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Evaluation of Adjunct Faculty Pools to Expand Nursing Education

Reporting on the Northeast Louisiana
Nurse Education Expansion Project

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September 1, 2023



Acknowledgements

We would like to thank the Blue Cross and Blue Shield of Louisiana Foundation for financial support that made this research possible. In addition, Dr. Anna Osland supported efforts to monitor progress of the Northeast Louisiana (NELA) Faculty Adjunct Project for an extended period of time during the program's operation. The authors of the report are responsible for the content and any interpretations contained within.

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Executive Summary

Nursing shortages have been a long-standing and pervasive challenge in the health care system, but commitments to solving them remain active. One such effort involves expanding educational resources for nursing education and teaching. Research suggests that while the nursing workforce has struggled to retain workers, the educational pipeline is one area where interventions are likely to succeed.

In Louisiana, the shortage is expected to be measured in the thousands of unfilled full-time nursing positions. Moreover, the complications within the healthcare system brought on by COVID-19 have exacerbated the problem. However, emerging trends suggest that the nursing profession will continue to grow, but future demands may outpace supply.

The Northeast Louisiana region responded to the shortage by creating a shared pool of faculty to teach at institutions that shared a similar set of student applicants. Thus was borne the Northeast Louisiana (NELA) Faculty Adjunct Project, supported by the Blue Cross and Blue Shield of Louisiana Foundation (BCBSLA Foundation). The program involved funding to support the expanding of instructional capacity, which allowed the institutions to serve a larger number of nursing students and help current nursing students finish the degree and enter the workforce. The project enrollees were 2- and 4-year educational institutions with nursing programs training to the Associate of Science in Nursing (ASN) and Bachelor of Science in Nursing (BSN) level. Nursing education was expanded through funding for the hiring of adjunct faculty at 3 programs in the region: Louisiana Delta Community College (LDCC), Louisiana Tech University (LA Tech), and University of Louisiana-Monroe (ULM).

The current report is an evaluation of the project implementation and performance of NELA programs. The report examines the impact of this effort by comparing outcomes in NELA and other regions within the state. The Blanco Center evaluated the program through the collection of external data on educational programs and the workforce, measuring the performance of grantee schools on data gathered from 2016-2022.

Nursing directors reported program activities faced obstacles presented by physical space limitations and the COVID-19 pandemic. However, results of the evaluation indicate that treated programs had more qualified students admitted and included more students with an LPN background over time. Further, the Northeast region performed comparably better than other regions across several metrics. Completion, licensing, and workforce participation trends are continuing to emerge and will become clearer as more data become available over time.

Introduction

Educating and training Registered Nurses (RNs) is vital to the healthcare system workforce and patient outcomes during critical care influx (Aiken et al. 2012; Kane et al. 2007; Needleman et al. 2002).

The nursing field is losing many new potential RNs, and increasing in the ratio of patient to nurse staff (e.g., 5 to 30 patients per nurse) that could result in a national deficit of over 900,000 RN jobs in the next decade (Juraschek et al. 2019). It has become increasingly vital to track regional and local impacts on the nursing shortage. In Louisiana, a statewide nursing forecast model projected that for 2020, the RN shortages could result in over 1700 unfilled FTEs across eight regions of the state (Bienemy 2015). The COVID-19 pandemic has added stress to the nursing pipeline through increasing incidences of early vacating the profession (within 2 years of degree completion), stress/burnout, and long-standing issues (e.g., low hospital capacity) (Lopez et al. 2022). Expanding nursing education can help with rising shortages (Juraschek et al. 2019), and programs targeting educational capacity have shown promising results (Aiken and Cheung 2008).

The following report is an evaluation of a faculty expansion project in the Northeast region of Louisiana. The intervention involved hiring new adjunct faculty. Schools within the region of the NELA Workforce Development Board (WDB83) were funded to replenish the pool of faculty following a recent increase in vacancies and strain on clinical programs. The project was dedicated for the hiring of additional master's level faculty for the general nursing curriculum and hard-to-fill specialties.

The expansion was expected to increase the number of students in the program with a subsequent increase in RNs employed in the region by 2023. The current evaluation focuses on measuring the impact of the faculty expansion on education and workforce in the Northeast region, and the state more generally. This evaluation also attempts to isolate the effects on the region against an evolving backdrop across the state that included notable nursing education interventions in other areas. In particular, the New Orleans and the Bayou (Houma-Thibodeaux) regions were funded to adopt similar strategies to NELA, which overlapped in implementation. This informed the current approach to measure regional differences to isolate the impact of the program on workforce expansion.

Education and Training for Registered Nursing

Professional nursing designated at the level of Registered Nurse (RN) involves training in didactic coursework and clinical rotations. RNs generally require a degree of Associates of Science in Nursing (ASN) or a Bachelor of Science in Nursing (BSN), respectively obtained from a 2-year or 4-year accredited post-secondary program. Nursing students undergo pre-clinical coursework, followed by on-the-job training through clinical rotations and residence focused on specific areas of practice. Attainment of a nursing license involves passing a national licensing exam known as the National Council Licensure Examination (NCLEX). With more advanced curriculum, RNs can specialize (e.g., treatment methods) and can undergo training to supervise others and work within other specialties and populations (e.g., neonatal and perinatology).

The types of training, responsibilities, and workload can offer unique contributions to healthcare. For example, BSN/RN nurses receive more advanced coursework, and can oversee groups of patients independently. There are pathways for getting Licensed Practical Nurses (LPNs) to RN programs, typically called a "bridge" curriculum. RNs with more advanced training at the BSN level can supervise staff.

Training Capacity

The RN has remained a popular degree for students pursuing post-secondary education and training. The American Association of Colleges of Nurses enrollment data indicates 2021 student enrollment increased 3.3% from the prior year for baccalaureate nursing programs across the US (American Association of Colleges of Nurses 2022). AACN also reported in 2021 that the highest number of qualified applicants were turned away from programs. The level of refusals for qualified students has been increasing, which is concerning due to the growing demand and hospital shortages (Aiken and Cheung 2008). Aiken and Cheung (2008) reported that the field would need to increase nursing slots in education by 25% to meet demand by 2020. According to the Bureau of Labor Statistics (BLS) nursing workforce participation is expected to grow approximately 6% between 2021-31 nationwide, adding around 195,000 jobs (“BLS Employment Projections” 2022). Taken together, the increased demand for the nursing career has strained the education to workforce pipeline, and strategies to minimize the impact of the shortage should be aimed at increasing educational and training capacity.

State and local funders may be in the best position to invest public resources to build capacity of nursing programs, due to the increase in regionally specific data on the nursing shortage (Aiken, Cheung, and Olds 2009; Bienemy 2015). The importance of educating new nurses is foreseen in projections showing an aging workforce, where an increasing number of currently employed nurses (who began careers in the late 90s/early 2000s) began aging out and retiring by 2020 in most states (Buerhaus, Staiger, and Auerbach 2000). Reports on the state of the nursing workforce point to future shortages in RN supply for most of the country (e.g., 30 states expected to have failed performance from shortages by 2030) (Juraschek et al. 2019; Zhang et al. 2018). Thus the impact of multiple causes of shortage, the aging workforce and the pandemic, are likely to present new challenges for public institutions working to provide education and training (i. fewer experienced nurses becoming instructors, fewer new students entering a program).

Nursing shortages were exacerbated in 2020, amid the COVID-19 pandemic. National trends show nursing turnover has increased, as has leaving the profession by younger employees. Evidence from the BLS from 2020 to 2022 showed declines in total nurses in the field across all ages from 16 to 64 years, but the greatest decline was 18% among 16-19 year old workers (i.e., nursing assistant level), followed by 13% among 25-34 year old workers (i.e., early career LPNs and RNs) (“Skilled Nursing Clinical Site by Age Groups 2019-22” n.d.). The National Nursing Workforce Study reported 41% of RNs leaving the field between 2020-22 had less than 10 years of experience. Twenty percent of the workforce still employed in 2022 indicated they were planning to leave the field by 2027 (“National Nursing Workforce Study” 2022).

While there signs of increased strain on the RN workforce, the immediate increase in RNs within the education and workforce pipeline remains an important goal. Targeted interventions to help the RN workforce can have regional and local workforce impacts. Buerhaus et al. (2013) suggested through projections of regional employment within the US that the South has a greater supply of younger-aged RNs available to replace fewer older-age RNs. The Northeast and West have by contrast fewer younger RNs currently in the workforce, yet a larger number of older RNs to retire.

The evidence presented thus far suggests that despite the COVID-19 pandemic the supply of RN students is increasing in the educational pipeline, and strategies to address it will need to remain sensitive to local and regional economic factors. Regions may benefit from locally administered expansions of nursing programs.

Nursing Capacity and Patient Outcomes

Systematic evidence suggests that increasing the supply of nurses is tied to improving patient outcomes. Kane et al. (2007) found through a systematic review that increasing the amount of BSN trained RNs in a hospital was associated with reduced mortality and lower failure to resuscitate. Yakusheva et al. (2014) conducted a policy analysis on labor supply of BSN trainees with patient records at the hospital level. The researchers showed a goal of reaching 80% supply of BSN to the workforce is associated with lower readmission rates and shorter patient length of stay. It was also reported that increasing hospital-level BSN staff and lowering the patient care ratio produced the largest benefit to patient outcomes (Yakusheva, Lindrooth, and Weiss 2014). Another review by Aiken et al. (2012) of 4 states revealed that a 10% increase in BSN-level nursing participation was associated with a 4% decline in patient outcomes of mortality, and this effect did not vary significantly by the care setting (Aiken et al. 2012). An analysis of 19 Canadian teaching hospitals found that a higher proportion of advanced trained nurses was associated with fewer incidences, and a greater use of experienced nurses for complex cases, but this evidence was correlational (Hall, Doran, and Pink 2004).

A reduction in capacity to train and educate nurses can lead to further deficits down the line of patient care. Shift deficit (i.e., over 8-hours of lost time allocated of one or more nurses per day) can create a higher patient to nurse ratio, further increasing the risk of patient mortality and exposure to complications (Needleman et al. 2002). The impact of COVID-19 elevated an existing problem of capacity. A recent study also shows that the COVID-19 pandemic heightened risks for already stressed hospitals. Data from a large US sample (over 150K nurses) before and after the pandemic indicated that hospitals that were staffed more robustly to oversee COVID patient influx fared better during the pandemic than hospitals with lower patient-staff ratios (Aiken et al. 2023). Further, the nurses from the appropriately staffed hospitals were less likely to leave in the first 18 months of the pandemic.

Prior Research on Education Expansion

The nursing shortage can also be viewed through the lens of education expansion of post-secondary programs. Recently, the field has turned to recruiting faculty through partnerships with clinical providers to provide continuing education of currently employed RNs. Wyte-Lake et al. (2013) reviewed program initiatives aimed at recruiting clinical nursing faculty to academic positions. Programs generally involved an academic-practice partnership (11 of 14 programs reviewed), where academic institutions partnered with a public agency or private funder to hire and fund additional faculty positions. The review did not provide quantitative results, as many of the studies were descriptive or qualitative in nature. One study in the systematic review (Ganley and Sheets 2009) reported that a program of a Southern California university hired additional faculty and reported overall positive experiences of faculty and students, but the program developers remarked that ongoing recruitment was a primary challenge.

The research on hospitals during the pandemic suggests existing strategies (e.g., recruitment to a wider range of specialties, more demographically diverse field, greater support of educational programs) remain important to addressing the shortage (Aiken and Cheung 2008; Peters 2023). Increasing educational capacity can have immediate effects on supply (e.g., number of applicants admitted, retained/graduated, and licensed), which in turn could minimize negative consequences of the shortage on patient care (Ganley and Sheets 2009).

Current Project Evaluation

The current evaluation will estimate the impact of a faculty expansion treatment for ASN and BSN programs in the Northeastern region of Louisiana. Evaluated schools within the NELA region include Louisiana Tech University (LA Tech), the University of Louisiana at Monroe (ULM), and Louisiana Delta Community College (LDCC). These programs serve a 12-parish region (see Appendix for parish population). The three schools initially selected to attract and accept more students with additional faculty. The building of an adjunct pool began in 2018-19, and the funding was administered from 2019-2021. Thus, the impact of the program was determined by its immediate draw of new students and the RN production after the 3-year project concludes.

In recent years, similar programs have emerged across the state. The Bayou region (Fletcher Technical Community College) and Orleans region (Loyola of New Orleans) were also funded to hire additional adjuncts, which were in part inspired by the NELA initiative. Fletcher TCC nursing was funded by BCBSLA Foundation to hire new faculty and a federal grant to build new teaching facilities (LeBoeuf and Vauclin 2022). Loyola of New Orleans received their funding in 2020-21 to provide expanded access to online programs for students in Terrebonne, Lafourche, and Calcasieu Parishes (“Loyola Expands Nurse Training in Bayou Region to Bridge Healthcare Shortage” n.d.). While these efforts are separate from the NELA treated region, it is important to account for these initiatives when establishing a comparison baseline for the NELA region. In addition, monitoring the impacts of faculty expansion in any region becomes increasingly important as this strategy becomes more widespread in the state.

The current program evaluation examines performance data recommended by prior research, including admissions, RN licensures, regional employment, and infrastructure (e.g., clinical sites where students gain supervised experience) (Wyte-Lake et al. 2013; Dillender et al. 2019; Kaufman 2013). This report also summarizes records related to the process of program implementation. The following objectives and hypotheses are outlined:

- 1) The first objective of the evaluation is to measure levels of qualified applicant admissions and new faculty. The following hypotheses are made:
 - a. NELA expanded programs will **accept more qualified applicants** than before implementation of the adjunct pool. The size of admissions from NELA expansion will be compared to levels across other regions of the state.
 - b. NELA adjunct programs will enroll more students **in pre-RN clinical coursework**. **Levels of total enrollment and enrolled students with prior LPN education** will be explored.
 - c. The post-implementation phase of the project will coincide with an increase in **faculty hiring and retention**.
- 2) A second objective of the report is estimating the level of RN production. The following hypotheses are proposed:
 - a. More **students will graduate** from NELA expanded programs than before implementation. Completion totals from NELA expansion will be compared to levels across other regions of the state.
 - b. **Passage of the RN licensures exam** will increase for NELA programs in the long-term.
 - c. Additional data for increases to **nurse employment** (e.g., skilled nursing sites, total employed) will be examined, but the long-term impacts are not yet expected to be visible due to the program’s recency.
- 3) A third objective is to explore grantee experiences with implementing faculty expansion.
 - a. The processes, successes, and challenges of the adjunct project will be explored through the experiences of nursing administration in the NELA region.

Evaluation Methodology

Design

The evaluation approach included analyses of time-series and aggregate data from before the faculty pool implementation) to after onset of the program (post-implementation). Treated programs (i.e., NELA programs with expanded faculty pools) were compared to untreated programs in other parts of the state. In addition, the data were analyzed by region using definitions of regional labor market area from the Louisiana Workforce Commission and the Bureau of Labor Statistics.¹

Program Sample

As of 2021 (October 1), there were 30 pre-RN programs in Louisiana: 12 ASN, 17 BSN, and 1 diploma credential. The data collected for the current evaluation include 28 of the programs accredited in Louisiana to deliver post-secondary nursing education (i.e., data are reported to a state accrediting body). There were 12 ASN and 16 BSN programs in the final data set. All programs are accredited according to the Louisiana State Board of Nursing and Louisiana Board of Regents.

NELA

The programs that expanded faculty adjunct pools were grouped as the NELA treatment programs. All programs are accredited to train to the RN level, but there were differences in each program organization. LDCC is a 2-year college with a ASN degree in nursing and includes an LPN to RN program track completed within 4 semesters as a post-diploma program. LA Tech is a 4-year college admitting students to a 2-year ASN. ULM is a 4-year institution admitting students to a BSN. ULM students can also be admitted to a diploma track for those opting into an LPN to BSN-RN bridge for an extra semester of courses. Note in the data analyzed, Grambling State University (Lincoln Parish) began a BSN-RN program in 2018. The program was not a faculty adjunct pool program; however, the school was included in compiling NELA regional data as it provided relevant program-level data linked to nursing investments in the area including increasing awareness, or interest in nursing programs even if some students may have ultimately enrolled in the Grambling program, or switched to that program if they otherwise would have enrolled in a program participating in the adjunct pool.

Nursing program directors received funding in December 2018. This start date would be reflected in implementation of the 2018-19 Academic Year (AY) and continued to July of AY 2021-22. The onset varied by school due to the academic calendar intervals.²

¹ Parishes/areas included in each region differ by the reporting source. For example, the Northeast region is defined by 12 parishes in the local workforce commission (WDB83), but by 13 parishes in the BLS non-metropolitan area (https://www.bls.gov/oes/current/msa_def.htm#2200003). These differences did not impact the analyses of educational and workforce data.

² ULM and LDCC observe the semester (Fall-Spring-Summer), while LA Tech observes the quarter system (Fall-Winter-Spring-Summer).

The following schools/regions were not included in the current program evaluation. Three programs in the untreated group were excluded. They included Herzing, Chamberlain, and William Carey. Herzing and Chamberlain are for-profit institutions in New Orleans, and William Carey is a college in Mississippi with a satellite campus in Baton Rouge, Louisiana. There were no statistically significant differences in the trends observed in the dataset including the 3 programs vs. the dataset excluding the programs. In addition, Fletcher and Nicholls State University were not included in the regional comparisons due to a potential confounding effect of other initiatives overlapping with faculty pool expansion. The state-level comparisons do not include the Bayou Region as a result.

Indicators of Performance

Evaluation indicators were selected to track the quantitative data below. For more information on these metrics and the indicator source, please see the table in the Appendix.

Education

- Number of admitted students, qualified student applicants accepted into a nursing program, and students enrolled in pre-RN clinical coursework
- Number of graduates from nursing education programs
- Number of licenses attained upon graduation
- Number of added nursing adjunct faculty positions in the program
- Number of new adjunct faculty transitioning to full-time faculty

Workforce

- Number of Registered Nurses participating in workforce
- Number of added clinical sites (by program, and by parish)

Data

Grantee source (2018-2022)

Annual grantee reports to the BCBSLA Foundation were used to monitor and assess the project during the life of the grant. Notes from meetings with stakeholders in the workforce development board office (e.g., WDB83 staff) and nursing program directors during the grant period were also used as a supplemental source of information.

Independent sources (2016-)

Data from sources dedicated to measuring educational, training, and workforce outcomes in Louisiana and the US were used to assess the indicators of the program. Louisiana Board of Regents Statewide Student Profile System, Bureau of Labor Statistics (Occupational Employment and Wage Estimates), and Louisiana State Board of Nursing data were included as sources for verifying the performance of nursing programs. The data were pulled from 2016-2021, or the most recent years available which in some cases was 2022. The year 2016 was used because it provides some pre-treatment baseline data and is a starting point for projecting regional shortages in the US in prior research (Zhang et al. 2018). The 2021 calendar year marked the end of the project funding period, and the expected year of graduation of the first student cohort from the faculty adjunct pool expansion. In addition, the data for total students completing RN programs was measured out to 2022 to determine if long-term trends persisted.

Data for RN programs were analyzed at the program level and aggregated into regions (i.e., NELA compared to other programs in the state). In addition, these data were schools, disaggregated by ASN and BSN levels.

Trends in the nursing workforce and regional employment levels were examined using the Bureau of Labor Statistics Occupation and Employment Statistics data. OES data are reported via surveys of metropolitan statistical areas (MSAs) and non-metropolitan (also called Balance-of-States, BOS) boundaries. MSAs are defined as areas which have at least 50,000 members to the population, and there is an elevated level of social and economic activity of areas adjacent to the focal area (i.e., strong commuting patterns). BOS refers to the OES survey expansion of territories beyond MSA, defined as areas which make a residual contribution to an economy. Thus, most of the data on employment can be captured by MSAs. To create a more complete picture of all parishes contributing RNs to the regional workforces across the state, the BOS data were added to the MSA data.³

Louisiana has nine MSAs (Alexandria, Baton Rouge, Hammond, Houma-Thibodaux, Lafayette, Lake Charles, Monroe, New Orleans-Metairie, and Shreveport-Bossier City) and three BOS estimates (Southwest, Central, and Northeast non-metropolitan). The resulting data were categorized into 6 regions. Northeast Louisiana included the Monroe MSA, Northwest Louisiana included Shreveport MSA, Central Louisiana included Alexandria MSA, Southwestern Louisiana included Lake Charles and Lafayette MSAs, Southeastern Louisiana included the Baton Rouge MSA, and Orleans included New Orleans-Metairie MSA.

Data collection methods vary between agencies. Louisiana Board of Regents data are organized by the academic calendar of Fall-Spring-Summer of an Academic Year (AY). The Louisiana State Board of Nursing uses the January 1st -December 31st Calendar Year (CY). Most data elements reported by the Board of Regents were also reported by the LA State Board of Nursing, and the reports only differ slightly because of the reporting intervals. The CY 2019 was defined as the first year of program implementation. AY intervals are used for reporting faculty pool totals.

Results

Summary of Evaluation Findings

The overall result of the project is that new students were added to programs in the Northeast region following the introduction of grant funds. Approximately 160 students were added between 2019-2021. The net increase of admitted students for treated ASN programs was approximately 113 more students, while the net change for the treated BSN program was at 57 more students. While raw totals of admitted students were increasing, the proportion of students who were admitted as qualified applicants was approximately 8% lower for ASN programs, but rebounded to net 0% (i.e., 100% were accepted) for the BSN program.

³ There is a tradeoff to including non-metropolitan areas in the data. The addition of the BOS data includes more parishes and locations to the dataset. However, the addition only affects regions that have BOS territories, and it may consequently over influence a statistic reported – for example, the location quotient of Northeast is the MSA + BOS data, while the Northwest region only has MSA data.

Enrollment in pre-RN clinical courses was higher for BSN at 275 more students compared to 140 students for ASN treated programs. Within ASN programs, there were more students entering the program with a prior LPN background at an increased level of 28 students after the program implementation. For BSN, the level was around 5 more students. Further down the pipeline, the project added approximately 54 graduates, and approximately 124 students were on their way to completing programs by the AY 2022. The evaluation supports a finding that overall graduation is trending upward for the region since 2016, albeit a slight decline for ASN programs.

The faculty expansion effort resulted in helping with interim changes to nursing supply. Long-term outcome data require more time to understand the impact of program development. While graduation levels increased over time in the Northeast, attrition rate during the project was reported at 23%. According to national models 20% is high for BSN programs (Elkins, n.d.). Passing the NCLEX was also notably lower for treated programs, but so was the level across the state.

RN workforce data indicate a mixed outlook for Louisiana and the Northeast region. Notably, the Northeast region began producing more RNs regionally than the rest of the state in 2020, and has maintained a concentration of RNs in the region above national levels measured by location quotient data. However, the trends were generally downward over time, especially in 2020 during COVID-19.

Data was used to examine structural supports to clinical faculty/education in the region. First, the total number of faculty was observed. The NELA programs added approximately 17 faculty positions. Adding faculty did result in a decline of turnover/vacancy in the first year of implementation, but then vacancies increased afterward. Nursing program directors commented on this difficulty of hiring and retaining faculty for the duration of the project. New clinical sites were added in the parishes supporting the Northeast nursing workforce.

The expansion in NELA is potentially spreading over the state. Other regions (Bayou, Orleans) have faculty expansion programs starting in 2022-23, and the data support projecting an upward trend of RN student enrollment across the state. At the writing of this report, the Louisiana State Board of Nursing published data for 2022 show that admissions levels are trending upward from 2021, and as presented in this report, the graduation levels remain up (Louisiana State Board of Nursing and Lyon 2023).

Analysis of Trends Over Time

The charts below illustrate trends over time across several key metrics related to program performance and capture what occurred in untreated regions. This was accomplished through analyses which compared the Northeast region performance to other regions/programs which have not implemented this type of expansion.

Admissions

Faculty expansion was expected to allow more students admitted to nursing programs in the Northeast region. Admissions were measured as the total students admitted in the region. Figures 1 and 2 are presented to provide context to the overall admissions numbers of programs. Each show total admitted students over time. For ASN programs, the total was between 120 and 170 for the Northeast region. The total admitted into BSN programs was between 110 and 140 students for the region. Across regions in the state, the range for ASN enrollment was from low 60s (Southeast, Baton Rouge) to 400s (New Orleans and Northwest). The range for BSN enrollment was between the 30s (Central) to near 600 (Southeast, Baton Rouge).

Figure 3 displays the change in total students admitted from the baseline year to assess the degree to which the faculty expansion added new students. Performance of the NELA programs was compared to other regions in the state, by measuring the change relative to a baseline year (CY 2016). The total enrollment for NELA ASN programs increased, while the NELA BSN program remained stable. The state by comparison continued to have increased admissions over time. The hypothesis that faculty expansion would increase admissions is partially supported by these data. The overall trend across the state also showed growth during this time, but the rate of growth in the NELA region shows a notable uptick after the program’s start helping the region to catch up with trends across the rest of the state. Moreover, a programmatic review makes it clear that the adjunct positions were directly tied to student enrollment in the northeast region. Without those funds, it is not clear if the Northeast region would have developed other strategies that would lead to growth as in the Northwest and Southeast regions, or declines as in the Orleans and Central regions.

Figure 1. Students admitted to ASN programs by region

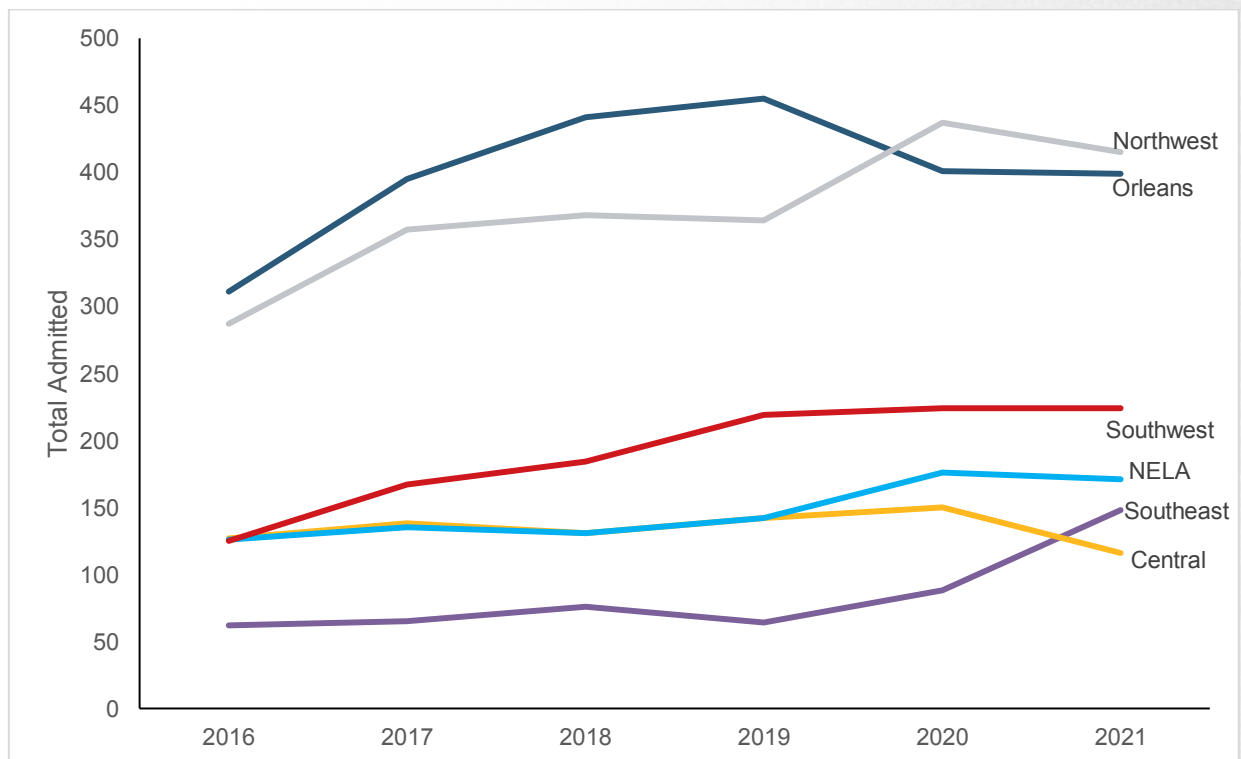


Figure 2. Students admitted to BSN programs by region

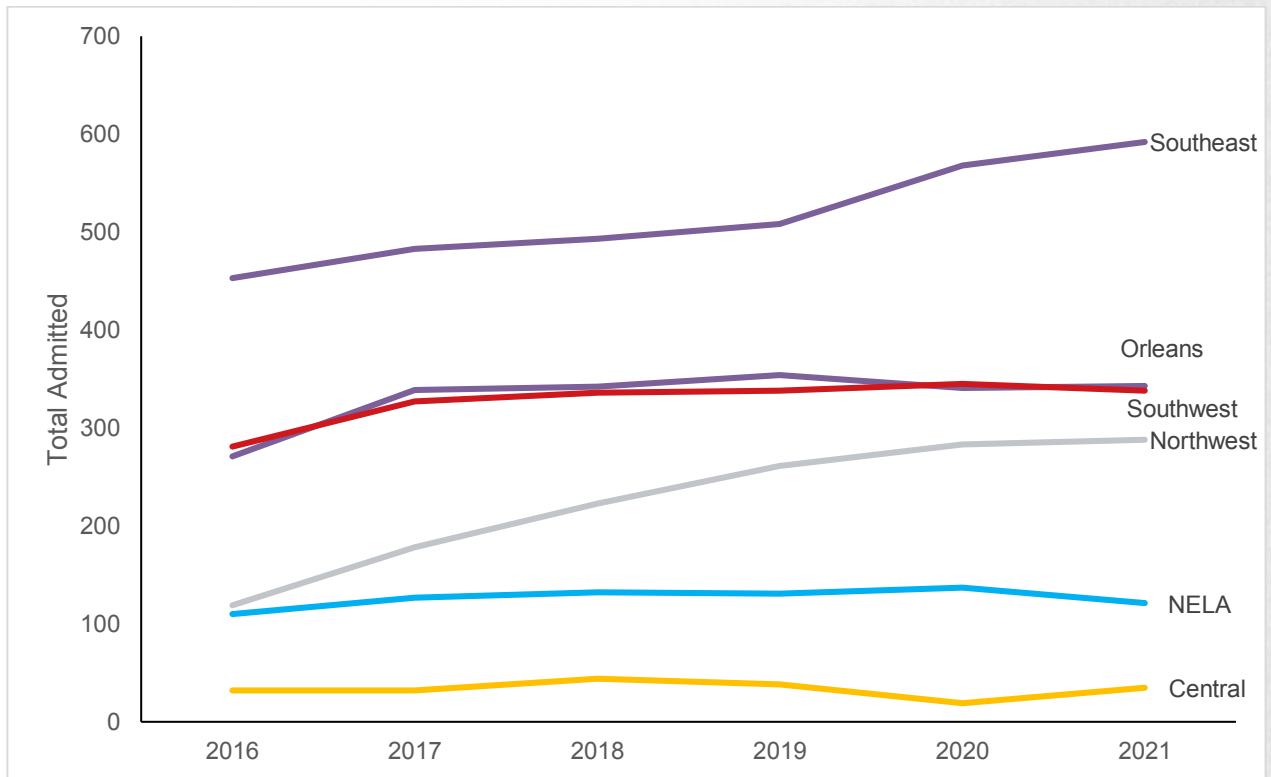
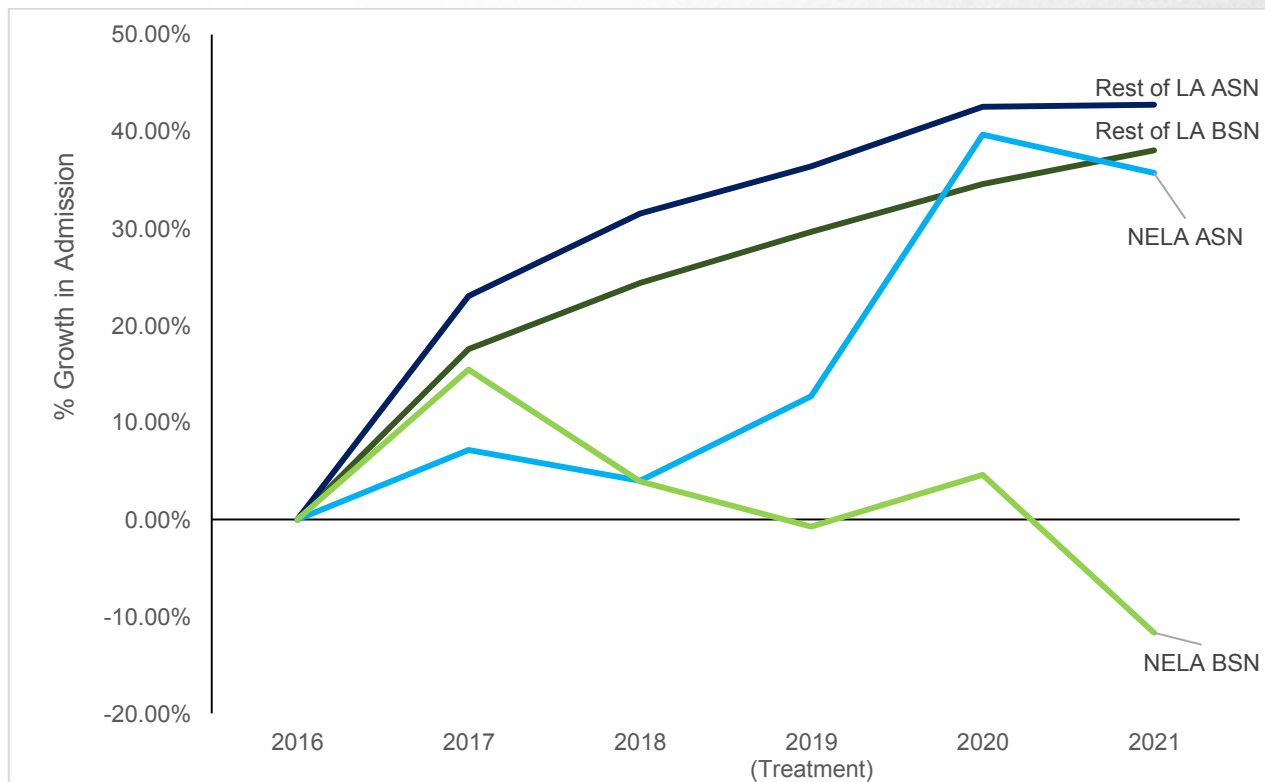


Figure 3 Growth over time in admitted students of NELA programs and the rest of the state ⁴



⁴ The intercept of 0 on the vertical represents the baseline year of 2016, and all scores are calculated as a change (in levels) from the baseline.

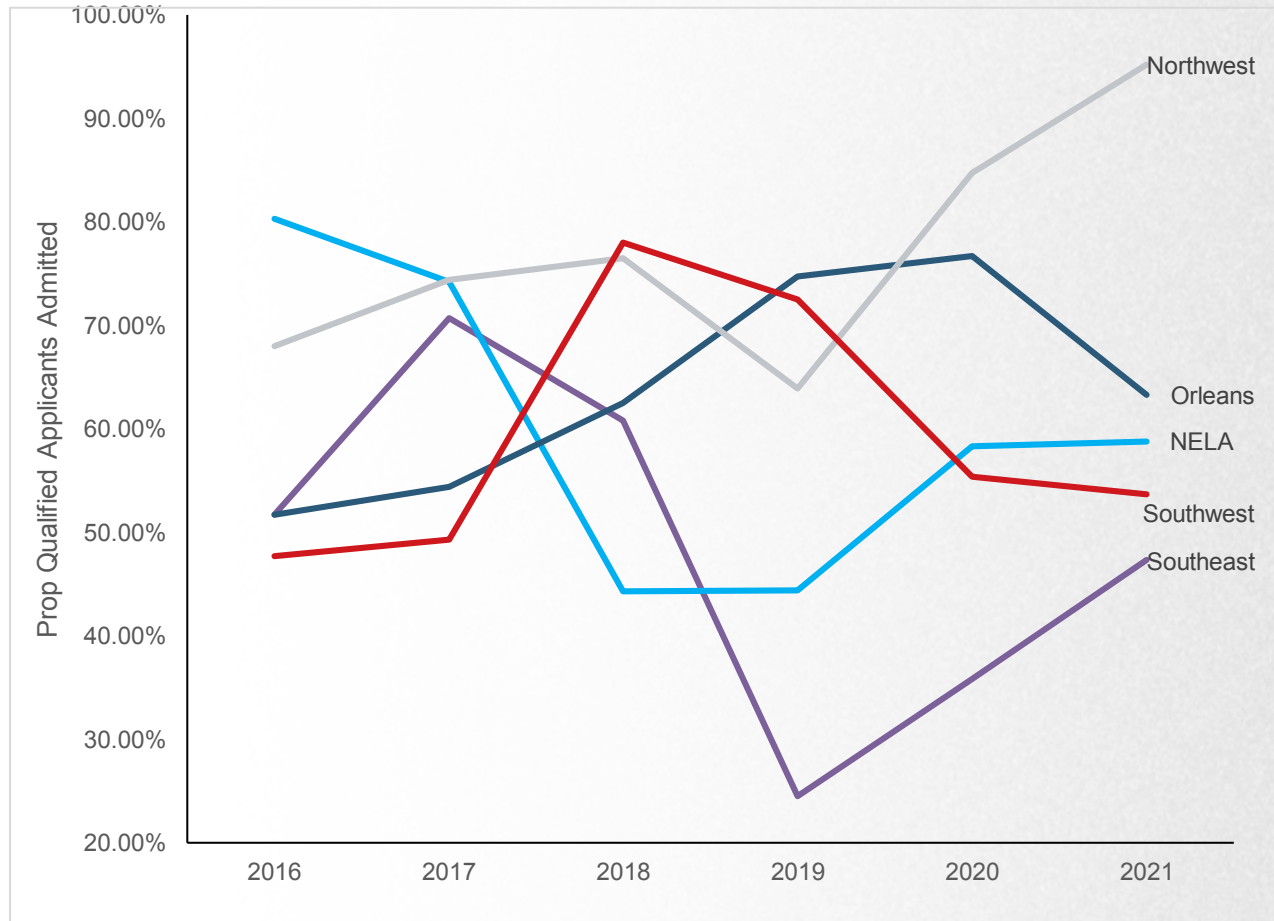
Qualified applicant admission

Admission was also assessed by level of qualified acceptance. Qualified acceptance is the proportion of the qualified students from an applicant pool admitted. The data on qualified acceptance depend on two factors, the size of the applicant pool, and the size of the admitted class from that pool. While an acceptance rate of 100% could indicate a highly efficient program that has resources sized to exactly match the size of the student pipeline, this can indicate that programs are operating at a scale that is larger than the student pipeline can support. On the other hand, a low acceptance rate is an indicate that the program faces either staffing (i.e. faculty) limitations, or physical space constraints.

Figures 4 and 5 show the mean level of qualified applicant acceptance into ASN and BSN programs, respectively. The Northeast region acceptance level for ASN programs was between 44% and 59% of qualified applicants. For BSN programs in the Northeast region, the level dipped in 2018, but remained at 100% afterward. The state average for ASN programs ranged from 63% to 76%. BSN programs in the state ranged between 79% to 87%. Regions varied widely in their acceptance of qualified applicants, but the Northeast region has trended toward the state average.

Lastly the change in qualified applicant acceptance was examined relative to baseline (2016). Results indicated (Figure 6) that the acceptance level of treated programs varied whether the program was ASN or BSN. The BSN treated program appeared to perform at a higher level than ASN programs in the treatment. These data can also be interpreted as BSN program having greater ability to admit more students because of a decline in size of the applicant pool over time. Overall, it appears that program resources did alleviate staffing constraints though the NELA ASN programs continued to exhibit a lower admission rate than the state even after program implementation.

Figure 4 Proportion of qualified applicants admitted to ASN programs⁵



⁵ Central region data were all at 100%, and not shown here in the visualization.

Figure 5 Proportion of qualified applicants admitted to BSN programs

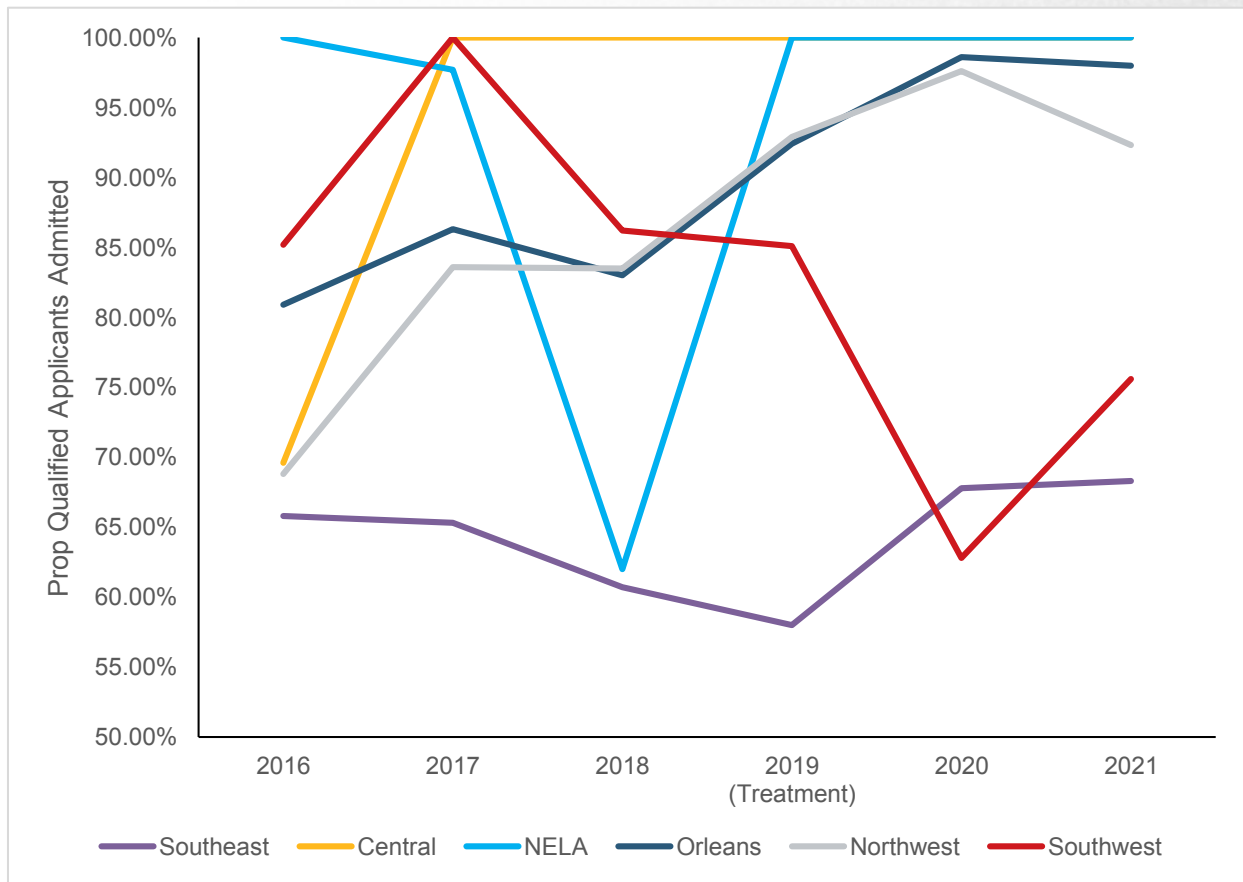
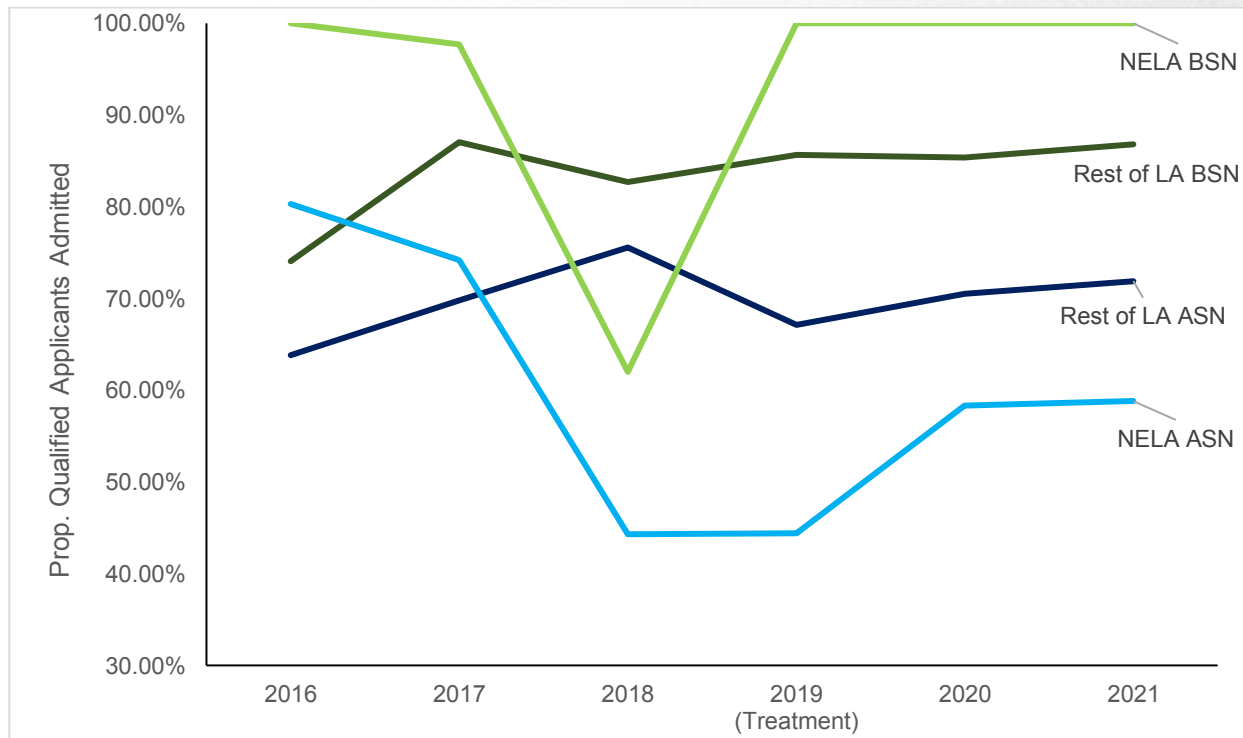


Figure 6 Qualified applicants admitted in NELA programs and the rest of the state



Clinical Course Enrollment

It was expected that treated NELA programs would see an increase in clinical course enrollment. Clinical course enrollment was measured by the total number of students enrolled in pre-RN courses and the total in pre-RN courses who had obtained prior LPN education. The outcome is referred to as pre-RN clinical coursework (see Figures 7 to 10).

Figures 7 and 8 display the trends for enrollment for ASN and BSN programs. The size of enrollment of the Northeast region was lower than half of the regions in the state. In addition, the trends indicate that totals increased over time for most regions. The Orleans region decreased in total enrolled for BSN programs after 2018.

The change in enrollment level (Figure 9) suggests that over time treated programs saw an increase relative to baseline. Further, the treated ASN programs enrolled more students with a prior LPN background over time and exceeded the state average in 2021 (Figure 10). These data tentatively support the trend that treated programs are improving in capacity, and admitting students who would have been turned away to pursue a vocational track/2-year program in lieu of a BSN or more advanced LPN to RN training.

Figure 7. Total enrolled to ASN programs for pre-RN clinical coursework

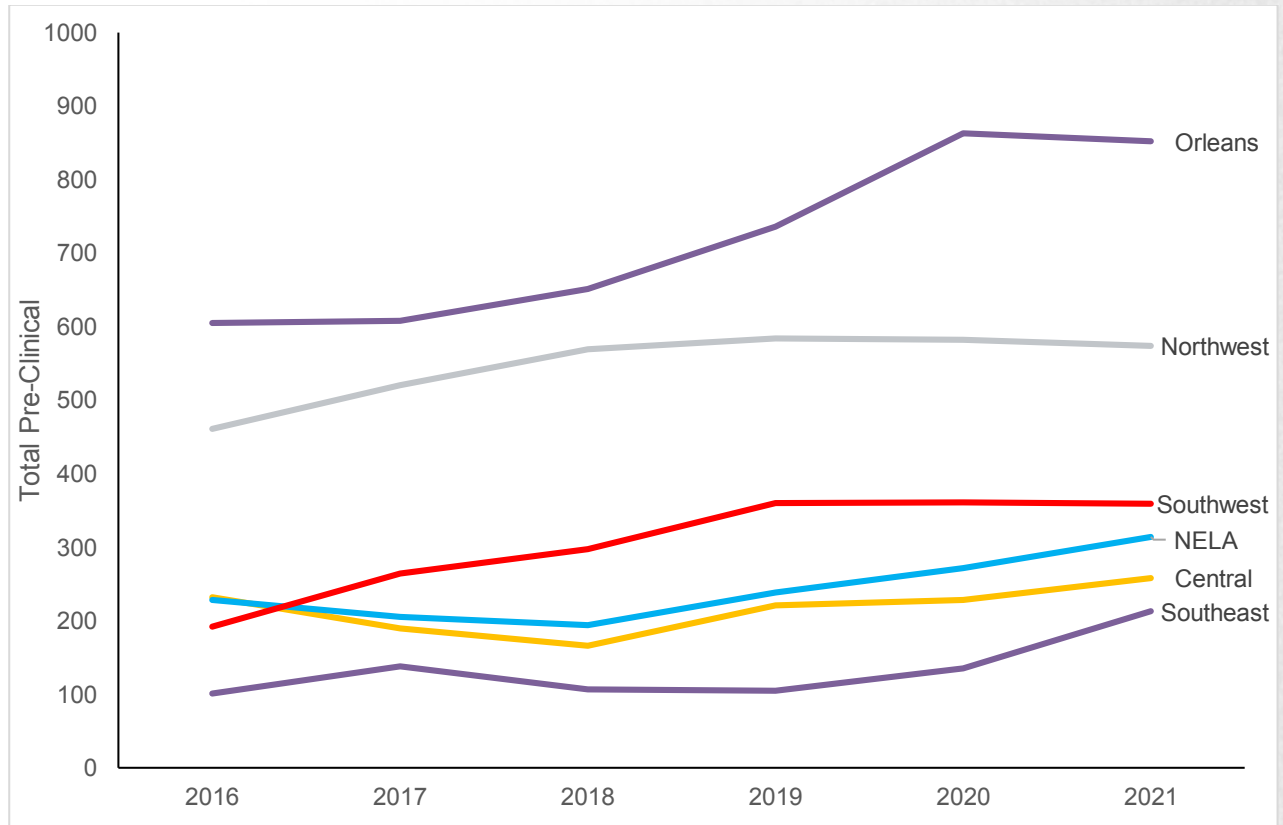


Figure 8 Total enrolled to BSN programs for pre-RN clinical coursework

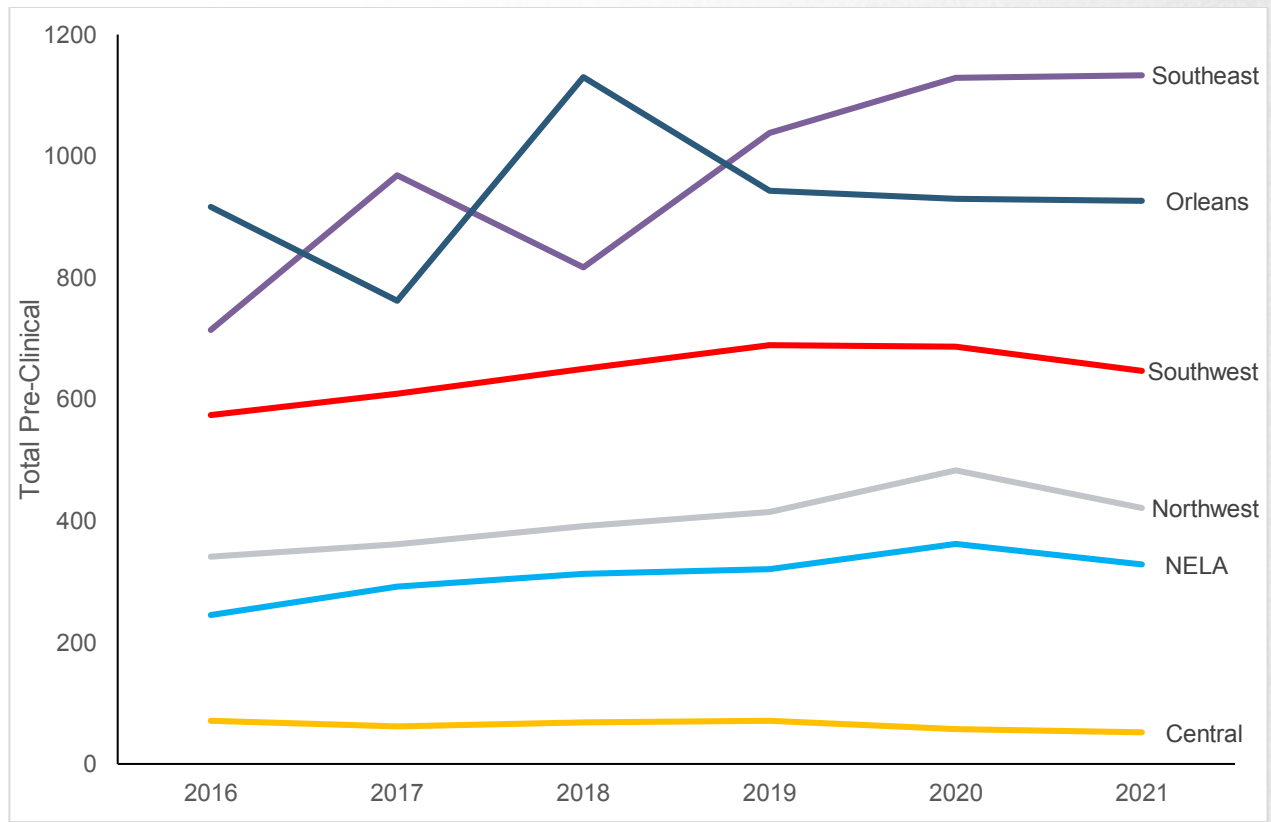
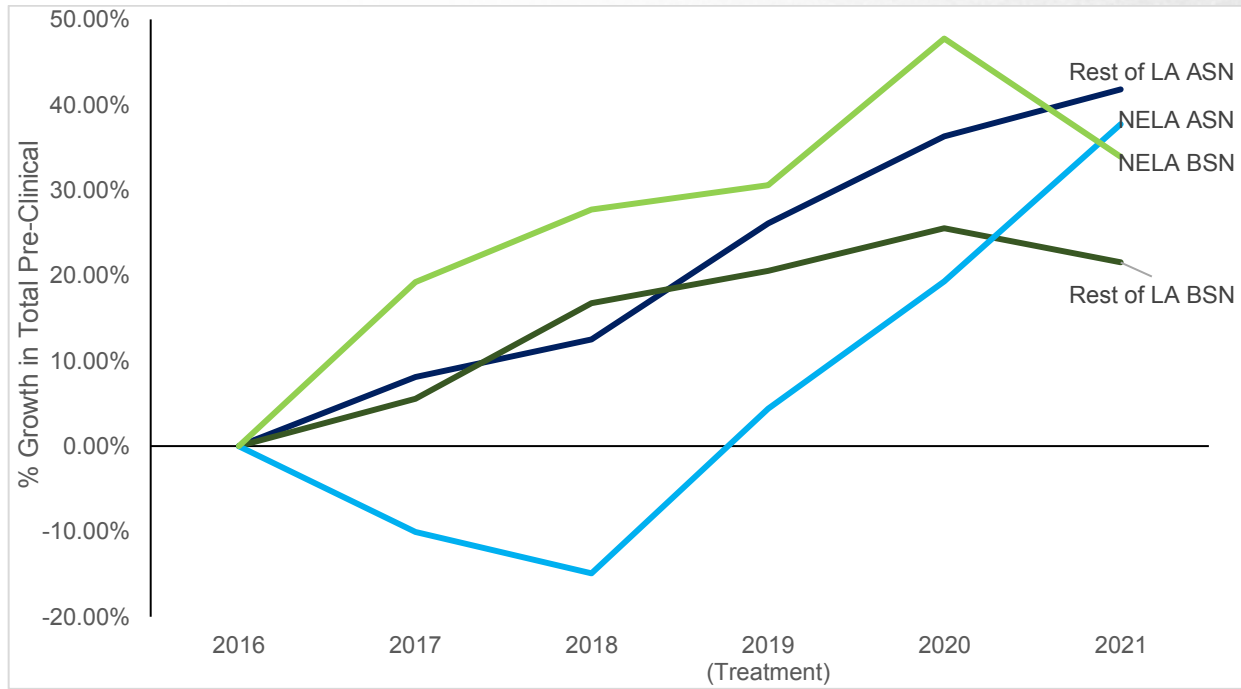
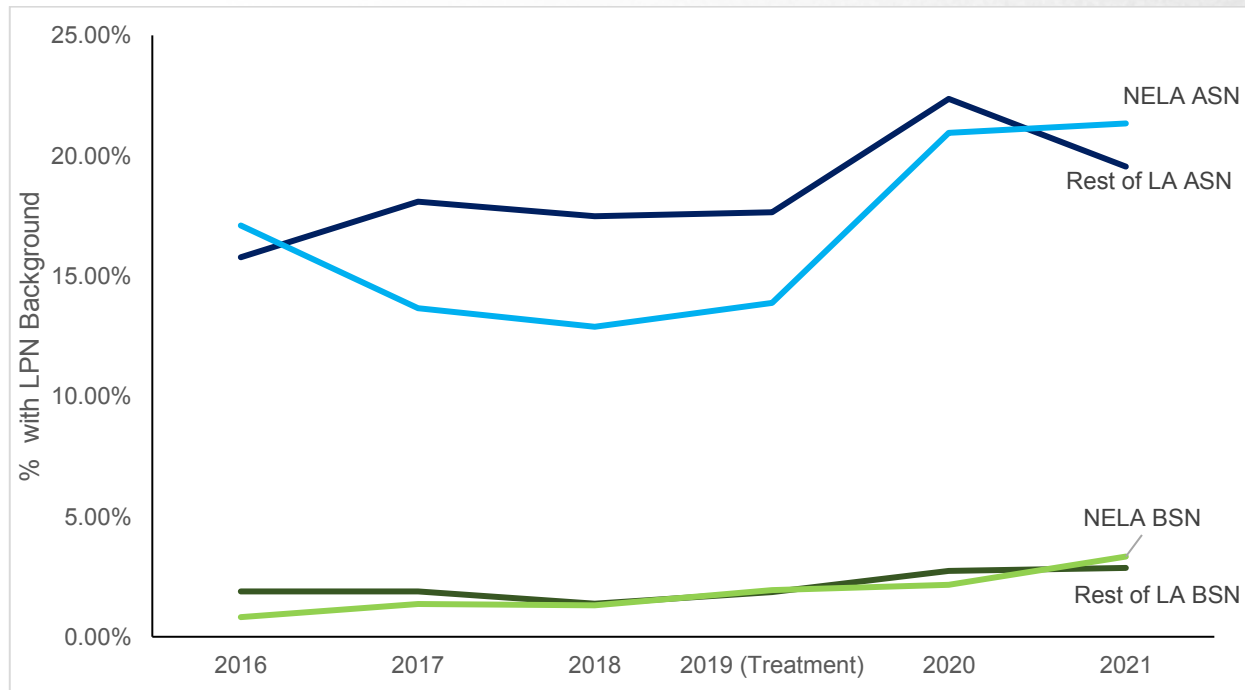


Figure 9 Growth in total students enrolled in pre-RN clinical courses in NELA programs and the rest of the state⁶



⁶ The intercept of 0 on the vertical axis represents the baseline year 2016.

Figure 10 Proportion of pre-RN clinical students with a prior LPN in NELA programs and the rest of the state



Long-term Trends

The following charts capture trends for indicators of graduation and RN production (hypotheses 2a-c). The first increase in size of graduation was expected for NELA programs three years into the project implementation, CY 2021 for ASN programs, and shortly after this for BSN programs. The criteria used to measure RN production was the completion level of the program, new nurses getting licensed, and nurses in the workforce.

Program completion

The total number of completers of each region was examined over time (Figures 11-13). Following program implementation, the Northeast region has produced an uptick in graduates in 2021 and 2022. Further, the completions compared to the state average show that treated programs could see continued positive trending relative to the state average (e.g., Figure 13 data indicate a rise in BSN completion).

Figure 11. Total students completing ASN programs by region

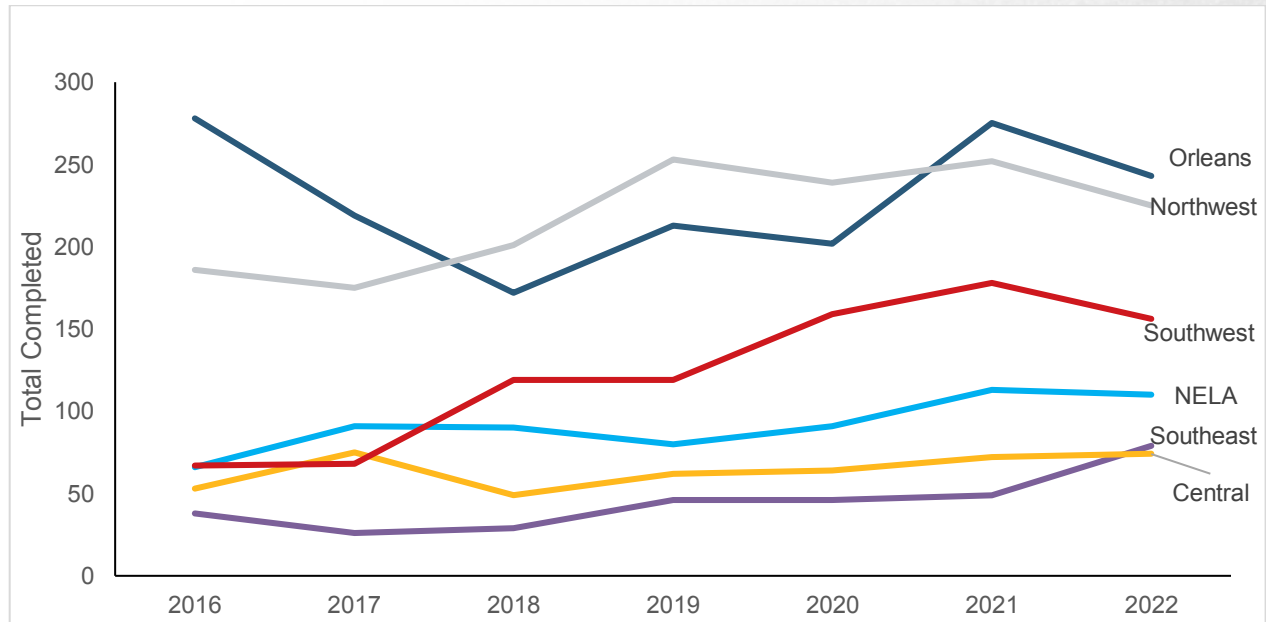


Figure 12 Total students completing BSN programs by region

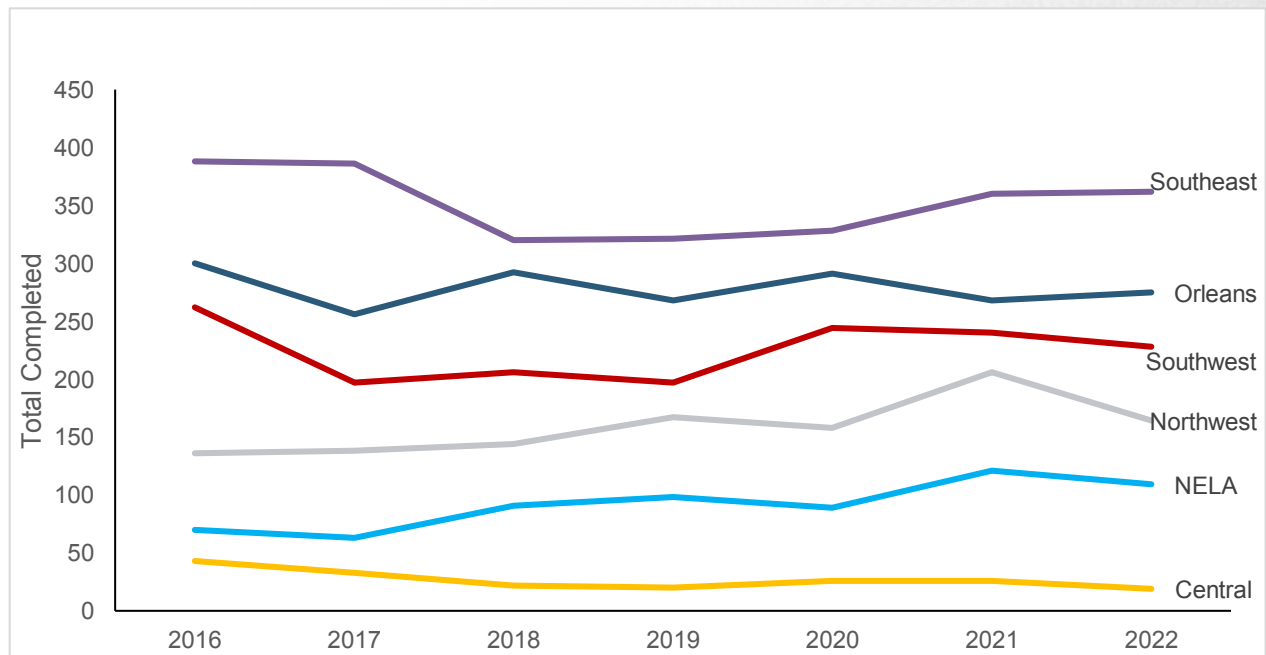
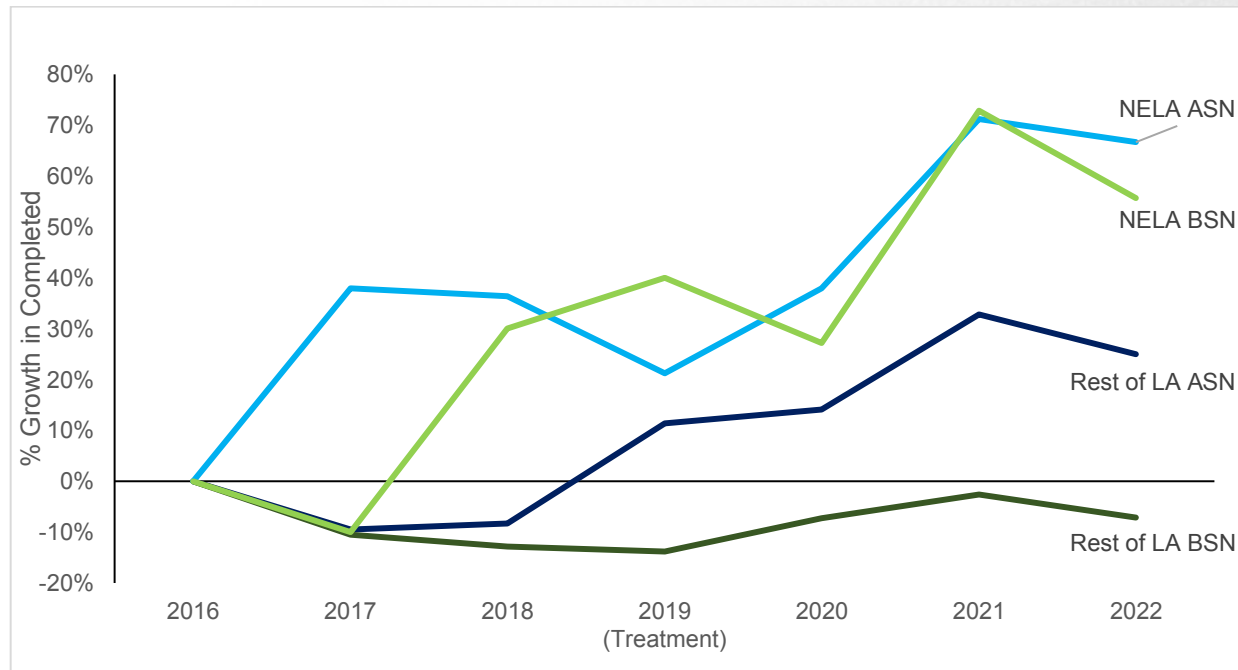


Figure 13 Growth in students completing RN degree programs in NELA and the rest of the state⁷



Licensure attained

Another hypothesis regarding RN production is faculty expansion could help with increasing the number of licensed nurses. The data from yearly NCLEX passing (total number and percentage passing on first attempt) are captured in the following trend analyses (see Figures 14-18). The number passing the exam was chosen because it relates strongly and positively to numbers of new RNs in the workforce (Dillender et al. 2019). The examinee pool was also reviewed and the trends by region are like those based on the number passing.

The total number of examinees across the state passing the NCLEX was between 20 and 240 for ASN programs (Figure 14) and between 12 and 338 for BSN programs (Figure 15). The NELA programs occupied a smaller share of students passing the exam than most regions. In addition, the total number of students passing in the region increased over time. Measuring change relative to baseline, the NELA treated programs grew over time, and this growth was above the rest of the state on performance of the NCLEX (Figure 16).

⁷ The intercept of 0 on the vertical axis represents the baseline year 2016.

Figure 14. Total passing the NCLEX from ASN programs by region

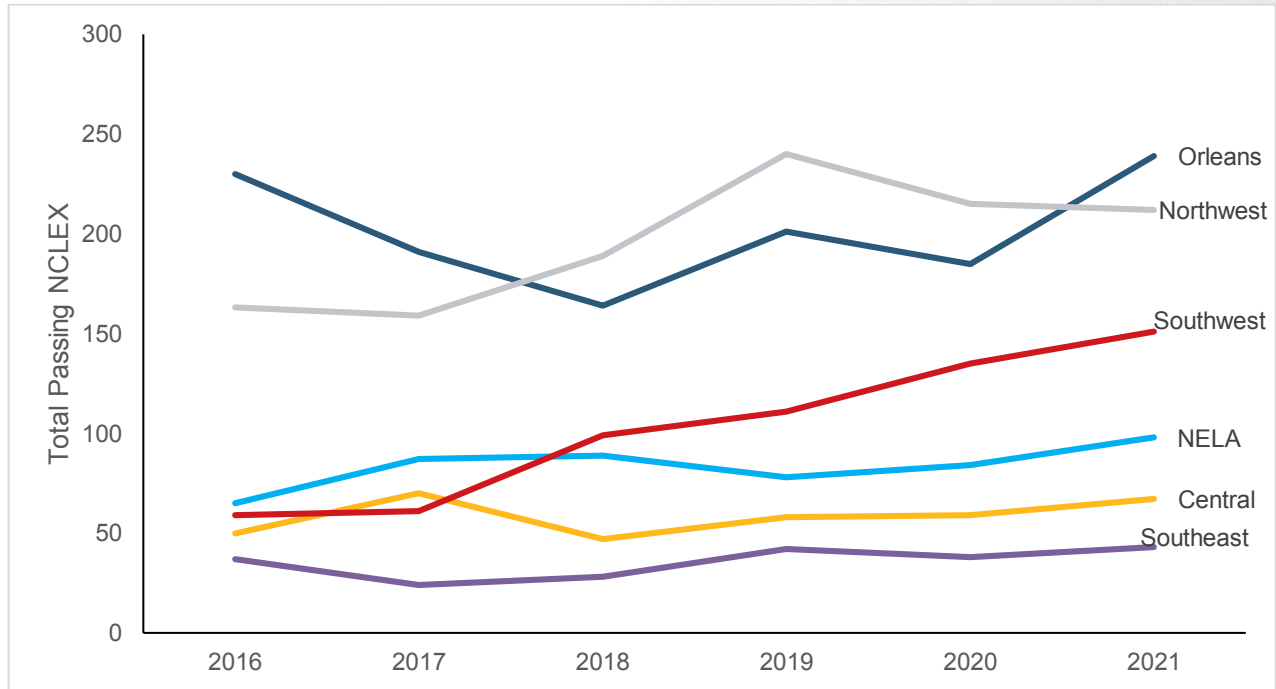


Figure 15 Total passing the NCLEX from BSN programs by region

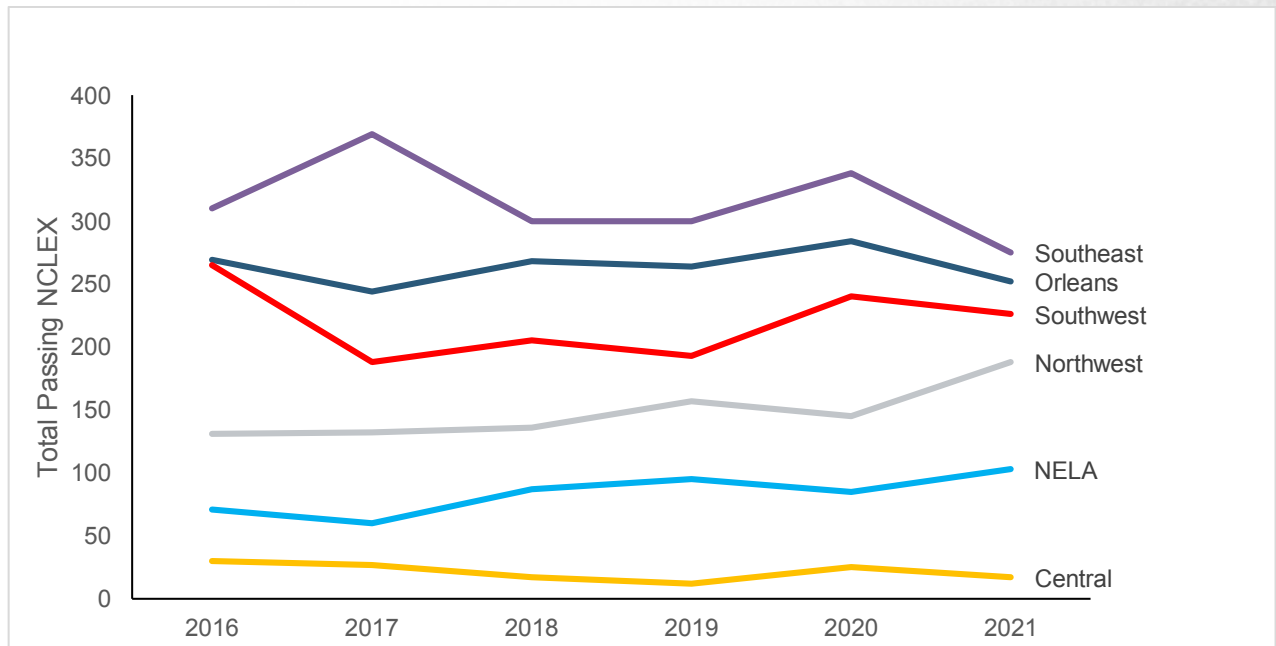
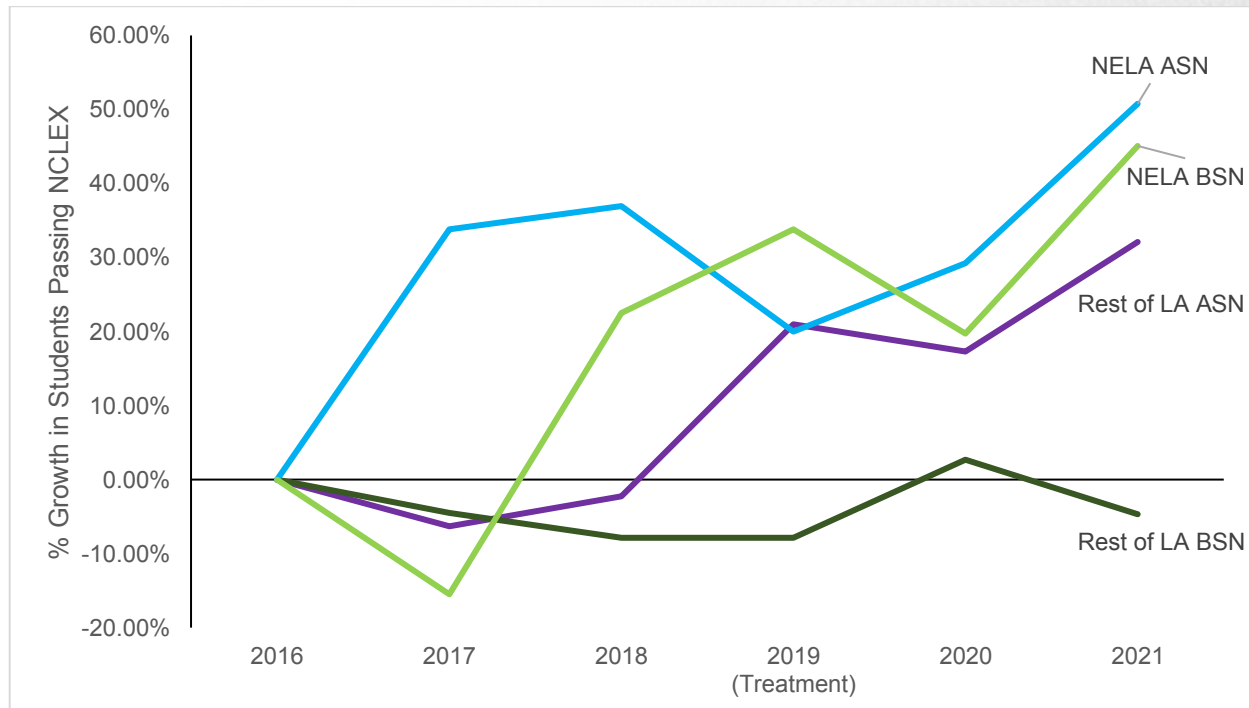


Figure 16. Growth in total students passing NCLEX exam in NELA programs and the rest of the state ⁸



Nursing Workforce and Regional Economic Data

The figures below (see Figures 17-20) are trends capturing employed RNs by region over time. The statistic reported in Figure 19, location quotient, refers to a BLS-based ratio comparing the employment level of a particular area/region with that of the US national workforce for RNs. For example, if a region occupies 10% of the workforce for nursing, and nationally the occupation level is 2%, then the location quotient would be 5. Numbers above 1 indicate higher relative employment levels in a region compared to the national level.

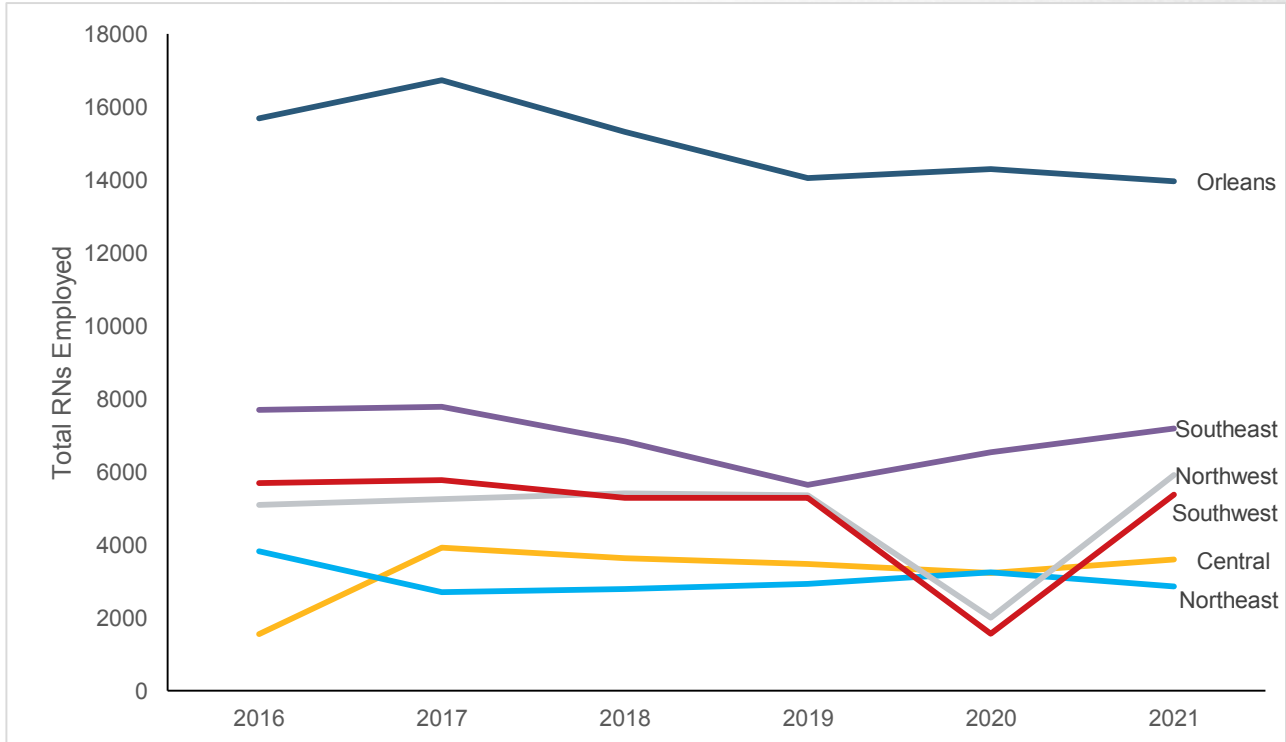
The trends in total RNs employed across regions illustrate a general decline over time in regional employment across the state. In addition, Figure 18 suggests that the employment in the Northeast region is 25% lower than in 2016, while the rest of the state has returned to 2016 levels. In addition, the Northeast region increased slightly in 2020 and 2021. Accounting for size of the workforce (Figure 19), the Northeast region was trending upward until 2020. The region occupied approximately the same level of national RN employment over time.

Another analysis was performed on the location quotient to show the change over time in the metric associated with regional growth of the RN sector. While it was found that the location quotient for the Northeast region was smaller compared to other regions (Figure 19), it was also found to trend upward in 2019 and exceed the rest of the state in 2020 (Figure 20). This result suggests that the workforce was potentially impacted by the concentrated effort to fund RN development in the region though the Northeast region's drop in 2021 suggests the benefit may

⁸ The intercept of 0 on the vertical axis represents the baseline year 2016.

have been short-lived. Workforce data should be tracked for longer to understand the full impacts of the program. The impacts are expected to be apparent only after additional years of data become available due to the lag between program entry and employment as an RN.

Figure 17. Total employment of Registered Nurses by region over time⁹



⁹ Reporting for the SWLA and NWLA regions for 2020 may be under-counting/mismeasured due to COVID-19 pandemic restrictions on data collection.

Figure 18. Growth in RN workforce in the Northeast region and the rest of the state

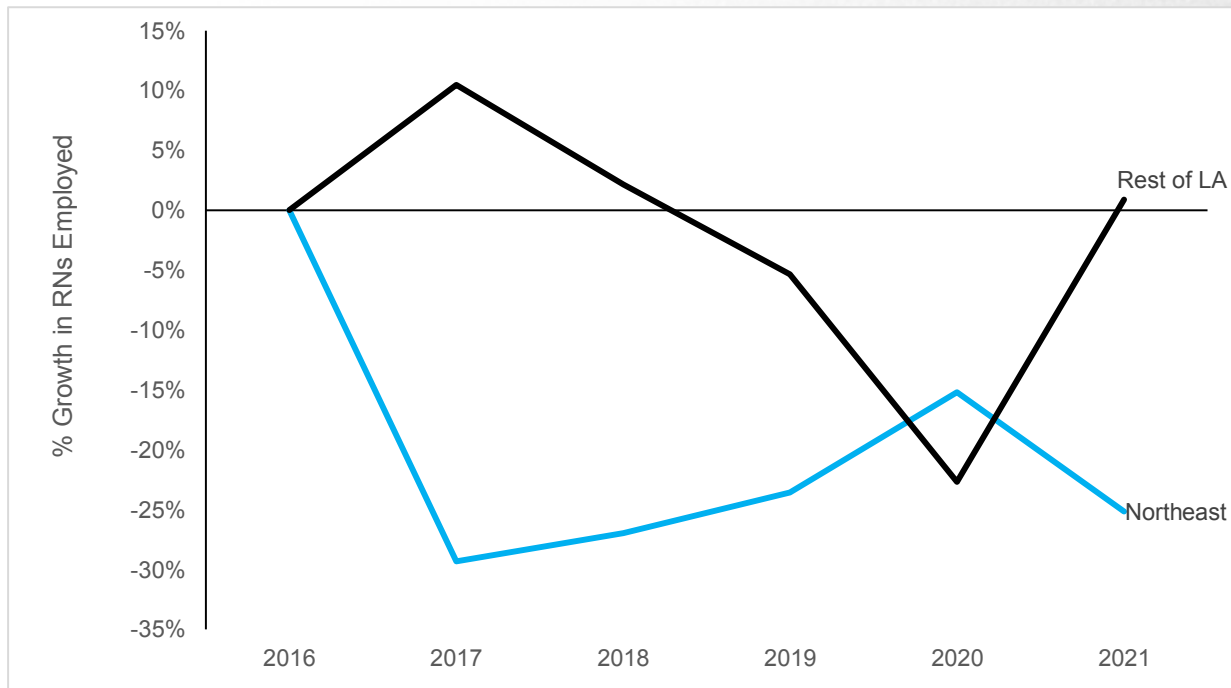


Figure 19. Proportion of Registered Nurses in the region compared to the nation¹⁰

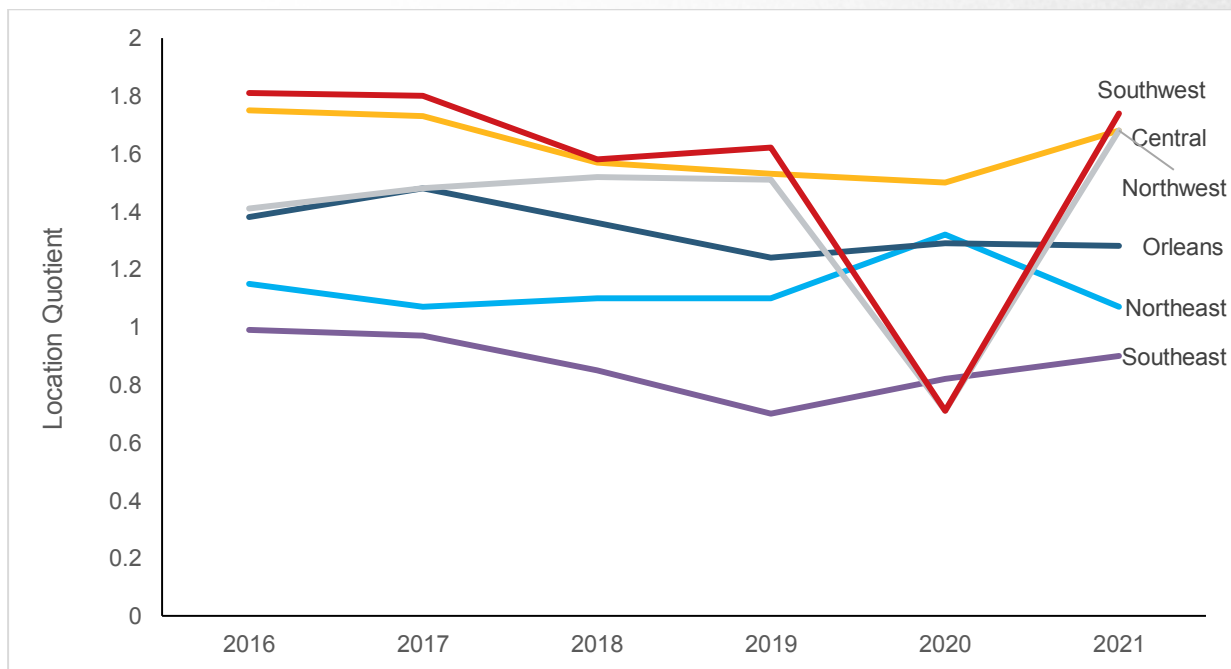
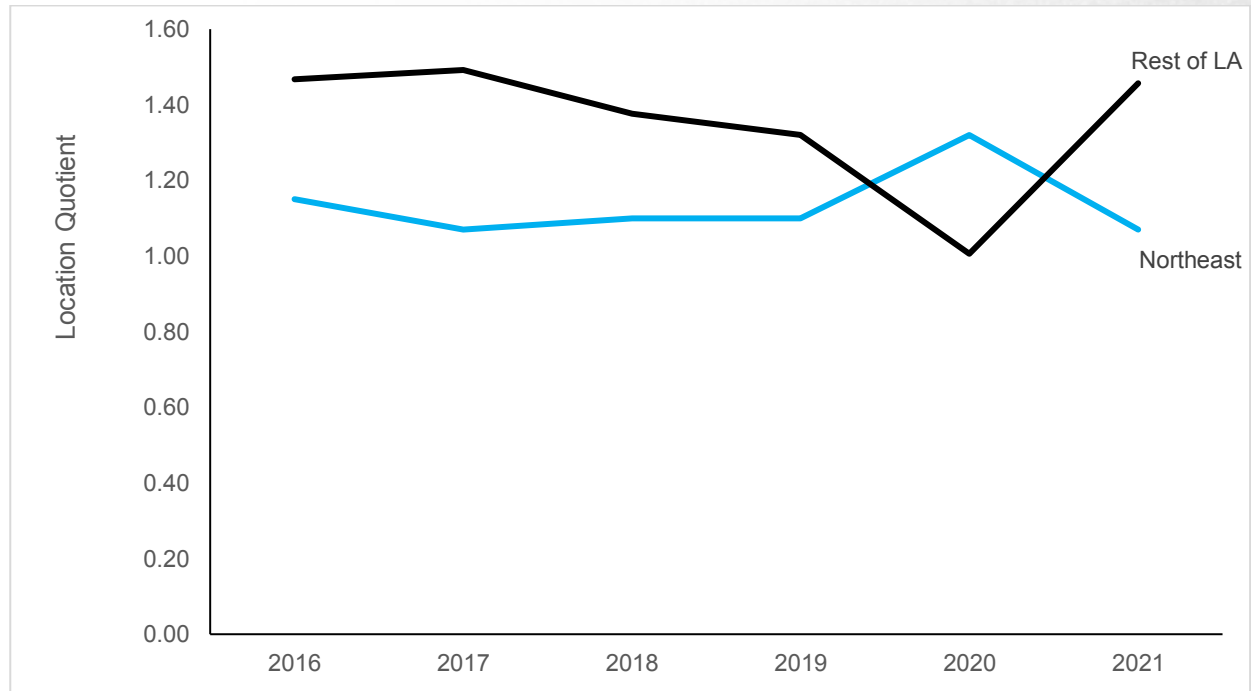


Figure 20 Proportion of nurses in the Northeast region and the rest of the state (compared to the nation)



Program Impact on Faculty and Clinical Sites

The data presented in this section include quantitative and qualitative results aimed at providing context to the trends captured on education and employment. The additional data include total faculty recruited and employed over time and the number of clinical sites added over time. This section also discusses information and insights from interviews with program directors.

Number of faculty teaching nursing programs

The number of faculty positions was examined through the state totals reported (Louisiana State Board of Nursing). The reported totals are budgeted positions by full-time, part-time, and adjunct status, and other sources of funding, which would include the NELA faculty expansion. The addition of faculty in the NELA treated programs appears to have increased the total number of faculty from this source (see Table 1 below).

Exit rate was calculated as the proportion of faculty exits over two consecutive years. A positive percentage relates to a higher exit rate. The vacancy rate was decreasing in the year leading up to implementation, and appeared to recover from a loss after the first period post-implementation (2019-20). However, the final year of observation shows an increased exit rate. Across the state, the rate of vacancy from 2017-2021 decreased over time by 20% for ASN programs and increased 118% for BSN programs (Louisiana State Board of Nursing and Lyon 2022).

¹⁰ 2020 data for the NWLA was missing. It was assumed that the value was like that of SWLA based on the raw total reported in 2020.

Table 1. State Totals for Budgeted Nurse Faculty Positions (Pre-RN Licensure) and Faculty Exits in LA

AY	2016-17		2017-18		2018-19		2019-20		2020-21	
Program Type	ASN	BSN	ASN	BSN	ASN	BSN	ASN	BSN	ASN	BSN
Full-time	136	302	130	325	144	334	152	348	153	323
Part-time/Adjunct	73	120	82	157	94	171	98	174	103	196
Other Funding Source	4	16	5	13	11	18	27	21	27	21
Exit of Faculty ¹¹	6.25%		-24.37%		7.78%		-15.46%		34.15%	
Prior AY Total Exits	112		119		90		97		82	

Skilled nursing clinical sites

Data on healthcare providers were measured by the number of additional clinical/skilled nursing sites added to the region from 2019-2021. The BCBSLA grantees reported a total of 15 additional clinical sites due to the project. To validate this report independently, the number of new clinical sites were counted using BLS data (Census of Employment and Wages). Clinical sites are reported as an estimated average of the number of establishments in an area. Total new establishments for skilled nursing were derived by counting the difference between two successive years (e.g., 6 counted in 2019, 7 in 2020, resulting in 1 new site). The data reported for the Northeast region are reported in the table below (see Table 2). The data indicate an increase in new clinical nursing establishments over time to a level commensurate with the report from BCBS. Note FY 2022 data are not yet available from BLS, which could account for any discrepancy in the totals between grantees report and the BLS data.

¹¹ The relative proportion of faculty exits was calculated as the total # of faculty resignations, retirements, terminations, and other categories excluding leave. The current year is divided over the total for the year prior, and positive numbers equate to increased exit. Data on leave was not available at the ASN/BSN distinction, so it is reported as overall.

Table 2. Total added number of clinical nursing sites in the NELA region from FY 2019-2021 (Bureau of Labor Statistics)

Parish	Total Skilled Sites Added (2019-21)
Ouachita	6
Richland	2
West Carrol	2
Lincoln	1
Jackson	1
Morehouse	1
Caldwell	0
East Carrol	0
Franklin	0
Madison	0
Union	0
Tensas	NR
Total	13

Program Interviews

In addition to the quantitative data presented, the current results also include meetings with the WDB83 members, as well as conversations with 2 nursing program directors in the Northeast region to provide context to the experience of grantee programs. A third ASN program was contacted, but a connection to a former director overseeing faculty expansion there could not be reached. A new program director did not have information on the program activities.

Meetings were held with the WDB83 from Fall 2019 to January 2022. Participants shared that grantees were able to start increasing their total number of students admitted, consistent with evidence reported from agency data. In addition, the participating programs encountered challenges related to COVID-19 as well as competitive pay for travel nursing, and bedside nursing positions.

The participating schools that benefited the most from the program, according to the WDB83, were those which supported their programs with additional funds to bolster the strategies of hiring more faculty and admitting new students.

There were positive impacts noted by program directors. The director of the Louisiana Tech ASN program reported that the grant was “the only reason the program was able to fill 60 seats twice a year, and that before there were only at 40-50 seats.” Further, they were able to admit students

who would have been on the margin of qualified applicants (e.g., a 2.9 GPA). This increase also led to more crowded classroom spaces.

When asked about general efforts to address the faculty shortage, the program director indicated that efforts were needed to increase faculty position pay to approach competitive levels (commensurate with that of bedside nurses), and a focus on improving the hiring process. They reported having difficulty with finding adjuncts, but they were helped by more senior nurses returning to teaching in the clinical setting.

Implementation was hampered during COVID-19 in 2020. Both program directors reported seeing increased burnout among faculty, and those leaving clinical/bedside nursing to find travel/contract labor. The ULM program director also noted larger issues contributed to their challenges, including low passage rate of nursing pre-requisites, poverty, and accessibility to educational resources (e.g., digital learning platforms) impacting students across the university institution.

BCBSLA in Bayou Region

While it is not the main objective of the current evaluation to determine the impact of the similar initiatives in other regions, it is important to capture the emerging results from investments to nursing education. For reference, the results of BCBSLA funded schools including Fletcher are presented in the Appendix (Supplementary Tables A-E).

Discussion

Project Implications

Prior research shows admissions and enrollment are on the rise in the presence of expanded faculty pools (Reinhard and Hassmiller 2009; Ganley and Sheets 2009; Wyte-Lake et al. 2013). The explanation of this trend lies in the increasing of program capacity to accept students. Prior research has reported that the primary vehicle for increasing admissions to programs involves expanding clinical faculty (Wyte-Lake et al. 2013). Many programs involve university-community or university-healthcare institution partnerships, and funding is most often internal to the university. The current program initiated in the Northeast region involved an external funder with universities paying the salaries out of the grant. The unique mechanism of external funding adds support to the idea that healthcare and external partners are increasingly viewing the nursing shortage as a systemic issue requiring cooperative programs.

Expanding program faculty is a viable path forward to providing flexibility and access to education. The increase in admissions and qualified applicant acceptance means that students who would otherwise not have access are admitted and have opportunities to move more quickly into careers in nursing. Programs, especially during the post-COVID 19 environment, are moving to increase flexibility of access to education including online/hybrid environments. Perhaps as a result of greater flexibility in course offerings, or stronger ties to the workforce through adjunct faculty, the NELA programs had more LPNs seeking an RN continue their studies, providing a path to those nurses through flexible training options (e.g., weekend clinical instruction). Program funding could be used to explore the impacts of adding faculty and clinical instructor flexibility to nurses in need of ongoing training, for example, among those nurses who are in the field and who choose to continue their education and advancement.

As expected, faculty expansion does appear to increase RN production. Graduation levels observed suggest an upward trend for the region toward the state graduation level. Data also

suggest that there were different outcomes for ASN and BSN programs. There are additional constraints we could not consider in measuring graduation. ASN and BSN programs have some differences in student population, and the demographics, social, and economic factors of students from different backgrounds can impact program completion. Traditional students entering BSN programs may have fewer impediments to completion, while non-traditional students have interruptions to their education that extend the time to complete or potentially prevent them from going back. It is important however not to overlook the fact that 4-year programs also have non-traditional students (e.g., older, parents, first-generation). It is important to pay attention to the school's local area and regional communities where students reside. Researchers have suggested measuring long-term effects such as completer rate, for example every 6 years with multiple cohorts of data, rather than completion totals by cohort (Blagg and Rainer 2020). Local research-to-policy strategies need to continue exploring which benchmarks help to communicate more nuance to the differences between ASN and BSN programs in regional programs.

The general increase in NCLEX passing suggests program expansion translated into more licensed nurses ready to engage in the workforce. Additional exploratory analysis found that the passage rate declined suggesting that fewer RNs were ready to sit for the licensing exam compared to students who were graduating, however that downward trend was consistent with downward trends seen around the state over the same time period. The Louisiana State Board of Nursing suggests that there was a decline in NCLEX testing overall (Louisiana State Board of Nursing and Lyon 2022). The pandemic may have impacted those trainees who were just about to enter the workforce (i.e., about to take the NCLEX). It may have made it more difficult to take the exam with exam sites closed. Prior research from interviews of students in BSN programs report anecdotally the difficulties of sitting for the NCLEX (e.g., question format, familiarity with how to take it) (Elkins, n.d.), and COVID may have increased this difficulty by making it more difficult for new nurses to persist through the difficulties encountered with the next milestone in their education and training (i.e., lack of support to prepare for the exam, providing digital access to study materials).

Despite the pandemic disruption, the results of program impact on employment are encouraging for the region. Examining the performance in the Northeast region compared to the US (location quotient), the region demonstrated 50% more RNs as a share of the workforce compared to the country as a whole between 2016 and 2021. This is an encouraging trend for the nursing profession. Economic forecasts from BLS indicate that all the top industries supported by nursing will see increases in nursing professionals by 2031 (for more detailed data, see Table A3 in the Appendix).

The current market for nursing faculty presents a different picture. The data in the state suggests that more faculty were leaving teaching positions in the academic years observed. However, this report is at odds with national data. OEWS data show that from May 2019 to 2021 the number of post-secondary teaching positions in nursing programs increased by approximately 8,000 bringing the rate of positions (per 1000) from 0.40 to 0.48 ("May 2019 National Occupational Employment and Wage Estimates" n.d.; "May 2021 National Occupational Employment and Wage Estimates" n.d.). The increased rate of vacancy in Louisiana in nursing instruction may be explained in part by the difficulties program directors reported with regard to hiring and maintaining faculty on clinical rotation. More work is needed to determine how to retain clinical faculty at public/regional institutions.

There were some factors related to RN production which could not be examined directly here, but are worth mentioning. Recent work has suggested that the pandemic deterred new nursing recruits more than nurses with more or higher levels of experience (Lin et al. 2021).

Hospital workforce retention during COVID-19 appeared to relate to resource capacity, as those with more adequate staffing and healthcare benefits survived major losses to the workforce (Aiken et al. 2023). Capacity in hospitals and perhaps an older and more rural workforce may have helped the region to stabilize during the pandemic, but further research is needed.

The faculty adjunct pool in the NELA region has been estimated to make a significant impact, reaching 13,850 individuals in the parishes served (Workforce Development Board SDA-83 2022). The faculty expansion efforts have since started in other regions of the state. The expansion into the Bayou and Orleans regions included building additional infrastructure to teach, as well as adding sources of funding to enhance nursing education. Prior research on funding nursing shortage strategies reinforces that a diversity of approaches and funds (e.g. internal and external) will better support long-term outcomes (Wyte-Lake et al. 2013). With more programs entering into faculty expansion partnerships, and more flexibility in funding the project, the results of the NELA project could attract more policy makers to support the sustainability of the RN faculty workforce.

Conclusion and Recommendations

The nature of the nursing shortage issue is dynamic, and requires multiple strategies and long-term monitoring. Thus it is important to communicate the findings of this work, as well as other evidence-informed recommendations.

The current evaluation shows that faculty expansion pools are related to increased capacity for RN program enrollment. NELA faculty adjunct pools may have also contributed to increased RN production by increasing the number of graduates and NCLEX passing levels, particularly for ASN programs. Employment outcomes were down across the state, though a full picture of the employment impacts may take additional time to emerge. Overall, this evaluation confirmed that implementation of faculty expansion pools could address immediate educational needs in nursing, with potentially enhanced outcomes from long-term strategies. The following recommended strategies are offered:

- Add supports to RNs in the form of continuing education and didactics
- Provide more accessible and flexible options for students completing clinical experiences (e.g., preceptorships).
- Incentivize public institutions and universities that recruit and retain nursing students with funding at the state level based on specific benchmarks.
- Evaluate the programs supporting institutions to expand educational pathways, as in the current report, to provide feedback and accountability to these processes.

Additional strategies that garner support, but further research is needed:

- Increasing mechanisms for education including dual-path or dual-enrollment in high school, universal transfer credit systems, and continuing education (Public Affairs Research Council 2023).
- Examine consequences of lowering minimum credentials of faculty from an MSN to a BSN (e.g., 20% of overall instructor pool need no MSN or be in pursuit of MSN).
- Focus on the variety of field specialties (i.e., the many fields nursing impacts) and highlight the work of under-represented groups within the profession. For example, in addition to having anecdotal evidence from job talks and shadowing of students, educators could include data on the workforce to provide an accurate picture of diversity in the workforce by using this federal data dashboard, the [Nursing Workforce Dashboard \(National Center for Health Workforce Analysis\)](#).

- Assign pre-RN students to advisors to address the planning of benefit losses to help with navigating the path from early/entry level to advanced, avoiding what are known as “benefit cliffs” (Altig et al. 2021).

While not definitive, the metrics presented in this report will with time hopefully provide a more accurate assessment of the program. There are trends toward more programs adopting this approach in Louisiana. This increase highlights the importance of studying regional and local workforce in response to public investment in education and training. As a backdrop, the nursing field in general incurred setbacks with the global COVID-19 pandemic. Thus, the outcomes of the program are more difficult to assess. However, the future presents an opportunity to perform ongoing evaluation with greater rigor, and inform the next steps for nursing leaders in the field.

References

- Aiken, Linda H., and Robyn Cheung. 2008. “Nurse Workforce Challenges in the United States: Implications for Policy.” Paris: OECD. <https://doi.org/10.1787/236153608331>.
- Aiken, Linda H., Robyn B. Cheung, and Danielle M. Olds. 2009. “Education Policy Initiatives to Address the Nurse Shortage in the United States.” *Health Affairs (Project Hope)* 28 (4): w646–56. <https://doi.org/10.1377/hlthaff.28.4.w646>.
- Aiken, Linda H., Jeannie P. Cimioti, Douglas M. Sloane, Herbert L. Smith, Linda Flynn, and Donna F. Neff. 2012. “Effects of Nurse Staffing and Nurse Education on Patient Deaths in Hospitals with Different Nurse Work Environments.” *Medical Care* 49 (12): 1047–53. <https://doi.org/10.1097/MLR.0b013e3182330b6e>.
- Aiken, Linda H., Douglas M. Sloane, Matthew D. McHugh, Colleen A. Pogue, and Karen B. Lasater. 2023. “A Repeated Cross-Sectional Study of Nurses Immediately before and during the COVID-19 Pandemic: Implications for Action.” *Nursing Outlook* 71 (1): 101903. <https://doi.org/10.1016/j.outlook.2022.11.007>.
- Altig, D., E. Illin, A. Ruder, and E. Terry. 2021. “Benefits Cliffs and the Financial Incentives for Career Advancement:” 01–20a. Community and Economic Development Discussion Paper. Federal Reserve Bank of Atlanta. <https://doi.org/10.29338/dp2020-01>.
- American Association of Colleges of Nurses. 2022. “Nursing Schools See Enrollment Increases in Entry-Level Programs, Signaling Strong Interest in Nursing Careers.” <https://www.aacnursing.org/news-information/press-releases/view/articleid/25183/nursing-schools-see-enrollment-increases-in-entry-level-programs>. Accessed March 28, 2023.
- Bienemy, Cynthia. 2015. “Developing a Multi-Regional Statewide Nursing Workforce Forecast Model Requires Innovation and Collaboration.” *Journal of Nursing Regulation* 6 (1): 14–19. [https://doi.org/10.1016/S2155-8256\(15\)30004-1](https://doi.org/10.1016/S2155-8256(15)30004-1).
- Blagg, K., and M. Rainer. 2020. “Measuring Program-Level Completion Rates.” Urban Institute. https://www.urban.org/sites/default/files/publication/101636/measuring_program-level_completion_rates.pdf.
- “BLS Employment Projections.” 2022. Data Dashboard. National Employment Matrix_OCC_29-1141. Accessed January 19, 2023. <https://data.bls.gov/projections/nationalMatrix?queryParams=29-1141&ioType=o>.
- Buerhaus, P. I., D. O. Staiger, and D. I. Auerbach. 2000. “Implications of an Aging Registered Nurse Workforce.” *JAMA* 283 (22): 2948–54. <https://doi.org/10.1001/jama.283.22.2948>.
- Buerhaus, Peter I., David I. Auerbach, Douglas O. Staiger, and Ulrike Muench. 2013. “Projections of the Long-Term Growth of the Registered Nurse Workforce: A Regional Analysis.” *Nursing Economics* 31 (1): 13–17.
- Dillender, Marcus, Andrew Friedson, Cong Gian, and Kosali Simon. 2019. “Does the Healthcare Educational Market Respond to Short-Run Local Demand?” *Economics of Education Review* 73 (December): 101932. <https://doi.org/10.1016/j.econedurev.2019.101932>.
- Elkins, N. n.d. “Failure to Complete BSN Nursing Programs: Students’ Views.” Department of Education. <https://files.eric.ed.gov/fulltext/EJ1252119.pdf>.
- Ganley, Barbara J., and Ingrid Sheets. 2009. “A Strategy to Address the Nursing Faculty Shortage.” *Journal of Nursing Education* 48 (7): 401–5.
- Hall, Linda M., Diane Doran, and George H. Pink. 2004. “Nurse Staffing Models, Nursing Hours, and Patient Safety Outcomes.” *The Journal of Nursing Administration* 34 (1): 41–45. <https://doi.org/10.1097/00005110-200401000-00009>.

- Juraschek, Stephen P., Xiaoming Zhang, Vinoth Ranganathan, and Vernon W. Lin. 2019. "United States Registered Nurse Workforce Report Card and Shortage Forecast." *American Journal of Medical Quality: The Official Journal of the American College of Medical Quality* 34 (5): 473–81. <https://doi.org/10.1177/1062860619873217>.
- Kane, Robert L., Tatyana A. Shamliyan, Christine Mueller, Sue Duval, and Timothy J. Wilt. 2007. "The Association of Registered Nurse Staffing Levels and Patient Outcomes: Systematic Review and Meta-Analysis." *Medical Care* 45 (12): 1195–1204. <https://doi.org/10.1097/MLR.0b013e3181468ca3>.
- Kaufman, K. 2013. "Findings from the Annual Survey of Schools of Nursing, Academic Year 2011-2012." *Headlines from the NLN* 34 (3): 205–6.
- LeBoeuf, C., and D. Vauclin. 2022. "Collaborations to Address the Bayou Region Nursing Shortage." Presented at the BCBS Louisiana Foundation Annual Convening, Baton Rouge, LA, May 6.
- Lin, Yulan, Zhijian Hu, Mahmoud Danaee, Haridah Alias, and Li Ping Wong. 2021. "The Impact of the COVID-19 Pandemic on Future Nursing Career Turnover Intention Among Nursing Students." *Risk Management and Healthcare Policy* 14 (December): 3605–15. <https://doi.org/10.2147/RMHP.S322764>.
- Lopez, Violeta, Judith Anderson, Sancia West, and Michelle Cleary. 2022. "Does the COVID-19 Pandemic Further Impact Nursing Shortages?" *Issues in Mental Health Nursing* 43 (3): 293–95. <https://doi.org/10.1080/01612840.2021.1977875>.
- Louisiana State Board of Nursing, and K. Lyon. 2022. "Nursing Education Capacity in Louisiana 2021." Louisiana Center for Nursing. <http://lcn.lsbn.state.la.us/Portals/0/Documents/2021NurseEdCapacity.pdf>.
- . 2023. "Nursing Education Capacity in Louisiana 2022." Louisiana Center for Nursing. <https://www.lsbn.state.la.us/wp-content/uploads/annual-reports/annualreport2022.pdf>.
- "Loyola Expands Nurse Training in Bayou Region to Bridge Healthcare Shortage." n.d. Accessed April 13, 2023. https://www.loyno.edu/news/aug-05-2020_loyola-expands-nurse-training-bayou-region-bridge-healthcare-shortage.
- "May 2019 National Occupational Employment and Wage Estimates." n.d. Accessed January 20, 2023. https://www.bls.gov/oes/2019/may/oes_nat.htm.
- "May 2021 National Occupational Employment and Wage Estimates." n.d. Accessed January 20, 2023. https://www.bls.gov/oes/current/oes_nat.htm.
- "National Nursing Workforce Study." 2022. NCSBN. Accessed July 10, 2023. <https://www.ncsbn.org/research/recent-research/workforce.page>.
- Needleman, Jack, Peter Buerhaus, Soeren Mattke, Maureen Stewart, and Katya Zelevinsky. 2002. "Nurse-Staffing Levels and the Quality of Care in Hospitals." *The New England Journal of Medicine* 346 (22): 1715–22. <https://doi.org/10.1056/NEJMsa012247>.
- Peters, Micah. 2023. "Time to Solve Persistent, Pernicious and Widespread Nursing Workforce Shortages." *International Nursing Review* 70 (2): 247–53. <https://doi.org/10.1111/inr.12837>.
- Public Affairs Research Council, dir. 2023. *The PAR Perspective: Scrambling for Health Workers*. <https://www.youtube.com/watch?v=DpZ0p47Vlp8>.
- Reinhard, Susan C., and Susan B. Hassmiller. 2009. "Partners in Solutions to the Nurse Faculty Shortage." *Journal of Professional Nursing: Official Journal of the American Association of Colleges of Nurses* 25 (6): 335. <https://doi.org/10.1016/j.profnurs.2009.10.005>.
- "Skilled Nursing Clinical Site by Age Groups (2019-22)." n.d. Data Dashboard. Labor Force Statistics from the Current Population Survey. Accessed September 8, 2022. <https://beta.bls.gov/dataViewer/view/90e2bdf1097348af87c8246317acd60f>.
- Workforce Development Board SDA-83. 2022. "Louisiana Foundation Final Report of BCBS NELA Nursing Faculty Adjunct Project." 5627.
- Wyte-Lake, Tamar, Kim Tran, Candice C. Bowman, Jack Needleman, and Aram Dobalian. 2013. "A Systematic Review of Strategies to Address the Clinical Nursing Faculty Shortage." *Journal of Nursing Education* 52 (5): 245–52. <https://doi.org/10.3928/01484834-20130213-02>.
- Yakusheva, Olga, Richard Lindrooth, and Marianne Weiss. 2014. "Economic Evaluation of the 80% Baccalaureate Nurse Workforce Recommendation: A Patient-Level Analysis." *Medical Care* 52 (10): 864–69. <https://doi.org/10.1097/MLR.000000000000189>.
- Zhang, Xiaoming, Daniel Tai, Hugh Pforsich, and Vernon W. Lin. 2018. "United States Registered Nurse Workforce Report Card and Shortage Forecast: A Revisit." *American Journal of Medical Quality: The Official Journal of the American College of Medical Quality* 33 (3): 229–36. <https://doi.org/10.1177/1062860617738328>.

Appendices: Supplemental Tables

Table 31. List of Evaluation Metrics and Data Sources

Indicator	Indicator Description	Source
Nursing Discipline	RN or LPN/LVN program designation	Board of Regents; Louisiana State Nursing Workforce Board
Degree	BSN or ASN designation	Board of Regents; Louisiana State Board of Nursing
Bridge	Program is an LPN-RN track	Board of Regents
Enrollment	Total enrolled in nursing program	Board of Regents
	Degree listed in nursing program	Board of Regents
	Number of qualified student applicants	Louisiana State Board of Nursing
	Number of qualified student applicants accepted	Louisiana State Board of Nursing
	Total student enrollment at the school	Board of Regents
	Students enrolled in pre-RN clinical courses	Louisiana State Board of Nursing
	Students in pre-RN clinical courses with a prior LPN	Louisiana State Board of Nursing
Graduates	Completers from nursing programs	Board of Regents; Louisiana State Board of Nursing
	Number of licensures attained upon graduation	Louisiana State Board of Nursing
	Program attrition rate (over 3 years)	BCBSLA Foundation grant report
Licensure	NCLEX passing total and %	Louisiana State Board of Nursing

Employment & Labor	Number employed as nurses in state and region	BLS-Occupational Employment Statistics
	Location quotient	BLS-Occupational Employment Statistics
	Ranked employment sectors of nurses	BLS-National Employment Matrix
	Average number of nursing facilities (skilled nursing establishments)	Bureau of Labor Statistics (Quarterly Census of Employment Wages)
	Number of new adjunct faculty transitioning to full time faculty	BCBSLA Foundation grant report
	Number of full time and part-time/adjunct faculty entering and exiting workforce	Louisiana State Board of Nursing; BCBSLA Foundation grant report; BLS-OES (state-wide)
Addressing shortage	Program addressed the workforce shortage	Researcher artifact website and phone interview

Table A2. Population of Areas Served by Louisiana Workforce Commission (WDB83)

Area	2020 Census Population
Northeast Region	
Ouachita Parish	160,368
Lincoln Parish	47,196
Morehouse Parish	25,398
Union Parish	22,330
Richland Parish	20,192
Franklin Parish	20,156
Jackson Parish	15,902
Madison Parish	11,161
West Carroll Parish	10,982
Caldwell Parish	9,960
East Carroll Parish	7,037
Tensas Parish	4,462
Total	355,144

Table A3. Ranking of industry and occupations employing Registered Nurses in the US

Ranking	Industry Title	2021 Employment	2021 Cumulative % of RN Occupation	2021 Cumulative % of RNs in Industry
1	Healthcare and social assistance	2,656,500	84.9	12.6
2	Hospitals; state, local, and private	1,885,600	60.2	30.4
3	General medical and surgical hospitals; state, local, and private	1,764,200	56.4	31.3
4	General medical and surgical hospitals; private	1,502,300	48	31.9
5	Ambulatory healthcare services	563,000	18	7.1
⋮				
22	Temporary help services	68,000	2.2	2.3
33	Jr colleges, colleges, universities, and prof schools; state, local, and private	32,900	1.1	0.7

Note. These rankings are based on the totals reported in the table for 2021 employment of the National Employment Matrix (NEM OCC, <https://data.bls.gov/projections/nationalMatrix?queryParams=29-1141&ioType=o>). The %s are cumulative with the rankings, meaning that if all were included in the table, it would account for all the nursing occupation and the industry."

Table Continued.

Ranking	Industry Title	Projected 2031 Employment	Projected 2031 Cumulative % of RN Occupation	Projected 2031 Cumulative % of RNs in Industry	Employment Change, 2021-2031	Employment % Change, 2021-2031
1	Healthcare and social assistance	2,834,100	85.2	11.9	177.6	6.7
2	Hospitals; state, local, and private	1,974,200	59.4	30.2	88.6	4.7
3	General medical and surgical hospitals; state, local, and private	1,836,900	55.2	31.2	72.8	4.1
4	General medical and surgical hospitals; private	1,574,300	47.3	31.8	72.1	4.8
5	Ambulatory healthcare services	642,400	19.3	7.1	79.4	14.1
⋮						
22	Temporary help services	74,200	2.2	2.5	6.2	9.1
33	Jr colleges, colleges, universities, and prof schools; state, local, and private	36,000	1.1	0.7	3.1	9.4

Note. These rankings are based on the totals reported in the table for 2021 employment of the National Employment Matrix (NEM OCC, <https://data.bls.gov/projections/nationalMatrix?queryParams=29-1141&ioType=o>). The %s are cumulative with the rankings, meaning that if all were included in the table, it would account for all the nursing occupation and the industry.

Results of BCBSLA programs including Fletcher/Bayou Region

Table B1. Total qualified applicant (QA) and admitted students

Program	QA 2016	QA 2017	QA 2018	QA 2019	QA 2020	QA 2021
LA Tech ASN	74	91	186	185	174	171
Admitted	74	91	88	95	106	104
LDCC ASN	83	91	110	135	128	120
Admitted	52	44	43	47	70	67
ULM BSN	110	130	209	125	109	82
Admitted	110	127	128	125	109	82
Fletcher ASN	54	87	61	48	78	40
Admitted	20	21	20	20	32	36

Table B2. Proportion of QA pool admitted

Program	2016	2017	2018	2019	2020	2021
LA Tech ASN	100.00%	100.00%	47.30%	51.40%	60.90%	60.80%
LDCC ASN	62.70%	48.40%	39.10%	34.80%	54.70%	55.80%
ULM BSN	100.00%	97.70%	61.20%	100.00%	100.00%	100.00%
Fletcher ASN	37.00%	24.10%	32.80%	41.70%	41.00%	90.00%
BCBS Avg.	74.92%	67.55%	45.10%	56.96%	64.16%	76.66%
LA ASN Avg.	69.59%	72.04%	79.77%	72.30%	71.10%	76.34%
LA BSN Avg.	77.26%	84.86%	80.71%	81.16%	79.22%	81.64%

Table B3. Students (% of total) enrolled in pre-clinical courses with prior background (NELA and Bayou programs)

	% Prior Health					
CY	2016	2017	2018	2019	2020	2021
ASN Avg.	3.53	7.3	11.98	6.32	4.03	5.71
BSN Avg.	3.96	1.57	1.03	2.52	2.36	1.95
BCBS Avg.	1.18	1.13	11.6	8.55	4.2	7.4
	% Prior LPN					
CY	2016	2017	2018	2019	2020	2021
ASN Avg.	15.42	20.21	19.52	20.13	25.03	23.12
BSN Avg.	2.69	2.59	2.94	3.27	3	3.74
BCBS Avg.	10.4	10.95	10.7	13.4	22.58	21.42

Table B4. Program completion

Program	CY 2016	CY 2017	CY 2018	CY2019	CY 2020	CY 2021	CY 2022 Proj.	6-yr Rate
LA Tech ASN	37	47	60	53	52	76	66	54.17
ULM BSN	70	63	91	98	89	114	113	87.5
LDCC ASN	29	44	30	27	39	37	59	34.33
Fletcher ASN	11	11	17	14	15	25	32	15.5
BCBS Avg.	36.75	41.25	49.5	48	48.75	63	67.5	47.88
LA ASN Avg.	77.75	70.35	69.63	83.88	84.63	98.75	110.38	80.83
LA BSN Avg.	107.75	98.42	98	99	105.33	113.25	117.18	103.63

Table B5. NCLEX passing totals

Program	Number Passing 2016	Number Passing 2017	Number Passing 2018	Number Passing 2019	Number Passing 2020	Number Passing 2021
Fletcher ASN	10	9	15	13	13	22
LA Tech ASN	36	47	59	52	47	66
ULM BSN	70	60	87	95	85	103
LDCC ASN	29	40	30	26	37	32
BCBS Avg.	36.25	39	47.75	46.5	45.5	55.75
LA ASN Avg.	55.81	54.63	56.18	72.44	70.22	79.11
LA BSN Avg.	96.83	93.25	92.08	93.81	105.45	99.63