Evaluation of the GNE Demonstration Project
Volume II: Demonstration Costs

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LEGISLATIVE SUMMARY

The Graduate Nurse Education (GNE) demonstration project was established by section 5509 of the Patient Protection and Affordable Care Act (ACA) of 2010, Pub. L. 111-148, which amended title XVIII of the Social Security Act by adding 42 U.S.C. 1395ww note. Section 5509 appropriated $50 million for each fiscal year 2012 through 2015 without fiscal year limitation. Under this demonstration project, the Centers for Medicare & Medicaid Services (CMS) was authorized to provide payments to eligible hospitals[1] for the reasonable costs they incurred in providing qualified clinical training to advanced practice registered nurse (APRN) students. The statute also required that participating hospitals enter into an agreement with eligible partners[2] for the provision of qualified training. The statute places an emphasis on primary care by requiring that at least half of the clinical training be provided in non-hospital community-based care settings. This requirement may be waived for rural or medically underserved areas.

The statute also requires an evaluation of the GNE demonstration project no later than October 17, 2017, including an analysis of the following: (1) the growth in the number of APRNs with respect to a specific base year as a result of the demonstration; (2) the growth for each of the following specialties—clinical nurse specialist (CNS), nurse practitioner (NP), certified registered nurse anesthetist (CRNA), and certified nurse-midwife (CNM); (3) the costs to the Medicare program under title XVIII of the Social Security Act as a result of the demonstration; and (4) other items the Secretary determines 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, and especially with the aging of the population. The proportion of people over age 65 is increasing faster than the general population, and older individuals are likely to have chronic conditions

[1] 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.

[2] The term “eligible partner” includes the following (A) an applicable non-hospital community-based care setting; (B) an applicable school of nursing.

and complex care needs.[3,4] A shortage of primary care physicians is expected due to a declining number of medical students who choose primary care as their specialty.[5] These trends pose challenges for the Medicare program, which will continue to be the largest insurer of the growing population of older Americans. Study findings suggest that nurse practitioners can augment and expand physician capacity in many care settings. This may help alleviate the shortage of primary care physicians in 2025.[6,7] APRNs are registered nurses (RNs) who have completed graduate-level education programs in nursing and have passed a national certification examination. The purpose of these education programs is to provide the advanced clinical knowledge and skills needed to deliver safe, competent, high-quality care to patients. Research has shown that APRNs treat patients as effectively as physicians and at a lower cost.[8]

In 2011, the Institute of Medicine (IOM) issued recommendations to promote a greater role for APRNs in primary care and improvements in the education system to enable nurses to more easily obtain advanced education in schools of nursing (SONs).[9] APRN graduations are increasing nationally;[10] however, SONs continue to face significant challenges in increasing enrollments due, in part, to difficulty finding clinical education sites and preceptors to provide one-on-one mentoring and supervision of APRN students. In addition, a limited number of graduate-level faculty are available to mentor clinical preceptors and supervise student clinical experiences.

The Graduate Nurse Education (GNE) demonstration project attempts to mitigate some of these challenges by increasing the number of clinical education sites and preceptors.

[3] U.S. Department of Health and Human Services. (2016). National and Regional Projections of Supply and Demand for Primary Care Practitioners 2013-2025. National Center for Health Workforce Analysis.

[4] Petterson, S. M., Liaw, W. R., Philips, R. L., Rabin, D. L., Meyers, D. S., & Bazemore, A. W. (2012). Projecting U.S. primary care physician workforce needs: 2010-2025. *Annals of Family Medicine*, *10*(6), 503-509.

[5] Association of American Medical Colleges. (2013). *Successful Primary Care Programs: Creating the Workforce We Need.* Subcommittee on Primary Health and Aging, Committee on Health, Education, Labor, and Pensions (HELP).

[6] Rohrer, J. E., K. B. Angstman, G. M. Garrison, J. L. Pecina, J. A. Maxson. 2013. Nurse Practitioners and Physician Assistants Are Complements to Family Medicine Physicians. Population Health Management 16(4):242-45,

[7] Horrocks, S., E. Anderson, and C. Salisbury. 2002. "Systematic Review of Whether Nurse Practitioners Working in Primary Care Can Provide Equivalent Care to Doctors." *British Medical Journal 324*:819-823 [accessed 5/11/2016]. Available from: http://www.bmj.com/content/324/7341/819

[8] American Nurses Association. (2011). 2011 ANA Health and Safety Survey. Silver Spring, MD.

[9] Institute of Medicine. (2011). The Future of Nursing: Leading Change, Advancing Health. Washington, DC: National Academies Press.

[10] Fang, D., Li, Y., Arietti, R., & Bednash, G. D. (2014). 2013-2014 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing. Washington, D.C.: American Association of Colleges of Nursing.

THE GNE DEMONSTRATION PROJECT

Per statute, under the GNE demonstration project, CMS provided payment to five eligible hospital awardees for the reasonable costs attributable to providing qualified clinical training to APRN students enrolled as a result of the demonstration. Reasonable costs include only those clinical training costs that are not covered by other revenue sources. Costs associated with didactic training, certification, and licensure are not eligible for payment under the demonstration.

The hospitals participating in the demonstration were required to partner with accredited schools of nursing and non-hospital community-based care settings (CCSs), but they also partnered with other hospitals in an effort to expand the number of APRN students receiving qualified clinical training. 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 to underserved areas of the country. Therefore, consistent with the statutory requirement, CMS required hospitals participating in the demonstration to ensure that students completed at least half of their qualified clinical education in such settings. These settings included Federally Qualified Health Centers (FQHCs) and rural health clinics (RHCs).

Payments to the participating hospitals are linked directly to the number of "incremental," or additional, APRN students that the hospitals and their partnering entities educate as a result of their participation in the demonstration. The payment is calculated on a per incremental student basis, by comparing enrollment levels in the APRN programs during the baseline period, January 2006–December 2010,[11] to increased enrollment under the demonstration. Participating hospitals reimburse their partners for the reasonable cost of providing qualified clinical training to APRN students based on their established agreements.

The participating hospitals receive monthly interim payments derived from their projected budget estimates based on the expected number of incremental students, divided by 12 months, for allowable and reasonable costs incurred for the provision of incremental APRN students' clinical education. These payments are calculated using the allowable costs derived from the updated budget estimates and enrollment information that the hospitals provide to CMS. The following year an independent audit is completed, during which any reconciliations are made. Any interim payments that exceed the actual reasonable GNE costs are paid back to CMS. Conversely, CMS pays the hospital a one-time lump sum in the event that the GNE interim

[11] The legislatively established baseline period is January 2006–December 2010.

payments are 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. Table 1 provides the total payment each awardee received over the first four-year demonstration period.

In a competitive selection process, CMS made awards to five hospitals to participate in the GNE demonstration project:

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

A summary of the characteristics of the GNE networks is shown in Table 1.

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

	Duke University Hospital (DUH)	Hospital of the University of Pennsylvania (HUP)	Memorial Hermann-Texas Medical Center (MH)	Rush University Medical Center (RUMC)	Scottsdale Healthcare Osborn Medical Center (SHC-O)
Partner Hospitals	5	8	2	3	4
Partner Schools of Nursing	1	9	4	1	4
Partner Community-Based Care Settings (CCSs)	More than 150 CCSs: affiliated practice primary care network, community clinics, free clinic, 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 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 1 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

	Duke University Hospital (DUH)	Hospital of the University of Pennsylvania (HUP)	Memorial Hermann-Texas Medical Center (MH)	Rush University Medical Center (RUMC)	Scottsdale Healthcare Osborn Medical Center (SHC-O)
APRN Specialty	NP CNS CRNA	NP CNS CRNA CNM	NP CRNA	NP CNS CRNA	NP CNS
Total Payment	$10,696,200	$42,942,600	$35,750,600	$9,243,400	$21,841,700

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 permits the 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 incremental APRN students enrolled under the demonstration project to complete their required clinical education, and (2) more accurate measurement of APRN graduation rates under the demonstration.

EVALUATION OF THE GNE DEMONSTRATION PROJECT

CMS contracted initially with Optimal Solutions, and then with IMPAQ International, to conduct an independent evaluation of the project as required by the statute. In addition to determining whether payments to participating hospitals for clinical training resulted in overall growth in APRN student enrollment and graduations across the four named clinical specialties relative to the specific base year period, the evaluation also examined the costs to the Medicare program by determining the overall cost of implementing the GNE demonstration as well as the cost to CMS for supporting an incremental APRN student to graduate. In addition, the evaluation assessed the structure and characteristics of the networks, the implementation processes, the successes and challenges, and the spillover effects.

The overarching research questions that the evaluation addressed were the following:

1. **How was the GNE demonstration project implemented and operated?**
    a. What are the networks' characteristics and demonstration operation processes?
    b. How does the demonstration influence precepted clinical education placements and the placement processes?
    c. What notable successes and challenges do networks experience?
    d. What are the networks' plans for sustainability?

2. **How effective was the GNE demonstration project in increasing growth in the APRN workforce?**
    a. What is the effect on APRN growth (i.e., student enrollment and graduation) overall?
    b. What is the effect on APRN enrollment and graduation by specialty?
    c. Is the demonstration associated with spillover effects to non-participating SONs?
3. **What is the total cost of the demonstration project overall?**

This report addresses all of the costs associated with the demonstration project for the first four years of the demonstration period (demonstration year (DY) 2012–DY 2015). A companion document prepared by IMPAQ, *Evaluation of the GNE Demonstration Project Volume I: Implementation and Impact,* presents the results for the first and second research questions.

DATA AND METHODS

The evaluation team used a mixed-methods approach to estimate the costs of implementing the GNE demonstration project during the first four years, the factors that influenced GNE SONs' costs, and the cost to CMS for supporting an incremental APRN student to graduate. To calculate the total cost for implementing the GNE demonstration project and identify factors influencing GNE SONs' costs, the team relied primarily on projected and audited (actual) financial data submitted annually by the demonstration networks to CMS. The team also analyzed qualitative findings from interviews with network participants to understand their perceptions about return on investment and to provide context to the financial data. To calculate the cost to CMS for supporting an incremental APRN student to graduate, the team combined the impact analysis results for graduations, described in *Evaluation of the GNE Demonstration Project Volume I*, with the cost analyses included in this report.

KEY EVALUATION FINDINGS

The evaluation team analyzed the cost of the GNE demonstration project using descriptive, regression, and per-student cost methods. The findings related to the networks' implementation costs, the factors influencing GNE SONs' costs, and the cost to CMS for supporting an incremental student to graduate are discussed below.

What Was the Cost for Implementing the GNE Demonstration Project?

Allowable costs for implementing the GNE demonstration project included GNE SONs' costs, CCS costs, indirect costs, direct costs, and other direct costs. These costs were used to calculate the total cost for implementing the GNE demonstration project, the average

implementation costs per network, and the cost per incremental APRN student overall and by network.

The descriptive analysis showed that the total cost of the GNE demonstration project in the four-year period from DY 2012 to DY 2015 was $120,474,500. This estimate is preliminary: the analysis used projected DY 2015 costs because audited (actual) costs were not available at the time of this report. The annual costs ranged between $17,873,500 and $41,823,500. Each year's total costs were well below the $50,000,000 annual cap mandated by section 5509 of the ACA, suggesting that networks were able to successfully implement the demonstration project within its scope. The total cost across networks also varied substantially, ranging from $493,400 (RUMC) to $4,780,200 (HUP). This variation can be largely, but not fully, explained by differences in network size, because the cost per auditor-based incremental APRN student also showed substantial variation. The cost of the demonstration project increased over the four-year period, from $17,873,500 in DY 2012 to $41,823,500 in DY 2015. However, the DY 2015 amount is projected, which suggests that it may be an overestimate because, historically, the audited costs of the demonstration were 24.9 percent lower than the projected costs.

CCS costs were the highest expenditure, followed by SON costs, indirect costs, direct costs, and other direct costs. CCS costs include preceptor payments and other costs related to partnership agreements with CCSs (including hospitals) that provided clinical opportunities for incremental APRN students. This finding suggests that most of the resources were spent on the activity that most directly related to the overall goal of the demonstration project—increasing the number of clinical training sites and expanding the supply of APRN clinical preceptors. The qualitative analysis found that network participants hired placement coordinators and purchased information management systems to support expanded clinical placements as key investments to support this goal.

The total demonstration project cost per auditor-based incremental APRN student increased over time, from $22,900 in DY 2012 to a projected $31,400 in DY 2015. Networks' start-up delays in the first one to two years of the demonstration project may explain part of this increase, along with an increase in enrollment over time. The average cost per auditor-based incremental APRN student varied across networks, from $24,820 (DUH) to $35,520 (HUP). Different compositions of networks, the degree to which CCSs in the networks' geographic area may have reached saturation in their ability to precept APRN students, and the relative success of the investments networks made (e.g., reconfiguration of the process used to place students, and the information systems used to facilitate this process) may have contributed to the difference in cost per auditor-based incremental APRN student across networks.

What Factors Influence GNE SONs' Costs?

Regression analysis showed that four major factors were associated with the variation in total cost across SONs: the number of incremental APRN students relative to baseline, the number of SONs in a network, faculty size, and affiliation with a hospital.

First, **the number of incremental APRN students (relative to baseline)** was associated with higher costs at the SON level. This finding supports the finding that CCS costs were the largest expenditure, suggesting that as SONs enroll additional students, they incur higher costs to pay for precepting more students. Second, the **number of SONs in a network** was associated with lower costs at the SON level. This finding suggests that networks with a larger number of affiliated SONs may share certain costs and resources (e.g., software, personnel) and information, and may achieve economies of scale. Third, larger **faculty size** was associated with higher SON costs. Because faculty size is a proxy for SON size, this finding suggests that larger SONs may incur higher costs for implementing the demonstration. Fourth, **affiliation with a hospital** was associated with lower costs, possibly because relationships with hospitals may offer established and sizable preceptor pools that reduce the costs and resources needed to find clinical placements for APRN students.

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

The estimated total cost to CMS to support an incremental APRN student as a result of the demonstration project ranged from about $28,200 to about $57,400 per graduate, depending on the estimation method used. This is the average estimated cost to CMS for supporting the clinical educational training for an additional APRN student to graduate, across the demonstration project. Additional costs not paid for by the demonstration project, such as didactic faculty, are likely to be incurred by the SONs for an additional APRN student to graduate.

Network participants reported that the demonstration project yielded a positive return on investment. Most participants indicated that the investments made to implement the demonstration project had paid off in producing a larger number of APRN students through increased placement opportunities and better placement coordination. Some respondents also noted increased clinical capacity because APRN students were available to see patients. However, some respondents were cautious about attributing the increased enrollment solely to the demonstration project.

LIMITATIONS OF THE GNE DEMONSTRATION EVALUATION

The evaluation findings should be assessed in the context of several limitations of the demonstration project and the evaluation design. The DY 2015 figures reported are based on projected cost and not audited costs, because audited costs for DY 2015 were not available at the time of this report. Since in previous years the projected costs were higher than the audited costs, the DY 2015 figures may overstate the actual audited costs for DY 2015. In addition, the criteria used to assign cost items to cost categories (direct, other direct, indirect, SON costs, and CCS costs) may present some differences across the years and networks.

Cost data were not available for the non-GNE SONs. For that reason, the evaluation team was unable to compare the cost to CMS for similar SONs or networks not participating in the demonstration project. In addition, the qualitative findings included in the evaluation are limited to the perspectives of those who participated in the site visits and check-in calls. There are likely other participants in each network who may have different experiences or opinions related to the costs and benefits of the demonstration project that are not represented in this report.

Another limitation is that the initial four-year demonstration period may be too short for part-time incremental APRN students enrolled to complete their programs and graduate. The post-master's program, pursued on a full-time basis, requires two years to complete, whereas the DNP requires four years to complete. Part-time APRN students may take even longer. The incremental APRN enrollment numbers combine post-master's, master's, and DNP programs. As a result, the long-term impact on cost cannot be determined based on the initial four years of the demonstration period.

Finally, the analysis of the cost to CMS for supporting an incremental student to graduate used the findings of the impact analysis to calculate these costs. The impact analysis has several limitations, one of which is that only 19 SONs participated in the demonstration out of the more than 420 SONs that offer master's-level or DNP APRN programs. Additionally, all 19 SONs were affiliated with large academic institutions. Implementation of the demonstration project across a larger number or a more diverse set of SONs might have yielded different impact estimates and therefore different estimates of the cost to CMS.

CONCLUSION

Five diverse networks that varied in composition and implementation processes implemented the GNE demonstration project. The study findings suggest that the annual GNE demonstration project costs remained within the mandated budget limits. The cost findings also suggest that the annual cost for supporting an incremental APRN student increased over the four-year

demonstration period, even though the annual costs did not exceed the mandated annual capped amount. The adjusted regression model examined factors associated with the GNE SONs' costs. Among other factors, increasing the number of incremental APRN students in a SON increased the cost to the SON by an average of $9,400 per incremental student. The estimated cost to CMS for supporting an additional APRN student to graduate varied depending on the method used. While $28,249 and $31,439 are descriptive estimates of the cost to CMS for graduating an additional APRN student, $57,434 is a more precise estimate of the total cost because it takes into account only the increases truly attributable to the demonstration project.

The study also revealed substantial differences in total cost across the networks, even after adjusting for important factors such as the number of incremental APRN students produced. Some of these differences may be attributable to the environment in which each network operates (number of CCSs available in the area, competition from other SONs, etc.). Other explanatory factors may be differences in their operations, such as the processes used to organize clinical placements. Respondents were generally positive when asked about whether the demonstration project had positive returns on investment, although some were cautious in attributing the observed growth in enrollment specifically to the project.

The GNE demonstration project is an innovative approach to furthering the clinical education of APRN students.

This report was based on the first four years of data collected after the initiation of the demonstration project. A final evaluation report that will provide findings for the complete six-year demonstration experience will be available in the fall of 2019.

Chapter 1: Introduction

The Graduate Nurse Education (GNE) demonstration project was established by section 5509 of the Patient Protection and Affordable Care Act (ACA) of 2010, Pub. L. 111-148, which amended title XVIII of the Social Security Act by adding 42 U.S.C. 1395ww note. Section 5509 appropriated $50 million for the project for each fiscal year, 2012 through 2015, without fiscal year limitation.

Under this demonstration, the Centers for Medicare & Medicaid Services (CMS) was authorized to provide payments to eligible hospitals[12] for the reasonable costs they incurred in providing qualified clinical training to advanced practice registered nurse (APRN) students enrolled as a result of the demonstration. The statute also required that the participating hospitals enter into an agreement with eligible partners[13] for the provision of qualified training. The statute places an emphasis on primary care by requiring that at least half of the clinical training be provided in non-hospital community-based care settings. This requirement may be waived for rural or medically underserved areas.

The statute also required an evaluation of the GNE demonstration project, no later than October 17, 2017, including an analysis of the following: (1) the growth in the number of APRNs with respect to a specific base year as a result of the demonstration; (2) the growth for each of the following specialties—clinical nurse specialist (CNS), nurse practitioner (NP), certified registered nurse anesthetist (CRNA), and certified nurse-midwife (CNM); (3) the costs to the Medicare program under title XVIII of the Social Security Act as a result of the demonstration; and (4) other items the Secretary determines appropriate and relevant.

This report provides background on the demonstration project, describes how it was implemented, and presents the evaluation findings for the first four years of the demonstration project (e.g., DY 2012–DY 2015).

[12] 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) 1 or more applicable schools of nursing; and (b) 2 or more applicable non-hospital community-based care settings.

[13] The term “eligible partner” includes the following: (a) an applicable non-hospital community-based care setting; (b) an applicable school of nursing.

PRIMARY CARE AND THE ROLE OF APRNS

Primary Care Provider Shortage

By 2025, the United States will need an additional 23,640 primary care physician provider full time equivalents (or FTEs) to meet growing demands associated with expanded access to insurance, and especially with the aging of the population.[14] The proportion of people over age 65 is increasing faster than the general population, and older individuals are likely to have chronic conditions and complex care needs.[15] A shortage of primary care physicians is expected due to a declining number of medical students who choose primary care as their specialty.[16] These trends pose challenges for the Medicare program, which will continue to be the largest insurer of the growing population of older Americans.

The Role of APRNs in Addressing the Provider Shortage

Study findings suggest that NPs can augment and expand physician capacity in many care settings. This may help alleviate the shortage of primary care physicians in 2025.[17,18] APRNs, which include NPs, are registered nurses (RNs) 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), APRNs 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.[19]

The primary difference between an APRN and a physician is the training involved. Medical education emphasizes the pathology, leading to a disease-centered model, whereas nursing school emphasizes the patient, promoting a patient-centered model. APRNs have the advanced clinical knowledge and skills needed to deliver safe, competent, high-quality care to patients.

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[14] U.S. Department of Health and Human Services. (2016). National and Regional Projections of Supply and Demand for Primary Care Practitioners 2013-2025. National Center for Health Workforce Analysis.

[15] Petterson, S. M., Liaw, W. R., Philips, R. L., Rabin, D. L., Meyers, D. S., & Bazemore, A. W. (2012). Projecting U.S. primary care physician workforce needs: 2010-2025. *Annals of Family Medicine*, *10*(6), 503-509.

[16] Association of American Medical Colleges. (2013). *Successful Primary Care Programs: Creating the Workforce We Need.* Subcommittee on Primary Health and Aging, Committee on Health, Education, Labor, and Pensions (HELP).

[17] Rohrer, J. E., K. B. Angstman, G. M. Garrison, J. L. Pecina, J. A. Maxson. (2013). Nurse practitioners and physician assistants are complements to family medicine physicians. Population Health Management 16(4):242-45,

[18] Horrocks, S., E. Anderson, and C. Salisbury. 2002. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. British Medical Journal 324:819-823. Available from: http://www.bmj.com/content/324/7341/819

[19] APRN Definition: http://www.graduatenursingedu.org/aprn-definition/

Research shows that APRNs treat individuals and families as effectively as physicians, at a lower cost,[20] and in some cases provide more effective care on selected measures than that provided by physicians.[21]

The APRN Education Process

Growth in the supply of APRNs relies on the ability of schools of nursing (SONs) to attract and train APRN students. Students may pursue APRN credentials through multiple pathways, including a master's degree, post-master's certificate, and doctorate of nursing practice (DNP). Although most APRNs are currently prepared at the master's level, advocates including the American Association of Colleges of Nursing (AACN) support a shift from master's-level to DNP education.[22] This response was based on recommendations from the Institute of Medicine (IOM) for APRNs to practice to the full extent of their education and training as primary care providers and, particularly, that "nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression."[23] In addition to their clinical skills, DNP-prepared APRNs are skilled in quality and process improvements within health systems.

SONs offer APRN degrees in a number of specialties, including nurse practitioner (NP), clinical nurse specialist (CNS), certified nurse-midwife (CNM), and certified registered nurse anesthetist (CRNA). Students can select from a number of population foci, including adult-gerontology, family, pediatric, neonatal, psychiatric-mental health, and acute care. The vast majority of APRN students enroll in NP programs.[24] The length of time spent in 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.

[20] American Nurses Association. (2011). 2011 ANA Health and Safety Survey. Silver Spring, MD.

[21] Naylor M. D., & Kurtzman, E. T. (2010). The role of nurse practitioners in reinventing primary care. *Health Affairs*, 29(5), 893-899.

[22] American Association of Colleges of Nursing. (2014). Annual Report 2014: Building a Framework for the Future. Washington, D.C.

[23] Institute of Medicine. (2011). The Future of Nursing: Leading Change, Advancing Health. Washington, DC: National Academies Press.

[24] Fang, D., Li, Y., Arietti, R., & Bednash, G. D. (2014). *2013–2014 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing*. Washington, D.C.: American Association of Colleges of Nursing.

Exhibit 1-1. APRN Degree Types and Roles

Type of APRN	Role
Nurse Practitioner (NP)	NPs typically work under the indirect supervision of physicians and use their expertise to consult on patient care. They are engaged in all aspects of care, including assessing, diagnosing, and managing acute episodes, ordering and conducting diagnostic tests and lab work, performing in-office procedures, making medical treatment referrals, and prescribing medications.
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. Regardless of the educational background, however, all anesthesia professionals administer anesthesia the same way.

Education Requirements

APRN education includes graduate-level core courses, including advanced physiology/ pathophysiology, health assessment, and pharmacology. Recommendations for the ratio of didactic faculty to students vary across APRN educational programs. For example, the National Task Force on Quality Nurse Practitioner Education recommends that SONs maintain an NP didactic faculty to NP student ratio of 1:6, while the National Association of Clinical Nurse Specialists recommends a ratio of 1:8. SONs are required to adhere to these ratios to maintain accreditation.

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 clinical sites, where they gain clinical competencies, skills, and knowledge from experienced health care providers. 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, medical doctors, doctors of osteopathic medicine, and physician assistants, are licensed and board-certified health care providers, who supervise APRN students in a preceptor: student ratio of 1:1 or 1:2. The required number of clinical hours varies by specialty program:

- NP and CNS programs require a minimum of 500 precepted clinical hours, which are distributed to develop competencies reflecting the needs of the relevant population.
- CRNA programs require a minimum of 600 precepted clinical cases rather than a fixed number of hours.
- Other specialized programs of study, such as family nurse practitioner (FNP), adult-gerontology nurse practitioner (AGNP), and psychiatric-mental health nurse (PMHN), typically require more precepted clinical hours to develop the required competencies.
- CNM programs are based on meeting competencies; therefore, no specific number of clinical hours or experiences is required for accreditation.

Barriers to the Growth of the APRN Workforce

The APRN workforce has grown in recent years. By academic year 2013-2014, the number of APRN programs had increased by 17 percent over a five-year span in the 420 SONs across the country. Among the APRN students enrolled, 81 percent were in NP programs.[25,26] Many factors may explain this trend, including increased public recognition of the need for and the value of APRNs, and advocacy for APRN practice authority. For example, the research literature suggests that the economic downturn in 2008 motivated more students to enroll in graduate nursing programs.[27] In addition, based on a 2008 initiative of the Robert Wood Johnson Foundation, the IOM, in 2011, issued the report *The Future of Nursing: Leading Change, Advancing Health.* The report recommended that nurses should (a) practice to the full extent of their education and training; (b) achieve higher levels of education and training through an

[25] Fang, D., Tracy, C., & Bednash, G. D. (2010). *2009-2010 Enrollment and Graduation in Baccalaureate and Graduation Programs in Nursing*. Washington, D.C.: American. American Association of Colleges of Nursing.

[26] Fang, D., Li, Y., Arietti, R., & Bednash, G. D. (2014). *2013-2014 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing.* Washington, D.C.: American Association of Colleges of Nursing.

[27] Terry, A. J., & Whitman, M. V. (2011). Impact of the economic downturn on nursing schools. *Nursing Economics, 29*(5)*,* 252-256, 264.

improved education system that promotes seamless academic progression; and (c) be full partners with physicians and other health care professionals in redesigning health care in the United States. The accessibility and affordability of graduate nurse education may play a role as well. Less time is needed to complete graduate nurse education in comparison with medical education.

State and federal initiatives targeting APRN education may also play a role in APRN workforce growth. In addition to authorizing the GNE demonstration project, the Affordable Care Act encouraged APRN growth through funding for nurse-managed health clinics and the establishment of the Advanced Nursing Education (ANE) grant program.[28] In addition, some states permit community colleges to award baccalaureate nursing degrees.[29] Other state initiatives to encourage APRN precepting, such as Maryland's tax credit for NP preceptors,[30] may continue to increase opportunities for growth in the number of APRN students.

Despite the growing demand for APRN education, SONs continue to face significant challenges in increasing enrollments. These challenges stem, in part, from difficulty finding clinical education sites and preceptors to provide individual mentoring and supervision of APRN students. SONs face increasing competition for funding and student placements with medical schools and physician assistant programs. Unlike medical schools, SONs are unable to provide payments to preceptors. Moreover, SONs compete for the limited number of clinical training sites. A national shortage of qualified nursing faculty and a lack of funds for increasing the number of faculty available to educate students amplify this challenge.[31] Faculty shortages within SONs and competition for clinical education sites have limited the number of APRN students that SONs can enroll each year. This has contributed to a highly competitive environment for applicants to APRN education programs.

The GNE demonstration project aims to mitigate some of these challenges by increasing the number of clinical training sites and preceptors.

[28] Administered by the Health Resources & Services Administration (HRSA), the ANE supports innovative academic-practice partnerships to improve education for APRN students in rural and underserved areas. https://bhw.hrsa.gov/sites/default/files/bhw/nchwa/advanced-nursing-education-highlights.pdf

[29] American Association of Colleges of Nursing. (2015). Community Colleges Operating Baccalaureate Nursing Programs. Policy Brief. http://www.aacn.nche.edu/government-affairs/Community-College-BSN.pdf

[30] Maryland Board of Nursing. Tax Benefit for Nurse Practitioner Preceptors. http://mbon.maryland.gov/Pages/advanced-practice-tax-benefit-np-preceptors.aspx

[31] American Association of Colleges of Nursing. (2014). *Annual Report 2014: Building a Framework for the Future*. Washington, D.C.

THE GNE 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 training to APRN students enrolled as a result of the demonstration. Reasonable costs include only those clinical training costs that are not covered by other revenue sources, such as:

- Salaries for staff in lead hospitals to administer the GNE demonstration project;
- Costs incurred by SONs for materials, salaries for non-didactic faculty, and coordination of clinical preceptorships for incremental APRN students;
- Costs associated with executing CCS partnership agreements; and
- Precepting payments for the clinical education of incremental APRN students.

Costs associated with didactic training as well as costs for certification and licensure are *not* eligible for reimbursement under the demonstration. Importantly, the demonstration provides 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 training program. Training that only enhances nurse competencies is not eligible for reimbursement. Individuals who have already been licensed to practice as APRNs are therefore not eligible for further training under the demonstration.

The hospitals participating in the demonstration were required to partner with accredited schools of nursing, with non-hospital care providers in community-based care settings (CCSs), and with other hospitals in an effort to expand the number of APRN students receiving qualified clinical training. 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 primary care access to medically underserved areas of the country. Therefore, consistent with the statutory requirement, 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.

Payments to the participating hospitals are linked directly to the number of "incremental," or additional, APRN students that the hospitals and their partnering entities educate as a result of their participation in the demonstration. Thus, payment is calculated by comparing enrollment levels in the APRN programs during the baseline period (i.e., January 2006–December 2010)[32]

[32] This is the legislatively established baseline period.

to increased enrollment under the demonstration. Participating hospitals reimburse their partners for the reasonable cost of providing qualified clinical training to APRN students based on their established agreements.

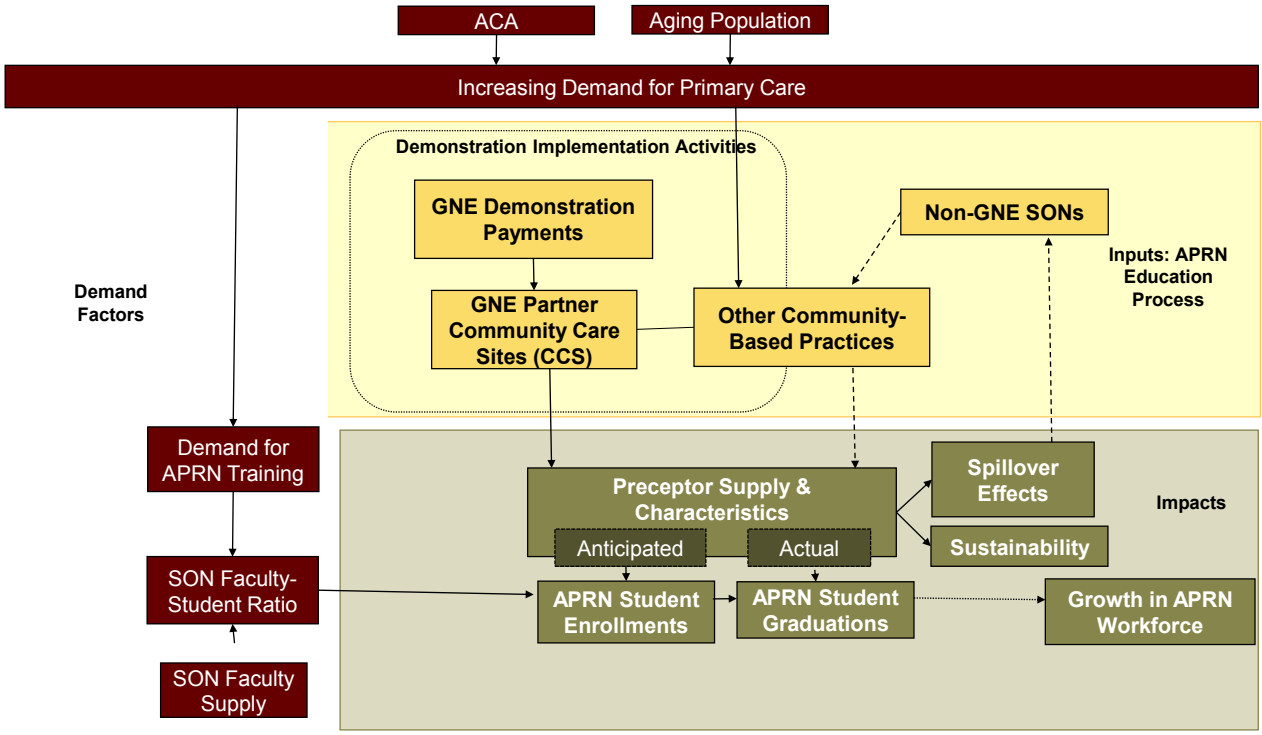
The participating hospitals receive monthly interim payments derived from their projected budget estimates based on the expected number of incremental students, divided by 12 months, for allowable and reasonable costs incurred for the provision of incremental APRN students' qualified clinical education. These payments are calculated using the allowable costs derived from the updated budget estimates and the enrollment information that the hospitals provide to CMS. The following year an independent audit is completed, during which any reconciliations are made. Any interim payments that exceed the actual reasonable GNE costs are paid back to CMS. Conversely, CMS pays the hospital a one-time lump sum in the event that the GNE interim payments are 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 1-3 provides the total payment each awardee received over the first four-year demonstration period.

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

Exhibit 1-2 depicts a logic model of the key pathways through which the GNE demonstration project may affect growth in the APRN workforce and shows the contextual factors that may influence the success of the demonstration.

The exhibit depicts the dynamic relationships through which growing demand for primary health care results in increased demand for APRN providers, which in turn increases the demand for precepted clinical education. The GNE demonstration project supports the formation of collaborative networks that recruit, coordinate, and pay clinical education sites to expand the number of opportunities for clinical precepted training. This design in which precepting payments are offered to clinical sites aims to address the difficulty the SONs experience in finding and building relationships with clinical sites and preceptors who will provide one-on-one mentoring and clinical training of APRN students. Financial support for precepted training is intended to enable SONs to enroll and graduate more APRN students and ensure that the students graduate on time. By compensating clinical sites for staff time educating students, the demonstration project aims to ensure that sufficient clinical preceptorships are available to permit the enrollment and facilitate the graduation of additional APRN students.

Exhibit 1-2. Logic Model of the GNE Demonstration Project



Overview of the GNE Demonstration Project Awardees

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

- Duke University Hospital, Durham, North Carolina
- Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania
- Memorial Hermann-Texas Medical Center, Houston, Texas
- Rush University Medical Center, Chicago, Illinois
- HonorHealth Scottsdale Osborn Medical Center, Scottsdale, Arizona

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 a GNE strategic planning and oversight team, and engaged SON administrators, clinical administrators, clinical placement coordinators, and preceptors to implement the demonstration project.

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 training. 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. Each of the five hospital-led networks is further described below.

Duke University Hospital

Duke University Hospital (DUH), the participant hospital for the Duke GNE demonstration network, is a large academic health and medical center located in Durham, North Carolina. It is the flagship hospital of Duke University Health Systems (DUHS), a nonprofit corporation that includes DUH, Duke Regional Hospital, Duke Raleigh Hospital, ambulatory care services, home health care, hospice, and other services.[33] The DUH demonstration network is made up of DUH, Duke Regional Hospital, Duke Raleigh Hospital, three rural, small/medium-sized hospitals, Duke University School of Nursing (DUSON), and many CCSs, including specialty and primary care private practices, community clinics, and health departments. The DUH network is one of two networks in the demonstration project with only a single school of nursing.

Hospital of the University of Pennsylvania

The Hospital of the University of Pennsylvania (HUP), located in Philadelphia, Pennsylvania, is the participant hospital for the Greater Philadelphia GNE demonstration network. The network consists of HUP, nine SONs, and eight other hospitals and community umbrella organizations representing free-standing ambulatory care clinics. The nine SONs partnering in the demonstration network are the University of Pennsylvania, Gwynedd Mercy College, LaSalle University, Drexel University, Neumann University, Temple University, Thomas Jefferson University, Villanova University, and Widener University.

Memorial Hermann-Texas Medical Center

Memorial Hermann-Texas Medical Center (MH) in Houston, Texas, is the hospital participant for the Memorial-Hermann (MH) GNE demonstration network. The network consists of 11 hospitals in the Memorial Hermann Health System (including MH), two additional hospitals, four SONs, four hospital-based physician partners, and many community-based partners. The network covers the Gulf Coast Region of Texas, which includes an area with a rapidly growing

[33] Optimal Solutions Group. (2014). Phase I Evaluation Report.

population and some of the highest rates of uninsured people in the country.[34] The following SONs are part of the network: University of Texas Health Science Center at Houston, Texas Woman's University, Prairie View A&M University, and University of Texas Medical Branch at Galveston. Memorial Hermann Health System has a history of partnering with these schools to place students for clinical education, and all the schools are part of a pre-existing Gulf Coast Committee, which promotes health care workforce solutions for Gulf Coast communities.[35]

Rush University Medical Center

Rush University Medical Center (RUMC), located in Chicago, Illinois is the hospital participant for the RUMC GNE demonstration network. The network includes three other hospitals, Rush University College of Nursing (CON), and over 20 clinical and community-based care training sites. The training sites are located throughout the Chicago area and rural Illinois and include health networks, FQHCs, and charity clinics. Rush CON, which is structurally affiliated with RUMC, acts as the coordinator of the RUMC demonstration network and is the sole SON in the network.

HonorHealth Scottsdale Osborn Medical Center[36]

HonorHealth Scottsdale Osborn Medical Center, previously known as Scottsdale Healthcare Osborn Medical Center (SHC-O), is the hospital participant for the SHC-O GNE demonstration network. It is a newly formed nonprofit health system in Scottsdale and Phoenix, Arizona, that consists of a merger between the Scottsdale Healthcare and the John C. Lincoln Health Network. The HonorHealth system has five acute care hospitals, which are located around the Scottsdale and Phoenix area. Four SONS (Arizona State University, Grand Canyon University, Northern Arizona University, and the University of Arizona) are partners on the demonstration project. Five other hospitals - Banner Health System, Mayo Clinic Hospital, Phoenix Children's Hospital, Maricopa Integrated Health System, and the University of Arizona Medical Center together with over 1,000 CCSs based in urban and rural areas participate in the GNE demonstration project.

A summary of the five GNE networks is presented in Exhibit 1-3.

[34] Memorial-Hermann (MH) Demonstration Application, MH Implementation Plan.

[35] MH Demonstration Application.

[36] In March 2015, Scottsdale Healthcare Osborn Medical Center (SHC-O) became HonorHealth Scottsdale Osborn Medical Center. In this report, it is still referred to as SHC-O.

Exhibit 1-3. Summary of Characteristics of the GNE Demonstration Networks

	Duke University Hospital (DUH)	Hospital of the University of Pennsylvania (HUP)	Memorial Hermann-Texas Medical Center (MH)	Rush University Medical Center (RUMC)	Scottsdale Healthcare Osborn Medical Center (SHC-O)
Partner Hospitals	5	8	2	3	4
Partner Schools of Nursing	1	9	4	1	4
Partner Community-Based Care Settings (CCSs)	More than 150 CCSs: affiliated practice primary care network, community clinics, free clinic, other CCSs[37]	More than 150 hospital- and non-hospital-affiliated CCSs, stand-alone nurse-managed primary care clinics, FQHCs[38]	More than 150 CCSs: clinics surrounding SONs, FQHCs, physician group primary-care practices, hospice, home health[39]	25 CCSs in Greater Chicago area and adjoining rural counties; initially 5 large community organizations[40]	More than 1,000 CCSs: FQHCs, rural health clinics, primary care practices, nurse-managed clinics, home health, long-term care[41]
Geographic Area	Regional, generally within approximately a 60-mile radius	Greater Philadelphia area with regional reach; 44 northern and central counties served by 1 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	$10,696,200	$42,942,600	$35,750,600	$9,243,400	$21,841,700

GNE Demonstration Project Timeline

The GNE demonstration project was initially implemented in July 2012 and designed to operate for a four-year period (demonstration years (DY) 2012–2015). Because there were

[37] Duke University Hospital (DUH), 2015 GNE semi-annual report.

[38] Hospital of the University of Pennsylvania (HUP), 2015 GNE semi-annual report.

[39] Memorial Hermann-Texas Medical Center (MH), 2015 semi-annual report.

[40] Rush University Medical Center (RUMC), 2015 semi-annual report.

[41] HonorHealth Scottsdale Osborn Medical Center (SHC-O), 2015 semi-annual report.

appropriations available at the end of that period, and the statute permits the use of these funds without fiscal year limitation, CMS extended the demonstration for an additional two years, through July 2018 (DY 2016–2017). The extension (1) allowed additional time for the incremental APRN students enrolled under the demonstration project to complete their required clinical education, and (2) made measurement of APRN graduation rates under the demonstration project more accurate. However, no payments for qualified clinical education were to be made for incremental APRN student enrollments during the extension period.

The demonstration project operates on an academic calendar. The academic year runs from the fall of a given calendar year through the summer of the subsequent year. Exhibit 1-4 relates academic years (AYs) to demonstration years (DYs).

Exhibit 1-4. GNE Demonstration Project Timeline

Academic Calendar Year (AY)	Demonstration Period					
	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Demonstration Year (DY)	DY 2012	DY 2013	DY 2014	DY 2015	DY 2016	DY 2017
	DY 1	DY 2	DY 3	DY 4	DY 5	DY 6

EVALUATION OF THE GNE DEMONSTRATION PROJECT

Section 5509 of the ACA required an independent evaluation of the GNE demonstration project, to determine whether payments to participating hospitals for qualified clinical training resulted in overall growth in APRN students in the four named clinical specialties relative to the specific base year. The evaluation also examined the costs to the Medicare program by determining the overall cost for implementing the GNE demonstration as well as the cost to CMS for supporting an incremental APRN student to graduate. In addition, the evaluation assessed the structure and characteristics of the networks, the implementation processes, successes and challenges, and spillover effects.

CMS awarded an initial two-year contract to Optimal Solutions Group, LLC, during the original evaluation design phase (Phase 1). A second contract, for five years, was awarded to IMPAQ International, LLC, to complete the independent evaluation of the GNE demonstration project (Phase II).

Research Questions

The overarching research questions that the evaluation addresses are:

1. **How was the GNE Demonstration project implemented and operated?**
    a. What are the networks' characteristics and demonstration operation processes?
    b. How does the demonstration influence precepted clinical education placements and the placement processes?
    c. What notable challenges and successes do networks experience?
    d. What are the networks' plans for sustainability?
2. **How effective was the GNE Demonstration project in increasing growth in the APRN workforce?**
    a. What is the effect on APRN growth (i.e., enrollment and graduations) overall?
    b. What is the effect on APRN enrollment and graduations by specialty?
    c. Is the demonstration associated with spillover effects to non-demonstration SONs?
3. **What is the total cost of the demonstration project overall?**

This report addresses the third research question, the total cost of the demonstration, for the first four years of the demonstration project period. The first and second research questions are addressed in a separate report, *Evaluation of the GNE Demonstration Project, Volume I: Implementation and Impact.*

Cost Evaluation Design

The evaluation team used a mixed-methods approach to understand the cost of implementing the GNE demonstration project, the factors that influenced GNE SONs' costs, and the cost to CMS for supporting an incremental APRN student to graduate. To calculate the total cost for implementing the GNE demonstration project and to identify the factors influencing GNE SONs' costs, the team relied primarily on projected and actual financial data submitted annually by the demonstration networks to CMS. The team also analyzed qualitative findings from interviews with network participants, to understand their perceptions about return on investment and to provide context to the financial data. To calculate the cost to CMS for supporting an incremental APRN student to graduate, the team combined the impact analysis results for graduations (described in the *Evaluation of the GNE Demonstration Project Volume I* report with the cost analyses included here.

Evaluation Timeline

This 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 (AY) 2006-2007 through 2009-2010 to approximate the legislatively established baseline period of calendar years January 2006–December 2010.[42] This report provides findings for the initial four years of the demonstration period. A final evaluation report for the complete six-year demonstration period will be available in the fall of 2019.

Organization of the Report

This report summarizes the cost findings of the GNE demonstration to date. Chapter 2 discusses the data sources and methodology underlying the cost analyses. Chapter 3 presents the findings related to the research questions, at both the demonstration project level and the network level. Chapter 4 presents the findings related to the cost for supporting an incremental APRN student to graduate, again at the demonstration project and network levels. Chapter 6 discusses the answers to each research question, indicates the strengths and limitations of the study, and presents the conclusions of the evaluation. Appendix A provides network-specific cost findings, and Appendix B reproduces selected cost exhibits from prior demonstration years.

[42] The AACN data used for the evaluation were available by academic year, not calendar year. As such, the legislatively mandated baseline period January 2006 –December 2010 was defined as academic years 2006-2007 through 2009-2010 for the evaluation. Academic years 2005-2006 and 2010-2011 were not considered part of the baseline period because calendar years 2005 and 2011 were not included in the legislatively defined baseline.

Chapter 2: Evaluation Methodology

This chapter discusses the data sources, methodology, and quality assurance procedures used to evaluate the costs and factors influencing the total cost of the GNE demonstration project across networks, and the cost to CMS for supporting an incremental APRN student to graduate. The evaluation team used a mixed-methods approach, which included both quantitative and qualitative data and methods.

DATA SOURCES

This section describes the primary and secondary data sources the team used to examine the costs for implementing the demonstration project, the factors influencing those costs, and the costs to CMS for supporting an incremental student to graduate. Exhibit 2.1 presents a summary of the data sources, which are discussed in more detail in the following sections.

Exhibit 2-1. Summary of Primary and Secondary Data Sources Used in the Cost Analyses

Data Source	Short Description	Content Relevant for the Evaluation	Use of Analysis Data
GNE Audit Summary Reports	Auditor validated (1) yearly allowable costs incurred by the GNE networks and (2) counts of incremental APRN students per year	DY 2012–2014 costs	Demonstration project implementation costs ▪ Descriptive costs Factors influencing GNE SON costs ▪ Linear regression trend analysis Cost to CMS analyses ▪ Numerator
		DY 2012–2014 APRN increments	Demonstration project implementation costs ▪ Descriptive costs Factors influencing GNE SON costs ▪ Linear regression trend analysis covariate Cost to CMS analyses ▪ Denominator
	Network-submitted annual	DY 2015 costs	Demonstration project implementation costs

Data Source	Short Description	Content Relevant for the Evaluation	Use of Analysis Data
Network Budget Reports	reports to CMS with projected costs and counts of incremental APRN students		▪ Descriptive costs Factors influencing GNE SON costs ▪ Linear regression trend analysis Cost to CMS analyses ▪ Numerator
		DY 2015 APRN increments	Demonstration project implementation costs ▪ Descriptive costs Factors influencing GNE SON costs ▪ Linear regression trend analysis covariate Cost to CMS analyses ▪ Denominator
American Association of Colleges of Nursing (AACN)	Administers the annual *Survey of Baccalaureate and Graduate Nursing Programs* to all accredited member SONs operating in the United States.	Reports the number of didactic and clinical faculty in the SON, whether the SON was affiliated with a health center, whether the SON was affiliated with a hospital; enrollment and graduation counts	Factors influencing GNE SON costs ▪ Linear regression trend analysis covariates Cost to CMS analyses ▪ Estimates for graduations and enrollments due to the GNE demonstration (from the Annual Demonstration Network Reports)
Integrated Post-secondary Education Data System (IPEDS)	Survey data collected annually by the National Institute of Education Sciences	Information on whether the SON is part of a public institution and whether the location is a city, suburb, town, or rural area	Factors influencing GNE SON costs ▪ Linear regression trend analysis covariates
US News & World Report	Survey data collected for "Best Nursing Schools of 2011"	School ranking	Factors influencing GNE SON costs ▪ Linear regression trend analysis covariate

Secondary Data Describing Implementation Costs

The cost analysis for implementing the GNE demonstration project was based on two main sources of cost data—the Network Budget Reports and the GNE Audit Summary Reports. To

provide additional context for interpreting the cost results, these sources were supplemented by three additional sources, which were used to create covariates for the regression analyses and by qualitative data from interviews with demonstration project participants from each network.

Actual Costs Incurred

The evaluation team used the annual GNE Audit Summary Reports produced by the independent auditor to extract yearly allowable costs incurred by the GNE networks and to count the number of incremental APRN students per year. The purpose of the Audit Summary Report is (1) to certify that the number of incremental APRN students reported by the networks was accurate; (2) to certify that the monthly interim payments based on projected costs reported by the demonstration networks were accurate and allowable; (3) to verify that at least 50 percent of students' clinical training occurred in a non-hospital-based community care setting; and (4) to reconcile annual payments. A one-year time lag occurs for each annual audit. The audits for DY 2014 (AY 2014/2015) were completed by September 9, 2016.[43]

In the Audit Summary Reports:

- All data were available at the network level.
- Some data were available at the GNE SON level, including contractual payments to GNE SONs, contractual payments to CCSs, and simulation costs.[44]
- Data not available at the GNE SON level include preceptor payments, office supplies, and travel costs.

Projected Network Demonstration Project Implementation Costs

The evaluation team extracted data about projected demonstration project implementation costs and projected numbers of incremental APRN students from the Network Budget Reports submitted annually by each network to CMS. The analysis of implementation costs used the following data from the DY 2012–2015 Network Budget Reports:

- Direct costs: Labor-related costs such as salaries paid to staff in the lead hospital in charge of the demonstration project's administration and coordination.

[43] The SHC-O hospital has a different fiscal year end from the other four demonstration hospitals, which required portions of multiple, audited Medicare cost reports to be combined to align with the academic year. For the DY 2014 academic year, for example, portions of two cost reporting periods were accumulated and audited: five months (August–December 2014) of the 12/31/2014 cost report and seven months (January–July 2015) of the 12/31/2015 cost report.

[44] The team was able to allocate these costs in collaboration with the GNE auditor. This provided more information than was available from the Budget Network Reports, which only reported contractual payments to SONs at the SON level.

- Other direct costs: Travel, office supplies, distance learning, preceptors, simulation, and other.
- SON costs: Costs incurred under the partnership agreements between the hospital awardee and the GNE SONs. These include costs associated with the simulation laboratory, payment for faculty who teach clinical courses for incremental APRN students, payment for SON employees who help coordinate the clinical placement of students, and indirect SON costs.
- CCS costs: Costs incurred under the partnership agreements between the hospital awardee and the CCSs, including the payments for precepting incremental APRN students.
- Indirect costs: Administrative and general, Medicare overhead, and other indirect costs.
- Projected incremental APRN students by GNE SONs.

APRN student increments are an accounting measure defined in the Audit Summary Report to determine payments to (or from) the network. This accounting measure is defined as the increase in completed credit hours per year earned by APRN students in the GNE SON programs during the demonstration period compared to the average number of completed credit hours per year earned by APRN students during the baseline period (i.e., AY 2006/2007–2009/2010). The APRN increment is an estimate of the number of incremental APRN graduates because it is based on the number of credit hours required for graduation. The number of baseline-year graduates is subtracted, so that the calculation is the number of incremental graduates relative to the baseline. CMS payments to each network were based on this number of incremental students.

The auditor reviewed the Network Budget Reports to ensure that non-allowable costs were not included. For this reason, these reports can be used only as a source of Medicare allowable costs. The GNE networks' non-allowable costs and the costs paid by third parties were not readily available. However, findings from the team's qualitative analysis indicate that some non-allowable costs were incurred by GNE networks and paid for with non-GNE funds (e.g., hiring of faculty to teach both non-GNE and GNE students in didactic settings, hiring a company to help manage and track incoming student compliance with the requirements for clinical education).

The cost report captures data only at the GNE network level, not at the SON and CCS levels. For this reason, not all costs could be allocated to specific SONs and CCSs. Allocated costs included contractual payments to the SONs. The team used this information, as available, to distribute the network-level payments to the SONs for the networks that have more than one SON. The information needed to break down other important costs—including simulation costs (costs incurred to teach students in a simulated practice environment) and payments the SONs

made to CCSs for students' precepted clinical education—was not available for all GNE networks. In such cases, the team imputed the cost with guidance from the CMS auditor, or distributed the actual cost using the proportion allocated in the projected amounts.

Secondary Data Used to Analyze Factors That Influenced GNE SONs' Costs

The team included three main covariates in the regression analyses of factors influencing SON costs: (1) the faculty and affiliation characteristics of the SONs; (2) the public institution and locational characteristics of the SONs; and (2) the quality of the APRN accredited programs.

Faculty and Affiliation Characteristics of the SONs

In the fall of each year, the American Association of Colleges of Nursing (AACN) administers an annual institutional survey to accredited SONs operating in the United States. The AACN data provided information on the number of faculty in the SON, whether the SON was affiliated with a health center, and whether the SON was affiliated with a hospital.

Public Institution and Locational Characteristics of the SONs

The Integrated Postsecondary Education Data System (IPEDS) contains detailed survey data collected by the National Institute of Education Sciences annually from every college, university, and technical and vocational institution that participates in federal student financial aid programs.[45] The evaluation team, in consultation with the team's nurse consultant, selected fields that were likely to be correlated with GNE participation and APRN student enrollment and graduations. The variables chosen were whether the SON is part of a public institution and whether the location is a city, suburb, town, or rural area. The team used the 2008 IPEDS survey responses to examine the relationship between SON-level characteristics and costs.

Quality of Accredited APRN Training Programs

In addition, the team used information from "Best Nursing Schools of 2011," published by *US News & World Report*, as a proxy for the quality of the program.[46] These rankings are based on the results of surveys sent to deans, other administrators, and faculty at accredited degree programs or schools in each discipline. Respondents rate the academic quality of the programs on a scale of 1 (marginal) to 5 (outstanding). Only fully accredited programs in good standing during the survey period are ranked. Information for 2011 was used because the data for 2008

[45] http://datainventory.ed.gov/Search?seriesID=189&searchTerm=Integrated Postsecondary Education Data System&searchType=Exact.

[46] Data retrieved on January 10, 2015.

were not publicly available. However, school rankings are mostly stable over short periods of time.[47] The evaluation team used these rankings to examine the relationship between cost and school ranking.

Primary Data Describing Network Participants' Perspectives on Implementation Costs and Return on Investment

The primary qualitative data for the study came from annual site visits, which consisted of participant interviews and focus groups, and annual check-in telephone calls. The evaluation team conducted eight rounds of qualitative data collection over the four-year period between DY 2012 and DY 2015. The team collected data from participants representing hospital and SON leaders who oversaw the demonstration, administrative staff and faculty involved in demonstration implementation activities, preceptors who provided clinical education to APRN students, and APRN students enrolled during the demonstration project.[48] Qualitative information on perceived returns on investment and other topics related to demonstration project costs was gathered to provide context to the cost analysis.

The interview guides developed by the evaluation team included the following questions and probes:

- What are the key investments your organization has made to support the demonstration project?
    - What are the main costs associated with your participation in the precepted clinical education program?
    - What costs will not be recouped via demonstration payments?
    - Where did the funding for these investments come from?
- To what extent do you think the investments you have made to support the demonstration project have paid off?
    - Has it been worth it?
    - What, if at all, do you see as the business case for expanding the number of APRN clinical placement opportunities?

[47] Tancredi, D. J, Bertakis, K. D., & Jerant, A. (2013). Short-term stability and spread of the U.S. News & World Report primary care medical school rankings. *Academic Medicine, 88*(8), 1107-15.

[48] See the Final Annual Demonstration Networks Report for a detailed description of the participants, the qualitative data collection methodology, and the findings of the qualitative analysis.

Secondary Data Used to Calculate the Number of Incremental Students

The evaluation used descriptive estimates of incremental students and an estimate based on the impact of the demonstration project on APRN student growth. The Audit Summary Reports provided the descriptive number of incremental students educated by each network.

The estimate of incremental students based on the impact of the demonstration project used annual survey data from AACN. Each year, AACN reports fall semester enrollment data together with graduation data for the previous academic year. For example, AACN's 2014 survey reports fall semester 2014 enrollment data and graduation data for the period August 1, 2013 through July 31, 2014.[49] The survey collects information on applications, enrollment, and graduation rates for all nursing specialties and program types, including the master's and DNP APRN programs.

The evaluation team used the AACN data for the years 2008 through 2015 to estimate the number of incremental students who graduated as a result of the demonstration project. The study outcomes were defined as total APRN student graduations at the GNE and non-GNE comparison SON level based on the master's, post-master's, and DNP programs in any of the following specialties: NP, CRNA, CNS, or CNM. The following variables were used:

- Total APRN enrollment and graduations at the master's, post-master's, and DNP levels
- Enrollment in CRNA, CNM, NP, and CNS programs by full-time/part-time status at the master's level
- Graduations in CRNA, CNM, NP, and CNS programs at the master's level
- Enrollment in CRNA, CNM, NP, and CNS programs by full-time/part-time status at the DNP level
- Graduations in CRNA, CNM, NP, and CNS programs at the DNP level
- Enrollment in NP and CNS programs by full-time/part-time status at the post-master's level
- Graduations in NP and CNS programs at the post-master's level.

The crucial advantage of the AACN data is that similar data were available for both the GNE SONs and the non-GNE SONs. This enabled the evaluation team to use total APRN

[49] AACN. *2013-2014 Enrollment and Graduations in Baccalaureate and Graduate Program in Nursing*. Retrieved September 26, 2014, from: http://www.aacn.nche.edu/research-data/standard-data-reports

graduations to isolate the demonstration project's effects on APRN student graduation from the effects of non-GNE factors.[50]

ANALYSIS METHODS

The evaluation team conducted two different types of quantitative analysis: descriptive analysis and trend analysis in a regression framework. We also used qualitative methods, including analyses of interviews and focus groups with network participants. The descriptive analyses examined the total cost of implementing the GNE demonstration project and the cost by network, how payments received were disbursed, whether payments were allocated according to the budgeted plans, and the cost to CMS for supporting an incremental APRN student to graduate. The trend analyses in the regression framework examined the cost of an incremental APRN student and the factors that might explain differences in SON costs over time. The qualitative data provided context to the quantitative research questions and insight into the GNE project's return on investment as perceived by GNE network participants.

Analysis of Demonstration Project Implementation Costs

Demonstration Project Implementation Cost and Cost Trends

The descriptive analyses of implementation costs used summary statistics, including means, counts, proportions, and ranges. These analyses provide a general overview of the costs of the GNE project, including tabular and graphical presentations. We also used descriptive statistics to compare audited against projected cost outcomes. This comparison allowed us to determine whether the networks performed above, below, or at the projected level.

Network Participants' Views About Demonstration Project Implementation Costs

The evaluation team followed the analysis framework developed by Miles and Huberman[51] to analyze the qualitative data from in-depth interviews and focus group discussions. This framework consists of three elements: data reduction, data display, and conclusion-drawing and verification. As a first step, we used a combination of deductive and inductive coding. The highest-level codes were used as the starting point for coding (a deductive approach); additional codes, subcodes, and code categories were created based on the interviews, focus groups, and telephone calls (an inductive approach). We then transcribed the interview and focus group

[50] Further details related to the data developed from the AACN surveys may be found in *Evaluation of the GNE Demonstration Project, Volume I*.

[51] Miles, M. B., & Huberman, A. M. (1994). Introduction. In *Qualitative Data Analysis* (2nd ed.) Thousand Oaks, CA: Sage Publications.

recordings and notes into text and entered them into NVivo version 10, a qualitative data analysis software used to apply codes and identify key themes.

We reviewed each interview transcript and assigned specific codes to sections of text of interest or related to associated subcodes. Then, for each network, we synthesized any new themes that were related to the evaluation research questions. Data across all networks were then analyzed together, using a cross-case process that enabled us to identify emergent themes and draw conclusions about overall demonstration impacts.

Evaluation team members reviewed all the interview transcripts, using the audio files as a reference. Any typographical errors, erroneous text, or omissions were corrected at this stage. The team then met as a group to brainstorm additions, changes, or exclusions to the coding framework developed from the first year of site visits.

Using a sample of site visit interview transcripts, team members examined instances where codes were not used or new codes were needed. The team met collaboratively to map new codes onto the coding scheme. The revised coding scheme was then tested on another sample of interviews, both to evaluate its applicability to additional data and to test inter-rater reliability.

In the inter-rater reliability testing, all coders applied codes to a subset of interviews (including interviews from sites they had not visited). Across these interviews, the agreement scores (Cohen's Kappa) averaged acceptable values of 0.7 to 0.8 across codes.[52] For the telephone calls (which had been coded independently by the team members who conducted the site visit), the team revisited the independent coding and found that the team-based approach produced good independent inter-rater reliability (an average Kappa value of 0.7 or better).

Analysis of Factors Influencing GNE SONs' Costs

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 and decrease bias. The analysis produced easily interpreted p-values for hypothesis testing to identify any upward or downward trend in total cost during the project period. The trend analysis was used to determine the factors associated with the cost of the demonstration project over time, since a before-and-after comparison could not be made. The dependent variable was the SON-level total cost; the main independent variables

[52] For open-ended interviews with complex coding schemes, a Kappa agreement score of 0.6 to 0.8 is considered "substantial" agreement. For further reading, see: Hruschka, D. J. et al. (2004). Reliability in coding open-ended data: lessons learned from HIV behavioral research. *Field Methods, 16*(3), 307-331.

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 was used to identify the network characteristics associated with changes in total costs. As discussed later in this report, the estimated DY effect (based on projected budget cost data) must be interpreted with caution because the demonstration's projected costs were generally higher than the audited costs incurred for DY 2012, DY 2013, and DY 2014.

We made the assumption that the network 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 Urban Wage Earners and Clerical Work Index compiled by the Bureau of Labor Statistics.[53,54]

The following covariates were included in the linear regression model:[55]

1) Indicators for each DY
2) Number of incremental APRN students, from the Audit Summary Reports for DY 2012–2014 and the Network Budget Report for DY 2015
3) Number of SON faculty during the baseline period, from the year 2008 AACN survey
4) Indicator for affiliation with a health center, from the year 2008 AACN survey
5) Indicator for affiliation with a hospital, from the year 2008 IPEDS data
6) Indicator for public university, from the year 2008 IPEDS data
7) Number of SONs in the network, from the Audit Summary Reports
8) SON ranking, from the 2011 "Best Nursing Schools," *US News and World Report*

Analysis of the Cost to CMS for Supporting an Incremental APRN Student to Graduate

We calculated the average cost for supporting an additional APRN student (APRN increment) to graduate by dividing the total demonstration project cost (numerator) by the number of additional students produced (denominator).[56] We calculated the numerator using budgeted and

[53] https://data.bls.gov/cgi-bin/surveymost?cw

[54] The local inflation adjustment is applied in the SON regression analyses. All other costs are reported as current dollars, except where noted in the per-student cost robustness analysis.

[55] The analysis used pooled-OLS regression with heteroskedastic-robust standard errors clustered at the SON level.

[56] Drummond, M. F., Sculpher, M. J., Torrance, G. W., O'Brien, B. J., & Stoddart, G. L. (2005). *Methods for the Economic Evaluation of Health Care Programmes* (3rd ed.). Oxford: Oxford University Press, p. 23.

actual costs, and calculated the denominator in three different ways using descriptive and impact estimates of the number of additional students supported by the demonstration project.

The numerator, or the total cost of the demonstration project, is the combined cost from each of the networks in each of the following cost categories: direct, other direct, indirect, CCS, and SON costs (see Chapter 2, above). These cost categories are based on audited cost data from the Audit Summary Reports for DY 2012, DY 2013, and DY 2014, but *projected* costs for DY 2015 from the Network Budget Report (the only source of cost data available for DY 2015 at the time of this analysis). We constructed projected cost measures using the same methodology described above for the audited costs, except that the cost data were drawn from the Network Budget Reports instead of the Audit Summary Reports. Note that negative costs represent accounting adjustments. We followed the cost classification categories used in the Audit Summary Report and supplementary files when available and used similar criteria when these files were not available.

The team used three different methods to estimate the number of additional APRN students who graduated:

1) The total number of additional APRN graduates during the demonstration project across all GNE SONs, using the GNE audit data.
2) The total number of additional APRN graduates during the demonstration project across all GNE SONs, using the AACN survey data.
3) The total number of additional APRN graduates during the demonstration project across all GNE SONs, relative to the number of additional graduates in non-GNE comparison SONs during the same time, using the AACN survey data.

The first two methods estimate an additional APRN student by taking the number of students who graduated from GNE SONs during the demonstration period that exceeds the number of students who graduated during the baseline period, but the two methods use different data sources. The first method uses the GNE audit data, and the method uses the AACN survey data. These two methods show graduations from GNE SONs over time, but do not account for factors beyond the demonstration effect that might have encouraged increases in graduations.

The third method estimates the number of additional APRN students who graduated during the demonstration period using the results of the regression analysis for the impact of the GNE project on graduation. This estimate can be specifically attributed to the GNE demonstration project. This method removes the increase in APRN student graduations occurring in GNE SONs that resulted from factors other than the demonstration project. The evaluation did not

address the demonstration project's cost per APRN increment relative to the counterfactual, because no comparable cost information for the comparison sites was available.

The team supplemented these results with qualitative findings on network participants' views about the return on investment of the GNE demonstration project, using the methods described earlier.

Chapter 3: What was the Cost for Implementing the GNE Demonstration Project, and What Factors Influenced GNE SON Costs?

This chapter discusses the costs associated with the implementation of the GNE demonstration project. The first section describes how the demonstration payments were used by the GNE networks, the allocation of these payments across cost categories, and the evolution of costs over time (including a comparison of audited to projected costs). 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 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 each network. The second section analyzes the factors associated with demonstration costs, using linear regression analysis to determine the network characteristics associated with changes in costs over the demonstration period. The last section presents the qualitative findings related to the investments made by the networks with the payments they received through the demonstration project.

Note that for the descriptive cost analysis, the costs are the dollar amounts reported by the network for the applicable DY. The regression analysis, described in this chapter, and the robustness checks of the cost to CMS of supporting an incremental student, described in Chapter 4, used local inflation estimates to adjust all dollar amounts to year 2011 dollars. This step was taken to ensure that any observed changes in cost over time were not solely due to inflation.

DESCRIPTIVE IMPLEMENTATION COST FINDINGS AND COST TRENDS

Demonstration-Level Results

The analyses included all costs to CMS incurred by the demonstration project. Incurred costs represent all allowable costs. Non-allowable costs incurred by the demonstration networks, as already discussed, are likely a small fraction of the overall cost of the demonstration project.

Exhibit 3-1 and Exhibit 3-2 provide cost information at the overall demonstration project level for DY 2012–2015. Exhibit 3-1 shows the cost data averaged across the five demonstration

networks, which gives a point of reference for the network-level analyses that follow. It is important to note that these figures represent projected and audited costs and auditor-based incremental APRN students relative to baseline for DY 2012–2014, but not for DY 2015. The DY 2015 figures are based on the 2015 Network Budget Report data, which are projections. The auditor-based incremental APRN student figures approximate the number of graduates.

Total cost rose substantially over the course of the demonstration, with the projected cost for DY 2015 ($41,823,500) representing a 26 percent increase from the audited total cost in DY 2014, a 52 percent increase from DY 2013, and a 134 percent increase from DY 2012. However, as emphasized throughout this report, since the projected costs for the demonstration project were typically higher than the audited costs throughout the project, the percentage increases in DY 2015 relative to previous years will likely be lower when the audited data are available.[57]

Cost per incremental APRN student, based on the audit report, showed more modest increases over the period, with DY 2015 costs per increment 8 percent, 14 percent, and 37 percent higher than those in DY 2014, DY 2013, and DY 2012, respectively. The much lower increase in auditor-based per incremental student cost compared to total cost is due to the higher number of incremental APRN students projected in DY 2015 compared to previous years.

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). For DY 2015, the demonstration networks projected $3,045,500 in direct costs, which represents 7.3 percent of the overall spending. Similar to total costs, direct costs show an increasing pattern over time, likely reflecting the additional personnel hours required to increase APRN enrollment.

Other direct costs include such items as consultants' expenses (including contracted services for arranging clinical training), equipment leases, office supplies, postage, travel, equipment, and software licenses. In DY 2015, the demonstration networks spent $1,280,400 on other direct costs, which represents 3.1 percent of overall spending. All cost categories displayed an increasing pattern over time.

GNE SON costs include all items related to the partnership agreements between the hospital awardee and the SONs in the network (e.g., simulation laboratory expenditures, payment for

[57] As is discussed below, calculations based on DY 2014 suggest that only 81 percent of projected costs were actually incurred.

faculty who taught clinical courses for incremental APRN students, payment for GNE SON employees who coordinated the clinical placement of students, and indirect SON costs). DUH and RUMC have only one SON; HUP, SHC-O, and MH each have several. In DY 2015, the demonstration networks spent $12,956,700 on GNE SON costs, which represents 31 percent of overall spending. Similar to total costs, GNE SON costs show an increasing pattern over time, likely reflecting the increasing number of auditor-based incremental APRN students as the scale of the demonstration project increased.

CCS costs cover the costs of partnership agreements with CCSs (including hospitals) that provided clinical opportunities for incremental APRN students. In DY 2015, the networks projected $19,577,700 for CCS costs, representing 46.8 percent of overall spending. Like total cost, CCS costs increased over the four-year demonstration period, which is directly linked to the increased number of incremental APRN students for the period DY 2012–2015.

Indirect costs include administrative and general costs associated with implementation of the demonstration project. In DY 2015, the demonstration project 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, likely reflecting the higher administrative and general costs needed to implement the demonstration project as the number of incremental APRN students increased.

The average cost per network for DY 2015 was $8,364,700. The average cost per auditor-based incremental APRN student for the same year was $31,400. These numbers were used for reference in comparing each network's cost per incremental student.

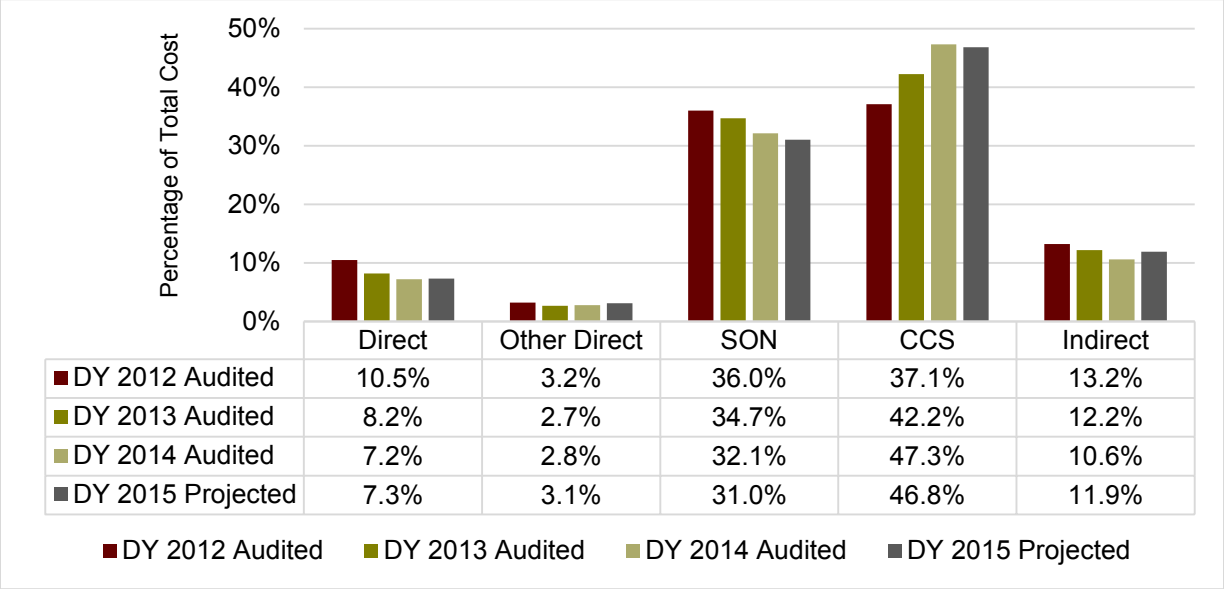
Exhibit 3-1. Total and per Auditor-Based Incremental APRN Student Demonstration Costs, by Cost Category and Demonstration Year

Cost Category	DY 2012		DY 2013		DY 2014		DY 2015			
	All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Audit)		All GNE (Source: Budget)		Per-Network Average (Source: Budget)	
	Total Cost	Cost per Increment	Total Cost	Cost per Increment	Total Cost	Cost per Increment	Total Cost	Cost per Increment	Total Cost	Cost per Increment
Direct	$1,876,700	$2,400	$2,253,100	$2,300	$2,385,500	$2,100	$3,045,500	$2,300	$609,100	$2,300
Other Direct	$570,500	$700	$749,400	$700	$915,100	$800	$1,280,400	$1,000	$256,100	$1,000
SON	$6,431,100	$8,200	$9,569,700	$9,600	$10,658,800	$9,300	$12,956,700	$9,700	$2,591,300	$9,700
CCS	$6,632,400	$8,500	$11,650,700	$11,700	$15,702,200	$13,700	$19,577,700	$14,700	$3,915,500	$14,700
Indirect	$2,362,800	$3,000	$3,360,000	$3,400	$3,533,00	$3,100	$4,963,200	$3,700	$992,600	$3,700
Total	**$17,873,500**	**$22,900**	**$27,582,900**	**$27,600**	**$33,194,600**	**$29,000**	**$41,823,500**	**$31,400**	**$8,364,700**	**$31,400**

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report (which presents projected figures). The figures were constructed based on the most updated documents at the time of the analyses. Because 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 may not fully coincide with the final audit and budget information.
SON = school of nursing, CCS = community-based care setting.

As Exhibit 3-2 shows, CCS and SON costs consistently explain the largest shares of total costs. CCS costs ranged from a minimum of 37.1 percent in DY 2012 to a maximum of 47.3 percent in DY 2014. SON costs ranged from a minimum of 31.0 percent in DY 2015 to a maximum of 36.0 percent in DY 2012. The percentage of total costs accounted for by direct costs decreased from 10.5 percent in DY 2012 to 7.2 percent in DY 2015. Other direct costs accounted for a stable share of total costs over time, while indirect costs decreased from 13.2 percent in DY 2012 to 10.6 percent in DY 2014 and were projected to increase by about 1.3 percentage points in DY 2015.

Exhibit 3-2. Cost Categories as a Percentage of Total Demonstration Cost, by Demonstration Year



	Direct	Other Direct	SON	CCS	Indirect
DY 2012 Audited	10.5%	3.2%	36.0%	37.1%	13.2%
DY 2013 Audited	8.2%	2.7%	34.7%	42.2%	12.2%
DY 2014 Audited	7.2%	2.8%	32.1%	47.3%	10.6%
DY 2015 Projected	7.3%	3.1%	31.0%	46.8%	11.9%

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report (which presents projected figures). The figures were constructed based on the most updated documents at the time of the analyses. Because 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 may not fully coincide with the final audit and budget information.
SON = school of nursing, CCS = community-based care setting.

Findings from the Qualitative Analysis

The findings from the team's in-depth interviews suggest that the network participants considered the most important demonstration project investments to be support staff (e.g., full-time clinical placement coordinators), additional faculty, and infrastructure. Infrastructure usually took the form of information systems, either to collect and standardize the reporting data needed for the project or to improve the clinical placement system. Some respondents also stressed the

importance (and relevance as a proportion of total costs) of the leadership time required to plan and manage the project.

Audited costs were much lower than projected costs, as shown in Exhibit 3-3 for DY 2014. Due to the lag in the auditing process, DY 2014 is the most recent year for which audited cost data were available. Only 81 percent of total projected costs were incurred. Audited costs were also lower than projected costs for each cost category. A plausible explanation for the difference is that the demonstration project was implemented at a substantially reduced scale relative to budget projections, a conjecture that is further supported by the fact that the audited number of incremental APRN students was lower than the projected number and that the difference between audited and projected costs carried through to each cost category. The interview findings suggest that one reason for the shortfall was the persistent shortage of preceptors and clinical education sites. Participants also reported that they experienced challenges in finding additional CCS sites as defined in the terms and conditions of the demonstration project, and this may have further reduced demonstration project costs.

Exhibit 3-3. Projected vs. Audited Costs by Cost Category, DY 2014

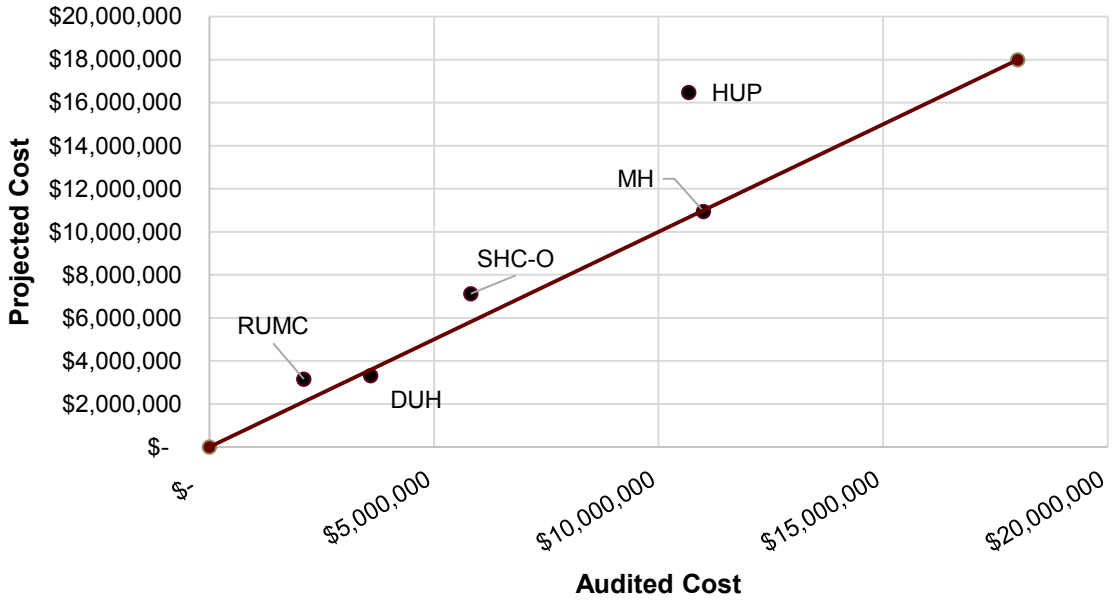
Cost Category	DY 2014			DY 2014		
	All GNE (Source: Budget)			All GNE (Source: Audit)		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$3,121,100	$2,300	7.6%	$2,385,500	$2,100	7.2%
Other Direct	$1,284,200	$900	3.1%	$915,100	$800	2.8%
SON	$13,187,900	$9,500	32.2%	$10,658,800	$9,300	32.1%
CCS	$17,813,900	$12,900	43.4%	$15,702,200	$13,700	47.3%
Indirect	$5,596,500	$4,000	13.6%	$3,533,000	$3,100	10.6%
Total	**$41,003,500**	**$29,600**	**100.0%**	**$33,194,600**	**$29,000**	**100.0%**

Notes: Cost and increment data come from the DY 2014 Network Budget Reports for the first three columns ("Projected Costs") and from the DY 2014 Audit Summary Report for the last three columns. DY 2014 data were used instead of DY 2015 data because DY 2015 audited data were not available.

Network-Level Results

Exhibit 3-4 provides an overview of the audited and projected costs in DY 2014 for each network. The 45-degree line, which depicts equality between the audited and projected amounts, shows that three of the five networks projected higher costs than they spent in that year, and none spent appreciably more than they projected. In DY 2013, the projected amounts exceeded the audited for all five networks and the network-specific findings for DY 2013 are similar to those for DY 2014 (see Appendix B-1, Exhibit B-6). The exhibit also highlights important differences across networks. HUP, which had the highest amounts, also had by far the largest divergence between the projected and audited costs. Also, the two networks (DUH and RUMC) with the lowest audited as well as projected amounts, were the networks with only one SON. The network-specific findings shown here for DY 2014 are similar to the DY 2013 patterns (see Exhibit B-6).

Exhibit 3-4. Networks' Projected vs. Audited Costs, DY 2014



Source: Projected costs extracted from the 2013 Network Budget Reports. Audited costs extracted from the 2014 Audit Summary Report.

The rest of this section discusses the projected and audited costs for each of the five demonstration networks. Exhibit 3-5 summarizes the actual payments to each network based on DY 2012 – 2014 audit reports and the DY 2015 budgeted payments based on the projected cost reported to CMS in the Network Budget Reports.

Exhibit 3-5. Total CMS Payments to GNE Networks by Demonstration Year

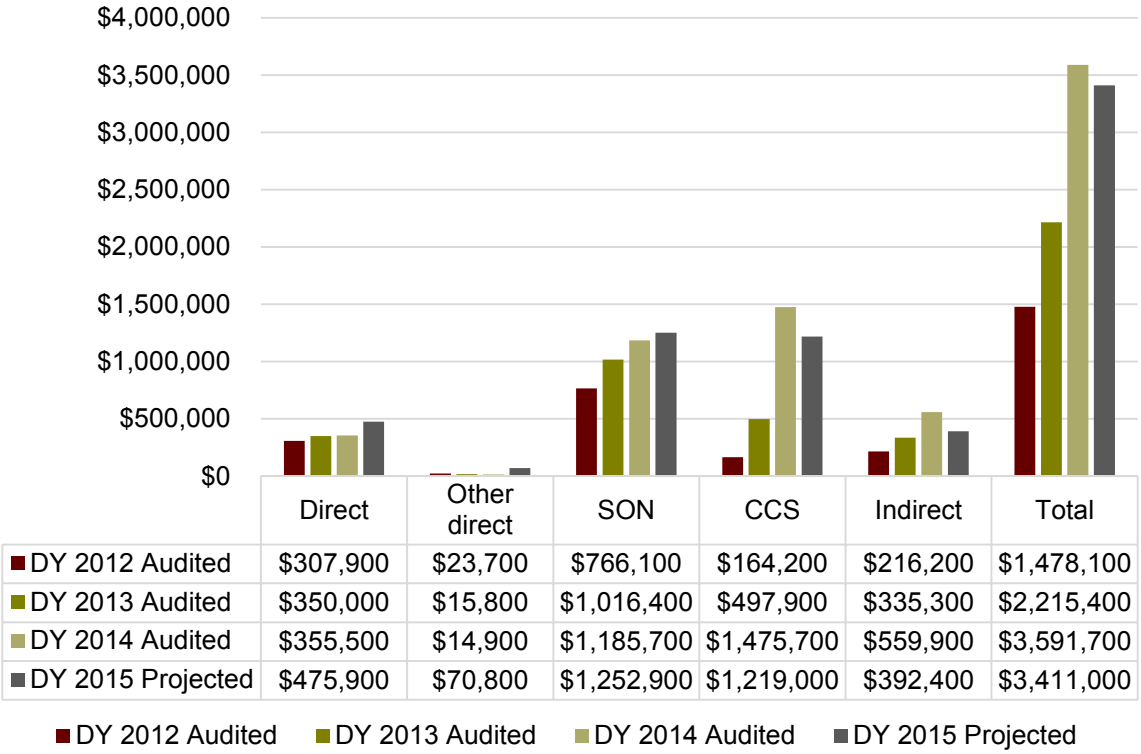
GNE Demonstration Network	Audited Cost			Budgeted Cost	Total Payment
	DY 1 (DY 2012)	DY 2 (DY 2013)	DY 3 (DY 2014)	DY 4 (DY 2015)	DY 1-DY 4 (DY 2012–2015)
Duke University Hospital	$1,478,100	$2,215,400	$3,591,700	$3,411,000	$10,696,200
Hospital of the University of Pennsylvania	$6,426,000	$9,749,400	$10,676,600	$16,090,600	$42,942,600
Memorial Hermann-Texas Medical Center	$4,928,600	$8,409,100	$11,001,600	$11,411,300	$35,750,600
Rush University Medical Center	$2,035,800	$2,356,400	$2,103,300	$2,747,900	$9,243,400
Scottsdale Healthcare Osborn Medical Center	$3,005,000	$4,852,600	$5,821,400	$8,162,700	$21,841,700
Total Payment	**$17,873,500**	**$27,582,900**	**$33,194,600**	**$41,823,500**	**$120,474,500**

The following discussion of each network begins with a description of the costs per category, followed by the percentage of costs per category, across the initial four-year demonstration project period, DY 2012–2015. Next, the cost per incremental APRN student across demonstration years is displayed. Finally, the projected and audited costs are compared for DY 2014. For the three networks with more than one SON (HUP, MH, and SHC-O), a chart is included that compares the audited and projected costs per SON for DY 2014. Appendix A presents, for each network, costs by cost category for DY 2012–2015. Appendix B compares the projected costs to the audited costs for each network for DY 2013.

Duke University Hospital

The DUH network's total demonstration project costs increased from DY 2012 through DY 2014, but decreased slightly from in DY 2015 (Exhibit 3-6). The total cost for DY 2015 ($3,411,000) was still more than twice that for DY 2012 ($1,478,100). The total cost increase from DY 2012 through DY 2014 is the result of both direct and SON costs. The other direct costs were very small and stable from DY 2012 through DY 2014, but increased in DY 2015, while the CCS and indirect costs increased over the first three demonstration years and then decreased.

Exhibit 3-6. DUH Costs by Cost Category and Demonstration Year

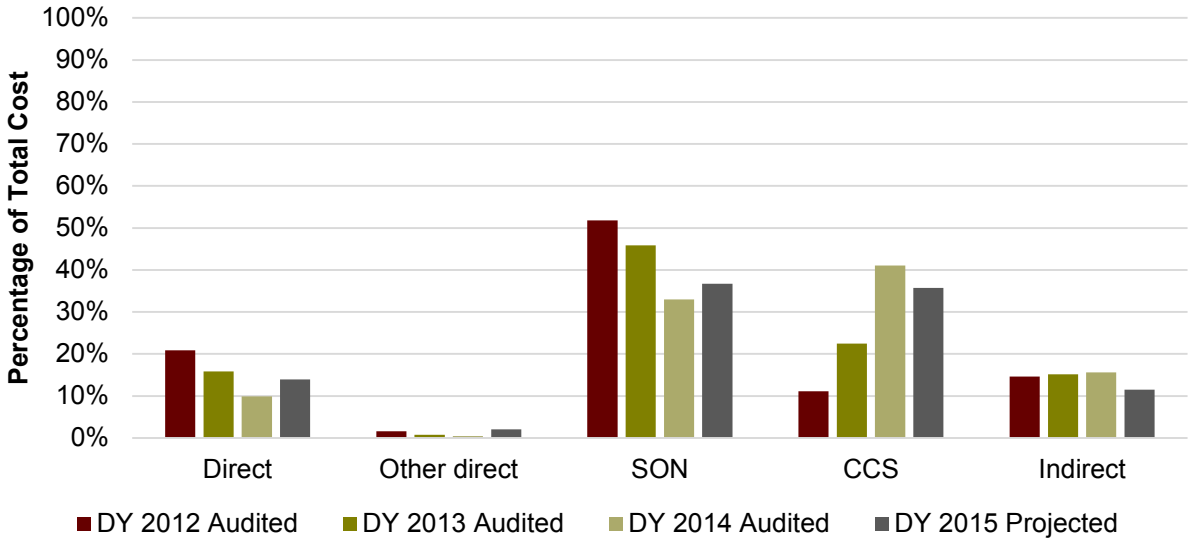


	Direct	Other direct	SON	CCS	Indirect	Total
DY 2012 Audited	$307,900	$23,700	$766,100	$164,200	$216,200	$1,478,100
DY 2013 Audited	$350,000	$15,800	$1,016,400	$497,900	$335,300	$2,215,400
DY 2014 Audited	$355,500	$14,900	$1,185,700	$1,475,700	$559,900	$3,591,700
DY 2015 Projected	$475,900	$70,800	$1,252,900	$1,219,000	$392,400	$3,411,000

Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

DUH's cost as a percentage of the total from DY 2012 through DY 2015 has a fairly consistent pattern— remaining the same or decreasing—for direct, other direct, SON, and indirect costs (Exhibit 3-7). The CCS cost, on the other hand, increased from DY 2012 to DY 2014, but decreased slightly in DY 2015. While the total cost of the DUH demonstration project increased over time, the CCS cost increased as a percentage of the total.

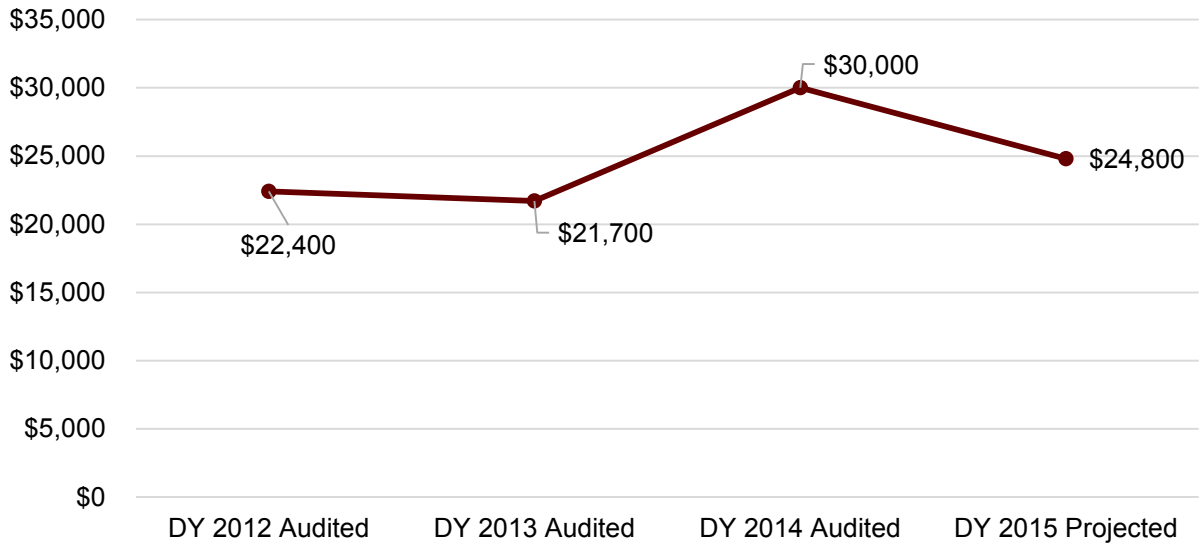
Exhibit 3-7. DUH Cost Percentage by Cost Category and Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Unlike total cost, cost per auditor-based incremental APRN student shows a moderate increase over time, 11 percent from DY 2012 to DY 2015 (from $22,400 to $24,800). Exhibit 3-8 shows, though, that cost per incremental student in the intermediate years ranged both lower and higher than the cost in DY 2012 and DY 2015. Comparing these figures with the average figures across networks (last column of Exhibit 3-1) shows that the DUH network is much smaller than average (with cost used as a proxy for size), $24,800 vs. $31,400 for the overall network average in DY 2015 budgeted numbers.

Exhibit 3-8. DUH Cost per Auditor-Based Incremental APRN Student Relative to Baseline, by Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Exhibit 3-9, which compares the audited and projected costs in DY 2014, shows that the total audited costs were 108.5 percent higher than the projected costs ($3,591,700 vs. $3,309,900). This is in contrast to earlier years. Most of the difference stems from increases in CCS and indirect costs, which are directly associated with the number of auditor-based incremental APRN students. The higher costs in DY 2014 overall, and the fact that the audited cost per incremental student ($30,000) was actually higher than the projected cost ($26,000), suggest that the network spent more than anticipated even though it had a lower number of incremental students than projected, the reverse of the case in DY 2013 (see Appendix B, Exhibit B-2).

Exhibit 3-9. DUH Projected vs. Audited Costs by Cost Category, DY 2014

Cost Category	Data from DY 2014 Budget		Data from DY 2014 Audit		Cost Difference	Audit (% of Budget)
	Cost	% of Total	Cost	% of Total	(Audit –Budget)	
Direct	$462,000	14.00%	$355,500	9.90%	-$106,500	76.9%
Other direct	$70,800	2.10%	$14,900	0.41%	-$55,900	21.0%
SON	$1,263,800	38.20%	$1,185,700	33.01%	-$78,100	93.8%
CCS	$1,132,500	34.20%	$1,475,700	41.09%	$343,200	130.3%
Indirect	$380,800	11.50%	$559,900	15.59%	$179,100	147.0%
Total	**$3,309,900**	**100.00%**	**$3,591,700**	**100.00%**	**$281,800**	**108.5%**

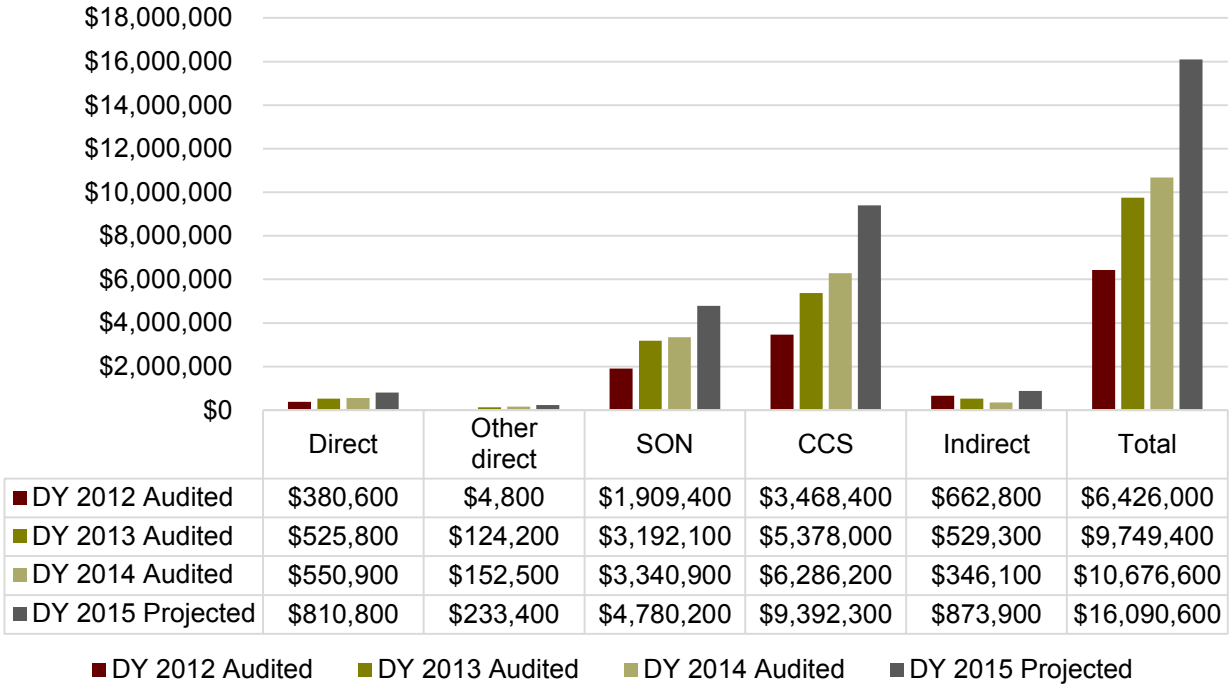
Notes: Cost data come from the DY 2014 Network Budget Report (which reports projected costs) for the first two columns and from the DY 2014 Audit Summary Report for the third and fourth columns. DY 2014 data were used instead of DY 2015 data because DY 2015 audit data were unavailable for the analyses.

The qualitative findings suggest that the deviation between actual and budgeted costs may have been due to structural changes in the program. DUH network respondents shared that the master's APRN program was shifting all didactic work to a distance-based curriculum. As reported by respondents, the DUH demonstration oversight team planned the recruitment of new sites to allow the precepting of distance education students and offered GNE incentives whenever possible to the new out-of-state clinical training sites. However, if the new sites did not participate in the DUH demonstration project (e.g., they might not qualify), DUH would not be able to use GNE precepting payments for those incremental APRN students. This may help to explain why the network spent less than originally projected in DY 2012 and DY 2013.

Hospital of the University of Pennsylvania

As shown in Exhibit 3-10, the HUP network's total demonstration costs increased over time, with a total cost for DY 2015 ($16,090,600) nearly two and a half times as that for DY 2012 ($6,426,000).

Exhibit 3-10. HUP Costs by Cost Category and Demonstration Year

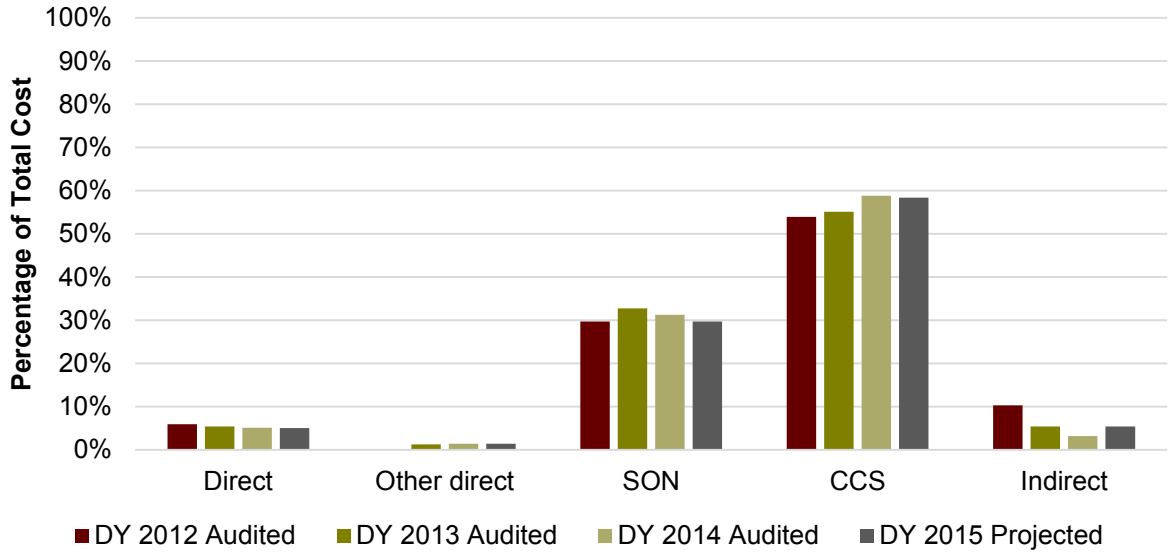


	Direct	Other direct	SON	CCS	Indirect	Total
DY 2012 Audited	$380,600	$4,800	$1,909,400	$3,468,400	$662,800	$6,426,000
DY 2013 Audited	$525,800	$124,200	$3,192,100	$5,378,000	$529,300	$9,749,400
DY 2014 Audited	$550,900	$152,500	$3,340,900	$6,286,200	$346,100	$10,676,600
DY 2015 Projected	$810,800	$233,400	$4,780,200	$9,392,300	$873,900	$16,090,600

Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and its supplementary files. DY 2015 costs come from DY 2015 Network Budget Reports. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

There was very little variation across years in the distribution of cost across cost categories (Exhibit 3-11), with the two major categories (SON and CCS costs) accounting for 83.7 percent to 90.2 percent of the total costs.

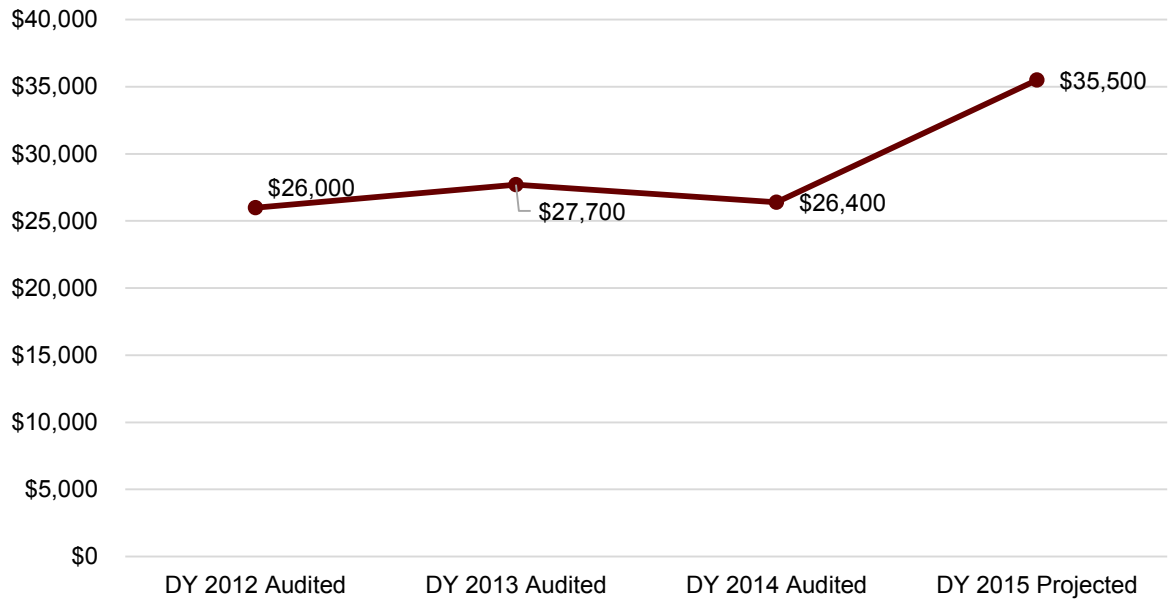
Exhibit 3-11. HUP Cost Percentage by Cost Category and Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Cost per incremental APRN student (Exhibit 3-12) shows a total increase of 37 percent, from $26,000 in DY 2012 to $35,500 in DY 2015. Note that the DY 2015 numbers are based on the projected costs and incremental APRN students, which have not been audited. The audited costs have historically been lower than the projected costs.

Exhibit 3-12. HUP Cost per Auditor-Based Incremental APRN Student Relative to Baseline, by Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

A comparison of total cost in DY 2015 to the average costs across networks (the last column of Exhibit 3-1) shows that HUP is much larger than the average network (with cost used as a proxy for size), which reflects the fact that the HUP network has nine SONs. However, HUP had a higher cost per incremental APRN student than that of the average network ($35,500 versus $31,400) as measured by the projected numbers for DY 2015.

Exhibit 3-13 shows that audited total costs ($10,676,600) represented only 64.8 percent of the projected costs ($16,477,300), a difference that is reflected in all cost categories. This pattern of higher projected than audited costs was also observed in DY 2013 (Exhibit B-3). In addition, HUP spent less than projected in DY 2014 (with an audited cost per APRN incremental student of $26,400 vs. a projected cost of $31,900).

Exhibit 3-13. HUP Projected vs. Audited Costs, by Cost Category, DY 2014

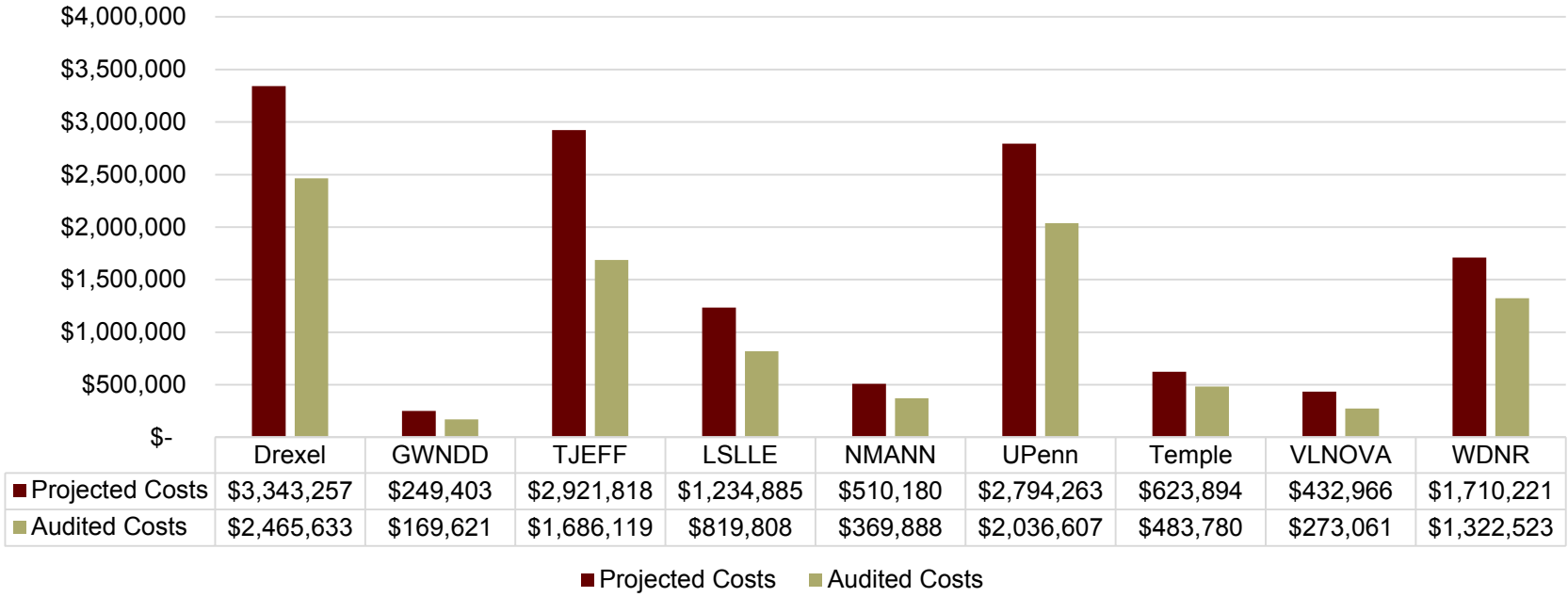
Cost Category	Data from DY 2014 Budget		Data from DY 2014 Audit		Cost Difference	Audit
	Cost	% of Total	Cost	% of Total	(Audit-Budget)	(% of Budget)
Direct	$719,400	4.40%	$550,900	5.2%	-$168,500	76.6%
Other Direct	$237,500	1.40%	$152,500	1.4%	-$85,000	64.2%
SON	$4,742,400	28.80%	$3,340,900	31.3%	-$1,401,500	70.4%
CCS	$9,078,500	55.10%	$6,286,200	58.9%	-$2,792,300	69.2%
Indirect	$1,699,600	10.30%	$346,100	3.2%	-$1,353,500	20.4%
Total	**$16,477,400**	**100.00%**	**$10,676,600**	**100.0%**	**-$5,800,800**	**64.8%**

Notes: Cost data come from the DY 2014 Network Budget Report (which reports projected cost) for the first two columns and from the DY 2014 Audit Summary Report for the third and fourth columns. DY 2014 data were used instead of DY 2015 data because DY 2015 audited data) were unavailable for the analyses.

Because HUP is a relatively large network, several factors may help explain the difference between the audited and projected costs. Findings from the qualitative analysis suggest that, for at least one SON with a large discrepancy between audited and projected costs, a high proportion of students admitted to the SON lived outside the SON's geographic area. Since the SON did not provide clinical placements for APRN students outside its area, GNE funds could not be used to pay for the clinical education hours for those students.

Finally, Exhibit 3-14 presents the audited and projected costs for each SON in the network: Drexel University (Drexel), Gwynedd Mercy University (GWNDD), Thomas Jefferson University (TJEFF), La Salle University (LSLLE), Neumann University (NMNN), University of Pennsylvania (UPenn), Temple University (Temple), Villanova University (VLNOVA), and Widener University (WDNR). The audited cost across SONs ranged from $170,000 (GWNDD) to $2,465,000 (Drexel). Projected costs were higher than audited costs for all SONs. The sum of the SONs' audited costs ($9,627,572) was lower than the network's total cost ($10,676,600) because some costs were associated not with specific SONs, but with the network as a whole. The residual was even greater for projected costs ($2,656,420) because information on a larger proportion of projected costs was not available at the SON level.

Exhibit 3-14. HUP Projected vs. Audited Costs by SON, DY 2014



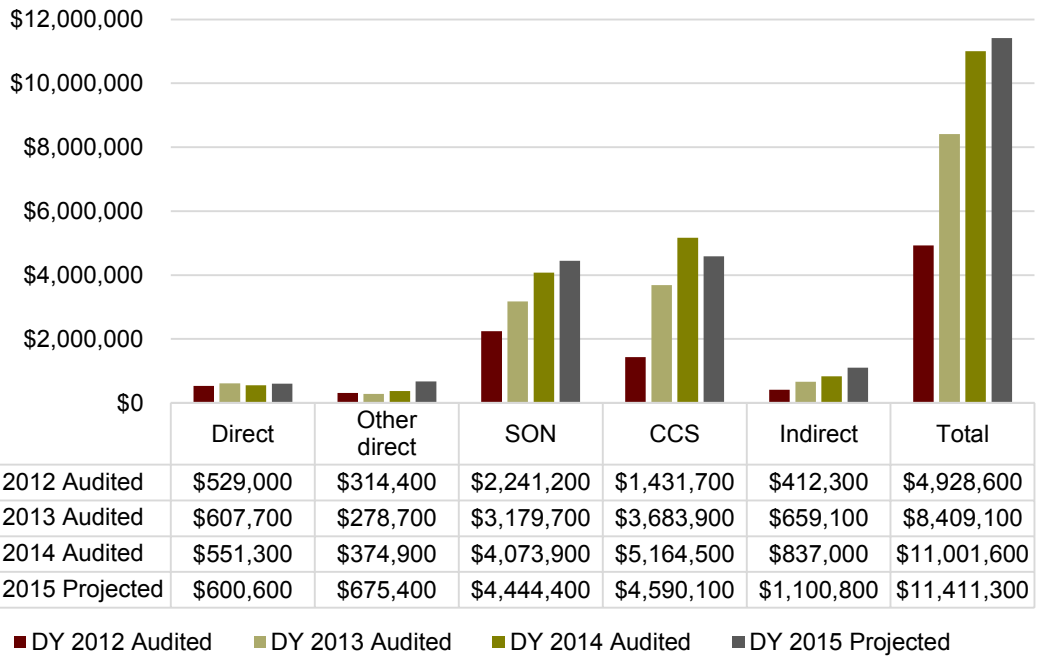
	Drexel	GWNDD	TJEFF	LSLLE	NMANN	UPenn	Temple	VLNOVA	WDNR
Projected Costs	$3,343,257	$249,403	$2,921,818	$1,234,885	$510,180	$2,794,263	$623,894	$432,966	$1,710,221
Audited Costs	$2,465,633	$169,621	$1,686,119	$819,808	$369,888	$2,036,607	$483,780	$273,061	$1,322,523

Source: Budgeted costs extracted from the DY 2014 Network Budget Report. Audited costs extracted from the DY 2014 Audit Summary Report and its supplementary files.

Memorial Hermann-Texas Medical Center

Exhibit 3-15 shows that the MH network's total demonstration project costs increased over time. The total cost for DY 2015 ($11,411,300) was 132 percent higher than the cost for DY 2012 ($4,928,600). The increase is mirrored for most years in all cost categories except direct and other direct costs, which had both increases and decreases across demonstration years. The exhibit shows a substantial increase in indirect costs (from $412,300 to $1,100,800) between DY 2012 and DY 2015, in addition to the expected increase in SON and CCS costs due to increases in the number of incremental APRN students. The SON costs increased in the first three years by 98 percent (from $2,441,200 to $4,444,400). The CCS costs increased by 221 percent (from $1,413,700 to $4,590,100). The indirect costs increased by 167 percent.

Exhibit 3-15. MH Costs by Cost Category and Demonstration Year

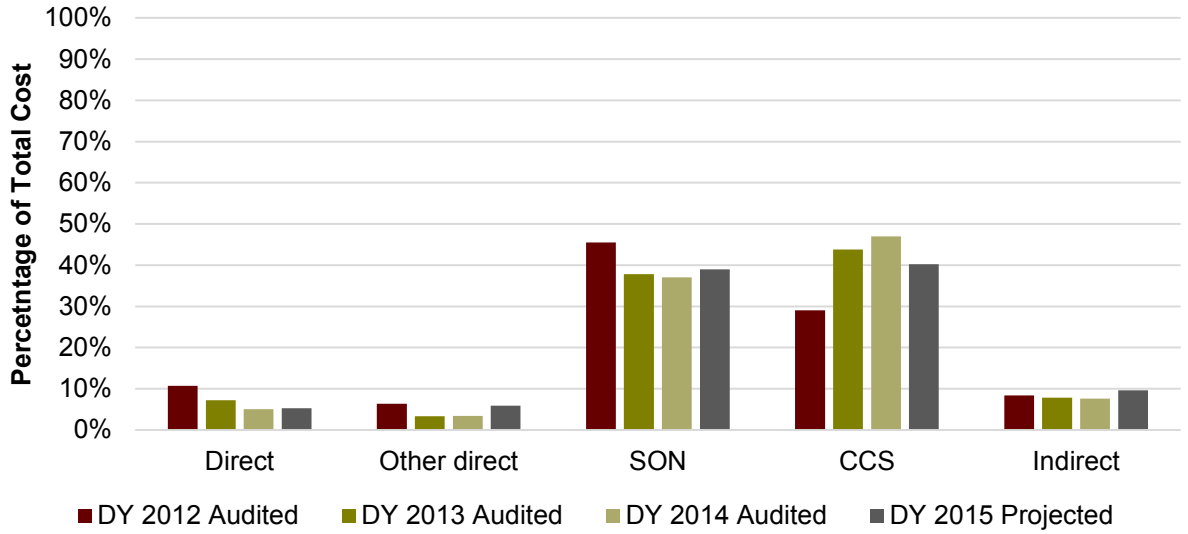


	Direct	Other direct	SON	CCS	Indirect	Total
DY 2012 Audited	$529,000	$314,400	$2,241,200	$1,431,700	$412,300	$4,928,600
DY 2013 Audited	$607,700	$278,700	$3,179,700	$3,683,900	$659,100	$8,409,100
DY 2014 Audited	$551,300	$374,900	$4,073,900	$5,164,500	$837,000	$11,001,600
DY 2015 Projected	$600,600	$675,400	$4,444,400	$4,590,100	$1,100,800	$11,411,300

Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

The percentages of total cost by demonstration year and cost category were fairly similar across the four-year period (Exhibit 3-16), but the CCS cost proportion increased more dramatically than other cost categories.

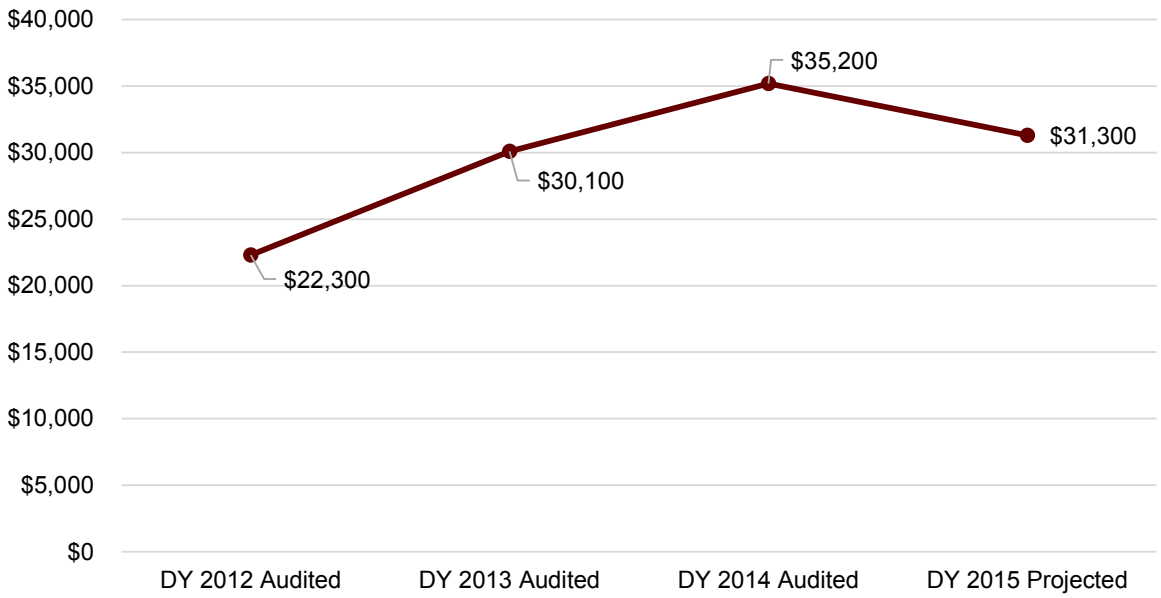
Exhibit 3-16. MH Cost Percentage by Cost Category and Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Costs per auditor-based incremental APRN student increased by 40 percent during the period DY 2012–2015 (from $22,300 to $31,300) (Exhibit 3-17). It is important to note, however, that although the cost per incremental student increased considerably from DY 2012 to DY 2014, it decreased slightly in DY 2015. If this downward trend continues, the network may reach a cost per incremental student similar to that observed in the first year of the demonstration project. Comparing these figures with the averages across networks (last column of Exhibit 3-1) shows that MH is larger (using total cost as a proxy for size). MH is also revealed to be about average in its cost per auditor-based incremental APRN student ($31,300), only $100 less than the average network cost ($31,400).

Exhibit 3-17. MH Cost per Auditor-Based Incremental APRN Student Relative to Baseline by Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Exhibit 3-18 shows that, in DY 2014, audited total costs were very similar to projected costs ($11,001,600 vs. $10,942,700). MH's projected costs were lower than its audited costs. Furthermore, its projected cost per incremental APRN student was lower than the audited cost ($27,200 vs. $35,200). By comparison, in DY 2013, MH's projected and audited costs per APRN increment were very similar to each other (Exhibit B-4) and to the average cost per increment across all networks.

Exhibit 3-18. MH Projected vs. Audited Costs by Cost Category, DY 2014

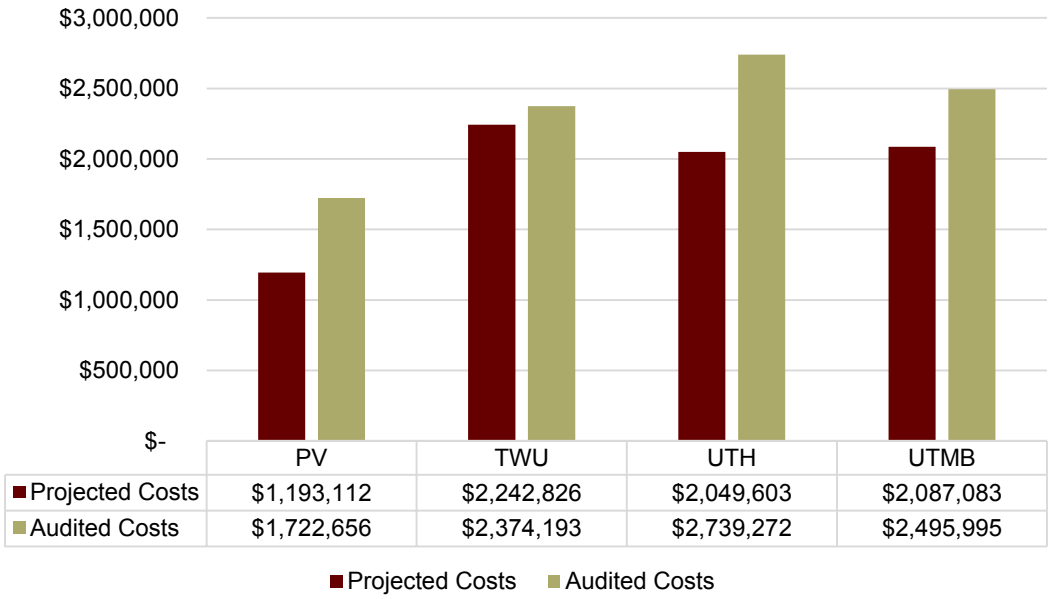
Cost Category	Data from DY 2014 Budget		Data from DY 2014 Audit		Cost Difference	Audit (% of Budget)
	Cost	% of Total	Cost	% of Total	(Audit-Budget)	
Direct	$813,100	7.43%	$551,300	5.01%	-$261,800	67.8%
Other Direct	$587,900	5.37%	$374,900	3.41%	-$213,000	63.8%
SON	$4,634,200	42.35%	$4,073,900	37.03%	-$560,300	87.9%
CCS	$3,851,900	35.20%	$5,164,500	46.94%	$1,312,600	134.1%
Indirect	$1,055,600	9.65%	$837,000	7.61%	-$218,600	79.3%
Total	**$10,942,700**	**100.00%**	**$11,001,600**	**100.00%**	**$58,900**	**100.5%**

Notes: Cost data come from the DY 2014 Network Budget Report (which report projected cost) for the first two columns and from the DY 2014 Audit Summary Report for the third and fourth columns. DY 2014 data were used instead of DY 2015 data because DY 2015 audited data were unavailable for the analyses.

Finally, Exhibit 3-19 presents the audited and projected costs for each of the four SONs in the MH network: Prairie View (PV), Texas Woman's University (TWU), University of Texas Health Science Center (UTH), and University of Texas Medical Branch (UTMB). The audited cost ranged from $1,723,000 to $2,739,000 across SONs.

All the SONs had higher audited costs than projected costs in DY 2014. Total SON audited costs summed across categories ($9,332,000) were lower than the total network cost ($11,001,600) (see Exhibit 3-12, above). The residual amount ($1,669,400) is explained by costs associated not with specific SONs, but with the network as a whole. The residual amount was higher for projected costs ($3,760,800) because information on some costs was not available at the SON level.

Exhibit 3-19. MH Projected vs. Audited Costs by SON, DY 2014



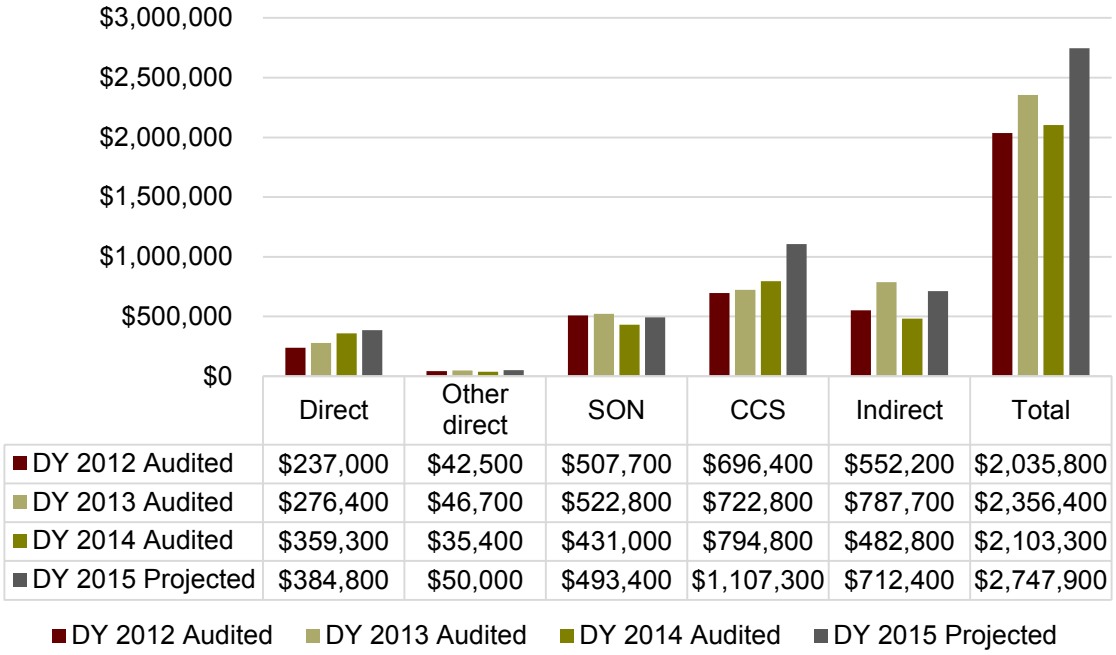
	PV	TWU	UTH	UTMB
Projected Costs	$1,193,112	$2,242,826	$2,049,603	$2,087,083
Audited Costs	$1,722,656	$2,374,193	$2,739,272	$2,495,995

Source: Projected costs extracted from the Network Budget Report for DY 2014. Audited costs extracted from the DY 2014 Audit Summary Report and its supplementary files.

Rush University Medical Center

The RUMC network's total demonstration project costs increased over time, with the exception of DY 2014 (Exhibit 3-20). The total cost for DY 2015 ($2,747,900) was 35 percent higher than the cost for DY 2012 ($2,035,800). Direct and CCS costs were the only cost categories that consistently increased across all demonstration years. To enhance comparability with other networks, the original definition of cost categories was slightly modified so that the direct cost category includes salaries for the GNE project director, GNE project manager, GNE clinical placement coordinator, and administrative staff, and the SON category includes payments to clinical faculty and SON support personnel.

Exhibit 3-20. RUMC Costs by Cost Category and Demonstration Year

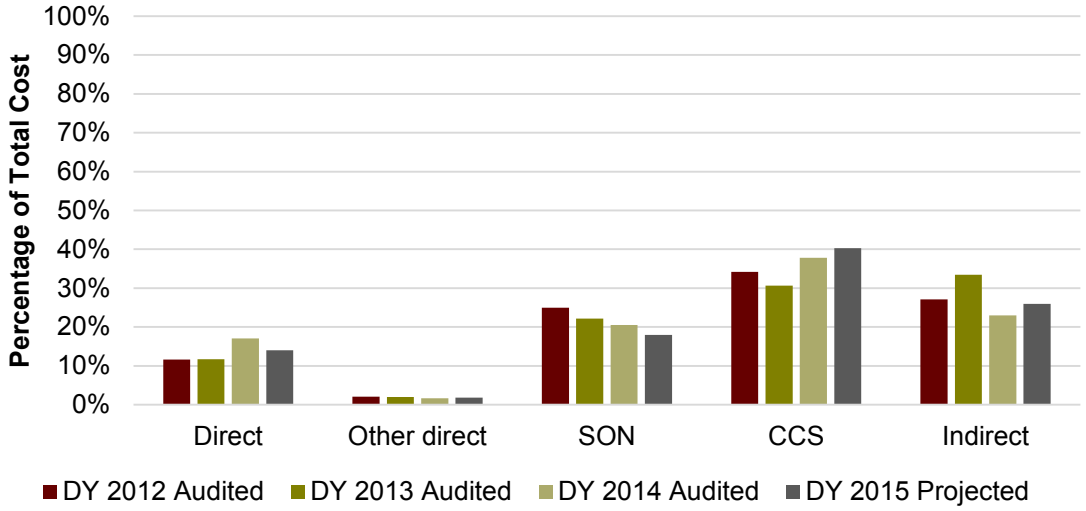


	Direct	Other direct	SON	CCS	Indirect	Total
DY 2012 Audited	$237,000	$42,500	$507,700	$696,400	$552,200	$2,035,800
DY 2013 Audited	$276,400	$46,700	$522,800	$722,800	$787,700	$2,356,400
DY 2014 Audited	$359,300	$35,400	$431,000	$794,800	$482,800	$2,103,300
DY 2015 Projected	$384,800	$50,000	$493,400	$1,107,300	$712,400	$2,747,900

Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

The percentage of total cost per cost category varied over the period DY 2012–2015 (Exhibit 3-21). Direct and CCS costs tended to increase as a percentage of total cost over the four years, while SON and other direct costs tended to decrease.

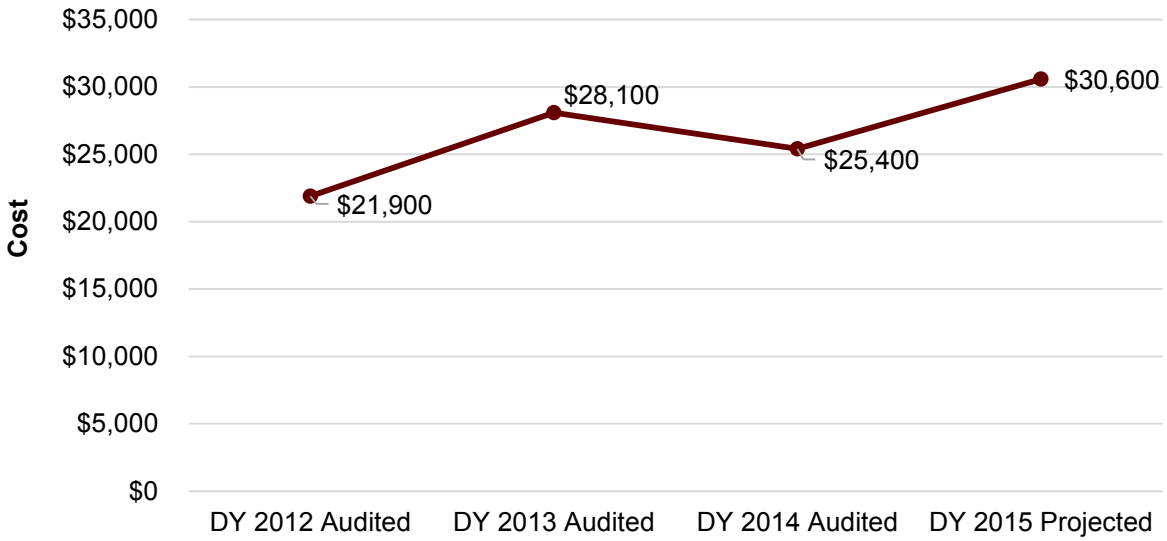
Exhibit 3-21. RUMC Cost Percentage by Cost Category and Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Costs per auditor-based incremental APRN student increased by 40 percent, from $21,900 in DY 2012 to $30,600 in DY 2015 (Exhibit 3-22). A comparison of RUMC with the averages across networks (last column of Exhibit 3-1) shows that RUMC is much smaller (with cost used as a proxy for size). Although smaller, it had a lower cost per incremental student compared to the overall network average ($30,600 vs. $31,400). Despite the increase in cost per incremental student over the four-year period, the network's DY 2015 projected costs per incremental student were still less than the network average.

Exhibit 3-22. RUMC Cost per Auditor-Based Incremental APRN Student Relative to Baseline by Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Exhibit 3-23 shows that audited total costs in DY 2014 were 33 percent lower than projected costs ($2,103,300 and $3,147,100, respectively). All audited cost categories were also lower than those projected in DY 2014. DY 2013 showed a similar pattern (Exhibit B-5). The network spent less per incremental APRN student than projected, with an audited cost per incremental student of $25,400 compared to the projected cost of $35,000.

Exhibit 3-23. RUMC Projected vs. Audited Costs by Cost Category, DY 2014

Cost Category	Data from DY 2014 Budget		Data from DY 2014 Audit		Cost Difference	Audit (% of Budget)
	Cost	% of Total	Cost	% of Total	(Audit-Budget)	
Direct	$373,600	11.9%	$359,300	17.1%	-$14,300	96.2%
Other Direct	$57,600	1.8%	$35,400	1.7%	-$22,200	61.5%
SON	$672,700	21.4%	$431,000	20.5%	-$241,700	64.1%
CCS	$1,227,300	39.0%	$794,800	37.8%	-$432,500	64.8%
Indirect	$815,900	25.9%	$482,800	23.0%	-$333,100	59.2%
Total	**$3,147,100**	**100.0%**	**$2,103,300**	**100.0%**	**-$1,043,800**	**66.8%**

Notes: Cost data come from the DY 2014 Network Budget Report for the first two columns and from the DY 2014 Audit Summary Report for the third and fourth columns. DY 2014 data were used instead of DY 2015 data because DY 2015 audited data were unavailable for the analyses.

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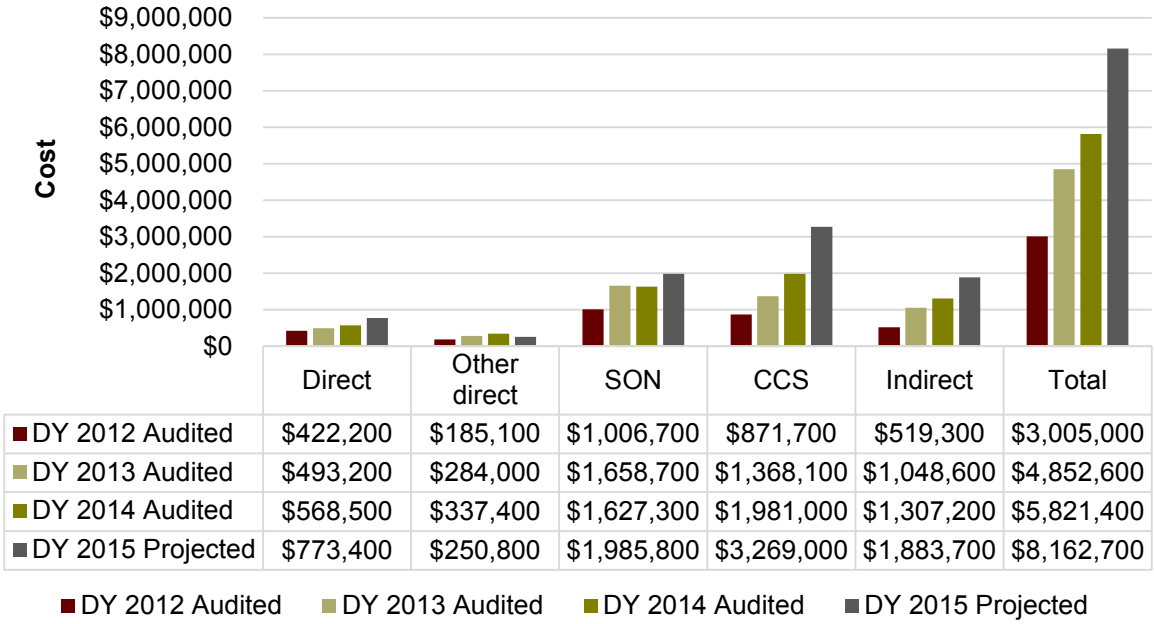
Exhibit 3-24 shows that the SHC-O network's total demonstration project costs increased over time. The total cost for DY 2015 ($8,162,700) was 172 percent higher than the cost for DY 2012 ($3,005,000), with moderate variation across years in the distribution of cost across cost categories. In particular, there are differences in the percentage of total cost explained by the SON and CCS costs (Exhibit 3-25). The SON and CCS categories accounted for 33.5 percent and 29 percent of the costs, respectively, in DY 2012; 28.2 percent and 34.2 percent in DY 2013; and 28.0 percent and 34.0 percent in DY 2014. Taken together, however, the costs explained by these two categories were very similar over time: 62.5 percent in DY 2012 and 64.4 percent in DY 2015. The proportion of costs represented by indirect costs increased from 17.3 percent in DY 2012 to 23.1 percent in DY 2015.

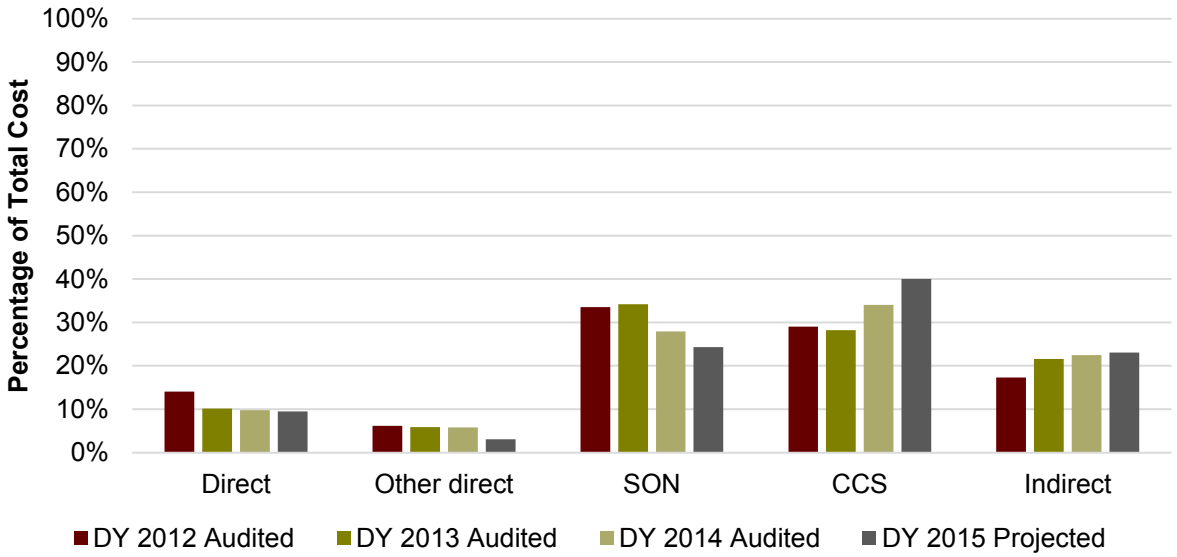
Exhibit 3-24. SHC-O Costs by Cost Category and Demonstration Year



	Direct	Other direct	SON	CCS	Indirect	Total
DY 2012 Audited	$422,200	$185,100	$1,006,700	$871,700	$519,300	$3,005,000
DY 2013 Audited	$493,200	$284,000	$1,658,700	$1,368,100	$1,048,600	$4,852,600
DY 2014 Audited	$568,500	$337,400	$1,627,300	$1,981,000	$1,307,200	$5,821,400
DY 2015 Projected	$773,400	$250,800	$1,985,800	$3,269,000	$1,883,700	$8,162,700

Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

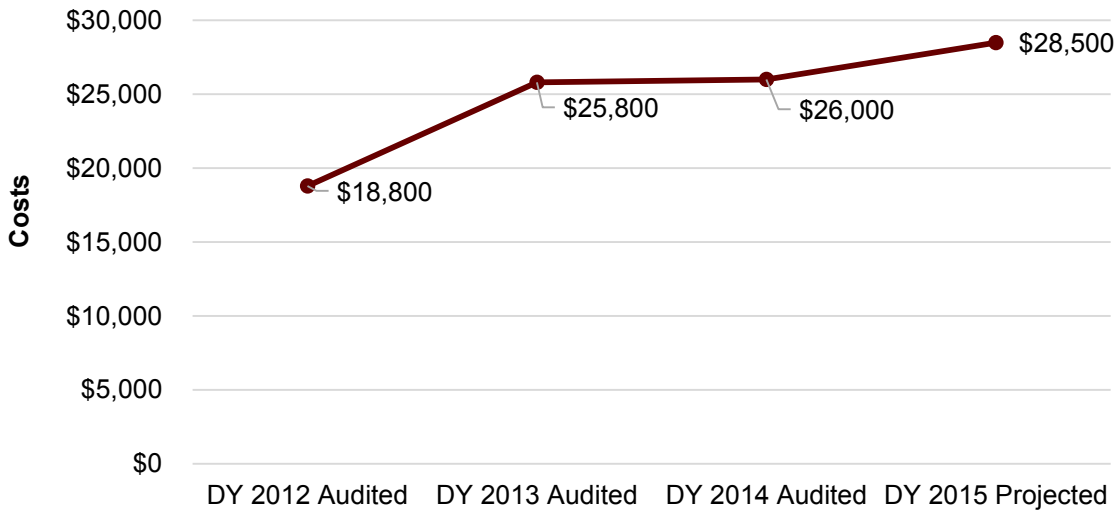
Exhibit 3-25. SHC-O Cost Percentage by Cost Category and Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 costs come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Cost per auditor-based incremental APRN student showed a substantial increase of 52 percent from $18,800 in DY 2012 to $28,500 in DY 2015 (Exhibit 3-26). A comparison with the average percentages across networks (last column of Exhibit 3-1) shows that this network is slightly smaller (with total cost used as a proxy for size). Notably, despite its small size, the network had a lower cost per increment than average ($28,500 vs. $31,400). The network's cost per incremental student, based on DY 2015 projections, was less than the overall network average, even though the network's cost per incremental student increased over time.

Exhibit 3-26. SHC-O Cost per Auditor-Based Incremental APRN Student Relative to Baseline by Demonstration Year



Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because the Audit Summary Reports and their supplementary files and the Network Budget Reports are updated on different timelines for the auditing process, the information reported does not reflect the final audit and budget information.

Exhibit 3-27 shows that audited total costs were 18 percent lower than projected costs ($5,821,400 and $7,126,500, respectively). Most of this difference is accounted for by CCS and indirect costs, which were projected at $2,523,700 and $1,644,600, respectively, but actually incurred at $1,981,000 and $1,307,200. SON and direct costs were also lower than projected. This pattern of lower audited costs compared to projected costs was also observed in DY 2013 (Exhibit B-6). The network had a lower audited cost per incremental APRN student than projected ($26,000 vs. $28,700).

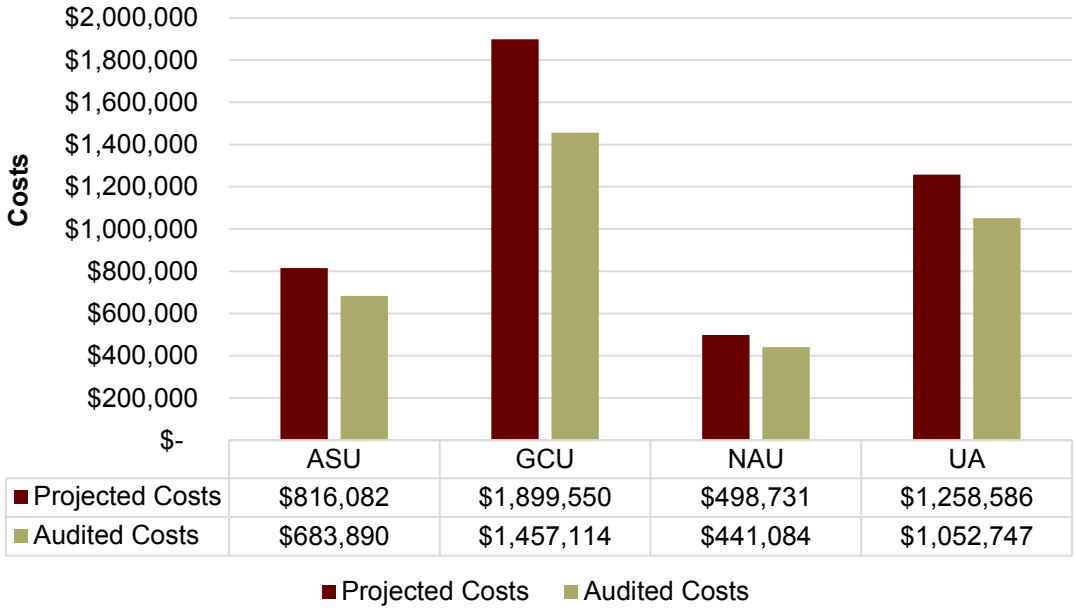
Exhibit 3-27. SHC-O Projected vs. Audited Costs, by Cost Category, DY 2014

Cost Category	Data from DY 2014 Budget		Data from DY 2014 Audit		Cost Difference	Audit (% of Budget)
	Cost	% of Total	Cost	% of Total	(Audit-Budget)	
Direct	$753,000	10.6%	$568,500	9.8%	-$184,500	75.5%
Other Direct	$330,400	4.6%	$337,400	5.8%	$7,000	102.1%
SON	$1,874,800	26.3%	$1,627,300	28.0%	-$247,500	86.8%
CCS	$2,523,700	35.4%	$1,981,000	34.0%	-$542,700	78.5%
Indirect	$1,644,600	23.1%	$1,307,200	22.5%	-$337,400	79.5%
Total	**$7,126,500**	**100.0%**	**$5,821,400**	**100.0%**	**-$1,305,100**	**81.7%**

Notes: Cost and increment data come from the DY 2014 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2014 Audit Summary Report for the last three columns ("Actual Costs"). DY 2014 data were used instead of DY 2015 data because DY 2015 audited data were unavailable.

Finally, Exhibit 3-28 presents the audited and projected costs for each SON in the SHC-O network: Arizona State University (ASU), Grand Canyon University (GCU), Northern Arizona University (NAU), and University of Arizona (UA). The audited cost per SON ranged from $441,084 (NAU) to $1,457,114 (GCU). For all SONs, projected costs were higher than audited costs. The sum of SON audited costs ($3,634,835) was lower than the total network cost, with the residual ($2,186,559) due to costs associated not with specific SONs but with the network as a whole. The residual was greater for projected costs ($2,653,519), because some costs were not available at the SON level. In DY 2013, the residual was also greater for projected costs.

Exhibit 3-28. SHC-O Projected vs. Audited Costs by SON, DY 2014



	ASU	GCU	NAU	UA
Projected Costs	$816,082	$1,899,550	$498,731	$1,258,586
Audited Costs	$683,890	$1,457,114	$441,084	$1,052,747

Source: Projected costs extracted from the Network Budget Report for DY 2014. Audited costs extracted from the DY 2014 Audit Summary Report and its supplementary files.

QUALITATIVE FINDINGS ON IMPLEMENTATION COSTS

This section discusses the qualitative findings related to the GNE demonstration project costs as reported in participant interviews and focus groups. These findings, which describe how the networks used demonstration payments and whether they found these investments to be successful, provide context for the overall assessment of the demonstration project's per-student cost.

Duke University Hospital

The DUH network used the demonstration payments to invest in support staff, faculty, and infrastructure for the project. As APRN enrollment increased, DUH hired new didactic faculty, but they had to be paid for with non-GNE funds. DUH also brought in additional academic and financial leadership to assist with the project, and some respondents expressed concern that demonstration project resources might be a little top-heavy. Like respondents in other networks, DUH respondents agreed that it took significant time and resources to set up the demonstration project. One respondent commented:

"We have these GNE executive meetings that have seven very expensive, high-rank people and this would cut down on administrative activities.… It doesn't make sense to me."

DUH also hired a lawyer in fall 2014, who was partially funded by the demonstration payments, to manage clinical affiliation agreements between the clinical placement sites and the contracting department at Duke University Hospital.

"The clinical placement people were trying to track this in the past, and some were easy, but others involved attorneys and it got more complicated. This gave us a devoted person, which sped up the whole process. I believe it has been a great success."

A major DUH infrastructure investment was a new electronic clinical placement system (CPS) to track clinical education placements. The CPS catalogs partnerships with placement sites and preceptors, captures clinical hour logs, and manages the contracts with placement sites. In addition, the system is used by faculty and staff to predict when placement opportunities are needed, facilitates the matching of students and sites, and allows the clinical placement office to better track and monitor placement data. An oversight team member explained:

"We always find ways to improve it [CPS], seeing an opportunity to add another function. It's starting to work for us, and we're seeing where it can be helpful."

The SON also used demonstration project funds to hire NP facilitators, who assisted with clinical site and preceptor recruitment and student matching by leveraging their personal and professional network. According to a DUH participant:

"The facilitators have contributed substantially to the increase of sites due to their ability to discuss peer-to-peer with other clinicians."

Hospital of the University of Pennsylvania

The HUP network used the demonstration payments to support staff, faculty, infrastructure, and innovative models to strengthen the demonstration project and APRN education. A number of the SON respondents mentioned hiring administrative staff and clinical faculty to support their increased APRN enrollment and subsequent clinical education requirements. The SONs also used demonstration payments to hire clinical placement coordinators and administrative staff to support additional clinical placements.

All the SONs in the HUP network agreed to use eValue, a computerized tracking system, to record students' clinical education. The initial objective was to have all the SONs use the system to match their APRN students to any clinical site, similar to the automatic match system used in medical education. However, the variations in clinical education requirements across the SONs made it difficult for the network to standardize the matching system to meet the requirements of each SON. Experiences with the eValue system varied widely across the SONs. Some respondents were very satisfied with the software, but at least one SON went back to the system it had used earlier. Some SONs used different programs for functions that either did not exist in eValue or were too cumbersome to use.

HUP project staff and some SON respondents mentioned using the demonstration payments to test new models of APRN education and for other educational initiatives. For example, the UPenn SON developed a four-week immersion and interprofessional education program for acute care NP students seeking to expand into other specialties. HUP also offered a monthly online preceptor development series, to give preceptors the tools they needed to be more effective.

HUP respondents all shared the sentiment that the initial set-up of the demonstration project took more time than expected, although the level of effort decreased as the project continued and processes improved. Two respondents stated that much of this effort went into determining and setting up the precepting payment model, as well as communicating this and other operational information to the SONs and clinical sites. In HUP's precepting payment model, increments were calculated by semester and, as a result, the number of incremental APRN students fluctuated from one semester to another. Respondents also found it difficult to expand CCS clinical education sites because many of the CCSs in the area were affiliated with a hospital and therefore ineligible for the demonstration project. As a result, the efforts expended usually returned only a handful of placements each semester because the unaffiliated CCSs were generally small practices in suburban or rural areas that could accept only one or two students per semester.

Memorial Hermann-Texas Medical Center

The MH network made key investments in expanding existing staff roles and hiring new personnel to support the demonstration project. MH hired additional clinical faculty to support APRN students in their clinical education. The network also expanded the roles of existing administrative staff and established new staff positions (such as project directors at PV and UTMB) to support the operations of the demonstration project.

To ensure that clinical placement coordination was uniform and fully supported, the MH network used demonstration payments to hire four clinical placement coordinators, one at each SON. As APRN enrollment grew at UTMB, the SON added a second clinical placement coordinator. MH respondents thought that the strong relationships and collaboration among the SON clinical coordinators was one of the keys to success in their network. Several MH respondents explained:

> *"Prior to GNE, [clinical placements] were a mess. Having a clinical placement coordinator is going to be very key to making the master's level successful because it's a lot of time, energy, and processing of paperwork."*

> *"The clinical placement coordinator has become invaluable at the graduate level."*

> *"[Clinical placement coordinators] improve the quality of education and preceptor experience."*

During initial project implementation, the MH network established a partnership with Gateway to Care (GTC), a nonprofit organization. Together with MH network staff, GTC supported efforts to develop, expand, and facilitate community-based clinical training opportunities. In addition, GTC assisted in student and preceptor data collection activities and was responsible for housing and managing student and preceptor information for future analysis. One SON administrator commented:

> *"MH and Gateway to Care have continued to recruit placements for our students. I think we have more sites than we have had in the past."*

The SONs also used non-GNE funds to support the demonstration project. For example, TWU hired a company that set up an online portal to help manage and track incoming student compliance with clinical education requirements such as vaccinations and tuberculosis testing. UTH hired a director for recruitment and student experience to support its growing APRN student body.

As in the other GNE networks, MH respondents stated that the requirements of setting up the demonstration project in its early phases required "extensive time and resources," often beyond what was anticipated. As one SON administrator stated:

> *"Meetings and time and effort have exceeded what we received. We've made a contribution to cover the expenses not covered by GNE."*

However, SON administrators reported that the time and resource needs of the demonstration project had lessened in DY 2014. As one SON administrator noted, “At the start, it took a lot of manpower to get the project up and running.”

Rush University Medical Center

During initial program implementation, key RUMC GNE program staff and College of Nursing (CON) administrators met two or three times a month to discuss the allocation of the demonstration payments. RUMC divided payments into five “buckets”:

- CON staff salaries
- CON faculty salaries
- GNE program staff salaries
- Simulation training materials
- Innovative model development

Similar to the experience of other demonstration networks, RUMC respondents found the project start-up time challenging due to the complexity of the structure needed to effectively operate the demonstration project. For example, RUMC network respondents reported that they had to decide how to compensate sites for the time preceptors spent mentoring students. They also created an internal database to track student clinical education information. RUMC’s database is modeled on the Graduate Medical Education database used at RUMC to track medical student hours.

A key investment made early on by the network was the hiring of a full-time clinical placement coordinator. Prior to the demonstration project, the clinical placement process was overseen by Rush CON faculty; when the project got underway, those activities were performed by the clinical placement coordinator. The coordinator’s role included acting as the liaison between the clinical education sites and students, initiating contracts, and reaching out to potential sites. One respondent reported:

> *“Everyone was skeptical because she was not a nurse, but she has been fantastic. Everything is completely systematic for her, and it’s worked out really well.”*

The clinical placement coordinator was also instrumental in developing a centralized clinical site information database, which can be accessed by RUMC project staff and CON faculty. The database contains student and clinical site information (such as general contact information, types of clinical training provided, and the experience of students who have been precepted at the site). RUMC staff found the database system to be very helpful as they matched and placed students at clinical education sites. As another respondent commented:

"The GNE has helped create this database that is going to be super useful. That has definitely paid off."

Project investments included expanding and diversifying clinical education sites by strategically selecting innovative sites. Like HUP, RUMC allocated precepting payments to the GNE clinical sites. RUMC based the designation of a GNE site on the site's innovative models and unique characteristics, such as CCSs that specifically served underserved populations. A Rush APRN student precepted at a GNE clinical site was designated as a GNE student for the trimester. The total number of credit hours completed by designated GNE students determined the amount of the precepting payment for each GNE site.

Similar to respondents from other networks, some RUMC respondents suggested that there should be more structure and guidelines for how the clinical sites use precepting payments. They stated that this would ensure that the preceptors are "seeing some of the benefit" and that the funds are not just "padding the budget" of the site. One RUMC respondent stated:

"Eventually it [GNE] has to be comparable to Graduate Medical Education, where every single student has money attached to them for facilitating clinical education."

RUMC also created a Start-Up Preceptor Program at clinical education sites that in the past were unable or unwilling to take APRN students. These sites varied in type, but were generally volunteer charity clinics that served low-income patients. The start-up preceptor sites and RUMC network staff worked together to place a RUMC preceptor (an APRN) at the site to practice and precept RUMC CON students. The preceptor's salary was paid by the demonstration project for one year, after which the clinical site had to decide whether to continue the position. Almost all the start-up preceptor sites were able to secure outside funding to keep their preceptor for a second year. One clinical site, however, was unable to secure funding in time. To maintain the site, the RUMC network chose to support the start-up preceptor for another year.

RUMC also made investments using non-GNE funding sources to support additional positions to assist with the large influx of students during the demonstration project. These positions included a new administrative staff member to support APRN programs, the expansion of financial and tracking roles within the dean's office, several additional didactic faculty, and more staffing in the admissions office.

As the RUMC network prepares for the end of the demonstration project, project staff and faculty have undertaken a variety of activities to sustain the clinical education sites. These activities include face-to-face meetings with key participants from clinical sites to establish

stronger relationships, and implementation of a preceptor survey of both those whose sites received precepting payments and those whose sites did not. The survey was designed to gauge preceptor engagement and asked for suggestions to maintain preceptor relationships. The results showed that the preceptors were interested in non-monetary incentives, such as opportunities to work with faculty members on papers, earn continuing education credits, and receive CON-hosted training/informational sessions on new medical practices in their areas of interest. The SON is actively exploring ways to meet these requests in order to maintain current preceptor levels.

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Initial key financial investments were made by the SHC-O network to support preliminary demonstration project operations. These included expanding the roles of existing SHC-O personnel and hiring new SHC-O program staff. A significant portion of staff time was allocated to standardizing the data collection process among the four SONs in the network. The investments included a standardized data collection platform for student clinical hours using Typhon, and the creation of standardized forms and processes. Initial data collection was a challenge due to lack of infrastructure and different data collection systems across the SONs. To ensure standardization across the SHC-O network, ASU used demonstration payments to purchase the Typhon system. In the fall of 2015, NAU changed from Typhon to EXXAT software, which allowed the SON staff, students, and clinical sites to manage information related to clinical placements in a centralized cloud-based system. Even though the SONs used different data collection software, the network developed a uniform data collection process.

Like respondents from other networks, the SHC-O oversight team and SON administrators reported that the limited project start-up time negatively impacted their ability to implement the demonstration within the required timeline. One respondent explained, “We stepped off running rather than doing solid ground work.”

To help support initial project implementation, one SHC-O participant suggested “having a month or two of additional funding to start up the program and get the important things in place so you can hit the ground running.”

In the SONs, demonstration payments were used to expand the role of existing staff or to hire new staff to assist with clinical placements, daily program operations, and APRN education. For example, UofA and ASU hired clinical placement coordinators to oversee the placement process. This allowed the SONs to “increase the number of new clinical sites and follow up with current clinical sites.” ASU also hired a research assistant to input GNE data and submit reports

to the SHC-O network, as well as a DNP recruiter to assist with student recruitment and enrollment.

GCU expanded its clinical site development team from one to three individuals to manage and maintain relationships with the clinical education sites. GCU also centralized its site recruitment and student placement processes because of increased APRN enrollment. As a result, GCU students no longer had to find their own clinical placements, which, according to one student, took anywhere from two to four weeks. NAU hired a family nurse practitioner coordinator in January 2015 to assist with data collection, input, and reporting. In addition, NAU added a part-time faculty clinical evaluator to meet the needs of the increased number of students.

The SONs also used demonstration payments to invest in faculty and preceptor training. For example, GCU used the payments to host a continuing education pharmacology event for APRNs and students in clinical rotations. UofA developed a Preceptor Toolkit, which included a video and pamphlet outlining best practices for precepting APRN students. A second video and pamphlet detailed the reasons why a graduating UofA APRN student should consider becoming a preceptor. According to SON administrators, "We have received compliments so far on the NP Preceptor Toolkit." ASU sent faculty to a conference, which staff found "incredibly helpful" because it allowed them to make connections with social workers and physicians in the area.

SHC-O has also invested in two innovative clinical training models each year. The costs were built into the network's projected cost. One was the development of a virtual clinical evaluation system at UofA for clinical education sites in hard-to-reach rural locations. The system allows UofA faculty and staff to evaluate students remotely during their preceptorships, using an iPad. According to one UofA SON administrator:

> *"Virtual evaluations allow us to literally call a student up and say 'at 2 p.m. today we will do an evaluation on you' without doing all of the arranging beforehand."*

The network also introduced an innovative interprofessional training model through a partnership with Adelante Healthcare, which currently trains APRN students from GCU and ASU.

A significant portion of the demonstration payments was invested in the clinical education sites that precept GNE-designated students. Similar to HUP, SHC-O strategically designated GNE students rather than clinical sites. As a result, neither the APRN students nor the SON faculty were aware of who was a GNE student. Because of this, the majority of clinical education site recruiters did not use GNE precepting payments as an incentive when recruiting new clinical

education sites, although, as SHC-O participants explained, the clinical education site may in fact receive precepting payments for training APRN students. SON administrators commented:

> *"[I] never used funds as a recruitment tool, so they (preceptors and sites) don't feel they are getting [cheated] in any way."*

> *"We couldn't talk about the money [when recruiting clinical placement sites]."*

It should be noted that the precepting payments were not paid directly to the preceptors. In fact, none of the preceptor respondents reported being aware of the payments allocated for APRN student clinical education.

FACTORS INFLUENCING GNE SON COSTS

The evaluation team conducted a SON-level regression analysis to better understand the factors associated with total GNE SON costs. The explanatory variables included demonstration year indicators, SON characteristics from the AACN survey and other secondary sources, and the number of incremental APRN students. Because audited cost data and the number of incremental students for DY 2015 were unavailable, we used data from the Network Budget Report for that year. For DY 2012–2014, the source for these three variables was the GNE Audit Summary Reports. We relied on a panel with four years of observations (DY 2012–2015) for each of the 19 GNE SONs.

Exhibit 3-29 summarizes the main regression results, which identify the factors associated with SON total cost deflated to year 2011 dollars. The cost has been deflated to account for local inflation using the Urban Wage Earners and Clerical Work Index from the Bureau of Labor Statistics. The variables in this regression came from a variety of sources. The 2008 AACN data provided the number of faculty, affiliation with a health center, and affiliation with a hospital. The 2008 IPEDS data furnished the public status and city indicators. The SON rankings came from *US News & World Report* (2011). The number of incremental APRN students was taken from the Audit Summary Report. Total SON costs for DY 2012, DY 2013, and DY 2014 were derived from the Audit Summary Reports, except for DY 2015, where the Network Budget Reports were used (because the audited data have a one-year lag). Network costs not associated with specific SONs were distributed uniformly across SONs (e.g., for the MH network, all costs not associated with specific SONs were divided equally and added to the four SONs in the network). Despite the small sample size of 76 observations (4 years x 19 GNE SONs), many of the covariates were statistically significant, which suggests that there was an association between these variables and the average GNE SON total cost.

Exhibit 3-29. GNE SON Cost to CMS, Linear Regression Results

Variables in the Model	Coefficient (β) in $	Standard Error	95% Confidence Interval
Indicator for DY 2012 [Reference]	--	--	--
Indicator for DY 2013	363,300***	77.5	(211.4, 515.2)
Indicator for DY 2014	562,200***	124.8	(317.6, 806.8)
Indicator for DY 2015	905,400***	90.7	(727.6, 1083.2)
Number of Incremental APRN Students Relative to Baseline	9,400***	1.9	(5.7, 13.1)
Number of Didactic/Clinical Faculty	9,700**	3.1	(3.6, 15.8)
City	-200,500	205.7	(-603.7, 202.7)
Affiliated Health Center (2008)	-60,700	154.8	(-364.1, 242.7)
Affiliated Hospital (2008)	-582,000***	113.5	(-804.5, -359.5)
Public Status (2008)	142,400	102.8	(-59.1, 343.9)
Number of SONs in GNE Network	-48,800**	20.1	(-88.2, -9.4)
Ranking of SON	200	1.0	(-1.8, 2.2)
Constant	1440,300***	258.6	(933.4, 1947.2)

** Statistically significant at 5%; *** statistically significant at 1%.

The estimates were based on pooled-OLS regression with heteroskedasticity-robust standard errors clustered at the SON level. No strong signs of skewness were observed in the distribution of the outcome—total SON cost.

It is important to note that the high R-squared (0.85) value cannot be interpreted as indicating causation, even though it suggests that the included characteristics explain a large share of total costs, with the remaining variation explained by unobservable characteristics.

DY 2012 is the reference period in the regression. The coefficients for the indicators for DY 2013, DY 2014, and DY 2015 in the regression results show that the average GNE SON cost increased in each additional year, when adjusting for all other variables. Compared with DY 2012, the regression-adjusted average cost for a SON increased by $363,300 in DY 2013, by $562,200 in DY 2014, and by $905,400 in DY 2015. This yielded an average annual increase of

$301,800, which is lower than the average difference based on the DY 2012–2014 data ($472,500). Importantly, this increasing cost cannot be fully explained by the number of incremental APRN students, because the regression model adjusts at least partially for that factor.[58]

The qualitative findings from the interviews and focus groups provide valuable contextual information to understand this upward cost trend. First, the networks reported that because it took time for the SONs to finalize the partnership agreements with clinical education sites, many financial resources were underutilized in DY 2012, especially GNE precepting payments to the sites. Students were still placed at clinical education sites, but the SONs were unable to pay the sites using GNE precepting payments. Some sites enacted retroactive precepting payments, but others did not, based on the advice of their legal counsel. In either case, more money was spent in subsequent years on precepting payments to the sites. As one participant explained:

> *"Getting the contracts in place took about a year. Some people had taken students and were hoping to get paid. We were not able to pay anyone retroactively. We could only pay the site once we had the contract. This ruffled some feathers, but the sites didn't send back the contract."*

In addition, the networks reported that as the SONs continued to increase enrollment, they faced a concomitant need for new CCS sites. The statute required that half of the incremental clinical placements occur at community-based sites. Although some respondents reported they had more of a "foot in the door" and greater visibility in the community, it may also be the case that the SONs established agreements with the more convenient sites first, which required less time and fewer resources to place the same number of students compared to the effort to recruit other sites.

The regression findings showing that total cost increased over time support the trend observed in the descriptive results (Exhibit 3-2). The regression results also show that the coefficient (9.4) for each additional auditor-based incremental APRN student is associated with an average increase in cost ($9,400) that is statistically significant. Note that this estimate represents the marginal cost of supporting an incremental APRN student while adjusting for other factors. This is different from the average cost to CMS of educating an incremental APRN student in a given year, which ranged from $22,900 to $31,400 in the period DY 2012–2015) (Exhibit 3-1). The estimates were obtained by dividing the total cost by the number of incremental APRN students

[58] The adjustment for incremental APRN students is partial rather than total because any non-linear effect would not be captured by the covariate.

relative to baseline, using audited numbers for DY 2012–2014 and projected numbers for DY 2015.

Exhibit 3-2 also shows that the total cost of the demonstration project declined as the number of SONs in the network increased. Each additional SON reduced the cost by $48,800. The likely reason is that the networks with more than one SON (MH, SHC-O, and HUP) had economies of scale in administering the demonstration project because staff, equipment, and software could be shared across SONs. It also suggests that the benefits derived from these economies of scale were larger than the costs derived from the networks' investment of time in standardizing the data collection process.

The number of faculty and the affiliation of a hospital with the SON were also statistically significant factors explaining cost. The SONs affiliated with hospitals had a much lower average cost ($582,000), with all other characteristics held constant. The reason may be that close relationships with hospitals offered the SON an available and sizable preceptor pool, which could reduce the need to find precepting opportunities further afield. The number of faculty, which was included as a proxy for SON size, showed that the larger SONs had higher average costs. The indicator for affiliated health center captured whether the SON is part of an academic health center. Although SONs that are part of an academic center could be expected to have more preceptors available, this indicator was not statistically significant.

Chapter 4: What is the Cost to CMS for Supporting an Incremental APRN Student to Graduate?

One of the objectives of the GNE demonstration project was to analyze the costs to CMS as a result of increasing APRN enrollment and graduations. The demonstration project provided CMS payments to hospital awardees for the clinical training of the incremental APRN students. The purpose of this analysis was to estimate the per-student cost ratio of educating an incremental APRN student. The ratio was generated by dividing the cost of clinically educating the incremental APRN students (numerator) by the number of incremental APRN students (denominator). The cost of educating the incremental APRN students is the sum of the costs reported for the first four years of the demonstration period. The analysis used three alternative definitions of the denominator: (1) The total number of additional APRN graduates during the demonstration project across all GNE SONs, using the independent auditor's data, (2) the total number of additional APRN graduates during the demonstration project across all GNE SONs, using AACN survey data, and (3) the total number of additional APRN graduates during the demonstration project across all GNE SONs relative to the number of additional graduates in the non-GNE comparison SONs during the same period, using AACN survey data.

To produce reliable estimates of the cost to CMS for supporting an incremental APRN student, two major types of adjustment were required:

1) Adjustment for *factors unrelated to the demonstration project* that nonetheless influence its measured impact (e.g., a nationwide increase in student enrollment and graduations over the four-year demonstration period). To make this adjustment requires some measure of what the networks would have achieved in the absence of the demonstration project. As noted earlier, the quasi-experimental design of the demonstration project's net impact evaluation provides the necessary data for this adjustment because it included a matched group of "comparison" non-GNE SONs (to represent the status quo) for which the evaluation team had the same data, for the same period, as for the demonstration networks. The analysis used comparisons between outcomes for the two groups to make the necessary adjustment, as is discussed further below.[59]

[59] That analysis used a difference-in differences (DID) statistical technique that corrects for time trends that may bias the estimation of output differences between the comparison and demonstration networks. For full details, see the *Evaluation of the GNE Demonstration Project, Volume I.*

2) Adjustment for *network-specific characteristics* that may affect the estimated cost of the project to CMS (for example, local wage levels, which can be expected to influence personnel costs) or estimated output (for example, academic reputation of the network, which can be expected to influence the employability of the APRN students, irrespective of the training they receive).

The main results presented in this report have not been adjusted for the potentially biasing effect of network-specific characteristics unrelated to the demonstration project. Therefore, the evaluation team conducted a supplementary analysis to test the robustness of the findings relative to an important network-specific characteristic, the local cost environment in which the SONs operate (see Chapter 5).

COST TO CMS FOR SUPPORTING AN INCREMENTAL APRN STUDENT TO GRADUATE

Main Results

The estimated costs to CMS to support an incremental APRN student to graduate are summarized in Exhibits 4-1 and 4-2. Overall, the total cost of the demonstration project was $120,474,500 for DY 2012–2015. The number of additional graduates estimated by each of the three definitions of incremental APRN students is as follows:

1. The total number of additional APRN students who graduated during the demonstration period across all GNE SONs, based on the independent audit data: **4,264.7**.
2. The total number of additional APRN students who graduated during the demonstration period across all GNE SONs, based on the AACN survey data: **3,832.0**.
3. The total number of additional APRN students who graduated during the demonstration period across all GNE SONs, relative to the number of additional students who graduated in the non-GNE SONs comparison group during the same time, based on the AACN survey data: **2,097.6**.

The team calculated each per-student cost ratio by dividing the total cost of the demonstration project for DY 2012–2015 by the estimated number of incremental APRN students. Each ratio represents an average estimated total cost to CMS to graduate an additional APRN student. Estimate 1, $28,249, is based on the first method for estimating an additional APRN student by counting the number of students who graduated from GNE SONs during the demonstration period that exceed the number of students who graduated during the baseline period, using the GNE audit data. Estimate 2, $31,439, is based on the second method for estimating an additional APRN student by counting the number of students who graduated from GNE SONs

during the demonstration period that exceed the number of students who graduated during the baseline period, using the AACN survey data.

Estimate 3, $57,434, is based on the number of students who graduated during the demonstration period that can be specifically attributed to the GNE demonstration project, using the results of the DID regression analysis for the impact of the project. This method used the AACN survey data. The DID estimate was adjusted using factors such as the ranking of the APRN program together with other SON-specific characteristics that may have influenced the results. Program ranking was included as a marker for the prestige and rigor of students' academic and clinical training. Students from highly ranked programs may receive job offers more readily than students from less highly ranked programs. This may lead to higher enrollment in the more highly ranked schools or higher graduation rates, as compared to schools with lower rankings.

The third per-student cost ratio is the largest average estimated total cost because the total cost of the demonstration project is distributed among fewer students than in the first two estimates. This is because the third estimate assumes that, in the absence of the demonstration project, the number of APRN students who graduated would still have increased. The estimate accounts for that increase by counting only the number of additional students who graduated as a result of the demonstration project. This estimate can be considered more precise because it makes a reasonable assumption about APRN growth.

It is important to note that, because the demonstration project is ongoing, both the total cost of the demonstration project and the total number of additional APRN students who graduate will change. As such, the three per-student cost ratios are preliminary and should not be considered a true assessment of the cost to CMS for supporting an incremental APRN student to graduate.

Exhibit 4-1. Average Estimated Cost to CMS for Supporting an Incremental APRN Student to Graduate, Unadjusted for Local Inflation

	Estimate 1	Estimate 2	Estimate 3
Total cost of the GNE demonstration project (DY 2012-DY 2015)	$120,474,500		
Estimated number of additional APRN graduates	4,264.7	3,832.0	2,097.6
Data source	Audit data for GNE SONs	AACN survey data for GNE SONs	AACN survey data for GNE and non-GNE SONs

	Estimate 1	Estimate 2	Estimate 3
Average estimated cost to CMS per APRN student	**$28,249**	**$31,439**	**$57,434**

Notes: DY 2012, DY 2013, and DY 2014 costs come from the Audit Summary Reports and the DY 2015 cost data come from the Network Budget Report. The number of incremental APRN students in Estimate 1 comes from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and the DY 2015 Network Budget Reports. The number of incremental APRN graduations in Estimate 3 is based on the DID coefficients discussed in the *Evaluation of the GNE Demonstration Project Volume I Report*. Since the DID results are annual estimates per GNE SON, we multiplied the four years by the 19 GNE SONs to obtain overall DY 2012–2015 estimates. The annual DID estimate for graduations was 27.600.

Robustness of the Main Results to Local Price Variation

Exhibit 4-2, which is displayed in the same format as Exhibit 4-1, shows the per-student cost results adjusted to account for *local price variation*, which affects the networks' cost for salaries and supplies. Removing the impact of prevailing cost differences among networks refines the comparison of costs to CMS and the per-student cost estimates for the demonstration project.

The differences between these results and the main results shown in Exhibit 4-1 are minimal. Because the figures in Exhibit 4-2 are expressed in constant year 2011 dollars, the cost and per-student cost results overall are slightly lower than those shown in Exhibit 4-1, which are based on dollars from the year reported. The adjusted figures in year 2011 dollars are $27,266 compared to $28,249 (Estimate 1), $30,345 compared to $31,439 (Estimate 2), and $55,435 compared to $57,434 (Estimate 3).

This robustness analysis produced estimates similar to those in the main results, which suggests that the local price variation occurring in the diverse locations of the GNE SONs did not dramatically affect the estimates. Using the costs as reported in each year provides an estimate of cost that reflects the actual payments made in each year. On the other hand, the robustness analysis scales each year's costs to year 2011 dollars. This removes the increase in cost over time that is due to inflation in the area where the GNE SON is located.

Exhibit 4-2. Average Estimated Cost to CMS for Supporting an Incremental APRN Student to Graduate, Adjusted for Local Inflation

	Estimate 1	Estimate 2	Estimate 3
Total cost of the GNE demonstration project (DY 2012-DY 2015)	$120,474,500		
Estimated number of additional APRN student graduates	4,264.7	3,832	2,097.6

	Estimate 1	Estimate 2	Estimate 3
Data source	Audit data for GNE SONs	AACN survey data for GNE SONs	AACN survey data for GNE and non-GNE SONs
Adjusted average estimated cost to CMS per APRN student	**$27,266**	**$30,345**	**$55,435**

Notes: DY 2012, DY 2013, and DY 2014 costs come from the Audit Summary Reports and the DY 2015 cost data come from the Network Budget Report. The number of incremental APRN students in Estimate 1 comes from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and the DY 2015 Network Budget Reports. The number of incremental APRN graduations in Estimate 3 is based on the DID coefficients discussed in the *Evaluation of the GNE Demonstration Project Volume I Report*. Since the DID results are annual estimates per GNE SON, we multiplied the four years by the 19 GNE SONs to obtain overall DY 2012–2015 estimates. The annual DID estimate for graduations was 27.600.

For further insight into these findings, we highlight, in the section below, respondents' perceptions of their network's demonstration project return on investment.

RETURN ON INVESTMENT AS PERCEIVED BY DEMONSTRATION RESPONDENTS

This section discusses participants' perceptions of the networks' return on investment as expressed in the interviews and focus groups. The findings provide context for the overall assessment of the cost to CMS of supporting an incremental APRN student because they point to specific aspects of the GNE demonstration project perceived to be valuable outcomes of CMS' investment.

Duke University Hospital

When asked if the demonstration project had shown a return on investment, DUH participants answered positively. Respondents reported that as a result of the demonstration project, the SON had expanded the clinical placement office and hired NPs as clinical placement facilitators. This enabled the SON to improve and strengthen its relationships with other practicing NPs, which has increased clinical training opportunities.

In addition, according to the faculty, expanding the clinical placement office has given APRN students a "foot in the door" in terms of competition with medical students for placements. For example, using precepting payments, the SON developed a partnership within the network with clinical sites that had previously not precepted DUH APRN students. As one SON administrator noted:

"[The clinical site] had never had an NP before [the GNE demonstration project] and they are now taking 65 students. This is one of the best things that has happened. That would never have happened without the GNE. And they are adding practices all the time."

Participants were also very pleased with the new electronic clinical placement system, which tracked clinical education placements. Respondents noted that this system has been particularly helpful because the APRN master's program is shifting to online learning. All didactic instruction is online, but the students come to the SON at least once every semester for two to five-day intensive sessions with faculty and other experts for simulation and hands-on activities.

According to respondents, expanding clinical education opportunities and developing the clinical placement system allowed DUH to increase the number of enrolled APRN students. As one DUH respondent explained:

"I think we couldn't have grown our enrollment related to the GNE project without those investments. We certainly couldn't have grown our enrollment without the site payments. It's worked well."

Hospital of the University of Pennsylvania

With support from the demonstration payments, all nine SONs in the HUP network enhanced and centralized their clinical placement process. This was done through a variety of infrastructure investments, such as hiring clinical placement coordinators and recruiters, as well as adjunct and full-time faculty, to support clinical education placements and evaluations. For example, SONs that did not have a designated clinical placement coordinator used the demonstration payments to hire them to oversee the clinical placement process. To support clinical site and preceptor data collection and management, some SONs also hired separate staff to oversee this effort. As respondents explained:

"We went from 13 site coordinators with different process[es] for matching preceptor and students to a centralized placement team to share site information across programs. We also have a team lead."

"With GNE funds we were able to hire someone [part time] to work on data management and clinical coordinating."

Using demonstration payments, the HUP network has produced a number of innovative models for clinical education through interprofessional or "immersion" pilots. In an immersion pilot, a number of students in a cohort enter into a full-time interprofessional clinical placement for a specific period of time, from one week to two months. During this time, APRN students learn

from a variety of health care professionals such as NPs and physicians. The immersion pilot also allows APRN students to work alongside medical and physician assistant students. One pilot currently being tested involves a clinical rotation at Children's Hospital of Philadelphia. Similar to students in medical rotations, APRN students rotate among several pediatric specialties in the hospital.

All HUP participants thought that the GNE demonstration project contributed to increases in APRN enrollment and graduation. However, opinions about the degree to which the demonstration project was responsible for this increase varied across the network. Some interviewees were more conservative about attributing APRN enrollment increases solely to the demonstration project.

> *"Very gently and kindly I want to say, we increase our numbers because of the IOM [Institutes 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."*

Conversely, other saw a direct tie between the demonstration project and the increase in enrollment. A strategic planning team member explained:

> *"The [GNE] investment has really been with the schools on enrollment and increasing the visibility of APRN education. Realizing that they [SONs] are part of something big and transformative has been huge for us in terms of PR."*

Memorial Hermann-Texas Medical Center

Like respondents in the other networks, MH participants reported that the demonstration project had provided several positive returns on investment. The demonstration payments helped the MH network to standardize its clinical placement process across all four SONs and to develop a sophisticated system to track clinical education placements, activities, and hours. As one clinical placement coordinator noted:

> *"Before the GNE demonstration, all the schools and even different tracks in the same schools were using different paperwork. The GNE forced us to standardize, and it has greatly benefited the placement process, preceptors, and students."*

Through the demonstration project, the MH network was able to expand clinical education opportunities to health care facilities and organizations that focus on underserved populations. For example, the network developed a strong partnership with San Jose Clinic, a large safety-net clinic in Houston that serves uninsured and underinsured individuals and families, many of whom are immigrants and refugees. Students who were placed at the clinic worked closely with

the head physician and a team of nurses to provide comprehensive primary care. The clinic operates like a patient-centered medical home, providing resources and care to patients that go beyond the health care needs of the patient at the time of the visit.

GNE precepting payments were also used to recruit clinical education sites that provide precepted education and focus on interprofessional models of care. For example, the head physician at one primary care clinic in Houston has developed a curriculum for cardiology and family medication rotations. The curriculum is designed to assess students' knowledge and skill level when they first begin their placement and to use this information to inform teaching. The curriculum promotes interprofessional, team-based approaches and includes a didactic component in which the preceptors give the students information to study and the students then present the information to each other and their preceptors. The head physician explained:

> *"We designed it [the curriculum] once the GNE program started. Before, when NP students came, it was random. We would get a notice from one person here and there. There was no reason. Now with the GNE program, students come on a regular basis and there's a structure. We saw a need to have a curriculum."*

Participants at all four SONs agreed that APRN enrollments and graduations had increased significantly since the demonstration project. Participants attributed the increases to standardized placement processes within and across the SONs that have allowed the schools to enroll more APRN students. They pointed particularly to the dedicated placement coordinators at each SON and the new and expanded partnerships with placement sites. Several participants noted that the demonstration project has complemented the overall goals of their SONs. As one SON administrator explained:

> *"I think the overall project goal is to increase the APRNs in the field. We were already in the process of increasing admissions, so this project came in line with what we needed to do. So it assisted us to support and admit new students."*

Rush University Medical Center

RUMC participants agreed that the overall impact of the demonstration project has been positive. Many participants reported that clinical education in the RUMC network has expanded and diversified because of the project. They attributed much of the success to infrastructure investments that allowed the College of Nursing (CON) to focus time and resources on centralizing its clinical placement process and developing a clinical site information system. The demonstration payments also allowed the college to develop innovative clinical education models that provide primary health care to medically underserved populations.

Another key return on investment has been the ability to organize and streamline the clinical placement process. Prior to the demonstration project, CON faculty members sent numerous emails and made dozens of phone calls to place students in clinical training sites, which was time consuming for faculty, who were also teaching and practicing. The constant staff turnover at clinical education sites, together with the sites' changing capacity for, and interest in, taking students for training each semester, made it much more difficult for faculty to place students. As part of the demonstration project, RUMC hired a clinical placement coordinator, who is the primary contact between the sites and the college, thus allowing the faculty to focus on other activities. As a CON faculty member explained:

> *"Historically we [faculty] were responsible for everything when it came to coordinating the clinical sites. Now, the placement coordinator does a lot of that work like follow-up communications after initial contact and writing thank you notes."*

The demonstration project also made it possible for RUMC to create a centralized clinical education site database that could be accessed by both RUMC staff and faculty. The database contained the following information:

- Contact information for both the clinical site and the preceptor
- Health care specialties practiced at the clinical site
- Current and past students who received clinical education at the site.

Because the clinical sites were constantly evolving, users of the database kept accessing and updating information. All participants found the system to be very helpful for matching and placing students at clinical sites, as well as keeping track of student information and site data. The database also fostered efficient communication among the sites, preceptors, faculty advisors, and students so that they didn't "step on each other's toes." Network participants commented:

> *"The GNE has helped create this database that is going to be super useful."*

> *"Capturing all that information and putting it into a place where everyone had access took a lot of time. It's definitely gotten better."*

The demonstration project has supported the expansion and diversification of clinical education sites within the network by distributing precepting payments to the clinical training sites, rather than directly to the preceptors. This allowed the RUMC network to incentivize and reward clinical sites that were "testing new and different models of care." One example is the creation of the Start-Up Preceptor Program, which pays a preceptor to precept students at a clinical education site that was previously unable or unwilling to provide clinical education to CON

students. The precepting payments also allowed RUMC to expand into clinical training sites that were traditionally reserved for medical students. According to RUMC participants, the demonstration "reset NP training and gave it legitimacy" within the medical community by sending the message that "medical training is not just for physicians, it's for the workforce."

According to RUMC respondents, APRN enrollment has "definitely increased" as a result of the demonstration project. Much of the success, according to these participants, was due to the increase in clinical education sites, which allowed the CON to enroll more students. The downside to increased APRN enrollment has been the increased burden on SON faculty, who advise and provide classroom support to students. As one RUMC administrator put it:

> *"It takes a lot of resources to support an APRN program. The fact that we've been able to increase enrollment, and put more APRNs out there, has been a major payoff."*

HonorHealth Scottsdale Osborn Medical Center

Like respondents in the other networks, SHC-O participants agreed that the investments made using GNE demonstration payments had produced positive returns. Initial successes included the standardization of data among all four network SONs, which allowed valid data comparisons to be made across the network. Many respondents cited the process of standardizing data collection as a key component that helped initiate regular communication and collaboration among the SONs, which prior to the demonstration had been limited and sporadic. A SON faculty member explained:

> *"We have developed stronger relationships with other college partners. It used to be completely siloed, no one shared anything. There has been much more collaboration."*

Because of the improvements in communication and collaboration, competition between the SONs also decreased. A SON administrator agreed:

> *"I think because I know them [other SONs] now, I feel even less competitive."*

The demonstration payments also allowed the SONs to better organize their clinical placement process while strengthening and building relationships with current and prospective clinical placement sites. According to an SHC-O administrator:

> *"[Clinical placement] has become significantly more organized. At first, one school did not have a full-time person for placement, and students were responsible for finding sites. There is now a process, and that school is placing students one or two semesters ahead of schedule."*

The SHC-O network has used demonstration payments to expand and diversify clinical education sites that serve medically underserved populations or that provide innovative clinical training models. According to an SHC-O strategic planning team member, the network tries to implement two new innovative clinical training models each year*:*

> *"We [the strategic planning team] drive this, but the schools sometimes come to us with ideas."*

Examples of these innovative models include the expansion of precepted interprofessional education opportunities at a community health care system that has nine health centers in Phoenix and the surrounding rural areas. The system also has a tele-health clinic that provides audio/video technologies to link health care providers, educators, and rural patients as a means to provide comprehensive primary health care, including family practice, pediatrics, and prenatal care.

SHC-O participants agreed that APRN student placements at CCSs are highly beneficial both to the student, who gains valuable clinical experience working with new populations, and to the community, which has a high demand for qualified health care providers. Interprofessional education also allows the student to train in a variety of medical specialties alongside different types of medical practitioners such as medical and pharmaceutical students. As one respondent noted:

> *"[In interprofessional clinical training] there is a team approach and a lot of co-managing of a patient, which is helpful for the APRN student."*

The increase in clinical education opportunities has allowed the SHC-O network to increase APRN enrollment across all four SONs. However, even with an increase in faculty and staff support, SON enrollment is still limited by the number of placements for precepted clinical education. One faculty member explained that is difficult for the SON to find a didactic faculty member to help with the increased APRN enrollment. Another expressly stated that the lack of clinical placements was the reason that the SON has not admitted more APRN students.:

> *"We cannot accept students without knowing that we will have enough clinical placements."*

Chapter 5: Summary and Conclusions

The GNE demonstration project was designed to increase APRN student enrollments and graduations by expanding the number of clinical training sites and the supply of APRN clinical preceptors. Participating hospitals received payments from CMS for providing qualified clinical training to incremental APRN students. The evaluation team analyzed data from primary and secondary sources to determine the cost to CMS associated with the demonstration project. This chapter summarizes the cost findings for the first four years of the GNE demonstration project.

SUMMARY OF FINDINGS

The evaluation team analyzed the cost of the GNE demonstration project using descriptive, regression, and per-student cost methods. The primary sources of quantitative data were the annual GNE Audit Summary Reports, the Network Budget Reports, and AACN data on APRN enrollment and graduations. The team also examined the cost of the project from the perspective of project participants, including network leadership, SON administrators, faculty, and staff.

What Was the Total Cost for Implementing the GNE Demonstration Project?

The descriptive analysis showed that the estimated total cost of the GNE demonstration project across networks in the four-year period DY 2012–2015[60] was $120,474,500. This estimate is preliminary because the DY 2015 costs were projected, not audited, costs. The annual costs ranged between $17,873,500 and $41,823,500. Each year's total costs were well below the $50,000,000 capped amount mandated by Section 5509 of the Affordable Care Act.

The total cost across networks also varied substantially. For example, based on the DY 2015 data, total costs across SONs ranged from $493,400 (RUMC) to $4,780,200 (HUP). This variation can be largely, but not fully, explained by differences in network size, since the cost per auditor-based incremental APRN student also showed substantial variation.

The cost of the demonstration project increased steadily over the four-year period: the cost was $17,873,500 in DY 2012, $27,582,900 in DY 2013, $33,194,600 in DY 2014, and $41,823,500 in DY 2015 (projected). The DY 2015 amount may be an overestimate because, over the first

[60] Academic years 2012/2013–2015/2016.

three years of the demonstration, the audited costs were nearly 25 percent lower than the projected costs.

The regression analysis provided further evidence of an increasing cost trend. It also confirmed that this trend is not fully explained by the number of incremental APRN students. In each demonstration year, the cost of the project increased by an average of $301,800 when adjusted for the number of incremental APRN students. This suggests that the cost of the demonstration project was increasing, even after considering the number of incremental APRN students educated in each year. Two considerations should be kept in mind when interpreting these results. Again, the DY 2015 amounts are budgeted, not audited, and the dollar amount spent across all networks for the project has remained within the mandated capped amount.

How Were Payments Allocated?

CCS costs were the largest expenditure, followed by SON costs, indirect costs, direct costs, and other direct costs. CCS costs included the payments made by the networks for the precepting of auditor-based incremental APRN students, while SON costs included all items related to the partnership agreements between the hospital participant and the SONs in the network (e.g., payment for clinical faculty and clinical placement coordinators). This suggests that most of the resources were spent on the activity that was most directly related to the overall goal of the demonstration project—increasing the number of clinical training sites and expanding the supply of APRN clinical preceptors. The findings from the qualitative analysis provide further context for the expenditures on clinical education: network participants reported making key investments in hiring placement coordinators and purchasing information management systems to support expanded clinical placements.

All cost categories except other direct costs contributed to the increase in total cost over the four-year period.[61] An important part of this increase was directly associated with activities to support increased student enrollments over time. To increase the number of incremental APRN students, the networks incurred additional costs not only for precepting payments to CCSs and hospitals, but also for the costs of administering and coordinating a larger and more complex operation. Another part of the cost increase after DY 2012 is explained by the fact that in the first year of the demonstration project certain expenditures were delayed, including substantial payments related to the precepting of incremental APRN students, due to the time needed to

[61] These calculations did not account for inflation; however, the growth of costs is of a much higher order of magnitude than the inflation over the period.

set up the organizational and administrative structure required to operate the demonstration project.

Were Payments Allocated According to Projected Budget Plans?

For the three years with available projected and audited cost data (DY 2012–2014), projected costs were considerably higher than audited costs. The networks cited structural changes to the project and delays in the start-up of the demonstration project as factors contributing to the discrepancies between projected and audited costs. It should be noted that the projected numbers of incremental APRN students (relative to baseline) also were considerably higher than the audited numbers. The differences between the projected and audited costs were roughly proportional to the differences in the numbers of incremental APRN students. As a result, *the projected and audited costs per incremental APRN student* were very similar ($29,600 and $29,000, respectively). Comparing projected and audited costs showed no major discrepancies in the proportions of costs allocated across cost categories. This is further evidence that the demonstration payments were spent according to budget plans.

What Was the Per-Student Cost Across Networks of APRN Student Clinical Training?

The descriptive analysis showed that the total cost per auditor-based incremental APRN student increased from $22,900 to $31,400 over the four-year demonstration period: $22,900 in DY 2012, $27,600 in DY 2013, $29,000 in DY 2014, and $31,400 in DY 2015 (projected). The payment and investment delays in the first one to two years of the project may explain part of this increase. The increased number of students, which is one of the factors explaining the increase in total costs, also applies, although with a slightly different logic. The qualitative findings show that as the networks tried to find additional CCSs, they incurred the same or even higher recruitment costs to place a smaller number of APRN students (since the obvious CCSs, which tended to be the largest, had been exhausted in previous efforts). In this respect, at least some of the networks seemed to be facing diseconomies of scale in expanding the demonstration.

The regression analysis suggests that, when adjusted for other factors each additional incremental APRN student cost the GNE SON $9,400 on average. This is not the total cost for graduating a student, which also includes other cost factors such as the characteristics of the SON (e.g., number of faculty, geographic location, hospital affiliation). The additional cost should be considered when examining the cost to CMS for continuing to increase the number of students educated under this model.

The descriptive analysis also showed substantial variation across networks in cost per auditor-based incremental APRN student, which ranged from $24,820 (DUH) to $35,520 (HUP). These network-specific estimates are crude estimates of the cost to CMS and were based on the network's audited cost and incremental APRN student numbers. The crude average cost of graduating an additional auditor-based incremental APRN student was $28,200.

Several factors may have contributed to these differences across networks:

1) The different composition of the networks (and, consequently, their differential ability to spread costs across a larger number of SONs and students).
2) The degree to which the CCSs in their geographic area have reached saturation in their ability to precept APRN students.
3) The relative success of the investments the networks made using the demonstration payments (e.g., reconfiguration of the process used to place students, and the information systems used to facilitate this process).

Which SON Characteristics Were Associated with Cost Variations?

The regression analysis showed that four major factors were associated with the variation in total cost across SONs:

1) The number of incremental APRN students (relative to baseline) was associated with higher costs at the SON level. This expected result reflects the fact that a major part of the total cost (CCS costs) was directly related to the costs of precepting incremental APRN students.
2) The number of SONs in a network was associated with lower costs at the SON level. This finding is likely because networks can spread certain costs (e.g., equipment, software, GNE administrators) across a number of SONs, thus reducing the cost per SON. It is also possible that networks with more than one SON can achieve further economies through collaborative activities, such as sharing information.
3) Faculty size was associated with higher SON costs. Because faculty size is a proxy for SON size, this finding is possibly due to the fact that larger SONs incurred higher costs for implementing the demonstration. However, the link between faculty size and cost increases is not obvious, and other reasons may also apply.
4) Affiliation with a hospital was associated with lower costs. This is likely because close relationships with hospitals offer SONs an established and sizable preceptor pool, which may reduce the need to spend additional resources to find clinical opportunities elsewhere.

What Was the Average Estimated Total Cost to CMS for Supporting an Incremental APRN Student to Graduate?

The team used three estimates to calculate the average total cost to CMS to support an incremental APRN student as a result of the demonstration project. The first estimate was calculated by dividing the total cost of the demonstration project for DY 2012–2015 by the calculated number of auditor-based incremental APRN students, resulting in about $28,200 per incremental APRN student. The second estimate followed the same calculation, but used graduation counts from the AACN data instead of auditor-based counts. This method produced an estimate of about $31,400 per APRN increment. These two estimates are crude average costs to CMS per APRN increment, for the four years of the demonstration project, not taking into account other factors that may have increased enrollments or graduations. This cost can be thought of as the estimated total cost to CMS of training one additional APRN student, on average, across the demonstration project. The DY 2012–2014 costs and the number of auditor-based incremental APRN students were taken from the Audit Summary Reports, whereas the DY 2015 costs and number of incremental APRN students were projected figures taken from the Network Budget Report. Additional costs not paid for by the demonstration project, such as payments to didactic faculty, are likely to be incurred by SONs for educating an additional APRN student.

Because the demonstration project also showed a statistically significant increase in APRN graduations overall, we used the impact estimates to calculate a second average total cost to CMS. When a quasi-experimental DID regression approach is used to obtain estimates (i.e., incremental students enrolled and incremental students graduated relative to the comparison sites), the estimates net out non-demonstration factors that potentially bias observed outcomes. In this approach, we used a similar method to calculate per-student cost ratios. In place of the descriptive number of incremental graduates relative to the GNE SONs' baseline, the team generated estimates of enrollment and graduations attributable to the demonstration project using secondary data from the AACN annual survey. This allowed us to estimate the number of additional APRN students enrolled and graduated as a result of the demonstration project, after taking into account the growth occurring in non-GNE SONs that were similar to the GNE SONs (the comparison group).

To calculate the third estimate, we divided the total cost of the demonstration project for DY 2012–2015 by the team-generated number of APRN graduations (about $57,400 per graduate). This third estimate can be interpreted as a more precise approximation of the total cost of training one additional APRN student, on average, across the demonstration project, because it only includes graduations attributable to the demonstration project. Compared to the audit-driven estimate (about $28,200), the cost per graduate is higher, because the denominator does

not include additional students who would have graduated in the absence of the demonstration project.

What Was the Return on Investment as Perceived by Demonstration Participants?

When asked if the GNE demonstration project had resulted in a return on investment, participants responded positively overall. Most indicated that the investments made to implement the demonstration project had paid off in producing a larger number of APRN students through increased placement opportunities and better placement coordination. Some respondents also noted increased health care capacity because APRN students were available to see patients. However, other respondents were cautious about attributing the increased enrollment to the demonstration project.

Specific investments that respondents mentioned included:

1) Creating clinical placement coordinator positions
2) Hiring more adjunct clinical faculty to maintain the required teaching ratios
3) Developing a centralized database to facilitate clinical placements
4) Building new relationships with CCSs and other organizations in the community.

LIMITATIONS OF THE EVALUATION

The evaluation findings should be assessed in the context of several limitations of the demonstration project and the evaluation design. Because audited costs for DY 2015 (AY 2015/2016) were not available for the analyses, the DY 2015 figures, which represent projected costs, were used. Since the projected costs were higher than the audited costs during the demonstration period, the estimates may overstate the audited costs for DY 2015. Because both cost and FTE data are updated on a regular basis, depending on the timeline of the auditing process, the findings presented in this report are based on figures that may be slightly different from the final ones.

In addition, the criteria used to assign cost items to cost categories (direct, other direct, indirect, SON costs, and CCS costs) may present some differences across years and networks. This categorization of costs comes from the Audit Summary Reports and their supplementary files.

The demonstration project collected data only from the GNE demonstration networks; cost data from non-GNE SONs were not available. For that reason, the evaluation team was unable to compare the cost to CMS for similar SONs or networks not participating in the demonstration project.

The pooled-OLS regression analysis of factors influencing GNE SONs' costs was not well equipped to eliminate the effect of all potential confounders. For this reason, the findings should be interpreted cautiously and as associations, rather than causal effects.

An additional limitation is that the secondary data used to calculate per-student cost estimates did not include summer semester graduations. If the GNE SONs increased summer semester graduations in the intervention period more intensively than did the comparison SONs, the per-student cost estimates would understate the true per-student cost of the demonstration networks.

Further, given the number of SONs participating in the demonstration project (19), the sample sizes for the regressions (pooled OLS and regressions used to estimate the per-student cost ratios) were relatively small. This reduced the statistical power of the analysis and produced less precise estimates. The results also suggest that the characteristics of the GNE SONs are associated with the cost of the demonstration project. Moreover, the sample size may have been insufficient to fully explore all cost factors captured by the differences between GNE SONs within the same network and across networks.

Another limitation is that the initial four-year demonstration period may have been too short for many of the incremental APRN students enrolled to complete their programs and graduate. The post-master's program pursued on a full-time basis requires two years to complete, whereas the DNP requires four years to complete. Part-time APRN students may take even longer. The incremental APRN enrollment numbers combine master's, post-master's, and DNP programs. We can expect any effects from the DNP program to be observed beginning only with the fourth year of data. And longer follow-up periods would likely reduce the measured difference between the enrollment and graduation measures of cost. As a result, the long-term impact on cost cannot be determined based on the initial four years of the demonstration period. The per-student cost estimates could, however, be used to compare demonstration project per-student cost with some established baseline measure of what "should" be expected; however, this was not included in this study because such a measure depends on a range of factors, many of which involve value judgments that include public policy preferences.

The length of the demonstration project and the design of the evaluation also precluded the ability to establish long-term impacts to the Medicare program. The study was not able to follow APRN student graduates over time, to capture whether they became health care providers for Medicare or Medicaid beneficiaries. Therefore, we were not able to address the question of whether the demonstration project costs were offset by reductions in beneficiary health care costs from improved access to APRN providers.

The analysis of the cost to CMS for supporting an incremental student to graduate uses the findings of an impact analysis to calculate these costs, which has several limitations. One of these limitations is that only 19 SONs participated in the demonstration project of the more than 420 SONs that offer master's-level or DNP APRN programs. Additionally, all 19 SONs were affiliated with large academic institutions. For example, only 19 SONs participated in the demonstration project of the more than 420 SONs that offer master's-level or DNP APRN programs. Implementation of the demonstration project 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 cost to CMS would also be different if the demonstration project were implemented for a different group of SONs.

Finally, although the qualitative data presented in this report reflect on-the-ground perceptions of cost and returns on investments, they represent only the perspectives of the respondents. There are likely other participants in each network who may have different experiences or opinions related to the costs and benefits of the demonstration project that are not represented in this report. Because the interviews were conducted prior to the quantitative analyses, the quantitative findings were not available to inform the qualitative data collection protocols.

DISCUSSION AND CONCLUSION

The GNE demonstration project resulted in increased enrollment and graduations in the GNE SONs, compared to a set of similar comparison SONs. The cost findings suggest that the annual cost for supporting an incremental APRN student increased over the course of the demonstration project, but that the annual costs did not exceed the mandated annual capped amount. The team estimated the cost to CMS of supporting an additional APRN student to graduate. While the descriptive estimates of the cost to CMS of graduating an additional APRN student ranged from $28,249 to $31,439, the regression-derived figure of $57,434 is a more precise estimate of the total cost because it takes into account only the increases truly attributable to the demonstration project. The adjusted regression model examined factors related to the total costs associated with the demonstration project. Increasing the number of incremental APRN students in a SON increased the cost to the SON by an average of $9,400 per increment. Other factors associated with the SON and with the demonstration project also influenced total SON costs.

The GNE demonstration project is a large, complex initiative that involved multiple participants and different network implementation models. This study suggests that the networks spent demonstration project funds according to budgets and within the expected budget limits. The study also revealed substantial differences in total costs across the networks, even after

adjusting for important factors such as the number of incremental APRN students produced. Some of these differences may be attributable to the environment in which each network operates (number of CCSs available in the area, competition from other SONs, etc.). Other explanatory factors may be differences in their operations, such as the processes used to organize clinical placements. Respondents were generally positive when asked about whether the demonstration project had positive returns on investment, although some were cautious in attributing the observed growth in enrollment specifically to the demonstration project. The cost analyses indicate that, as of DY 2015, the costs may be leveling off, and there is evidence that the demonstration project is a better alternative than the status quo in expanding the APRN supply. This conclusion is based primarily on the impact analysis and the per-student cost findings that the GNE demonstration project increased enrollment and graduations *relative to* matched comparison SONs specifically selected to represent what the demonstration project networks would have experienced in the absence of the project.

This report was based on four years of data collected after the initiation of the demonstration project. A final evaluation report that will provide findings for the complete six-year demonstration project will be available in the fall of 2019.

Appendix A: Network-Specific Costs and Costs Per Incremental APRN Student

Appendix A includes tables that show the costs by cost category for each network overall the cost per incremental APRN student, and the percentage of the total cost by year for the period DY 2012–2015. The data are discussed and presented graphically in Chapter 3.

Exhibit A-1. DUH Costs by Cost Category and Demonstration Year

Cost Category	DY 2012			DY 2013			DY 2014			DY 2015		
	Audit			Audit			Audit			Budget		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$307,900	$4,700	20.8%	$350,000	$3,400	15.8%	$355,500	$3,000	9.9%	$475,900	$3,500	14.0%
Other Direct	$23,700	$400	1.6%	$15,800	$200	0.7%	$14,900	$100	0.4%	$70,800	$500	2.1%
SON	$766,100	$11,600	51.8%	$1,016,400	$10,000	45.9%	$1,185,700	$9,900	33.0%	$1,252,900	$9,100	36.7%
CCS	$164,200	$2,500	11.1%	$497,900	$4,900	22.5%	$1,475,700	$12,300	41.1%	$1,219,000	$8,900	35.7%
Indirect	$216,200	$3,300	14.6%	$335,300	$3,300	15.1%	$559,900	$4,700	15.6%	$392,400	$2,900	11.5%
Total	**$1,478,100**	**$22,400**	**100.0%**	**$2,215,400**	**$21,700**	**100.0%**	**$3,591,700**	**$30,000**	**100.0%**	**$3,411,000**	**$24,800**	**100.0%**

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because 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, these figures may not fully coincide with the final audited and budget information.

Exhibit A-2. HUP Costs by Cost Category and Demonstration Year

Cost Category	DY 2012			DY 2013			DY 2014			DY 2015		
	Audit			Audit			Audit			Budget		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$380,600	$1,500	5.9%	$525,800	$1,500	5.4%	$550.9	$1,400	5.2%	$810,800	$1,800	5.0%
Other Direct	$4,800	$0.00	0.1%	$124,200	$400	1.3%	$152.5	$400	1.4%	$233,400	$500	1.5%
SON	$1,909,400	$7,700	29.7%	$3,192,100	$9,100	32.7%	$3,340.9	$8,300	31.3%	$4,780,200	$10,600	29.7%
CCS	$3,468,400	$14,000	54.0%	$5,378,000	$15,300	55.2%	$6,286.2	$15,500	58.9%	$9,392,300	$20,700	58.4%
Indirect	$662,800	$2,700	10.3%	$529,300	$1,500	5.4%	$346.1	$900	3.2%	$873,900	$1,900	5.4%
Total	**$6,426,000**	**$26,000**	**100.0%**	**$9,749,400**	**$27,700**	**100.0%**	**$10,676.6**	**$26,400**	**100.0%**	**$16,090,600**	**$35,500**	**100.0%**

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because 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 data shown in this table may not fully coincide with the final audited and budget information.

Exhibit A-3. MH Costs by Cost Category and Demonstration Year

Cost Category	DY 2012			DY 2013			DY 2014			DY 2015		
	Audit			Audit			Audit			Budget		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$529,000	$2,400	10.7%	$607,700	$2,200	7.2%	$551,300	$1,800	5.0%	$600,600	$1,700	5.3%
Other Direct	$314,400	$1,400	6.4%	$278,700	$1,000	3.3%	$374,900	$1,200	3.4%	$675,400	$1,900	5.9%
SON	$2,241,200	$10,200	45.5%	$3,179,700	$11,400	37.8%	$4,073,900	$13,000	37.0%	$4,444,400	$12,200	38.9%
CCS	$1,431,700	$6,500	29.0%	$3,683,900	$13,200	43.8%	$5,164,500	$16,500	46.9%	$4,590,100	$12,600	40.2%
Indirect	$412,300	$1,900	8.4%	$659,100	$2,400	7.8%	$837,000	$2,700	7.6%	$1,100,800	$3,000	9.6%
Total	**$4,928,600**	**$22,300**	**100.0%**	**$8,409,100**	**$30,100**	**100.0%**	**$11,001,600**	**$35,200**	**100.0%**	**$11,411,300**	**$31,300**	**100.0%**

Notes: The DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. The DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Reports. The figures were constructed based on the most updated documents at the time of the analyses. Because 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 may not fully coincide with the final audited and budget information.

Exhibit A-4. RUMC Costs by Cost Category and Demonstration Year

Cost Category	DY 2012			DY 2013			DY 2014			DY 2015		
	Audit			Audit			Audit			Budget		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$237,000	$2,600	11.6%	$276,400	$3,300	11.7%	$359,300	$4,300	17.1%	$384,800	$4,300	14.0%
Other Direct	$42,500	$500	2.1%	$46,700	$600	2.0%	$35,400	$400	1.7%	$50,000	$600	1.8%
SON	$507,700	$5,500	24.9%	$522,800	$6,200	22.2%	$431,000	$5,200	20.5%	$493,400	$5,500	18.0%
CCS	$696,400	$7,500	34.2%	$722,800	$8,600	30.7%	$794,800	$9,600	37.8%	$1,107,300	$12,300	40.3%
Indirect	$552,200	$5,900	27.1%	$787,700	$9,400	33.4%	$482,800	$5,800	23.0%	$712,400	$7,900	25.9%
Total	**$2,035,800**	**$21,900**	**100.0%**	**$2,356,400**	**$28,100**	**100.0%**	**$2,103,300**	**$25,400**	**100.0%**	**$2,747,900**	**$30,600**	**100.0%**

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. The DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because 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 may not fully coincide with the final audited and budget information.

Exhibit A-5. SHC-O Costs by Cost Category and Demonstration Year

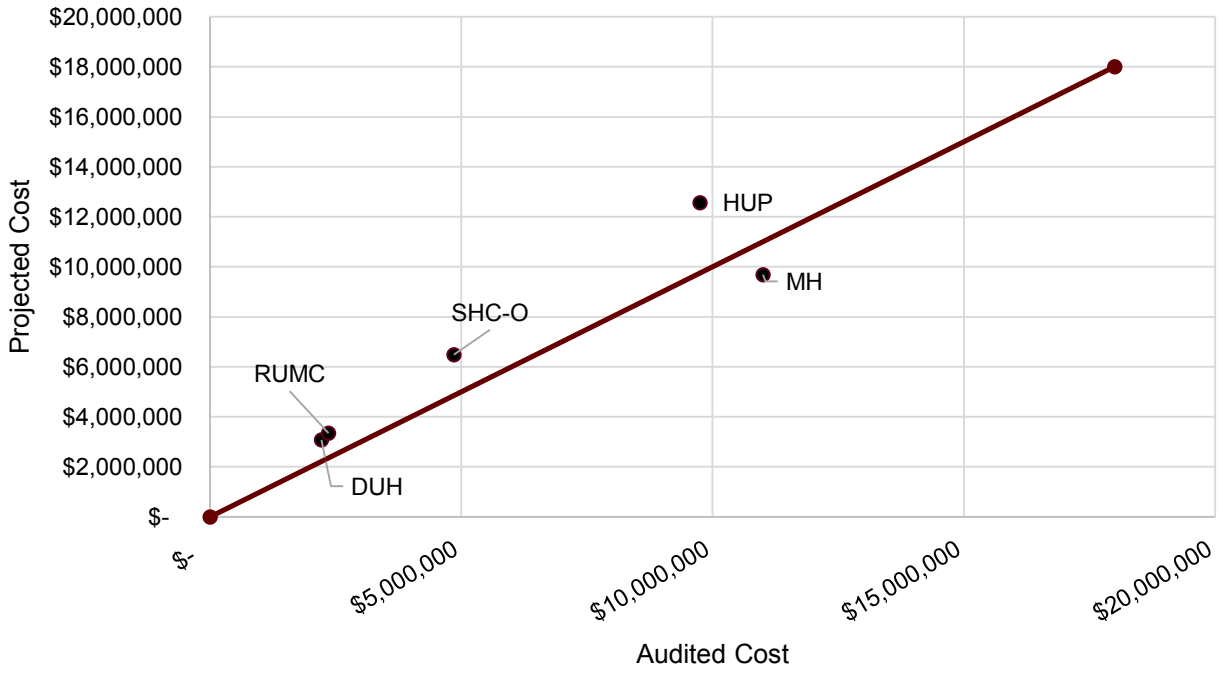
Cost Category	DY 2012			DY 2013			DY 2014			DY 2015		
	Audit			Audit			Audit			Budget		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$422,200	$2,600	14.0%	$493,200	$2,600	10.2%	$568,500	$2,500	9.8%	$773,400	$2,700	9.5%
Other Direct	$185,100	$1,200	6.2%	$284,000	$1,500	5.9%	$337,400	$1,500	5.8%	$250,800	$900	3.1%
SON	$1,006,700	$6,300	33.5%	$1,658,700	$8,800	34.2%	$1,627,300	$7,300	28.0%	$1,985,800	$6,900	24.3%
CCS	$871,700	$5,400	29.0%	$1,368,100	$7,300	28.2%	$1,981,000	$8,800	34.0%	$3,269,000	$11,400	40.0%
Indirect	$519,300	$3,200	17.3%	$1,048,600	$5,600	21.6%	$1,307,200	$5,800	22.5%	$1,883,700	$6,600	23.1%
Total	**$3,005,000**	**$18,800**	**100.0%**	**$4,852,600**	**$25,800**	**100.0%**	**$5,821,400**	**$26,000**	**100.0%**	**$8,162,700**	**$28,500**	**100.0%**

Notes: DY 2012, DY 2013, and DY 2014 cost and APRN increment figures come from the DY 2012, DY 2013, and DY 2014 Audit Summary Reports and their supplementary files. The DY 2015 cost and APRN increment figures come from the DY 2015 Network Budget Report. The figures were constructed based on the most updated documents at the time of the analyses. Because 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 may not fully coincide with the final audited and budget information.

Appendix B. Selected DY 2013 Cost Exhibits

Appendix B includes selected exhibits from the prior year's report that were referenced in the preceding chapters.

Exhibit B-1: Network Projected vs. Audited Costs, DY 2013



Notes: Cost data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.

Exhibit B-2. DUH Projected vs. Audited Costs by Cost Category, DY 2013

Cost Category	Data from DY 2013 Budget			Data from DY 2013 Audit		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$441,600	$4,000	14.4%	$350,000	$3,400	15.8%
Other Direct	$56,400	$500	1.8%	$15,800	$200	0.7%
SON	$1,241,200	$11,200	40.3%	$1,016,400	$10,000	45.9%
CCS	$983,500	$8,900	32.0%	$497,900	$4,900	22.5%
Indirect	$354,000	$3,200	11.5%	$335,300	$3,300	15.1%
Total	**$3,076,700**	**$27,900**	**100.0%**	**$2,215,400**	**$21,700**	**100.0%**

Notes: Cost and increment data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.

Exhibit B-3. HUP Projected vs. Audited Costs by Cost Category, DY 2013

Cost Category	Data from DY 2013 Budget			Data from DY 2013 Audit		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$603,500	$1,000	3.4%	$525,800	$1,500	5.4%
Other Direct	$132,500	$700	2.4%	$124,200	$400	1.3%
SON	$3,678,900	$8,200	29.3%	$3,192,100	$9,100	32.7%
CCS	$6,583,800	$14,800	52.4%	$5,378,000	$15,300	55.2%
Indirect	$1,563,700	$3,500	12.4%	$529,300	$1,500	5.4%
Total	**$12,562,400**	**$28,200**	**100.0%**	**$9,749,400**	**$27,700**	**100.0%**

Notes: Cost and increment data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.

Exhibit B-4. MH Projected vs. Audited Costs by Cost Category, DY 2013

Cost Category	Data from DY 2013 Budget			Data from DY 2013 Audit		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$832,800	$2,500	8.6%	$607,700	$2,200	7.2%
Other Direct	$497,000	$1,500	5.1%	$278,700	$1,000	3.3%
SON	$3,956,000	$12,100	40.9%	$3,179,700	$11,400	37.8%
CCS	$3,464,300	$10,600	35.8%	$3,683,900	$13,200	43.8%
Indirect	$934,200	$2,900	9.7%	$659,100	$2,400	7.8%
Total	**$9,684,300**	**$29,500**	**100.0%**	**$8,409.10**	**$30,100**	**100.0%**

Notes: Cost and increment data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.

Exhibit B-5. RUMC Projected vs. Audited Costs by Cost Category, DY 2013

Cost Category	Data from DY 2013 Budget			Data from DY 2013 Audit		
	Cost	Cost per Increment	% of Total	Cost	Cost per Increment	% of Total
Direct	$372,500	$3,800	11.1%	$276,400	$3,400	11.7%
Other Direct	$77,800	$800	2.3%	$46,700	$600	2.0%
SON	$643,800	$6,600	19.2%	$522,800	$6,400	22.2%
CCS	$1,389,400	$14,300	41.4%	$722,800	$8,800	30.7%
Indirect	$869,200	$9,000	25.9%	$787,700	$9,600	33.4%
Total	**$3,352,700**	**$34,600**	**100.0%**	**$2,356,400**	**$28,700**	**100.0%**

Notes: Cost and increment data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.

Exhibit B-6. SHC-O Project vs. Audited Costs by Cost Category, DY 2013

Cost Category	Data from DY 2013 Budget			Data from DY 2013 Audit		
	Cost	Cost per Increment	% of total	Cost	Cost per Increment	% of Total
Direct	$720,500	$3,000	11.1%	$493,200	$2,700	10.2%
Other Direct	$295,700	$1,200	4.6%	$284,000	$1,500	5.9%
SON	$1,959,700	$8,200	30.2%	$1,658,700	$9,000	34.2%
CCS	$2,007,500	$8,400	31.0%	$1,368,100	$7,400	28.2%
Indirect	$1,495,000	$6,300	23.1%	$1,048,600	$5,700	21.6%
Total	**$6,478,400**	**$27,100**	**100.0%**	**$4,852,600**	**$26,400**	**100.0%**

Notes: Cost and increment data come from the DY 2013 Network Budget Report for the first three columns ("Budget Costs") and from the DY 2013 Audit Summary Report for the last three columns ("Audited Costs"). DY 2013 data were used instead of DY 2014 data since DY 2014 audited data were unavailable.