

The Graduate Nurse Education Demonstration Project: Final Evaluation Report



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Acronyms

Adult Gerontological Clinical Nurse Specialist (AGCNS)

Adult Gerontological Nurse Practitioner (AGNP)

Advanced Practice Registered Nurse (APRN)

Affordable Care Act (ACA)

American Association of Colleges of Nursing (AACN)

Baseline Year (BY)

Centers for Medicare & Medicaid Services (CMS)

Certified Nurse-Midwife (CNM)

Clinical Nurse Specialist (CNS)

Community-Based Care Setting (CCS)

Contracting Officer's Representative (COR)

Demonstration Year (DY)

Difference-In-Differences (DID)

Doctor of Nursing Practice (DNP)

Duke University Hospital (DUH)

Family Nurse Practitioner (FNP)

Federally Qualified Health Center (FQHC)

Full-Time Equivalent (FTE)

Gateway to Care (GTC)

Graduate Nurse Education (GNE)

Health Resources and Services Administration (HRSA)

HonorHealth Scottsdale Osborn Medical Center (SHC-O)

Hospital of the University of Pennsylvania (HUP)

Master of Science in Nursing (MSN)

Memorial Hermann-Texas Medical Center (MH)



Neonatal Clinical Nurse Specialist (NCNS)

Neonatal Nurse Practitioner (NNP)

Nurse Practitioner (NP)

Pediatric Nurse Practitioner (PNP)

Physician Assistant (PA)

Psychiatric Mental Health Nurse Practitioner (PMHNP)

Report to Congress (RTC)

Rush University Medical Center (RUMC)

School of Nursing (SON)

Women's Health Nurse Practitioner (WHNP)

Executive Summary

Overview and Purpose of the Report

Both clinical and didactic education are required for Advanced Practice Registered Nurse (APRN) students to graduate. The Graduate Nurse Education (GNE) demonstration project was mandated under section 5509 of the Patient Protection and Affordable Care Act of 2010, Pub. L. 111-148, to focus on just the clinical education of additional APRN students. The GNE demonstration project involved the Centers for Medicare & Medicaid Services (CMS) providing payments to five eligible hospitals, each of which partnered with schools of nursing (SONs), community-based care settings (CCSs), and other hospitals (CCSs and other hospitals are collectively referred to as clinical education sites) to expand clinical education for additional APRN students. Authorized by the Patient Protection and Affordable Care Act, the GNE demonstration project was designed to test whether payments for clinical education increased the number of APRN student graduates from SONs, with the ultimate aim of increasing the supply of primary care providers to meet growing U.S. demand.

The Affordable Care Act also required an independent evaluation of the demonstration project. This report presents findings of that evaluation. The primary purpose of this report is to update the previous GNE demonstration project evaluation reports,^{1,2} which covered the first four demonstration years (2012–2015), with results from the last two demonstration years (2016–2017) and the Closeout Period³ (2018).⁴ In addition, this report presents the impacts of the full demonstration project, across all demonstration years.

Along with updating findings from the previous reports, this report describes an additional evaluation activity undertaken to understand more about APRNs in the healthcare workforce. The goal of the APRN Alumni Case Study was to examine whether APRN alumni affiliated with the GNE demonstration project had pursued employment within CCSs after graduation, and to understand the employment choices of APRNs after graduation more broadly.

¹ CMS, Center for Medicare and Medicaid Innovation (CMMI). (2017, October). *Evaluation of the GNE Demonstration Project, Volume 1: Implementation and Impact*. Retrieved from <https://innovation.cms.gov/files/reports/gne-rtc-vol1.pdf>

² CMS, CMMI. (2017, October). *Evaluation of the GNE Demonstration Project, Volume II: Demonstration Costs*. Retrieved from <https://innovation.cms.gov/files/reports/gne-rtc-vol2.pdf>

³ Results for the Closeout Period are reported in the body of the report for the qualitative and cost analyses, but not the quantitative impact analyses.

⁴ Demonstration project results for 2012 through 2015 can be found in the *Evaluation of the GNE Demonstration Project Volume I: Implementation and Impact*, the *Evaluation of the GNE Demonstration Project Volume II: Demonstration Costs*, and the *Evaluation of the Graduate Nurse Education Demonstration Project: Report to Congress*. Results in these previous reports are not included in detail in this report

Legislative Summary

The GNE demonstration project was established by section 5509 of the Patient Protection and Affordable Care Act of 2010, Pub. L. 111-148, which amended title XVIII of the Social Security Act by adding 42 U.S.C. 1395ww note.⁵ Section 5509 appropriated \$50 million for each fiscal year from 2012 through 2015 without fiscal year limitation. Under this demonstration, CMS was authorized to provide payments to up to five eligible hospitals⁶ for the reasonable costs they incurred in providing qualified clinical education to additional APRN students. The statute required that awardee hospitals enter into an agreement with non-hospital CCSs and SONs for the provision of qualified education. The statute emphasized primary care by requiring that at least half of the clinical education be provided in non-hospital CCSs, although this requirement was waived for hospitals in rural or medically underserved areas.

The statute also required a Report to Congress (RTC)⁷ based on the evaluation of the GNE demonstration project, no later than October 17, 2017, which was completed and is available to the public on the CMS website. The RTC provided an analysis of the following: (1) the growth in the number of APRNs with respect to a baseline period as a result of the demonstration project; (2) the growth for several APRN specialties—clinical nurse specialist, nurse practitioner, certified registered nurse anesthetist, and certified nurse-midwife;⁸ (3) the costs to the Medicare program under title XVIII of the Social Security Act as a result of the demonstration project; and (4) other items the Secretary determined appropriate and relevant.

Background

By 2025, the United States will need an additional 23,640 primary care physician provider full-time equivalents to meet growing demands associated with expanded access to insurance due to the Affordable Care Act, as well as aging of the population.⁹ Research suggests that APRNs, either working independently or serving on a physician-led team, can add value to a number of patient and health care outcomes through augmenting and expanding physician capacity in many care

⁵ Patient Protection and Affordable Care Act, Pub. L. No. 111-148, § 5509, 124 Stat. 674 (2010). Retrieved from <https://www.govinfo.gov/content/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>

⁶ According to the Affordable Care Act, “the term ‘eligible hospital’ means a hospital (as defined in subsection (e) of section 1861 of the Social Security Act (42 U.S. C. 1395x)) or a critical access hospital (as defined in subsection (mm) (1) of such section) that has a written agreement in place with (A) 1 or more applicable schools of nursing; and (B) 2 or more applicable non-hospital community-based care settings.”

⁷ U.S. Department of Health and Human Services (HHS). (2018, May). *Evaluation of the Graduate Nurse Education demonstration project: Report to Congress*. Retrieved from <https://innovation.cms.gov/Files/reports/gne-rtc.pdf>

⁸ The Commission on Collegiate Nursing Education established the four primary APRN categories used in the GNE demonstration project.

⁹ HHS, Health Resources and Services Administration, National Center for Health Workforce Analysis. (2016, November). National and regional projections of supply and demand for primary care practitioners: 2013–2025. Rockville, MD: National Center for Health Workforce Analysis. Retrieved from <https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf>

settings^{10,11,12} and thus help alleviate the expected future shortage of primary care physicians. APRNs are registered nurses who have at least a master's degree in nursing, are certified by professional or specialty nursing organizations, and are licensed to deliver care consistent with their areas of expertise and the laws that govern the nursing scope of practice in each state. Like a physician or physician assistant, APRN students require both clinical and didactic education to graduate and are prepared by education and certification to assess, diagnose, and manage patient problems, order and conduct diagnostic tests and order laboratory work, perform in-office procedures, and prescribe medications.

The GNE Demonstration Project

Both clinical and didactic education are required for APRN students to graduate. The GNE demonstration project focused on just the clinical education of APRN students. The GNE demonstration project was initially implemented in July 2012 for a four-year period. Because appropriations were available at the end of that period, and the statute permitted use of these funds without fiscal year limitation, CMS extended the demonstration project for an additional two years, through July 2018, to allow sufficient time for (1) the additional APRN students enrolled under the demonstration project to complete their required clinical education, and (2) more accurate reporting of APRN graduation rates under the demonstration project.

As required by statute, under the GNE demonstration project, CMS provided payment to five eligible hospital awardees for the reasonable costs attributable to providing qualified clinical education to APRN students enrolled as a result of the demonstration project.¹³ The hospitals participating in the demonstration project were required to partner with accredited SONs and non-hospital CCSs. They also partnered with other hospitals in an effort to expand the number of APRN students receiving qualified clinical education. The need for primary care access is especially critical in medically underserved areas of the country. As such, CMS not only aimed to increase the overall number of primary care providers, but also to expand primary care access in underserved areas of the country.

Therefore, consistent with statutory requirement, CMS required hospitals participating in the demonstration project to ensure that students completed at least half of their qualified clinical education in CCSs, including Federally Qualified Health Centers (FQHCs) and rural health clinics.

¹⁰ Woo, B. F. Y., Lee, J. X. Y., & Tam, W. W. S. (2017, September). The impact of the advanced practice nursing role on quality of care, clinical outcomes, patient satisfaction, and cost in the emergency and critical care settings: A systematic review." *Human Resources for Health*, 15, 1–22.

¹¹ Donald, F., Martin-Misener, R., Carter, N., Donald, E. E., Kaasalainen, S., Wickson-Griffiths, A., & DiCenso, A. (2013). A systematic review of the effectiveness of advanced practice nurses in long-term care. *Journal of Advanced Nursing*, 69(10), 2148–2161.

¹² Kilpatrick, K., Kaasalainen, S., Donald, F., Reid, K., Carter, N., Bryant-Lukosius, D. . . . DiCenso, A. (2014). The effectiveness and cost-effectiveness of clinical nurse specialists in outpatient roles: A systematic review. *Journal of Evaluation in Clinical Practice*, 20(6), 1106–1123.

¹³ Reasonable costs include only those clinical education costs that are not covered by other revenue sources. Costs associated with didactic education (classroom-based instruction), certification, and licensure were not eligible for payment under the demonstration project.

Payments to the awardee hospitals were linked directly to the number of additional APRN students that the hospitals and their partnering entities educated as a result of their participation in the demonstration project. The payment was calculated on a per additional student basis, by comparing enrollment levels in the APRN programs during the baseline period established by the Affordable Care Act, calendar years 2006–2010, to enrollment levels under the demonstration project. Participating hospitals reimbursed their partners for the reasonable cost of providing qualified clinical education to additional APRN students based on their established agreements.

Exhibit 1 presents a summary of the characteristics of the hospital awardees and their partner SONs and clinical education sites, collectively referred to as GNE networks, including the total payment each awardee received over the full period of the demonstration project.

Exhibit 1. Summary of the Characteristics of the GNE Demonstration Networks

	Duke University Hospital	Hospital of the University of Pennsylvania	Memorial Hermann-Texas Medical Center	Rush University Medical Center	HonorHealth Scottsdale Osborn Medical Center
Hospital City	Durham	Philadelphia	Houston	Chicago	Scottsdale
Hospital State	North Carolina	Pennsylvania	Texas	Illinois	Arizona
Partner Hospitals	5	8	2	3	4
Partner SONs	1	9	4	1	4
Partner CCSs	More than 150 CCSs: affiliated practice primary care network, community clinics, free clinics, other CCSs	More than 150 hospital- and non-hospital-affiliated CCSs, stand-alone nurse-managed primary care clinics, FQHCs	More than 150 CCSs: clinics surrounding SONs, FQHCs, physician group primary care practices, hospice, home health	25 CCSs in greater Chicago area and adjoining rural counties; initially 5 large community organizations	More than 1,000 CCSs: FQHCs, rural health clinics, primary care practices, nurse-managed primary care clinics, home health, long-term care
Geographic Area	Regional, generally within approximately a 60-mile radius	Greater Philadelphia area with regional reach; 44 northern and central counties served by one partner	Southeastern Texas, near the Gulf Coast	Greater Chicago area and adjoining counties in Illinois	Large geographic region across Arizona, other southwestern bordering states, and parts of Mexico

APRN Specialty	NP, CNS, CRNA	NP, CNS, CRNA, CNM	NP, CRNA	NP, CNS, CRNA	NP, CNS
Total Payment	\$15,245,420	\$65,813,534	\$50,340,387	\$12,088,127	\$32,890,025

Notes: NP = nurse practitioner; CNS = clinical nurse specialist; CRNA = certified registered nurse anesthetist; CNM = certified nurse-midwife.

Evaluation of the GNE Demonstration Project

CMS contracted with IMPAQ International to conduct an independent evaluation of the GNE demonstration project.¹⁴ The evaluation determined whether payments to networks for clinical education resulted in overall growth in APRN student enrollment and graduations across the four named clinical specialties relative to the baseline period. It also examined the costs to CMS for supporting clinical education by determining the overall cost of implementing the GNE demonstration project as well as the average cost to CMS of supporting the clinical education of an additional APRN student to graduation. In addition, the evaluation assessed the structure and characteristics of the networks; the implementation processes; successes and challenges; and the spillover effects (i.e., any unintended consequences of the GNE demonstration project that are likely to affect APRN enrollment and graduations in non-GNE SONs).

In addition to these primary goals, the evaluation team conducted a supplemental activity to improve understanding of APRNs in the healthcare workforce. We conducted an APRN Alumni Case Study to examine the employment choices of APRN alumni affiliated with the SONs included in GNE networks (i.e., partners of hospital awardees). Characteristics of employment choices included APRN specialty, urbanity, and whether they served a medically underserved population.

Data and Methods

The evaluation used a mixed-methods approach that combined data from primary (i.e., in-depth interviews and focus groups) and secondary (i.e. survey and audit data) sources for descriptive and impact analyses.

Key Evaluation Findings

The evaluation addressed research questions related to implementation, sustainability, APRN student growth, cost, and perceptions of the GNE demonstration project. Below we provide high-level summaries of the evaluation findings for each research question.

How Was the GNE Demonstration Project Implemented and Operated?

¹⁴ IMPAQ’s evaluation built on methodology and primary data collected from the previous evaluation contractor, Optimal Solutions.

Key findings suggest that the GNE demonstration project had a positive impact on APRN student growth; allowed SONs to enhance and formalize clinical placement processes, and to create and strengthen relationships with clinical education sites, hospitals, and other SONs; and increased awareness of the role and value of APRNs among physicians and physician assistants who served as clinical education preceptors.

Initial Program Implementation

All GNE networks reported challenges during initial implementation of the demonstration project due to the relatively short timeframe for project development. According to the networks, implementing the project's payment policies and procedures for precepting was the most challenging aspect,¹⁵ as well as hiring qualified support staff and faculty within a limited timeframe and establishing uniform data collection activities, particularly within networks with multiple SONs. To assist with implementation, each network held quarterly or biannual in-person meetings and monthly telephone calls where GNE stakeholders shared best practices and lessons learned. Network leadership and SON administrators reported that the meetings were helpful in establishing new and lasting partnerships between the hospital and SONs.

Investments to Support Implementation

All SONs used GNE funds to create or expand administrative resources devoted to managing and overseeing the clinical placement process. SONs used funds to update their clinical placement database systems by either buying new or enhancing existing systems, as well as hiring support staff to oversee the clinical placement process and site/preceptor recruitment. Of the 19 SONs involved in the GNE demonstration project, 14 hired staff to support clinical education placements and recruitment during the project.

Clinical Education Hours

The percentage of clinical education hours completed by additional APRN students in CCSs remained well above the mandated 50 percent. The statute emphasized primary care by requiring that at least half of the clinical education be provided in non-hospital CCSs. The percentage of clinical hours completed at CCSs in 2015 (77 percent) and 2016 (76 percent) were similar to the percentage in 2014 (78 percent).

Extension Years

During the extension years, SONs and oversight teams reported that the reductions in precepting payments increased the competition for clinical placements among SONs to pre-demonstration levels. Many respondents attributed the increase in competition to the decrease in precepting payments during the demonstration's extension years (2016 and 2017). As of spring 2018 (during the Closeout Period), nearly half of the SONs continued to report an increase in

¹⁵ Although preceptors for physician assistant and physician students are generally paid, preceptors for APRNs are traditionally unpaid.

competition for clinical education sites, particularly from non-GNE for-profit SONs that could afford to pay preceptors.

Sustainability

SONs varied in their perception of their ability to maintain the APRN student enrollment levels attained during the GNE demonstration project. About a third of SONs were unsure if enrollment would increase or decrease after the demonstration ended. When asked why they were uncertain, many mentioned their inability to continue to provide precepting payments to clinical education sites. Eight SONs expected their APRN enrollment to remain the same after the demonstration ended. One SON expected their enrollment to decrease after the demonstration ended; however, the reason for the decrease was not attributed to the demonstration ending.

Only one of the 19 SONs reported that they would continue to provide precepting payments to their clinical education sites/preceptors. To offset the lack of precepting payments, about two-thirds of the SONs reported that they had developed, or were in the process of developing, non-financial incentives to encourage preceptor engagement. The SON that will continue to provide payments to clinical education sites had done so prior to the GNE demonstration project and noted that the amount they would be paying would be substantially lower than what they paid during the demonstration. Examples of the non-financial incentives SONs planned to provide include preceptor development courses and access to the SON's library. About a third of the SONs also mentioned that they would continue to explore alternative funding sources.

Two-thirds of the SONs viewed the clinical education coordinator or recruitment-related positions as indispensable and sustainable beyond the GNE demonstration project. All SONs who maintained a staff member in this position noted that they had come to rely heavily on the position to oversee placement coordination.

All respondents reported that the increase in collaboration and partnerships among clinical education sites, individual preceptors, hospitals, and SONs had been a key success of the demonstration project. To maintain collaboration following the demonstration, SONs in multi-SON networks had requested to continue meetings with oversight teams and SONs; however, without the GNE project, stakeholders were unsure if this would be possible.

How Effective Was the GNE Demonstration Project in Increasing Growth in the APRN Workforce?

APRN Student Growth

The results of the evaluation suggest that the GNE demonstration project increased the number of enrollments and graduations of APRN students. A quasi-experimental difference-in-differences (DID) analysis using secondary survey data from the American Association of Colleges of Nursing suggests that the demonstration led to increases in both APRN student

enrollments and graduations among GNE SONs during the demonstration period. The DID results showed that the demonstration increased annual APRN student enrollment in GNE SONs by about 93 students per SON per year on average, and increased annual graduations by about 35 students per SON, in comparison to a weighted comparison group of non-GNE SONs during the same period. These increases were statistically significant and meaningful, as they represent 54 and 67 percent increases in APRN student enrollment and graduations, respectively, relative to the baseline means of the GNE SONs.

Despite the growing demand for APRN education, SONs continue to face significant challenges to increasing enrollment. These challenges stem in part from difficulty finding clinical education sites and preceptors for the clinical placements APRN students must complete in order to graduate. Stakeholders from all networks mentioned that one of the unintended consequences of the GNE demonstration project was that clinical education sites began to expect, and in some cases demand, payment from SONs in order to precept their APRN students. When SONs were unable to guarantee payment to those sites, the sites would then refuse to serve as precepting sites, or they would reduce the number of APRN students they precepted.

The majority of SONs reported that APRN student enrollments had increased since the demonstration project, but not all of these stakeholders were willing to attribute the enrollment increase solely to the demonstration project. Some stakeholders commented that “the increases were due to the upward trajectory of the healthcare field in general,” and that “the SONs would have experienced larger enrollment cycles even without the demonstration project.” Still, the majority of stakeholders emphasized the importance and impact of the GNE demonstration project in increasing APRN enrollment. For example, some stakeholders noted that without the additional faculty hired using demonstration project funds, it would have been difficult for the SONs to accept the increased number of students that they enrolled during the demonstration period.

GNE stakeholders from all networks reported an increase in the number of physicians and physician assistants precepting APRNs, and an increase in awareness among these preceptors of the role and value of APRNs. As a result of these additional clinical education opportunities, some sites hired APRN students after they graduated and have continued to precept APRN students even after the end of the demonstration. However, these are the same preceptors who asked about precepting payments. Some GNE stakeholders expressed concern that there would be increased competition for placing APRN students with physician and physician assistant preceptors once the demonstration project ended and they would no longer be able to provide precepting payments.

APRN Student Enrollment and Graduation by Specialty

The results suggest that the positive effects of the GNE demonstration project were concentrated among students in nurse practitioner education programs and those seeking master’s degrees. The demonstration project resulted in a statistically significant increase in

annual nurse practitioner enrollments of about 89 students per SON and an increase in annual nurse practitioner graduations by about 35 students per SON, relative to a comparison group of non-GNE SONs. These increases represent 96 and 97 percent of the total increases in APRN enrollments and graduations, respectively. The other APRN specialties (certified registered nurse anesthetist, certified nurse-midwife, and clinical nurse specialist) did not experience enrollment and graduation increases of a meaningful magnitude, nor were these differences statistically significant.

Spillover Effects to Non-GNE SONs

The evaluation found no evidence of negative spillover effects on non-GNE SONs located in the same state as the GNE SONs. However, the methodological limitations for determining whether there were spillover effects preclude a definitive conclusion.

What Was the Cost of the GNE Demonstration Project?

The trend analysis showed that the total estimated cost of the GNE demonstration project was \$176,377,494. This total cost included SON expenditures, payments to CCSs, direct costs such as salaries for hospital demonstration project oversight staff and new equipment, and indirect expenditures. The total estimated cost is preliminary because audited (actual) costs were not available at the time of this report.

The estimated cost for each hospital awardee varied from \$12,088,127 (Rush University Medical Center) to \$65,813,534 (Hospital of the University of Pennsylvania). This variation may be due to the differences in network size. That is, larger hospital networks with higher costs also tended to have a larger number of new students enrolled due to the demonstration project.

CCS costs were the highest expenditure, followed by SON costs, direct costs, indirect costs, and other direct costs.¹⁶ The finding that the highest costs were for CCSs indicates that most of the project costs were spent on increasing the number of clinical education sites and expanding the supply of APRN clinical preceptors.

What Was the Cost to CMS for Supporting an Additional APRN Student to Graduate?

The average cost to CMS, under the demonstration, of supporting the clinical education of an additional APRN student to graduation was \$47,172 per graduate. This does not include the cost of the didactic training, which was not part of the GNE demonstration project. Additional costs not paid for by the demonstration project were likely to be incurred by the SONs for

¹⁶ CCS costs included preceptor payments and other costs related to partnership agreements with CCSs and other clinical education sites such as other hospitals that provided clinical education opportunities for additional APRN students. SON costs included items related to the partnership agreements between the hospital and the SONs in its network. Direct costs included hospital labor-related costs, such as salaries for network oversight staff. Indirect costs included administrative and general costs associated with the implementation of the demonstration project. Other direct costs included items such as consultants, equipment, travel, and office supplies.

supporting an additional APRN student to graduation, but they were not measured as part of this evaluation.

Supplemental Research Question

Where and What Types of Post-Graduate Employment Opportunities Exist for Recent APRN Graduates from GNE SONs?

All nine alumni interviewed as part of the Alumni Case Study said their preceptorship experiences influenced their employment search and decisions, and, specifically, made them more likely to serve medically underserved populations in CCSs. Alumni employment decisions were also influenced by a range of factors including employment preferences, interest in working with a specific patient population, location of the employer, salary and benefits, capacity for flexible work schedules, and the ability to pay off school loans.

Limitations of the GNE Demonstration Project Evaluation

Although the number of APRN students that were enrolled in GNE SONs was large, they were from a small number of GNE SONs that were similar to each other in terms of certain characteristics, leading to uncertainty about generalizability of findings. Our analyses were also limited by unavailability of APRN licensing and credit hours information in American Association of Colleges of Nursing survey data, as well as lack of clinical education cost data for non-GNE SONs.

Conclusion

The networks reported that the demonstration project has made significant improvements to the SONs' clinical placement processes and enhanced relationships between and among clinical education sites, hospitals, and SONs. GNE networks also reported that knowledge of APRN student education and skill sets improved among non-APRN preceptors. Non-APRN preceptors expressed increased willingness to precept APRN students in the future. Relative to the comparison group of non-GNE SONs, APRN student enrollment and graduations increased across the GNE SONs. These results were driven by APRN students in the nurse practitioner specialty and in the master's degree program.

APRN student enrollment continued to modestly increase after payments for additional APRN students ended. Furthermore, networks reported that the GNE SONs and the APRN students will likely continue to benefit after the demonstration project ends from the partner collaborations formed during the project and from the streamlined clinical placement processes.

Interviews with APRN alumni from GNE SONs revealed that their precepting clinical education experiences influenced their employment decisions, including increasing their inclination to provide patient care to rural and underserved populations.



In brief, the GNE demonstration project was effective in increasing APRN student enrollment and graduation as well as opportunities for clinical education.

Chapter 1: Introduction

1.1 Overview and Purpose of this Report

Both clinical and didactic education are required for Advanced Practice Registered Nurse (APRN) students to graduate. The Graduate Nurse Education (GNE) demonstration project was mandated under section 5509 of the Patient Protection and Affordable Care Act of 2010, Pub. L. 111-148, to focus on just the clinical education of additional APRN students. The GNE demonstration project involved the Centers for Medicare & Medicaid Services (CMS) providing payments to five eligible hospitals, each of which partnered with schools of nursing (SONs), community-based care settings (CCSs), and other hospitals (CCSs and other hospitals are collectively referred to as clinical education sites) to expand clinical education for additional APRN students. Authorized by the Patient Protection and Affordable Care Act (ACA), the GNE demonstration project was designed to test whether payments for clinical education increased the number of APRN student graduates from SONs, with the ultimate aim of increasing the supply of primary care providers to meet growing U.S. demand. The ACA also required an independent evaluation of the demonstration project. This report presents findings of that evaluation.

Previous evaluation reports covered the first four demonstration years (DYs), 2012–2015 (i.e., DY1–DY4). The primary purpose of this report is to update the earlier findings with results from 2016, 2017, and 2018 (called DY5, DY6, and the Closeout Period¹⁷, respectively), and to contrast results in these years with the results from 2012 to 2015. In addition, this report presents the impacts of the full demonstration project, across all demonstration years. Demonstration project results for DY1 to DY4 can be found in the *Evaluation of the GNE Demonstration Project Volume I: Implementation and Impact*¹⁸ (referred to throughout this report as *DY1–DY4 Impact Evaluation Report*), the *Evaluation of the GNE Demonstration Project Volume II: Demonstration Costs*¹⁹ (referred to throughout as *DY1–DY4 Cost Evaluation Report*) and in the *Evaluation of the Graduate Nurse Education Demonstration Project: Report to Congress*²⁰ (referred to throughout as the *RTC*). Topics covered in the aforementioned reports, including background, methodologies, and past results, are described briefly in this report.

Along with updating findings from the previous reports, this report describes an additional evaluation activity undertaken to understand more about APRNs in the healthcare workforce. The

¹⁷ Results for the Closeout Period are reported in the body of the report for the qualitative and cost analyses, but not the quantitative impact analyses.

¹⁸ CMS, Center for Medicare and Medicaid Innovation (CMMI). (2017, October). *Evaluation of the GNE Demonstration Project, Volume I: Implementation and Impact*. Retrieved from <https://innovation.cms.gov/files/reports/gne-rtc-vol1.pdf>

¹⁹ CMS, CMMI. (2017, October). *Evaluation of the GNE Demonstration Project, Volume II: Demonstration Costs*. Retrieved from <https://innovation.cms.gov/files/reports/gne-rtc-vol2.pdf>

²⁰ U.S. Department of Health and Human Services (HHS). (2018, May). *Evaluation of the Graduate Nurse Education Demonstration Project: Report to Congress*. Retrieved from <https://innovation.cms.gov/Files/reports/gne-rtc.pdf>

goal of the APRN Alumni Case Study was to examine whether APRN alumni affiliated with the GNE demonstration project had pursued employment within CCSs after graduation, and to understand the employment choices of APRNs after graduation more broadly.

1.2 Legislative Summary

The GNE demonstration project was established by section 5509 of the Patient Protection and ACA of 2010, Public Law 111-148, which amended title XVIII of the Social Security Act by adding 42 U.S.C. 1395ww note.²¹ Section 5509 appropriated \$50 million for the project for each fiscal year from 2012 through 2015, without fiscal year limitation. The demonstration project was extended for two additional years, starting on August 1, 2016. This extension period was intended to provide funding to support APRN students who enrolled as a result of the GNE demonstration project in the first four demonstration years to graduate.

Under this demonstration project, CMS was authorized to provide payments to five eligible hospitals^{22,23} for the reasonable costs they incurred in providing qualified clinical education to APRN students enrolled as a result of the demonstration project. The statute also required that the participating hospitals enter into an agreement with eligible partners—non-hospital CCSs and SONs—for the provision of qualified clinical education. The statute emphasized primary care by requiring that at least half of the clinical education be provided in non-hospital CCSs. The statute allowed the requirement to be waived for rural or medically underserved areas.

The statute also required an independent evaluation of the GNE demonstration project including an analysis of the following: (1) the growth in the number of APRNs with respect to a baseline period as a result of the demonstration; (2) the growth for each of the following APRN specialties—clinical nurse specialist, nurse practitioner, certified registered nurse anesthetist, and certified nurse-midwife;²⁴ (3) the costs to the Medicare program under title XVIII of the Social Security Act as a result of the demonstration project; and (4) other items the Secretary determined appropriate and relevant.

1.3 Primary Care and the Role of APRNs

By 2025, the United States will need an additional 23,640 primary care physician provider full-time equivalents (FTEs) to meet growing demands associated with expanded access to insurance

21 Patient Protection and Affordable Care Act, Pub. L. No. 111-148, § 5509, 124 Stat. 674 (2010). Retrieved from <https://www.govinfo.gov/content/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>

22 An eligible hospital means a hospital (as defined in subsection (e) of section 1861 of the Social Security Act (42 U.S.C. 1395x)) or critical access hospital (as defined in subsection (mm) (1) of such section) that has a written agreement in place with (a) one or more applicable schools of nursing; and (b) two or more applicable non-hospital community-based care settings.

23 CMS payments were made to hospitals rather than directly to SONs and CCSs because CMS has payment mechanisms established with hospitals but not with SONs and CCSs. Specifically, CMS reimbursement comes through settlement of hospitals' cost reports. SONs and CCSs do not have cost reports or a funding mechanism already established with CMS.

24 The Commission on Collegiate Nursing Education established the four primary APRN categories used in the GNE demonstration.

and the aging of the population.²⁵ APRNs are registered nurses who have at least a master's degree in nursing, are certified by professional or specialty nursing organizations, and are licensed to deliver care consistent with their areas of expertise and the laws that govern the nursing scope of practice in each state. Like a physician or physician assistant (PA), APRN students require both clinical and didactic education to graduate and are prepared by education and certification to assess, diagnose, and manage patient problems, order and conduct diagnostic tests and lab work, perform in-office procedures, and prescribe medications.²⁶

Substantial research has studied APRNs and their impact on patient health outcomes, quality and experience of care, health resource use, and health care costs. Studies suggest that APRNs can serve a crucial role in the transformation of the health care system to value-based, team-based, and patient-centered care.^{27,28,29,30} Several systematic reviews suggest that APRNs, either working independently or serving on a physician-led team, can add value to a number of patient and health care outcomes through augmenting and expanding physician capacity in many care settings^{31,32,33,34,35,36,37} and thus help alleviate the expected future shortage of primary care physicians.

²⁵ U.S. Department of Health and Human Services. Health Resources and Services Administration, National Center for Health Workforce Analysis. (2016). *National and regional projections of supply and demand for primary care practitioners: 2013–2025*. Rockville, MD: National Center for Health Workforce Analysis. Retrieved from <https://bhwh.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf>

²⁶ GraduateNursingEDU.org. (n.d.). APRN definition: Advanced practice registered nursing defined. Retrieved from <http://www.graduatnursingedu.org/aprn-definition/>

²⁷ Salmund, S.W., & Echevarria, M. (2017). Healthcare transformation and changing roles for nursing. *Orthopedic Nursing*, 36(1), 12–25.

²⁸ Fairchild, D., Dukes, E., Greer, L. & Kisilewicz, E. (2017). APCs: An important primary care resource for value-based care; Advanced practice clinicians offer an important solution to the looming challenge facing health systems from a growing demand for primary care physicians amid a waning supply. *Healthcare Financial Management*, 71(6), 58–65.

²⁹ Bodenheimer, T., & Bauer, L. (2016). Rethinking the primary care workforce—an expanded role for nurses. *New England Journal of Medicine*, 375(11), 1015–1017.

³⁰ Newhouse, R. P., Stanik-Hutt, J., White, K. M., Johantgen, M., Bass, E. B., Zangaro, G., White, K. (2011). Advanced practice nurse outcomes 1990–2008: A systematic review. *Nursing Economics*, 29 (5), 230–250.

³¹ Woo, B. F. Y., Lee, J. X. Y., & Tam, W. W. S. (2017, September). The impact of the advanced practice nursing role on quality of care, clinical outcomes, patient satisfaction, and cost in the emergency and critical care settings: A systematic review." *Human Resources for Health*, 15, 1–22.

³² Donald, F., Martin-Misener, R., Carter, N., Donald, E. E., Kaasalainen, S., Wickson-Griffiths, A., DiCenso, A. (2013). A systematic review of the effectiveness of advanced practice nurses in long-term care. *Journal of Advanced Nursing*, 69(10), 2148–2161.

³³ Johantgen, M., Fountain, L., Zangaro, G., Newhouse, R., Stanik-Hutt, J., & White, K. (2012). Comparison of labor and delivery care provided by certified nurse-midwives and physicians: A systematic review, 1990 to 2008. *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health*, 22(1), e73-81.

³⁴ Kilpatrick, K., Kaasalainen, S., Donald, F., Reid, K., Carter, N., Bryant-Lukosius, D., . . . DiCenso, A. (2014). The effectiveness and cost-effectiveness of clinical nurse specialists in outpatient roles: A systematic review. *Journal of Evaluation in Clinical Practice*, 20(6), 1106–1123.

³⁵ Lovink, M. H., Persoon, A., Koopmans, R. T. C. M., Van Vught, A. J. A. H., Schoonhoven, L., & Laurant, M. G. H. (2017). Effects of substituting nurse practitioners, physician assistants or nurses for physicians concerning healthcare for the ageing population: A systematic literature review. *Journal of Advanced Nursing*, 73(9), 2084–2102.

³⁶ Martin-Misener, R., Harbman, P., Donald, F., Reid, K., Kilpatrick, K., Carter, N., . . . DiCenso, A. (2015). Cost-effectiveness of nurse practitioners in primary and specialised ambulatory care: Systematic review." *BMJ Open*, 5(6).

³⁷ Donald, F., Kilpatrick, K., Reid, K., Carter, N., Bryant-Lukosius, D., Martin-Misener, R., . . . DiCenso, A. (2015, January). Hospital to community transitional care by nurse practitioners: A systematic review of cost-effectiveness. *International Journal of Nursing Studies*, 52(1), 436–451.

Growth in the supply of APRNs relies on the ability of SONs to attract and train APRN students and students' ability to secure precepted clinical education. Students may pursue APRN credentials through multiple pathways, including master's degree, post-master's certificate, and doctor of nursing practice (DNP) programs. SONs offer APRN degrees in a number of specialties, including nurse practitioner, clinical nurse specialist, certified nurse-midwife, and certified registered nurse anesthetist. The vast majority of APRN students enroll in nurse practitioner programs.³⁸ The length of time required to complete a specific APRN program depends on the degree type offered (from one and a half years to five years), and whether a student enrolls as a full- or part-time student. Exhibit 1-1 provides a description of each APRN specialty.

Exhibit 1-1. APRN Degree Types and Roles³⁹

Type of APRN	Role
Nurse Practitioner (NP)	CNP's are educated and practice at an advanced level to provide care, independently, in a range of setting and in one of six described patient populations. CNP's are responsible and accountable for health promotion, disease prevention, health education and counseling as well as the diagnosis and management of acute and chronic diseases. They provide initial, ongoing and comprehensive care to patients in family practice, pediatrics, internal medicine, geriatrics, and women's health. NPs are prepared to practice as primary care NPs or acute care NPs, which have separate national competencies and unique certifications.
Clinical Nurse Specialist (CNS)	The CNS is typically in charge of a department of nursing, either at a private practice or a hospital. CNSs are experts in diagnosing and treating illness in their area of expertise. They are responsible and accountable for the diagnosis and treatment of health/illness states; disease management; health promotion; and prevention of illness and risk behaviors among individuals, families, groups, and communities.
Certified Nurse-Midwife (CNM)	CNMs provide a full range of primary health care services to women throughout the lifespan. These include gynecologic care, family planning, preconception care, prenatal and postpartum care, childbirth, and newborn care. CNM care is provided in diverse settings, which may include hospitals, birth centers, homes, and a variety of ambulatory care settings.
Certified Registered Nurse Anesthetist (CRNA)	CRNAs provide the full spectrum of patients' anesthesia care. They provide anesthesia in a variety of settings in collaboration with surgeons, anesthesiologists, dentists, podiatrists, and other qualified health care professionals. When anesthesia is administered by a CRNA, it is recognized as the practice of nursing; when administered by an anesthesiologist, it is recognized as the practice of medicine.

³⁸ Fang, D., Li, Y., Arietti, R., & Bednash, G. D. (2014). *2013–2014 enrollment and graduations in baccalaureate and graduate programs in nursing*. Washington, DC: American Association of Colleges of Nursing.

³⁹ National Council of State Boards of Nursing (n.d). *APRNS in the U.S.* Retrieved from <https://www.ncsbn.org/aprn.htm>

Regardless of the educational background, however, all anesthesia professionals administer anesthesia the same way.

Accredited SONs require APRN students to receive precepted clinical education. Precepted clinical education entails the placement of APRN students in acute care or community-based care settings, where they gain clinical competencies, skills, and knowledge from experienced health care providers.⁴⁰ All APRN programs of study require a minimum number of credit hours in precepted clinical experiences as stipulated by their accrediting body. Clinical preceptors, such as APRNs, physicians, doctors of osteopathic medicine, and PAs, are licensed and board-certified health care providers who provide clinical education to APRN students in a preceptor: student ratio of 1:1 or 1:2. The required number of clinical hours varies by specialty program. Although preceptors for PA and physician students are generally paid, preceptors for APRNs students are traditionally unpaid.⁴¹

1.4 The GNE Demonstration Project

1.4.1 Eligibility Requirements

The hospitals selected by CMS to participate in the demonstration project were required to partner with accredited SONs and with non-hospital CCSs in an effort to expand the number of APRN students receiving qualified clinical education. Because the need for primary care access is especially acute in underserved areas, CMS aimed not only to increase the overall number of primary care providers, but also to expand access to primary care in medically underserved areas of the country. Therefore, CMS required hospitals participating in the demonstration project to ensure that students completed at least half of their qualified clinical education in medically underserved areas. These settings included Federally Qualified Health Centers (FQHC) and rural health clinics.

1.4.2 Funding Process

As required by statute, under the GNE demonstration project whose focus was only on clinical education, CMS provided payment to five eligible hospital awardees for the reasonable costs attributable to providing qualified clinical education to APRN students enrolled as a result of the demonstration project. The five hospitals participating in the demonstration project formed networks that included partnerships with accredited SONs, CCSs, and other hospitals. Reasonable costs included only those clinical education costs not covered by other revenue sources, such as:

- Salaries for staff in lead hospitals to administer the GNE demonstration project;

⁴⁰ Preceptors are defined as health care providers who partner with medical students in clinical environments and teach them how to apply the knowledge they have attained in their courses to patient care.

⁴¹ See section “Barriers to the Growth of the APRN Workforce” on pages 23–24 of the *DY1–DY4 Impact Evaluation Report* for additional information.

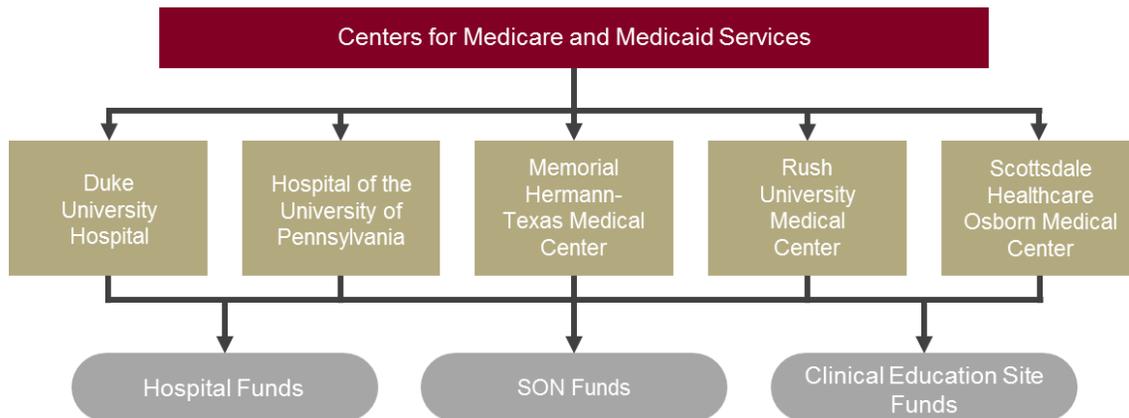
- Costs incurred by SONs for materials, salaries for non-didactic (i.e., administrative or clinical) faculty, and coordination of clinical preceptorships for additional APRN students that the hospitals and their partnering entities educated as a result of their participation in the demonstration project;
- Costs associated with executing partnership agreements with clinical education sites; and
- Precepting payments for the clinical education of additional APRN students.

In Exhibit 1-2 we provide a high-level overview of the GNE demonstration project funding process starting with CMS. As shown in the exhibit, CMS provided funds to each of the five hospital awardees:

- Duke University Hospital (DUH) in Durham, North Carolina
- Hospital of the University of Pennsylvania (HUP) in Philadelphia, Pennsylvania
- Memorial Hermann-Texas Medical Center (MH) in Houston, Texas
- Rush University Medical Center (RUMC) in Chicago, Illinois
- HonorHealth Scottsdale Osborn Medical Center (SHC-O) in Scottsdale, Arizona

The hospitals distributed the funds among themselves, their partner SONs and clinical education sites. Section 3.3 presents detailed findings on how the hospitals, SONs, and clinical education sites reported spending the funds. Chapter 5 describes the distribution of funds between and among hospitals, SONs, and clinical education sites.

Exhibit 1-2. Overview of the GNE Demonstration Project Funding Process



Costs associated with didactic education as well as costs for certification and licensure were *not* eligible for reimbursement under the demonstration project. Importantly, the demonstration project provided reimbursements only for costs incurred for students seeking graduate nurse education for the purpose of being employed in a new capacity, that is, one in which they could not have been employed without completing the additional education program. Education that only enhanced nursing competencies was not eligible for reimbursement. Individuals who had already been

licensed to practice as APRNs were therefore not eligible for further education under the demonstration project.

Payments to the participating hospitals were based on the number of additional APRN students that the hospitals and their partnering entities educated as a result of their participation in the demonstration project. Thus, payment was calculated by comparing enrollment levels in the APRN programs during the baseline period established in the ACA (i.e., January 2006–December 2010) to increased enrollment under the demonstration project. Awardee hospitals reimbursed their partners for the reasonable cost of providing qualified clinical education to APRN students based on their established agreements.

The participating hospitals received monthly interim payments derived from their projected budget estimates based on the expected number of additional students, divided by 12 months, for allowable and reasonable costs incurred for the provision of additional APRN students' qualified clinical education. These payments were calculated using the allowable costs derived from the updated budget estimates and the enrollment information that the hospitals provided to CMS. In the following year, an independent audit was completed, during which any reconciliations were made. Any interim payments that exceeded the actual reasonable GNE costs were paid back to CMS. Conversely, CMS paid the hospital a one-time lump sum in the event that the GNE interim payments were less than the actual reasonable GNE costs, with the stipulation that the demonstration expenditures not exceed the amount of funds appropriated under the authorizing statute. Exhibit 1-5 shows the total payment each awardee received over the entire period of the demonstration project (i.e., DY1–DY6 and the Closeout Period).

1.4.3 Clinical Education Placement Process

The clinical placement process varied across the demonstration project networks and SONs. DUH, MH, and RUMC had a more centralized clinical placement and payment process compared to HUP and SHC-O. Because DUH and RUMC were single-SON networks where the hospital and SON had established partnerships prior to the GNE demonstration project, the placement and subsequent payment processes were more centralized and straightforward. Additionally, while the MH network included four SONs, it also had a centralized clinical placement process, which was facilitated by the MH oversight team. Each of the four MH SONs used GNE funds to hire a clinical placement coordinator who was responsible for coordinating clinical placements for the MH network. While each SON remained responsible for recruiting and coordinating hospital-based sites, the MH network relied on Gateway to Care (GTC), a third-party vendor, to recruit CCSs. The hiring of clinical placement coordinators and the SONs' collaboration with GTC are a result of the demonstration project. The placement coordinators from each MH-affiliated SON met monthly with GTC staff to coordinate CCS placements, discuss challenges, exchange best practices, and confirm that all SONs were on schedule with their clinical placement activities.

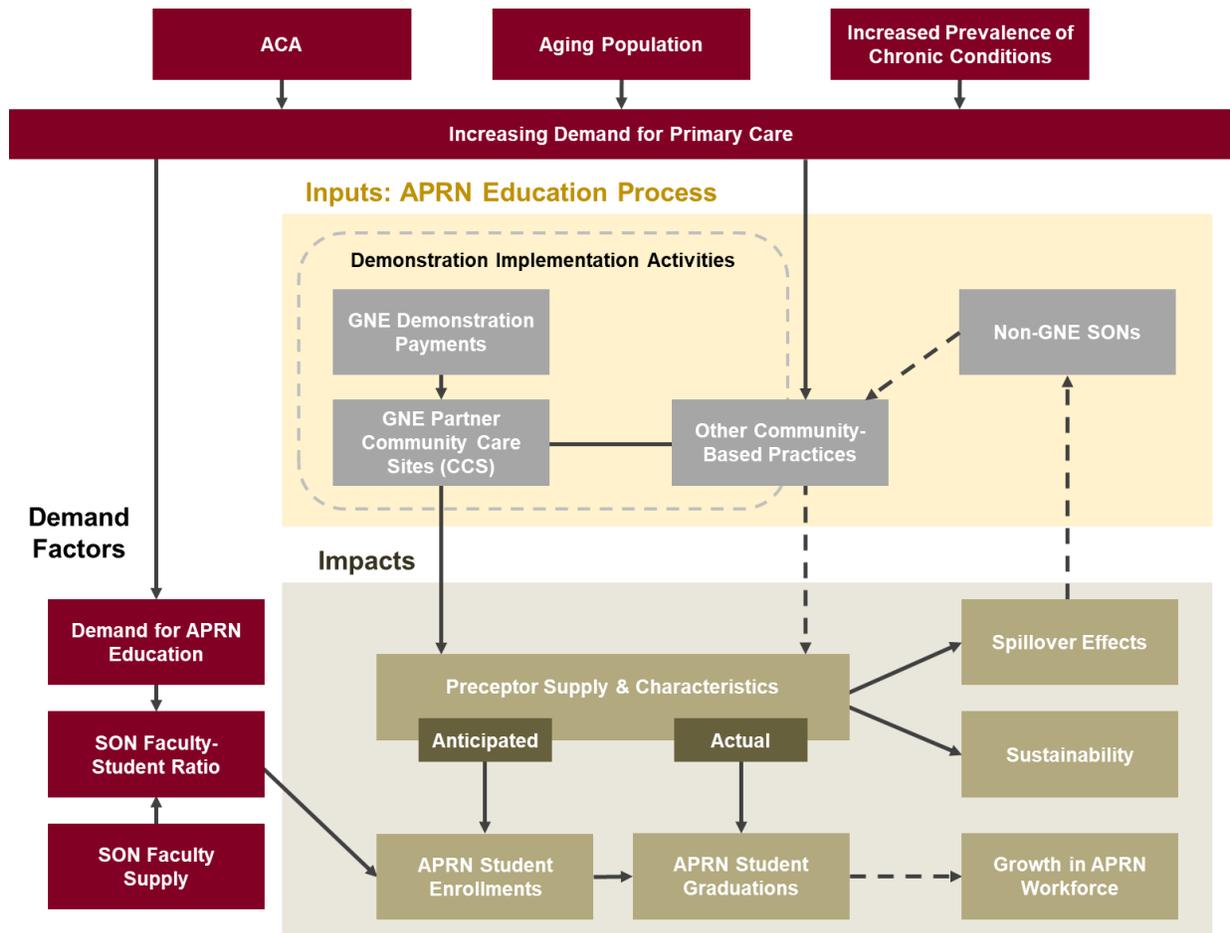
By contrast, the SHC-O and HUP networks, which also contained multiple SONs, did not have a centralized clinical placement process within their networks. Instead, each SON oversaw its own

placement activities, and the process therefore varied substantially. In both networks, some SONs oversaw the entire clinical placement process, while others relied on assistance from their students to identify and secure their own placements. In addition, some SONs used demonstration project payments to hire clinical placement coordinators or recruiters, while others expanded the roles of current staff and faculty.

1.4.4 Logic Model of the Intended Effects of the GNE Demonstration Project on the APRN Workforce

Exhibit 1-3 depicts a logic model of the key pathways through which the GNE demonstration project could affect growth in the APRN workforce and shows the contextual factors with the potential to influence success of the demonstration. The arrows linking “ACA,” “Aging Population,” “Increasing Demand for Primary Care,” and “Demand for APRN Education” illustrate the dynamic relationships through which growing demand for primary health care results in increased demand for APRN providers. Increased demand for APRNs in turn increases the demand for precepted clinical education. The GNE demonstration project supported the formation of collaborative networks that included hospitals and SONs that recruited, coordinated, and paid clinical education sites to expand the number of opportunities for clinical precepted education. Precepting payments offered to clinical education sites through the demonstration project aimed to overcome the difficulty SONs experience in finding and building relationships with clinical education sites and preceptors who will provide one-on-one mentoring and clinical education to APRN students. If successful, the payments would enable SONs to enroll and graduate more APRN students and ensure that the students graduate on time. By compensating clinical education sites for preceptor time educating students, the demonstration project aimed to ensure that sufficient clinical preceptorships were available to permit the enrollment and facilitate the graduation of additional APRN students.

Exhibit 1-3. Logic Model of the GNE Demonstration Project



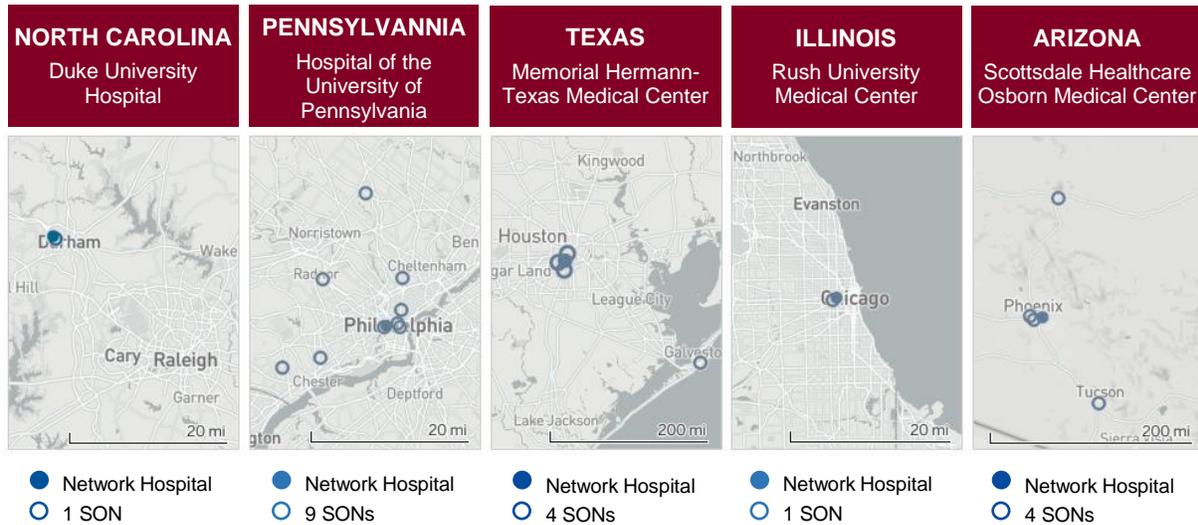
1.4.5 Overview of the GNE Demonstration Project Awardees

In a competitive selection process, CMS awarded the aforementioned five hospitals the opportunity to participate in the GNE demonstration project.

Each hospital participant formed a network partnership composed of other hospitals, SONs, and CCSs, which together developed network-specific processes and priorities for implementing the demonstration project. Each network established an oversight team and engaged SON administrators, clinical administrators, clinical placement coordinators, and preceptors to implement the demonstration project.

Exhibit 1-4 displays regional maps of the geographical location of each of the five hospital awardees and their partner SONs. These maps include only partner SONs, not clinical education sites.

Exhibit 1-4. Regional Maps of GNE Hospital Awardees and Partner SONs



Each GNE network appointed a designated GNE oversight team and SON administrators to establish network- and SON-level clinical placement processes, hire the necessary program support staff and faculty, and invest in innovative models of care and education. The GNE oversight teams, formed at the beginning of the project period, typically consisted of hospital leadership including chief financial officers, SON administrators, and other high-level hospital affiliates designated to manage the demonstration project. A description of the five GNE networks is presented in Exhibit 1-5.⁴²

Exhibit 1-5. Characteristics of the GNE Demonstration Project Networks

	Duke University Hospital	Hospital of the University of Pennsylvania	Memorial Hermann-Texas Medical Center	Rush University Medical Center	HonorHealth Scottsdale Osborn Medical Center
Hospital City	Durham	Philadelphia	Houston	Chicago	Scottsdale
Hospital State	North Carolina	Pennsylvania	Texas	Illinois	Arizona
Partner Hospitals	5	8	2	3	4
Partner SONs	1	9	4	1	4

⁴² See section “Overview of the GNE Demonstration Project Awardees” on pages 27-29 of the *DY1-DY4 Impact Evaluation Report* for additional information.

Partner CCSs	More than 150 CCSs: affiliated practice primary care network, community clinics, free clinics, other CCSs	More than 150 hospital- and non-hospital- affiliated CCSs, stand-alone nurse-managed primary care clinics, FQHCs	More than 150 CCSs: clinics surrounding SONs, FQHCs, physician group primary care practices, hospice, home health	25 CCSs in greater Chicago area and adjoining rural counties; initially 5 large community organizations	More than 1,000 CCSs: FQHCs, rural health clinics, primary care practices, nurse-managed primary care clinics, home health, long- term care
Geographic Area	Regional, generally within approximately a 60-mile radius	Greater Philadelphia area with regional reach; 44 northern and central counties served by one partner	Southeastern Texas, near the Gulf Coast	Greater Chicago area and adjoining counties in Illinois	Large geographic region across Arizona, other southwestern bordering states, and parts of Mexico
APRN Specialty	NP, CNS, CRNA	NP, CNS, CRNA, CNM	NP, CRNA	NP, CNS, CRNA	NP, CNS
Total Payment	\$15,245,420	\$65,813,534	\$50,340,387	\$12,088,127	\$32,890,025

1.4.6 GNE Demonstration Project Timeline

The demonstration project operated on an academic calendar. The academic year runs from the fall of a given calendar year through the summer of the subsequent year. Exhibit 1-6 relates the demonstration timeline to academic years. The GNE demonstration project was initially implemented in July 2012, prior to the start of academic year 2012–2013 and designed to operate for a four-year period (DY1–DY4). Because there were appropriated funds remaining at the end of the four-year period, and the statute permitted the use of these funds without fiscal year limitation, CMS extended the demonstration for two additional years, through July 2018 (DY5–DY6), to allow (1) the additional APRN students enrolled under the demonstration project to complete their required clinical education, and (2) more accurate reporting of APRN graduation rates under the demonstration project. The extension allowed the five awardee hospitals to receive reimbursement for the reasonable costs of the clinical education of the additional APRN students who enrolled in DY1–DY4. That is, CMS reimbursed the awardee hospitals for additional APRN students who enrolled as part of the GNE demonstration project in DY1–DY4 to support their graduation, but they did not reimburse the hospitals for the clinical education of additional students enrolled in DY5 and DY6. There was no difference in the guidelines for DY5 and DY6 payments, so any differences in DY5 and DY6 costs reflect other factors, such as fewer additional students in DY6 and closing of demonstration project-related functions. During the year following DY6, known as the Closeout Period, CMS reimbursed awardee hospitals for the closing of demonstration project-related functions.

Exhibit 1-6. GNE Demonstration Project Timeline

Academic Year	Demonstration Year (DY)
2012–2013	DY1
2013–2014	DY2
2014–2015	DY3
2015–2016	DY4
2016–2017	DY5
2017–2018	DY6
2018–2019	Closeout Period

1.5 Evaluation of the GNE Demonstration Project

Section 5509 required an independent evaluation of the GNE demonstration project, to determine whether payments to awardee hospitals for qualified clinical education resulted in overall growth in APRN students in the four named clinical specialties relative to the baseline period. The evaluation also examined the costs to CMS by determining the overall cost for implementing the GNE demonstration, as well as the average cost to CMS, under the demonstration, of supporting the clinical education of an additional APRN student to graduation. In addition, the evaluation assessed the structure and characteristics of the networks, the implementation processes, successes and challenges, and spillover effects (any unintended consequences of the GNE demonstration project that were likely to affect APRN student enrollment and graduations in non-GNE SONs).

CMS awarded a two-year research evaluation contract to Optimal Solutions Group, LLC during the original evaluation design phase (Phase I). A second research evaluation contract with a five-year period of performance was awarded to IMPAQ International, LLC to complete the independent evaluation of the GNE demonstration project (Phase II).

1.5.1 Research Questions

The evaluation addressed the following research questions:

1. How was the GNE demonstration project implemented and operated?

- a. What were the networks’ characteristics and demonstration operation processes?
- b. How did the demonstration project influence precepted clinical education placements and placement processes?
- c. What notable successes and challenges did networks experience?
- d. What were the networks’ plans for sustainability?

2. How effective was the GNE demonstration project in increasing growth in the APRN workforce?

- a. What was the effect on APRN growth (i.e., student enrollment and graduation) overall?

- b. What was the effect on APRN enrollment and graduation by specialty?
- c. Was the demonstration project associated with spillover effects to non-demonstration SONs?

3. What was the total cost of the demonstration project overall?

1.5.2 Evaluation Design

The IMPAQ team used a mixed-methods approach to evaluate the GNE demonstration project.⁴³ The team integrated qualitative and quantitative data from a variety of primary and secondary sources. These data are described in Chapter 2. The team used these data to describe:

- Processes used by the networks to implement and operate the demonstration project;
- Strategies for sustaining support for expanded precepted clinical educational opportunities for APRNs after the end of the demonstration; and
- Trends in enrollments, precepted education hours, and graduations.

The team also used a quasi-experimental, difference-in-differences (DID) model to estimate the impact of the demonstration project on growth in APRN student enrollment and graduations, overall and by specialty, relative to the defined baseline period. In addition, the team used the DID model to determine whether the demonstration project had spillover effects on non-GNE SONs operating in geographic proximity to GNE SONs.

1.5.3 Evaluation Timeline

The research evaluation of the GNE demonstration project began in September 2012 and will end in September 2019. The evaluation team defined the baseline period as academic years 2006–2007 through 2009–2010 to approximate the legislatively established baseline period of January 2006–December 2010. This report provides findings for the demonstration project's complete six-year operational period and Closeout Period.

1.5.4 Organization of This Report

This report describes the methods and cumulative findings from the mixed-methods evaluation of the GNE demonstration project conducted by the evaluation team. Chapter 2 briefly summarizes the evaluation methodologies including the data sources and analysis methods. Chapter 3 discusses the findings to date regarding the implementation and operations of the project including key investments made, the demonstration project funding process, the clinical education placement process, closeout activities, and sustainability. Chapter 4 examines the quantitative impacts of the demonstration on APRN student enrollment and graduations and the spillover effects on non-GNE SONs, as well as the impact of the demonstration on the number of preceptors and APRN student growth from a qualitative perspective. Chapter 5 discusses the cost of implementing the

⁴³ Optimal Solutions Group developed the original evaluation design and methodology in 2012 and independently carried out the evaluation of the first two demonstration years (Phase I). IMPAQ International built on that methodology.



demonstration at both the demonstration and network levels. Chapter 6 describes the estimated average cost to CMS, under the demonstration, of supporting the clinical education of an additional APRN student to graduation. Chapter 7 contains the results of the Alumni Case Study to better understand the APRN healthcare workforce. Finally, Chapter 8 discusses the limitations of the data and the methods used to conduct the evaluation, provides a summary of findings, and presents a discussion of the demonstration in relation to preceding programs discussed in the literature.

Chapter 2: Evaluation Methodology

This section presents brief descriptions of the data sources and methodologies used in the analyses in this report, as well as updates to the data sources and methodologies used in the *DY1-DY4 Impact Evaluation Report* and *DY1-DY4 Cost Evaluation Report*. Detailed discussion of the data sources and methodologies for the analyses discussed in Sections 2.1.1.1, 2.1.1.2, 2.1.2.1, 2.1.2.2, 2.2.1.1, and 2.2.2 are discussed in the *DY1–DY4 Impact Evaluation Report* and *DY1–DY4 Cost Evaluation Report*.

2.1 Quantitative Data

2.1.1 Data Sources

2.1.1.1 Impact of the GNE Demonstration Project on APRN Student Growth

The evaluation team used secondary data to describe the characteristics of the GNE SONs and to measure evaluation outcomes. We constructed outcome measures for the impact analysis using responses to the Annual Institutional Survey administered by the American Association of Colleges of Nursing (AACN) in the fall of each year. These outcomes include APRN student enrollment and graduations by degree program (master’s, post-master’s, and DNP) and clinical specialty (NP, CNS, CNM, and CRNA). We also used baseline data from the AACN survey to identify a comparison group of non-GNE SONs that were similar to GNE SONs based on characteristics measured in the survey. Other matching characteristics came from various secondary data sources and included urbanity, quality of the SON, and public status.⁴⁴

2.1.1.2 GNE Demonstration Project Cost Analysis

The evaluation team used both primary and secondary data sources to examine the costs incurred by networks, including costs by hospitals, SONs, and clinical education sites, for implementing the demonstration project, the factors influencing those costs, and the average cost to CMS, under the demonstration, of supporting the clinical education of an additional APRN student to graduation. The main data sources used for the cost analyses in this report are GNE Audit Summary Reports, produced by an independent auditor, and Network Budget Reports, produced by the awardee hospitals. This report uses the same data as the previous evaluation reports, in addition to GNE Audit Summary Reports for DY4 and DY5, and Network Budget Reports for DY6 and the Closeout Period.⁴⁵

⁴⁴ See section “Secondary Data Describing SON Characteristics and Demonstration Outcomes” on pages 36–38 of the *DY1–DY4 Impact Evaluation Report* for additional information.

⁴⁵ See section “Data Sources” on page 33–39 of the *DY1–DY4 Cost Evaluation Report* for additional information.

2.1.1.3 Alumni Case Study Quantitative Data

To better understand the APRN healthcare workforce, the IMPAQ team conducted a case study to examine the employment choices of APRNs who graduated from GNE SONs and, in particular, whether these alumni pursued employment in CCSs after graduation. The Alumni Case Study provided valuable information about the downstream impacts of the GNE demonstration project. For example, it provided evidence of the extent to which alumni from GNE SONs were seeking employment in rural areas and CCSs, which is a goal of the demonstration project. To conduct the study, IMPAQ contacted the 19 GNE SONs in the five hospital networks, inquiring about the availability of alumni data for use in the voluntary case study. A subgroup of eight SONs indicated that they routinely collected data from their APRN alumni and were interested in participating in the study. IMPAQ scheduled a 30-minute call with those SONs to learn about the APRN alumni data.

IMPAQ requested de-identified APRN alumni data for the 2006–2018 period, from SONs who tracked APRN employer information and were willing to share their data. Once we received the data files, we assessed their usability based on the comparability of the file contents across SONs and the completeness of each data file. Five SONs from four networks met our study requirements and submitted data files with variables that were sufficiently comparable and complete to support quantitative analyses. Exhibit 2-1 lists the variables used to conduct the case study analysis.

Exhibit 2-1. APRN Alumni Data Variables and Classifications

Variable	Variable Classification
APRN Specialty	<ul style="list-style-type: none"> ▪ Certified Registered Nurse Anesthetist ▪ Clinical Nurse Specialist ▪ Nurse Practitioner ▪ Certified Nurse-Midwife
APRN Population Focus	<ul style="list-style-type: none"> ▪ Adult Gerontological Clinical Nurse Specialist (AGCNS) ▪ Adult Gerontological Nurse Practitioner (AGNP) ▪ Certified Registered Nurse Anesthetist (CRNA) ▪ Family Nurse Practitioner (FNP) ▪ Neonatal Clinical Nurse Specialist (NCNS) ▪ Neonatal Nurse Practitioner (NNP) ▪ Pediatric Nurse Practitioner (PNP) ▪ Psychiatric Mental Health Nurse Practitioner (PMHNP) ▪ Women’s Health Nurse Practitioner (WHNP)
Employer Name	<i>Not applicable</i>
Employer ZIP Code	<i>Not applicable</i>
Employment Area	<ul style="list-style-type: none"> ▪ Rural ▪ Urban

Employment Setting⁴⁶

- Convenient Care
- Educational Institution
- Federally Qualified Health Center
- Government or Community Health Department
- Hospital
- Primary Care Practice
- Private Specialty Practice
- Urgent Care
- Other

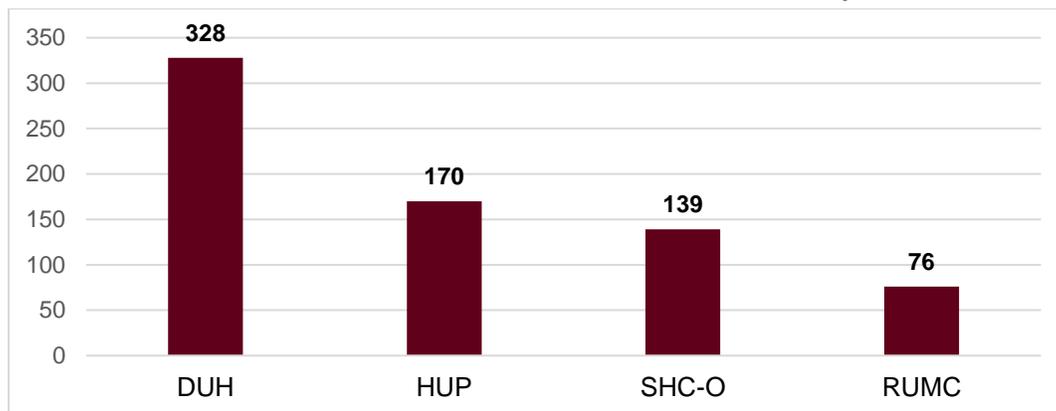
Practicing in a Medically Underserved Area

- Yes
- No

Cleaning of the SON data files involved standardizing and categorizing the data elements across each dataset. To be included in our analysis, each alumni record had to include one of the four APRN specialties targeted by the GNE demonstration project as well as one of the other six variables listed in Exhibit 2-1. Where necessary, we used the employer name to determine the employment setting and employer ZIP code. We then used the employer ZIP code to determine urban or rural employment area and whether or not the APRN’s employment was in a medically underserved area. Specifically, rural or urban status was determined by mapping the ZIP code of each APRN’s employer to rural or urban status using the 2013 Rural-Urban Continuum Codes.⁴⁷ ZIP codes were mapped to medically underserved status using a tool provided by HRSA.⁴⁸

Exhibit 2-2 presents the total number of records received for each of the four networks that submitted data.

Exhibit 2-2. Total Number of APRN Alumni Records Received by GNE Network



2.1.2 Analysis Methods

⁴⁶ FQHCs are the only employment setting that qualifies as a CCS for which we received data.

⁴⁷ United States Department of Agriculture, Economic Research Service. (2013). *2013 rural-urban continuum codes* [Dataset]. Retrieved from <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>

⁴⁸ U.S. Department of Health and Human Services, HRSA. (2019). Find shortage areas by address. Retrieved from <https://data.hrsa.gov/tools/shortage-area/by-address>

2.1.2.1 Impact of the GNE Demonstration Project on APRN Student Growth

A critical goal of the evaluation was to understand whether the GNE demonstration project was effective in increasing APRN student growth. To accomplish this, the evaluation team estimated the direct impact of the GNE demonstration project on APRN student enrollments and graduations across the GNE SONs relative to the comparison group of non-GNE SONs. The team also tested whether the demonstration project resulted in indirect spillover effects on enrollment and graduations in non-GNE SONs located in the same state as GNE SONs. The following sections describe the methods we used to conduct these analyses.⁴⁹

Impact Evaluation Approach

The team used a DID regression approach to measure the direct and indirect effects of the GNE demonstration project on APRN enrollment and graduations.

We estimated the direct effect of the demonstration project using DID regressions that compared the average difference between pre- and post-demonstration project outcomes for the 19 GNE SONs that participated in the demonstration project to corresponding outcome differences for a comparison group of SONs that did not participate in the demonstration and were not located in states with GNE SONs.

As noted earlier in this report, spillover effects are any unintended consequences of the GNE demonstration on APRN student enrollment and graduations in non-GNE SONs. We measured spillover effects on similar non-GNE SONs located in the same states as GNE SONs. We chose the state as the relevant geographic area to measure spillovers because all schools in the same state are affected by the same regulatory and policy environment, and, as such, were likely to be influenced by the presence of the demonstration project.

We estimated the indirect spillover effects using a DID approach. In this case, the average outcome differences for the *spillover group* were compared to those for a *spillover comparison group*. The spillover group was composed of SONs that did not participate in the demonstration project, but had observable characteristics similar to those of the GNE SONs and were located in the same states as the GNE SONs. The spillover comparison group was made up of SONs that were not in the same states as the GNE SONs and had observable characteristics similar to the spillover group.

However, the spillover group exhibited large year-to-year variation in total APRN student enrollment and graduations during the baseline period, suggesting that the results for the spillover effects should be interpreted with caution.⁵⁰

Comparison Group Selection

⁴⁹ See section “Impact of the GNE Demonstration Project on APRN Student Growth” on pages 42–57 of the *DY1–DY4 Impact Evaluation Report* for additional information.

⁵⁰ The standardized biases for each covariate are reported on page 53 of the *DY1–DY4 Impact Evaluation Report*. The baseline trends are shown on page 54.

Calculation of the unbiased estimate of the demonstration project relied on selecting an appropriate comparison group. The evaluation team selected a comparison group that satisfied two main requirements. First, the GNE group and the comparison group needed to have parallel outcome trends during the baseline period (academic years 2006–2007 through 2009–2010 which were chosen to approximate the legislatively established baseline period of January 2006–December 2010). Second, the GNE group and the comparison group needed to be similar based on observable characteristics. We assessed the comparability of the GNE and comparison groups by examining the standardized bias metric.⁵¹ Using a comparison group that satisfies these two requirements increased the likelihood that the comparison group would serve as a reasonable counterfactual for the GNE SONs, and therefore that the DID estimates would represent the impacts of the GNE demonstration project and not the effects of other influences.

We evaluated the impact of the demonstration project on APRN student enrollment using the comparison group that best satisfied these criteria. We also estimated the sensitivity of our findings to the use of two alternative comparison groups and found that results were qualitatively similar with each of the three comparison groups. Appendix C.2 presents the results of these sensitivity analyses.

2.1.2.2 GNE Demonstration Project Cost Analysis

The team analyzed the cost data described in Section 2.1.1.2 in two ways. First, the team conducted descriptive analyses to examine the total cost of the GNE demonstration project (i.e., the cumulative cost incurred by hospitals, SONs, and clinical education sites), the cost by network, and the estimated average cost to CMS, under the demonstration, of supporting the clinical education of an additional APRN student to graduation. The team also conducted regression-based trend analyses to determine factors that might explain differences in SON-level costs over time. These results can be found in Appendix D.1.

The descriptive analysis of secondary data used summary statistics, including means, counts, proportions, and ranges. These analyses provided a general overview of the costs of the GNE project, including tabular and graphical presentations. In this report, we focus on describing patterns in costs over time and, specifically, how costs changed between the first four demonstration years, DY1–DY4; the extension period, DY5 and DY6; and the Closeout Period.

2.1.2.3 APRN Alumni Case Study Data Analysis

Our analysis of the 713 alumni records was limited to descriptive statistics and comparisons of the variables listed in Exhibit 2-2. The descriptive analysis included singular and cross-tabulations by selected data fields, presented using charts to display the data succinctly. For example, in Chapter 7 we present a chart that displays the total number and percentage of alumni who work in rural

⁵¹ Rosenbaum, P., & Rubin, D. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, 39, 33–38.

and urban settings, and a cross-tabulation chart that displays the number and percentage of alumni who serve medically underserved populations in urban areas and in rural areas. All results except for the number of data points per network are for the combined data from all five hospital networks that submitted data.

2.2 Qualitative Data

The purpose of the qualitative component of the evaluation was to analyze the structural features of the demonstration networks, their implementation and operational processes, perceived outcomes, and sustainability strategies. The analysis of qualitative data provides insight into the meanings, motives, reasoning, and perceptions of respondents that cannot usually be obtained from analyses of quantitative data. The qualitative findings also provide context for framing and interpreting the quantitative results and were used for the process and effectiveness domains of the evaluation. In this section, we describe the qualitative data sources used to inform the evaluation of the GNE demonstration project as well as our analysis technique.⁵²

2.2.1 Data Sources

We gathered qualitative data from a variety of GNE stakeholders during site visits to network hospitals and SONs, annual check-in calls, and APRN alumni interviews. In total, we conducted 292 interviews with GNE stakeholders. In Exhibit 2-3 we describe the distribution of interviews across different types of stakeholders by GNE network and the source of data collection i.e. site visits, annual check-in calls, or alumni interviews.

Exhibit 2-3. Number of Qualitative Interviews by Stakeholder Type, Venue, and GNE Network

Network	DUH	HUP	MH	RUMC	SHC-O	Total
Site Visit Data						
2014 Site Visit	15	19	21	16	21	92
Clinical Placement Coordinators/Recruiters	1	1	4	1	2	9
Faculty Focus Groups	2	1	2	1	2	8
Oversight Teams	3	0	3	1	4	11
Preceptors	5	2	3	4	4	18
SON Administrators	0	12	5	1	5	23
Student Focus Group	2	2	2	2	2	10
Other (i.e., financial analysts, etc.)	2	1	2	6	2	13
2015 Site Visit	10	17	10	12	15	64
Clinical Placement Coordinators/Recruiters	1	0	1	2	2	6
Faculty Focus Groups	1	1	1	1	1	5
Oversight Teams	1	2	2	1	1	7
Preceptors	5	4	4	3	5	21

⁵² See section “Secondary Data Used to Analyze Factors that Influenced GNE SONs’ Costs” on pages 37–38 of the *DY1–DY4 Cost Evaluation Report* for additional information.

SON Administrators	1	9	1	3	3	17
Student Focus Group	1	1	1	1	1	5
Other (i.e., financial analysts, etc.)	0	0	0	1	2	3
Annual Check-In Call Data						
2015 Check-In Call	3	12	6	3	8	32
SON Oversight	1	1	1	1	1	5
SON Administrators	2	11	5	2	7	27
2016 Check-In Call	2	11	5	2	5	25
SON Oversight	1	2	1	1	1	6
SON Administrators	1	9	4	1	4	19
2017 Check-In Call	2	10	5	2	5	24
SON Oversight	1	1	1	1	1	5
SON Administrators	1	9	4	1	4	19
2018 Check-In Call	1	11	5	2	5	24
SON Oversight	1	1	1	1	1	5
SON Administrators	0	10	4	1	4	19
2019 Check-In Call	1	10	5	1	5	22
SON Oversight	1	1	1	1	1	5
SON Administrators	0	9	4	0	4	17
APRN Alumni Data						
APRN Alumni Telephone Interviews	2	0	0	4	3	9
All Qualitative Data Total	34	79	52	37	59	292

2.2.1.1 Annual Check-In Call Data

The evaluation team conducted five rounds of annual check-in calls with GNE SON administrators and oversight teams each spring from 2015 to 2019. The 30-minute telephone calls served as the primary source of data collection after the team had completed their site visits in fall 2015. The calls focused on changes or updates to the demonstration project, extension year activities, sustainability plans, and closeout activities. In addition, these calls served as an opportunity to confirm or clarify information gathered during the previous check-in calls.⁵³ The qualitative information presented in this report was gathered primarily from the 2017 to 2019 annual check-in calls.

2.2.1.2 APRN Alumni Data

We conducted interviews with nine APRN alumni to understand the experiences of APRN alumni in finding employment and factors that influenced their employment decisions. Seven SONs agreed to collaborate with IMPAQ in the APRN alumni interviews, which formed the database for the qualitative component of the Alumni Case Study. To encourage participation, we offered a

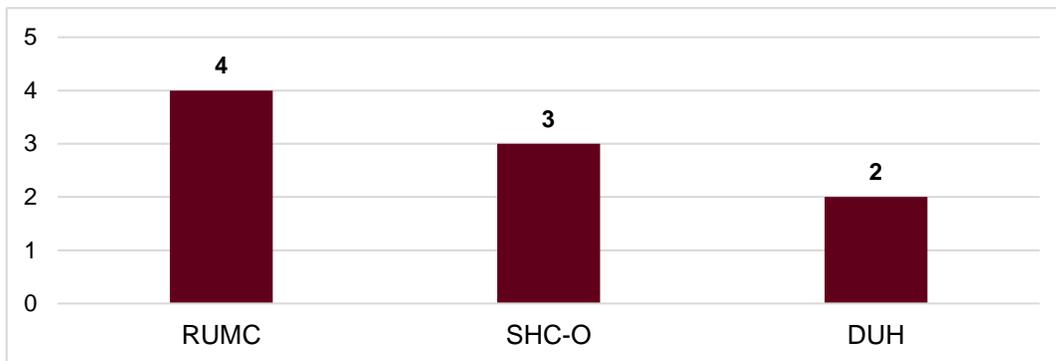
⁵³ See section “Stakeholder Interviews and Focus Groups” on pages 38-42 of the *DY1–DY4 Impact Evaluation Report* for detailed description of discussion topics covered during these calls and the methodology for check-in calls.

\$150 gift card for all alumni who participated in the 60-minute telephone interview. Twelve alumni expressed willingness to be interviewed.

Our selection process prioritized alumni who precepted in CCSs that received GNE funds. We also selected APRNs from different SONs and networks to the extent possible, to ensure we interviewed a variety of APRNs. From these efforts, the IMPAQ team chose a maximum of nine APRN alumni from four SONs and three different networks for the telephone interviews. The maximum number of nine for APRN alumni interviews was chosen to meet the Paperwork Reduction Act requirement from the Office of Management and Budget.⁵⁴ Appendix A presents the protocol for the APRN Alumni Case Study structured interviews.

We present the distribution of APRN alumni interviewed by network in Exhibit 2-4.

Exhibit 2-4. Total Number of APRN Alumni Interviewed by Network



2.2.2 Analysis Methods

To analyze the qualitative data, the team used NVivo, a qualitative data analysis software program, to identify patterns and themes that allowed us to answer the research objectives. Prior to coding the qualitative data, the team used the audio recording to clean the interviewer's notes taken during the interview. Any typographical errors, erroneous text, or omissions were corrected at this stage. To develop the NVivo nodes, which are references about a specific theme or area of interest, the qualitative team used a combination of deductive and inductive coding. As new qualitative data were gathered, the coding scheme was enhanced to address emerging themes.

⁵⁴ <https://whitehouse.gov/omb/information-regulatory-affairs/federal-collection-information/>

Chapter 3: How Was the GNE Demonstration Project Implemented and Operated?

In this chapter, we describe the implementation and operation of the GNE demonstration networks, briefly summarize demonstration project activities during initial program implementation and demonstration years, and focus on demonstration project activities during the extension years (DY5 and DY6) and the Closeout Period.⁵⁵ In particular, Sections 3.1, 3.2, and 3.3 of this chapter provide brief summaries of program implementation and funding processes which saw minimal changes during DY5 and DY6. Section 3.4 provides an update to the number and percentage of clinical education hours completed by setting and APRN specialty. Sections 3.5–3.7 focus on results from the annual check-in calls conducted during the extension years and Closeout Period.

3.1 Project Implementation

During our site visits and annual check-in calls, all the networks reported a variety of challenges during the implementation of the demonstration project due to the short timeframe allocated by CMS for project development. The limited timeframe continued to be one of the major challenges that stakeholders mentioned during the extension years and Closeout Period check-in calls. According to network leadership, the following project aspects were the most difficult to implement:

- Developing GNE clinical precepting payment policies and procedures;
- Hiring qualified support staff and faculty within a limited timeframe; and
- Establishing uniform data collection activities in multi-SON networks.

To assist with implementation, each network oversight team worked to foster communication and collaboration among its partners by establishing biannual or quarterly meetings. The oversight teams were particularly important for networks with multiple SONs, such as HUP, MH, and SHC-O, because they helped streamline communication within the network and facilitated partnerships and information sharing across the SONs. The meetings discussed best practices, lessons learned, and emerging concerns. Interview participants representing the strategic oversight teams and SON administrators all reported that the meetings were very helpful in establishing new and lasting partnerships.

“ The biggest challenge is that there was not startup time, both for the networks and for CMS to oversee it. It was a tremendous challenge to figure out the rules as the program was being implemented. ”

⁵⁵ See “Chapter 3: How was the GNE Demonstration Project Implemented and Operated?” of the *DY1–DY4 Impact Evaluation Report* (pages 58–74) for additional information about detailed qualitative results from DY1–DY4.

3.2 Key Investments to Support Implementation

The networks and SONs varied in how they invested demonstration project funds, but generally investments included the following:

- Hiring support staff to oversee the clinical placement process and site/preceptor recruitment;
- Hiring clinical faculty; and
- Purchasing equipment such as database software systems and simulation equipment to educate students.



Because of the clinical coordinator position, we have been able to expand our search for [clinical education] sites to areas we've not looked at before.



All five demonstration networks used CMS payments to create or expand administrative resources devoted to managing and overseeing the clinical placement process. This included hiring clinical placement coordinators/recruiters and purchasing database systems to track placements. Furthermore, interview

participants reported using funds to develop and implement several innovative clinical education models, including those that serve medically underserved populations. For example, RUMC developed an innovative start-up preceptor program, which places RUMC preceptors at clinical education sites that were previously unable, or unwilling, to provide clinical education to APRN students. These clinical education sites were generally volunteer-based clinics that serve low-income patients.⁵⁶ For more information on innovative models, please see Section 3.7.5.

3.3 Funding Process Implementation

As noted earlier in this report, under the GNE demonstration project, CMS provided payments to five eligible hospital awardees to provide qualified clinical education to APRN students enrolled as a result of the demonstration project. The five hospitals participating in the demonstration project formed networks that included partnerships with accredited SONs and qualified clinical education sites. In this section, we provide an overview of how GNE demonstration project funding was distributed and used by hospitals, SONs, and clinical education sites. For further context regarding the funding process, please see Section 1.4.2.

3.3.1 Hospital Disbursement of GNE Demonstration Project Funds

Each of the five awardee hospitals used the GNE funds for salaries to support a demonstration project oversight team who administered the GNE demonstration project. The oversight team's staffing structure varied across the networks but generally consisted of a project director and one to three support staff. The support staff typically oversaw general program administration, precepting payments, and annual audits, which included data collection from the SONs. GNE

⁵⁶ Volunteer-based clinics are staffed by providers and support staff who donate their time and services.

funds provided to the MH network also supported GTC, a third-party vendor who recruited and coordinated clinical education sites, particularly CCSs.

During the extension years and Closeout Period check-in calls, about three-quarters of SONs agreed that the GNE funding process that had hospitals disburse precepting payments to sites worked well. By having the hospital oversee precepting payments, SONs were able to spend time and resources on other areas, such as enhancing or developing their clinical education placement process, developing innovative clinical education models, recruiting sites and preceptors, and increasing APRN student enrollment. However, a quarter of SONs stated that the process added an additional layer of unnecessary complexity. These SONs would have preferred to be in direct contact with their clinical education sites instead of having their sites work with their network's hospital.

3.3.2 SON Disbursement of GNE Demonstration Project Funds

During the extension years we asked about how funding was distributed throughout each SON. GNE stakeholders from all networks reported that the awardee hospitals reimbursed the SON(s) in their network for costs associated with providing qualified clinical education to APRN students based on their established agreements. The reimbursement costs varied among the networks but generally consisted of funds for the following items:

- Salaries for non-didactic faculty (full and adjunct), administrative support staff, and clinical education placement coordinators/recruiters; and
- Key infrastructure (i.e., database systems and simulation education equipment and materials).

“ We were able to support three clinical placement coordinators and I firmly believe we can't do it [clinical placements] with less. ”

While funding provided to the SONs for key infrastructure to support the GNE demonstration project was generally disbursed as one lump sum, the funds for the SON's GNE staff salaries varied over time to adjust for staff turnover and general restructuring. The demonstration project did not support costs associated

with didactic education nor costs for certification and licensure. To expand opportunities for clinical education, the SONs used demonstration project payments to streamline the clinical education placement processes through staff that improved coordination of the placement process, as well as databases that enabled SONs to recruit, manage, and evaluate clinical education sites more effectively.

3.3.3 Precepting Disbursement of GNE Demonstration Project Funds

The participating hospitals disbursed funds directly to the clinical education sites. The GNE funds were used to support precepting payments for clinical education of additional APRN students. To determine how to allocate GNE funds to clinical education sites, network oversight teams considered (1) designating specific clinical education sites as “GNE sites,” or (2) designating APRN students enrolled during the demonstration project as “GNE students.” If the network designated a clinical education site, then that site received precepting payments for *any student* who was placed at that location. If the network designated students, then *any clinical education site* at which a GNE student was placed received precepting payments. The oversight teams for each GNE network determined whether sites or students would be designated, and they allocated the number of GNE sites or GNE students to the SONs in their network each semester. Exhibit 3-1 outlines the GNE designation methods across networks.

“ *The additional student idea has been confusing to [sites]. [The sites] are not able to understand what revenues are coming in. That has been really difficult.* ”

Exhibit 3-1. GNE Designation Method by Network

Network	GNE Designation
DUH	Clinical education sites
HUP	APRN students
MH	DY1: APRN students DY2–DY6: Clinical education sites
RUMC	Clinical education sites and start-up preceptors
SHC-O	APRN students

Because DUH, MH, and RUMC established a centralized clinical placement process, their networks’ oversight teams oversaw all GNE designations. Although the oversight teams for HUP and SHC-O allocated the total number of students the SON could designate as GNE students, they allowed the SONs to place those students strategically at clinical education sites. All networks reported targeting precepting payments to clinical education sites and preceptors that:

- Served medically underserved populations;
- Provided inter-professional or other innovative models of clinical education, for example, the Start-up Preceptor Program at RUMC; and
- Had been difficult to partner with in the past, such as obstetrics and gynecology or pediatric sites.

“ *The money goes to the health system. How that goes out to a primary care practice, where one preceptor is GNE and one is not—I can’t answer that question.* ”

To disburse precepting payments, each network’s oversight team created its own methodology as part of its project implementation. HUP, RUMC, and SHC-O based the precepting payments on the number of student clinical hours. MH, however, based the payments on the preceptor’s lost productivity time. DUH used the Medicare fee schedule to determine precepting payments to physicians and other providers, based on provider type and location.

The networks’ oversight teams distributed the precepting payments, the vast majority of which were made to the clinical education site, not to the preceptor. The sites then decided how to disburse or use those payments. Many sites used the precepting payments to provide bonuses to staff or subsidize staff education through conferences and training. Some sites gave all or a portion of the precepting payment directly to the preceptor as a bonus. In a few instances, preceptors who worked at CCSs declined the payments and asked that they be used to support patient care. These declined precepting payments, however, were made directly to a different preceptor who had a contract with the GNE network, as was the case in RUMC’s Start-up Preceptor Program. HUP and SHC-O respondents also noted initial challenges in clearly communicating the GNE designations and the disbursement process to all SONs and clinical education sites. To address these communication issues, the HUP and SHC-O networks worked to set expectations and clearly explain their GNE designation and disbursement methodology.

3.3.4 In-State vs. Out-of-State Precepting Payments

The majority of precepting payments were made within the state in which the awardee hospital was located; however, there were a few exceptions. For example, one of the HUP network’s nine SONs placed a few GNE-designated students at out-of-state clinical education sites. Therefore, HUP made a small amount of payments to out-of-state clinical education sites. DUH also made precepting payments to several out-of-state sites where students from the DUH online program were placed. In addition, two of the four SONs in the SHC-O network placed GNE-designated students at out-of-state sites. To ensure that the majority of precepting payments would go to in-state sites, the oversight team at SHC-O asked their SONs to place GNE-designated students in the following order: (1) to sites in Arizona, (2) to sites in border states, and (3) to sites elsewhere.

3.4 Clinical Education Hours

This section presents the number and percentage of clinical education hours by setting and APRN specialty using data from the GNE Audit Reports. The *DY1–DY4 Impact Evaluation Report* presented findings using DY1–DY3 data because audited DY4 information was not available at the time. This report updates those results with DY4 and DY5 data because audited DY6 data was not available at the time of this report.

The number of precepted clinical education hours completed by additional APRN students increased by 13 percent, from 577,192 hours in DY3 to 650,953 hours in DY4 (Exhibit 3-2). The number of clinical education hours then dropped by 16 percent to 545,810 hours in DY5. This pattern is consistent with the evidence presented in Chapter 4 showing that the number of additional APRN students increased every year until DY4, and then decreased starting in DY5. Exhibit 3-2 also shows that, in all years, additional APRN students completed more education hours in CCSs than in hospitals. The percentage of completed clinical education hours for additional APRN students at CCSs remained stable throughout the demonstration period, peaking at 78 percent in DY3, and decreasing only slightly thereafter to 77 percent in DY4, and to 76 percent in DY5.

Exhibit 3-2. Clinical Education Hours Completed by Additional APRN Students from DY1 to DY5, Overall and by Setting

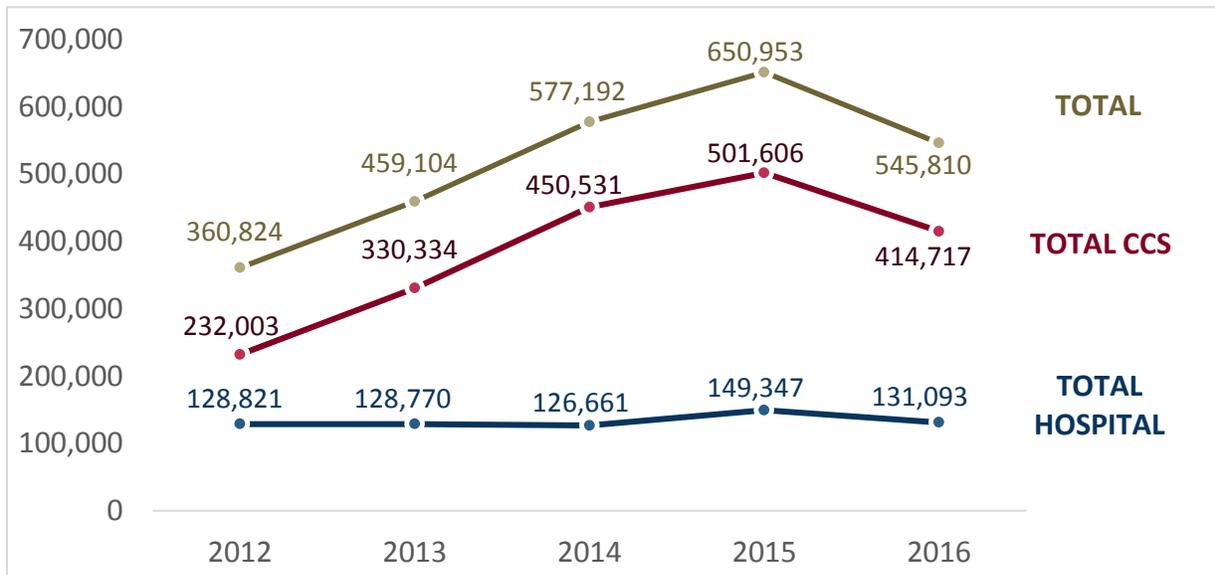
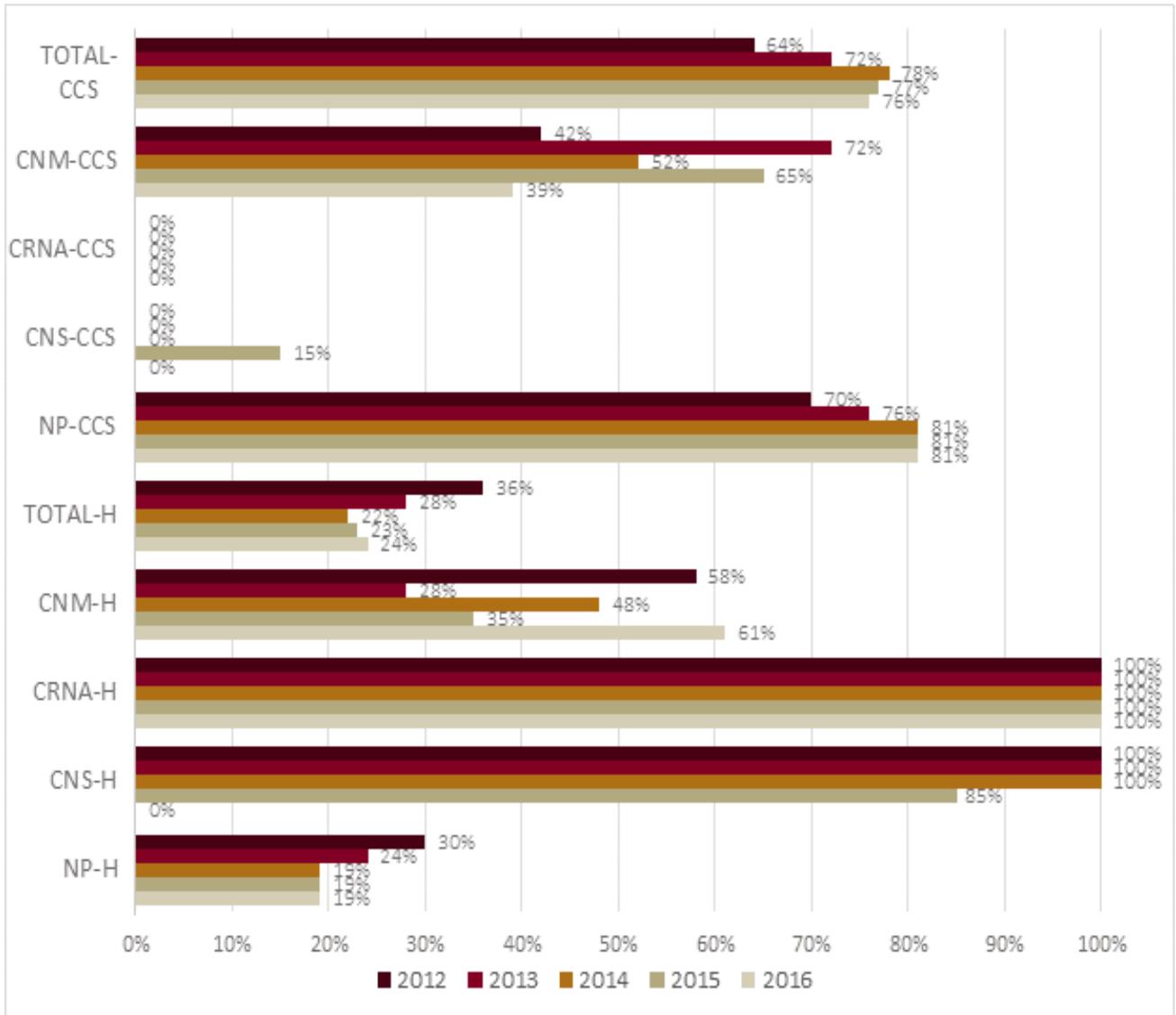


Exhibit 3-3 shows the percentage of clinical hours completed by additional APRN students in demonstration-affiliated CCSs and in hospitals, by specialty, between DY1 and DY5. In all demonstration years, NP students completed the highest percentage of their clinical education hours in CCSs, followed by CNM students. Additional CRNA and CNS students completed all their clinical hours in hospital settings with the exception of a small number of CNS students that completed some clinical education hours in DY4, consistent with the nature of practice within these specialties. The percentage of clinical education hours completed by NP students in CCSs remained the same in DY4 and DY5 as it was in DY3, while the percentage of clinical education hours completed by CNM students fluctuated in all years.

Exhibit 3-3. Percentage of Precepted Clinical Hours Completed at Hospital (H) and CCS Settings by Additional Students Enrolled in GNE SONs, by APRN Specialty and Year



3.5 Extension Years

During check-in calls that occurred during the extension years and Closeout Period, we asked GNE oversight teams and SON administrators about extension year activities. All five networks participated in a two-year extension of the demonstration project (DY5 and DY6). The extension period allowed additional time for additional APRN students enrolled during DY1–DY4 to complete their required clinical education. Networks did not receive payments for qualified clinical education of additional

“ We are very pleased to have the option of the GNE additional support, which will be very helpful for the students and us placing them during the remaining part of their program. ”

APRN student enrollment in DY5 or DY6. As such, the hospitals received fewer dollars overall in DY5 and DY6 compared to each previous demonstration year to implement and operate the project and provide precepting payments to clinical education sites. These costs are provided overall and by network in Chapter 5.

3.5.1 Demonstration Project Operations

During the annual check-in calls that covered demonstration project activities during DY5 and DY6, respondents reported no significant changes to the demonstration project operational processes. Oversight teams and SON respondents reported that the support staff hired to manage the GNE demonstration project continued to oversee demonstration project activities. Additionally, SONs reported that they continued to maintain their clinical faculty positions as well as clinical placement coordinators and/or recruiters who were fully or partially funded by the GNE demonstration project. Respondents at most SONs also reported maintaining administrative and clinical faculty positions funded through the GNE demonstration project, and didactic faculty funded through non-GNE dollars, in DY5. However, SONs reported different degrees of certainty about their ability to sustain these positions through the final extension year (DY6) and beyond GNE demonstration project funding.

The GNE demonstration project funding process was not changed among the networks during the extension years. All funding continued to flow from the network's hospital to either the SONs to implement the demonstration project, or clinical education sites to pay for precepting APRN students. For more information on the funding process, please see Section 3.3.

Toward the end of DY5 and during DY6, all SONs and networks had begun closing out their GNE demonstration project operations to prepare for the end of the demonstration project; however, the pace at which stakeholders were working to close the demonstration project varied. In spring 2018, one-third of the SONs and oversight teams reported that some or all staff hired to implement the demonstration project had been, or would be, absorbed by the SON or hospital, or laid off. Almost all clinical placement coordinators and recruiters continued to manage their SON's clinical placement processes through the end of DY6 in some capacity. Two SONs also reported that they were working with their school's administrators and financial staff to decide whether they would maintain certain GNE-supported positions once the demonstration ended.

During the 2019 annual check-in calls, SONs and hospitals reported that they had already implemented their GNE closeout staffing plan and had either absorbed GNE staff into the SON or hospital or laid them off. Stakeholders also reported that several GNE-funded staff had also timed their retirement to coincide with the ending of the demonstration. All SONs and hospitals had designated one or two staff to assist with the final audit and any other closeout activities.

3.5.2 Clinical Education Site Availability

Throughout the extension years, SON administrators expressed growing concern regarding the ability of SONs to maintain the current number of preceptor and clinical education sites,

“*At the end of the project, I'm not sure what we're going to do when the preceptors want to be paid and won't precept if not. I think there will be an impact. I don't know what I'm going to do.*”

particularly once the demonstration project ended. Several SON respondents stated that they continued to observe the effects of limited funds for preceptor payments on preceptor engagement. Almost all SONs reported that preceptors (or their clinical practices) were beginning to decline to serve as preceptors (or clinical education sites) due to lack of compensation. As a result, during DY5 and DY6, SONs expressed a growing concern that they might not be able to maintain their current number of preceptors and clinical

education sites after the end of the GNE demonstration project. To offset the expected decrease in clinical education sites and subsequent decrease in available preceptors, one SON used DY6 GNE funds to hire adjunct faculty whose personal connections gave them entry into new clinical education sites.

In addition, the within-network competition for clinical education sites among SONs had begun to increase to pre-demonstration levels. Many respondents attributed the increase in competition to the decrease in demonstration payments in DY5 and DY6. In fact, in spring 2018, nearly half of the SONs continued to report an increase in competition for clinical education sites, particularly from non-GNE for-profit SONs that could afford to pay preceptors. Many respondents worried that this competition would only increase among the SONs once the GNE demonstration project ended, especially in networks with multiple SONs where competition for clinical education sites was a challenge prior to the GNE demonstration project.

3.5.3 APRN Enrollment vs. CCSs

During the extension years, stakeholders discussed the tension between the two primary objectives of the demonstration project—increased enrollment and availability of CCSs. With a large and growing number of APRN student enrollees, GNE SONs had to increase their preceptor pools significantly. To do so, they targeted larger clinical practices to precept multiple students every semester. These sites were located in well-served geographic areas and were often affiliated with a hospital system. However, a key goal of the demonstration project was to precept students in medically underserved areas, including rural communities, and FQHCs where students would continue to practice after graduation. Often these types of sites accommodated only one or two placements and would commit to precepting only one semester of each year. Stakeholders commented on the tension between these two project objectives, noting that it was not always clear how to target resources to accomplish both goals. Nevertheless, as discussed in Section 3.4, the majority of clinical education hours in DY5 were at CCSs rather than hospitals.

3.6 Closeout Activities

As discussed above, oversight teams and SON administrators had begun planning for the GNE demonstration project closeout during DY5 and DY6 with the GNE demonstration project officially ending in July 2018. Beginning in winter 2019, oversight teams and SONs began to prepare their final audit reports. As of February 2019, all SONs had submitted all documents needed to complete their final audit or were near completion. Below we discuss closeout activities, including communication among networks and SONs, decisions about support staff, and the clinical education payment closeout process.

“ The deadline was very clear for closeout activities from CMS. ”

3.6.1 Communication and Planning

All five network oversight teams received guidance from CMS on closeout activities, including a timeline of deliverables. Multi-SON networks also held meetings with their SON administrators to review the closeout timeline and answer any questions the SONs had regarding closeout activities. After the network meetings, SONs also held internal meetings to discuss and plan for closeout activities; specifically, those surrounding demonstration payments and information needed to complete the final audit.

3.6.2 Support Staff

All SONs reported working to determine which GNE-funded support staff would be maintained to support the closeout efforts. In February 2019, respondents reported that while many GNE-funded staff had either already been absorbed by the SON or hospital or were let go, the SON or hospital did maintain one or two staff to assist with the final audit and any additional closeout activities.

3.6.3 Clinical Education Payment Closeout Process

To prepare for the end of the GNE demonstration project, many SONs sent formal letters or emails in late winter or early spring of 2018 to clinical education sites and preceptors informing them that the GNE demonstration project was ending in July 2018 and they would no longer receive payment. One network, however, decided not to send formal letters to their clinical education sites and preceptors about payments because they were concerned that they would see a large decrease in the availability of the sites and preceptors. However, the SONs in that network did individually respond to inquiries regarding payment rather than having any formal communication with their sites and preceptors regarding the end of the demonstration project and payments.

“ We had a discussion about sending out a letter from all the participants in the project to thank them for their participation. . . . After a long discussion, we decided not to send that letter, and deal with it on an individual basis. ”

In July 2018, all demonstration payments provided by the GNE demonstration project ended, and in early fall 2018 networks began to process the final precepting payments to their sites. As of February 2019, the majority of precepting payments were disbursed; however, networks who still had outstanding payments to sites established an internal deadline to ensure all precepting payments were disbursed by spring 2019.

3.7 Sustainability

In this section, we discuss the aspects of the GNE demonstration project that were sustained by the networks, including innovative models, clinical education placement processes, and precepting incentives.

3.7.1 APRN Enrollment

SONs varied in their perception of their ability to maintain APRN student enrollment levels achieved during the GNE demonstration project once the demonstration ended. Eight SONs expected their APRN student enrollment to remain the same after the GNE demonstration project ended. As one SON explained, the school now expected them to maintain the same level of student enrollment they had during the GNE demonstration project, which would be difficult due to lack of support staff and resources that were originally been supported by GNE demonstration project funds. Four other SONs expected their student enrollment to continue to increase after the GNE demonstration project ended. Two SONs attributed the increase to changes in their curricula, while another mentioned increased community demand for APRNs. About a third of the SONs were unsure if their student enrollment would increase or decrease after the GNE demonstration project ended. When asked why they were uncertain, many mentioned their concern about the impact the lack of clinical education payments would have on availability of clinical education sites. Only one SON expected their enrollment to decrease after the GNE demonstration project ended.

“One of the concerns will be if there can't be placements for students, enrollments will ultimately decline since that is the critical part of APRN education.”

3.7.2 Precepting Payments

“As small school, we can't afford to pay the preceptors. We definitely have to come up with an improved strategy to incentivize [preceptors] without [payment].”

Only one of the 19 SONs planned to continue to provide payments to their clinical education sites/preceptors. This SON provided payments to clinical education sites prior to the GNE demonstration project and noted that the amount to be paid would be substantially lower than what they paid during the GNE demonstration project.

To offset the lack of precepting payments, about two-thirds of the SONs reported during the 2018 check-in calls that they had developed, or were in the process of developing, non-financial incentives to encourage

preceptor engagement. Examples of these non-financial incentives included preceptor development courses, and access to the SON's library. About a third of the SONs also mentioned that they would continue to explore alternative funding sources. One SON mentioned that they were looking into tax credits for their clinical preceptors to offset the lack of clinical payments.

3.7.3 Clinical Education Placement Process

All SONs that used GNE demonstration project funds to enhance or develop their clinical education placement processes sustained those processes after the demonstration ended. This included funds used to purchase database systems such as E-value and Typhon. One SON reported that they would sustain the database they developed in DY1 using GNE demonstration project funds to assist with their clinical placements.

Of the 19 SONs, 14 hired staff to support clinical education placements and recruitment during the GNE demonstration project. About two-thirds of those SONs retained the clinical placement coordinator or recruiter position after the GNE demonstration project ended. All SONs who kept this position noted that they had come to rely heavily on the position to oversee the paperwork and frequent communications with clinical education sites. Additionally, the new positions also alleviated some of the workload for SON faculty, who had generally overseen those activities, and allowed them to focus on other responsibilities.

“

One of our greatest victories from this project is that particularly with the clinical placement coordinator we made the case for the need for this role within our college.

”

3.7.3.1 Anticipated Increase in Competition among SONs

SON respondents worried that competition would increase among the GNE SONs once the GNE demonstration project ended, especially in networks with multiple SONs where competition for clinical education sites was a challenge prior to the GNE demonstration project. The competition for clinical education sites among GNE SONs had begun to increase to pre-demonstration levels during the extension years. Many respondents attributed the increase in competition to the decrease in precepting payments in DY5 and DY6.

“

We all have the same database of preceptors, so we will all be contacting the same preceptors asking for clinical placements for our students. As a result, there will be more competition than collaboration.

”

GNE stakeholders also mentioned that there is increased competition from non-GNE SONs, specifically for-profit SONs, and medical schools. Unlike medical schools, PA programs, and for-profit SONs, 18 of the 19 GNE SONs reported being unable to provide payments to preceptors. Additionally, the one SON that was able to provide precepting payments noted that the amount provided was much smaller than the amount provided by other schools.

“ There are local PA and MD programs that are paying for sites and preceptors, which has increased competition for sites. ”

SONs reported finding that they had a limited number of clinical education sites that were willing to take APRN students for free.

3.7.4 Collaboration

All respondents reported that the increase in collaboration and partnerships among clinical education sites, individual preceptors, hospitals, and SONs had been a key success of the demonstration project. To maintain collaboration once the GNE demonstration project ended, SONs in multi-SON networks had requested continuation of annual or biannual meetings with oversight teams and SONs; however, without the GNE demonstration project, oversight teams and SON administrators were unsure if this would be possible. Regardless, stakeholders during the extension year and Closeout Period check-in calls stated that they “hoped” that the relationships developed through the demonstration project would continue informally once the demonstration project ended.

“ We really come together in terms of sharing best practices and forming relationships with each other. We hope to maintain that and keep that communication ongoing. ”

3.7.5 Innovative Models

The SONs who used GNE demonstration project funds to purchase equipment for clinical education sustained the simulation and telehealth equipment after the demonstration project ended. This includes an ear simulator, prostate prosthesis, vaginal exam simulator, iPads and other tablets. For example, Texas Woman’s University will also maintain the use of a live model lab at another school as part of their students’ advanced assessment course. Additionally, the virtual clinical evaluations developed using GNE demonstration project funds at the University of Arizona will be sustained. Another example of a sustained innovative model is that RUMC will sustain four of their Start-up Preceptor Programs that were established using GNE demonstration project funds.

Chapter 4: How Effective Was the GNE Demonstration Project in Increasing Growth in the APRN Workforce?

The evaluation team examined APRN student growth over time in the GNE SONs and assessed the impact of the GNE demonstration project on the growth of APRN students during the entire demonstration period (DY1–DY6).⁵⁷ The results in this chapter do not include data from the Closeout Period because hospital awardees did not receive demonstration payments in that year. The team assessed whether the demonstration project was effective in increasing APRN student enrollment and graduations overall, by specialty, and by degree type. In addition, the team assessed whether the demonstration project had spillover effects on non-GNE SONs located within the same state as a GNE SON. All these analyses are described in Section 4.1. To provide context to the quantitative findings, the team collected qualitative data from stakeholders in the GNE networks to capture their perceptions of how the demonstration project facilitated growth in APRN student enrollment and graduations, as well as growth in preceptors and the change in awareness of APRN roles and skillsets among preceptors. These results are described in Section 4.2.

4.1 Quantitative Data

This section examines the impact of the GNE demonstration project on APRN student enrollment and graduations during the entire demonstration period. Sections 4.1.1 and 4.1.2 provide a descriptive analysis of the growth of APRN students in GNE SONs during the baseline and demonstration years. Section 4.1.3 describes the quasi-experimental impact evaluation results during the entire demonstration period. These results are compared and contrasted with the findings for the first four demonstration years described in the *DY1–DY4 Impact Evaluation Report*. Section 4.1.4 presents the results of the spillover analysis, which as mentioned in Section 2.1.2 compares SONs that did not participate in the demonstration project, but had observable characteristics similar to those of the GNE SONs and were located in the same states as the GNE SONs, to a comparison group.

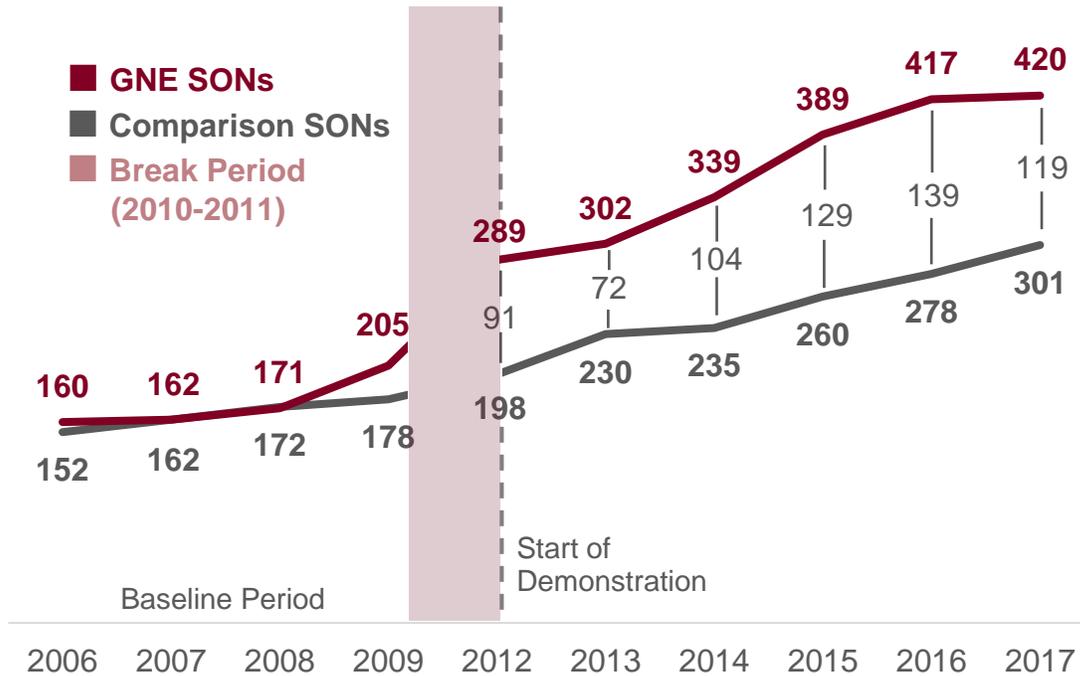
4.1.1 Descriptive Analysis of Enrollment Trends

Exhibit 4-1 presents descriptive annual APRN student enrollments in GNE and non-GNE SONs during the baseline period (2006 - 2009) and the demonstration period (2012 - 2017). The graph shows that the GNE and non-GNE SONs have enrollment trends that are close to parallel during the baseline period. A steeper increase in enrollment is observed in GNE SONs compared to non-

⁵⁷ We exclude the Closeout Period from this analysis because during this period awardee hospitals were only reimbursed for the closing of demonstration project-related functions and not for costs incurred to support enrollment or graduations of additional APRN students, which was the case during the first six years of the demonstration project.

GNE SONS in 2012 (DY1) through 2017 (DY6). During the demonstration period, the enrollment trend of the GNE group increased more quickly than that of the comparison group. These APRN enrollment trends provide initial descriptive evidence of a positive effect of the GNE demonstration project on APRN enrollment.

Exhibit 4-1. Mean APRN Student Enrollment in GNE SONS vs. non-GNE SONS Comparison Group

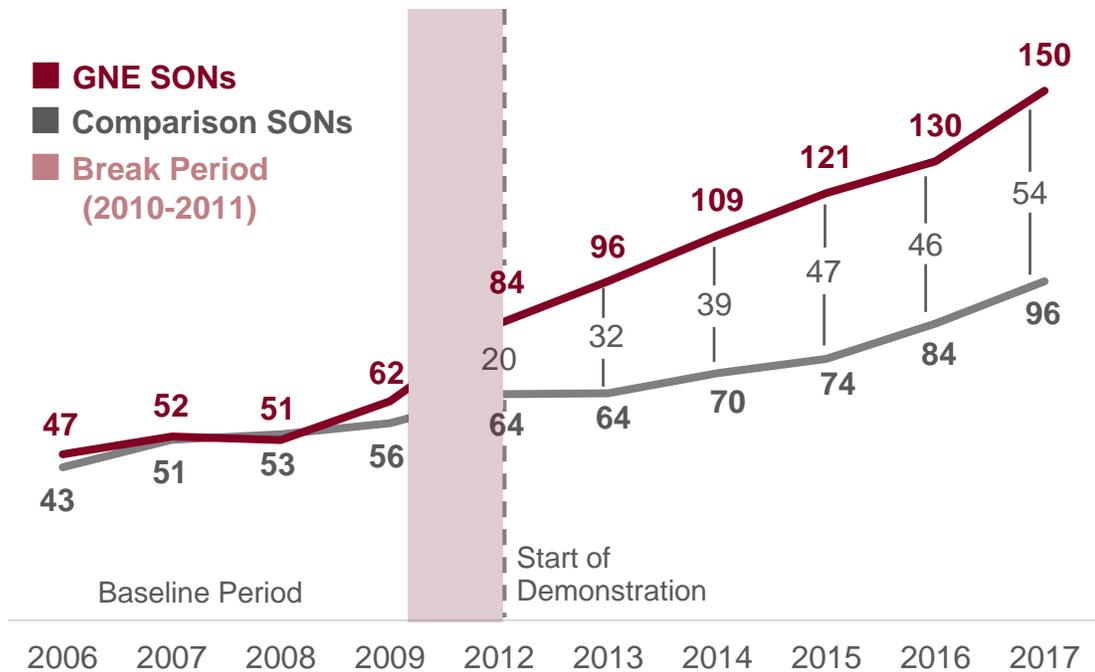


Source: This exhibit uses information from AACN’s Annual Institutional Surveys. **Notes:** The non-GNE SONS comparison group is a weighted comparison group with weights found using an entropy balancing method with quadratic and cubic terms. Each year in the graph corresponds to a baseline year (BY) or demonstration year: 2006 = BY1, 2007 = BY2, 2008 = BY3, 2009 = BY4, 2012 = DY1, 2013 = DY2, 2014 = DY3, 2015 = DY4, 2016 = DY5, 2017 = DY6. AYs 2010 and 2011 were not part of the analysis because they were not part of the legislatively mandated baseline or demonstration periods.

4.1.2 Descriptive Analysis of Graduation Trends

Exhibit 4-2 shows that the mean APRN student graduations follow a similar pattern to APRN student enrollments described in Exhibit 4-1. GNE and non-GNE SONS have graduation trends that are close to parallel during baseline years. During the demonstration period, APRN student graduations increased steeply for the GNE group, while increasing at a more modest rate for the comparison group. The graduations trend in the comparison group increased at a steady rate, whereas the trend for the GNE group became steeper in 2017 (DY6), which aligns with the increase in student enrollment observed in Exhibit 4-1 because most APRN students enrolled in part time and full time two-year master’s programs. Like the APRN student enrollment trends, these APRN student graduation trends provide initial descriptive evidence of a positive effect of the GNE demonstration project on APRN graduations.

Exhibit 4-2. Mean APRN Student Graduations per SON, GNE Group vs. Entropy Weighted Comparison Group



Source: This exhibit uses information from the AACN’s Annual Institutional Surveys. **Notes:** The non-GNE SONS comparison group is a weighted comparison group with weights found using an entropy balancing method with quadratic and cubic terms. Each year in the graph corresponds to a baseline year or demonstration year: 2006 = BY1, 2007 = BY2, 2008 = BY3, 2009 = BY4, 2012 = DY1, 2013 = DY2, 2014 = DY3, 2015 = DY4, 2016 = DY5, 2017 = DY6. Information for APRN graduations is reported with a one-year lag (the AACN 2018 Annual Institutional Survey reports graduation data for AY 2017–2018 (August 1, 2017 through July 31, 2018)). Note that AYs 2010 and 2011 were not part of the analysis because they are not part of the legislatively mandated baseline or demonstration period.

4.1.3 Impact of the GNE Demonstration Project on APRN Student Growth

As described in Section 2.1.2, the evaluation team analyzed the impact of the demonstration project on enrollment and graduations using a DID model that compares the GNE group to an entropy-weighted comparison group.⁵⁸ We also performed sensitivity analyses using two alternative comparison groups. The results using the alternative comparison groups can be found in Appendix C.2.

4.1.3.1 Effect of the GNE Demonstration Project on Overall APRN Enrollment

Exhibit 4-3 shows the DID coefficient estimates for the average effect of the demonstration project on total APRN student enrollment. The DID coefficient estimate is statistically significant at the 5 percent level and shows that APRN enrollment in the GNE group increased by 93 students per SON per year on average relative to the comparison group as a result of the demonstration project. This represents an increase of 54 percent with respect to the baseline mean of the GNE group.⁵⁹ Results in the *DY1–DY4 Impact Evaluation Report* using this comparison group suggested an

⁵⁸ The entropy balancing algorithm included quadratic and cubic terms of continuous covariates.

⁵⁹ The percentage change is calculated by dividing the DID estimate by the baseline level of the outcome for the GNE SONS. For total APRN enrollment, this calculation is: $(93.47/174.28) * 100 = 54$ percent.

average increase in annual APRN enrollment of 87 students per year.⁶⁰ Because the results are similar but slightly higher when measuring the impact of all six demonstration years, they suggest that student enrollment increased only slightly in DY5 and DY6.

Exhibit 4-3. Difference-in-Differences Results: Total APRN Enrollment

APRN Enrollment	
Average Impact Estimate	93.47**
90% Confidence Interval	[24.93, 162.01]
Standard Error	(41.66)
P-value	[0.02]
Baseline Mean for GNE SONs	174.28
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	54%
Number of Observations	2,314

Notes: *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The comparison group was defined using an entropy balancing method with quadratic and cubic terms. Baseline period = BY1–BY4; demonstration period = DY1–DY6.

Exhibit 4-4 shows the results of a DID specification that estimates the impact of the demonstration project separately for each demonstration year. The advantage of using this specification is that it allows separate estimation of the impact of the demonstration project in each demonstration year. The specification measures the changes in outcomes due to the GNE demonstration project relative to the baseline period.

Results show that during the first demonstration year GNE SONs enrolled on average about 83 more APRN students than the non-GNE comparison SONs, relative to baseline years. In subsequent years, enrollment tended to increase until APRN student enrollment reached a peak in DY4, when GNE SONs enrolled 115 more APRN students per SON than non-GNE comparison SONs, relative to the baseline period. Starting in DY5, the first extension year, APRN student enrollments continued to be higher in GNE SONs than in non-GNE comparison SONs, but the difference was of a slightly smaller magnitude than in the previous demonstration year. In DY6, the difference in APRN student enrollment between GNE SONs and non-GNE comparison SONs decreased further, with GNE SONs enrolling on average 96 more APRN students than the comparison group, relative to the baseline period. This coefficient is not statistically significant at the 10 percent level ($p = 0.12$).

Exhibit 4-4. Difference-in-Differences Results: APRN Enrollment, Per-Year Effects

APRN Enrollment	
DY1 Impact Estimate	82.54***
Standard Error	(25.43)
DY2 Impact Estimate	65.72*
Standard Error	(37.77)

⁶⁰ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 84.

APRN Enrollment	
DY3 Impact Estimate	97.20**
Standard Error	(42.08)
DY4 Impact Estimate	114.97**
Standard Error	(56.76)
DY5 Impact Estimate	105.65**
Standard Error	(53.16)
DY6 Impact Estimate	96.17
Standard Error	(61.64)
Number of Observations	2,314

Notes: *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

These results are consistent with interview findings that indicate an initial ramp-up period, in which SONs consistently increased enrollment each year as processes, infrastructure, and relationships were developed and expanded. In the 2017 check-in calls, SON respondents indicated their intention to sustain the same level of enrollment during the extension years, but, as described above, they also mentioned some challenges that emerged during the first extension year. For example, respondents from a few SONs reported that preceptors (or their clinical practices) were beginning to decline opportunities to serve as preceptors (or preceptor sites) without compensation. The initial ramp-up period of the demonstration project, and the challenges faced by SONs as a result of the decline in funding during the extension years, may explain the initial acceleration and subsequent slowdown in APRN enrollment increases during the period of analysis.

We also explored whether the demonstration project had any effects during the Closeout Period. Results can be found in Appendix C.1.

4.1.3.2 Effect of the GNE Demonstration Project on APRN Enrollment by Specialty and Degree

Exhibit 4-5 displays the DID estimates separately for each specialty. The estimates show that the increase in the student enrollments in the NP specialty drove the overall increase in APRN student enrollment. During the entire demonstration period (DY1–DY6), annual NP student enrollment in GNE SONs increased by an average of 89 students per SON compared to the non-GNE SONs. This estimate is statistically significant at the 5 percent level and represents 96 percent of the increase we observed in overall APRN student enrollment.⁶¹ Results in the *DY1–DY4 Impact Evaluation Report* also showed that NPs represented 96 percent of the overall increase in APRN student enrollment.⁶²

⁶¹ The percentage change is calculated by dividing the DID estimate by the overall estimate in Exhibit 4-3. This calculation is: $(89.28/93.47) \times 100 = 96$ percent.

⁶² This result can be found on page 85 of the *DY1–DY4 Impact Evaluation Report*.

Exhibit 4-5. Difference-in-Differences Results: APRN Enrollment by Specialty

	NP	CRNA	CNM	CNS
Average Impact Estimate	89.28**	4.29	0.20	-0.30
90% Confidence Interval	[20.12, 158.44]	[-1.36, 9.94]	[-0.37, 0.76]	[-5.80, 5.20]
Standard Error	(42.04)	(3.43)	(0.34)	(3.34)
P-value	[0.03]	[0.21]	[0.56]	[0.93]
Baseline Mean for GNE SONs	135.77	26.47	2.11	9.93
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	66%	16%	9%	-3%
Number of Observations	2,314	2,314	2,314	2,314

Notes: NP = nurse practitioner, CRNA = certified registered nurse anesthetist; CNM = certified nurse-midwife; CNS = clinical nurse specialist. Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

Exhibit 4-6 displays the DID estimates separately by degree. The results show that during the entire demonstration period, annual enrollment in master’s degree programs in the GNE SONs increased by an average of 73 students relative to the comparison group. However, this estimate is not statistically significant at the 10 percent level ($p = 0.147$); this is similar to the *DY1–DY4 Impact Evaluation Report* findings.⁶³ In addition, after the GNE demonstration project was implemented, post-master’s-level enrollment in GNE SONs increased by four students on average relative to the comparison group, and DNP enrollment increased by 16 students on average. These results show that most of the increase in total APRN student enrollment shown in Exhibit 4-6 was due to an increase in master’s-level enrollment.

Exhibit 4-6. Difference-in-Differences Results: APRN Enrollment by Degree

	Master’s	Post-Master’s	DNP
Average Impact Estimate	72.89	4.29	16.28
90% Confidence Interval	[-9.47, 155.25]	[-4.30, 12.89]	[-32.02, 64.59]
Standard Error	(50.07)	(5.22)	(29.36)
P-value	[0.15]	[0.4]	[0.58]
Baseline Mean for GNE SONs	157.49	8.9	7.9
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	46%	48%	207%
Number of Observations	2,314	2,314	2,314

Notes: *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. DNP = doctor of nursing practice. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

4.1.3.3 Effect of the GNE Demonstration Project on Overall APRN Graduations

Exhibit 4-7 shows the DID estimates of the effect of the GNE demonstration project on APRN graduations during the entire demonstration period. DID results show that during the demonstration period there was an average annual increase in APRN graduations in the GNE SONs of 35 APRN students. This estimate is statistically significant at the 5 percent level and represents an increase of 67 percent with respect to the baseline mean of GNE SONs. This

⁶³ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 86.

coefficient estimate is larger than what was reported in the *DY1–DY4 Impact Evaluation Report* (28 APRN students),⁶⁴ consistent with the descriptive evidence in Section 4.1.2 that the APRN student graduation increases continued to accelerate in DY4, DY5, and DY6.⁶⁵

Exhibit 4-7. Difference-in-Differences Results: APRN Graduations

APRN Graduations	
Average Impact Estimate	35.37**
90% Confidence Interval	[7.92, 62.82]
Standard Error	(16.69)
P-value	[0.04]
Baseline Mean for GNE SONs	52.97
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	67%
Number of Observations	2,323

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

Exhibit 4-8, column 2, shows that statistically significant effects started to appear in the second year of the demonstration project (DY2) and increased in each subsequent year. In DY2, GNE SONs had 31 more graduates per SON than non-GNE SONs, relative to the baseline period. In DY6, GNE SONs had on average 47 more APRN students graduate per SON than the non-GNE SONs, the largest increase in graduations of any demonstration year, although this result is not statistically significant at the 10 percent level ($p = 0.12$). These results are in line with the initial ramp-up period of the demonstration project that was reflected as an increase in APRN student enrollments, shown in Exhibit 4-4, which peaked in DY4.

Exhibit 4-8. Difference-in-Differences Results: APRN Graduations, Per-Year Effects

APRN Graduations	
DY1 Impact Estimate	18.34
Standard Error	(11.86)
DY2 Impact Estimate	30.97**
Standard Error	(14.38)
DY3 Impact Estimate	36.89**
Standard Error	(16.71)
DY4 Impact Estimate	39.86**
Standard Error	(18.25)
DY5 Impact Estimate	40.06**
Standard Error	(20.32)
DY6 Impact Estimate	46.91

⁶⁴ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 87.

⁶⁵ APRN student graduations are reported with a one-year lag (the AACN 2017 Annual Institutional Survey reports graduation data for AY August 1, 2016 through July 31, 2017); therefore, the *DY1–DY4 Impact Evaluation Report* only included graduation findings through DY3.

APRN Graduations	
Standard Error	(29.96)
Number of Observations	2,323

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

4.1.3.4 Effect of the GNE Demonstration Project on APRN Graduations by Specialty and Degree

Exhibit 4-9 shows the DID estimates on graduations separately by APRN specialty. Consistent with the findings for APRN student enrollment, these results show that the increase in overall APRN graduations is almost entirely driven by an increase in NP student graduations. During the demonstration period, annual NP student graduations in GNE SONs increased by an average of 35 students per SON compared to non-GNE SONs and relative to the baseline period. This estimate is statistically significant at the 5 percent level. It represents 98 percent of the increase we observe in overall APRN student graduations.⁶⁶ This result is consistent with the results we observed in the *DY1–DY4 Impact Evaluation Report*.⁶⁷

Exhibit 4-9. Difference-in-Differences Results: APRN Graduations by Specialty

	NP	CRNA	CNM	CNS
Average Impact Estimate	34.73**	0.62	0.10	-0.07
90% Confidence Interval	[7.72, 61.74]	[-2.35, 3.58]	[-0.24, 0.45]	[-1.66, 1.51]
Standard Error	(16.42)	(1.80)	(0.21)	(0.97)
P-value	[0.04]	[0.73]	[0.62]	[0.94]
Baseline Mean for GNE SONs	40.15	9.54	0.73	2.55
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	86%	6%	14%	-3%
Number of Observations	2,323	2,323	2,323	2,323

Notes: NP = nurse practitioner; CRNA = certified registered nurse anesthetist; CNM = certified nurse-midwife; CNS = clinical nurse specialist. Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

Exhibit 4-10 presents the results separately for each degree type. These results show that the increase in APRN graduations was driven by increases in master’s-level graduations. During the demonstration period, annual master’s degree programs APRN student graduations in GNE SONs increased by an average of 29 students per SON compared to non-GNE SONs, relative to the baseline period. This estimate is statistically significant at the 10 percent level and represents 82 percent of the increase we observed in overall APRN student graduations. This result is consistent with the results we observed for APRN student enrollment, and with the results we observed in the *DY1–DY4 Impact Evaluation Report*.⁶⁸

⁶⁶ The percentage change is calculated by dividing the DID estimate by the overall estimate in Exhibit 4-3. This calculation is: $(34.73/35.37) \times 100 = 98$ percent.

⁶⁷ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 88.

⁶⁸ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 89.

Exhibit 4-10. Difference-in-Differences Results: APRN Graduations by Degree

	Master's	Post-Master's	DNP
Average Impact Estimate	28.91*	2.57	3.89
90% Confidence Interval	[0.22, 57.60]	[-2.28, 7.41]	[-5.61, 13.40]
Standard Error	(17.44)	(2.94)	(5.78)
P-value	[0.10]	[0.38]	[0.50]
Baseline Mean for GNE SONs	47.76	4.35	0.86
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	61%	59%	450%
Number of Observations	2,323	2,323	2,323

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. The comparison group was defined using an entropy balancing method with quadratic and cubic terms.

4.1.4 Spillover Effects

Results in Exhibit 4-11 show the difference in APRN student enrollment and graduations between SONs in the same state as GNE SONs (spillover group), and SONs in non-GNE states that have similar observable characteristics to the spillover group. The sign of the coefficient estimates suggests that the SONs in the same states as GNE SONs had less of an increase in enrollment and graduations than SONs in non-GNE states. However, due to large standard errors, these negative spillover effects are not statistically significant. Due to the high variance in enrollment and graduations of the spillover group and the fact that baseline trends between the spillover and the spillover comparison groups were not identical, we conclude that there is not enough evidence to assess whether there were spillover effects on non-GNE SONs located in the same state. These results are consistent with the results in the *DY1–DY4 Impact Evaluation Report* because in both sets of estimations, the coefficient estimates are negative and not statistically significant.⁶⁹

**Exhibit 4-11. Difference-in-Differences Results, Spillover Effect
Outcomes: APRN Enrollment, APRN Graduations**

	APRN Enrollment	APRN Graduations
Average Spillover Estimate	-32.87	-12.16
90% Confidence Interval	[-81.93, 16.19]	[-39.34, 15.02]
Standard Error	(29.82)	(16.52)
P-value	[0.27]	[0.46]
Baseline Mean for Spillover SONs	134.7	44.8
Average Impact Estimate as a Percentage of the Spillover Group Baseline Mean	-24%	-27%
Number of Observations	2,239	2,250

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. Comparison group is weighted to be balanced with the spillover group, with weights found using entropy balancing. A spillover SON is defined as a SON that is located in the same state as a GNE SON and has similar observable characteristics to the GNE SON.

⁶⁹ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 94.

4.2 Qualitative Data

In this section, we discuss the impact of the GNE demonstration project based on perceptions of awardee hospitals and SON staff. Additionally, because APRN student enrollment and graduation were closely tied to the availability of precepting payments, we also discuss the impact of precepting payments on the number of preceptor and clinical education sites, based on the perceptions of awardee hospitals and SON staff.

4.2.1 Impact on the Number of Preceptor and Clinical Education Sites

As previously discussed, despite the growing demand for APRN education, SONs continued to face significant challenges to increasing student enrollment. These challenges stemmed, in part, from difficulty finding sufficient clinical education sites and preceptors needed by APRN students to graduate. To expand the pool of available clinical education sites, the networks offered precepting payment to selected sites. In our interviews with GNE stakeholders, respondents disagreed about the impact of payments on preceptors' willingness to accept students. Below we discuss the main drivers that influenced preceptors' decision to precept students, how the payments expanded the pool of preceptors to include more physicians and PAs, and the unintended consequences of precepting students.

“ I think it’s also important to note that there is a lot of concern at the schools about recruiting preceptors; [they are] even more concerned than they had [been] before we started the demonstration. ”

4.2.1.1 Engaging Preceptors and Clinical Education Sites

“ We did a survey and found that a factor [encouraging precepting] is reimbursement, but not the main reason It depends on the individual preceptors. ”

Five of the nineteen SONs reported having informal or formal discussions with preceptors about factors that influenced their decision to precept APRN students. The majority of the SONs reported that preceptors were not primarily driven by payments. Instead, a preceptor's decision-making process to accept a student was generally based on his or her willingness to give back to the APRN profession, current workload (heavy vs. light), and factors unrelated to work (e.g., personal factors). Additionally, one SON found that their preceptors,

who had accepted students for several consecutive semesters and then began to turn down students, were overworked and needed a break for a semester or two.

During our discussion with preceptors, we asked if the availability of payment would affect their willingness to provide clinical education. Many reported that they were not motivated by payments. Instead, the preceptors viewed precepting as a way to give back, teach the future generation

“ When we started years ago, prior to GNE, we just [precepted] because we wanted to. It’s a good way for us to evaluate new potential hires. ”

of APRNs, and continue their own education. Additionally, preceptors and sites used APRN clinical education to evaluate potential new hires.

“ I’m a preceptor, and my practice is always asking, ‘You know you can’t see as many patients when you’re taking a student. What’s your plan for that?’ It takes me at least one, one and a half hours longer when I have a student. ”

In contrast, other stakeholders agreed that the clinical education sites, not individual preceptors, were driven by precepting payments. The sites used the precepting payments to offset the negative impact that precepting APRN students had on the site’s productivity level. Preceptors we spoke with noted that by taking on an APRN student, their productivity decreased. Sites also noticed a decrease in their staff’s productivity due to precepting APRN and physician students. To offset this productivity loss, many sites used the precepting payments as compensation for the preceptor’s time. This allowed the site to take on more students without

affecting the quality of care or their financial bottom line. Sites also ultimately decided if and how many of their staff would precept students each semester. Because of the time and resources needed to educate students clinically in professional health care programs, sites were more inclined to accept students whose schools paid for them to precept.

4.2.1.2 Number of Physician and Physician Assistant Preceptors

Interestingly, many stakeholders across the networks observed an increase in the number of other health care preceptors willing to precept APRN students. Some reported this change was directly related to the precepting payments, as physicians and PAs are accustomed to receiving reimbursement for precepting medical students. For example, prior to the demonstration project, physicians in RUMC precepted very few APRN students, but as a result of the precepting payments, the number of physician preceptors at RUMC increased.

“ Physicians are being paid for [education] residents, but not for NP students. ”

“ When I talk to a physician or a practice manager, they don’t understand why precepting payments are not being done for NPs. They [MDs and PAs] get paid to precept their medical students. ”

SONs also reported decreased competition with medical schools to place APRN students in sites that had generally only accepted medical and PA students. During the extension year check-in calls, however, one SON mentioned that many of the sites and preceptors that were asking about payments were primarily managed by physicians or PAs. As a result, GNE stakeholders expected increased competition for finding student clinical placements affiliated with medical schools and PA programs, as well as with other SONs once the demonstration project ended and SONs no longer provided precepting payments. For more information about

anticipated competition for clinical education sites, see Section 3.7.3.

“ We are seeing the shift in the field from more MDs to more NPs. And I don't think that it would have happened without GNE. ”

GNE stakeholders from all networks also reported that the increase in the number of APRNs being precepted by other health care professionals had created dialogue, and encouraged greater awareness throughout the health care community, about the role and value of APRNs in providing care. According to respondents, often health care professionals outside of the field of nursing were not aware of the APRN role until they precepted an APRN student. As a result of these new clinical education opportunities, some sites hired APRNs after they graduated and have continued to precept APRN students even after the GNE demonstration project ended.

4.2.1.3 Building New and Strengthening Existing Partnerships

Although there was no consensus about the impact of precepting payments on preceptors' willingness to take students, stakeholders from all networks reported that the demonstration project allowed them to build new partnerships with clinical education sites that had not previously accepted APRN students. Many attributed the expansion in number of clinical education sites to the ability to use GNE precepting payments to invest in additional staff and key infrastructure such as staff to oversee the clinical placement process, and the ability to develop databases that enabled administrators to more effectively recruit clinical education sites and manage preceptors' assignments. The respondents indicated that the precepting payments were particularly helpful in promoting their ability to recruit and retain preceptors at CCSs that were more dispersed geographically.

The SHC-O network, for example, built a relationship with two FQHCs—Adelante Healthcare and North Country Healthcare—that have multiple rural health centers that serve medically underserved populations. Prior to the demonstration project, Adelante Healthcare only precepted physician students; however, in January 2016, the system began to accept multiple APRN students from SHC-O SONs. Additionally, as of April 2018, SHC-O's oversight team reported, 70 APRNs from their network had their clinical education experiences at North Country Healthcare since the GNE demonstration project began. After the demonstration project ended in July 2018, SHC-O SONs reported that they were hopeful that their relationships with these sites would continue.

These stakeholders also noted that demonstration project payments and additional staff time had allowed SONs to strengthen relationships with sites that had only occasionally precepted APRN students in the past. Stakeholders also noted that clinical payments increased the number of students the sites were willing to precept per semester. For example, prior to the GNE demonstration project, one site originally only precepted one to two students a semester, but during the GNE demonstration project, it increased the number of students precepted each semester to five to six students.

4.2.1.4 Clinical Education Payment Expectations

Stakeholders from all networks mentioned that one of the unintended consequences of the GNE demonstration project was that clinical education sites began to expect, and in some cases demand, payment from SONs in order to precept their APRN students. When SONs were unable to guarantee payment, the sites would then refuse or reduce the number of students they precepted. To mitigate the payment expectations among sites and preceptors, some SONs sent out letters thanking the sites and preceptors for participating in the GNE demonstration project and reminding them that they would no longer be able to pay them to precept their students once the GNE demonstration project ended in July 2018.

“ The idea that [preceptors] are going to be paid to have students is sticking around. ”

“ Now preceptors are saying they are only willing to precept one day a week. They have accepted another student for [a] different day. ”

After the demonstration project ended in July 2018, almost all SONs had sites that refused to continue to precept their students. Additionally, a third of SONs reported a decrease in the number of clinical education sites, while only one SON saw an increase. About a fourth of SONs reported no change in clinical education placements, and a third were unsure of the impact the GNE demonstration project’s ending would have on their clinical education placements.

4.2.2 Impact on APRN Student Growth

GNE SON stakeholders discussed their perceptions of the impact of the demonstration project on APRN student growth. The majority of SONs reported that APRN enrollments had increased since the demonstration project, but not all networks were willing to attribute the enrollment increase solely to the demonstration project. Stakeholders commented that “the increases were due to the upward trajectory of the health care field in general,” and that “the SONs would have experienced larger enrollment cycles even without the demonstration project.” Some stakeholders were particularly cautious when asked if the GNE demonstration project contributed to APRN enrollment increases.

“ Very gently and kindly I want to say, we increased our numbers because of the IOM [Institute of Medicine] and because this is where health care is going, and because we have had GNE behind us to help us with some of the challenges. ”

“ *I think we couldn't have grown our enrollment the way we did, without those [GNE] investments and certainly not without the site payments.* ”

Still, stakeholders emphasized the importance and impact of the GNE demonstration project in increasing APRN enrollment. For example, SONs hired both adjunct and full-time clinical faculty using GNE demonstration project funds to support a growing APRN student body. As noted by the SON stakeholders, without additional faculty to facilitate classroom and clinical education, it would have been difficult for the SONs to accept the large number of students that they

enrolled over the course of the demonstration project period.

Chapter 5: What Was the Cost for Implementing the GNE Demonstration Project?

This chapter discusses the costs associated with the implementation of the GNE demonstration project incurred by CMS. All costs discussed in this chapter were incurred initially by the GNE networks (i.e., hospital awardees and their partner SONs and clinical education sites), and reimbursed by CMS as part of the demonstration project. In this report, we report cost results for all demonstration years and the Closeout Period, but we focus our description of the results on the data for DY5, DY6, and the Closeout Period. The first section describes how the demonstration project payments were used by the GNE networks; the allocation of these payments across cost categories (direct, other direct, SON, CCS, indirect); and the evolution of costs over time. We discuss costs for the demonstration project overall and then for each network. The demonstration-level findings provide a general overview of the costs associated with the demonstration project. The network-level results provide a more granular understanding of the costs incurred. The results also shed light on differences in the magnitude and allocation of resources across networks.

Note that for the descriptive cost analysis, the costs are the dollar amounts reported by the network for the applicable demonstration year.

In this chapter, we present costs by cost category, year, and network. Auditor-based costs per APRN student are presented in Appendix D.2.

5.1. Descriptive Implementation Cost Findings and Cost Trends

5.1.1 Demonstration-Level Results

The costs presented in this section include all costs to CMS associated with the demonstration project. Incurred costs represent all allowable costs incurred for the clinical education of additional APRN students. Non-allowable costs incurred by the demonstration networks are likely a small fraction of the overall cost of the demonstration project.

Exhibit 5-1 provides cost information at the overall demonstration level for DY1–DY6 and the Closeout Period, broken down by cost category. Exhibit 5-1 shows the sum of the cost data across the five demonstration networks, which gives a point of reference for the network-specific analyses that follow. These figures represent audited costs for DY1–DY5, while DY6 and Closeout Period figures are based on the 2017 Network Budget Report data, which are projections because the audit results are not yet available.⁷⁰ *Total cost*, which represents the total cost to CMS of the demonstration project, is defined as the sum of the five cost categories (direct, other direct, SON, CCS, indirect). Total cost rose significantly each year between DY1 and DY4, but decreased in

⁷⁰ Page 50 of the *DY1–DY4 Cost Evaluation Report* shows that in DY3, only 81 percent of projected costs were incurred. This pattern has remained fairly stable throughout the demonstration. This suggests that DY6 and Closeout Period costs will be somewhat lower than reported in this report.

each subsequent year. In particular, SONs and hospital network staff began to shut down operations and processes in DY5, which led to a 15 percent decrease from a total cost of \$37,405,820 in DY4. Operations continued to shut down in DY6, leading to a 16 percent decrease from \$31,947,883 in DY5 to a total cost of \$26,916,151 in DY6. Finally, in the Closeout Period, when SONs and hospital networks spent minimal resources to close down all demonstration project activities, total costs were \$1,456,550, a 95 percent decrease from DY6. The total cost to CMS for the clinical education of additional APRN students was **\$176,377,494** for the six demonstration years and the Closeout Period.

Direct costs include hospital labor-related costs, such as salaries and fringe benefits for various categories of staff (e.g., project directors, managers and administrators, billing analysts, coordinators, clinical placement coordinators, and administrative assistants). These costs do not include any payments to GNE SON staff or faculty who were paid under contractual agreements with the GNE SON (discussed below under SON costs). Direct costs have remained fairly constant throughout the demonstration project, especially since DY2. As shown in the *DY1–DY4 Cost Evaluation Report*, audited direct costs were found to be substantially lower than budgeted direct costs, so actual DY6 direct costs will likely be lower than the DY5 direct costs. Because administrative staff salaries are the largest expense of the Closeout Period, direct costs represent 73 percent of the total costs in the Closeout Period. However, Closeout Period direct costs are still substantially lower than the rest of the demonstration project. For example, Closeout Period direct costs were 56 percent lower than direct costs in DY6.

Other direct costs include such items as consultants' expenses (including contracted services for arranging clinical education), equipment leases, office supplies, postage, travel, equipment, and software licenses. Other direct costs increased every year from DY1 to DY5, but fell sharply from \$1,044,790 in DY5 to \$428,600 in DY6, a 59 percent decrease. This sharp decline in other direct costs is consistent with the findings reported in Chapter 3 from our check-in calls, in which contacts indicated the closing down of demonstration project activities, which has a disproportionate impact on other direct costs.

The *GNE SONs' costs* include all items related to the partnership agreements between the awardee hospital and the SONs in the network (e.g., simulation laboratory expenditures, payment for faculty who taught clinical courses for additional APRN students, payment for GNE SON employees who coordinated the clinical placement of students, and indirect SON costs). Consistent with total cost, payments to SONs increased between DY1 and DY4, and decreased in both DY5 and DY6. For example, GNE SONs' costs decreased from \$11,512,135 in DY4 to \$9,682,244, a 16 percent decrease. *SON costs* being lower in DY5 and DY6 than DY4 is consistent with SONs reporting that they were lowering the number of preceptors they were paying as the demonstration project was nearing its end. Additionally, many SONs could not guarantee payment, and starting during the extension years, SONs reported that some preceptors had refused to precept if the SON could not guarantee payment. In the Closeout Period, only three networks had any SON costs, which totaled \$219,216, a 97 percent decrease from DY6.

CCS costs cover the costs of partnership agreements with CCSs (including hospitals) that provided clinical opportunities for additional APRN students. CCS costs followed a very similar pattern to the GNE SONs' costs. For example, CCS costs decreased from \$18,224,009 in DY4 to \$15,938,076 in DY5, a 13 percent decrease. Additionally, CCS costs decreased further from \$15,938,076 in DY5 to \$12,646,729, a 21 percent decrease. As with SON costs, this is consistent with qualitative evidence that preceptor payments, which drove CCS costs, decreased substantially in DY5 and further in DY6. There were no CCS costs in the Closeout Period. This is because preceptor payments and other GNE payments to CCSs ended in DY6 for all demonstration networks.

Indirect costs include administrative and general costs associated with implementation of the demonstration. In DY4, the demonstration projected \$4,963,200 for indirect costs, representing 11.9 percent of overall spending. Similar to total costs, indirect costs show an increasing pattern over time between DY1 and DY4, likely reflecting the higher administrative and general costs needed to implement the demonstration as the number of additional APRN students increased. Also as seen with total costs, there was a relatively large decrease in indirect costs from DY4 (\$4,343,473) to DY5 (\$3,108,404), a 28 percent decrease. Indirect costs increased 11 percent from DY5 to DY6. However, the audited *indirect costs* in DY5 were 12 percent lower than the budgeted *indirect costs* in DY5. Therefore, if this pattern holds for DY6, the actual *indirect costs* incurred by the demonstration networks in DY6 will be similar to those incurred in DY5. Indirect costs in the Closeout Period were 96 percent lower than in DY6.

Exhibit 5-1. GNE Demonstration Project Costs—Overall

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$1,876,700	\$2,253,100	\$2,385,500	\$2,353,183	\$2,278,647	\$2,416,792	\$1,067,613
Other Direct	\$570,500	\$749,400	\$915,100	\$973,110	\$970,627	\$428,600	\$35,300
SON	\$6,431,100	\$9,569,700	\$10,658,800	\$11,512,135	\$9,652,129	\$7,988,072	\$219,216
CCS	\$6,632,400	\$11,650,700	\$15,702,200	\$18,224,009	\$15,938,076	\$12,646,729	\$0
Indirect	\$2,362,800	\$3,360,000	\$3,533,000	\$4,343,473	\$3,108,404	\$3,435,959	\$134,421
Total	\$17,873,500	\$27,582,900	\$33,194,600	\$37,405,910	\$31,947,883	\$26,916,151	\$1,456,550

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

Exhibit 5-2 presents the percentage of total costs represented by each cost category for each demonstration year and the Closeout Period. These results show that until the Closeout Period, *CCS* and *SON costs* consistently amounted to the largest shares of total costs. Between DY1 and DY6, the percentage of total costs for each cost category had only mild fluctuations, generally with no clear pattern. One notable exception is that the percentage of total costs represented by *SON* costs decreased every year from DY1 to DY6, but this decrease was very slight between DY4 and DY6 (31 percent in DY4 to 30 percent in DY6). In contrast, the percentage of total costs represented by *CCS* costs increased each year from DY1 to DY5, but dropped slightly in DY6. Because demonstration project activities had mostly ended and hospital networks and SONs were spending resources only to finalize the closeout of the demonstration project, closeout period percentages for each cost category substantially differ. *Direct costs* represented 73 percent of total closeout period costs because most resources were spent on demonstration project staff salaries during this year. The rest of Closeout Period costs comprise those in *other direct*, *SON*, and *indirect cost* categories.

Exhibit 5-2. Cost Categories as a Percentage of Total Demonstration Cost—Overall

	Direct	Other Direct	SON	CCS	Indirect
DY1 Audited	10.5%	3.2%	36.0%	37.1%	13.2%
DY2 Audited	8.2%	2.7%	34.7%	42.2%	12.2%
DY3 Audited	7.2%	2.8%	32.1%	47.3%	10.6%
DY4 Audited	6.3%	2.6%	30.8%	48.7%	11.6%
DY5 Audited	7.1%	3.3%	30.3%	49.9%	9.7%
DY6 Budgeted	9.0%	1.6%	29.7%	47.0%	12.8%
Closeout Budgeted	73.3%	2.4%	15.1%	0.0%	9.2%

Notes: DY1, DY2, DY3, DY4, and DY5 costs and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 cost figures come from the DY6 Network Budget Report (which presents budgeted figures). The figures were constructed based on the most updated documents at the time of the analyses. The Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for reasons related to the auditing process. The figures in this table, therefore, may not fully coincide with the final audit and budget information.

SON = school of nursing; CCS = community-based care setting; DY = demonstration year.

5.1.2 Network-Level Results

This section discusses the projected and audited costs for each of the five demonstration networks. Exhibit 5-3 summarizes the actual payments to each network based on DY1–DY5 audit reports and DY6 and Closeout Period budgeted payments based on the projected cost reported to CMS in the Network Budget Reports. Total payments by GNE network varied from \$12,088,127 (RUMC) to \$65,813,534 (HUP). All networks followed the pattern of increasing total costs between DY1 and DY4, followed by decreasing total costs in DY5. All but SHC-O projected that they would decrease total costs in DY6, while SHC-O projected slightly higher costs in DY6 than their actual costs in DY5.

Exhibit 5-3. CMS Payments to Each GNE Network and Total by Demonstration Year

GNE Demonstration Network	Audited Total Cost					Budgeted Total Cost		Total Payment
	DY1	DY2	DY3	DY4	DY5	DY6	Closeout Period	DY1–DY6 + Closeout
DUH	\$1,478,100	\$2,215,400	\$3,591,700	\$3,874,857	\$2,997,362	\$1,048,851	\$39,150	\$15,245,420
HUP	\$6,426,000	\$9,749,400	\$10,676,600	\$13,236,287	\$13,026,270	\$12,256,641	\$442,336	\$65,813,534
MH	\$4,928,600	\$8,409,100	\$11,001,600	\$11,366,838	\$8,347,426	\$5,854,019	\$432,804	\$50,340,387
RUMC	\$2,035,800	\$2,356,400	\$2,103,300	\$2,099,489	\$1,843,817	\$1,624,559	\$24,762	\$12,088,127
SHC-O	\$3,005,000	\$4,852,600	\$5,821,400	\$6,828,439	\$5,733,008	\$6,132,080	\$517,498	\$32,890,025
Total Payment	\$17,873,500	\$27,582,900	\$33,194,600	\$37,405,910	\$31,947,883	\$26,916,151	\$1,456,550	\$176,377,494

Notes: DY1, DY2, DY3, DY4, and DY5 costs come from the DY1–DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

DUH = Duke University Hospital; HUP = Hospital of the University of Pennsylvania; MH = Memorial Hermann-Texas Medical Center; RUMC = Rush University Medical Center; SHC-O = HonorHealth Scottsdale Osborn Medical Center.

DUH displayed similar trends over time to the overall figures (Exhibit 5-4), with several notable exceptions. First, while direct costs increased gradually between DY1 and DY4, they decreased sharply from \$283,372 in DY5 to \$153,350 in DY6, a 46 percent decrease. In contrast, direct costs increased slightly between DY5 and DY6 overall. This is because DUH projected staff salaries to be significantly lower in DY6 than they were in DY5, where most other networks projected similar staff salaries in DY6. Second, indirect costs decreased substantially from \$452,384 in DY5 to \$142,401 in DY6, a 69 percent decrease. This decrease is due to a large decrease in the projection of administrative and general costs in DY6 compared to actual administrative and general costs in DY5. Third, CCS costs decreased from \$1,482,735 in DY5 to \$335,000 in DY6, a 77 percent decrease. This was a result of drastic reductions in preceptor payments between DY5 and DY6. These three cost categories were the main contributors to the 65 percent decrease in total costs between DY5 and DY6. These results imply that DUH was beginning to cease demonstration project activities in DY6 more quickly than other hospital networks.

Exhibit 5-4. GNE Demonstration Project Costs—Duke University Hospital

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$307,900	\$350,000	\$355,500	\$350,858	\$283,272	\$153,350	\$17,150
Other Direct	\$23,700	\$15,800	\$14,900	\$12,883	\$95,814	\$10,400	\$250
SON	\$766,100	\$1,016,400	\$1,185,700	\$1,374,333	\$683,157	\$407,700	\$21,750
CCS	\$164,200	\$497,900	\$1,475,700	\$1,556,904	\$1,482,735	\$335,000	\$0
Indirect	\$216,200	\$335,300	\$559,900	\$579,879	\$452,384	\$142,401	\$0
Total	\$1,478,100	\$2,215,400	\$3,591,700	\$3,874,857	\$2,997,362	\$1,048,851	\$39,150

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

Exhibit 5-5 shows that for DUH the percentage of total costs represented by SON costs decreased between DY1 and DY5, while the percentage of CCS costs increased. However, due to the sharp reduction in CCS costs in DY6, the percentage of total costs represented by CCS costs decreased from 50 percent in DY5 to 32 percent in DY6, and the percentage of total costs represented by SON costs increased from 23 percent in DY5 to 39 percent in DY6. In the Closeout Period, nearly all costs (95 percent) were from a final payment to the SON and staff salaries for overseeing the closeout.

Exhibit 5-5. Cost Categories as a Percentage of Total Demonstration Cost—Duke University Hospital

	Direct	Other Direct	SON	CCS	Indirect
DY1 Audited	20.8%	1.6%	51.8%	11.1%	14.6%
DY2 Audited	15.8%	0.7%	45.9%	22.5%	15.1%
DY3 Audited	9.9%	0.4%	33.0%	41.1%	15.6%
DY4 Audited	9.1%	0.3%	35.5%	40.2%	15.0%
DY5 Audited	9.5%	3.2%	22.8%	49.5%	15.1%
DY6 Budgeted	14.6%	1.0%	38.9%	31.9%	13.6%
Closeout Budgeted	43.8%	0.6%	55.6%	0.0%	0.0%

Exhibit 5-6 shows that total costs for HUP increased between DY1 and DY4, which was similar to the increase overall. HUP also decreased total costs in both DY5 and DY6 compared to DY4, but this decrease was one of the smallest of the hospital networks. Costs were much more stable across all cost categories for HUP than other hospital networks in DY4, DY5, and DY6. For example, direct costs increased from \$547,548 in DY4 to \$658,334 in DY6, a 20 percent increase. These stable costs between DY4 and the extension years DY5 and DY6 imply that HUP was still spending very similar resources in the extension years as in the main demonstration project years. In the Closeout Period, HUP’s only costs were staff salaries.

Exhibit 5-6. GNE Demonstration Project Costs—Hospital of the University of Pennsylvania

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$380,600	\$525,800	\$550,900	\$547,548	\$595,039	\$658,334	\$442,336
Other Direct	\$4,800	\$124,200	\$152,500	\$150,787	\$142,505	\$147,500	\$0
SON	\$1,909,400	\$3,192,100	\$3,340,900	\$3,876,158	\$3,894,644	\$3,419,369	\$0
CCS	\$3,468,400	\$5,378,000	\$6,286,200	\$7,699,792	\$7,688,455	\$7,138,880	\$0
Indirect	\$662,800	\$529,300	\$346,100	\$962,002	\$705,627	\$892,558	\$0
Total	\$6,426,000	\$9,749,400	\$10,676,600	\$13,236,287	\$13,026,270	\$12,256,641	\$442,336

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1–DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

HUP’s percentages of total costs by category were remarkably consistent between DY1 and DY6 for all cost categories (Exhibit 5-7). As noted above, direct costs were responsible for 100 percent of costs in the Closeout Period.

Exhibit 5-7. Cost Categories as a Percentage of Total Demonstration Cost—Hospital of the University of Pennsylvania

	Direct	Other Direct	SON	CCS	Indirect
DY1 Audited	5.9%	0.1%	29.7%	54.0%	10.3%
DY2 Audited	5.4%	1.3%	32.7%	55.2%	5.4%
DY3 Audited	5.2%	1.4%	31.3%	58.9%	3.2%
DY4 Audited	4.1%	1.1%	29.3%	58.2%	7.3%
DY5 Audited	4.6%	1.1%	29.9%	59.0%	5.4%
DY6 Budgeted	5.4%	1.2%	27.9%	58.2%	7.3%
Closeout Budgeted	100.0%	0.0%	0.0%	0.0%	0.0%

For all cost categories except direct costs, costs for MH increased for all cost categories between DY1 and DY4, then had significant reductions in both DY5 and DY6 (Exhibit 5-8). Direct costs had little variation throughout all demonstration years. Not surprisingly, this led to increases in total cost in each year between DY1 and DY4, and decreases in DY5 and DY6. Specifically, total cost decreased from \$11,366,838 in DY4 to \$5,854,019 in DY6, a 48 percent decrease. This decrease is substantially larger in percentage terms than the decrease between DY4 and DY6 across all hospital networks. Closeout Period costs were \$432,804, a 93 percent decrease from DY6.

Exhibit 5-8. GNE Demonstration Project Costs—Memorial Hermann-Texas Medical Center

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$529,000	\$607,700	\$551,300	\$565,512	\$501,119	\$570,812	\$298,050
Other Direct	\$314,400	\$278,700	\$374,900	\$444,389	\$374,960	\$75,900	\$28,850
SON	\$2,241,200	\$3,179,700	\$4,073,900	\$3,816,106	\$2,817,721	\$2,063,442	\$64,153
CCS	\$1,431,700	\$3,683,900	\$5,164,500	\$5,521,787	\$3,673,935	\$2,579,142	\$0
Indirect	\$412,300	\$659,100	\$837,000	\$1,019,044	\$979,691	\$564,722	\$41,752
Total	\$4,928,600	\$8,409,100	\$11,001,600	\$11,366,838	\$8,347,426	\$5,854,019	\$432,804

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1–DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

MH displayed overall patterns of total cost represented by each category that were similar to all hospital networks combined (Exhibit 5-9). The percentage of total costs represented by SON costs decreased between DY1 and DY4, while the percentage of total costs represented by CCS costs increased during that same period. However, this pattern reversed in DY5 and DY6. The percentage of total costs represented by direct, other direct, and indirect costs did not have considerable variance between DY1 and DY6. In the Closeout Period, as for all hospital networks, the majority (69 percent for MH) of total costs were represented by direct costs.

Exhibit 5-9. Cost Categories as a Percentage of Total Demonstration Cost— Memorial Hermann-Texas Medical Center

	Direct	Other Direct	SON	CCS	Indirect
DY1 Audited	10.7%	6.4%	45.5%	29.0%	8.4%
DY2 Audited	7.2%	3.3%	37.8%	43.8%	7.8%
DY3 Audited	5.0%	3.4%	37.0%	46.9%	7.6%
DY4 Audited	5.0%	3.9%	33.6%	48.6%	9.0%
DY5 Audited	6.0%	4.5%	33.8%	44.0%	11.7%
DY6 Budgeted	9.8%	1.3%	35.2%	44.1%	9.6%
Closeout Budgeted	68.9%	6.7%	14.8%	0.0%	9.6%

Exhibit 5-10 shows that RUMC displayed similar trends over time for each cost category compared to the overall trends for DY1 and DY5. Total costs were relatively constant between DY1 and DY4, but decreased modestly in both DY5 and DY6. RUMC projected that direct costs would be 38 percent higher in DY6 than DY5, and indirect costs would be 201 percent higher in DY6 than DY5. However, Section 3.1.2 of the *DY1–DY4 Cost Evaluation Report* shows that RUMC projects on average roughly 30 percent higher costs than their actual costs, so actual costs will likely be much closer in DY6 to costs in DY5. CCS costs increased slightly between DY4 and DY5, but decreased from \$834,277 in DY5 to \$198,531 in DY6, a 76 percent decrease. Closeout Period total costs were \$24,762, a 98 percent decrease from DY6. Direct and indirect costs were the only costs for RUMC in the Closeout Period.

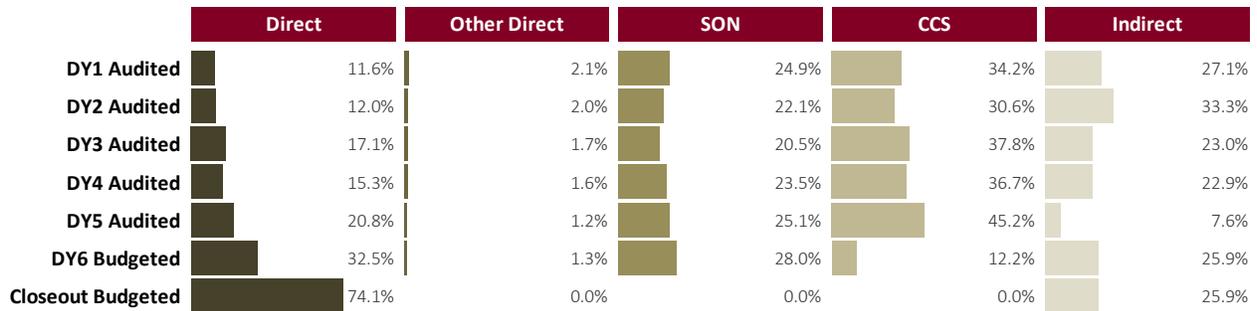
Exhibit 5-10. GNE Demonstration Project Costs—Rush University Medical Center

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$237,000	\$276,400	\$359,300	\$320,438	\$384,033	\$528,306	\$18,342
Other Direct	\$42,500	\$46,700	\$35,400	\$34,241	\$22,990	\$21,000	\$0
SON	\$507,700	\$522,800	\$431,000	\$492,797	\$462,682	\$455,540	\$0
CCS	\$696,400	\$722,800	\$794,800	\$770,252	\$834,277	\$198,531	\$0
Indirect	\$552,200	\$787,700	\$482,800	\$481,761	\$139,835	\$421,182	\$6,420
Total	\$2,035,800	\$2,356,400	\$2,103,300	\$2,099,489	\$1,843,817	\$1,624,559	\$24,762

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1–DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

Total costs represented by direct costs for RUMC were generally increasing through all demonstration years and the Closeout Period (Exhibit 5-11). Other direct costs had a slightly decreasing trend through all years. SON, CCS, and indirect costs remained relatively stable between DY1 and DY6. In the Closeout Period, direct costs represented the majority (74 percent for RUMC) of total costs. Indirect costs represented the other 26 percent.

Exhibit 5-11. Cost Categories as a Percentage of Total Demonstration Cost—Rush University Medical Center



Total costs for SHC-O increased each year between DY1 and DY4 (Exhibit 5-12). As for all other hospital networks, total costs decreased between DY4 and DY5 (16 percent for SHC-O), before increasing between actual costs in DY5 and projected costs in DY6 by 7 percent. However, Section 3.1.2 of the *DY1–DY4 Cost Evaluation Report* shows that SHC-O’s projected costs have typically been about 20 percent higher than audited costs. If this pattern continued into the extension years, DY5 and DY6 actual costs will likely be very similar. Direct costs increased between DY1 and DY4 and decreased in both DY5 and DY6, although the changes in each year were relatively small.

Exhibit 5-12. GNE Demonstration Project Costs—HonorHealth Scottsdale Osborn Medical Center

Cost Category	DY1	DY2	DY3	DY4	DY5	DY6	Closeout
	All GNE (Source: Audit)	All GNE (Source: Budget)	All GNE (Source: Budget)				
	Costs	Costs	Costs	Costs	Costs	Costs	Costs
Direct	\$422,200	\$493,200	\$568,500	\$568,827	\$515,184	\$505,989	\$291,735
Other Direct	\$185,100	\$284,000	\$337,400	\$330,810	\$334,358	\$173,800	\$6,200
SON	\$1,006,700	\$1,658,700	\$1,627,300	\$1,952,741	\$1,793,925	\$1,642,021	\$133,313
CCS	\$871,700	\$1,368,100	\$1,981,000	\$2,675,274	\$2,258,674	\$2,395,175	\$0
Indirect	\$519,300	\$1,048,600	\$1,307,200	\$1,300,787	\$830,867	\$1,415,095	\$86,250
Total	\$3,005,000	\$4,852,600	\$5,821,400	\$6,828,439	\$5,733,008	\$6,132,080	\$517,498

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1–DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

Exhibit 5-13 shows that the percentage of total costs for SHC-O represented by direct costs decreased from 14 percent to 10 percent between DY1 and DY2, but stayed relatively constant between DY2 and DY6. The percentage of total costs represented by other direct costs and indirect costs had relatively high variation between DY1 and DY6, but did not follow a consistent pattern. The percentage of total costs represented by SON costs displayed a generally decreasing pattern between DY1 and DY6, while the percentage of total costs represented by CCS costs displayed a generally increasing pattern between DY1 and DY6. However, this pattern was not as stark as for most other hospital networks. As for all hospital networks, direct costs represented the majority (56 percent for SHC-O) of costs in the Closeout Period.

Exhibit 5-13. Cost Categories as a Percentage of Total Demonstration Cost—HonorHealth Scottsdale Osborn Medical Center

	Direct	Other Direct	SON	CCS	Indirect
DY1 Audited	14.0%	6.2%	33.5%	29.0%	17.3%
DY2 Audited	10.2%	5.9%	34.2%	28.2%	21.6%
DY3 Audited	9.8%	5.8%	28.0%	34.0%	22.5%
DY4 Audited	8.3%	4.8%	28.6%	39.2%	19.0%
DY5 Audited	9.0%	5.8%	31.3%	39.4%	14.5%
DY6 Budgeted	8.3%	2.8%	26.8%	39.1%	23.1%
Closeout Budgeted	56.4%	1.2%	25.8%	0.0%	16.7%

Chapter 6: What Was the Cost to CMS for Supporting an Additional APRN Student to Graduation?

6.1 Cost Estimation Methods

One of the objectives of the evaluation was to analyze the costs to CMS as a result of the demonstration. Under the demonstration project, CMS reimbursed hospital awardees for the clinical education of additional APRN students. Therefore, the central purpose of this analysis was to estimate the average cost per student for CMS to support the clinical education of an additional APRN student to graduation. The estimated average cost to CMS of supporting the clinical education of an additional APRN student to graduation was generated by dividing the total cost to CMS of clinically educating the additional APRN students (numerator) by the number of additional APRN student graduates attributed to the demonstration (denominator). The denominator was defined as the total number of additional APRN graduates during the demonstration across all GNE SONs, relative to the number of additional graduates in non-GNE comparison SONs during the same time period, using AACN survey data. This estimate uses the DID estimates presented in Chapter 4 and therefore counts additional APRN students that can be specifically attributed to the GNE demonstration project by removing the number of additional APRN students that would have graduated in the absence of the demonstration project by using an entropy-weighted comparison group with quadratic and cubic terms.

We also estimated the average cost to CMS of supporting the clinical education of an additional APRN student to graduation using two alternative methods to calculate the denominator. The alternative methods to calculate the denominator did not include a comparison group, therefore are less robust. More details can be found in Appendix D.3.

In Chapter 4 of the *DY1–DY4 Impact Evaluation Report*⁷¹ we explain the adjustments that need to be made to obtain accurate per-student cost ratios. We performed a robustness analysis of the results to local price variation and found that results were very similar with and without adjusting for local price variation. Therefore, we do not adjust for local price variation in the estimates reported in this chapter.

⁷¹ See section “Robustness of the Main Results to Local Price Variation” on pages 89 and 90 of the *DY1–DY4 Cost Evaluation Report* for additional information.

6.2 Findings

Overall, the total cost of the demonstration project was **\$176,377,494** for DY1–DY6 and the Closeout Period. Exhibit 6-1 presents the findings. The estimated number of additional APRN graduates was **3,739**.⁷² This results in an estimated average cost to CMS of supporting the clinical education of an additional APRN student to graduation of **\$47,172**.

Exhibit 6.1 – Average Cost to CMS under the Demonstration of Supporting the Clinical Education of an Additional APRN Student to Graduation

Data Source	GNE & non-GNE SONs AACN Survey Data
Estimated Number of Additional APRN Student Graduates Due to the Demonstration	3,739
Estimated Average Cost to CMS, under the Demonstration, of Supporting the Clinical Education of an Additional APRN Student to Graduation	\$47,172

⁷² This estimate is calculated by multiplying the overall DID estimate for graduations, 32.8, by the number of SONs and years (19 and 6, respectively). Therefore, $32.8 \times 19 \times 6 = 3,739$.

Chapter 7: Where and What Types of Post-Graduate Employment Opportunities Exist for Recent APRN Graduates from GNE SONs?

As part of this evaluation, IMPAQ conducted interviews with GNE demonstration project stakeholders across five networks—documenting innovative approaches networks used to expand the pool of APRNs in CCSs. However, the evaluation team had not previously had the opportunity to closely examine whether APRN alumni affiliated with GNE networks had pursued employment within CCSs after graduation, primarily because alumni data were not systematically available across networks. To address this gap, the IMPAQ team conducted an APRN Alumni Case Study to identify where APRN graduates were hired after graduation and to better understand their experiences after graduation.

The APRN Alumni Case Study examined the post-graduate employment opportunities and experiences of recent APRN graduates from the GNE SONs. We used alumni data voluntarily provided to the IMPAQ team by GNE SONs and qualitative data from interviews with nine APRN alumni.

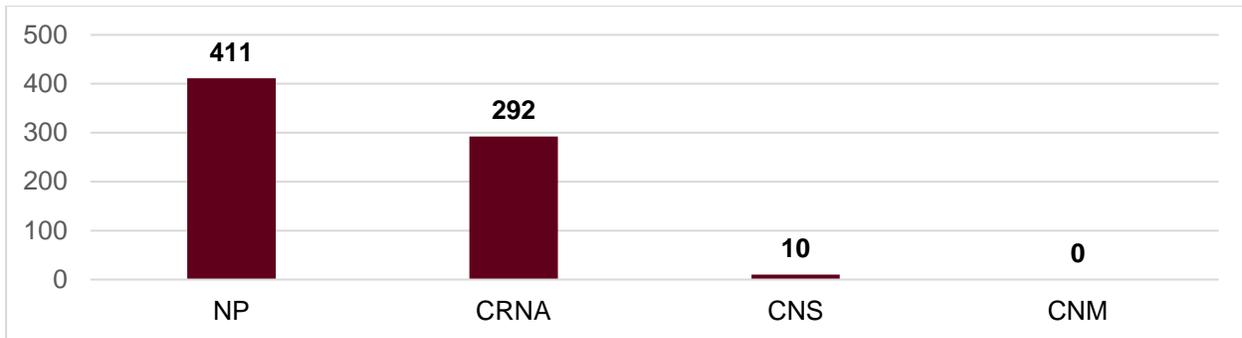
Case Study Research Question:
Where and what type of post-graduate employment opportunities exist for recent graduates?

Because this study only includes information from a limited number of GNE SONs, the results are not representative of the APRN alumni who participated in the GNE demonstration project. This chapter presents a summary of our findings from both our SON alumni data analysis and interviews with nine APRN alumni.

7.1. Alumni Case Study Quantitative Findings

In this section, we present a high-level overview of the quantitative data from five SONs who provided data on their APRN alumni. In particular, we present tabulations by each field of interest. Appendix B provides cross-tabulations of many of the fields available in the data and thus provides more detailed results than are presented in this chapter. IMPAQ received data from five SONs in four networks for a total of 713 alumni records. Of APRN alumni of SONs who provided data, 58 percent (411) are NPs, 41 percent (292) are CRNAs, only 1 percent (10) are CNSs, and none are CNMs. Exhibit 7-1 presents the total number of APRN alumni by specialty.

Exhibit 7-1. Total Number of APRN Alumni by Specialty

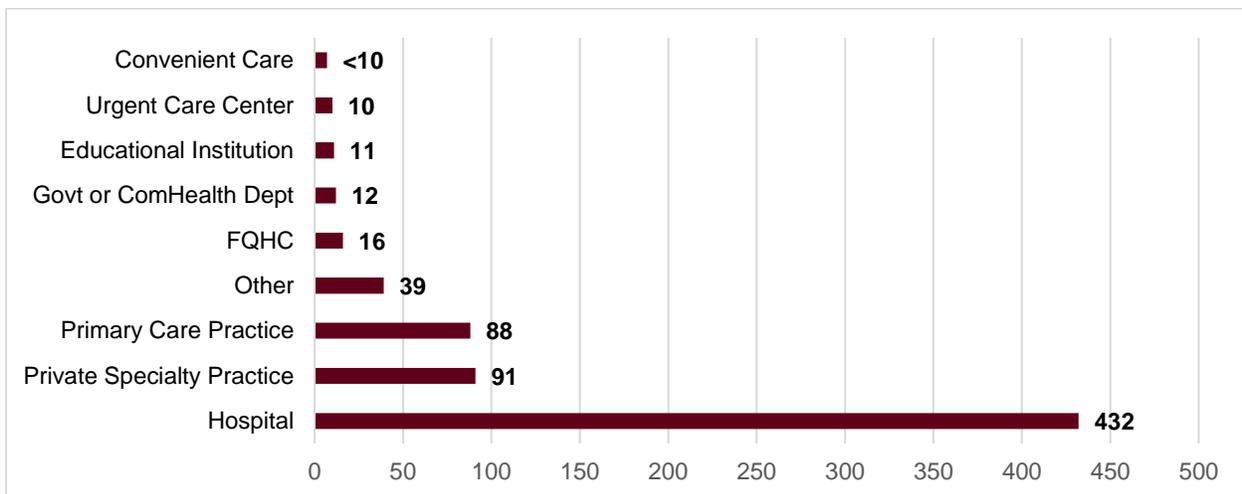


Notes: NP = nurse practitioner; CRNA = certified registered nurse anesthetist; CNS = clinical nurse specialist; CNM = certified nurse-midwife.

7.1.1 Employment Setting

The majority (432 alumni records, 61 percent) of APRN alumni work in hospital settings. A quarter (179 alumni records, 25 percent) work in private specialty or primary care practices. The data provides only limited information as to the proportion of alumni working in CCSs. Only 2 percent (16 alumni records) work in FQHCs, which is the only employment setting that we can confirm is a CCS.

Exhibit 7-2. Number of APRN Alumni by Employment Setting



Notes: FQHC = Federally Qualified Health Center.

7.1.2 Urban/Rural Setting

Few of the alumni included in our SON alumni data work in rural settings. As shown in Exhibit 7-3, 91 percent of the APRN alumni work in urban areas, while Exhibit 7-4 shows that 25 percent of APRN alumni serve medically underserved populations. This means that most of the APRNs who work in underserved areas, and for CCSs in particular, are serving urban underserved populations rather than rural.

Exhibit 7-3. APRN Alumni Employed, by Rural/Urban Setting

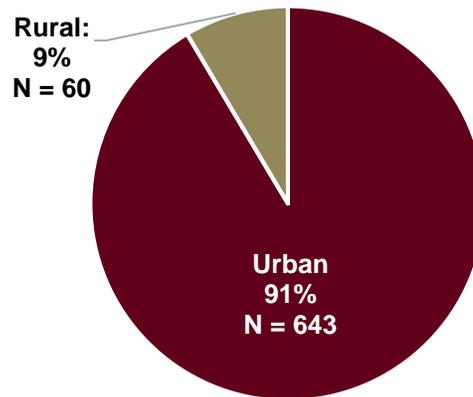
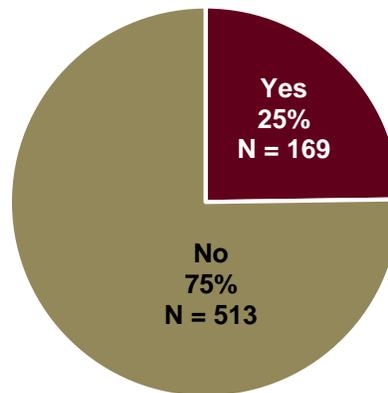


Exhibit 7-4. APRN Alumni Serving Medically Underserved Populations



7.2. Alumni Case Study Qualitative Findings

In this section, we present the qualitative data gathered from nine interviews with APRN alumni. The qualitative data provide more in-depth information about employment decisions discussed in the previous section, although the interview respondents and alumni in the quantitative data are separate samples.

All alumni were recent graduates who had received their degree within the two years preceding the interview. Five of the APRN alumni had recently received DNP degrees; the remaining four had recently received Master of Science in nursing (MSN) degrees. Eight of the nine APRN alumni we interviewed were family nurse practitioners (FNPs); one was a psychiatric-mental health nurse practitioner (PMHNP). All nine alumni completed their clinical education at a CCS that received GNE funds for one or more semesters. At the time of our interviews, seven of the nine respondents provided care to medically underserved populations. Only one of the nine alumni reported working in a rural area. Finally, seven of the nine respondents are female.

7.2.1 Factors that Influenced Education Choice

Of the nine alumni we interviewed, five reported that the biggest factor influencing their decision to attend their particular SON was the program’s reputation. Four of the nine alumni reported that the ability of the SON to arrange for their clinical placements was a primary or secondary factor influencing their decision. As one respondent explained, having the SON secure their clinical placements “was a big factor because many schools in the area did not place their students.”

“ One of the huge benefits of [SON] was that they place you in clinical education sites. ”

7.2.2 Clinical Education Experience

Respondents reported different clinical education placement processes, depending on the SON. The alumni who had to find and arrange for their own clinical education sites reported that they found the placement process stressful and time-consuming, whereas alumni who attended a SON that coordinated clinical education placements for their students found the process straightforward and “easy”.

“ Each [precepted experience] was great. [The community-based care setting] was more of a complex experience, but it did give me exposure to a diverse population. ”

All nine respondents said they were satisfied with their overall clinical education experience, although all mentioned some clinical education experiences that were extremely helpful and others that could have been improved. The six respondents who completed clinical placements with underserved populations reported having

enjoyed their experiences and reported that their preceptorships influenced their career choices after they graduated. The same respondents also reported looking for post-graduate employment within the same CCS where they had completed their clinical education.

7.2.3 Current Employment

Alumni mentioned a wide range of factors when asked what led them to accept their current positions. Many reported that salary and benefits were a major factor in their decision to take a job. Many also noted location, flexible work schedule, and eligibility for loan repayment as important factors. All nine of the respondents reported having worked in their current jobs for less than two years, with the majority starting their positions in 2018. Five of the interview respondents reported working in CCSs. Seven of the nine respondents reported providing care to medically underserved populations—including African Americans, Hispanics, and Native Americans, as well as people on Medicaid or without insurance. Overall, the APRN alumni respondents expressed an interest in, and commitment to, working in CCSs and serving medically underserved populations either now or in the future

The alumni respondents all said they were happy with the health care setting choices they made. The respondents cited a range of reasons for being happy with their choice in setting, including having a flexible work schedule and being paid well. Respondents working in the CCSs also reported that they enjoyed working with diverse populations with wide-ranging health care needs.

Some alumni also saw serving diverse populations as a challenging aspect of their jobs—explaining that they must treat patients with complex health care needs and complications often due to limited access to care. Language barriers were also noted as a challenge in serving diverse populations.

7.2.4 Influence of APRN Program

When asked how their overall APRN education—including didactic education and precepted experience—influenced their employment decisions, all respondents agreed that the APRN program had a large influence on their employment decisions. One respondent said that her SON’s didactic education and research on how to treat specific populations more effectively influenced how she cares for her medically underserved population. Others credited their clinical education experiences working with underserved populations with showing them new career opportunities they had not previously considered.

“ I wanted to work for a clinic where I could apply the research I was constantly learning and implementing it into practice for continuous quality improvement. ”

Chapter 8: Limitations and Conclusions

8.1 Limitations of the Evaluation

In the sections that follow, we provide summaries of the limitations of the evaluation for the estimate of the impact of the GNE demonstration project on APRN enrollment and graduations, qualitative analysis, and cost analysis (Sections 8.1.1 and 8.1.2). We also describe the complete limitations of the Alumni Case Study in Section 8.1.3.⁷³

8.1.1 Estimation of the Impact of the GNE Demonstration Project on APRN Enrollment and Graduations, and Qualitative Data

8.1.1.1 Lack of Data on Non-GNE SONs

The design of the evaluation limited the team’s ability to evaluate the impact of the demonstration project on APRN student growth in non-GNE SONs and spillover SONs. For example, the evaluation team did not have access to audit data from non-GNE SONs, nor did we design the evaluation to include conducting site visits, telephone calls, or other qualitative data collection with non-GNE SONs or networks. In addition we did not have access to non-GNE SONs’ preceptors or clinical education sites. The team was therefore not able to assess which specific demonstration project processes or features (e.g., precepting payments, streamlined placement processes, number of affiliated SONs or CCSs) contributed to increased APRN student enrollments and graduations. As a result, the team depended primarily on estimates based on secondary data from AACN to determine the impact of the demonstration project on APRN student growth.

8.1.1.2 Alternative Measurement of Additional APRN Students

For CMS payment purposes, the auditor defined the number of additional FTE APRN students based on the number of credit hours required to complete each APRN program offered at the SON. Whereas the impact analysis of the evaluation defined the additional number of FTE APRN students based on the information in the AACN survey which was regardless of credit hours completed or whether they were part-time or full-time students. Ideally, the impact analysis would use the same FTE measure that is used to calculate CMS payments to the networks, but the AACN annual survey data did not include the credit hours completed for APRN students.

8.1.1.3 Impact Estimate Models

To estimate the impact of the demonstration project, the evaluation team used a DID model to estimate the causal effect of the demonstration project using an entropy-weighted comparison

⁷³ See section “Limitations of the Evaluation” on pages 100–103 of the *DY1–DY4 Impact Evaluation Report* and section “Limitations of the Evaluation” on pages 102–104 of the *DY1–DY4 Cost Evaluation Report* for additional information.

group with quadratic and cubic terms. There are some typical limitations of this approach that also apply to this context. First, while DID models control for all time-invariant SON characteristics, they do not control for time-varying unobservable characteristics, which might bias the estimates. Second, a common concern with any weighting approach is that estimates can be unstable when very small or very large weights are used. To limit this concern, the team confirmed that the models did not produce extreme weights, by re-estimating the impact results after removing the comparison SONs that had relatively high weights.

Another limitation is that only 19 SONs that participated in the demonstration project of the more than 400 SONs that offer master's-level or DNP APRN programs. All 19 SONs affiliated with large academic institutions were more likely than non-GNE SONs to have an APRN NP specialty program, had more faculty, and were more likely to have an affiliated health center. These differences were not directly due to the eligibility criteria described in the solicitation, but were likely an indirect consequence of the administrative infrastructure required to meet the terms of participation (e.g., form partnerships, accept and channel CMS payments). Implementation of the demonstration project across a larger number or a more diverse set SONs might have yielded different results.

8.1.2 Analysis of Demonstration Project Costs

Because audited costs for DY6 and the Closeout Period were not available for the analyses, the cost estimates for these years are projected. We showed in the *DY1–DY4 Cost Evaluation Report*⁷⁴ that the projected costs were generally higher than the audited costs, so the estimates may overstate the audited costs for DY6 and the Closeout Period.

The analysis of the cost to CMS of supporting the clinical education of an additional APRN student to graduation uses the findings of an impact analysis to calculate these costs. As mentioned above, given the number and characteristics of the GNE SONs, the impact of the GNE demonstration across a larger number or a more diverse set SONs might have yielded different impact estimates. Therefore, it is possible that the estimates of the average cost to CMS of supporting the clinical education of an additional APRN student to graduation would also be different if a different group of SONs or networks participated.

8.1.3 Alumni Case Study

IMPAQ implemented the APRN Alumni Case Study under a number of data constraints. Due to these constraints, neither the quantitative nor qualitative samples for the case study are representative of the APRN alumni population who participated in the GNE demonstration project. This lack of representativeness prevents the study findings from being generalizable to the overall demonstration project alumni population. The study limitations are described below.

⁷⁴ See section “Findings from the Qualitative Analysis” on page 50 of the *DY1–DY4 Cost Evaluation Report* for the overall audited versus projected costs.

Quantitative Data Limitations. Only five of the 19 GNE SONs provided APRN alumni data that met our data criteria. Of those five SONs, the amount of complete data provided varied substantially by SON. Additionally, many alumni records were missing data for multiple variables. This limitation prevented us from conducting more robust data analysis to see if there were correlations between APRN alumni employment decisions and other variables such as specialty, clinical education settings, and others.

Qualitative Data Limitations. Because of the Paperwork Reduction Act requirement from the Office of Management and Budget, we only conducted nine APRN alumni interviews. Additionally, the APRN alumni only attended four of the 19 SONs. As a result, the sample was too small to generalize the findings to the entire population of alumni attending GNE SONs.

8.2 Discussion and Conclusion

Even though the projected demand for primary care providers such as NPs is increasing,⁷⁵ barriers still exist to increasing nursing student enrollment. To overcome these barriers, the AACN has recommended to increase the supply of nurses through partnerships between hospitals and SONs.⁷⁶ Other experts have also recommended similar strategies such as collaboration and building long-lasting partnerships.^{77,78} Although there is evidence that some partnerships have formed and that there may be some positive outcomes that resulted,⁷⁹ there is not sufficient information available as to how those partnerships formed, what challenges were experienced, or how those programs may inform future partnerships.

Both clinical and didactic education are required for APRN students to graduate; however the GNE demonstration project focused on only clinical education. The GNE demonstration project was an innovative project that formed community partnerships between hospitals, SONs, and clinical education sites. The demonstration consisted of five awardee hospitals that developed formal agreements with their partners including financial reimbursement arrangements. An important feature of the demonstration was that the hospitals distributed demonstration funds to physician and PA preceptors, in addition to APRN preceptors, to precept APRN students. Typically, preceptors of physician and PA students are paid, while preceptors of APRN students are not. So, by offering financial incentives to precept APRN students, the demonstration altered the landscape

⁷⁵ U.S. Department of Health and Human Services Health Resources and Services Administration. (2016). National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025. Retrieved from <https://bh.w.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf>

⁷⁶ American Association of Colleges of Nursing (2003). Building Capacity through University Hospital and University School of Nursing Partnerships. Retrieved from: <https://www.aacnursing.org/News-Information/Position-Statements-White-Papers/Building-Capacity>

⁷⁷ Hussain, A., Rivers, P., Glover, S., & Fottler, M (2012). Strategies for dealing with future shortages in the nursing workforce: a review. *Health Services Management Research*, 25(1), 41-47.

⁷⁸ Grant, R. (2016). The U.S. is Running Out of Nurses. Retrieved from <https://www.theatlantic.com/health/archive/2016/02/nursing-shortage/459741/>

⁷⁹ San Diego State University. (2000). Nurses Now Partnership Established to Address Nursing Shortage. Retrieved from <https://chhs.sdsu.edu/newsletters/nl-00f.pdf>

by allowing all participating SONs, rather than only the few that could afford it, to more easily obtain clinical education for their APRN students.

The GNE networks reported that the demonstration project has made significant improvements to the SONs' clinical placement processes and also enhanced relationships between and among clinical education sites, hospitals, and SONs. Network staff also reported that knowledge of APRN education and skill sets improved among non-APRN preceptors. Non-APRN preceptors also expressed increased willingness to precept, and hire, APRN students in the future.

To provide additional information about the APRN healthcare workforce beyond the direct impacts of the demonstration, we interviewed APRN alumni from the GNE SONs. These interviews revealed that their employment decisions were influenced by a range of employment preferences including their interest in working with a specific population, location, salary and benefits, and flexible work schedules. Interestingly, all respondents we spoke with said their preceptorship influenced their employment search and decisions, including being more inclined to serve rural or medically underserved populations in the future.

The quantitative results show that, relative to a comparison group of non-GNE SONs, APRN student enrollment increased across the GNE SONs by 93 per SON per year on average, depending on the comparison group used. APRN student graduations increased across the GNE SONs by 35 per SON per year on average. These results were driven by APRNs in NP programs and at the master's degree level.

Quantitative and qualitative evidence suggest that it is plausible that some effects of the demonstration are sustainable after the end of the demonstration. APRN student enrollment continued to increase after payments for additional APRN students ended, although these increases were somewhat smaller than during the final years where CMS provided funds for the clinical education of additional APRN students. Furthermore, networks reported that the GNE SONs and the APRN students will likely continue to benefit after the demonstration project ends from the partner collaborations formed during the project and from the streamlined clinical placement processes.

Analysis of cost data suggests that the annual GNE demonstration project costs remained within the mandated budget limits. The estimated average cost to CMS of supporting the clinical education of an additional APRN student to graduation as a result of the demonstration project was \$47,172 per graduate. This does not include the cost of the didactic training, which was not part of the GNE demonstration project. Additional costs not paid for by the demonstration project were likely to be incurred by the SONs for supporting an additional APRN student to graduation, but they were not measured as part of this evaluation.

In summary, the GNE demonstration project had a positive impact on APRN student growth; allowed SONs to enhance and formalize clinical placement processes, and to create and strengthen



relationships with clinical education sites, hospitals, and other SONs; and increased awareness of the role and value of APRNs among physician and PA preceptors.

Appendix A. Alumni Case Study Protocol

As part of the Alumni Case Study, IMPAQ developed an Alumni Case Study protocol to lead semi-structured 60-minute telephone discussions with nine APRN alumni who attended GNE SONs at the time of the GNE demonstration project. We present the Alumni Case Study protocol below including the overall introduction and main discussion topics and questions.

A.1 Introduction

IMPAQ International was hired to conduct an independent evaluation of the Graduate Nurse Education (GNE) Demonstration which [SON] participated in. As part of this evaluation, we have selected alumni like yourself to participate in interviews to help us understand where APRN alumni have been hired and identify factors that influenced post-graduate employment decisions.

This interview will take approximately one hour. Your participation is completely voluntary, and all responses you share with us will be kept confidential. We will summarize and report findings across all interviewees, and if we use any direct quotations to support those findings, we will use a pseudonym. We will never link anything you say with your name in any reports or presentations.

For note-taking purposes, we would like to request your permission to record the conversation. We will delete the recording once we confirm that our notes are comprehensive. Do we have your permission to record?

A.2 Education Background

We would like to begin by asking a few questions about your educational background.

1. Can you tell us about the APRN nursing program you graduated from?
 - What school did you attend?
 - What is your APRN specialty?
 - What type of degree did you earn?
 - Post-master's certificate
 - Master of science in nursing (MSN)
 - Doctor of nursing practice (DNP)
2. In what year and month did you graduate?
3. Why did you choose to attend [SON name]? Was this decision influenced by how [SON name] places APRNs in precepting sites?
4. When did you get your APRN certification?

A.3 Precepting Experience

Next, we would like to learn more about your clinical precepting experience.

5. How many clinical preceptorships did you complete?
6. Please describe each of your clinical precepted experiences.
 - In what type of health care setting was your preceptorship (i.e., hospital, community-based care setting, etc.)?
 - How long did the preceptorship last?
 - What types of patients did you see?
 - Please describe your preceptor(s)—NPs, MDs, or other?
 - Were you the only student being precepted by your preceptor?
 - What kinds of tasks or activities did you complete?
 - How did you find the clinical placement? Please describe the process.
 - Did [SON] assist you in finding the placement?
 - Was this clinical preceptorship successful, from your perspective? What was the best part? What would you have liked to change about the experience?
 - How did this preceptorship influence your career as an APRN?

A.4 Employment Search Experience

Next, we would like to talk about your experience looking for employment once you received your APRN certification.

7. Please describe your experience looking for your first job after you received your APRN certification.
 - How/where did you start looking for a job?
8. What did you consider to be your options for employment when looking for a job? And why?
9. Did you feel your options for employment were limited? If so, why?
10. What preferences did you have when looking for a job?
 - Employer
 - Setting type (community-based care setting vs. hospital)
 - Salary and/or benefits
 - Population served
 - Geographic location
 - Location characteristics (rural/urban/suburban, cost of living, etc.)
11. Did you receive employment guidance during your job search?
 - If so, who shared this guidance?
 - And what type of guidance did they provide?
12. How long did you look for a job before accepting an offer?

13. Did you have multiple offers to choose from? If so, what factors did you consider when deciding which one to take?

A.5 Current Employment

Now we have some questions about your current job.

14. Where are you currently working?

- What type of health care setting is it?
 - Community-based care setting
 - Acute care hospital
 - Outpatient clinic
 - Other
- Is your place of employment a nurse-run/nurse-managed clinic?
- Are you serving an underserved population?

15. How long have you been with this employer?

16. What is your current position or title? Please briefly describe your roles and responsibilities.

17. Have you been in the same position since you started with this employer? If no, what previous positions have you held?

18. What factors led you to choose this position?

- Employer
- Setting type
- Salary and/or benefits
- Population served
- Geographic location
- Location characteristics (rural/urban/suburban, cost of living, etc.)

19. You mentioned that you currently work in [SETTING TYPE]. Are you happy with your decision to choose a job in this health care setting? Why? What are the best and most challenging aspects about working in this setting?

20. Based on your work experience so far, would you take a job in this same type of setting again? Why? What would you do differently?

21. Did you have job offers to work in different types of health care settings? If so, why did you choose your current setting over the other opportunities?

22. (If respondent does **not** work in a community-based care setting) Would you consider practicing in a community-based care setting? Why or why not?

- What factors would encourage you to work in a community-based care setting?
- What factors would discourage you from working in a community-based care setting?

23. Are you employed in the same setting where you received any or all of your precepted experiences?
- If so, what characteristics of the setting do you like most?
 - What characteristics do you like the least?
24. Are you currently precepting APRN students?
- If so, what motivated you to precept?
 - If no, why not?
25. Do you see yourself serving as a preceptor in the future?
- If so, why?
 - If no, why not? What would it take to change your mind?

A.6 Other Employment (If Applicable)

We would also like to hear about any other jobs you may have had since you received your APRN certification.

26. Have you had any other jobs since you received your APRN certification? *NOTE: If no, please skip to the next section.*
27. If yes, in what types of health care settings were your previous jobs?
- Community-based setting
 - Acute care hospital
 - Outpatient clinic
 - Other
28. Why did you leave your previous job(s)?
- How, if at all, was your decision to leave your previous job(s) related to the health care setting?
29. What did you like about the health care setting(s) of your previous job(s)?
30. What did you like least about the health care setting(s) of your previous job(s)?

A.7 Influence of APRN Program

Finally, we have a few questions about how your APRN program influenced your employment decision.

31. How did your overall APRN education (didactic instruction and precepted experiences) influence your employment decisions?
- Specifically, how did your APRN education influence your decision to pursue a job in your current health care setting?
32. How, if at all, did your preceptor(s) influence your employment decisions?



A.8 Closing & Thank You

Those are all the questions we have for you today. To thank you for your participation, we would like to send you a gift card. Can you please provide us with your current address where we can mail the gift card?

Thank you again and please let us know if you do not receive your gift card within the next two weeks.

Appendix B. APRN Alumni Case Study—Detailed Quantitative Findings

We present further findings from the APRN Alumni Case Study, which was described in Chapter 7. The findings from Chapter 7 focus on single tabulation analysis whereas this appendix focuses on our cross tabulation analysis of APRN alumni data provided by five SONs from four GNE networks for a total of 713 alumni records. Because the alumni data is from a limited number of GNE SONs, the findings cannot be generalized to the overall GNE APRN alumni population.

Appendix Exhibit B-1 presents APRN specialty by APRN population focus. Within the NP group (the largest specialty), 56 percent (232 alumni) are FNPs; another 26 percent (106 alumni) are AGNPs.

Appendix Exhibit B-1. APRN Specialty by Population Focus

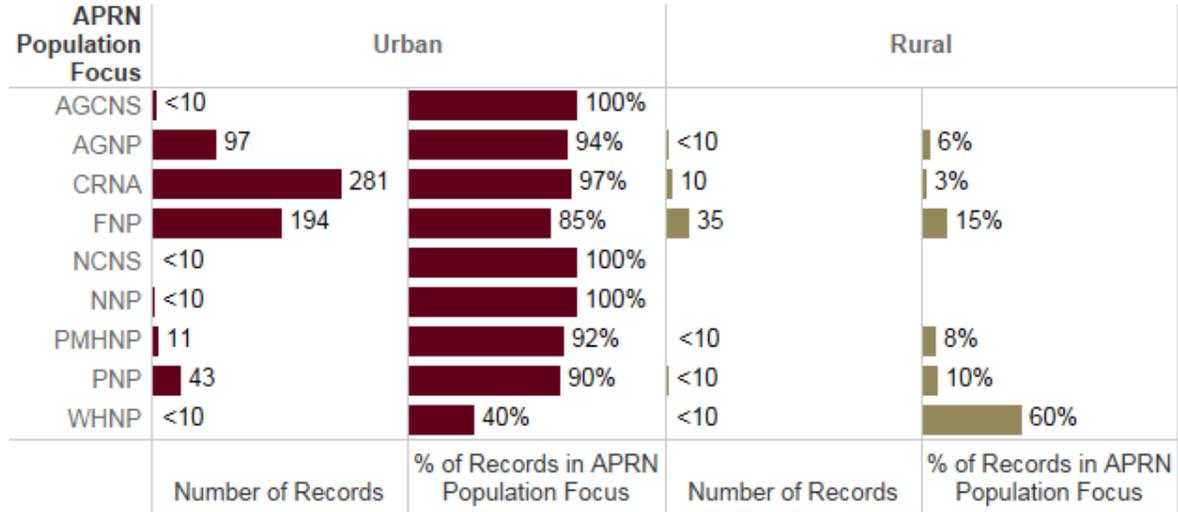
APRN Specialty	APRN Population Focus	Number of Records	% of APRN Specialty
CNS	AGCNS	<10	70%
	NCNS	<10	30%
CRNA	CRNA	292	100%
	AGNP	106	26%
	FNP	232	56%
NP	NNP	<10	1%
	PMHNP	13	3%
	PNP	50	12%
	WHNP	<10	1%

Notes: CNS = clinical nurse specialist; CRNA = certified registered nurse anesthetist; NP = nurse practitioner.

AGCNS = adult gerontological clinical nurse specialist; NCNS = neonatal clinical nurse specialist; AGNP = adult gerontological nurse practitioner; FNP = family nurse practitioner; NNP = neonatal nurse practitioner; PMHNP = psychiatric mental health nurse practitioner; PNP = pediatric nurse practitioner; WHNP = women’s health nurse practitioner.

Appendix Exhibits B-2 and B-3 present the APRN alumni population focus, employment setting, and service to medically underserved populations, by rural/urban work setting. As shown in Appendix Exhibit B-2, the APRN population focus with the largest share of alumni working in rural areas is WHNP (60 percent). Notably, only 15 percent of alumni FNPs work in rural settings. Ninety-six percent of alumni who are CRNAs and 100 percent of alumni serving neonatal populations reported working in urban settings. This is not surprising, as CRNAs may be more likely to work in urban settings with larger anesthesia departments than in CCSs and Neonatal NPs are more likely to work in neonatal intensive care units in urban tertiary care hospitals.

Appendix Exhibit B-2. APRN Population Focus by Rural/Urban Setting



Notes: AGCNS = adult gerontological clinical nurse specialist; AGNP = adult gerontological nurse practitioner; CRNA = certified registered nurse anesthetist; FNP = family nurse practitioner; NCNS = neonatal clinical nurse specialist; NNP = neonatal nurse practitioner; PMHNP = psychiatric mental health nurse practitioner; PNP = pediatric nurse practitioner; WHNP = women’s health nurse practitioner.

Appendix Exhibit B-3 presents the percentage of alumni within each employment setting that work in rural and urban areas. As shown, the majority of alumni in each employment setting work in urban areas. Notably, the two settings with the largest percentages of APRNs working in rural settings are primary care practices (22 percent) and government or community health departments (40 percent). Only 6 percent of alumni employed in hospitals work in rural areas. Access to hospitals in rural areas is limited compared to urban areas which could limit opportunities for employment in rural hospital settings.^{80,81}

⁸⁰ Lam, O., Broderick, B., & Toor, S. (2018, December 12). How far Americans live from the closest hospital differs by community type. Washington, DC: Pew Research Center. Retrieved from <http://www.pewresearch.org/fact-tank/2018/12/12/how-far-americans-live-from-the-closest-hospital-differs-by-community-type>

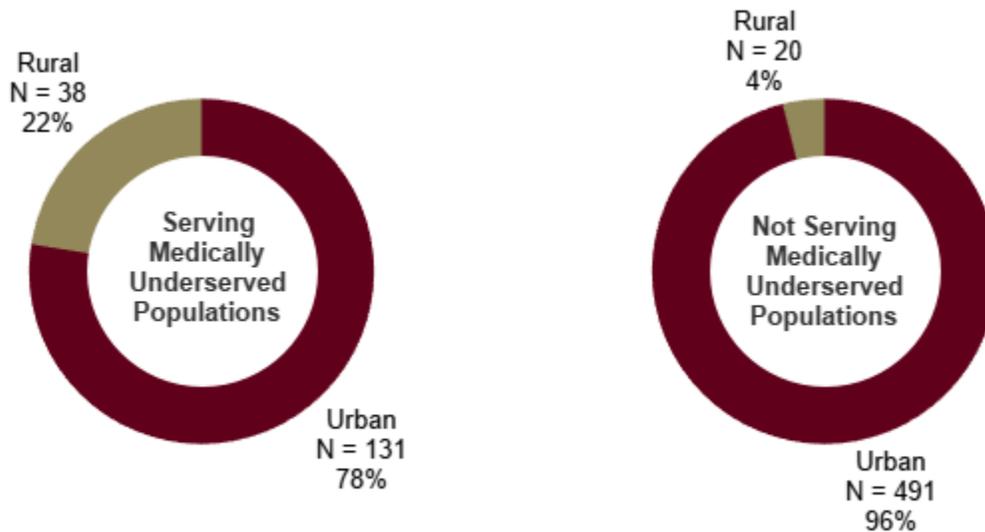
⁸¹ U.S. Government Accountability Office. (2018, August). *Rural hospital closures: Number and characteristics of affected hospitals and contributing factors* (GAO-18-634). Retrieved from <https://www.gao.gov/assets/700/694125.pdf>

Appendix Exhibit B-3. Employment Setting by Rural or Urban Setting

Employment Setting	Urban		Rural	
	Number of Records	% of Total Number of Records	Number of Records	% of Total Number of Records
Hospital	405	94%	24	6%
Private Specialty Practice	87	98%	<10	2%
Primary Care Practice	69	78%	19	22%
Other	33	87%	<10	13%
Federally Qualified Health Center	13	81%	<10	19%
Urgent Care Center	<10	80%	<10	20%
Government or Community Health Department	<10	60%	<10	40%
Educational Institution	10	100%		
Convenient Care	<10	100%		

Finally, we examined the rural/urban work status by whether alumni were serving medically underserved populations. As shown in Appendix Exhibit B-4, 22 percent of SON-provided APRN alumni who served underserved populations work in rural settings. Sixty-six percent of alumni working in rural settings served underserved populations, while only 21 percent of alumni working in urban settings serve underserved populations. Only 4 percent of alumni who do not serve underserved populations worked in rural settings. These findings align with the fact that most rural communities are defined as underserved because they have limited access to health care.

Appendix Exhibit B-4. APRN Alumni Serving Medically Underserved by Rural/Urban Setting



Appendix C. Additional Impact Analyses

This appendix describes the exploratory analysis we conducted to estimate the effects of the GNE demonstration project on APRN enrollment during the Closeout Period (CO) and the sensitivity analysis we conducted for the main results in the report using alternative comparison groups.

C.1 Effect of the GNE Demonstration during the Closeout Period

Exhibit C-1 shows the descriptive annual mean APRN student enrollments in GNE and non-GNE SONs from BY1 to DY7. The only difference between Appendix Exhibit C-1 and Exhibit 4-1 is the addition of the Closeout Period (2018). The exhibit shows that there was an increase in GNE SONs' enrollment in 2018 relative to the comparison group. Furthermore, the comparison group showed a decline in enrollment relative to the previous year for the first time during the period of analysis.

Appendix Exhibit C-1. Mean APRN Student Enrollment in GNE SONs vs. Non-GNE SONs Comparison Group with Closeout Period



Source: This exhibit uses information from the AACN's Annual Institutional Surveys. **Notes:** The non-GNE SONs comparison group is a weighted comparison group with weights found using entropy balancing on means, quadratic, and cubic terms. Each year in the graph corresponds to a baseline year, demonstration year, or the Closeout Period: 2006 = BY1, 2007 = BY2, 2008 = BY3, 2009 = BY4, 2012 = DY1, 2013 = DY2, 2014 = DY3, 2015 = DY4, 2016 = DY5, 2017 = DY6, 2018 = CO. Note that AYs 2010 and 2011 were not part of the analysis because they are not part of the legislatively mandated baseline or demonstration period.

Appendix Exhibit C-2 shows the results of a DID specification that separates the demonstration period into years. Coefficient estimates show that in 2018, GNE SONs enrolled on average 119 more APRN students per SON than non-GNE SONs, relative to the baseline period. This estimate

suggests that the largest gains in enrollment in GNE SONs occurred during the Closeout Period. There are several important considerations related to this finding. First, the qualitative information we collected suggests that GNE SONs put in place improvements in clinical placement processes that they maintained after GNE demonstration project funding ended (e.g., having a person in charge of clinical education coordination or recruitment). In light of these improvements, it is plausible that the demonstration project could have had impacts after the end of the demonstration project. However, it is unlikely that the effect of these improvements is large enough to create such a large increase in APRN enrollment during the Closeout Period.

Second, the unusual dip in the comparison group was mainly caused by reductions in enrollment in a few non-GNE comparison SONs with large weights. Because of the large weights, changes in their enrollment disproportionately affect the comparison group. It is possible that these few non-GNE comparison SONs are facing transitions that temporarily affected their enrollment (e.g., closing of some APRN programs) and that these temporary transitions are resulting in an overestimation of the effect that the GNE demonstration project had on APRN enrollment in the Closeout Period.

**Appendix Exhibit C-2. Weighted Difference-in-Differences Results:
APRN Enrollment, Per-Year Effects with Closeout Period**

APRN Enrollment	
DY1 Impact Estimate	82.44***
Standard Error	(25.39)
DY2 Impact Estimate	65.89*
Standard Error	(38.50)
DY3 Impact Estimate	97.41**
Standard Error	(42.52)
DY4 Impact Estimate	114.58**
Standard Error	(57.31)
DY5 Impact Estimate	103.79*
Standard Error	(53.36)
DY6 Impact Estimate	94.92
Standard Error	(61.81)
CO Impact Estimate	119.42*
Standard Error	(63.65)
Number of Observations	2,547

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. Baseline period = BY1–BY4; demonstration period = DY1–DY6. CO=Closeout Period. The comparison group was defined using an entropy balancing method with cubic and quadratic terms.

C.2 Sensitivity Analysis

Comparison Group Selection

We evaluated the impact of the demonstration project on APRN student enrollment using three alternative approaches to form comparison groups of non-GNE SONs from the universe of SONs that completed the 2008 AACN Annual Institutional Survey and had an APRN program (N = 353). The year 2008 was selected because it is the first baseline year in which the SONs reported data to AACN for DNP programs. The three alternative approaches were (1) a propensity score weighted⁸² comparison group (which will be referred to as Comparison Group 1), (2) an entropy weighted⁸³ comparison group using entropy balancing inclusive of quadratic and cubic terms for continuous variables (Comparison Group 2), and (3) an entropy weighted comparison group using entropy balancing inclusive of quadratic terms for continuous variables (but not cubic terms) (Comparison Group 3). An entropy weighted approach can be a better alternative to propensity score weighting because the entropy weighting algorithm tends to select weights that minimize the difference in means and higher order moments between the demonstration and the comparison groups, whereas the propensity score algorithm does not.

These three methods of forming comparison groups generated pre-implementation trends that were close to parallel, based on both visual inspection and the outcomes of statistical tests. However, of the three comparison groups, Comparison Group 2 was the preferred one because it had lower standardized biases than Comparison Group 1 and because it balanced on several cubic continuous terms, which Comparison Group 3 did not. Section 4.1.3 shows the results using the preferred comparison group, Comparison Group 2. This appendix shows the results we found using Comparison Groups 1 and 3. To facilitate the comparison of results to our preferred comparison group, we also include the results for Comparison Group 2 in the sections that follow.

C.2.1 Effect of the GNE Demonstration Project on Overall APRN Enrollment

Appendix Exhibit C-3 shows the DID coefficient estimates for the average effect of the demonstration project on total APRN student enrollment using each of the three alternative comparison groups. The first column of the table reports the results using Comparison Group 1. The DID coefficient estimate is statistically significant at the 5 percent level and shows that APRN enrollment in the GNE group increased by 95 students per SON per year on average relative to the comparison group as a result of the demonstration project. This represents an increase of 54 percent with respect to the baseline mean of the GNE group.⁸⁴

The second column of Appendix Exhibit C-3 shows the estimated effect of the demonstration project on enrollment using Comparison Group 2 (the preferred comparison group).⁸⁵ The DID coefficient estimate is very similar to the estimate obtained using Comparison Group 1 and

⁸² Rosenbaum, P. R. (1985). Estimation of causal effect using propensity score weighting in observational studies. Springer Verlag.

⁸³ Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20, 25–46.

⁸⁴ The percentage change is calculated by dividing the DID estimate by the baseline level of the outcome for the GNE SONs. For total APRN enrollment, this calculation is: $(93.47/174.28)*100 = 54$ percent.

⁸⁵ Comparison Group 2 estimates the comparison group weights using an entropy-balancing approach that includes quadratic and cubic terms for continuous covariates.

suggests that annual APRN enrollment in GNE SONs increased by an average of 93 APRN students as a result of the demonstration project. This represents a 54 percent increase with respect to the baseline mean and is statistically significant at the 5 percent level.

The last column in the exhibit shows the results obtained using Comparison Group 3. These results suggest that the demonstration project increased annual APRN student enrollment by an average of 72 students. This coefficient estimate is statistically significant at the 10 percent level. Results in the *DY1–DY4 Impact Evaluation Report* suggested an average increase in annual APRN enrollment that ranged between 57 and 87 per year.⁸⁶ Because the results are similar but slightly higher when measuring the impact of all six demonstration years, they suggest that student enrollment increased only slightly in DY5 and DY6.

Appendix Exhibit C-3. Difference-in-Differences Results: Total APRN Enrollment

	Comparison Group 1: Propensity Score Weighted	Comparison Group 2: Entropy Weighted (Preferred)	Comparison Group 3: Entropy Weighted
Average Impact Estimate	94.58**	93.47**	72.47*
90% Confidence Interval	[17.99, 171.17]	[24.93, 162.01]	[4.28, 140.67]
Standard Error	(46.56)	(41.66)	(41.46)
P-value	[0.05]	[0.02]	[0.09]
Baseline Mean for GNE SONs	174.28	174.28	174.28
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	54%	54%	42%
Number of Observations	1,904	2,314	2,314

Notes: *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. DID = difference-in-differences. Comparison Group 1 was specified using a propensity score-weighting methodology, where each GNE SON was given a weight of 1 and the comparison non-GNE SON a weight estimated from a function of the propensity score. Comparison Group 2 was defined using an entropy balancing method with cubic and quadratic terms. Entropy balancing is similar to propensity score weighting in that each GNE SON is assigned a weight of 1, and each comparison non-GNE SON is assigned a weight from the entropy balancing algorithm. Comparison Group 3 was defined using an entropy balancing method with quadratic terms only. The propensity score weighted model has fewer observations than the entropy balanced models because 42 SONs were dropped due to perfect prediction when propensity scores were estimated, but these observations were not dropped in the entropy balancing algorithm.

C.2.2 Effect of the GNE Demonstration Project on Overall APRN Graduations

Appendix Exhibit C-4 shows the DID estimates of the effect of the GNE demonstration project on APRN graduations during the entire demonstration period using each of the three alternative comparison groups. Although the results are positive regardless of the comparison group used, the size and statistical significance of the effect varies depending on the comparison group. The magnitude of the coefficient estimate ranges between 25 to 35 additional APRN student graduations, which represent increases between 48% and 67% of the baseline mean of GNE SONs.

Appendix Exhibit C-4. Weighted DID Results: APRN Graduations

⁸⁶ This result can be found in the *DY1–DY4 Impact Evaluation Report* on page 84.

	Comparison Group 1: Propensity Score Weighted	Comparison Group 2: Entropy Weighted (Preferred)	Comparison Group 3: Entropy Weighted
Average Impact Estimate	35.38*	35.37**	25.17
90% Confidence Interval	[2.73, 68.04]	[7.92, 62.82]	[-2.57, 52.92]
Standard Error	(19.85)	(16.69)	(16.87)
P-value	[0.08]	[0.04]	[0.14]
Baseline Mean for GNE SONs	52.97	52.97	52.97
Average Impact Estimate as a Percentage of the GNE Group Baseline Mean	67%	67%	48%
Number of Observations	1,911	2,323	2,323

Notes: Standard errors, clustered at the SON level, are in parentheses. *** indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. DID = difference in differences. Baseline period = BY1–BY4; demonstration period = DY1–DY6. Comparison Group 1 was specified using a propensity score weighting methodology, where each GNE SON was given a weight of 1 and the comparison non-GNE SON a weight estimated from a function of the propensity score. Comparison Group 2 was defined using an entropy balancing method with cubic and quadratic terms. Entropy balancing is similar to propensity score weighting in that each GNE SON is assigned a weight of 1, and each comparison non-GNE SON is assigned a weight from the entropy balancing algorithm. Comparison Group 3 was defined using an entropy balancing method with quadratic terms only. The propensity score weighted model has fewer observations than the entropy balanced models because 42 SONs were dropped due to perfect prediction when propensity scores were estimated, but these observations were not dropped in the entropy balancing algorithm.

Appendix D. Additional Cost Analyses

D.1 Analysis of Factors Influencing the Cost of the GNE Demonstration Project to SONs

The team conducted regression-based trend analyses to measure the average cost of an additional APRN student and the factors that might explain differences in SON-level costs over time. Given that cost data were not available for the baseline period or for the non-GNE comparison SONs, the evaluation team used regression-based trend analysis at the GNE SON level with DY-specific effects to increase precision. The trend analysis was used to determine the factors associated with the cost of the demonstration project over time, as a before-and-after comparison could not be made. The dependent variable was the SON-level total cost; the main independent variables were DY-specific indicators. We used the regression coefficients and associated *p*-values to determine whether any trend in total cost was statistically significant. The same regression framework was used to identify the network characteristics associated with changes in total costs. These network characteristics were the following:

- Number of additional APRN students relative to baseline
- Number of faculty
- Indicator for the SON being in a city
- Indicator for the SON being an affiliated health center
- Indicator for the SON being public
- The number of SONs in the GNE network
- The ranking of the SON according to *U.S. News & World Report*

We assumed that the hospital administrative costs not associated with specific SONs were distributed equally across SONs. For example, for MH, all costs not associated with specific SONs were split equally across the MH network's four SONs. We deflated all DY total costs to year 2011 dollar values to account for local inflation, using the Bureau of Labor Statistics' Urban Wage Earners and Clerical Workers Index.^{87,88,89}

Appendix Exhibit D-1 displays the results of the SON-level regression analysis undertaken to understand the factors associated with total GNE SON costs for DY1–DY6. Because these

⁸⁷ Bureau of Labor Statistics. (n.d.). *Data tools: Top picks; CPI-Urban Wage Earners and Clerical Workers (Current Series)*. Retrieved from <https://data.bls.gov/cgi-bin/surveymost?cw>

⁸⁸ The local inflation adjustment is applied in the SON regression analyses. All other costs are reported as current dollars.

⁸⁹ See section "Secondary Data Used to Analyze Factors that Influenced GNE SONs' Costs" on pages 37–38 of the *DY1–DY4 Cost Evaluation Report* for additional information.

associations are not estimated using a quasi-experimental methodology, they are only associations, not causal impact estimates.

Rows 2–6 present the coefficients of dummy variables that take on a value of 1 for the indicated year and 0 otherwise. For example, row 4, column 2 shows that the 19 GNE SONs had on average \$1,069,303 higher costs in DY4 than in the reference period, DY1. Consistent with the results presented in Section 5.1.1, these indicators show that SON costs increased every year from DY1 to DY4. However, the average SON costs in DY5 were substantially lower than in DY4. The regression results also show that the average SON costs in DY6 were the lowest they had been since DY1, which is consistent with the SON cost figures in Exhibit 5-1, and with the closing down of demonstration project activities. Notably, DY6 average SON costs are not statistically significantly higher than DY1 average SON costs at the 5 percent significance level. This is consistent with qualitative findings because in DY6, many positions developed to support the GNE demonstration project had been absorbed by the SON or awardee hospital, or either had been or would be dissolved once the GNE demonstration project ends. Additionally, as the number of GNE-designated students and preceptor payments ended, about one-third of the SONs had decreased the level of effort of positions supported by the GNE demonstration project.

Row 7 shows that each auditor-based additional APRN student (relative to baseline) is associated with an average increase in cost (\$10,302) that is statistically significant. Note that this estimate represents the marginal cost of supporting an additional APRN student while adjusting for other factors. This is different from the average cost to CMS of supporting the clinical education of an additional APRN student to graduation in a given year.

None of the other characteristics included in the regression have statistically significant associations with GNE SON costs. This differs from the results of this analysis for DY1–DY4 (reported in the *DY1–DY4 Cost Evaluation Report*) where three of the included characteristics were estimated to have significant associations with GNE SON costs.

Appendix Exhibit D-1. GNE SON Cost to CMS, Linear Regression Results

Variables in the Model	Coefficient (β) in \$	Standard Error	95% Confidence Interval
Indicator for DY1 [Reference]	--	--	--
Indicator for DY2	353,325***	87,034	(170,473, 536,177)
Indicator for DY3	563,568***	140,168	(269,086, 858,051)
Indicator for DY4	1,069,303***	152,986	(747,891, 1,390,714)
Indicator for DY5	651,372***	139,865	(357,527, 945,217)
Indicator for DY6	295,231	147,342	(-14,323, 604,785)
Number of Additional APRN Students Relative to Baseline	10,302***	2,300	(5,469, 15,134)
Number of Didactic/Clinical Faculty	6,436	4,446	(-2,905, 15,776)

City	-80,169	259,562	(-625,487, 465,150)
Affiliated Health Center (2008)	200,270	190,602	(-200,170, 600,711)
Affiliated Hospital (2008)	-270,577	177,453	(-643,391, 102,238)
Public Status (2008)	-34,188	147,412	(-343,890, 275,513)
Number of SONs in GNE Network	-6,656	34,111	(-78,321, 65,008)
Ranking of SON	-49	1,337	(-2,858, 2,761)
Constant	690,833	402,277	(-154,321, 1,535,986)

D.2 Auditor-Based Cost per Additional APRN Student Overall and by Network

This section presents total costs and costs per additional APRN student for each GNE network. We describe the trends in cost per auditor-based additional APRN student for all networks combined, but for each network, we present the tables of results without narrative.

Appendix Exhibit D-2 provides cost information at the overall demonstration level for DY1–DY6 and the Closeout Period. *Cost per auditor-based additional APRN student* (as defined for CMS payment purposes) showed modest increases between DY1 and DY4, followed by a relatively large increase in DY5, and a small decrease in DY6 compared to DY5. The total cost per additional APRN student increased from \$29,017 in DY4 to \$41,632 in DY5, a 43 percent increase. The reason for this increase is that despite a 15 percent decrease in total costs between DY4 and DY5, the number of estimated auditor-based additional APRN students also decreased (from 1,289 to 767, a 40 percent decrease). Because the percentage decrease in additional students was larger than the percentage decrease in total costs, the total cost per additional APRN student increased from DY4 to DY5. The cost per additional APRN student was nearly unchanged between DY5 and DY6. The Closeout Period does not have a cost per additional student calculation because demonstration project activities had ceased, so there are no estimated additional APRN students.

Appendix Exhibit D-2. GNE Demonstration Project Total and per Additional APRN Student Costs—Overall

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Budget)		All GNE (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost	CPI	Total Cost	CPI	Total Cost	CPI	Total Cost	CPI	Total Cost
Direct	\$1,876,700	\$2,405	\$2,253,100	\$2,254	\$2,385,500	\$2,085	\$2,353,183	\$1,825	\$2,278,647	\$2,969	\$2,416,792	\$3,719	\$1,067,613
Other Direct	\$570,500	\$731	\$749,400	\$750	\$915,100	\$800	\$973,110	\$755	\$970,627	\$1,362	\$428,600	\$660	\$35,300
SON	\$6,431,100	\$8,240	\$9,569,700	\$9,572	\$10,658,800	\$9,316	\$11,512,135	\$8,930	\$9,652,129	\$12,617	\$7,988,072	\$12,292	\$219,216
CCS	\$6,632,400	\$8,498	\$11,650,700	\$11,653	\$15,702,200	\$13,725	\$18,224,009	\$14,137	\$15,938,076	\$20,769	\$12,646,729	\$19,460	\$0

Indirect	\$2,362,800	\$3,027	\$3,360,000	\$3,361	\$3,533,000	\$3,088	\$4,343,473	\$3,369	\$3,108,404	\$4,051	\$3,435,959	\$5,287	\$134,421
Total	\$17,873,500	\$22,901	\$27,582,900	\$27,588	\$33,194,600	\$29,014	\$37,405,910	\$29,017	\$31,947,883	\$41,632	\$26,916,151	\$41,418	\$1,456,550

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

Appendix Exhibit D-3. GNE Demonstration Project Total and per Additional APRN Student Costs—Duke University Hospital

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	DUH (Source: Audit)		DUH (Source: Audit)		DUH (Source: Audit)		DUH (Source: Audit)		DUH (Source: Audit)		DUH (Source: Budget)		DUH (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost								
Direct	\$307,900	\$4,665	\$350,000	\$3,431	\$355,500	\$2,966	\$350,858	\$3,249	\$283,272	\$6,403	\$153,350	\$12,056	\$17,150
Other Direct	\$23,700	\$359	\$15,800	\$155	\$14,900	\$124	\$12,883	\$119	\$95,814	\$2,166	\$10,400	\$818	\$250
SON	\$766,100	\$11,608	\$1,016,400	\$9,965	\$1,185,700	\$9,892	\$1,374,333	\$12,725	\$683,157	\$15,442	\$407,700	\$32,052	\$21,750
CCS	\$164,200	\$2,488	\$497,900	\$4,881	\$1,475,700	\$12,312	\$1,556,904	\$14,416	\$1,482,735	\$33,516	\$335,000	\$26,336	\$0
Indirect	\$216,200	\$3,276	\$335,300	\$3,287	\$559,900	\$4,671	\$579,879	\$5,369	\$452,384	\$10,226	\$142,401	\$11,195	\$0
Total	\$1,478,100	\$22,395	\$2,215,400	\$21,720	\$3,591,700	\$29,966	\$3,874,857	\$35,878	\$2,997,362	\$67,752	\$1,048,851	\$82,457	\$39,150

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

Appendix Exhibit D-4. GNE Demonstration Project Total and per Additional APRN Student Costs—Hospital of the University of Pennsylvania

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	HUP (Source: Audit)		HUP (Source: Audit)		HUP (Source: Audit)		HUP (Source: Audit)		HUP (Source: Audit)		HUP (Source: Budget)		HUP (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost								
Direct	\$380,600	\$1,541	\$525,800	\$1,494	\$550,900	\$1,361	\$547,548	\$1,163	\$595,039	\$2,753	\$658,334	\$3,016	\$442,336
Other Direct	\$4,800	\$19	\$124,200	\$353	\$152,500	\$377	\$150,787	\$320	\$142,505	\$659	\$147,500	\$676	\$0
SON	\$1,909,400	\$7,730	\$3,192,100	\$9,068	\$3,340,900	\$8,255	\$3,876,158	\$8,230	\$3,894,644	\$18,016	\$3,419,369	\$15,665	\$0
CCS	\$3,468,400	\$14,042	\$5,378,000	\$15,278	\$6,286,200	\$15,532	\$7,699,792	\$16,348	\$7,688,455	\$35,565	\$7,138,880	\$32,705	\$0
Indirect	\$662,800	\$2,683	\$529,300	\$1,504	\$346,100	\$855	\$962,002	\$2,042	\$705,627	\$3,264	\$892,558	\$4,089	\$0
Total	\$6,426,000	\$26,016	\$9,749,400	\$27,697	\$10,676,600	\$26,380	\$13,236,287	\$28,103	\$13,026,270	\$60,257	\$12,256,641	\$56,151	\$442,336

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

Appendix Exhibit D-5. GNE Demonstration Project Total and per Additional APRN Student Costs—Memorial Hermann-Texas Medical Center

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	MH (Source: Audit)		MH (Source: Audit)		MH (Source: Audit)		MH (Source: Audit)		MH (Source: Audit)		MH (Source: Budget)		MH (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost								
Direct	\$529,000	\$2,398	\$607,700	\$2,172	\$551,300	\$1,764	\$565,512	\$1,651	\$501,119	\$2,482	\$570,812	\$4,081	\$298,050

Other Direct	\$314,400	\$1,425	\$278,700	\$996	\$374,900	\$1,200	\$444,389	\$1,297	\$374,960	\$1,857	\$75,900	\$543	\$28,850
SON	\$2,241,200	\$10,160	\$3,179,700	\$11,364	\$4,073,900	\$13,035	\$3,816,106	\$11,141	\$2,817,721	\$13,957	\$2,063,442	\$14,753	\$64,153
CCS	\$1,431,700	\$6,490	\$3,683,900	\$13,166	\$5,164,500	\$16,525	\$5,521,787	\$16,121	\$3,673,935	\$18,199	\$2,579,142	\$18,440	\$0
Indirect	\$412,300	\$1,869	\$659,100	\$2,356	\$837,000	\$2,678	\$1,019,044	\$2,975	\$979,691	\$4,853	\$564,722	\$4,037	\$41,752
Total	\$4,928,600	\$22,343	\$8,409,100	\$30,053	\$11,001,600	\$35,202	\$11,366,838	\$33,186	\$8,347,426	\$41,348	\$5,854,019	\$41,853	\$432,804

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

Appendix Exhibit D-6. GNE Demonstration Project Total and per Additional APRN Student Costs—Rush University Medical Center

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	RUMC (Source: Audit)		RUMC (Source: Audit)		RUMC (Source: Audit)		RUMC (Source: Audit)		RUMC (Source: Audit)		RUMC (Source: Budget)		RUMC (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost								
Direct	\$237,000	\$2,551	\$276,400	\$3,371	\$359,300	\$4,331	\$320,438	\$3,424	\$384,033	\$6,277	\$528,306	\$11,006	\$18,342
Other Direct	\$42,500	\$458	\$46,700	\$557	\$35,400	\$427	\$34,241	\$366	\$22,990	\$376	\$21,000	\$438	\$0
SON	\$507,700	\$5,466	\$522,800	\$6,235	\$431,000	\$5,195	\$492,797	\$5,266	\$462,682	\$7,563	\$455,540	\$9,490	\$0
CCS	\$696,400	\$7,497	\$722,800	\$8,620	\$794,800	\$9,581	\$770,252	\$8,231	\$834,277	\$13,636	\$198,531	\$4,136	\$0
Indirect	\$552,200	\$5,945	\$787,700	\$9,394	\$482,800	\$5,820	\$481,761	\$5,148	\$139,835	\$2,286	\$421,182	\$8,775	\$6,420
Total	\$2,035,800	\$21,916	\$2,356,400	\$28,177	\$2,103,300	\$25,353	\$2,099,489	\$22,435	\$1,843,817	\$30,138	\$1,624,559	\$33,845	\$24,762

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

Appendix Exhibit D-7. GNE Demonstration Project Total and per Additional APRN Student Costs—HonorHealth Scottsdale Osborn Medical Center

Cost Category	DY1		DY2		DY3		DY4		DY5		DY6		Closeout
	SHC-O (Source: Audit)		SHC-O (Source: Audit)		SHC-O (Source: Audit)		SHC-O (Source: Audit)		SHC-O (Source: Audit)		SHC-O (Source: Budget)		SHC-O (Source: Budget)
	Total Cost	CPI	Total Cost	CPI	Total Cost								
Direct	\$422,200	\$2,639	\$493,200	\$2,623	\$568,500	\$2,538	\$568,827	\$2,076	\$515,184	\$2,112	\$505,989	\$2,190	\$291,735
Other Direct	\$185,100	\$1,157	\$284,000	\$1,511	\$337,400	\$1,506	\$330,810	\$1,207	\$334,358	\$1,371	\$173,800	\$752	\$6,200
SON	\$1,006,700	\$6,292	\$1,658,700	\$8,823	\$1,627,300	\$7,265	\$1,952,741	\$7,127	\$1,793,925	\$7,355	\$1,642,021	\$7,108	\$133,313
CCS	\$871,700	\$5,448	\$1,368,100	\$7,277	\$1,981,000	\$8,844	\$2,675,274	\$9,764	\$2,258,674	\$9,261	\$2,395,175	\$10,369	\$0
Indirect	\$519,300	\$3,246	\$1,048,600	\$5,578	\$1,307,200	\$5,836	\$1,300,787	\$4,747	\$830,867	\$3,407	\$1,415,095	\$6,126	\$86,250
Total	\$3,005,000	\$18,781	\$4,852,600	\$25,812	\$5,821,400	\$25,988	\$6,828,439	\$24,921	\$5,733,008	\$23,506	\$6,132,080	\$26,546	\$517,498

Notes: DY1, DY2, DY3, DY4, and DY5 cost and APRN increment figures come from the DY1, DY2, DY3, DY4, and DY5 Audit Summary Reports and their supplementary files. DY6 and Closeout Period costs come from the DY6 Network Budget Report (which presents projected figures).

CPI = cost per auditor-based additional APRN student.

D.3 Alternative Average Cost to CMS of Supporting the Clinical Education of an Additional APRN Student to Graduation Estimation Methods

This section presents the methodology and results for two alternative methods to calculate the estimated average cost to CMS of supporting the clinical education of an additional APRN student to graduation. These methods do not use a comparison group and therefore do not have a causal interpretation. We caution that these cost estimates are not an accurate representation of the average cost to CMS of supporting the clinical education of an additional APRN student to graduation for additional APRN students attributable to the demonstration. Instead, the cost estimates define the number of additional APRN students as the difference between the number of graduated students at GNE SONs in the demonstration period versus the baseline period. This change could be due both to the demonstration and to external factors. The definition of the methods are as follows:

1. Method 1 uses independent auditor data and compares the number of APRN students that graduated in the demonstration period to the number of APRN students that graduated in the baseline period. The number of APRN students that graduated in the demonstration period that exceeds the number that graduated in the baseline APRN period is the number of additional APRN student graduates.
2. Method 2 uses AACN survey data and, like Method 1, compares the number of APRN students that graduated in the demonstration period to the number of APRN students that graduated in the baseline period to obtain the number of additional APRN student graduates.

The findings for these methods are as follows:

1. The total number of additional APRN students who graduated during DY1–DY6 across all GNE SONs, based on the independent audit data (Method 1), is **5,641**. Using this estimate, the average cost to CMS of supporting the clinical education of an additional APRN student to graduation is **\$31,269**.
2. The total number of additional APRN students who graduated during the demonstration project period across all GNE SONs, based on the AACN survey data (Method 2), is **8,128**. Using this estimate, the average cost to CMS of supporting the clinical education of an additional APRN student to graduation is **\$21,521**.