 COVID-19 hospitalizations dropped below 1,000 for the first time since March 18th.[55] On August 1, 2020 New York performed a record number of tests in a single day: 82,737 with .91 percent of results coming back positive.[56] On August 2, 2020 New York has completed 6 million COVID-19 diagnostic tests. The number of hospitalizations had dropped to 556, the lowest number since March 17th.[57]

B. Snapshots of Direct Care Nurse Staffing Hours During Peak Surge In Hospitals on April 12, 2020 and Nursing Homes on May 7, 2020

For purposes of this report, it is important to look at the impact on RN LPN and CNA staffing during the COVID-19 crisis. The pandemic is ongoing and more data and analysis will be collected over time.

Hospital Data:

During the outbreak, the statewide total number of hospitalized patients with COVID-19 peaked on April 12, 2020 with 18,825 patients (5,156 in the ICU) (Source: Hospital COVID-19 Daily Hospital HERDS Survey). Using the Assembly proposed staffing ratios by staff service category (ICU and medical/surgical), the total nurse FTEs needed at the peak would be 17,986, assuming that a full-time staff worked eight hours on that day. Thus, the total cost would be $8.67 million on the day of the peak (see the table below), after applying the hourly pay rate. It

[52] https://abcnews.go.com/US/News/timeline-100-days-york-gov-andrew-cuomos-covid/story?id=71292880
[53] https://www.governor.ny.gov/news/governor-cuomo-announces-new-york-city-enter-phase-1-reopening-june-8-and-five-regions-enter#:~:text=in%2048%20Counties-,Governor%20Andrew%20M.,Phase%202%20of%20reopening%20today.
[54] https://www.governor.ny.gov/news/governor-cuomo-announces-12-more-counties-are-now-eligible-resume-elective-surgeries

[55]https://www.governor.ny.gov/news/governor-cuomo-announces-hospitalizations-drop-below-1000-first-time-march-18-0

[56] https://thehill.com/homenews/state-watch/504476-new-york-hospitalizations-fall-below-1000-for-the-first-time-since-march

[57] https://www.governor.ny.gov/news/governor-cuomo-announces-new-york-state-has-completed-6-million-diagnostic-covid-19-tests

should be noted that the estimated total cost could be higher because of increased pay rate due to current COVID-19 pandemic situation.

At 50% of the peak, there would be 9,413 total hospitalized patients with COVID-19 (2,578 in the ICU) and 8,993 nurse FTEs would be needed with the total cost of $4.34 million. Similarly, at 25% of the peak, there would be 4,706 total hospitalized patients with COVID-19 (1,289 in the ICU) and 4,496 nurse FTEs would be needed with the total cost of $2.17 million.

Table 6: COVID-19 Hospital Peak

Total Hospitalized COVID-19 Patients		**Proposed Ratio (Patient/ Nurse)[a]**	**Proposed Nurse Staffing Hours Need (Patient days x 24 hours/ Proposed Ratio)**	**Proposed Nurse FTEs (Staffing hours /8 hours)[b]**	**Wage Cost (calculated with hourly pay rate: RN, $39.86; LPN, $22.73) [c]**		**Total Cost (Wage + Fringe)[e]**
					RN (96%)[d]	**LPN (4%)[d]**	
at 100% Peak	**18,825**		**143,886**	**17,986**	**5,506,312**	**130,832**	**8,672,529**
ICU	5,156	2	61,872				
Med/surg	13,669	4	82,014				
at 50% Peak	**9,413**		**71,943**	**8,993**	**2,753,156**	**65,416**	**4,336,264**
ICU	2,578	2	30,936				
Med/surg	6,835	4	41,007				
at 25% Peak	**4,706**		**35,972**	**4,496**	**1,376,578**	**32,708**	**2,168,132**
ICU	1,289	2	15,468				
Med/surg	3,417	4	20,504				

[a]Bill A2954/S1032 of 2019-20

[b] Assume each nurse staff worked 8 hours on that day.

[C] Projected using hospital cost report data 2015-2017: RN, $39.86; LPN, $22.73. They may be modified by a factor of percent increase during the outbreak.

[d] Calculated distribution by staff category (RN, 96%; LPN, 4%) using hospital staffing survey data (March 2019).

[e] Total Cost = Additional Wage Cost/(1-35.7%), added fringe cost which is 35.7% of total cost, based on the data reported by the US Labor Department.

Nursing Home Data:

During the COVID-19 outbreak, the statewide total number of nursing home residents with COVID-19 peaked on May 7, 2020 with 14,817 COVID patients (11,936 confirmed and 2,881 presumed) (Source: Nursing Home COVID-19 Daily Survey). Using the Assembly proposed staffing ratios (staffing hours per patient days) by staff category (RN, LPN, and Nurse Aide), the total nurse FTEs needed at the peak would be 8,983, assuming that a full-time staff worked eight hours on that day. Thus, the total cost would be $2.62 million at the day of peak (see the table below), after applying the hourly pay rate. It should be noted that the estimated total cost could be higher because of increased pay rate due to current COVID-19 pandemic situation.

At 50% of the peak, there would be 7,409 total nursing home patients with COVID-19 and 4,491 nurse FTEs would be needed with the total cost of $1.31 million. Similarly, at 25% of the peak, there would be 3,704 total nursing home patients with COVID-19 and 2,246 nurse FTEs would be needed with the total cost of $0.66 million.

Table 7: COVID-19 Nursing Home Peak

Total COVID-19 Nursing Home Patients		Proposed Ratio (staffing hours/ Patient days) [a]			Proposed Staffing Hours (Patient days x Ratio)			Proposed Nurse FTEs (Total Staffing hours /8 hours) [b]	Wage Cost (calculated with hourly pay rate: RN, $37.05; LPN, $25.08; Nurse aide, $16.90) [c]			Total Cost (Wage+ Fringe
		RN	LPN	Aide	RN	LPN	Aide		RN	LPN	Aide	
At 100% Peak	14,817	.75	1.30	2.80	11,113	19,262	41,448	8,893	$411,762	$483,065	$701,174	$2,620,690
At 50% Peak	7,409	.75	1.30	2.80	5,556	9,631	20,744	4,491	$205,881	$241,532	$350,587	$1,310,345
At 25% Peak	3,704	.75	1.30	2.80	2,778	4,816	10,372	2,246	$102,940	$120,766	$175,293	$665,172

[a] *Bill A2954/S1032 of 2019-20*

[b] Assume each nurse staff worked 8 hours on that day.

[C] Calculated using nursing home Cost report, 2017: RN, $37.05; LPN, $25.08; Nurse Aide, $16.9. They may be modified by a factor of percent increase during the outbreak.

[d] Total Cost = Additional Wage Cost/(1-39.1%), added fringe cost which is 39.1% of total cost, based on 2017 NH cost report data.

C. California's Response to Mandated Staffing Ratios During COVID-19 Pandemic

In addition to reviewing a snapshot of New York's direct nurse staffing during COVID-19's peak surge, it is important to review how similar jurisdictions are dealing with nurse staffing ratios during the pandemic. As outlined on page 13 of this report, California is one of the only states with statutory mandated nurse staffing ratios.

Responding to the crisis, California issued a state of emergency order which in part allows for the waiver of mandated nurse staff ratios.[58] Any acute care hospital or skilled nursing facility who requests such a waiver must apply with the State of California and have an alternative staffing plan in place. Such waivers will only be granted to those facilities affected by a surge of COVID-19 patients.

[58] https://www.cdph.ca.gov/Programs/CHCQ/LCP/Pages/AFL-20-26.aspx#

D. Safety and Protection of New York State's Nurses.

The COVID-19 pandemic has highlighted the crucial need that medical staff, including nurses, must be protected. Crisis staffing plans must be in place to mitigate nurse workforce shortages. Issues such as testing of employees, the use and ability to receive personal protective equipment, and easing the ability of skilled nurses practicing in New York State to enter the workforce need to be examined and implemented.

New York State has taken proactive steps, issuing several Executive Orders to achieve these goals. During the course of the remainder of 2020, and beyond, the Department will review these executive orders reviewing the most effective orders and take steps to make such changes permanent in statute and regulation.

V. Conclusion

Maintaining a nursing workforce that effectively meets the needs of patients requires a comprehensive approach to address today's multifaceted and complex healthcare delivery challenges. While the Department supports measures to improve quality of care and patient outcomes, the COVID-19 pandemic has only highlighted the need to maintain workforce flexibility. The team-based approach to healthcare that fundamentally requires flexible staffing solutions is essential to a sustainable system that can support an effective pandemic response. The Department will continue to work with stakeholders to ensure staffing is adequate to serve patients.

APPENDIX – CORNELL UNIVERSITY STUDY

A Report on Potential Effects of New York State's Proposed Minimum Nurse Staffing Legislation

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1. Introduction

In the 2018-2019 budget cycle, the New York legislature drafted proposed legislation introducing mandated nursing-related staffing ratios for hospitals and nursing homes. Given the potential implications of such mandated staffing ratios for a host of important outcomes, the legislature tasked the Department of Health with the preparation of a report assessing the consequences associated with these proposed rules. In turn, the Department of Health requested that the College of Human Ecology (CHE) and the School of Industrial and Labor Relations (ILR), both at Cornell University, provide additional information on the potential effects of the proposed mandated nursing-related minimum staffing ratios. In this report, we detail our work for the New York State Department of Health along two key dimensions:

- First, we focus on the supply of healthcare professionals given likely increases in demand as a result of mandated minimum staffing ratios. In this section, we describe the existing nursing workforce in New York State (Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and Nursing Assistants and Other Aides (NAOAs)) providing direct care in hospital and nursing home settings. Then we discuss the pool of nurses and related workers that might be drawn into the workforce in New York State and outline potential effects of proposed staffing mandates on the overall nursing workforce. We also explore how policies and organizational changes could improve recruitment and retention as well as ensuring efficient deployment of nursing-related staff.
- Second, we discuss the relationship between staffing changes, quality of care, and healthcare costs. We assess economic impacts on the health care sector of the staffing mandates in the proposed legislation, including effects on the wages of the nursing workforce in New York State; overall economic impacts in the health care sector; and impacts on the costs of health care services.

The Proposed Required Minimum Staffing Ratios

The proposed legislation would introduce required minimum staffing levels for hospitals (acute care facilities; see Appendix 1 for the full text). The ratios are defined in terms of nurses to patients. "Nurses" are defined as RNs and LPNs. The required ratios vary across different service units within the hospitals; the more intensive the care needs in a unit, or for a group of patients in that unit, the more nurses would be required. The proposed ratios would need to be met at all times of the day rather than averaged across the day.

The proposed legislation would also introduce required minimum staffing levels for nursing homes (residential health care facilities, see Appendix 2 for the full text). These ratios are defined on a per resident-day basis, and are specified for RNs, LPNs, and certified nurse aides.

Both areas include specification of minimum staffing levels for RNs and LPNs; the proposal for nursing homes further specifies minimum ratios for certified nurse aides. The minimum ratios in hospitals are defined in terms of patients, while the minimum ratios in nursing homes are defined in terms of hours per patient days. This implies that the minimum ratios in hospitals must be maintained throughout the day, but that in nursing homes, there is the potential for greater levels of scheduling flexibility. We return to this discussion below.

2. Current Staffing in New York State

Before turning to the discussion of how the new minimum nursing-related staffing ratios might affect the supply and demand for nursing staff, we first describe the existing nurse staffing levels absent regulations requiring minimum nurse staffing ratios.

Like the vast majority of states without minimum nurse staffing ratio legislation, staffing in New York is determined in a number of ways. Where occupational groups are unionized, wages and nurse staffing levels of those workers are, for the most part, set forth in the collective bargaining agreement between management and the union. Unionization levels of healthcare professionals vary across the state. Where frontline workers are not unionized, staffing levels and wages are solely determined by management with the need to engage in bi-lateral negotiations. In both unionized and nonunion settings, staffing levels are influenced by market forces in both the labor market for nurses and the market for health care. Concerns over provision of quality care also influence healthcare facilities' decisions to increase or decrease staffing.

To describe existing nurse staffing, we use data on nurse staffing of hospitals and nursing homes provided to us by the Department of Health. These data, and the process we followed to compute the numbers discussed in this section, are described in Appendix 3. To calculate existing nurse staffing levels, we standardized both patient hours and nursing hours to be in full-time-equivalent units so that we could estimate the expected need and report it in terms of full-time-equivalent (FTE) nursing staff. Throughout our main analysis, we define FTE as three 12-hour shifts per week, with 1.5 hours of break time per shift, and two weeks of vacation time per year. Therefore, each FTE nurse provides 31.5 hours of direct patient care per week for 50 weeks per year and 36 hours of paid work per week for 52 weeks per year. (We provide estimates under an alternative FTE definition of 40-hour weeks with 37.5 hours of direct patient care per week in Appendix Tables 1 and 2.)

Current Levels and Projected Need in Hospitals

First, we review the nurse staffing levels in hospitals. In Table 1, we present information on the reporting hospitals in the survey, including the number of nursing staff and patient FTEs. The table contains information for the entire state, as well as for each of 11 regions within the state (refer to Appendix Table 3 for list of counties comprising each region). Across the hospitals in the state there were 71,386 FTE RNs and 1,583 FTE LPNs. There were 245,744 FTE patients.

The numbers on existing patient FTEs in each service unit can be used with the proposed ratios to calculate the proposed minimum staffing levels. In turn, these minimum staffing levels can be used to project the additional amount of nursing staff, in FTEs, that will be required under the proposed law.

In Table 2, we present our projections of the additional amount of nursing staff that will be required to meet the proposed minimum nurse staffing mandates, summed across each service unit in hospitals in which the minimum is not being met. Across the state, 24,779 FTEs of new nursing staff will be needed in hospitals. Based on the current mix of RNs and LPNs, the vast majority (24,059) of these are registered nurses; 720 are LPNs. Because New York City has the largest population of hospitals, and about half the state's beds and patients, it will require the largest share – about half – of the new nursing staff.

The proposed legislation would impose different minimum levels of staffing across different types of service units in hospitals. In Table 3, we present information on current levels of staffing and projected need for the 33 different service units in the survey of hospitals affected by the minimum staffing mandates. In this analysis, we have assumed that nursing staff cannot be directly shared across units within a hospital. We have also assumed that hospitals will not

reallocate staff away from units where staffing is above the minimum mandated levels. These two assumptions may not be true. To the extent that nursing staff is mobile in these two ways, our projected need estimates are over-estimates. We return to a discussion of labor mobility in Section 4, The Impacts of Mandates Staffing Ratios on Healthcare Costs and Outcomes.

The proposed minimum nurse staffing mandates would require the most new nurses in Adult Operating Room Units. This is likely because the proposed minimum staffing ratios are the lowest, at 1 nurse per patient, and those units have a sizeable number of patient FTEs. Significant numbers of new nursing staff will also be needed in Emergency Departments as a result of the proposed minimum nurse staffing levels.

Current Levels and Projected Need in Nursing Homes

Second, we review the staffing levels in nursing homes. Unlike with the proposed make-up of nursing staff in hospitals, the proposed levels for nursing homes specify a minimum level of staffing for certified nurse assistants, so we include NAOAs in our calculations. (For more details on our calculations, see Appendix 3.)

In Table 4, we present information on the reported number of existing nursing staff and the projected need of nursing staff of each type in nursing homes by region of the state. Overall, we project that the state will need 10,181 FTE additional registered nurses, 15,007 FTE additional LPNs, and 19,970 FTE additional NAOAs, for a combined additional 45,158 FTE nursing staff, if the proposed legislation is implemented. Almost half of these new workers will be required for staffing nursing homes in New York City, and the rest at nursing homes across the state.

Combined Nurse Staffing Projected Need

Summing across hospitals and nursing homes in the state, meeting the proposed minimum staffing standards would require an additional 34,239 FTE RNs, 15,727 FTE LPNs, and 19,970 FTE NAOAs. The combined total of existing FTEs in these groups are 79,226 RNs, 17,382 LPNs, and 74,157 NAOAs. Therefore, the projected additional needed nursing staff are 43, 90, and 27 percent of the RNs, LPNs, and NAOAs, respectively.

Given that the proposed legislation requires minimum nurse staffing ratios that are not currently being met in all New York State hospitals and nursing homes, the introduction of mandated minimum nurse staffing ratios will create gaps in the availability of frontline healthcare workers. The size of these gaps will vary across different occupational groups (RNs, LPNs, NAOAs), types of facilities (hospitals, nursing homes), and geographic regions.

It is worth noting that our analyses are based on the assumption that facilities will adhere strictly to the mandated minimum nurse staffing ratios, but will not replace their existing staff in units that met the minimum staffing requirements before the law's introduction. This may or may not be true in practice. On the one hand, although mandated minimum nurse staffing ratios would serve as a minimum standard, labor and management could agree to levels that went beyond those set forth in the proposed legislation. On the other, evidence from mandated minimum nurse staffing legislation in California indicates that the highest-staffed hospitals actually decreased their nurse staffing post-mandate to align more closely with the legislated ratios rather than exceeding them.[iii]

3. Potential Ways to Meet the Mandate-Related Gap

One of the questions central to our report is the extent to which the demand for workers created by the proposed legislation can be met by leveraging the existing supply of frontline professionals. In this section, we provide an overview of a number of potential mechanisms

through which the supply of nurses in New York State hospitals and nursing homes could be increased. The information and suggestions are based on i) our analyses of various data (described in Appendices 3-5) and ii) evidence from elsewhere in the literature.

Drawing on the Pool of Unemployed Nurses

Efforts could be made to match unemployed nurses with available jobs. Table 5 indicates that New York has 2,014 RNs, 1,388 LPNs, and 11,566 NAOAs who are unemployed. Of these, the vast majority are now available or are looking for work (Table 6).

Because these individuals are seeking work, they represent a natural pool of labor to help hospitals and nursing homes meet the minimum nurse staffing requirements. As such, investments in the recruitment of this group of workers is likely to be especially fruitful. To be successful, healthcare organizations and policymakers may need to address a number of recruitment barriers, like spatial mismatch issues. Thus, recruitment of nurses currently not working in healthcare may require more targeted advertising, adjustments to compensation, improvements in working conditions, changes in design and scope of work, or incentives for relocation (see Changes to Work Design, Working Conditions & Skill Development). It is important to note that recruitment barriers are likely to vary across regions and between hospitals and nursing homes. As such, recruitment enhancing strategies will likely need to be tailored to a given region and type of healthcare organization.

Managing Nurse Retirement

Changes to the structure of work, earnings, and pension system incentives could have a sizeable impact on recruiting retired nurses back to work, and on stemming upcoming retirements that may make it even harder for hospitals and nursing homes to meet the mandated nursing-related staffing ratios. Nationally, retirement is the primary reason why nurses leave the workforce.[iv] Approximately 62% of RNs and 59% of LPNs are over 50 across the U.S., and New York state numbers are comparable, with 2/3 of RNs age 50 or over.[v] Recent state and national studies have indicated that this number is increasing, and the population of nurses is aging.[vi]

In New York State, there are approximately 12,800 registered nurses ages 18 to 65 who are not in the labor force. Over 60 percent of these workers, or 8,000 nurses, are ages 55 to 65. In fact, relative to the number of nurses not in the labor force under age 55, there is a marked increase in the number of registered nurses who report not being in the labor force and are 55 years of age or older (Figure 1). There is another jump in the number of nurses not in the labor force at age 63, just after the age at which workers become eligible for early collection of Social Security benefits.

The stark increase in stepping out of the labor force that starts at age 55 is likely driven by the structure of the defined benefit pension systems in which many nurses participate. In general, defined benefit pensions have clear incentive systems built in that encourage workers to continue working until they are eligible for pension benefits and to retire immediately afterwards.[vii] Oftentimes, these pensions have retirement ages between 55 and 65. Research across occupations has shown that these incentives have strong effects on retirement behavior.[viii] Similarly, the increase at age 62 is likely driven by retirement at the time of eligibility for Social Security benefit collection.

Either policymakers or employers could offer incentives aimed at enticing retired nurses back into the profession and at retaining workers who might be considering retirement. This could include *deferred retirement option plans, bonus incentives for continued work, flexible work schedules, reductions in mandatory overtime/shorter shifts, increased part-time work opportunities, less variable scheduling, or redesign of work*.[ix] Of course, not all retired workers

will want to return to work and some nurses will retire as early as possible regardless of incentives, particularly those struggling with physically demanding nursing jobs or poor health.[x] However, incentives can be set up so as to encourage work, and participation can be optional to allow for employee flexibility.

Managing Occupational Turnover

Although retirement is the primary reason nurses leave the workforce, non-retirement occupational turnover should also be addressed. A large body of research suggests that family obligations motivate many younger nurses to leave nursing and that policies facilitating caregiving may enable them to continue working.[xi] Policies geared towards potential retirees—particularly *increased part-time work opportunities, less variable scheduling, reductions in mandatory overtime/shorter shifts,* or *flexible work schedules*—may also incentivize caregivers to remain in the workforce.[xii] More specifically, in a survey of New York RNs from 2003, 96% indicated that *childcare reimbursement* or *on-site daycare* would help address staffing concerns.[xiii]

The potential impact of these policies is illustrated in Tables 7 and 8. In Table 7, we show the substantial number of former workers in New York who are RNs, LPNs, and NAOAs who gave birth in the past 12 months or who have children under age six present in their households. In Table 8, we show the number of workers who retired within the past five years. Indeed, where the need for additional FTEs will be greatest subsequent to legislation—as revealed in Tables 1 and 4 (e.g., New York City, Mid-Hudson, Long Island, and the Finger Lakes)—we observe the largest presence of qualified former nurses.

Transitioning Part-Time Workers to Full-Time

A nontrivial number of nurses are employed part-time. By increasing their hours, these professionals may be able to reduce the gap between the demand for and supply of nurses.

To illustrate the size of the part-time workforce, we report numbers of part-time nursing staff who worked for the full-year last year. These are the people most attached to the labor force, who may be most easily transitioned to full-time full-year work. Additional nurse staffing could be provided by increasing the hours worked of nursing staff who work part-time part of the year. Table 9 breaks down the number of part-time/full-year employees available to potentially take on additional hours by occupational group. Note that each individual represented in this table would only be able to contribute a fraction of the hours of a FTE worker.

In Table 9, we observe that the 12,742 RNs who are part-time/full-year employed in hospitals could contribute additional working hours. 1,879 RNs in skilled nursing facilities work part-time/full-year. 6,208 part-time/full-year RNs are in other industries and may be tapped into as a source to address the needs in hospitals and nursing facilities.

Hospital needs for LPNs can potentially be reduced by increased hours for part-time/full-year LPNs (1,350 part-time/full-year employees are in New York). 1,914 LPNs work part-time/full-year in skilled nursing facilities. Another 3,913 LPNs work part-time for the full-year in other industries.

The number of part-time/full-year NAOA employees in nursing homes is 6,948. Considerably more NAOAs work part-time/full-year in other industries (37,406).

It is unclear how many of these part-time workers can be enticed to work full-time. Previous research suggests that approximately one third of part-time nurses in New York work multiple part-time positions.[xiv] This group would, therefore, likely welcome the opportunity to transition to full-time employment. The remaining two thirds of part-time nurses are influenced by a variety of factors, such as family commitments and obligations.[xv] As with recruitment of

unemployed or retired nurses, shifting these workers from part-time to full-time employment will likely require increases in wages, changes in the design of work, or other incentives (see Changes to Work Design, Working Conditions & Skill Development).

Recruiting & Educating New Nurses

Increasing the inflow of new nursing staff by expanding recruitment and education could alleviate shortages. Table 10 depicts awarded nursing degrees by region. Overall, in 2017, 12,735 RN degrees were awarded in New York state. Another 2,505 LPN degrees were awarded, and 654 Nursing Assistant or Nursing Aide degrees.[xvi] As shown, institutions in New York City award the most RN degrees (3,896), followed by the Capital District (1,960) and Long Island (1,510). Long Island generates the most LPNs—with 474 certificates awarded—while the Southern Tier produces the fewest—with only 71. As shown, the IPEDS data is limited for NAOAs; of the four regions with data available, NAOAs awarded range from 12 NAOAs in the Finger Lakes to 496 NAOAs in New York City. Overall, New York's post-secondary schools produce 12,735 RNs, 2,505 LPNs, and 654 NAOAs.[xvii]

Although these numbers represent a significant pool of new nurses to mitigate the gap between current and mandated staffing, they are not sufficient to wholly resolve it as is. Also, the information in Table 10 underscores disparities across regions in the training of new nurses. Since most nurses in New York State work in the region in which they were educated, this points to the need for targeted development of stronger regional pipelines for nursing staff—most obviously for RNs in Central New York, the Mid-Hudson Valley, and New York City as well as for LPNs in Long Island, the Mid-Hudson Valley, and New York City.[xviii]

Expanding the pool of incoming nurses requires efforts on two fronts: recruitment and educational capacity. As in most other states, the New York State nursing workforce is primarily female and less diverse than the state population; this suggests that recruiting untapped sources of nursing talent—minority populations and men—may represent a valuable opportunity to increase the pool of available nurses but also better align the demographics of nursing staff with the patients they serve.[xix] Recruitment efforts aimed at minority populations may be particularly useful in addressing the staffing gap given that minority nurses are less likely to report intent to leave the profession.[xx] Complementing traditional approaches to recruitment with those explicitly aimed at the increasing proportion of nurses who are second-career could be beneficial as well.[xxi] Finally, greater use of tuition reimbursement programs to attract nurses should have long-term impacts on nurse supply, given that those who receive educational reimbursement have much lower turnover.[xxii]

However, improved recruitment must be paired with expanded educational capacity. Bottlenecks in nursing education limit the population of new nurses, and many programs are rejecting large numbers of qualified applicants.[xxiii] Experimenting with curricular innovations like VR simulation training, MSN/PhD instruction, and non-traditional/accelerated learning pathways; funding options like earmarked nurse licensure funds; and partnerships between and among educational institutions and healthcare organizations may alleviate resource constraints.[xxiv] Educational expansion might also be especially focused on LPN programs given low numbers of LPNs relative to need, declining LPN graduation rates, and historically low investment in LPN training.[xxv]

Tapping into the Pool of Nurses Outside New York State

Many of the registered nurses working in New York State have come from other countries or states, and it may be possible to attract even more nurses into the state's hospitals and nursing homes from other places.

Approximately 5 percent of employed nurses in hospitals and nursing homes moved from a country outside of the U.S. in the year before responding to the survey. The number of foreign nurses working in New York State has declined since the mid-2000s.[xxvi] Recruitment of foreign-trained nurses may be especially crucial to minimizing staffing gaps, as there is evidence to suggest that foreign-trained nurses are less likely to leave the profession than domestic-trained nurses.[xxvii] However, attracting and retaining this workforce may necessitate greater investment in social support from supervisors and peers.[xxviii] Efforts should also be made to attract foreign-trained nurses to hospitals and nursing homes outside New York City, where the vast majority are currently concentrated.[xxix] Doing so will likely require increases in wages, changes in work design, or other incentives (see Changes to Work Design, Working Conditions & Skill Development).

An even larger percentage of employed nurses in New York State—approximately 11 percent—lived in a different state up to one year before responding to the survey. Although about 80% of New York State nurses are educated in state, surrounding states may represent a viable pool of graduating nurses to fill the demand for additional nursing FTEs.[xxx]

Table 11 presents the number of degrees awarded for these states that may contain individuals who desire to relocate. After New York, Pennsylvania produces the most RNs (9,788), while New Jersey (4,357) and Massachusetts (4,576) generate less than half as many graduates seeking employment as RNs. These three states also award the most LPN certificates, with 1,825 in Pennsylvania, 713 in Massachusetts, and 652 in New Jersey. New Jersey has the most NAOAs (434), followed by 223 in Connecticut, and 106 in Pennsylvania.

In addition to newly-graduated nurses, given the right motivation and awareness of need, unemployed nurses now available or looking for work in states bordering New York may consider relocating or commuting. Table 12 shows that Pennsylvania (1,589), Massachusetts (1,051), and New Jersey (745) in particular have RNs in search of jobs. Pennsylvania has the largest number of LPNs (1,635) ready for work, followed by Connecticut (602), and New Jersey (522). In terms of NAOAs, if New York is unable to fill its demand within state, Pennsylvania (4,823), New Jersey (2,736), and Massachusetts (2,328) have the next largest sets of trained nursing assistants and aides who are seeking employment.

Changes to Work Design, Working Conditions & Skill Development

If hospitals and nursing homes are to attract substantial number of nurses from any of the proposed sources discussed above, they will need to address persistent barriers that have created substantial recruitment and retention challenges. There are a number of indicators that organizational structures and practices may play a role in exacerbating difficulties in recruiting and retaining nurses. For example, the relatively large proportion of nurses not currently employed in the profession may suggest organizational improvements could be effective for recruiting employees back into nursing positions.

While there are staffing factors outside the control of healthcare organizations, there is much that hospitals and nursing homes can do to attract and retain a skilled and committed workforce. Put simply, healthcare organizations' staffing challenges are—among other factors—the product of work design, working conditions, and internal mobility pathways. While addressing these factors is, to some extent, within the control of individual healthcare organizations, efforts to improve recruitment and retention in healthcare should be accompanied by a robust policy discussion and interventions.

A number of organizational efforts to address the likely nursing gap should be considered. First, work design and the division of labor across healthcare professionals can likely

yield improvements in nursing hours per patient. For example, New York State RNs report spending up to a third of their time on paperwork and data entry with only about half their time on direct patient care.[xxxi] Changes to work design and coordination across other occupational groups could, therefore, lead to increased time spent by RNs on direct patient care, both efficiently using RNs 'at the top of their license' and improving RN job satisfaction.[xxxii] In order to do so, however, organizations will need to invest in ways to increase and enhance coordination and collaboration.

Second, in addition to the design of work, healthcare organizations should also provide for upskilling opportunities. In New York State, a large proportion (~40%) of RNs report their facility lacks clear promotional pathways and opportunities.[xxxiii] Shortages exacerbated by mandated staffing ratios can be addressed through organizational efforts to allow for internal career ladders from nursing aides to LPNs and from LPNs to RNs. For example, partnerships between healthcare facilities and educational institutions to allow for clear professional pathways could serve as a vehicle to increase availability of skilled and organizationally committed professionals.[xxxiv] The goal would be for upskilling pathways to make the profession more attractive for new entrants. Professional development and continued education can also serve the purpose of retaining existing workers, as some evidence suggests these factors matter more for retention than compensation or workload.[xxxv] For this model to succeed, healthcare organization will need to invest in worker training and development with the goal of enhancing internal capacity to address the aforementioned shortage.

Finally, healthcare organizations are plagued by high levels of worker stress and burnout that are often associated with high rates of attrition from the profession.[xxxvi] In New York State specifically, nurse job satisfaction is lower than the national average, and high stress is one of the top three reasons for leaving the profession.[xxxvii] If hospitals and nursing homes are to attract and retain skilled frontline professionals, they will need to focus on employment practices that promote work-life balance, support workers' wellbeing, and foster a climate that addresses underlying sources of worker stress. This is an essential insight for organizations dealing with efforts to address a shortage driven by the mandated minimum nurse staffing levels given the likely temptation to increase overtime hours and to reduce employment levels for professionals not included in the legislation. To the extent that such efforts will exacerbate the challenge of stress and burnout of nurses and other professionals, such efforts are likely to backfire and to create conditions that make it more difficult to comprehensively address this shortage.

4. The Impacts of Mandated Staffing Ratios on Healthcare Outcomes & Costs

The second key question our report addresses is how mandated staffing impacts the quality of care and healthcare costs. In this section, we discuss the connection between mandated ratios and patient outcomes. We then address the effect of staffing ratios on nurse wages; how this translates to costs of health care services for consumers (patients); and potential consequences for facility operating margins and overall financial viability. Additionally, we explore several possible facility cost minimization strategies. We use three sources to speak to these questions: i) our analyses of various data (described in Appendices 3-5), ii) evidence from the effects of nursing-related staffing ratios introduced by California in 2004, and iii) evidence from elsewhere in the literature.

Relationship between Staffing Ratios & Quality of Care

The proposal to implement mandated staffing ratios in New York State is motivated by the overarching goal of advancing patient care while at the same time improving the working

conditions of nursing staff. In considering the potential patient care effects of mandated staffing ratios in New York State it is important to distinguish between three categories of evidence regarding staffing ratios.

First, there is a body of literature that provides empirical support for the association between *non-mandated* staffing level increases and improvements to a variety of quality of care outcomes. Thus for example, in a 2007 meta-analysis of twenty eight studies, Kane and colleagues documented evidence for an association between increased RN staffing levels and lower odds of patient mortality and other negative patient outcomes.[xxxviii] Aiken and colleagues documented an association between increased number of patients per nurse and increased likelihood of mortality of thirty days after admission and increased odds of failure to rescue[xxxix]. These and other studies provide a foundation for the policy argument in support of staffing ratio adjustments as a central mechanism through which to drive improvements to quality of care. Nevertheless, this evidence is based non-mandated staffing ratio differences across healthcare organizations and not on state policies requiring specific staffing levels. It is possible that where ratios are mandated these the effects on patient care outcomes might differ.

A second category of potential evidence relates to states that have experimented with a variety of models through which to limit patient to nurse ratios short of comprehensive mandated staffing ratios. Some 14 states have tackled the issue of staffing ratios using a number of different methods including required disclosures and staffing committees. Unfortunately, given the varied nature of these efforts and the documented enforcement challenges, there is limited evidence on their actual effect on patient care.

The final category of evidence comes from the two states that have mandated staffing rations—California, which implemented comprehensive mandated RN staffing ratios in 2004 and Massachusetts, which implemented a mandate for maximum patient-nurse ratios assisted by a patient acuity tool in intensive care units in 2014. Existing evidence on the Massachusetts mandate does not support actual improvements to actual nurse staffing levels or to patient care outcomes.[xl] Empirical evidence regarding California's mandated staffing ratios has been mixed, with mostly limited support for improved patient care outcomes.[xli] A 2010 review of the literature on the California mandate concludes that while staffing levels increased in acute care hospitals there is no evidence for significant patient care impact[xlii].

It is important to note that the lack of evidence regarding patient care improvements may be a function of a host of implementation related factors discussed below. The means by which hospitals met required staffing ratios likely varied with adjustments that may have, themselves, affected patient care outcomes. Thus, for example, the extent to which hospitals increased nurse overtime in an effort to meet the required mandate may have had unintended negative effects on nurse burnout and stress, which could have affected care. Similarly, reductions in staffing levels of other healthcare professionals in an effort to reduce increases in labor costs, could have also affected quality of patient care. As such, while evidence regarding California and Massachusetts does not provide strong support for the link between mandates and patient care outcomes, it does highlight the importance of considering a variety of implementation related issues.

Effect on Wages

Before discussing the potential effects of the proposed minimum staffing regulations on the wages of nursing staff in New York State, it is useful to first understand current wage levels.[xliii] Table 13 reports the average wages (in 2019 dollars) for each nursing group by industry and state-level location as reported by workers in the 2017 5-year American Community

Survey (ACS, which covers the years 2013-2017, see Appendix 5 for details). These results include both part-time and full-time workers; separate analysis showed that restricting the sample to full-time only did not change the interpretation of the findings.

RNs working in hospitals in New York State command a relatively high wage, earning $37.07 per hour on average compared to $36.53 and $33.03 for RNs in surrounding states and other states, respectively. The wages of RNs working in skilled nursing facilities and other settings in New York State fall below the wages of comparable RNs in surrounding states but above the wages of RNs in other states. Wages for LPNs across all three industries follow a similar pattern with New York State wages falling between wages in surrounding states and other states. NAOAs in New York State and its surrounding states consistently earn wages higher than NAOAs in other states.

Table 14 examines variation of wages within New York State. RNs working in hospital settings earn the highest wages across all settings and nursing occupational groups. Among RNs working in hospitals, the variation in wages is significant with Long Island earning $40.71 per hour compared to $31.65 in Mohawk Valley. The wage distribution across the state for LPNs also reveals that those working in Long Island have the highest earnings with those in the Capital District or the Mid-Hudson Valley near the top of the distribution. Similarly, NAOAs in Long Island have the highest wages across all settings.

To estimate the possible total wage costs of the proposed legislation, we need both the information on current wages presented in Tables 13 and 14 and an estimate for how a large increase in the demand for nursing staff will affect wages of nursing staff. One possibility for predicting how wages will shift with increased staffing levels would be to examine the relationship between current staffing levels and wages. Such an estimate would give information on how, in the current environment, costs increase as staffing levels increase. However, the environment under the proposed legislation would be quite different than the current environment because all hospitals and nursing homes would need to meet these higher staffing levels, not just the ones that now choose to have those levels currently. This large shift in demand will lead to much larger pressure on wages as providers compete for nursing staff. This would make the environment of the proposed legislation so different from anything seen today, that it is not useful to conduct the exercise using existing staffing levels and wages.

Instead, we make use of the closest environment to that of the proposed legislation: the introduction of minimum nurse staffing regulations in California. Although there are some differences in the California regulations and the general setting of the industry in California, it is the only place where demand for nursing staff suddenly and dramatically changed because of state legislation. Therefore, it is useful for projecting possible effects in New York. Estimates of the effects of the minimum staffing level regulations in California on wages range between 0 and 9 percent statewide, and up to 12 percent for nurses in metropolitan areas.[xliv] However, the California setting was different from this one in ways that likely led the wage effects to be lower than might be seen in New York.[xlv] Based on this, we create two projections of increased wage costs. In one, we apply a 5 percent increase in wages, which is chosen as close to, but just slightly higher than the average wage increase in California. In the other, we apply a 15 percent increase in wages, which is chosen as just above the high end of the California estimates. In this way, we provide a range of cost estimates, which is appropriate given that it is hard to precisely predict the complex reaction of the nurse labor market to these changes.

Specifically, in Tables 15 and 16, we present estimates of the possible wage increases in hospitals and nursing homes of the proposed minimum nursing staffing levels regulation in the

state of New York. To calculate these estimates, we used our estimates of the existing nurse staffing levels in hospitals and nursing homes using the DOH data. (In the main estimates, we again use the definition of FTE using 3 12-hour shifts per week. In Appendix Table 2, we use the alternative definition of FTE as 40 hours per week.) We also use average wage information by occupation, industry of employment, and region of the state from the ACS. We estimate two levels of wage costs, a lower-bound using a 5 percent increase in wages and an upper bound using a 15 percent increase in wages. We assume that all workers subject to the minimum staffing regulation in hospitals and nursing homes experience the wage increase. Therefore, total costs for a group are the sum of the 5 (or 15) percent increase for current nursing staff and the additional costs for new nursing staff (either 105 or 115 percent of current wages). It is important to note that, although wages for nursing staff in other industries may also rise, we have not taken that into account in our calculations. In that way, our estimates are likely an underestimate of the true wage costs in the health care industry.

In hospitals, the estimated total new wage costs are between $1.8 and $2.4 billion dollars. In nursing homes, the total wage costs are similar, potentially between $1.9 and $2.3 billion. In both hospitals and nursing homes, the majority of new wage costs will come from hiring additional staff. The projected costs from wage increases for existing staff range from $226 to $677 million in hospitals and between $119 and $358 million in nursing homes.

These increased wage costs are large relative to the existing costs of nursing staff in these industries. Current wage costs of nursing staff in hospitals are on the order of $4.5 billion, which is about twice the projected new wage costs. Current wages costs of nursing staff in nursing homes are about $2.4 billion, only $100 million more than the upper bound of projected new wage costs. Therefore, it can be expected that providers will have to respond to these significantly increased operating costs. In what follows, we detail possible responses providers might take to the increased wage costs drawing on relevant research evidence where possible.

Other Potential Costs

There are additional costs of the minimum nurse staffing requirements not included in the above analysis of the added costs of RNs, LPNs, and NAOAs in hospitals and nursing homes. First, as discussed in the previous section, the increased demand for nursing staff in hospitals and nursing homes will drive up demand for nursing staff in ways that increase wages in those industries as well as in other related industries employing nursing staff. Second, there will be costs to providers and to the state of implementing the minimum nurse staffing requirements, as well as of overseeing compliance with the mandate. Third, there will be increased costs due to the recruitment, onboarding and training of new workers, as well as due to any changes in work design, working conditions, and skill development implemented. These last costs may be offset by improvements in employee satisfaction and decreases in employee turnover.

Costs for Patients & Insurance Providers

The increase in costs to providers of nursing staff induced by the proposed minimum nurse staffing ratios may lead hospitals and nursing homes to increase the prices of their services. Since many consumers pay for their health care through health insurance, this could lead to increases in health insurance premiums in order to cover the increase in cost of care. Consumers without health insurance will face higher prices, which could lead to less utilization of hospital and nursing home care. However, if the quality of care improves with the increase in nurse staffing, consumers may be more willing to pay for the health care.

Cost Minimization Strategies & their Implications

Based on the experiences of other states that have mandated staffing ratios, facilities may adopt a variety of strategies to limit the financial costs of compliance. Cost management approaches may include *cutting non-nursing staff* to recoup increased nursing-related costs, *reclassifying staff or altering staff responsibilities*, and *restricting service provision*. We examine the evidence for each of these as well as their potential consequences for delivery of care.

Limiting unlicensed personnel hours: One oft-discussed facility strategy to limit costs in the face of minimum nurse staffing mandates is cutting care provided by staff not covered by mandated requirements. Evidence from California on the prevalence of this practice is mixed and suggests that restriction of non-nursing staff was stratified by facilities' pre-mandate staffing levels.[xlvi] Hospitals with the patient to nurse ratios (PNRs) less than 4 prior to the mandate tended to increase orderly and aide hours (though they likely were not experiencing the same cost increase pressures given that nurse hiring could remain stable or even decrease), while hospitals with the worst ratios (PNR>6) cut orderly and aide hours.[xlvii] Overall, evidence across California suggests that the facilities minimizing unlicensed personnel hours to compensate for higher costs of nurse staffing outweighed the facilities increasing unlicensed personnel hours.[xlviii]

This approach may be problematic for patient care and efficient allocation of nurse supply. Licensed nurses in these settings may be unable to delegate appropriate tasks and may spend more time performing duties below their scope of practice, effectively constituting the substitution of licensed nurses for unlicensed staff.[xlix]

Reclassification of staff or staff responsibilities: Another frequently raised concern in the conversation around minimum nurse staffing mandate effectiveness is that facilities will reclassify staff to meet the demands of the mandate at the lowest possible labor cost. Substitution of LPNs for RNs constitutes the most commonly-cited approach to this, since the two are grouped together under mandate requirements.

However, evidence from California and Texas suggests that hospitals largely did not use increases in LPN staffing to meet ratio requirements. In fact, increases in RN staffing as a proportion of the total increased staffing suggests that RNs may be substituting for LPNs, rather than the reverse.[l] As in New York State, more severe LPN shortages (compared to RN shortages) and declining LPN graduation rates likely underlie the limited use of this substitution strategy; if New York State is successful in increasing the pool of available LPNs, it is possible that organizations may turn to this approach.[li]

Another possible reclassification strategy is overreliance on cheaper temporary nurses (also known as registry or agency nurses). In California, temporary nurse hours per patient day increased by .5 to 1.5 hours, and 43% of nurses reported their hospitals were using these nurses in lieu of hiring more permanent staff to meet required ratios.[lii] The use of these temporary employees raises concerns for continuity of care as well as employee satisfaction and turnover.[liii]

Finally, there is some evidence that hospitals may shift responsibilities of current nursing staff to ensure that ratios are met. The California experience highlights that this responsibility reclassification affects two key nursing populations: floating nurses and nurse managers. Although regulations around floating nurses were specified in the mandate, almost a third of California nurses reported increased use of floating staff from other units; the lack of formal documentation of this practice suggests it may be occurring in an informal manner, in which nurses 'pick up slack' in one unit (potentially in the form of non-nursing tasks) while formally

assigned to another.[liv] Functionally, this allows facilities to evade the mandate's requirements of adequate PNRs while meeting them on paper.

California hospitals also reclassified nurses working in management positions as RNs to meet patient ratios, accounting for 14-21% of the annual growth in RN staffing. It is unclear whether these reclassified nurses' work responsibilities actually changed from administration to direct provision of care.[lv] With this strategy, if management duties are not reassigned, then reclassification impedes the mandate's goal of ensuring sufficient staff to meet patient needs. If duties are reassigned, the loss of nurse managers may negatively affect efficiency and quality of care by reducing oversight and supervision.

Service cuts: The final cost-cutting strategy facilities may adopt in light of the minimum nurse staffing mandate is to reduce their provision of care to the detriment of the populations they serve. Facilities with lower pre-mandate staffing may be particularly vulnerable to the cost pressures of the mandate and thus more prone to this approach.

Although the evidence from California is not conclusive, there are suggestions that the minimum nurse staffing mandate may have led to service cuts.[lvi] Post-staffing mandate, the probability of Emergency Department (ED) closure doubled for hospitals with higher nurse staffing pre-mandate and increased by 3.5 times for hospitals with low nurse staffing pre-mandate.[lvii] Similarly, hospitals with low nurse staffing pre-mandate were 15% more likely to reduce patient volume for mental health services by at least 70% compared to hospitals with higher staffing.[lviii] In addition to cutting departments and patient volume, hospitals may increase wait times prior to admittance to avoid factoring patients into their ratios.[lix]

Consequences for Facility Viability

If the increased wage costs of the proposed legislation cannot be borne by providers by either shifting resources or passing it through to customers, it may threaten provider viability. If profit margins for providers fall too low, it may force some providers to close entirely. For example, research suggests that the California mandate may have negatively impacted operating margins, particularly for hospitals in the middle quartiles of pre-mandate staffing levels, with margins approximately 6-12% lower than comparison states.[lx] In turn, there was an increase in hospital closures. Estimates suggest that there were approximately 7 percent fewer hospitals in California relative to other states after the mandate was introduced.[lxi] Provider closure could have an important impact on community vitality and on access to care, particularly in rural areas with limited hospital and nursing home service.

5. Conclusion

In this report, we have summarized the minimum nurse staffing levels proposed by legislators in the state of New York in 2019. We have detailed information on the existing staffing levels and estimated the effects of the proposed minimum nurse staffing regulation on the need for nursing staff and the increased wages costs. We have used data on the workforce and training of nurses to highlight potential areas for recruitment of nursing staff. We have also detailed potential benefits to patients, providers and nursing staff, as well as the potential ways that providers may shift prices and costs in order to meet the proposed minimum nurse staffing levels.

Tables & Figures

Table 1. Annual Hospital Nurse and Patient FTEs, by Region

Region	Reporters	Certified beds	RNs	LPNs	Patients
Capital Region	12	2,556	5,333	108	12,077
Central NY	14	2,942	3,941	197	11,017
Finger Lakes	17	3,123	4,960	199	16,394
Long Island	23	7,263	9,454	89	31,378
Mid-Hudson	31	6,332	7,334	109	29,585
Mohawk Valley	7	487	709	116	3,781
New York City	57	23,837	31,828	476	114,658
North Country	7	887	990	20	2,774
Southern Tier	9	1,075	1,152	34	4,073
Tug Hill Seaway	9	675	724	75	2,366
Western NY	26	4,091	4,961	160	17,639
Total	212	53,268	71,386	1,583	245,744

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

Table 2. Additional Hospital FTE Nursing Staff Needed Under Minimum Staffing Mandates, by Region

	Additional need		
Region	Total	RNs	LPNs
Capital Region	1,238	1,217	21
Central NY	644	618	27
Finger Lakes	2,052	1,925	126
Long Island	3,014	2,986	28
Mid-Hudson	3,560	3,471	89
Mohawk Valley	320	172	148
New York City	12,011	11,793	218
North Country	114	113	1
Southern Tier	372	356	16
Tug Hill Seaway	112	102	11
Western NY	1,341	1,306	35
Total	24,779	24,059	720

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Needs are calculated for each hospital in each service unit, then summed across service units in each hospital and across hospitals in each region.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

Table 3. Annual Hospital Nurse and Patient FTEs and Additional FTE Needs Under Minimum Staffing Mandates, by Service Unit

Service unit	Max patients per nurse	Current staff and patient FTEs		Additional RN/LPN needs
		RN/LPNs	Patients	
Operating Room, Adult	1	3,412	13,771	10,416
Operating Room, Pediatric	1	52	82	45
Critical Care, Adult	2	11,354	15,346	115
Critical Care, Pediatric	2	1,070	1,340	3
Level III/IV, Neo-Natal Critical Care	2	2,520	4,956	122
Emergency Department	3	10,209	41,248	5,704
Level I, Neo-Natal Continuing Care	3	45	63	2
Level II, Neo-Natal Intermediate	3	410	444	0
Medical, Pediatric	3	308	621	1
Medical/Surgical Combined, Pediatric	3	1,213	3,315	80
Mixed Acuity, Adult	3	2,697	8,661	405
Mixed Acuity, Pediatric	3	380	784	10
Neo-Natal Mixed Acuity	3	621	1,164	15
Obstetrics	3	7,627	14,017	168
Step Down and Telemetry, Adult	3	4,757	16,014	913
Step Down and Telemetry, Pediatric	3	46	161	13
Adolescent Psych	4	169	648	28
Adult Psych	4	3,045	17,867	1,605
Behavioral Health/Chemical Psych	4	732	6,352	874
Child Psych	4	51	146	7
Child/Adolescent Psych	4	177	654	27
Geropsych	4	215	1,448	147
Medical, Adult	4	7,639	33,135	1,188
Medical/Surgical Combined, Adult	4	11,290	46,365	1,611
Multiple Unit Types Psych	4	221	0	0
Other Psychiatric	4	144	424	26
Specialty Psych	4	15	77	4
Rehabilitation, Adult	5	1,079	4,819	97
Rehabilitation, Adult Mixed Acuity	5	343	3,017	290
Rehabilitation, Pediatric	5	106	493	0
Rehabilitation, Pediatric Mixed Acuity	5	0	3	1
Skilled Nursing, Adult	5	556	6,549	852
Well Baby Nursery	6	467	1,761	12
Total		72,969	245,744	24,779

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Needs are calculated for each hospital in each service unit, then summed across all hospitals for each service unit.
Source: Authors' calculations using data from DOH's Hospital Survey for CY 2018.

Table 4. Annual Nursing Home FTE Nursing Staff and Additional Needs, by Region

		Current			Additional Needs		
Region	Facilities	RNs	LPNs	NAOAs	RNs	LPNs	NAOAs
Capital Region	34	335	1,009	2,314	495	434	837
Central NY	45	358	1,192	3,052	739	712	1,087
Finger Lakes	62	456	1,564	3,976	908	816	1,159
Long Island	77	1,370	2,255	6,668	1,192	2,011	2,560
Mid-Hudson	86	958	1,874	5,302	1,187	1,593	2,201
Mohawk Valley	14	122	324	772	182	203	362
New York City	169	3,154	4,744	17,167	3,976	7,529	9,164
North Country	17	123	250	671	141	208	314
Southern Tier	25	158	535	1,380	338	320	488
Tug Hill Seaway	9	82	178	576	120	172	179
Western NY	73	725	1,874	4,567	903	1,010	1,619
Total	611	7,841	15,799	46,446	10,181	15,007	19,970

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. NAOAs=Unlicensed assistive personnel, which correspond in this case to nurse aides, orderlies, and assistants.
Source: Authors' calculations using data from the Nursing Home Cost Report 2017.

Table 5: Unemployed Nurses, by Region

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total
Capital District	83	39	31	153	25	71	46	142	109	357	146	612
	(47)	(33)	(25)	(54)	(22)	(45)	(24)	(53)	(52)	(136)	(89)	(172)
Central New York	14	-	18	32	-	34	83	117	33	62	114	209
	(15)	-	(18)	(23)	-	(20)	(45)	(50)	(17)	(43)	(46)	(63)
Finger Lakes	29	33	104	166	2	33	61	96	41	147	480	668
	(29)	(29)	(48)	(60)	(2)	(32)	(30)	(45)	(24)	(67)	(131)	(150)
Long Island	140	16	193	349	19	-	40	59	77	191	537	805
	(56)	(16)	(54)	(69)	(19)	-	(29)	(35)	(34)	(118)	(152)	(200)
Mid-Hudson Valley	201	-	121	322	41	27	136	204	26	67	602	695
	(81)	-	(52)	(106)	(31)	(29)	(63)	(74)	(27)	(38)	(161)	(173)
Mohawk Valley	10	-	-	10	33	23	29	85	16	95	52	163
	(7)	-	-	(7)	(23)	(18)	(29)	(41)	(13)	(51)	(26)	(59)
New York City	287	72	369	728	209	17	343	569	243	766	6,378	7,387
	(84)	(38)	(91)	(122)	(79)	(12)	(88)	(111)	(72)	(172)	(492)	(533)
North Country	-	-	-	-	-	9	20	29	-	21	90	111
	-	-	-	-	-	(11)	(21)	(18)	-	(20)	(60)	(64)
Southern Tier	18	29	73	120	3	17	-	20	77	118	251	446
	(15)	(23)	(43)	(51)	(4)	(12)	-	(13)	(65)	(51)	(140)	(160)
Tug Hill	-	-	24	24	-	-	11	11	19	34	-	53
	-	-	(18)	(18)	-	-	(12)	(12)	(17)	(24)	-	(29)
Western New York	53	-	57	110	15	10	31	56	49	164	204	417
	(29)	-	(31)	(43)	(15)	(9)	(21)	(25)	(35)	(62)	(81)	(111)
Total -- New York	835	189	990	2,014	347	241	800	1,388	690	2,022	8,854	11,566
	(150)	(60)	(160)	(195)	(95)	(76)	(137)	(189)	(149)	(294)	(610)	(729)

Note: Standard errors in parentheses.
Source: American Community Survey 5-year 2017.

Table 6: Unemployed Nurses Now Available or Looking for Work, by Region

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**
Capital District	83	39	31	153	25	71	41	137	99	357	102	558
	(47)	(33)	(25)	(54)	(22)	(45)	(23)	(53)	(51)	(136)	(61)	(155)
Central New York	14	-	18	32	-	34	83	117	33	62	105	200
	(15)	-	(18)	(23)	-	(20)	(45)	(50)	(17)	(43)	(45)	(62)
Finger Lakes	29	33	94	156	2	33	30	65	41	147	436	624
	(29)	(29)	(47)	(59)	(2)	(32)	(20)	(38)	(24)	(67)	(128)	(146)
Long Island	98	16	123	237	19	-	40	59	56	191	537	784
	(43)	(16)	(33)	(55)	(19)	-	(29)	(35)	(27)	(118)	(152)	(201)
Mid-Hudson Valley	201	-	108	309	41	27	98	166	26	37	508	571
	(81)	-	(50)	(102)	(31)	(29)	(55)	(69)	(27)	(21)	(139)	(145)
Mohawk Valley	10	-	-	10	13	23	-	36	16	95	52	163
	(7)	-	-	(7)	(13)	(18)	-	(22)	(13)	(51)	(26)	(59)
New York City	215	72	341	628	209	17	303	529	175	676	5,737	6,588
	(75)	(38)	(91)	(123)	(79)	(12)	(82)	(112)	(61)	(165)	(449)	(478)
North Country	-	-	-	-	-	9	20	29	-	21	87	108
	-	-	-	-	-	(11)	(21)	(18)	-	(20)	(60)	(64)
Southern Tier	18	7	70	95	3	17	20	77	71	230	378	-
	(15)	(7)	(43)	(46)	(4)	(12)	(13)	(65)	(30)	(140)	(154)	-
Tug Hill	-	-	24	24	-	-	11	11	3	34	-	37
	-	-	(18)	(18)	-	-	(12)	(12)	(3)	(24)	-	(24)
Western New York	53	-	32	85	15	10	31	56	36	164	204	404
	(29)	-	(19)	(35)	(15)	(9)	(21)	(25)	(33)	(62)	(81)	(110)
Total -- New York	721	167	841	1,729	327	241	657	1,225	562	1,855	7,998	10,415
	(129)	(61)	(146)	(181)	(92)	(76)	(124)	(184)	(136)	(302)	(575)	(700)

Note: Standard errors in parentheses. Source: American Community Survey 5-year 2017.

Table 7: Nurses out of the Labor Force who are Caregivers of Children under Age 6, by Region

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total
Capital District	38	-	-	38	-	-	-	-	28	35	136	199
	(39)	-	-	(39)	-	-	-	-	(25)	(23)	(68)	(73)
Central New York	49	-	16	65	-	-	95	95	-	14	61	75
	(40)	-	(16)	(41)	-	-	(74)	(74)	-	(14)	(48)	(50)
Finger Lakes	156	-	34	190	5	-	11	16	61	64	131	256
	(78)	-	(22)	(79)	(6)	-	(8)	(11)	(47)	(39)	(49)	(78)
Long Island	78	-	62	140	-	-	16	16	31	177	80	288
	(35)	-	(35)	(52)	-	-	(17)	(17)	(21)	(100)	(49)	(113)
Mid-Hudson Valley	38	11	116	165	11	12	-	23	25	39	94	158
	(29)	(12)	(52)	(61)	(11)	(12)	-	(15)	(25)	(28)	(44)	(58)
Mohawk Valley	13		19	32	5	56	-	61	20	92	99	211
	(14)		(13)	(19)	(5)	(41)	-	(42)	(20)	(54)	(54)	(77)
New York City	119	35	237	391	23	-	86	109	165	176	1,820	2,161
	(56)	(29)	(122)	(136)	(23)	-	(51)	(56)	(65)	(67)	(270)	(291)
North Country	-	-	31	31	-	-	4	4	-	4	27	31
	-	-	(31)	(31)	-	-	(5)	(5)	-	(4)	(25)	(25)
Southern Tier	15	-	8	23	-	18	12	30	7	106	26	139
	(16)	-	(8)	(18)	-	(19)	(12)	(23)	(8)	(45)	(23)	(51)
Tug Hill	49	-	-	49	-	-	14	14	8	21	102	131
	(40)	-	-	(40)	-	-	(11)	(11)	(8)	(17)	(52)	(55)
Western New York	24	-	86	110	-	18	53	71	-	147	41	188
	(25)	-	(46)	(51)	-	(15)	(40)	(42)	-	(99)	(29)	(102)
Total -- New York	579	46	609	1,234	44	104	291	439	345	875	2,617	3,837
	(119)	(31)	(148)	(193)	(27)	(49)	(103)	(112)	(93)	(169)	(304)	(389)

Note: Standard errors in parentheses. Source: American Community Survey 5-year 2017.

Table 8: Nurses out of the Labor Force who are Retired within the Last Five Years, by Region

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total	Hospitals	Skilled Nursing Facilities	Other	Total
Capital District	514	147	516	1,177	136	108	179	423	133	217	203	553
	(114)	(51)	(105)	(166)	(59)	(38)	(72)	(104)	(62)	(66)	(60)	(109)
Central New York	467	50	394	911	180	135	71	386	68	222	110	400
	(85)	(29)	(79)	(109)	(59)	(62)	(30)	(83)	(42)	(80)	(49)	(103)
Finger Lakes	553	196	433	1,182	131	125	240	496	108	103	453	664
	(109)	(67)	(77)	(151)	(44)	(50)	(69)	(97)	(52)	(37)	(93)	(114)
Long Island	1,493	163	850	2,506	98	144	140	382	409	367	201	977
	(200)	(53)	(150)	(247)	(40)	(59)	(54)	(82)	(126)	(146)	(62)	(212)
Mid-Hudson Valley	1,388	200	730	2,318	104	159	205	468	342	274	613	1,229
	(154)	(59)	(102)	(190)	(44)	(70)	(58)	(99)	(93)	(75)	(136)	(191)
Mohawk Valley	158	104	120	382	68	20	180	268	90	102	144	336
	(39)	(54)	(41)	(72)	(30)	(12)	(62)	(71)	(36)	(52)	(45)	(84)
New York City	2,482	550	1,144	4,176	389	289	423	1,101	1,149	1,171	6,869	9,189
	(247)	(131)	(178)	(327)	(85)	(81)	(108)	(150)	(191)	(171)	(441)	(519)
North Country	45	5	162	212	52	-	31	83	31	6	74	111
	(23)	(6)	(66)	(68)	(32)	-	(28)	(43)	(23)	(6)	(31)	(38)
Southern Tier	224	108	302	634	78	71	38	187	116	51	135	302
	(46)	(41)	(79)	(96)	(36)	(31)	(18)	(48)	(49)	(23)	(43)	(65)
Tug Hill	131	21	71	223	60	4	36	100	44	2	105	151
	(44)	(12)	(33)	(57)	(25)	(4)	(27)	(41)	(25)	(2)	(44)	(50)
Western New York	541	88	628	1,257	267	110	185	562	324	264	522	1,110
	(97)	(36)	(113)	(168)	(80)	(30)	(57)	(103)	(89)	(84)	(92)	(141)
Total -- New York	7,996	1,632	5,350	14,978	1,563	1,165	1,728	4,456	2,814	2,779	9,429	15,022
	(423)	(177)	(351)	(576)	(190)	(160)	(204)	(280)	(263)	(253)	(445)	(533)

Note: Standard errors in parentheses. Source: American Community Survey 5-year 2017.

Table 9: Currently Employed Part-Time/Full-Year Nurses

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**
Capital District	860	140	592	1,592	194	125	220	539	592	561	919	2,072
	(143)	(60)	(126)	(202)	(89)	(50)	(74)	(127)	(136)	(125)	(181)	(268)
Central New York	768	44	159	971	106	150	254	510	143	253	575	971
	(132)	(21)	(59)	(152)	(42)	(57)	(64)	(98)	(48)	(95)	(109)	(152)
Finger Lakes	749	255	582	1,586	178	272	248	698	546	442	887	1,875
	(105)	(78)	(116)	(173)	(61)	(87)	(62)	(119)	(153)	(97)	(168)	(234)
Long Island	2,883	291	1,397	4,571	215	253	842	1,310	510	628	2,229	3,367
	(272)	(113)	(187)	(351)	(72)	(108)	(150)	(183)	(127)	(163)	(306)	(382)
Mid-Hudson Valley	2,115	137	931	3,183	64	174	355	593	371	727	2,032	3,130
	(243)	(57)	(147)	(308)	(39)	(83)	(100)	(133)	(109)	(187)	(253)	(340)
Mohawk Valley	337	29	132	498	34	107	208	349	13	447	449	909
	(65)	(15)	(46)	(77)	(21)	(40)	(73)	(89)	(13)	(124)	(97)	(144)
New York City	3,096	580	1,411	5,087	351	450	1,147	1,948	1,988	2,542	28,623	33,153
	(337)	(152)	(209)	(415)	(92)	(143)	(175)	(230)	(247)	(289)	(1,025)	(1,023)
North Country	137	10	53	200	8	10	62	80	29	118	102	249
	(54)	(11)	(29)	(64)	(8)	(10)	(37)	(41)	(24)	(65)	(36)	(80)
Southern Tier	512	82	92	686	3	81	146	230	144	353	435	932
	(106)	(33)	(32)	(115)	(3)	(33)	(53)	(68)	(55)	(92)	(93)	(125)
Tug Hill	138	8	26	172	53	27	22	102	109	100	204	413
	(65)	(8)	(14)	(69)	(38)	(17)	(12)	(42)	(44)	(40)	(79)	(107)
Western New York	1,147	303	833	2,283	144	265	409	818	441	777	951	2,169
	(165)	(117)	(130)	(242)	(51)	(70)	(108)	(126)	(106)	(167)	(178)	(259)
Total -- New York	12,742	1,879	6,208	20,829	1,350	1,914	3,913	7,177	4,886	6,948	37,406	49,240
	(634)	(270)	(386)	(802)	(169)	(231)	(315)	(379)	(382)	(513)	(1,125)	(1,231)

Note: Standard errors in parentheses. Source: American Community Survey 5-year 2017.

Table 10: Awarded Degrees and Certificates by Instructional Program, by Region

	Registered Nurses	Licensed Practical Nurses	Nursing Assistants and Other Aides
Capital District	1,960	255	-
Central New York	603	186	47
Finger Lakes	1,239	270	12
Long Island	1,510	474	99
Mid-Hudson Valley	863	325	-
Mohawk Valley	519	142	-
New York City	3,896	208	496
North Country	199	106	-
Southern Tier	688	71	-
Tug Hill	128	101	-
Western New York	1,130	367	-
Total -- New York	**12,735**	**2,505**	**654**

Table 11: Awarded Degrees and Certificates by Instructional Program (States Bordering New York)

	Registered Nurses	Licensed Practical Nurses	Nursing Assistants and Other Aides
Connecticut	2,326	405	223
Massachusetts	4,576	713	50
New Jersey	4,357	652	434
New York	12,735	2,505	654
Pennsylvania	9,788	1,825	106
Vermont	457	135	-
5-State Total	**21,504**	**3,730**	**813**
6-State Total	**34,239**	**6,235**	**1,467**

Note: The 5-state total includes Connecticut, Massachusetts, New Jersey, Pennsylvania, and Vermont. The 6-state total additionally includes New York.

Table 12: Unemployed Nurses Now Available or Looking for Work (States Bordering New York)

	Registered Nurses				Licensed Practical Nurses				Nursing Assistants and Other Aides			
	Hospitals	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**	**Hospitals**	**Skilled Nursing Facilities**	**Other**	**Total**
Connecticut	116	37	199	352	27	312	263	602	186	289	1,171	1,646
	(53)	(27)	(67)	(85)	(19)	(123)	(123)	(182)	(67)	(83)	(233)	(247)
Massachusetts	334	115	602	1,051	73	87	198	358	413	569	1,346	2,328
	(84)	(47)	(119)	(152)	(35)	(58)	(71)	(102)	(140)	(160)	(189)	(300)
New Jersey	342	84	319	745	121	115	286	522	273	703	1,760	2,736
	(87)	(42)	(81)	(127)	(66)	(50)	(81)	(102)	(79)	(150)	(242)	(280)
New York	721	167	841	1,729	327	241	657	1,225	562	1,855	7,998	10,415
	(129)	(61)	(146)	(181)	(92)	(76)	(124)	(184)	(136)	(302)	(575)	(700)
Pennsylvania	639	429	521	1,589	270	683	682	1,635	340	1,477	3,006	4,823
	(146)	(122)	(93)	(190)	(117)	(182)	(162)	(259)	(106)	(266)	(398)	(452)
Vermont	9	-	-	9	6	88	22	116	-	81	36	117
	(9)	-	-	(9)	(6)	(83)	(22)	(86)	-	(54)	(36)	(65)

Note: Standard errors in parentheses. Source: American Community Survey 5-year 2017.

Table 13: Average Wages of Nursing Occupations by Industry Setting and State

	Registered Nurses			Licensed Practical Nurses			Nursing Assistants and Other Aides		
	Hospitals	Skilled Nursing Facilities	Other	Hospitals	Skilled Nursing Facilities	Other	Hospitals	Skilled Nursing Facilities	Other
New York	37.07	30.52	31.11	23.56	24.17	21.37	19.82	17.25	15.49
Surrounding States	36.53	31.65	32.29	23.89	24.59	21.98	19.24	16.51	16.24
Other States	33.03	27.21	29.03	21.54	21.48	20.17	17.29	14.55	15.35

Note: Cells contain means expressed as 2019 dollars.
Source: American Community Survey 5-year 2017.

Table 14: Average Wages of Nursing Occupations by Industry Setting and Regions within New York State

	Registered Nurses			Licensed Practical Nurses			Nursing Assistants and Other Aides		
	Hospitals	Skilled Nursing Facilities	Other	Hospitals	Skilled Nursing Facilities	Other	Hospitals	Skilled Nursing Facilities	Other
Western New York	33.32	26.61	28.25	19.50	20.86	19.82	17.06	15.99	15.68
Finger Lakes	31.83	25.47	26.65	18.05	22.43	20.40	14.81	15.41	17.12
Southern Tier	32.11	31.40	28.02	19.13	19.71	21.56	16.06	15.65	17.97
Central New York	33.19	26.33	28.17	20.80	19.91	17.19	17.39	14.39	16.00
North Country	36.08	29.30	24.89	20.80	16.03	21.51	16.61	18.41	18.46
Tug Hill	33.84	21.90	30.54	19.42	17.97	21.25	16.23	14.72	14.09
Mohawk Valley	31.65	22.48	27.95	18.54	23.00	21.19	20.32	13.89	15.70
Capital District	31.79	24.92	29.72	26.61	24.54	22.41	18.49	15.94	15.90
Mid-Hudson Valley	40.22	31.37	33.34	20.28	26.61	21.79	21.81	17.09	16.69
New York City	38.82	33.27	32.57	25.58	25.64	20.67	20.49	18.31	14.99
Long Island	40.71	33.69	34.64	28.72	27.43	27.08	22.69	20.07	18.42

Note: Cells contain means expressed as 2019 dollars.
Source: American Community Survey 5-year 2017.

Table 15. Projected Wage Costs in Hospitals of Proposed Minimum Staffing Legislation, in Millions of 2019 Dollars

	Wage Increases for Existing Nurses		Wages for New Nurses		Total Additional Wage Costs	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	16.8	50.5	80.5	88.2	97.3	138.7
Central NY	12.1	36.2	39.6	43.3	51.7	79.6
Finger Lakes	15.3	45.8	126.3	138.3	141.5	184.1
Long Island	29.5	88.6	195.9	214.6	225.5	303.2
Mid-Hudson	25.0	74.9	249.8	273.6	274.8	348.5
Mohawk Valley	2.5	7.4	17.1	18.7	19.6	26.1
New York City	95.1	285.3	741.6	812.2	836.7	1,097.6
North Country	3.0	9.0	7.1	7.8	10.1	16.8
Southern Tier	4.4	13.2	28.8	31.5	33.2	44.7
Tug Hill Seaway	2.8	8.4	8.3	9.1	11.1	17.5
Western NY	19.3	58.0	106.5	116.6	125.8	174.6
Total	225.8	677.4	1,601.5	1,754.0	1,827.3	2,431.5

Note: Lower bound wage calculations assume a 5% increase in wages for nursing staff. Upper bound calculations assume a 15% increase in wages for nursing staff. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region are multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.

Source: Authors' calculations using data from the American Community Survey 5-year 2017 and DOH's Hospital Survey for CY 2018.

Table 16. Projected Wage Costs in Nursing Homes of Proposed Minimum Staffing Legislation, in Millions of 2019 Dollars

	Wage Increases for Existing Nurses		Wages for New Nurses		Total Additional Wage Costs	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	6.3	18.8	69.9	76.6	76.2	95.4
Central NY	7.8	23.3	101.3	111.0	109.1	134.3
Finger Lakes	10.0	30.1	123.3	135.1	133.4	165.2
Long Island	16.6	49.7	212.8	233.0	229.3	282.7
Mid-Hudson	14.6	43.7	198.2	217.1	212.8	260.8
Mohawk Valley	1.9	5.6	25.5	27.9	27.3	33.5
New York City	39.2	117.5	766.3	839.3	805.5	956.9
North Country	1.9	5.6	26.7	29.3	28.6	34.9
Southern Tier	4.0	12.0	54.0	59.1	58.0	71.1
Tug Hill Seaway	1.7	5.0	22.9	25.1	24.6	30.1
Western NY	15.7	47.0	178.1	195.1	193.8	242.1
Total	119.5	358.4	1,779.2	1,948.6	1,898.6	2,307.0

Note: Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.

Source: Authors' calculations using data from the American Community Survey 5-year 2017 and the Nursing Home Cost Report 2017.

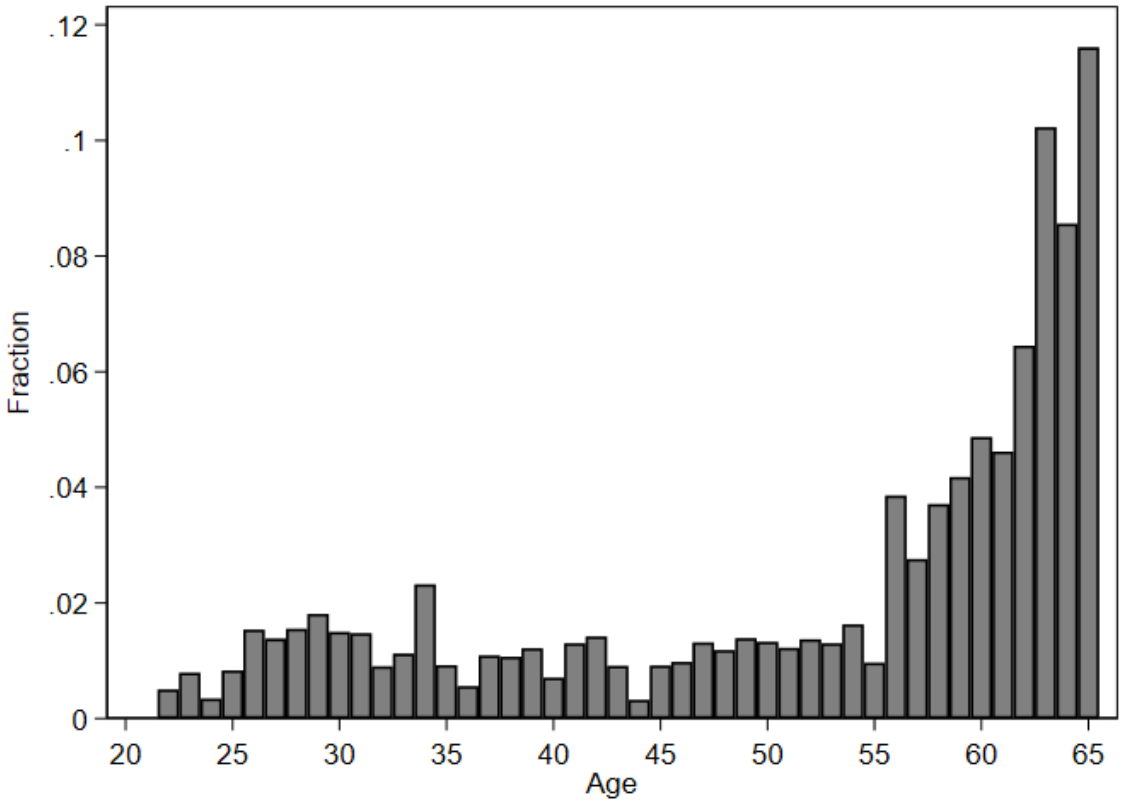
Table 17. Total Projected Wage Costs of Proposed Minimum Staffing Legislation, in Millions of 2019 Dollars

	Nursing Homes		Hospitals		Total	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	76.2	95.4	97.3	138.7	173.5	234.1
Central NY	109.1	134.3	51.7	79.6	160.7	213.8
Finger Lakes	133.4	165.2	141.5	184.1	274.9	349.3
Long Island	229.3	282.7	225.5	303.2	454.8	586.0
Mid-Hudson	212.8	260.8	274.8	348.5	487.5	609.3
Mohawk Valley	27.3	33.5	19.6	26.1	46.9	59.6
New York City	805.5	956.9	836.7	1,097.6	1,642.2	2,054.4
North Country	28.6	34.9	10.1	16.8	38.7	51.7
Southern Tier	58.0	71.1	33.2	44.7	91.2	115.9
Tug Hill Seaway	24.6	30.1	11.1	17.5	35.7	47.7
Western NY	193.8	242.1	125.8	174.6	319.6	416.7
Total	1,898.6	2,307.0	1,827.3	2,431.5	3,725.9	4,738.4

Note: Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.

Source: Authors' calculations using data from the American Community Survey 5-year 2017, DOH's Hospital Survey for CY 2018, and the Nursing Home Cost Report 2017.

Figure 1: Fraction of Registered Nurses Not in the Labor Force by Age



Source: American Community Survey 5-year 2017.

Appendix Table 1. Additional Staffing Needs Under Alternative FTE Definition

	Additional Hospital Staff		Additional Nursing Home Staff		
Region	RNs	LPNs	RNs	LPNs	NAOAs
Capital Region	1,022	17	396	313	579
Central NY	519	22	600	529	748
Finger Lakes	1,617	106	736	602	787
Long Island	2,508	24	933	1,559	1,773
Mid-Hudson	2,916	74	951	1,226	1,545
Mohawk Valley	145	124	145	151	265
New York City	9,906	183	3,179	6,056	6,735
North Country	95	1	111	159	223
Southern Tier	299	14	276	237	336
Tug Hill Seaway	85	9	96	134	121
Western NY	1,097	30	719	751	1,110
Total	20,209	605	8,142	11,717	14,223

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 40 hours per week and 52 weeks per year to obtain annual FTE costs. Under the alternative FTE definition, a full-time nurse provides 37.5 hours of patient care per week instead of 31.5 hours.

Source: Authors' calculations using data from the American Community Survey 5-year 2017, DOH's Hospital Survey for CY 2018, and the Nursing Home Cost Report 2017.

Appendix Table 2. Projected Wage Costs Under Alternative FTE Definition, in Millions of 2019 Dollars

	Nursing Homes		Hospitals		Total	
Region	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Capital Region	63.8	81.8	90.8	129.4	154.6	211.2
Central NY	92.2	115.8	48.2	74.3	140.4	190.0
Finger Lakes	113.3	143.2	132.1	171.8	245.4	315.0
Long Island	193.7	243.7	210.5	283.0	404.1	526.7
Mid-Hudson	180.5	225.4	256.5	325.3	436.9	550.7
Mohawk Valley	23.2	29.0	18.3	24.4	41.5	53.4
New York City	703.9	845.5	780.9	1,024.4	1,484.8	1,869.9
North Country	24.2	30.1	9.5	15.7	33.7	45.7
Southern Tier	49.2	61.5	31.0	41.7	80.2	103.3
Tug Hill Seaway	21.0	26.2	10.4	16.4	31.3	42.5
Western NY	162.2	207.5	117.4	163.0	279.7	370.5
Total	1,627.2	2,009.7	1,705.5	2,269.4	3,332.7	4,279.0

Notes: Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 40 hours per week and 52 weeks per year to obtain annual FTE costs. Under the alternative FTE definition, a full-time nurse provides 37.5 hours of patient care per week instead of 31.5 hours.

Source: Authors' calculations using data from the American Community Survey 5-year 2017, DOH's Hospital Survey for CY 2018, and the Nursing Home Cost Report 2017.

Appendix Table 3. List of counties and Public Use Microdata Areas (PUMAs) included in each of the 11 NYS regions

Region	Counties included
Capital Region	Albany, Columbia, Greene, Saratoga, Schenectady, Rensselaer, Warren, Washington
Central NY	Cayuga, Cortland, Madison, Onondaga, Oswego
Finger Lakes	Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates
Long Island	Nassau, Suffolk
Mid-Hudson	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester
Mohawk Valley	Fulton, Herkimer, Montgomery, Oneida, Otsego, Schoharie
New York City	Bronx, Kings, New York, Queens, Richmond
North Country	Clinton, Essex, Franklin, Hamilton
Southern Tier	Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, Tompkins
Tug Hill Seaway	Jefferson, Lewis, St. Lawrence
Western NY	Allegany, Cattaraugus, Chautauqua, Erie, Niagara

Notes: Counties are aggregated into NYS economic development regions using definitions from Cornell's Program on Applied Demographics (https://pad.human.cornell.edu/maps2010/maps/NYS_PUMAs.pdf). In addition, we follow the standards set by the NYS Department of Health in dividing the North Country region into two regions Tug Hill Seaway and North Country.

Appendix 1. Proposed Staffing Levels for Hospitals

From the full text of the proposed bill, the minimum staffing requirements for acute-care facilities are in § 2830:

3. Minimum staffing requirements.

(a) The documented staffing plan shall incorporate, at a minimum, the following direct-care nurse-to-patient[59] ratios:

(i) one nurse to one patient: operating room and trauma emergency units and maternal/child care units for the second or third stage of labor;

(ii) one nurse to two patients: maternal/child care units for the first stage of labor, and all critical care areas including emergency critical care and all intensive care units and post-anesthesia units;

(iii) one nurse to three patients: antepartum, emergency room, pediatrics, step-down and telemetry units and units for newborns and intermediate care nursery units;

(iv) one nurse to three patients: postpartum mother/baby couplets (maximum six patients per nurse);

(v) one nurse to four patients: non-critical antepartum patients, postpartum mother only units and medical/surgical and acute care psychiatric units;

(vi) one nurse to five patients: rehabilitation units and subacute patients;

(vii) one nurse to six patients: well-baby nursery units.

For any units not listed in this paragraph, including, but not limited to, psychiatric units, and acute care facilities operated pursuant to the mental hygiene law or the correction law, the department shall establish by regulation the appropriate direct-care nurse-to-patient ratio.

[59] "Nurse" shall mean a registered professional nurse or licensed practical nurse licensed pursuant to article one hundred thirty-nine of the education law.

Appendix 2. Proposed Staffing Levels for Nursing Homes

And the minimum staffing requirements for residential health care facilities are in the proposed § 2895-b:

4. Statutory standard. Beginning two years after the effective date of this section, every residential health care facility shall maintain a staffing ratio equal to at least the following:

(a) 2.8 hours of care per resident per day by a certified nurse aide;

(b) 1.3 hours of care per resident per day by a licensed practical nurse or a registered nurse;

(c) 0.75 hours of care per resident per day by a registered nurse; the minimum of 0.75 hours of care per resident provided by a registered nurse shall be divided among all shifts to ensure an appropriate level of registered nurse care twenty-four hours per day, seven days a week, to meet resident needs; and

(d) Residential health care facilities that care for subacute patients shall maintain at a minimum, the following direct-care nurse-to-patient ratio: one nurse to five patients.

Appendix 3. Description of Department of Health (DOH) Data

In early 2019, DOH conducted a survey of all hospitals. They requested information on patient days and direct care nursing hours for the calendar year 2018. Specifically, the survey asked facilities to record, for each of 36 service units, the annual numbers of patient days and nursing hours by staff type: registered nurses, licensed practical nurses, and unlicensed assistive personnel. We followed a preliminary DOH analysis in dropping three of the service units (ambulatory, interventional, and peri-operative) and in applying minimum staffing ratios to each of the remaining 33 service units, as shown in Table 3.

To estimate the existing staffing levels of hospitals, we used the reported annual number of direct care nursing hours from registered nurses and licensed practical nurses. To estimate the number of patient hours of care required, we used the reported annual number of patient days multiplied by 24.

Not all hospitals report patient days and nursing hours in all 33 service units. Three of the 215 reporting hospitals do not report positive patient days or nursing hours in any of these service units; we drop these three hospitals. If a hospital reports neither patient days nor nursing hours in a given service unit, we treated these as true zeros. But for hospitals reporting patient days but no nursing hours for a particular service unit or reporting nursing hours but no patient days, we imputed the missing data using the state-wide unit-specific median levels adjusting for the hospital's number of beds.

We also correct for outliers in terms of the ratio of patient days to nursing hours in a given hospital and service unit, defining these outliers as ratios more than two standard deviations from the state-wide unit-specific median ratio. We imputed the nursing hours and patient days for outliers in the same way as the missing data. More information, including code to replicate these estimates, is available from the authors upon request.

After these corrections, we put our measures of nursing hours and patient hours into units of full-time equivalents (FTEs) by dividing annual hours by 50 weeks per year and 31.5 hours per week. This definition of FTE assumes that a full-time nurse works three 12-hour shifts per week, receives 1.5 hours of break time per shift, and receives two weeks of vacation time per year. In the Addendum in Appendix 6, we present results with a definition of FTE that assumes more direct care hours per full-time nurse.

We then used the reported patient and nurse FTEs to calculate proposed minimum staffing levels and compare them to current staffing levels. The proposed minimum staffing levels for each service unit in each hospital is equal to the number of patient FTEs divided by the proposed maximum number of patients per nurse in that service unit. For example, if the proposed ratio is two patients per nurse, then the proposed minimum staffing level is equal to the patient FTEs divided by two. The additional nurse FTEs needed is then equal to the gap between the proposed minimum level and the current level. We calculated this gap for each service unit within each hospital separately. If the current staffing levels were higher than the minimum staffing levels, we set the gap to zero. This assumes that hospitals will not reallocate staff across units. To break down the additional nurses needed by RN and LPN, we applied each hospital's overall RN/LPN distribution to its need summed across its service units.

To calculate the existing supply and projected need of nursing staff in nursing homes, we made use of data from the Nursing Home Cost Report of 2017 provided to us by the DOH. We first translated reported paid nurse staffing hours to FTEs by dividing annual paid hours by 52 weeks per year and 36 hours per week. For facilities reporting patient days but no nursing hours,

or nursing hours but no patient days, we imputed missing hours as above using the state-wide medians adjusting for the facility's number of beds.

We calculated the total FTE need under the proposed legislation using the proposed minimum staffing levels and the reported patient days in each nursing home. As in the hospital analysis, we assume that a full-time nurse or aide provides 31.5 hours of care per week for 50 weeks per year (though paid for 36 hours per week and 52 weeks per year). We then calculated the projected new nursing staff needed under the proposed legislation as the difference between the projected total need and the existing total staffing in each nursing home facility. If the current staffing levels were higher than the minimum staffing levels in the proposed legislation, we set the gap to zero. This assumes that nursing homes will not cut nursing staff if they are above the minimum staffing levels, which may not be true.

Appendix 4. Description of Integrated Postsecondary Education Data System (IPEDS) Data

The IPEDS annually collects post-secondary education data from approximately 7,000 institutions that participate in federal student aid programs, including colleges, universities, and technical and vocational schools. We use the 2016-2017 IPEDS final data release, covering degrees awarded July 1, 2015-June 30, 2016, which reflect revisions to the provisional release files.

The IPEDS data are collected by several survey components. Geographic detail is acquired from the Institutional Characteristics Survey (Table HD2016), while the Completions Survey (Table C2016_A) provides information on awarded certificates and degrees by 6-digit Classification of Instructional Programs (CIP) code. These files are integrated using the unit identifier for the educational institution, and a crosswalk is used to map New York counties into eleven Economic Development Regions (EDRs). We summarize the total number of awarded certificates and degrees across first and second majors by CIP codes for those who have received instruction in Registered Nursing/Registered Nurse (51.3801), Licensed Practical/Vocational Nurse Training (51.3901), and Nursing Assistant/Aide and Patient Care Assistant/Aide (51.3902).

Appendix 5. Description of American Community Survey (ACS) Data

The ACS is an ongoing national survey that releases annual data containing demographic, geographic, labor force, and income details on over 3 million individuals. Due to the small population estimates required, we utilize the 5-year 2013-2017 ACS files over the 1-year 2017 ACS file. The 5-year files provide more precision in our estimates and are more reliable despite being less current. They contain data for all areas instead of only for areas with populations of 65,000 or more, which is a prohibitive restriction of the 1-year files when analyses of smaller geographic regions or specialized populations are required. Wages in the survey are reported in 2017 dollar terms. We inflate these to 2019 values using the Bureau of Labor Statistics wage and salary index for health care and social assistance industries.

The ACS enables us to evaluate the sample of individuals who are 18 and older and who currently work in nursing occupations, or whose previous employment up to five years ago was in a nursing occupation. In this way, we are able to consider both current employment, as well as recent job separations. We group occupations in the following way: Registered Nurses are those with 2010 Standard Occupational Classification (SOC) code 291141 (Registered Nurses),; Licensed Practical Nurses are those with SOC code 292061 (Licensed Practical and Licensed Vocational Nurses); and Nursing Assistants and Other Aides are those with SOC code 311010 (Nursing, Psychiatric, and Home Health Aides). The 2012 North American Industry Classification System (NAICS) codes are used to determine industry: 622 identifies Hospitals, while 6231 identifies Nursing Care Facilities (Skilled Nursing Facilities). We denote industries as Other that are not one of the aforementioned two industries.

With its detailed questionnaire, the ACS allows us to understand more about the pool of current nursing employees and former employees who may be permanently or temporarily out of the labor force. We can observe 12-month income, including wage/salary income, Social Security or Railroad Retirement, and other retirement income (excluding Social Security). Key variables provide information on current school enrollment, employment status, usual hours worked per week during the past 12 months, weeks worked during the past 12 months, when last worked, now available for work, looking for work, marital status, disability status, whether females gave birth within the past 12 months, and household presence and age of own children. This rich set of data enables us to construct an employment indicator of part-time (less than 35 hours usually worked per week in the past year) and full-time status (35 or more hours usually worked per week in the past year). We incorporate knowledge of weeks worked during the past year (50 to 52 weeks) to reveal part-time/full-year and full-time/full-year status. Additionally, we identify those who have left the workforce due to retirement or to care for a young child using our knowledge of income and the existence of own young children in the household. A crosswalk maps Public Use Microdata Areas (PUMAs) in New York to the eleven Economic Development Regions for more focused analysis.

We follow Census Bureau documentation for calculating standard errors using replicate weights (Census Bureau 2017).[lxii]

Appendix 6. Addendum to Compare Estimated Impacts of the Proposed Minimum Staffing Law with New Minimum Staffing Levels for New York City's Health and Hospitals

Table A. Additional FTE Staffing Needs and Projected Wage Costs for Hospitals Under Originally Proposed Minimum Staffing Levels, All Hospitals

	Additional Staffing Needs (FTEs)			Projected Wage Costs (Millions 2019$)	
Region	Total	RNs	LPNs	Lower Bound	Upper Bound
Capital Region	1,238	1,217	21	97.3	138.7
Central NY	644	618	27	51.7	79.6
Finger Lakes	2,052	1,925	126	141.5	184.1
Long Island	3,014	2,986	28	225.5	303.2
Mid-Hudson	3,560	3,471	89	274.8	348.5
Mohawk Valley	320	172	148	19.6	26.1
New York City	12,011	11,793	218	836.7	1,097.6
North Country	114	113	1	10.1	16.8
Southern Tier	372	356	16	33.2	44.7
Tug Hill Seaway	112	102	11	11.1	17.5
Western NY	1,341	1,306	35	125.8	174.6
Total	24,779	24,059	720	1,827.3	2,431.5

Notes: RNs=Registered nurses. LPNs=Licensed practical nurses. Lower and upper bound wage calculations assume a 5% and 15% increase in wages for nursing staff, respectively. Hourly wages from the ACS (see text for description of calculation) for each type of staff and region multiplied by 36 hours per week and 52 weeks per year to obtain annual FTE costs.

Source: Authors' calculations using data from the American Community Survey 5-year 2017, DOH's Hospital Survey for CY 2018, and the Nursing Home Cost Report 2017.

Table B. Additional FTE Staffing Needs and Projected Wage Costs for Hospitals Under Originally Proposed Minimum Staffing Levels, Excluding H&H Hospitals

	Additional Staffing Needs (FTEs)			Projected Wage Costs (Millions 2019$)	
Region	Total	RNs	LPNs	Lower Bound	Upper Bound
Capital Region	1,238	1,217	21	97.3	138.7
Central NY	644	618	27	51.7	79.6
Finger Lakes	2,052	1,925	126	141.5	184.1
Long Island	3,014	2,986	28	225.5	303.2
Mid-Hudson	3,560	3,471	89	274.8	348.5
Mohawk Valley	320	172	148	19.6	26.1
New York City	8,197	8,139	58	584.7	785.8
North Country	114	113	1	10.1	16.8
Southern Tier	372	356	16	33.2	44.7
Tug Hill Seaway	112	102	11	11.1	17.5
Western NY	1,341	1,306	35	125.8	174.6
Total	20,965	20,405	560	1,575.4	2,119.7

Notes: See notes to Table A.

Table C. Additional FTE Staffing Needs and Projected Wage Costs for Hospitals Under H&H Minimum Staffing Levels, All Hospitals

	Additional Staffing Needs (FTEs)			Projected Wage Costs (Millions 2019$)	
Region	Total	RNs	LPNs	Lower Bound	Upper Bound
Capital Region	1,036	1,024	13	84.3	124.4
Central NY	594	571	23	48.6	76.3
Finger Lakes	1,858	1,761	97	130.1	171.5
Long Island	1,970	1,960	11	157.8	229.1
Mid-Hudson	1,944	1,897	47	161.4	224.4
Mohawk Valley	243	129	114	15.4	21.5
New York City	7,484	7,377	106	557.9	792.3
North Country	93	93	0	8.8	15.4
Southern Tier	206	194	12	20.2	30.5
Tug Hill Seaway	28	26	2	4.9	10.7
Western NY	958	941	17	95.6	141.5
Total	16,414	15,973	441	1,285.1	1,837.6

Notes: See notes to Table A.

Table D. Additional FTE Staffing Needs and Projected Wage Costs for Hospitals Under H&H Minimum Staffing Levels, Excluding H&H Hospitals

	Additional Staffing Needs (FTEs)			Projected Wage Costs (Millions 2019$)	
Region	Total	RNs	LPNs	Lower Bound	Upper Bound
Capital Region	1,036	1,024	13	84.3	124.4
Central NY	594	571	23	48.6	76.3
Finger Lakes	1,858	1,761	97	130.1	171.5
Long Island	1,970	1,960	11	157.8	229.1
Mid-Hudson	1,944	1,897	47	161.4	224.4
Mohawk Valley	243	129	114	15.4	21.5
New York City	5,446	5,417	29	414.3	599.1
North Country	93	93	0	8.8	15.4
Southern Tier	206	194	12	20.2	30.5
Tug Hill Seaway	28	26	2	4.9	10.7
Western NY	958	941	17	95.6	141.5
Total	14,376	14,012	364	1,141.5	1,644.5

Notes: See notes to Table A.

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[xxxviii] Kane and colleagues
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[xlii] Donaldson and Shapiro
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