

FINANCIAL RETURNS TO SOCIETY BY NATIONAL HEALTH SERVICE CORPS
SCHOLARS WHO RECEIVE TRAINING AS PHYSICIAN ASSISTANTS AND
NURSE PRACTITIONERS

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2005

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This document is dedicated to the clinicians of the National Health Service Corps. Your unwavering dedication to the medically underserved certainly makes you “America’s Health Care Heroes.”

ACKNOWLEDGMENTS

Thanks to the patience and generosity of colleagues, committee members, friends and family, working on this dissertation has been a rich and rewarding experience. I am grateful to those who lent critical support, patiently listened while I discussed the current state of my research, and simply gave me space and time to work.

Dr. David Honeyman, the chair of my committee, was extremely helpful in all of my graduate studies. I am grateful for his willingness to discuss various aspects of my project even by cell phone while vacationing in another state. His demeanor and sage advice put things into reasonable perspective when everything felt chaotic.

Dr. Parker Small took the time to help me focus on the dissertation from the very beginning. Always eager to hear about my progress, it was not unusual for him to call from Cape Cod to discuss my findings. I am grateful that he, too, was willing to give up some of his vacation time to critique my work.

Dr. Larry Tyree always seemed to have time to listen to my concerns and aspirations. From family and work responsibilities to my involvement in Operation Iraqi Freedom, he was always available for advice and encouragement.

Dr. Dale Campbell was an early influence during my graduate studies. He opened my eyes to the diverse and exciting world of the community college and to the world of educational leadership and administration. His careful analysis and critique of my performance helped me to better understand what it takes to excel in higher education.

My colleagues and friends at the University of Florida Physician Assistant Program were all directly or indirectly responsible for my success. Wayne Bottom, Dean and Director of the Program, patiently gave me opportunities and time to develop as a faculty member and doctoral student. Joan Crisman was willing to proofread my manuscript and provide excellent feedback. The rest of the faculty and staff were always willing to listen and provide feedback as I repeatedly discussed my research. For all of this I am, indeed, grateful.

I thank the soldiers from Camp Blanding who volunteered in their off-duty time to help me address, stamp and stuff envelopes. Similarly I am grateful to the graduate students who volunteered to file and tally the survey results as they came in. This was important but tedious work that has not gone unnoticed.

Last, but certainly not least, I am grateful to my family. Their support and encouragement were instrumental in getting me through some of the more challenging phases of this research. Cynthia is my foundation. She never complained when I needed time and space to work. Despite the enormous challenges she faced in her battle with cancer she continually sacrificed her own time to cover my responsibilities at home. Finally, I appreciate my two sons, Rob and Austin, for enduring my absence during all of my graduate studies and for sharing the wonders and challenges of adolescence.

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Abstract of Dissertation Presented to the Graduate School of the University of Florida in
Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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December 2005

Chairman: David Honeyman

Major Department: Educational Leadership, Policy and Foundations

The purpose of this study was to examine the investment return to society and to the individual for the National Health Service Corps (NHSC) scholarship recipients from physician assistant (PA) and nurse practitioner (NP) programs in the United States who would have completed service obligations between the years 2003 and 2006. The study examined the difference in the amount of Federal taxes generated between the pre- and post-training wages compared to the cost of students' scholarship awards and differences in payback potential between NPs and PAs. Differences in foregone earnings, scholarship debt and starting salaries are also compared.

This study examined 187 NHSC scholars who would have completed their service obligation between the years 2003 and 2006 in numerous Health Professional Shortage Areas (HPSAs) across the nation. The initial data were collected by surveys sent to 314 scholarship recipients as well as existing census data from the Bureau of Labor Statistics,

the American Academy of Physician Assistants and the American Academy of Nurse Practitioners.

The major findings of this study were that (a) scholars repaid society's investment within 19 years after graduation, (b) PA scholars generated more tax revenue than NP scholars, (c) time to repayment was highly dependent upon scholarship debt, (d) nurse practitioner students were required to forego an average of \$5,216.00 more potential income than physician assistant students during training. While most scholars received more income as a result of training, the PA scholars in this study appeared to enjoy larger increases in salary than NP scholars. Finally, the service period for NHSC scholars was, in no way, contingent on the amount of money invested in their scholarship.

CHAPTER 1 INTRODUCTION

The Federal government, through various programs, provides more primary care clinicians to Health Profession Shortage Areas (HPSAs) in the United States than any other source (see Appendix A for a complete list of abbreviations). During fiscal year 2003 the Department of Health and Human Services (DHHS) received 20 % (\$25.4 billion) of the Federal on-budget funds for education. From these funds the DHHS provided \$46 million to the National Health Service Corps (NHSC) (U.S. Department of Education, 2004). These funds were used to support numerous programs with the aim of providing doctors, dentists, physician assistants, nurse practitioners, and other trained health care professionals to care for the medically underserved populations of America.

In 1970 the Emergency Health Personnel Act, which authorized assignment of Federal personnel to shortage areas, served as a mandate for the creation of the National Health Service Corps. Two years later a group of clinicians consisting of 14 physicians, four dentists and two nurses were assigned to underserved communities. Later that year Congress passed amendments to the Emergency Health Personnel Act that authorized scholarships to aspiring health professionals in return for service in communities with critical health needs. Throughout the rest of the decade and into the 1980s, the NHSC identified HPSAs, created loan repayment programs, and expanded scholarship offerings to a wider range of health care providers. With this expansion came large increases in funding (National Health Service Corps [NHSC], 2004b).

The NHSC scholarship program was mandated by Congress to supply health care professionals trained in those disciplines and specialties most needed to deliver quality primary health care services to HPSAs with the greatest need. Scholarship funds were made available to health professional students training for a period of up to 4 years. In return, the clinicians served in an identified area of need 1 year for each year of scholarship support. The expectation of the DHHS was that many of these clinicians would continue to serve in these underserved areas after their service obligation had been fulfilled. Repeated training and recruitment of clinicians for these HPSAs required additional funding.

One of the missions of the DHHS was to staff HPSAs with well trained clinicians. This was done through a number of Federal initiatives to include the NHSC Scholarship program. There was an inherent expectation that the scholarship was a good investment. However, no research was found in the literature that provides an estimate of financial return from the government's scholarship investment. There was also an expectation that certain societal benefits accrue from the availability of primary health care services in an underserved community. Yet few, if any, studies attempted to measure the societal dividends of the NHSC scholarship program.

This study provides an evaluation of the NHSC Scholarship for PAs and NPs with the hope that more efficient ways of making health care services available to America's medically underserved populations could be developed. Careful analysis of the relationship between funds invested and outcomes achieved can lead to funding and policy decisions that result in a more efficient use of tax dollars.

Definition of Terms

The following definitions were used in this study:

Federally Qualified Health Center (FQHC) is a type of provider defined by the Medicare and Medicaid statutes. FQHCs include all organizations receiving grants under section 330 of the Public Health Service Act.

Health Professional Shortage Area (HPSA) is a geographic area, population group, public or nonprofit private medical facility or other facility determined by the Secretary of Department of Health and Human Services to have a shortage of primary health care professionals.

Index of Medical Underservice (IMU) is a score used to measure the adequacy of medical service in a service area. The index involves four variables—ratio of primary medical care physicians per 1,000 population, infant mortality rate, percentage of the population with incomes below the poverty level, and percentage of the population age 65 or over. The value of each of these variables for the service area is converted to a weighted value, according to established criteria. The four values are summed to obtain the area's IMU score.

Medically Underserved Area (MUA) is a geographic area or population designated by the Department of Health and Human Services based on an index of variables known as the index of medical underservice (IMU).

Non-physician clinician (NPC) is a licensed medical provider, usually a physician assistant, nurse practitioner or nurse midwife who practices within limited guidelines or under the supervision of a physician.

Payback Potential refers to the potential to repay debt through the generation of additional tax revenues.

Persistence refers to a scholar's continued service in a designated health profession service area beyond the terms of the service obligation.

Scholar refers to a recipient, past or present, of the NHSC Scholarship.

Scholarship is an award usually based on academic achievement, community involvement, or similar factors. Most scholarships do not require repayment. For the purposes of this study, the term scholarship specifically refers to the NHSC Scholarship.

Service Obligation refers to a defined period of service, normally 2 to 4 years in a medically underserved area to satisfy the terms of the NHSC Scholarship contract. Generally, each year of scholarship support incurs 1 year of service obligation.

Social Debt Ratio is the monetary value of scholarship debt to be forgiven during a defined period divided by the income for the same period.

Social Debt Ratio Factor was derived from the ratio of total scholarship costs to tax revenue generated during the obligated service period.

Workforce Contingent Financial Aid (WCFA) programs provide financial aid to students by assisting individuals with their educational expenses in exchange for service in either specified fields or specified locations.

Statement of the Problem

The problems addressed in this research involved the fiscal return to society and to the individual from the Federal government's investment in NHSC scholarships for physician assistants and nurse practitioners. The research was specific to PAs and NPs who received NHSC scholarships to complete training programs across the United States between 2001 and 2004. The study examined the following specific research questions:

1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards?
2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards?
3. Are there differences in payback potential between nurse practitioners and physician assistants?
4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants?
5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program?

Few, if any, studies have been published that pertain to the NHSC Scholarship program for physician assistants and nurse practitioners or to the benefits derived by society and by the individual students.

A 1995 U.S. General Accounting Office (GAO) report analyzed cost, retention, and other data in an effort to (1) compare costs and benefits of the NHSC scholarship and loan repayment programs and (2) determine whether NHSC has distributed available providers to as many eligible areas as possible. Investigators concluded that the NHSC loan repayment program costs the government one half to one third less than the scholarship program. The report also found that recipients of loan repayment funds were not only more likely to complete their obligated service commitment than scholarship recipients, but they were more likely to stay beyond the end of their commitment.

The scholarship program was intended to allow the NHSC to place health care providers in the areas with the most critical health care needs because the scholars enjoyed less freedom of choice when selecting service sites. The GAO report, however, suggested that there was generally little difference in the priority of sites where scholarship and loan repayment recipients practice.

Additionally, the report pointed out that the NHSC does a poor job of allocation of provider resources based upon the health care service needs of eligible shortage areas. The awkward measurement criterion used often resulted in excess placements in some shortage areas and limited the government's ability to meet needs in others. The study did not, however, compare the scholarship program's fiscal costs and benefits to the government or to the individual (United States General Accounting Office [USGAO], 1995).

For participants of this study, the NHSC scholarship paid for the entire cost of their training plus a taxable stipend of \$1,065 per month for living expenses. Other non-taxable funds were provided to cover the costs of books, supplies and travel. The tuition

payments were also non-taxable. The scholarship was awarded for a minimum of 2 years and a maximum of 4.

Scholarships were funded based on the expenses the scholars were expected to incur at the educational institution they attended. In other words, as long as the school met the NHSC criteria as an eligible, accredited school, the amount of scholarship dollars invested was not an issue. For instance, a student at an expensive, private college could have received substantially more in scholarship dollars than a student at a more economical public university. Placement of graduates, on the other hand, was done with no regard to the amount of Federal funds invested in the scholar's training. For example, a scholar who received only \$30,000 in financial support could have been placed at a site with a higher HPSA score, indicating a critical need for health care services. Conversely, a scholar who received \$90,000 in financial support could have been placed in a site with a much lower HPSA score. This could have resulted in a much lower potential for social return on the investment. As it was administered, this system failed to provide any incentive for scholars to seek out sites with higher need. In other words, the NHSC lacked scholarship, loan repayment or other incentive programs that definitively tied the amount and type of award to the health care needs of the communities they served. More important, there was no system in place to evaluate the returns, fiscal or otherwise, of society's investment in this scholarship program.

Conceptual Framework

The fiscal return on investments made in NHSC scholarship support for NPs and PAs provides a reasonable outcome measure by which data can be evaluated. This study examined the relationship between NHSC scholarship support and enhanced productivity of income and additional tax revenues generated by the scholar.

Hansen (1963) defined production value as the generation of wages from employment pursuits. Wage-earning activity results in generation of tax revenue. Positive production value then becomes the increase in wage-earning capacity due to increased employment opportunity as a result of education or training. As an individual's earnings increase it is reasonable to expect that the contribution to the tax base will increase accordingly. Within this framework, Dunn (1996) used increases in tax revenues generated to demonstrate financial returns by Pell Grant recipients receiving Associate in Science degrees. Using an approach similar to the one used in this study, he found that grant recipients repaid society for the cost of the grant within 2 years.

Because positive productivity is a direct result of human capital development, the concept of human capital continues to dominate the economics of education and the analysis of labor markets. "The concept of human capital refers to the fact that human beings invest in themselves, by means of education, training, or other activities, which raises their future income by increasing their lifetime earnings" (Woodhall, 1987 p.21). Investment, or the expenditure of time or money on assets which could produce income in the future, must be distinguished from consumption, which requires the expenditure of time or money on goods and services to satisfy an immediate need but creates no potential for increased future benefit. Using this framework, one could draw a working analogy between investment in physical capital and investment in human capital.

While much has been written about measuring the fiscal returns of education, there was a paucity of literature examining workforce-contingent scholarship programs and the monetary returns to the individual or to society. The NHSC, for example, spent a large number of Federal dollars to recruit, train, and place clinicians in medically underserved

areas. But there were no effective measures being taken to track long-range production and fiscal returns.

Patterns of funding should be established with at least some awareness and consideration of expected returns to the scholarship investment. If the returns are not measured, it is impossible to compare the program to other reasonable alternatives.

As the largest provider of scholarships for clinicians destined to work in HPSAs, the NHSC has faced numerous large changes in funding over the years. In the 1970s the corps enjoyed funding of over \$140 million to provide scholarships for about 1700 clinicians annually. Following Senate hearings which revealed a default rate of nearly 20%, funding was cut to less than \$10 million (USGAO, 1995) and scholarships dropped to about 50 per year (Shapiro, 1994). Although it was likely that the program had successfully delivered medical care to underserved areas, the results were difficult to demonstrate. Without measuring such outcomes the corps will continue to be challenged to demonstrate the positive impact the scholarship program has on America's medically underserved communities.

It was important to study the NHSC scholarship program for NPs and PAs because the outcomes of these endeavors were an often-overlooked investment return. The scope of practice for NPCs was expanding and the roles and responsibilities for members of these two fairly new professions were becoming better established. Medical care organizations were responding by finding new ways to maximize their productivity. Yet many studies that examined physician workforce issues still did not consider the contribution of NPs and PAs.

Financing Physician Assistant and Nurse Practitioner Training

Reasons to become a physician assistant (PA) or nurse practitioner (NP) vary. Two common reasons were for higher pay and for job satisfaction. While non-physician clinician (NPC) salaries were much lower than those of physicians, the shorter training period resulted in much less foregone income. Job satisfaction may have stemmed from the increased ability to help others or from greater autonomy in decision making. Job satisfaction also came from the flexibility to easily move from one work setting to another. Students had the expectation that these benefits would offset the sacrifices endured during their training years.

The American Academy of Physician Assistants (AAPA) 2003 census of new enrollees in PA programs found that among the respondents most planned to pay for their education with loans. Other popular sources of funding included personal savings, family support, grants and scholarships. Service-obligated sources were the smallest source of funds. While the amount of expected debt from PA training ranged greatly, from \$5,000 (10th percentile) to \$80,000 (90th percentile), the mean amount of expected debt was \$41,032 (American Academy of Physician Assistants [AAPA], 2004).

The costs for nurse practitioner training were similar. Yet NPs seemed less likely to rely on loans. In a 2000 national sample survey Spratley, Johnson, Sochalski, Fritz, and Spencer (2000), asked registered nurses to indicate all of the sources of money used to fund their education. Among the respondents, 72% of nurses pursuing master's degrees relied on personal and/or family resources to cover the costs of tuition and fees. About 41% of the respondents received tuition reimbursement from their employers and a little more than 20% relied on loans. Only about 20% were supported by traineeships,

scholarships or grants such as the NHSC Scholarship. Figure 1.1 is an illustration of sources used by PAs and NPs to fund their training.

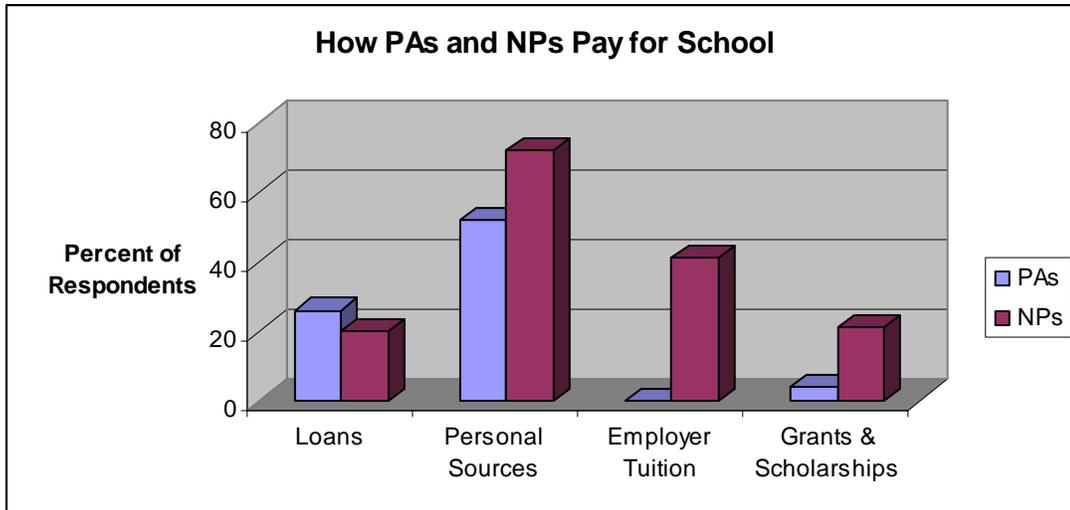


Figure 1-1. A Comparison of Sources Used by Physician Assistants and Nurse Practitioners to Pay for Training. Adopted from Spratley et al. (2000) and AAPA (2003c)

Some Federal programs sought to provide incentives for students in the health care professions with the aim of influencing them to provide medical care to underserved populations. One such program was the NHSC Scholarship Program. This program provided fiscal support to students in the form of tuition, stipends and allowances for travel, books, supplies and other reasonable expenses. In exchange, graduates agreed to repay the debt through 1 year of service in an identified service area for each year of financial support.

Upon initial examination, workforce-contingent investments, such as the NHSC scholarship program, may appear to be noble and responsible endeavors in that they required the recipients to “repay” society for the investment made in their education. But the terms of the contract sent the implied message that 1 year of service was equal in value to 1 year of scholarship support.

Outcomes were, at best, haphazardly measured using criteria that were cumbersome and subject to misinterpretation. This resulted in duplication of placement in some areas and shortages in others. Similarly, HPSA criteria could have been so narrowly interpreted that a doctor's office could have qualified as a HPSA while the hospital across the street from the office did not.

Yet, few have ever questioned the fiscal responsibility and effectiveness of such government programs. Perhaps because of the immense size and complexity of these programs and the departments that administered them, or perhaps due to the beneficent nature of a program designed to educate health care providers and serve the great need for medical care in certain populations, the public unequivocally accepted the idea that these programs met society's needs in an efficient and responsible manner.

The NHSC scholarship program was chosen for this study because its mission of providing care to underserved populations was important enough to warrant the expenditure of significant amounts of social capital and resources. But just as important was the need to identify, measure, and understand variables and outcomes that could facilitate efficient investment and allocation of Federal funds.

At the end of the day the question must be asked whether the large amount of time and money invested in the NHSC scholarship program produced a future offset through positive production. There should have been a point where it became necessary to properly account for these funds and measure returns on the government's human capital investments. Programs not meeting some minimum return threshold could have been deemed too expensive to become justifiable. DHHS funds were designated specifically for the purpose of decreasing morbidity and mortality in the neediest Americans. With

this designation comes the emotional baggage that makes funding cuts seem cruel and maleficent. But excessive waste of such funds due to program mismanagement and lack of accountability would be equally irresponsible.

Measuring Production

It was important to determine the relevance of the NHSC scholarship to rewards and compensation in order to gain an understanding of the benefits to society and to the individual. A number of methods could be used to estimate such benefits and returns.

Fiscal Returns to the Individual

Honeyman, Wattenbarger, and Westbrook (1996) described three ways to estimate the monetary yield of a college education:

1. earnings differentials
2. the net present value approach
3. private rates of return

The earnings differential approach is perhaps the easiest to calculate and most rudimentary of the three. This measure describes how much more, on average, an individual earns than other individuals with less education. The earnings differential has a number of limitations. Most important, it fails to measure preexisting differences as well as costs of education.

The net present value approach attempts to estimate the present value of an education by adjusting costs and benefits to reflect the changing value of a dollar over time. The result of such analyses is a benefit/cost ratio. For example Cohn and Geske (1990) demonstrated that each dollar invested in 4 years of college yielded, on average, \$1.19 for women and \$1.62 for men. Interestingly, postgraduate education dollars

invested yielded \$3.05 for women and only \$1.00 for men when compared to the baccalaureate-prepared student.

Estimation of the present value of a college education using the net present value approach is, however, problematic in that the discount rate (the interest rate used to determine the present value of future cash flows) selected by the analyst is based on the analyst's own view of the economic future. The net present value calculation is heavily influenced by the discount rate (Leslie & Brinkman, 1988).

The most broadly used measure for estimating the value of an education is the internal rate of return (IRR). The IRR is the discount rate at which the net present value calculation equals zero. By projecting a lifetime stream of earnings and costs of attendance, the IRR relates total resource costs of education to income benefits (Honeyman et al., 1996). Unlike the net present value calculation, the IRR is not heavily influenced by the discount rate selection.

To calculate the IRR the analyst must first examine earnings and costs corrected to current dollars. The discount rate that would set the earnings value equal to the cost value is the IRR. In other words, the IRR can be considered to be the relative increment of earnings associated with a given increment of education (Mincer, 1974).

The IRR is useful in that it is easy to compare to other potential yields. Leslie and Brinkman (1988) pointed out, however, that IRR calculations were extremely sensitive to the cost, as opposed to the benefits, of education. They also explained that because IRR calculations compound costs forward and discount earnings backward the calculation tells us more about the costs of education than the benefits.

They suggested that IRRs were an inappropriate base for making decisions about public support for higher education because the calculation is more of a reflection of how generous society has been in supporting higher education. Simply stated, society can easily influence IRRs by funding a larger share of the cost of education.

This study evaluated the usefulness of continuing support for the NHSC scholarship program. Specifically, the study examined the levels of income and years required to return the value of the scholarship to society. The study also allowed for generalizations to be made about the time required for payback of taxpayer funds based on starting salaries and average number of years a scholar stays in a HPSA.

Fiscal Returns to Society

Investments in education may also result in growth of the national income. Specifically, medical education may raise labor quality by imparting greater discipline, better health, and heightened mobility. The practice of medicine may not only influence the amount of available labor in the community, but also could impact the labor participation rate. Preventive medicine also has the potential to decrease costs associated with disease and therefore boost the rates of savings and investment among patients.

Non-physician clinicians underwent shorter training periods than physicians and the graduates were able to enter the workforce earlier. In the case of NPs and PAs, value added could be measured not only as the proportion of clinicians employed as a result of training, but also by many of the same measures that apply to the physician workforce.

Investments in medical education could result in a number of other returns, both positive and negative. The aforementioned is merely a sample of the education-related outcomes and is by no means a comprehensive listing. Indeed, one could argue that many other intangible benefits accrue that offset monetary losses. But measurement of fiscal

outcomes is important in that it allows us to understand and adjust our current practices to increase productivity, thereby increasing the other benefits as well.

Justification for the Study

There have been no studies that address the economic impact and ramifications to society of funding NHSC scholarships for PAs and NPs. While a 1995 GAO report analyzed and compared costs of the NHSC scholarship and loan repayment program, the report did not attempt to measure fiscal benefits to society or to the individual that could accrue from these programs. Scheffler (1975) produced early estimates of private rates of return for physician assistants. He found that the rates of return for this fledgling profession—over 20%—were comparable to those of physicians. But these estimates were based on imprecise data. Since Scheffler's 1975 study the scope of practice, salaries, and costs of training physician assistants has dramatically changed. Nurse practitioners have experienced similar advances. Yet there was a paucity of literature describing the impact of these changes on the current productivity of non-physician clinicians.

Title VII and Title VIII of the Health Profession Service Act provided large numbers of Federal dollars to education programs for nursing and allied health professionals through the Bureau of Health Professions and the Bureau of Primary Health Care. In 2001, approximately \$460 million was allocated for health professions education, including scholarship and loan repayment funds from the NHSC. Almost \$100 million of this was devoted to education programs. One of these programs, the NHSC Scholarship Program, provided \$8.4 million in scholarship support to physician assistants, nurse practitioners, and certified nurse midwives in exchange for service in HPSAs (Medicare Payment Advisory Commission, 2001).

Since the Federal government devoted such a large portion of the budget to the funding of medical education and since health care costs were skyrocketing nationwide, knowledge of the costs and benefits of such programs is important. Analysis of such programs could facilitate policy change, reallocation of funds and program modification in order to achieve the most efficient outcomes for the dollars spent. This research will show what, if any, fiscal benefits may accrue to the individual and/or society from funds received through the NHSC scholarship program.

Human capital theory holds that education, whether formal or on-the-job, is an investment both for the individual and the society that devotes resources to providing it. Individuals decide on how much to invest based on their expected private return, whereas governments base their decisions to invest or subsidize human capital on the social return. As an investment, education has been shown to increase a person's income even after adjusting for the costs of schooling and adjusting for differences in ability and family backgrounds. For the society, there is a social return that results from more productive individuals and there is a close link between education and GDP growth. (Langelett, 2002 p.10)

This study used a sample of NHSC scholars who completed nurse practitioner or physician assistant training between 2001 and 2004 to determine, through statistical analysis and descriptive data, whether societal returns justified the scholarship program as it is presently structured and administered. Society should expect that funds committed to the NHSC scholarship program were not wasted.

Waste could be described in a variety of ways. It could be defined by some strictly as a lack of monetary return from an investment. Payment of Federal taxes could be viewed as a positive fiscal by-product of NP or PA training. Default of a service contract resulting in the loss of a potential health care provider in a medically underserved area could also be viewed as waste.

In a 2001 JAMA report, Rabinowitz, Diamond, Markham, and Paynter (2001) sought to identify factors independently predictive of rural primary care supply and

retention and to determine which components of the Physician Shortage Area Program (PSAP) at Jefferson Medical College in Philadelphia, PA, were responsible for the outcomes. The group found a number of variables such as having a freshman-year plan for family practice, being in the PSAP, having an NHSC scholarship, being of the male gender, growing up in a rural community, and taking rural family practice electives were predictive of physicians practicing in rural primary care. However, they also noted that only three variables, selecting a rural preceptorship, growing up in a rural area, and attending college in a rural area, were univariately related to retention. While the study examined graduates from only a single medical school, it sheds some light on factors that could apply to health profession students nationwide.

Over time, the characteristics of scholars who were more likely to stay in a service site beyond their service obligation were identified by the NHSC and were actively sought during the application process. Scholarship applicants were scored numerically based on the extent that they appeared to have the following characteristics: (1) strong primary care post-service career goals in HPSAs, (2) experience within indigent or underserved communities, (3) understanding and acceptance of the mission of the NHSC and, (4) intent to participate in pre-professional clinical experiences in rural or urban community-based health care facilities serving HPSAs (Department of Health and Human Services [DHHS], 2003). Identification of retention characteristics was increasingly important as each year of service beyond the initial commitment greatly increased the positive returns on the scholarship investment.

The success of the NHSC provider training and placement programs could be measured by how well primary care providers were placed in HPSAs. Shortage areas

with the greatest need should have received additional emphasis and patterns of funding established with at least some awareness and consideration of expected return on investment. The assumption could be made that any given non-physician health care provider had the capacity to create roughly the same societal benefit to a given HPSA regardless of the institution where the clinician trained. One could also posit that communities with the greatest need for health care services accrued the greatest benefit from any given health care provider. It would be only reasonable, then, that scholarship funds were allocated with some consideration of the HPSA of assignment for each scholar. By analyzing the fiscal costs and benefits of the NHSC scholarship, the awards could have been administered in a way that made more efficient use of funds allocated to the Department of Health and Human Services.

Additionally, this study examined and compared individual costs and benefits of the scholarship program for NPs and PAs. A fully funded 2-year scholarship program with over \$26,000 in stipends plus allowances for books, equipment and travel expense reimbursements appears to be a good investment for the scholar. But foregone earnings, tax liabilities and other school-related expenses could have created significant differences in the degree of personal financial return between PAs and NPs.

The results of this study are important because they reported the fiscal costs and benefits of funding a Federal program aimed at providing primary health care services to underserved populations in the most efficient manner possible. These results should be useful in analyzing and comparing existing scholarship and loan repayment programs and in the development of models for future programs.

If the results of this study imply that the NHSC scholarship for PAs and NPs was an inefficient fiscal investment for society, the NHSC should carefully examine how funds were distributed, how providers were placed, and which methods were used to measure outcomes in underserved areas. It is entirely possible that the number of social and global economic benefits that accrued outweighed financial costs. But those benefits could also have been maximized as a result of changes in the program.

Limitations

Upon graduation and employment the scholars enjoyed enhanced income generation abilities. This was one means of validating investment returns. Such income allowed the scholars to purchase additional goods and services as well as generate additional tax revenues. The results of this study reported the years of income needed to repay the NHSC scholarship program investment through additional tax revenues generated.

It is evident that many costs and benefits, societal and personal, resulting from the NHSC scholarship program were ignored in this study. Those costs and benefits deserve additional study. This research was limited to monetary value considerations.

There were a number of other limitations to this study. Some of these limitations include the following:

1. The study was limited to 187 participants from four selected year groups of NHSC physician assistant and nurse practitioner scholars whose demographic and financial data were available through surveys, and in government and professional association databases. Scholars with invalid addresses on file with the DHHS and non-respondents were not included in the study. Forty percent of potential participants did not respond to the mail survey.
2. The study was limited to a review of investment returns through increased income generation due to employment at HPSA sites following NP or PA

training using NHSC scholarship funds. Additional income from related activities such as public speaking or moonlighting was not considered.

3. The study was limited to NHSC scholarship recipients. No comparison was made to other types of financial aid for health care providers. Similarly, income and obligations from other sources of financial aid were not considered in any comparisons.
4. Unique tax filing circumstances were not considered. For the purposes of this study a special report by the tax foundation (Moody & Hoffman, 2003) was used to estimate the average Federal tax burden on the American wage earner. Tax revenues were estimated by determining mean personal income of the subjects and applying the appropriate tax rate for that income bracket. Marriage, divorce, adoption or other changes to their tax-filing status could influence the amount of taxes paid by each of the subjects over the period of years studied.
5. Differences in training programs between schools and between years at the same school were not measured. While differences and variations in individual learning experiences are bound to exist, all of the programs are required to meet the standards of their respective accrediting bodies. These standards ensure that each program's curriculum is rigorous enough to produce competent clinicians capable of passing national certification examinations.

CHAPTER 2 REVIEW OF THE LITERATURE

This research concerns the National Health Service Corps (NHSC) Scholarship Program; therefore the literature review emphasized the Federal government's involvement in education and health care. While the NHSC also awarded scholarships to physicians, dentists and nurse-midwives, this research explored the funding of education for nurse practitioners (NPs) and physician assistants (PAs).

The Maldistribution of Health Care Providers in the United States

Accurate and meaningful measurement of the U.S. health workforce has always been an enormous task. This was due, in part, to the lack of consensus and varying definitions of workforce composition. The task was further complicated by the multiplicity of data sources including the Department of Labor (DOL), Department of Health and Human Services (DHHS), and a number of private organizations. To add to this confusion, studies involving measurement of the health workforce often did not consider the roles of non-physician clinicians (Matherlee, 2003).

The Secretary of the Department of Health and Human Services has designated numerous facilities, geographic areas, and population groups as Health Profession Shortage Areas (HPSAs). These were identified on the basis of agency or individual requests for such designation. The HPSA designation qualified these areas for Federal aid in the form of grants, enhanced Federal insurance reimbursements, and placement of NHSC practitioners.

A Federally Qualified Health Center (FQHC) was a type of provider defined by the Medicare and Medicaid statutes. This included all organizations receiving grants under section 330 of the Public Health Service Act. Federally qualified health centers received automatic HPSA designation.

Non-automatic HPSAs were scored using a point system based on four factors: (1) population to primary care physician ratio, (2) percent of the population with incomes below 100% of the poverty rate, (3) infant mortality and low-birth weight rates, and (4) travel time or distance to the nearest available source of care (Health Resources and Services Administration [HRSA], 2004b).

The population to primary care physician ratio generated up to ten points and each of the other four factors generated up to five points toward a maximum possible HPSA score of 25. Scholarship-eligible sites usually had a HPSA score of at least 15. Data used in scoring HPSAs came from a number of sources. Population and poverty data usually came from available U.S. Census information. In most cases, infant mortality/low birth-weight rates came from county-level sources. Most facilities did not qualify for points in this category and it was unusual for any facility to score higher than one or two points. Provider data included all non-Federal providers without NHSC obligations or J1 visa waiver obligations. Travel time and distance estimates were based on Primary Care Service Area (PCSA) and Graphic Information System (GIS) road classification data. These were sometimes modified based on local data (HRSA, 2004b).

According to a fact sheet developed by the North Carolina Rural Health Research Program, the Department of Health and Human Services used a ratio of one primary care physician per 3,500 population or more as the standard for a primary care HPSA

designation. The same department's recommended ratio for an "adequately served" population was one primary care physician per 2,000 people. In 1997, over 2,000 physicians would have been required in non-metropolitan areas in order to remove the HPSA designations. More than twice that number would have been required to meet the "adequately served" 2,000:1 ratio (HRSA, 1997).

In 1986, Congress authorized the Council on Graduate Medical Education (COGME) to provide an ongoing assessment of physician workforce trends and to recommend appropriate efforts to address identified needs. The tenth report, published in 1998, examined physician distribution in rural and inner-city areas. Rural areas seemed to be particularly hardest hit by shortages. Only about 9% of physicians in the United States practiced in rural areas despite the fact that roughly 20% of the population— about 50 million people—resided in rural communities (Council on Graduate Medical Education [COGME], 1998). The Bureau of Health Professions area resource files (Dill et al., 1996) demonstrated an inverse relationship between county population size and primary care physicians per 100,000 residents. Counties with populations greater than 50,000 had over 50 physicians per 100,000 while those with fewer than 2,500 residents had less than 20 per 100,000 residents.

According to the Federal Office of Rural Health Policy, persons living in non-metropolitan areas were nearly 4 times more likely to live in a HPSA than persons in metropolitan areas (HRSA, 1997). In a report of conference proceedings from the 5th International Medical Workforce Conference, Gary Hart (2000) cited the Rural Policy Research Institute (RUPRI) to further characterize the vulnerability of rural populations. He explained that, according to RUPRI, rural U.S. populations had relatively more

elderly and children, unemployment or underemployment, and poor and uninsured residents. Additionally, these populations were more vulnerable to economic downturns than their urban counterparts. More serious, Pol (as cited in Hart, 2000) stated that during the 10th decade of the last century, the percentage of the rural population under 65 without health insurance increased 11% to approximately 7 million (15.7% of the rural population).

More than 40 million adults and children in the United States were uninsured in 2000. When they sought health care, they often utilized a patchwork of unrelated community providers who were willing to care for them. This included a number of hospitals, community health centers, rural health clinics and a host of other providers. Care for the uninsured created challenges that left few resources to devote to creating an infrastructure to ensure continuity of care across providers (U.S. Congress, 2001).

Ricketts, Johnson-Webb, and Randolph (as cited in Hart, 2000) described rural health status as generally similar to that of urban areas. He also asserted that rural residents experienced increased risks from auto, gun, and farm accidents, and exposure to pesticides and herbicides, as well as an overall increase in the prevalence of chronic disease.

HPSAs were designated and ranked according to a number of statistics, namely, the availability of health care providers. The ratios used to designate HPSAs did not, however, consider contributions made by health care providers who were not physicians. Data definitional problems and differences in State laws also made estimation of non-physician Clinician (NPC) impact on the health care workforce difficult. Yet NPCs, such as physician assistants and nurse practitioners, were becoming increasingly important

providers of medical care services. As of 2003, approximately 110,000 PAs and NPs comprised approximately one-sixth of the physician work force. Their productivity and range of services approached 90% of what a primary care physician provided. The supply of NPCs was increasing. As of 2002, the annual number of PA and NP graduates had risen to 12,000. This number rivaled the 17,000 medical graduates produced each year (Hooker, 2003). Cooper, Laud, and Dietrich (as cited in Hart, 2000) estimated that the number of trained nurse practitioners would nearly double by 2015.

Gamm, Castillo, and Pittman (2003) asserted that non-physician clinicians appeared to slightly favor rural settings, provided needed primary care, and in most cases, costed less and were better able to conform to the resource constraints in rural areas than physicians. Baer and Smith (as cited in Gamm and Pittman, 2003) made the point that among the 55,730 active nurse practitioners and 31,084 physician assistants in 1996, a large percentage practiced in rural or urban settings. NPs and PAs in rural settings numbered 24.72 and 11.91 per 100,000 population, respectively; for the urban populations the numbers were slightly smaller at 20.08 and 11.66, respectively.

Very little research has been done to examine characteristics of non-physician clinicians and their decisions to practice in non-metropolitan versus metropolitan areas. Many of the same factors that influenced physicians may have also shaped the location decisions of non-physician clinicians and their dedication to practice in underserved areas. Rabinowitz et al. (2001) found that having an NHSC scholarship, being of the male gender, and taking an elective senior family practice rural preceptorship were independently predictive of physicians practicing in rural primary care. In their study,

participation in a physician shortage area program was the only independent predictive factor of retention.

A study by Fowkes, Gamel, Wilson, and Garcia (1994) suggested that older PA and NP students who clearly identified practice goals and had backgrounds in underserved areas were more likely to practice in such areas after graduation. It also seems plausible that clinicians with families would have been more likely to remain in one geographic location as children attended schools and developed circles of friends.

Characteristics of the site, such as scope of practice, turf conflicts, and reimbursement issues were also important to physicians. It is reasonable to assume that many, if not all, of these factors applied to PAs and NPs. Additionally, acceptance of non-physician clinicians by the local medical community may have played an important role in NPC retention.

From the literature it appears that reimbursement was not a strong incentive for clinicians serving in non-metropolitan areas. A report by the Federal Office of Rural Health Policy (1996) asserted that non-metropolitan physicians derived a larger share of their gross practice revenue from public programs that pay lower rates, such as Medicare and Medicaid. Conversely, metropolitan physicians served more patients with higher paying private insurance. Commonly used indicators of physician work load in 1995 indicated that non-metropolitan physicians worked longer hours and had more patient visits per week than their metropolitan counterparts (Federal Office of Rural Health Policy, 1996).

In a National Health Policy Forum Background Paper, Karen Matherlee (2003) provided a comprehensive view of the structure of the health workforce as well as public

and private insurance coverage and payment policies. Her assertion was that the health workforce “follows the dollars” of public (Medicare and Medicaid) and private insurers. She described Medicare as the “standard bearer” for many private insurers. Medicare covered eligible persons over 65 and younger people with qualifying disabilities. This made Medicare the largest payer for most hospitals and many practitioners and therefore a major influence on the health workforce.

Reimbursement for services provided also impacted a provider’s decisions regarding practice location. Certain practitioners could receive direct payments from Medicare and others could not. According to a 2002 Medicare Payment Advisory Commission report to Congress (as cited in Matherlee, 2003), nurse practitioners received 75-85% and physician assistants received 85% of the physician fee when they provided services within their legal scopes of practice. If, however, they provided these services under the direct supervision of the physician they billed directly under the physician’s number (billing incident to physician services) at 100% of the fee schedule.

Medicaid, a Federal-State entitlement program for certain persons and families with low incomes and resources, was another large source of funds to health providers in underserved areas. This public program allowed states a great deal of flexibility to administer their own plans. The Federal government provided matching funds to the states and outlined certain requirements. “A state’s Medicaid program was *must* to offer medical assistance for certain *basic* services to most categorically needy populations.” (Matherlee, 2000, p.11) Matching funds were also available for 34 optional services. Some states have undertaken initiatives to give different types of incentives to practitioners who selected certain specialty and practice locations. Because the states had

considerable flexibility in program administration, there was great variation from state to state in a practitioner's legal scope of practice and payment rates. All State programs covered medical services provided by NPs and PAs in fee-for-service and managed care plans either at the same rate or a lower rate than was paid to physicians (Matherlee, 2003).

The Use of Non-Physician Clinicians

At the time of this study, non-physician clinicians were well into their fourth decade of history in American medicine. They were employed by over one-quarter of all group practices and provided a major source of access in many large health maintenance organizations (Hooker, 2003).

The physician assistant and nurse practitioner professions were initially created as a strategy to address health care needs caused by a nationwide shortage of physicians. Many practices later employed them for a number of other reasons. Non-physician clinicians were trained in a much shorter period of time at a much lower cost than physicians. When this was coupled with the lower salary ranges, these clinicians became a cost-efficient way to improve the productivity of a practice.

An analysis by the U.S. Congress Office of Technology Assessment concluded that within their areas of competence, nurse practitioners and physician assistants provided health care whose quality was equivalent to that of care provided by physicians. Further, some studies indicated that these midlevel practitioners were more adept at providing supportive care, health promotion activities and services that depended on communication with patients (U.S. Congress, 1986).

More important, an NPC could handle routine office visits, see acute patients quickly, provide in-depth patient education, and perform a number of other routine tasks,

freeing the physician to concentrate on more complex cases, handle practice management tasks, or just spend a few extra hours each week at home.

Many practices used NPCs to handle overflow of patients and cover scheduled appointments when the physician was called away from the office for emergencies. Their flexibility and willingness to shift where demand for medical services was greatest made them an asset in a medical practice environment that was rapidly evolving. Other practices used NPCs to boost productivity and augment clinic services.

But a study by Shi, Samuels, Ricketts, and Konrad (1991) examined major factors influencing the use of NPCs in rural community and migrant health centers based on national survey data. The study demonstrated a significant but inverse relationship between the number of physicians and the number of NPCs employed. This finding suggested that NPCs primarily served as substitutes for physicians in rural community and migrant health centers.

In many work settings nurse practitioners and physician assistants provided comparable services and enjoyed similar scopes of practice. Yet the differences between the advanced nursing practice approach used by NPs and the medical model employed by PAs also allowed these two groups to offer a more diverse array of health care services when working side by side. With this in mind, it is useful to highlight the characteristics of the two professions.

Nurse Practitioners

Nurse practitioners were registered nurses (RNs) with advanced academic and clinical experience. They were trained to take principal responsibility for the diagnosis and management of uncomplicated illness either independently or as part of a health care team. NPs provided a full range of primary care services in the community setting and

made decisions about their patients' nursing needs. In some states, they had the authority to independently prescribe medications.

They were able to spend more time with their patients and provide education and counseling on wellness and disease prevention. Some nurse practitioners developed and implemented community programs dealing with issues such as self-help or group therapy, parenting, nutrition, and stress reduction. Many worked under the supervision of a physician. In their practice they often collaborated with other health care professionals on matters regarding patient care.

Their clinical knowledge and experience as RNs, coupled with their advanced clinical training, enables NPs to work with patients on a wide range of clinical tasks. NP practice blurs the discipline boundaries between nursing and medicine so their services can both substitute for and complement the care of physicians (HRSA, 2004a p.4).

Profile

In 1992 there were approximately 28,000 NPs practicing in the U.S. In an 8-year period the number rose 240% to more than 95,000 in 2000 (HRSA, 2004a). By 2004 there were 106,000 NPs practicing in the U.S. (American Academy of Nurse Practitioners [AANP], 2004). Approximately 96% of NPs were female and their mean age was 46. About 85% of them worked in primary care. Approximately 58% of NPs worked more than 32 hours per week (Hooker, 2003).

Training

The typical training program ranged from 15 to 36 months in length (with a mean of 26 months.) In 2002 these programs produced almost 7000 graduates. The programs taught assessment, diagnosis and intervention as an extension of nursing practice. At least 80% of NPs graduated with a master's degree (Hooker, 2003). According to a report by Nurse Practitioner Alternatives (NPA), over 83% of nurse practitioners were certified in

family and adult advanced practice nursing (Nurse Practitioner Alternatives [NPA], 2004).

By the end of the 20th century there were 321 institutions sponsoring nurse practitioner training programs. Around 72% of the graduates of these programs trained in primary care disciplines such as adult, family practice or pediatrics. Nurse practitioner education programs were accredited by the National League for Nursing Accrediting Commission, the National Association of Nurse Practitioners in Women's Health, and the Commission on Collegiate Nursing Education (HRSA, 2004a).

Scope of Practice

Most states required NPs to pass an examination from one of four certifying bodies; the American Academy of Nurse Practitioners (AANP), the National Certification Council for the Obstetric, Gynecologic and National Nurse Specialties (NCC), the American Nurses Credentialing Center (ANCC), or the National Certification Board of Pediatric Nurse Practitioners and Nurses (NCBPNP/N) (American Association of Colleges of Nursing [AACN], 2005).

Clinical activities for NPs were usually regulated by the State Board of Nursing. In nursing care functions, NPs were professionally autonomous. Most states, however, required them to work in collaboration with a physician. They were allowed to practice independently in 16 states, and in 10 of those they prescribed independently (Hooker, 2003).

The roles, responsibilities and privileges of NPs varied greatly depending upon the jurisdiction in which they practiced. In many states, the legislation defining scope of practice treated PAs and NPs fairly equally. But some states treated them unequally,

providing a competitive advantage for one profession over the other (Wing, Langelier, Continetti, Slocum, & Salsberg, 2003).

Salaries

A 2003 national salary of nurse practitioners showed the average salary as \$69,203 for full-time nurse practitioners. This was up 9.55% from the \$63,172 average in 2001. The survey also demonstrated differences based on practice setting. NPs working in urban areas fared best, with salaries averaging \$70,040, followed closely by those working in suburban areas, who made an average of \$69,835. Nurse practitioners in rural areas reported an average salary of \$66,842 (Tumolo & Rollet, 2004). According to the same survey, masters-prepared NPs made only around \$1,200 per year more than those with bachelor degrees (\$67,951 and \$69,144, respectively). Those with doctoral degrees who worked outside of academic settings earned \$77,243.

Work Settings

In 2004, almost 60% of NPs were practicing in ambulatory settings, including HMOs, school health, and private clinics and offices. Among these clinicians, 4.7% described their practices as independent (NPA, 2004).

Productivity

Nurse practitioners averaged about 75 outpatient visits per week (Hooker, 2003). Hooker also asserted that productivity of non-physician clinicians (NPCs) in a managed care setting was generally 10% higher than physicians in a similar or same setting. He further explained that this was due to the collateral roles and hospital responsibilities of physicians that took them away from the clinic.

According to a 2004 report (NPA, 2004) the majority of NPs saw between 11 and 15 patients per day. Only 21% of nurse practitioners surveyed reported more than 20 patient encounters per day.

Physician Assistants

Physician assistants (PAs) were trained to provide health care services under the supervision of physicians. The level of supervision, direct or indirect, varied depending on experience, the task performed, the legal environment and practice setting. PAs should not be confused with medical assistants, who performed routine clerical and clinical tasks. Physician assistants performed diagnostic, therapeutic, and preventive medical tasks as delegated by their supervising physician. This may have required them to take medical histories, perform physical examinations, order laboratory tests and x-rays, diagnose illnesses, and prescribe medications. PAs also treated minor injuries by suturing, splinting, casting, and performing other therapeutic procedures. Patient education and counseling was another important service provided by physician assistants.

While PAs worked under the supervision of a physician, they were sometimes the principal provider in clinics where a physician was only occasionally present or was primarily available by phone. PAs consulted with their supervising physician or other health care professionals as needed or required by law. The duties of the PA were determined by the supervising physician in accordance with State law (U.S. Department of Labor, 2004).

The American Academy of Physician assistants (AAPA) estimated that there were approximately 61,871 individuals eligible to practice as physician assistants during 2004. Physician assistants practiced in at least 61 specialty fields. According to a 2004 census, 42% of the respondents reported their primary specialty as one of the primary care fields:

family/general practice (30%), general internal medicine (8%), obstetrics/gynecology (3%), and general pediatrics (3%). Other prevalent specialties included emergency medicine (10%), surgery (23%), and internal medicine subspecialties (10%) (AAPA, 2004).

Profile

In a 2003 census of new enrollees in physician assistant programs, females accounted for 71% of respondents. The mean age of the newly enrolled students was 28.1 years. Three fourths had no dependents at the time of the census; one fourth report at least one dependent. The census also revealed that 76% of respondents were students during the 12-month period prior to PA school. Half of these were full-time students and half attended part-time. Approximately 58% were previously employed full-time in a health care field. In 2002, the average pre-PA student had worked 3.1 years in a health care field with direct patient contact prior to PA school (AAPA, 2003a).

Education levels of new applicants ranged from high school diplomas to doctoral degrees with 89% of respondents having 4 years or less of college. PA students come from a wide variety of backgrounds. Unlike nurse practitioner students who were all nurses prior to matriculation, PA students came from a number of medical-technical positions such as EMT/paramedic (17%), medical assistant (17%), emergency room technician (8%), and phlebotomist (9%). Only about 4% of PA students were registered nurses. Other types of nurses account for 8% of PA students (AAPA, 2003c).

Physician Assistant Training

In 2002 there were 133 accredited physician assistant training programs in the United States. Among these programs, 68 of them offered a master's degree. The rest offered a bachelor's or an associate's degree. Most applicants (79%) to PA programs in

2003 had already earned at least a bachelor's degree (U.S. Department of Labor, 2004). Despite the variety of degrees offered, most PA program curricula were very similar in structure and length.

Physician assistant training programs usually lasted at least 2 years and included classroom instruction in biochemistry, clinical pharmacology, clinical medicine, human anatomy and physiology, disease prevention and medical ethics. Similar to medical students and residents, PA students obtained supervised clinical training in several areas, including primary care medicine, inpatient medicine, psychiatry, surgery, obstetrics and gynecology, geriatrics, emergency medicine, and pediatrics.

Some PAs pursued additional education in specialties such as surgery, neonatology, or emergency medicine. PA postgraduate training programs were also available in areas such as internal medicine, rural primary care, emergency medicine, surgery, pediatrics, neonatology, and occupational medicine.

All states required graduates from accredited PA programs to pass the Physician Assistant National Certifying Examination (PANCE) to become eligible to practice. Afterwards, they were required to log 100 hours of continuing medical education every 2 years and pass the Physician Assistant National Recertification Examination (PANRE) every 6 years.

Salaries

Physician assistant salaries vary by location, specialty, and years of experience. According to a 2004 census by the American Academy of Physician Assistants, the median annual income for physician assistants with an average of 6 years of clinical experience was \$74,264. This was up from \$65,783 the previous year. Individuals in the 10th percentile earned \$57,823 while those in the 90th percentile earned \$103,614.

Approximately 24% of respondents reported receiving some type of bonus or incentive pay and 18% received overtime pay. Other forms of reported compensation included funds for malpractice insurance, licensing, credentialing, professional dues and continuing medical education. Respondents who graduated in 2003 reported a median starting salary of \$65,783. This was an increase from the previous year survey amount of \$63,437 (AAPA, 2004b).

Scope of Practice

Depending on the setting, physician assistants could perform roughly 80% of the routine tasks that physicians normally perform. These tasks included obtaining medical histories, performing physical examinations, and diagnosing and treating illnesses and injuries. They also performed a number of procedures such as suturing, lumbar punctures, thoracenteses, paracenteses, and central line placements. PAs worked under the delegated authority of a physician and they were not allowed to perform tasks that were not within the scope of practice of their supervising physician. The scope of practice in some states was very broadly defined; other states restricted the scope of practice in such detail that performance of routine tasks was limited.

Work Settings

PAs worked in a diverse array of settings. From military battalion aid stations, hospitals, and correctional institutions to private practices, community health centers, and inner city clinics, almost one fourth of PAs were located in rural and frontier communities (Cawley, 2002).

In 2004 only 8% of practicing PAs worked in Federally Qualified Health Centers, correctional facilities or other community health centers. Of the respondents practicing in

fields generally in demand at HPSA clinics, 30% practiced in family/general medicine, 3% in general pediatrics, and 8% in general internal medicine (AAPA, 2004).

When new enrollees to PA programs were asked about an intended specialty area, only 40% indicated family/general practice and 26% were undecided. Approximately 80% of respondents indicated that they would be willing to practice in a medically-underserved area, yet only 32% expressed an intention to practice in such areas (AAPA, 2003a).

Productivity

Roughly 88% of PAs worked more than 32 hours and averaged about 105 patient visits per week. In a report on non-physician clinicians in the U.S., Hooker (2003) cited a medical group management association (MGMA) survey that described the compensation-to-production ratio, (the salary and benefit cost to employ a provider compared to the revenue generated from their services.) This ratio was 0.38 for PAs, 0.41 for NPs, and 0.49 for family physicians. This was, perhaps, because PAs were paid substantially lower salaries than physicians and they saw a comparable number of patients per day. This made NPC utilization quite profitable for health care organizations at certain levels of medical care. The MGMA survey data also indicated that for every dollar a PA generated, 26 cents went to pay the PA (Medical Group Management Association (MGMA) as cited in Hooker, 2003).

Larson, Hart, and Ballweg (2001) estimated the productivity of a nationally representative sample of PAs at 83% of that of physicians. They reported that the PAs performed 61.4 outpatient visits per week compared to 74.2 visits performed by physicians. The authors go on to say that rural PA productivity was higher than urban productivity due to the concentration of generalist PAs in rural settings.

Assistance to Health Profession Shortage Areas

Since the 1970s financial support for the education of health care providers to serve in shortage areas has been provided primarily through a few foundations and a number of government programs. Some programs were designed to facilitate the training of new health care providers or to influence them to practice in shortage areas. Other programs improved reimbursement for existing health care providers in underserved areas.

Medicare

The role of Medicare in (1) funding of Graduate Medical Education (GME) and (2) enhanced reimbursement played an enormous role in the preparation and support of health care providers serving HPSAs. Direct GME funds covered residents' salaries and fringe benefits, allocated hospital overhead connected with training programs, and other costs. Indirect GME dollars were added to inpatient prospective payment of diagnosis-related group rates in order to recognize the additional costs teaching hospitals incur as a result of their teaching programs. According to Matherlee (2003), Medicare GME outlays in 2000 were approximately \$7.8 billion.

Medicaid

Medicaid was a Federal-State entitlement program aimed at low-income and resource-poor individuals. While states were required to offer medical assistance for certain basic services to most categorically needy populations, the system provided states with a great deal of flexibility to administer plans in ways that best met the needs of their recipients. Matching funds were also available for a number of optional services.

Under Federal-State arrangements, states were responsible for purchasing health care services and paying health care providers. Most states, however, contracted with health plans under managed care arrangements. The flexibility of the program allowed a

number of states to create incentives for practitioners who selected certain specialty areas and practice locations. Payment rates and legal scopes of practice varied from state to state (Matherlee, 2003). According to Heinrich (USGAO, 2000) Medicaid became the largest source of health care revenues for community and migrant health centers. In 1998, health centers reported revenues of almost \$3 billion.

Foundations and Trusts

For many years the W. K. Kellogg Foundation, the Pew Charitable Trusts, and the Robert Wood Johnson Foundation offered philanthropic support to programs that sought to improve the availability of community-based medical care and primary care practitioners (Matherlee, 2003).

The W.K. Kellogg Foundation was created in the 1930s to prepare health care providers with the values, skills, and perspective associated with promoting health and preventing illness and with community in its broadest sense. Since then the Foundation's programs brought together educational institutions with community-based organizations to improve health professions education.

The Pew Charitable Trusts embarked on a four-part strategy to appropriately train health care providers and improve the provision of primary and population-based health care. The strategy involved defining the system and the roles and responsibilities of the practitioners, determining financing changes necessary to support shifts in training, redirecting training to community-based outpatient settings, and educating the public about primary care services and how to use them more effectively.

The Robert Wood Johnson Foundation's programs related to primary care workforce development covered several categories. These included training and leadership development, enhancement of generalist physician training programs,

development of primary care practice in communities, and improvement of diversity of the health care workforce (Matherlee, 2003).

Public Health Service Act

The Federal government, through Titles VII and VIII of the Public Health Service Act (PHSA) supported a number of efforts aimed at training health professionals to serve in shortage areas. Title VII covered medical, dental and allied health. Title VIII covered general and advanced practice nursing (Matherlee, 2003). A number of initiatives fell under the umbrella of these two titles:

The Minority and Disadvantaged Health Professions Initiative provided support to health professions and scholarships to disadvantaged and minority students who attended a health professions or nursing school. This included Centers of Excellence Programs, the Health Careers Opportunity Program, the Scholarship for Disadvantaged Students Program, and the Faculty Loan Repayment Program.

Primary care medicine and dentistry programs promoted training of practitioners including general pediatricians, generalists in internal medicine, family physicians, dentists, and PAs. The Geriatrics Health Professions Program supported geriatric faculty fellowships, entry of geriatric physicians into academic medicine, and geriatric training in schools.

The Quentin N. Burdick Program for Rural Interdisciplinary Training strengthened the distribution, diversity, and quality of health care practitioners by providing opportunities for collaboration among academic institutions, rural health care agencies, and health care professionals.

The National Center for Health Workforce Analysis collected and analyzed data on the health care workforce in an effort to help State and local planners. The center

conducted workforce issue analyses, evaluated training programs, and conducted research on the health workforce.

The PHSA, through Title VIII, provided for public health workforce development, nursing education initiatives and nursing workforce development as well as loans for needy and disadvantaged medical and nursing students (Matherlee, 2003).

Area Health Education Centers

The Health Resources and Services Administration (HRSA) encouraged students to take advantage of training opportunities by serving the health care needs of underserved communities. This was done with financial support to Area Health Education Centers (AHECs) as authorized by the PHSA. These centers served the communities by extending the resources of academic health centers into rural areas and providing clinical training opportunities for health professions and nursing students (National Rural Health Association [NRHA], 2003).

The AHEC initiative enjoyed great success since the inception of the first generation of centers in 1972. A second generation of AHECs began in 1977, followed by a third generation in 1984. Unlike the first-generation AHECs, subsequent generations placed greater emphasis on non-physician clinician education (Bernstein, 1990).

Each of the AHECs was eligible for Federal funding for up to 9 years. During this time State and local governments contributed at least 25%. The goal was to eventually function without Federal funding. As of 1998, over 23 AHEC programs were functioning without Federal funding and eighteen more were moving toward independence.

The AHECs differed greatly in their unique goals and priorities. These centers were involved in a wide variety of activities designed to meet the needs of the local populations and the students. In Southwestern border-states they emphasized recruitment

of health professionals to serve Hispanic communities while others targeted Native American and Black populations. Urban AHECs often concentrated on graduate medical education, health profession career opportunities, undergraduate medical education, health education and nutrition programs. Rural AHECs, on the other hand, emphasized nursing education and continuing professional education, and provided strong support for area NHSC clinicians.

The continued success of the AHECs resulted in a relatively stable funding history. As of 1990, appropriations for these programs totaled \$18.5 million. The decentralized clinical education experiences made possible by the AHECs provided confirming education for health professionals in remote communities. These experiences often influenced health care providers to make the decision to serve in a HPSA after graduation (Bernstein, 1990).

National Health Service Corps

Initially enacted by the Emergency Health Personnel Act of 1970 to respond to geographic maldistribution of primary care professionals, the NHSC was later authorized under Title III of the PHSA. The NHSC, which offered scholarship and loan repayment dollars in return for obligated service in shortage areas, has gone through periods of fluctuating fiscal support.

In 1972, the NHSC scholarship program was created, followed by the loan repayment program in 1987. The NHSC loan repayment program was accompanied by a State Loan Repayment Program created in the same year. Under the State Loan Repayment Program, states were encouraged to create loan repayment programs similar to the NHSC program. The Department of Health and Human Services was to then fund up to 75% of the total costs through a grant to the state.

The 1980s were particularly hard years for the NHSC scholarship program. Appropriations fell from \$63.8 million in FY1981 to \$0 in FY1989 and FY1990. In 1987, Congress initiated the NHSC loan repayment program under which the Corps would repay educational loan obligations incurred by health care professionals in exchange for obligated service in HPSAs.

The 1990s saw a revitalization of the programs and the number of HPSA designations increased dramatically. Between 1990 and 1994, Congress increased NHSC program funding in response to an increase in the number of HPSAs. As a result, the number of health professionals with scholarship obligations increased precipitously and the funding continued to increase in the years following, from \$112.4 million in FY1998 to \$115.3 million in FY1999, \$116.9 million in FY2000, and \$125 million in FY2001. However, this still met less than 13% of the current need for primary care clinicians in HPSAs (U.S. Congress, 2001). In FY 2002, \$90 million in NHSC scholarships and loan repayments were awarded to health care clinicians (Duke, 2002).

The scholarship program remains a vital piece of the NHSC package. As a result of the Public Health Service Act, at least 40% of NHSC funding was required to be used for scholarships (USGAO, 2000). In 2003 an estimated 522 new and 70 continuing scholarships were awarded, obligating roughly \$39.6 million. The total estimate for FY 2004 was \$57.2 million (NHSC, 2004c).

Economic Incentives for Community Health Centers

In addition to financial support for education of health care providers, a number of economic incentives were available to establish and maintain the community health centers that provided training and future employment opportunities to students. Barnes et al. (2004) outlined six strong economic incentives for these organizations. These include

(1) Section 330e grant funding, which allowed communities to receive up to \$650,000 in Federal grant dollars to establish and operate health centers; (2) malpractice insurance coverage under the Federal Tort Claims Act; (3) access to medicines at a discounted rate through the 340B drug pricing program; (4) Enhanced Medicaid reimbursements; (5) State and local funding and donations; and (6) health care provider recruiting assistance through the NHSC.

Federal Support for Higher Education

In accordance with the tenth amendment of the U.S. Constitution, responsibility and authority for funding higher education belongs to each of the 50 states. But the Federal government has a long and diverse history of increasing support for higher education. This history is marked by a number of significant events. A few of these milestones deserve mention in that they help build an understanding of the current Federal financial aid environment. Beginning with the Land Grant College Acts of 1862 and 1890, Federal support has served to stimulate the growth of public higher education in the United States. These Acts also forged a link to economic development of the industrial classes through higher education.

Following the Second World War, the Serviceman's Readjustment Act of 1944, also known as the GI Bill, opened the door to a broad middle class that built upon the research partnerships that had developed between the Federal government and higher education. The benefit covered all tuition, books and fees along with a monthly stipend. In the peak years of the program the costs amounted to \$2.7 billion, almost 1% of the gross national product. According to Prisco, Hurley, Carton, & Richardson, (2002), the GI Bill marked the emergence of the most significant Federal role in higher education and set in motion the growth and expansion of numerous public institutions.

In the late 1950s the launch of Sputnik by the Soviet Union started a space race which resulted in the creation of the National Defense Student Loan (NDSL) program. The program, which sought to increase the U.S. supply of scientists and teachers by forgiving up to half of a student's loan in exchange for service teaching science, math, or a foreign language, later became known as the Perkins loan program (Shapiro, 1994).

In 1964 the civil rights act, Title IX of the Education Amendments of 1972, and the Americans with Disabilities Act of 1991 opened the doors to even more Americans. Higher education institutions continued to respond to calls for diversity inspired by these changes.

In 1965 President Lyndon B. Johnson signed the Higher Education Act which sought to ensure access to higher education institutions for high school seniors regardless of their financial status. Backed by an unprecedented \$804 million, the bill effectively shifted the focus of Federal support from areas defined as national priorities to those of community service, continuing education, library assistance, and teacher programs (National Education Administration [NEA], 2003).

The Federal government also supported higher education through a number of student assistance programs, tax policies, and research support. Following the NDSL program of 1950s, the 1960s saw several programs emerge that were designed to fight the war on poverty. Through the Guaranteed Student Loan program, for instance, the Federal government guaranteed loans to economically disadvantaged students. Similarly, the Supplemental Educational Opportunity Grant (SEOG) program distributed funds to institutions of higher education to provide grants to needy undergraduate students. In the

1970s, the largest Federal grants program in history, the Pell Grant program, began making grants available to undergraduate students in need (Prisco et al., 2002).

In addition to the numerous loan and grant programs, a number of tax programs were favorable towards institutions and their students. Wolanin (NEA, 2003) estimated that Federal tax benefits afforded to institutions of higher learning could be valued at approximately \$50 billion per year.

Individual tax credits could be appreciated in the form of tax-free scholarships as well as tax credits and deductions. The Taxpayer Relief Act of 1997 created one of the largest and most expensive tax benefit programs for higher education expenses in history. Conklin (as cited in NEA, 2003) described the resulting Hope tax credit as a program so large that when taxpayers fully use the tax credits, the cost to the government could easily exceed the cost of all other existing Federal financial aid programs combined.

Research support was another large source of funding for U.S. colleges and universities. According to a 2002 American Association for the Advancement of Science intersociety working group report (as cited in NEA, 2003), Federal sources were responsible for \$17.5 billion of funds for research in higher education. The lead supporters of research funding for higher education were the National Science Foundation and the National Institutes of Health.

Despite the appearance of an enormous increase in support for higher education, McPherson and Shapiro (1997) contended that State governments have been decreasing the appropriations to public colleges and universities and that the burden of college costs had been shifted to students and families through increased tuition. They pointed to a 26% increase in tuition in 1979-1980 and a 35% rise in 1992-1993. They further

explained that higher costs were restricting college options for some lower income students and that Federal student aid programs failed to keep pace with the increases.

Recent Federal Involvement in Higher Education

A 2001 report to the U.S. Department of Education (U.S. Department of Education, 2001) stated that Federal support for education, excluding estimated Federal tax expenditures, was over \$128 billion in FY 2001. The report further pointed out that Federal support for education increased 56% between FY 1990 and FY 2001. Of the estimated \$678 billion in direct expenditures by schools and colleges in FY 2001, over \$77 billion was in the form of revenues from Federal sources.

The 1992 reauthorization of the Higher Education Act dramatically changed the landscape of student financial aid and debt burden. Choy and Li (2005) described dramatic increases in Federal borrowing due to the increased loan limits and eligibility for Stafford loans and the introduction of the unsubsidized Stafford loan. They assert that after adjusting for inflation, the Federal loan volume increased 137% in the decade following the reauthorization. The amendment also increased family income eligibility limits for Pell Grants. Part-time students became eligible as well (Prisco et al., 2002).

1993 saw the Student Loan Reform Act dramatically expand the direct loan program from 100 to 1000 institutions. During the same year, the National Service Trust Act created “AmeriCorps” and established a national service trust offering individual grants of nearly \$5,000 annually for college costs in exchange for each year of full-time community service (Prisco et al., 2002).

Choy and Li (2005) also pointed out that the percentage of bachelor’s degree recipients who had borrowed money from any source to finance their undergraduate education increased from 49% in 1992 to 65% in 2000. Graduate student borrowing

increased from 67% to 72% for dependent students during the same period. More important, they concluded that higher salaries, low interest rates, and loan consolidation programs resulted in increased overall debt without substantially increasing the debt burden (monthly loan payment as a percentage of monthly income).

Zuckman (1991) added that students received fewer grants in the 1980s and into the 1990s. He reported in *Congressional Quarterly Weekly* that 80% of all Federal financial assistance in 1975 came from grants. By the early 1990s that figure had dropped to 49%.

President Clinton (1997) began his second term with a State of the Union Address that declared educational reform his top priority. As a result, the 1997 Taxpayer Relief Act called for an increase in Federal grants to low-income undergraduates (Kane, 1997) and \$38.4 billion in education tax cuts over 5 years. This included the HOPE Scholarship tax credit, a Lifelong Learning Credit, and elimination of penalties for IRA withdrawal if funds were used for postsecondary education. Many argued that these tax credits benefited primarily middle-income students at higher priced institutions and neglected lower-income students (Prisco et al., 2002).

Similarly, Thomas Kane (1997), who estimated the cost at approximately \$48 billion over 5 years, asserted that the tax cuts were poorly targeted and could be abused for leisure-oriented coursework. He also claimed that the plan would do little to reduce the cost to families of future tuition increases. He recommended greater reliance on income-contingent loan forgiveness as an alternative way to help families pay for college.

Since the Land Grant Acts and the GI Bill, the Federal role in higher education support has greatly expanded. By increasingly manipulating the terms under which

Federal resources were made available, the Federal government developed substantial influence over higher education behaviors and outcomes.

Federal Support for Medical Education

Medical training in the United States evolved from an endeavor largely funded by tuition, fees, endowments, and appropriations to one supported by research grants, contracts, and clinical practice (Abrahamson, 2000). As funding sources and priorities changed, the activities of medical students and the roles of faculty changed.

In the 19th century and through the first 10 years of the 20th century, medical education was very poorly funded. According to Shyrock (1947), theological schools received \$18 million in total endowments. Medical schools received only half a million.

In the years following Abraham Flexner's grilling review of medical education in the United States, medical schools began to receive hundreds of millions of dollars. Many of these funds came from national foundations such as the Carnegie Corporation and the General Education Board. These were added to already generous contributions from private philanthropists (Ludmerer, 1999).

Following World War I medical schools grew enormously. This growth was partly fueled by advances in medical research. Research evolved from an activity whose purpose was to enhance teaching to one that promised to solve the medical problems of the world. During the 20th Century, the number of medical discoveries in France, Britain, and Germany began to decline, but the United States experienced dramatic research breakthroughs in a number of fields. While some U.S. medical schools generated modest funds from faculty practice, research was clearly at the forefront of means for generating revenue in U.S. medical schools.

When Medicare and Medicaid legislation was enacted in 1965, the emphasis for revenue sources slowly began to shift from research to medical service. For instance, in the early 1960s, every dollar generated from medical service was matched by 4.7 dollars from medical research. By the late 1970s, the ratio had become 1:1 and by the early 1990s U.S. medical schools received two dollars of revenue from clinical practice for every one dollar from research (Ludmerer, 1999). Clinical practice was clearly becoming the cash cow for medical schools.

Federal Funding of PA and NP Training

Non-physician clinician training programs experienced a different history of financial support. These programs were almost exclusively dedicated to education with a small amount of faculty practice activity. Since their inception in the late 1960s, the nurse practitioner and physician assistant professions gained great momentum and support from Federal programs aimed at improving access to medical care for underserved populations. While many of their respective training programs were conceived primarily with “soft money” from grants, the duration of these sources of funding was usually limited; schools were pressed to find more durable streams of revenue in the future.

Title VII of the Public Health Service Act authorized competitive grants for the training of physicians, physician assistants, dentists, and other health professionals. Title VIII programs supported nursing education. Under these titles, the Bureau of Health Professions (BHPR) administered about 40 grant programs.

In fiscal year 2001, Title VII programs allocated \$4.0 million to accredited schools to meet the costs of planning, developing, and maintaining programs to train physician assistants in primary care medicine. In the same year, Title VIII programs appropriated \$59 million to support accredited programs in advanced nursing education, including

master's degree programs, post-masters certificate programs and nurse midwifery certificate programs (Medicare Payment Advisory Commission, 2001).

The National Health Service Corps Scholarship Program

The National Health Service Corps was originally enacted by the Emergency Health Personnel Act of 1970 to respond to the geographic maldistribution of primary health care professionals. The program, authorized under Title III of the Public Health Service Act, was comprised of scholarship and loan repayment programs that provided education and financial assistance to students in the health professions. In return, the graduates served in HPSAs for a period of up to 4 years. By placing health professionals in medically underserved areas, the NHSC played a critical role in providing medical care to populations that would otherwise have had no access to health care services.

The scholarship program was created in 1972 and the loan repayment program was initiated in 1987. The NHSC scholarship was created to provide financial support to health professions students in return for service in designated areas. Similarly, the loan repayment program repaid both governmental and private loan obligations in exchange for service. In 1987, Congress also established a State Loan Repayment program. Under this program, if a state established a loan repayment program similar to the NHSC program, the Department could fund up to 75% of the total costs through a grant to the State (U.S. Congress, 2001).

The NHSC Revitalization Amendments of 1990 extended the program for 10 more years and increased the use of nurse practitioners and physician assistants. In FY 2003 the NHSC made 1204 new loan repayment contracts and 147 new scholarship awards; they also continued 78 scholarships from the previous year. FY 2004 saw \$124 million in appropriations for NHSC loan repayment and scholarships. President Bush's FY 2005

budget proposal called for a 21% increase to \$159 million (Association of American Medical Colleges [AAMC], 2004).

NHSC Scholarship Program Description. Congress mandated the NHSC to supply health care professionals with the necessary training and skills to deliver quality health care services to HPSA populations with the greatest need. The scholarship program provided the NHSC with graduates from qualified training programs who were capable of providing health care services to HPSAs throughout the United States.

The program was not a general financial assistance program for students in health-related professions; rather it was a competitive Federal program, which awarded scholarships to students pursuing primary care health professions training. The scholarship provided payment of tuition, fees, and other reasonable costs as determined by the school. The scholars also received a monthly stipend of \$1,065 (DHHS, 2003).

Kirshstein, Berger, Benatar, and Rhodes argued that even though these types of programs were labeled as “scholarship programs”; they could be more accurately described as Workforce Contingent Financial Aid (WCFA) programs because recipients were required to repay the money if they failed to meet the workforce requirements. The authors described the critical elements of WCFA programs as (1) support to cover educational expenses either during or after schooling in exchange for (2) a workforce commitment as a condition for receiving assistance (American Institutes for Research, 2004).

Scholarship programs, on the other hand, award funds for the support of education with no requirement for repayment or workforce commitment.

Student Eligibility. In order to be eligible for NHSC scholarship awards, applicants were required to meet a number of requirements. According to DHHS, (2003) they must have been U.S. citizens or nationals and enrolled or accepted for enrollment as full-time students in an eligible, accredited training program. Training programs must have resulted in the appropriate certification and/or licensure as defined by the DHHS.

While most scholarship recipients served their commitments as salaried non-Federal employees of public or private entities approved by the NHSC, there were occasional vacancies which required Federal employment. Therefore applicants were required to be eligible to hold appointments as commissioned officers in the Public Health Service (PHS) or as Federal civil servants. Additionally, applicants were required to be free of Federal judgment liens and delinquent debts. They were also required to be free of other conflicting service commitments (DHHS, 2003).

The scholarship program selection process was very competitive. A number of factors were considered when selecting applicants. Potential scholars were required to demonstrate geographic flexibility and a strong interest in providing primary health care to the underserved populations nationally. First priority was given to previous scholarship recipients and medical students who were recipients of the Federal Scholarship Program for Students of Exceptional Financial Need (EFN).

The second priority was given to applicants who demonstrated characteristics that increased the probability they would continue to practice in HPSAs after they completed their service commitments. These characteristics included experience with indigent or underserved communities, intent to participate in pre-professional clinical experiences in

rural or urban community-based health care facilities serving HPSAs, and strong primary care post-service career goals in HPSAs.

A third priority was given to applicants from disadvantaged backgrounds. These applicants demonstrated the HPSA retention characteristics and also were certified as having come from “disadvantaged backgrounds” (DHHS, 2003).

Training Program Requirements. Nurse practitioner training programs were required to be accredited by one of several listed accrediting bodies and must have awarded either a Master’s degree or a Post-Master’s Certificate. Physician assistant training programs were required to be accredited by the Accreditation Review Commission on the Education of Physician Assistants (ARC-PA). PA applicants were to have graduated from a 4-year baccalaureate PA training program or a 2-year post-baccalaureate program with a Bachelor’s or Master’s degree. Applicants graduating from a certificate program or Associate degree program were also required to demonstrate broad background knowledge of the medical environment, practices and procedures. In lieu of this knowledge, they were required to provide proof of 3 or more years of responsive and progressive health care experience as a corpsman, medical technician or other health care worker. Programs must also have led to national certification as family nurse practitioners or as physician assistants (DHHS, 2003).

Student Application Process. Applicants were required to submit applications along with supporting documents several months in advance. Application deadlines were usually in late March and award notifications complete by the end of September of the same year. The applicants submitted a signed contract and verification of acceptance or of good standing from an eligible training institution. Applications of eligible individuals

were scored numerically. If the application fell within a competitive range, he or she was invited to a personal interview (DHHS, 2003).

The NHSC scholarship program enjoyed a high level of interest among potential recipients. In a March 2000 testimony before a Senate Subcommittee on Public Health and Safety, Heinrich (USGAO, 2000) pointed out that the program had almost seven applicants for every available scholarship.

Scholarship Benefits to Student. Scholarship benefit availability depended on funding appropriated by Congress for the current year. The scholarship award consisted of payments, in whole or in part, for tuition, an amount for all other reasonable expenses incurred by the student and a monthly stipend for the 12-month period beginning with the first month of each school year in which the applicant was a participant in the scholarship program. Scholarship support was limited to a maximum of 4 school years (NHSC, 2004a).

Payments for Other Reasonable Costs (ORC) were based on cost estimates submitted by the scholar's educational institution. These funds covered the costs of required books, clinical supplies, lab expenses, instruments, two sets of uniforms, graduation fees, computer/PDA purchase or rental (if required of all students), and travel expenses for one clinical rotation. A taxable stipend of \$1,065 was also provided for each month of scholarship support (DHHS, 2003).

Scholars were also eligible to receive travel support for pre-employment interviews at eligible sites. Travel support was authorized up to a total of \$1,100 in accordance with Federal Travel Regulations and NHSC travel policies.

Upon placement, scholars were provided with support for relocation. This included reimbursement of travel expenses, shipment of household goods up to 18,000 pounds and storage of household goods for a maximum period of 90 days (NHSC, 2002).

Repayment through service. In return for financial support, the scholars were required to fulfill their service commitment at HPSA locations in the United States and its territories. Students agreed to provide 1 year of service for each school year or partial school year of scholarship support received (DHHS, 2003). Scholars were required to engage in a full-time clinical practice, defined as a minimum of 40 hours per week for at least 45 weeks per year, not including on-call or teaching activities. The minimum service commitment was 2 years and the maximum was 4 years (NHSC, 2002).

The scholars fulfilled the service commitment as non-federal employees, commissioned officers of the U.S. Public Health Service, or as civilian employees of the U.S. Government. About 92% of scholars served as non-federal employees of public or private entities. Scholars provided full-time clinical primary health care services in high-need, high-priority HPSAs selected by the Secretary of DHHS. The scholars were provided with a list of eligible sites approximately 4 months prior to the scheduled start of service. The Early Decision Alternative (EDA) option allowed scholars to compete for their choice of job vacancies on the list. Recipients who failed to obtain placement in one of the approved practices by the deadline announced by the NHSC were involuntarily assigned to a practice based on the needs of the NHSC (DHHS, 2003).

Several types of placement sites appeared on the HPSA list. These included Non-Federal placements such as Private Practice Assignments (PPAs), which were public or private entities that operated a community-based system of care, and Private Practice

Options (PPOs), which were private practices that provided fee-for-service or salaried positions at public, private non-profit, or for-profit sites. Federal placements included positions with the Indian Health Service (IHS), the Federal Bureau of Prisons (BOP), or the division of Immigration Health Services of the Immigration and Naturalization Service (INS). Governing Statutes allowed the NHSC to provide a ratio of up to three potential practice positions for each scholar up to a maximum of 500 positions (DHHS, 2003). While this may seem to be a generous number of potential employers from which each scholar may choose, the truth is that this same list of employers was shared by loan repayment recipients and anyone else that desires to work in a HPSA.

Persistence, Employment and Default. Default, the failure of a scholarship recipient to provide services as defined in the scholarship contract, resulted in severe penalties. If a recipient was found to be in breach of contract, the United States was entitled to recover damages equal to 3 times the scholarship award plus interest in accordance with the formula:

$$A = 3 \phi \frac{(t-s)}{t}$$

Where 'A' = the amount the U.S. is entitled to recover; 'φ' is the sum of the amounts paid to or on behalf of the participant and the interest on such amounts which would be payable if, at the time the amounts were paid, they were loans bearing interest at the maximum legal prevailing rate as determined by the Treasurer of the United States; 't' is the total number of months in the participant's obligated period of service; and 's' is

the number of months of the period of obligated service served by the participant. This was all to be paid within 1 year of the date of default (DHHS, 2003).

Challenges to this policy enjoyed little success. An analysis by Helms and Helms (1991) examined 110 cited judicial decisions from 1950 to 1989 involving medical students and undergraduate medical education. Disputes over financing medical education were involved in 54% of these cases. These primarily arose from challenges to NHSC obligations and from attempts to reorganize or discharge debt under the Bankruptcy Code. The authors pointed to a need for informed counseling for medical students, particularly the default consequences of NHSC service obligations and of incurring loans under the Health Education Assistance Loan (HEAL) program as opposed to other loan sources.

According to the Department of Health and Human Services, each year a number of NHSC scholars defaulted on their contractual agreements. Between January 1st, 1999, and August 18th, 2004, approximately 120 physicians did not fulfill their obligation. Among nurse practitioners, 27 were in default. Of the approximately 50 nurse practitioner scholarships awarded per year, 4.5 scholars, or 9%, failed to fulfill their obligation. Physician assistants were less compliant. During the same 6-year period, 42 scholars defaulted. This was roughly seven per year or 14% of scholars (DHHS, 2004).

Cullen, Hart, Whitcomb, and Rosenblatt (1997) examined the December 1991 American Medical Association (AMA) master file to determine the practice locations and specialties of 2903 NHSC physician scholars who graduated from medical school from 1975 to 1983. They found that 20% of the physicians assigned to rural areas were still located in the county of their initial assignment. An additional 20% were in some other

rural location in 1991. The master file also indicated that 20% of all students graduating from medical schools between 1975 and 1983 who were currently practicing in rural counties with small urbanized populations were initially NHSC scholars. A 2004 assessment report by the Office of Management and Budget (OMB) stated that in 2000, the long-term retention of up to 15 years of NHSC providers after the required service was 52% (U.S. Congress, 2004).

But NHSC physicians may have demonstrated less dedication to service in HPSAs than non-NHSC physicians. A study by Pathman, Konrad, and Ricketts (1992) which contrasted the retention of NHSC and non-NHSC physicians serving in rural settings between 1981 and 1990, demonstrated that fewer NHSC physicians than non-NHSC physicians remained in their index practices (12% versus 39%), their index communities (29% versus 52%), or even in any rural county. Characteristics leading to long-term retention received much attention at the Federal level in recent years.

NHSC Loan recipients may also have been more likely than scholars to continue practicing in an underserved community after completing their initial service obligation. In testimony before the Senate Subcommittee on Public Health and Safety, Heinrich (USGAO, 2000) referred to an analysis of data for calendar years 1991 through 1993 indicating that 48% of loan repayment recipients were still at the same site 1 year after fulfilling their obligation compared to 27% of scholarship recipients. She suggested that this finding may be a result of the timing of the commitment by the recipient. Loan repayment recipients did not commit to service until after they have completed training. Therefore, they were more likely to know what they wanted to do and where they wanted to practice at the time they made the commitment.

While the findings of the Heinrich report merit consideration, these findings were based on anecdotal evidence drawn from a small sample of years. The NHSC did not have a comprehensive tracking system in place and did not consider the quality of life or the specific medical needs at the HPSAs. In an effort to direct scholarship recipients to the neediest sites, for instance, they were provided fewer choices of where they could fulfill their service obligation. Heinrich (USGAO, 2000) pointed to more anecdotal evidence suggesting no significant difference between service sites for scholars and loan repayers. Finally, the report raises an important point that the NHSC could make more efficient use of allocated funds.

Few, if any, studies have examined the retention rates of NHSC non-physician clinicians and non-NHSC NPCs in these settings. Debt levels were generally lower and service obligation times were shorter for non-physician clinicians. The mean obligation time for participants in this study was 2.2 years compared to approximately 4 years for physicians. Demographic differences such as age, marital status and family size may also have influenced NPCs differently than physicians. Further, amounts of income foregone during the service period may have been significantly different for physician assistants and nurse practitioners than for physicians, due to the shorter training period.

There was an inherent expectation that the NHSC scholarship program was a good investment in that it provided a benefit to society. But, given the dearth of studies demonstrating any estimate of financial return, perhaps it was the program's potential to create political capital that allowed it to continue from year to year.

Accountability and Workforce Contingent Financial Aid Programs

Perhaps it was time for the NHSC to revisit the conceptual ideas and methodology involved in the creation, formulation, and distribution of scholarship funds. More

important, the comparison of scholarship funds invested to health care needs met should have been more objectively considered.

A 2004 report by the American Institutes for Research examined 161 workforce contingent financial aid programs in 43 states. Three fourths of these programs were “in-school” programs that provided financial aid to students while they were enrolled in school in exchange for a future workforce commitment. The remainders were loan repayment programs. Participation data were provided by 100 of the programs citing 23,000 individuals receiving support during the 2001-2002 academic year. Only 50 of the programs studied were able to provide data about how many students fulfilled their work commitment. The report questioned the effectiveness of the programs and expressed the need for closer monitoring and evaluation (American Institutes for Research, 2004).

Peter Schmidt (2004) described the report as providing little data to answer questions such as:

1. Did these programs help reduce labor shortages?
2. How well did the programs cover educational expenses?
3. How many participants drop out of the programs before fulfilling their work obligations?
4. Did these programs attract people who otherwise might not have entered the occupations or specialties covered?

Schmidt (2004) cited other concerns raised by the report. He contended that such programs may actually have caused harm because they provided “psychological and political cover” for college officials and State lawmakers seeking to raise tuition. He speculated that the programs made it easier to pretend that tuition increases didn’t hurt

real priorities like getting people into the teaching work force. Despite the costs, loan forgiveness and service-obligated programs may have been one of the only effective methods to provide medically underserved populations with adequate primary health care services.

While numerous programs existed for funding the training of health care providers for service in underserved areas, the Federal government lacked an efficient and comprehensive system to measure outcomes and alleviate severe shortages. Many of the problems stemmed from the process used to assign providers to service areas. Other problems were the result of faulty reporting requirements and unreliable methods for identification and staffing of the areas with the most critical needs.

In testimony before the Congressional Subcommittee on Public Health and Safety, Janet Heinrich (USGAO, 2000) listed a number of ways that programs providing health care access to underserved populations could have been improved. Among her recommendations, she stated that more dollars should be shifted from NHSC scholarship programs to loan repayment programs. Among the reasons for a change in priorities, she explains that (1) the loan repayment programs cost less, (2) loan repayment recipients were more likely to complete their service obligations, and (3) loan repayment recipients were more likely to continue practicing in underserved communities after completing their obligation.

She also stressed a need for an improved system for identifying the need for health care services in a community. Heinrich further explained that HHS processes for determining HPSA designation were flawed in a number of ways. For example, non-physician providers such as physician assistants and nurse practitioners as well as NHSC

providers already practicing in the shortage area were not routinely counted. As a result, the system tended to overstate the need for more providers.

In a related issue, she asserted that the current system for placement of providers was severely flawed. She cited a 1993 analysis which found that at least 22% of shortage areas that received NHSC providers received more providers than needed to increase their provider-to-population ratio to the point that their HPSA designation could have been removed. Meanwhile, 65% of shortage areas with Corps-approved vacancies remained unfilled. Of these vacancies, 143 locations remained unfilled for at least 3 years.

Heinrich also recommended the reevaluation of J-1 visa waivers for physicians who had just completed their graduate medical education in the United States. In exchange for service in specified areas, the requirement for these new physicians to return to their home country could be waived. She contended that in 1999, the number of waiver physicians was large enough to meet the needs of over one third of HPSA designated sites nationwide. She concluded by describing the domestic placement effort as “rudderless” and without accountability (USGAO, 2000).

Human Capital Theory

Investment in human capital is as old as learning itself. Certainly, even the most primitive societies understood that teaching skills such as hunting, fishing and foraging would result in an increase in benefits to the group or tribe. Medieval blacksmiths invested time and effort to train apprentices with the expectation that the increased productivity would accrue benefits to the business.

But it was not until the 20th century that human capital became a theoretical and empirical focus of the study of economics. In the 1930's Eugene Gorseline examined

185 pairs of brothers who had differing levels of education within each pair. After controlling for intelligence, gender, region of the country, time, and family characteristics, he found that schooling had a significantly positive effect on income. He did, however, describe a sorting effect and asserted that ability plays a large part in the decision to further educate oneself (Langelett, 2002).

In the early 1960s Theodore Schultz studied education as a method of building human capital. He examined the fundamentals of education both as an investment and as an institution (Schultz, 1963). Building on the work of Schultz, Becker (1964) developed a broader theory of human capital. As Becker pointed out, countries that enjoy consistent per capita GDP growth have simultaneously devoted substantial resources to the development of human capital through nationwide education.

According to human capital theory, any type of education is an investment made by both the individual and the society or organization that devoted resources to it. Decisions on the amount of time, money and other resources to invest are based on expectations of private returns for the individual and social returns for the organizations and/or governments. Education, as an investment, has been shown to increase personal productivity and income. Langelett (2002) stated:

Human capital is the “know how” of the work force that increases the productivity of each worker. The theory of human capital is that investments can be made in human beings as well as in physical capital, which yield a future stream of returns or dividends to the initial investment. Investment in human capital has been one of the major sources of growth in modern economies during the past century. The process of investing in human capital normally takes a much longer time period than physical capital. Most often it takes approximately eighteen years of formal education. In addition, there are shorter investments in human capital over the lifetime of the individual that can include additional formal education, on-the-job training, informal education, life experiences, and learning by doing. (p.1).

As a social investment, education and training have resulted in a more productive workforce and growth of the Gross Domestic Product (GDP) (Psacharopolous, 1984). Critics argued, however, that education may simply function to screen out individuals with higher innate ability or characteristics that make employees more productive. Perhaps education serves as one of many mechanisms which sort individuals by their abilities and labels those abilities with educational credentials. Certainly, innate ability may directly impact one's productivity. Similarly, ability can help a student maximize educational opportunity. Belfield (2000) described the "alpha factor" as the so-called element of the returns to education which is a function of prior ability which may absorb between 40-80% of any earnings premium. In addition to screening and innate ability, one must consider factors such as deterioration of education during the years following commencement, gains made from job experience and opportunities, or lack thereof, resulting from job performance.

Belfield (2000) also described the "sheepskin effect" as an increase in earnings solely as a result of a credential attained. For instance, a promotion may be awarded simply as a result of a person's academic degree attainment. The "sheepskin effect" implies that the awarding of a credential serves as a signal, and that non-credentialed years of education produce smaller returns. Belman and Heywood (1997) acknowledged the importance of the "sheepskin effect", but demonstrated that as workers age and become more experienced the credential holds less significance. Perhaps the most powerful signal produced by the credential was when it became a screening tool for employers planning to hire young, new employees with limited experience and few references.

Grubb (1993) attempted to demonstrate evidence of the sheepskin effect in a paper that estimated the returns of postsecondary education using the National Longitudinal Survey of the Class of 1972 with earnings measured at about age 32. He found that most of the individuals who enrolled in postsecondary programs but failed to complete credentials had no higher earnings than high school graduates.

Kane and Rouse (1995) questioned the empirical support for Grubb's findings. They contended that several variables were mis-measured and that, when corrected with reasonable alternatives, showed that those who entered but failed to earn credentials at community colleges did seem to earn more than similar high school graduates. The authors showed that both men and women who completed 1 year of community college without completing a degree earned approximately \$900 to \$1,000 (1985 dollars) more per year than high school graduates. While they conceded that the t-statistics were only marginally significant and did not provide overwhelming evidence of the value of a community college education without credentials, they used the study to discount any evidence for "sheepskin" effects.

For health care professionals, credentials are critically important. Without proper credentials at each level of professional development, health care practitioners would not be eligible for national certification examinations, licensure and, ultimately, employment in their field. In fact, attainment of such credentials is clearly the most important yardstick by which the worthiness and competence of health care professionals is measured.

Psacharopoulos (1979) distinguished a "weak" version from a "strong" version of the screening hypothesis. In the weak version, the employer pays higher starting wages to

more educated workers because he lacks other information about their potential productivity. In the strong version, the employer continues to pay higher wages to the more educated employee even though he has had an opportunity to evaluate their job performance. He discounted the strong version as irrational, arguing that an employer will re-evaluate hiring decisions on an ongoing basis and make adjustments accordingly.

Cohn and Geske (1990) pointed out another challenge to the human capital approach in the dual labor market hypothesis. Proponents of this hypothesis argue that the human capital approach is only valid for certain segments of the labor force. In the “dual” theory the labor force is divided into a primary segment consisting of individuals hired into positions holding promise of economic and job mobility, and a second segment consisting of workers who were hired into positions where they were not likely to receive good ladder-type positions no matter how much they’ve invested in training and education.

The above concerns should not be viewed as arguments against the human capital model but as factors which may enhance or dilute the effects of an investment in education. Gains made from an investment in education could vary widely among the many disciplines of study. Prior work experience, motivation, and academic preparation could all play an important role in the acquisition of skills during the education process. Many forms of employment require the specific skills and funds of knowledge acquired from training and education. In the case of medical training, for instance, it would be unthinkable to assume that a person could be productive as a clinician without some form of investment in education.

The Benefits of Education

Education bestows a number of benefits on an individual. Cohn and Geske (1990) classified these benefits into “consumption” and “investment” components. Consumption benefits are those products or services which yield satisfaction or utility in a single period only. For instance, a certain sense of satisfaction and pleasure may be derived simply from the activity of learning. In addition, many college students gain certain social and entertainment benefits from campus life and would certainly prefer that to some of the alternatives. Investment benefits are those which are expected to yield satisfaction in future periods. By increasing one’s productivity and, thus, one’s capacity to earn higher wages in a free market, education not only contributes to the social product but could increase future consumption benefits to the individual. Education introduces students to works of music, literature, and the arts and enables them to comprehend material they would otherwise not be expected to master. From this they are likely to derive greater utility from leisure activities.

Benefits to the Individual. Education is, perhaps, the single most important activity that a person can undertake to improve their economic and social success. In addition to increasing the capacity to earn income, schooling and training increases one’s productivity and, as such, increases one’s chances, in a free market, to obtain higher wages and increase the contribution to the social product (Cohn & Geske, 1990).

Benefits of education may also be classified as “private” and “social”. Edwin Dean (as cited in Langelett, 2002) pointed out eight ways in which education affects a person’s economic well-being or income:

First, and most directly, it increases one’s human capital. The rest of the effects are indirect effects, but nevertheless they do affect one’s income and well being. Second, there is an inverse relationship between the average level of education and

fertility rates in a cross section of countries. Third, education reduces search time in labor markets. Fourth, there is a correlation between education and health of the work force. Fifth, there is a direct relationship between the education level of children and their parents. More highly educated parents generally value education more and provide greater opportunities for their children to get a higher level of education. Sixth, there were consumption effects of education. More highly educated persons make more informed choices in their consumption patterns. Seventh, education has an effect on crime, social cohesion, and technology development. Regions with more educated citizens have more social cohesion and less crime, *ceteris paribus*. Finally, there are income distribution effects that affect average income. (p.11)

Some benefits may belong to both domains. Social benefits include tax payments associated with the increased income stream and other external benefits that the individual cannot capture (Cohn & Geske, 1990).

Benefits to Society. Schultz (as cited in Langelett, 2002) identified a number of ways investments in education benefit not only the individual but the economy as a whole. First, education changes people's images of themselves and of their society around them. It empowers them to question the status quo and build better lives for themselves and for those around them. Second, education empowers us to become better stewards of scarce resources while developing new ways to create alternate, and sometimes renewable, resources. Third, education improves the health and increases life expectancies of individuals and societies as a whole. Fourth, the business of education and the funds used to attend schools make a net contribution to overall economic growth. Fifth, research done at colleges and universities often leads to new products and more efficient ways of producing existing products. Gains in practical commercial research may also be enhanced as a result of research done at institutions of higher learning. Sixth, educational institutions nurture, discover, and cultivate talent. By raising the efficiency of the workforce and improving productivity, education enhances physical capital and raises GDP. Educated workers are better able to choose fields that best utilize their interests,

talents and ability. Seventh, education enhances people's ability to adapt to change. The capability to adjust to changes in job requirements and opportunities results in higher incomes and increased gross domestic product. Eighth, the education system is flexible enough to expand as demand increases for training required to fill high paying jobs and to meet the country's needs for people with specific skills and knowledge. Finally, education increases the labor force participation rate of women and minorities. In developing countries participation in education reduced fertility rates of women as well.

Many professionals, such as health care providers, provide a social benefit through activities that improve the health and productivity of the community they serve. Some health care professionals use their education to produce professional literature for the benefit of their peers and the health care industry as a whole (Cohn & Geske, 1990).

Fiscal Returns

It was important to determine the relevance of the NHSC scholarship to rewards and compensation in order to gain an understanding of the benefits to society and to the individual. A number of methods may be used to estimate such benefits and returns.

Fiscal Returns to the Individual. In *The Economic Value of Higher Education*, Leslie and Brinkman (1988, p.39) immediately conceded that "...in conventional scientific and quantitative terms we were incapable of proving higher education to be worthy of any particular amount of public support." They go on to explain that the three major ways to estimate monetary yields of a college education were (1) earnings differential, (2) net present value (NPV) approach, and (3) internal rate of return (IRR). All have limitations that preclude any accurate application to education policy decisions.

Yet most estimates of return on educational investment seemed to imply that the margin of the value of higher education over that of most alternatives was great enough

to justify the expenditures. In 1980 the earnings differential for college graduates (men and women) compared to high school graduates was 58% higher (Leslie & Brinkman, 1988).

Cohn and Geske (1986) used 1976 census data to show that NPV earnings estimates at a 5% discount rate reflected a 62% greater benefit than cost for male college graduates and a 19% greater benefit for females.

Leslie and Brinkman (1988) demonstrated four methods for grouping results of IRR estimates of college graduates. The mean estimates of the four methods suggested returns ranging from 11.8 to 13.4%.

It is easy to conclude that by most estimates, investments in education seem to produce positive returns. But accurate measurements of the intrinsic variables that contribute to those conclusions remain elusive at best.

Fiscal Returns to Society. In 1961 Theodore Schultz attributed additional schooling of the labor force for the about one-fifth of the rise in national income between 1929 and 1957 (Schultz, 1961). Over 2 decades later, Denison (1985) explained the 25% growth in the country's per capita income between 1929 and 1982 by attributing it to a substantial growth in years of schooling observed during the same time period. Meanwhile, George Psacharopolous studied relationships between education and economic growth in a number of countries around the globe. Using methodology developed by Schultz, he examined private and social returns using education as a proxy for human capital (Psacharopolous, 1979, 1984, 1985, 1987).

More recently, Robert Barro (1999) found that increased investments in education in the 1960s were at least partially responsible for the subsequent growth in per capita income.

Individual and Societal Costs

Cohn and Geske (1990) recognized the importance of earnings foregone by the student as an important element in total educational cost. These foregone earnings represented a loss to the student and the unrealized tax revenues, a loss to society. Additionally, health care professionals, such as nurses, through their work increased the productivity of some of their patients by getting them back into the workforce sooner. These productivity gains were lost as the PA or NP student refrained from work to complete their training.

Return Methodologies

Honeyman et al. (1996) described three ways to estimate the monetary yield of a college education: (1) earnings differentials, (2) the net present value approach, and (3) private rates of return. There was a continuing lack of consensus among some educators and economists over which of these was the most appropriate approach and exactly how returns were to be measured.

Earnings Differential

The earnings differential approach is perhaps the easiest to calculate and most rudimentary of the three. This measure describes how much more, on average, an individual earns than other individuals with less education. The earnings differential approach measures the calculated difference between the average sum of money that subjects with h years of schooling receive and the average sum received by those with only $h-1$ years of schooling using the formula:

$$\text{DIFF} = \sum_{t=0}^n (W_{th} - W_{th-1})$$

where W_{th} is the average earnings, in year t , for subjects with h years of schooling and n is the number of years worked (Becker, 1992).

Becker (1992) also pointed out that while these calculations are easy to understand and simple to perform, they are unable to control for costs, discounting, or individual characteristics. He cautions, however, against dismissing the method too quickly. He adds that other more sophisticated methods are highly sensitive to changes in costs or discount rates. He touts the simplicity of this approach as a virtue. Certainly, in more casual contexts and comparisons, this approach is adequate.

Net Present Value Approach

The net present value approach attempts to estimate the present value of an education by adjusting costs and benefits to reflect the changing value of a dollar over time. The result of such analyses is a benefit/cost ratio. Becker (1992) describes the following formula for calculating the net present value for each year of schooling beyond $h-1$ years:

$$\text{NPV} = \sum_{t=1}^n (W_{th} - W_{th-1}) (1+d)^{-t} - \sum_{t=-s}^0 (C_{th} + W_{th-1}) (1+d)^{-t}$$

where: C_{th} is a measure of cost, in year t , for years of schooling h ; W_{th} is a measure of earnings, in year t for a person with h years of schooling; s is years of schooling considered, n is a measure of working life; and d is a rate of interest or discount.

For instance, using net present value calculations, Cohn & Geske (1990) demonstrated that each dollar invested in 4 years of college yielded, on average, \$1.19 for women and \$1.62 for men. Interestingly, the authors also showed that postgraduate education dollars invested yielded \$3.05 for women and only \$1.00 for men when compared to the baccalaureate-prepared student.

By discounting dollars to a common year, the NPV approach allows us to compare investments and returns made in different years. The approach also allows us to consider costs and foregone earnings.

This method is very sensitive to changes in the discount rate (Becker, 1992). Because this requires the analyst to make calculations based on their own expectations about the future of the economy, a large amount of variation can be evident from one analyst to the next.

Internal Rate of Return

By calculating the discount rate at which the NPV is equal to zero, one may arrive at the internal rate of return (IRR). This is, perhaps, the most broadly used measure for estimating the value of an education. By projecting a lifetime stream of earnings and costs of attendance, the IRR relates total resource costs of education to income benefits (Honeyman et al., 1996). The utility of the IRR calculation comes from the ability to use this measure as a means for comparison of different investments. The IRR is, essentially, a reverse calculation of the NPV. But unlike the net present value calculation, the IRR is not heavily influenced by the discount rate selection. It is, however, very sensitive to fluctuations in the cost of the investment (Becker, 1992).

Economists and educators continue to develop new approaches to the problem. In the 1960s and 70s, for instance, researchers such as Eckaus (as cited in Bowen, 1977),

Becker (as cited in Bowen, 1977), and Mincer (as cited in Bowen, 1977) considered the impact of ability, occupation and post-college influences on earnings. The importance of variables such as these depends upon the research question and conditions.

Investment Returns

Positive Production

Several potential indicators of a positive return may be described as acceptable outcomes of the scholarship program: (1) service in a medically underserved area, (2) improved community access to health care services, (3) increased productivity of the community workforce through improved medical care, (4) involvement in community service activities and organizations, (5) attainment of continuing medical education, (6) personal advancement through specialized training which required attainment of a specific degree or license provided by the scholarship program, and (7) continuation in a postgraduate educational program that would not have otherwise been available without such a degree.

Negative Production

Several types of investment returns may not be considered to be positive. Some negative returns include: (1) failure to complete NP or PA school, and (2) failure to complete service agreement at a designated HPSA site, resulting in default. In these cases the NHSC recovers a penalty from the scholar equal to three times the amount of unsatisfied debt from scholarship support. While this penalty may reimburse fiscal losses to the NHSC, it cannot make up for lost opportunity for other potential scholars.

Other positive or negative investment returns also may have existed. In some cases, the fiscal return to society may not have been realized through increased tax revenues generated during the service commitment period. In these cases a scholar's departure

from a service site at the end of his or her commitment may still have constituted a negative return to society.

CHAPTER 3 METHODOLOGY

Research Design

The purpose of this study was to examine the investment return to society and the individual for the National Health Service Corps (NHSC) scholarship recipients from physician assistant (PA) and nurse practitioner (NP) programs in the United States who would have completed service obligations between the years 2003 and 2006. The problem will be addressed by answering the following questions:

1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards?
2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards?
3. Are there differences in payback potential between nurse practitioners and physician assistants?
4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants?
5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program?

To determine the societal investment return, the amount of total scholarship funds received by each scholar was compared to the total present value of additional taxes paid over a 35-year period. To determine the individual's investment return, pre- and post-training wages were compared.

The estimates of additional tax revenues generated from students who received the NHSC scholarship and a theoretical group of those who did not receive PA or NP

training were determined by comparing post-training wage (scholarship group), and the expected salaries without the training (no investment group). These two distributions were used to determine an estimate of the difference in the present value of taxes paid over a 35-year period. The 35-year career span was determined by adding the average PA student age of 28 years (AAPA, 2003b) to the training period (2 years) then subtracting the sum from the customary retirement age (65 years). The estimate of taxes paid each service year was compared to the total amount of NHSC funds awarded. The study used annualized pre- and post-training data from scholars who would have completed their service obligation in 2003, 2004, 2005, and 2006 and compared them to NHSC scholarship expenses reported by the Department of Health and Human Services (DHHS, 2003, 2004), as well as data from the Bureau of Labor Statistics (Bureau of Labor Statistics [BLS], 2003), the American Academy of Physician Assistants (AAPA, 2003a, 2003b, 2003c, 2004), and the American Academy of Nurse Practitioners (AANP, 2004).

Participants

Physician assistant and nurse practitioner NHSC scholars with valid mailing addresses on file at DHHS who would have completed their service obligation between 2003 and 2006 participated in the study. These participants trained at accredited colleges and universities throughout the United States and repaid their scholarships through service at Health Profession Shortage Areas (HPSAs) across the nation. While these colleges and universities may not have been representative of all PA and NP training sites, the data were adequate for estimating the costs of NHSC scholarships for students completing PA and NP training as well as estimating the needed payback levels.

Participant Characteristics

Scholars who would have completed service obligations between 2003 and 2006 provided the following data:

1. Pre-training salary
2. Post-training salary
3. Number of dependents claimed on last tax return
4. Pre-training vocation
5. Payback requirement in years

Scholarship costs were estimated using data provided by the DHHS (2004). For comparison, scholarship costs were calculated as the sum of tuition, stipend and awards for reasonable expenses.

Payback

Payback was defined as the reimbursement of monetary benefits to society and to the individual resulting from the scholarship investment. Student incomes before training as a PA or NP were considered incomes available through “no further investment” in education.

To determine payback, wages for the “no investment” PA and NP groups were compared to the “scholarship” groups. For each subject the estimated annual income tax obligation was determined. Investment return was the difference in the aggregate net present values of all Federal income tax paid subtracted from the remaining scholarship debt.

The required number of years of obligated service (service span) was defined for each subject. For the NHSC “scholarship group”, the obligated service span was defined as the mean number of years required to satisfy the scholarship contract. The projected

number of years to payoff was then calculated for both the “scholarship” and the “no-investment” groups.

Present Value

The net present value returns the sum of any series of regular cash flows, discounted to a particular date using a single discount rate. In order to determine the present value of the wages and scholarship support, the NPV calculation was used to convert all values to 1997 dollars. This was calculated year-by-year using the applicable consumer price index reported by the Bureau of Labor Statistics for that year as the discount rate (BLS, 2005). By converting all values to 1997 dollars subjects can be treated as if all scholarships started on the same day.

Social Debt Ratio

Debt ratio is considered to be the debt payment over a given period of time divided by the gross income over the same time period. The social debt ratio, then, is the monetary value of total scholarship debt to be forgiven during a defined period divided by the additional tax revenues generated for the same period. Further, the social debt ratio factor can be derived from the ratio of total scholarship costs to tax revenue generated during the obligated service period. To obtain the social debt ratio factor the following formula was used:

$$\text{Social Debt Ratio Factor} = \frac{\sum_{i=1}^Y (C_b + S_b + H_b)}{\sum_{i=1}^W (R_b)}$$

where: C_b is a measure of tuition, in year b ; S_b is a measure of stipends paid, in year b ; H_b is a measure of other reasonable costs (books, fees, and supplies), in year b ; R_b is a

measure of tax revenue generated, in year b ; Y is a measure of scholarship years; and W is a measure of service years. All values were indexed to 1997.

Qualifying Scholars for the Study

There were a number of reasons why some participants were excluded from the study. Some disqualifying reasons included failure to respond to the survey, breach of contract, or deferment due to military service. For this study, any scholar who did not match to a HPSA and begin service was not included. Scholars without valid mailing addresses on file with DHHS were considered ineligible and were also excluded.

Data Collection Procedures

Subject contact information, scholarship costs, service obligation and other reimbursement data were obtained through a series of Freedom of Information Act (FOIA) requests to the National Health Service Corps (DHHS, 2004).

To obtain salary, service obligation, pre-training occupation and dependent information, a five question survey was developed. Following Institution Review Board (IRB) approval the surveys were mailed to 421 potential subjects. After a second mailing 107 envelopes were returned marked “undeliverable due to invalid address.” Among the remaining 314 scholarship recipients, nurse practitioners returned 68 surveys. Physician assistants returned 63%, or 119, of the 187 surveys. This yielded a combined response rate of 60%.

Treatment of the Data

The present value of wages earned by each individual scholar was used to compute two different distributions, one to represent expected earnings for “no investment” and one to represent “scholarship investment” of the study group. The “no investment” distribution projects wages earned in the absence of the scholarship investment over the

same time period as the “scholarship” group. Similarly, a second distribution was generated on wages earned after the scholarship investment. Based on the annualized starting salaries, a “taxes generated” figure was determined by projecting those salaries through the total service period. Salaries were increased by 3% annually to approximate customary raises in the industry. This was based on the average changes in total inflation-adjusted income from primary employers for PAs who stayed in primary care between the years 1997 and 2003 as reported in the American Academy of Physician Assistants annual census reports (AAPA, 2003b, 2004) and Nurse Practitioners between the years 1997 and 2001 as reported by the Nurse Practitioner Associates for Continuing Education annual census report (Pulcini, Vampola, & Ward, 2002).

A special report by the tax foundation (Moody & Hoffman, 2003) was used to estimate the average Federal tax burden on the American wage earner. The report estimated the national average effective Federal tax rate for taxpayers in five income brackets earning between \$0 and \$292,913. Tax rates ranged from 4.1% to 23.7%. The effective tax rate was calculated for each year and for each participant based on the estimated income for that year.

Starting with the reported pre-training salaries, a similar method was used to calculate foregone earnings of each of the scholars. Mean foregone earnings estimates were computed for PAs and NPs separately. The mean starting salary for all scholars was compared to the mean pre-training salary reported by the scholars.

Payback

Societal Payback

The estimated monetary returns to society were determined by comparing the 1997 value of the estimate of taxes paid over a 35-year period of the study group to the 1997 value of the scholarship expenses provided during the training period. Scholarship expenses were calculated as the sum of tuition payments, stipends and reasonable expense allowances. Travel and relocation allowances were not considered as part of the scholarship cost since it is customary for employers to remunerate these costs. To determine the benefit to society, the differential between pre- and post-training taxes paid was computed for the study group.

Using a report by Moody and Hoffman (2003), the annual taxes owed were then calculated based on the income for that year. Taxes were then totaled to determine an aggregate annual sum. As the projected income increased the tax rate was increased. This total was compared to a similar aggregate sum for pre-training earnings. The difference between both sets of tax revenues generated figures is the estimated increase in societal benefits attributable to the increased wages earned by PA or NP training.

For each service year the total of all taxes paid by each of the scholars was then subtracted from the balance of scholarship funds awarded for PA or NP training. The result was the remaining debt owed by the scholar. This procedure was used to calculate the payback potential for the average scholar and for the scholars found to have the minimum and maximum social debt ratios.

Individual Payback

Individual payback was measured as increased individual earnings as a result of the scholar's personal investment in their education. This study examined the difference

between annualized pre- and post- training wages based on survey responses of recent scholarship recipients. Pre-training wages were used to determine foregone earnings that scholars would have otherwise received during the training period. A 3% per annum increase was applied to both distributions. The difference between pre- and post-training wages projected over the service period minus foregone earnings is the potential payback to the individual scholar.

Assumptions

The payback to society and to the taxpayer was based on a number of assumptions: (1) scholars began service in HPSAs immediately after graduation, (2) salaries increased by 3% each service year and followed the same pattern as the U.S. gross national product (GNP), (3) students who did not receive scholarships did not have other higher education opportunities that increased their wages during the service period, and (4) scholars did not earn wages from a second job or have other sources of income during the service period.

Comparisons

Income Potential. Annual estimates of earnings for each year were compared between the “scholarship” group and the “no investment” group. This was projected over a 35-year period. A 3% annual raise was applied to each group based on reported annual salaries. All comparisons were made using pre-tax dollars discounted to 1997 values using the consumer price index.

Social Debt Ratio Factor. The total scholarship cost was divided by the aggregate tax revenue estimate for the obligated service period for each of the participants. This resulted in the social debt ratio factor which was then used to determine the scholars with the maximum and minimum debt ratios. A projection of tax revenue revealed that more

than the 35-year expected career span was required for some of the scholars to pay back their debt. The projection was extended over a 49 year period in order to more accurately determine the times to pay back scholarship debt.

Payback Potential. Mean annual estimates of value added tax revenues generated for each year were projected over a 35-year period for NPs and PAs. A 3% per annum increase was applied to each scholar's salary and taxes were computed based on the appropriate income split point. Three components of payback potential: (1) scholarship costs, (2) social debt ratio, and (3) starting salaries were compared for PAs and NPs using independent-samples t-tests. The relative magnitude of the difference between means for each component was estimated using an eta squared calculation.

Foregone Earnings. Foregone earnings were estimated for each of the scholars based on their reported pre-training income, a 3% per annum salary increase and tax payments based on the appropriate income split points. The mean foregone earnings estimates for PAs and NPs were then compared using an independent-samples t-test. The relative magnitude of the difference between means was estimated using a partial eta squared calculation.

Effect of Training on Salaries. Mean pre-training and post-training salaries and were computed separately for NPs and PAs. A split-plot analysis of variance was conducted to determine which variable (training or discipline) had a greater influence on salaries and whether there was an interaction effect. The relative magnitude of the difference between means for training, discipline and interaction effect was estimated using a partial eta squared calculation.

Effect Size

Calculations of eta squared were done to determine the relative magnitude of the differences between means. According to Tabachnick & Fidell (as cited in Pallant, 2005) eta squared represents the proportion of the variance in the independent variable that is explained by the dependent variable.

The following formula was used to compute eta squared:

$$\text{Eta squared} = \frac{t^2}{t^2 + (N1 + N2 - 2)}$$

where: t is the value derived from the t test; and N is a measure of the size of each of the samples in the study.

Cohen (as cited in Pallant, 2005) described the following guidelines for the interpretation of strength of eta squared:

.01 = small effect

.06 = moderate effect

.14 = large effect

CHAPTER 4 RESULTS

The purpose of this study was to examine the investment return to society and the individual for the National Health Service Corps (NHSC) scholarship recipients from physician assistant (PA) and nurse practitioner (NP) programs in the United States who would have completed service obligations between the years 2003 and 2006. One hundred and eighty seven scholars chose to participate by completing a mail survey. Other data were obtained from the NHSC through a series of Freedom of Information Act requests (DHHS, 2004), from the Bureau of Labor Statistics (BLS, 2003), and from census data provided by the American Academy of Physician Assistants (AAPA, 2003a, 2003b, 2003c, 2004), and the American Academy of Nurse Practitioners (AANP, 2004).

The study examined the following specific research questions:

1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards?
2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards?
3. Are there differences in payback potential between nurse practitioners and physician assistants?
4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants?
5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program?

Results of the Study

Nurse practitioners and physician assistants who received the NHSC scholarship participated in this study. Specifically, 421 scholarship recipients who would have completed their service obligations between the years 2003 and 2006 were initially selected as the study population. From this population, 187 participants chose to participate through their response to a mail survey. In each mail survey the participants indicated the length of service obligation, number of dependents claimed on last tax return, profession and income received in the year prior to training, and starting salary immediately after training,

While detailed demographic information was not collected on each of the participants, there were a number of characteristics that were normally considered when applicants are interviewed for the scholarship. Specifically, the scholars must demonstrate geographic mobility and a strong interest in providing health care to underserved populations. Experience with indigent or underserved communities, intent to participate in pre-professional clinical experiences in rural or urban community-based health care facilities and strong primary care post-service career goals in HPSAs were also important. The NHSC also gave priority to applicants from disadvantaged backgrounds (DHHS, 2003).

The NHSC provided contact information for each of the scholars and data pertaining to the amount of scholarship funds invested and years of service obligation. This information was obtained through the use of a series of Freedom of Information Act (FOIA) requests (DHHS, 2004). Following appropriate Institutional Review Board (IRB) approval, short questionnaires (Appendices B and C) were mailed out to scholars on the mailing list provided by NHSC. The initial mailing yielded 159 responses and 135

envelopes marked undeliverable due to invalid addresses. A second mailing list was developed using the AAPA and AANP member directories. This yielded 28 more responses for a total of 187 out of 314 possible participants and a yield of 60%. The remaining 107 scholarship recipients were found to have invalid mailing addresses and were eliminated from the study population. The invalid addresses may have been due to participants who had changed service assignments, joined the military, deceased, or defaulted on their service obligation prior to the latest NHSC database update.

Due to the differing lengths and dates of scholarship support, years of service, and end obligation dates, all figures were indexed to 1997, the first year of the study. This was done by sequentially indexing each figure year-by-year using the net present value calculation with the pertinent year consumer price index as the discount rate. Table 4-1 shows the consumer price index and cumulative discount for each year of the study.

Table 4-1. Consumer Price Index and Cumulative Discount Rates (adopted from U.S. Department of Labor, 2005)

	1998	1999	2000	2001	2002	2003	2004	2005
Consumer Price Index	1.56%	2.21%	3.36%	2.85%	1.58%	2.28%	2.66%	2.33%
Cumulative Discount	98.47%	96.34%	93.21%	90.63%	89.22%	87.23%	84.97%	83.03%

Tax revenues generated were estimated using a special report by the tax foundation (Moody & Hoffman, 2003) that reported the average Federal tax burden on the American wage earner.

A 3% per annum raise was applied to each participant's salary estimate. This was based on the average changes in total inflation-adjusted income from primary employers for PAs who stayed in primary care between the years 1997 and 2003 as reported in the American Academy of Physician Assistants annual census reports (AAPA, 2003b, 2004),

and Nurse Practitioners between the years 1997 and 2001 as reported by the Nurse Practitioner Associates for Continuing Education annual census report (Pulcini et al., 2002). As the next tax bracket was reached, the appropriate tax rate was applied for that year. Table 4-2 illustrates the income split points for each of the tax brackets used in this calculation.

Table 4-2. Federal Tax Brackets (adopted from Moody & Hoffman, 2003)

Income Split Point	Average Tax Rate (Payment/AGI)
Above \$292,913	27.5%
Above \$127,904	23.7%
Above \$92,754	21.4%
Above \$56,085	18.1%
Above \$28,528	15.9%
Below \$28,528	4.1%

Examination of the data showed that the payment for the average scholarship award, when indexed to 1997 dollars, was \$56,625. The scholarship award included allowances for books, fees, lab supplies and a limited amount of travel. The median amount was \$57,689. When the cost of the \$1,065 monthly stipend is added, the mean scholarship award increases to \$81,883. The maximum scholarship award was \$164,678, provided to a physician assistant student over a 3-year period. The minimum award, \$36,616, was awarded to another physician assistant student for a 2-year scholarship. The minimum number of years of scholarship support was 2 and the maximum was 4. Table 4-3 shows the distribution of years of support by discipline. Among the participants in the study, 36% of NP students received more than 2 years of scholarship support compared to only 11% of PA students.

Table 4-3. Years of Scholarship Support by Discipline

Years	4	3	2
NPs	1	17	50
PAs	4	8	107

A total of over \$15.3 million was used to provide 409 aggregate years of scholarship support to participants of this study. The mean length of award for all participants was 2.2 years.

Returns to Society

The findings of this study indicate that the mean pre-training annual salary for PA and NP scholars combined was \$31,302. Nurse practitioner scholars earned \$35,502 during the year prior to starting their training while physician assistant scholars earned \$28,874.

Research Question 1—Income Potential. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards? To answer this question, a “scholarship” group and a theoretical “no investment” group were used to compare the wages earned by participants in this study to those that would have been earned by similar PA and NP applicants had they not received any further training. Wages were projected over a 35 year period for both of the groups. From this, the additional tax revenue generated was calculated. Figure 4-1 illustrates the projected cumulative Federal taxes generated for the “scholarship” group compared to the “no investment” group.

While the “no investment” group continued to generate tax revenue during the scholars’ 2-year training period, the “scholarship” group did not generate tax revenues until year 3. But by the end of the fifth year after matriculation, the “scholarship” group surpassed the “no investment” group in cumulative Federal taxes generated.

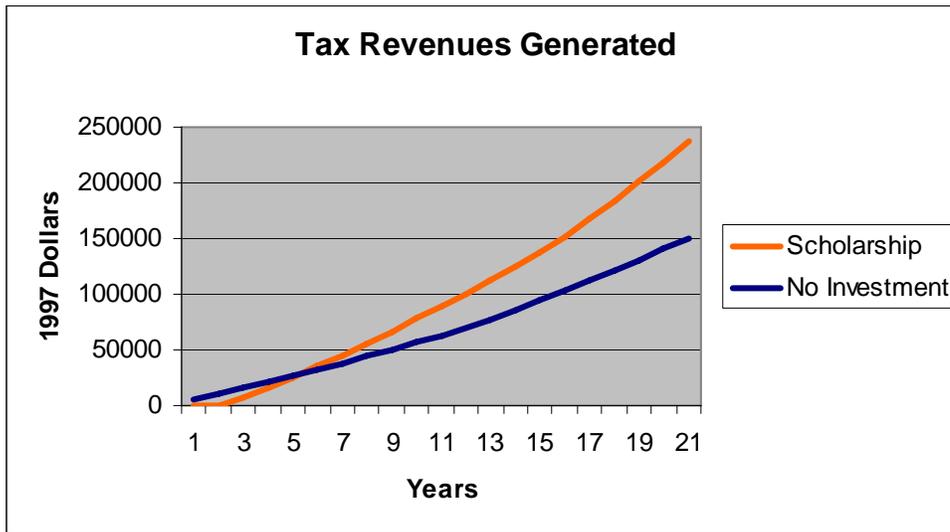


Figure 4-1. Comparison of Cumulative Taxes Generated

It was also evident that none of the scholars generated enough additional tax revenue during the obligated service period to cover the costs of their scholarship award. The calculation was extended to investigate how many additional years of service would be required to pay back the cost of the scholarship. The scholarship group generated enough total tax revenue to repay the average scholarship debt in about 10 years. Another 9 years would have been required to repay the debt with “value added” taxes. The “no investment” group needed 13 years to generate the same amount of tax revenue.

Research Question 2—Social Debt Ratio. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards? To answer this question, tax revenue projections were done based on the minimum and maximum social debt ratio factors.

In this context social debt is the cumulative sum of scholarship funds invested by society through programs such as the NHSC scholarship. Payback is accomplished by the

generation of additional tax revenues as a result of the investment. The social debt ratio factor, then, is the ratio of the total amount of scholarship funds invested to the additional tax revenues generated during the obligated service period. Table 4-4 compares the minimum and maximum social debt ratios for PAs and NPs.

Table 4-4 Minimum and Maximum Social Debt Ratio Factors by Profession

		Debt Ratio Factor	Yrs Oblig	Total Scholarship Debt	Mean Aggregate Tax Payment	Starting Wage
NP	Min	2.13	3	\$63,164	\$29,600	\$54,168
	Max	7.96	2	\$129,580	\$16,271	\$49,920
PA	Min	1.64	2	\$46,789	\$28,567	\$77,417
	Max	8.10	2	\$129,468	\$15,993	\$49,067

Figure 4-2 suggests that the time required to payback scholarship funds through additional tax revenues was directly related to the magnitude of social debt ratio factor of the scholar. The payback period ranged from 3 to 49 years.

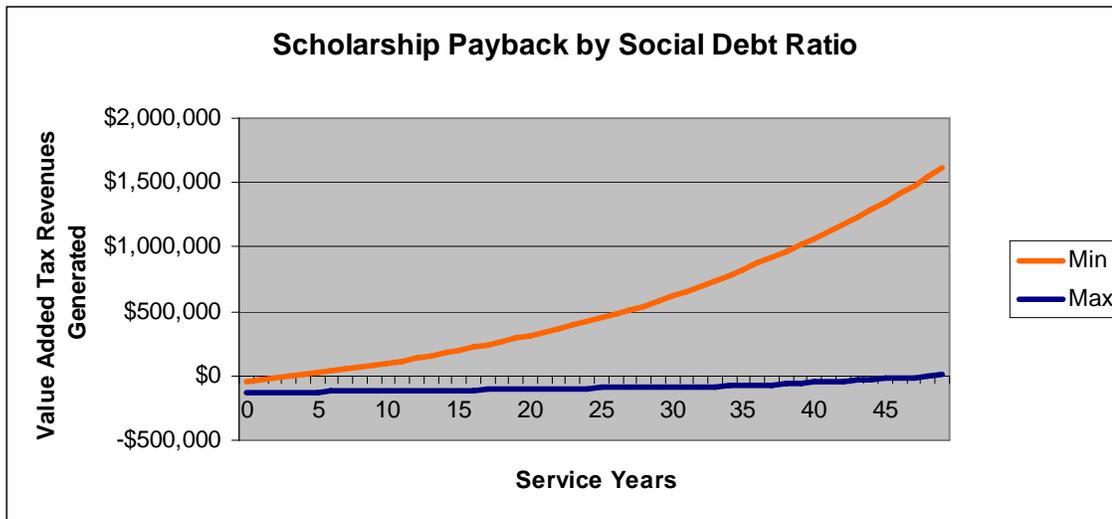


Figure 4-2. Scholarship Payback by Social Debt Ratio

Research Question 3—Payback Potential. Are there differences in payback potential between nurse practitioners and physician assistants? To answer this question, tax revenue projections were made based on the mean scholarship costs and starting

salaries of the two groups. As Figure 4-3 illustrates, the PA scholars were able to generate enough additional tax dollars to pay back the scholarship debt to society within 15 years. Nurse practitioner scholars needed almost 5 more years to pay back their debt. The rate of payback increased as participants reached higher tax brackets.

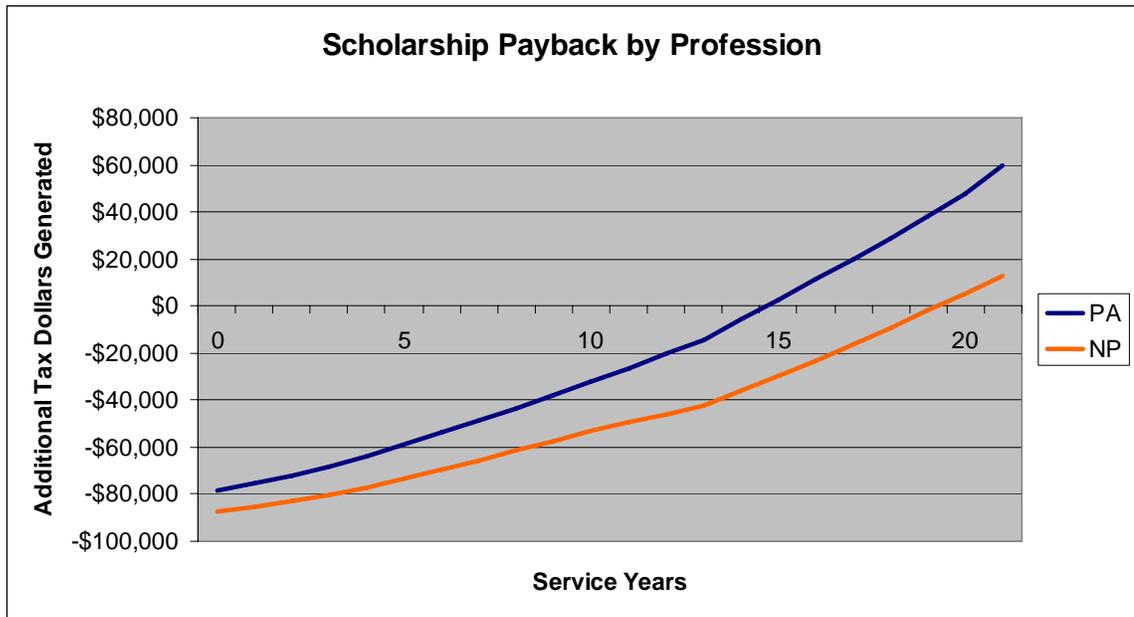


Figure 4-3. Scholarship Payback by Profession

Differences in payback potential may have resulted from differences in factors such as social debt ratio, scholarship costs, and starting salaries. Research Question 3 was further investigated by comparing these three factors between the two groups. Table 4-5 illustrates a comparison of these three factors using independent-samples t-tests.

Table 4-5 Independent-Samples t-test Analysis of Factors Affecting Payback Potential

Factor	Discipline	Significant Difference	Mean	SD	DF	t	P	ETA ²
Scholarship Costs	PA	Yes	\$78,623	\$18,251	101	2.405	.018	.003
	NP		\$87,587	\$27,469				
Social Debt Ratio Factor	PA	No	4.717	1.42	185	.236	.814	.00003
	NP		4.768	1.35				
Starting Salary	PA	No	\$49,586	\$7,871	185	.134	.893	.00005
	NP		\$49,743	\$7,338				

PAs were compared to NPs across the three variables: Scholarship Costs, Social Debt Ratio Factors, and Starting Salaries. There was a statistically significant difference in mean scholarship costs for PAs ($M = 78623.25$, $SD = 18,251.22$) compared to NPs [$M = 87587.44$, $SD = 27469.31$; $t(101) = 2.405$, $p = .018$]. But the magnitude of the differences in the means was small ($\eta^2 = .003$). Chapter 3 includes a discussion of eta squared.

There was no significant difference in social debt ratio factors between PAs ($M = 4.717$, $SD = 1.42$) compared to NPs [$M = 4.768$, $SD = 1.35$; $t(185) = .236$, $p = .814$]. The magnitude of the differences in the means was small ($\eta^2 = .00003$).

Because payback is measured by additional tax revenues generated as a result of the scholarship-funded training, differences in payback potential between nurse practitioners and physician assistants may also be influenced by this factor. There was no significant difference in starting salaries between PAs ($M = \$49,586$, $SD = \$7,871$) compared to NPs [$M = \$49,743$, $SD = \$7,338$; $t(185) = .134$, $p = .893$]. The magnitude of the differences in the means was small ($\eta^2 = .00005$).

This suggests that the mean payback potential was greater for the PA scholars in this study than for the NP scholars. This may not, however, hold true for scholars from year groups not included in this study.

Research Question 4—Foregone Earnings. Are there differences in foregone earnings during training between nurse practitioners and physician assistants? To answer this question the pre-training salaries for each of the groups were used to estimate the potential after-tax income lost by each participant during their training period. It was estimated that each participant would have received a 3% per annum increase in pay

during this period. Estimated tax payments were subtracted based on income split points (Moody & Hoffman, 2003).

The NHSC scholarship provides funding for tuition, books, supplies and a monthly stipend. This generous support decreases, but in most cases does not eliminate, all costs associated with schooling. Many of the participants earned some type of income prior to beginning their training.

The costs of foregone earnings along with the costs of inflation caused many of the participants to make some fiscal sacrifices during their training years. Some also realized a decrease in annual income after training. The mean amount of foregone earnings for all participants was \$27,661. The maximum amount of foregone earnings was \$66,830 and the minimum was \$8,684. Figure 4-4 shows that the personal cost of training per annum for nurse practitioners was highest at \$30,995. This was probably due to the fact that most NP applicants had an annual salary of over \$35,000 as nurses. The physician assistant students, on the other hand, came from medical-technical fields and earned less than \$30,000 prior to training.

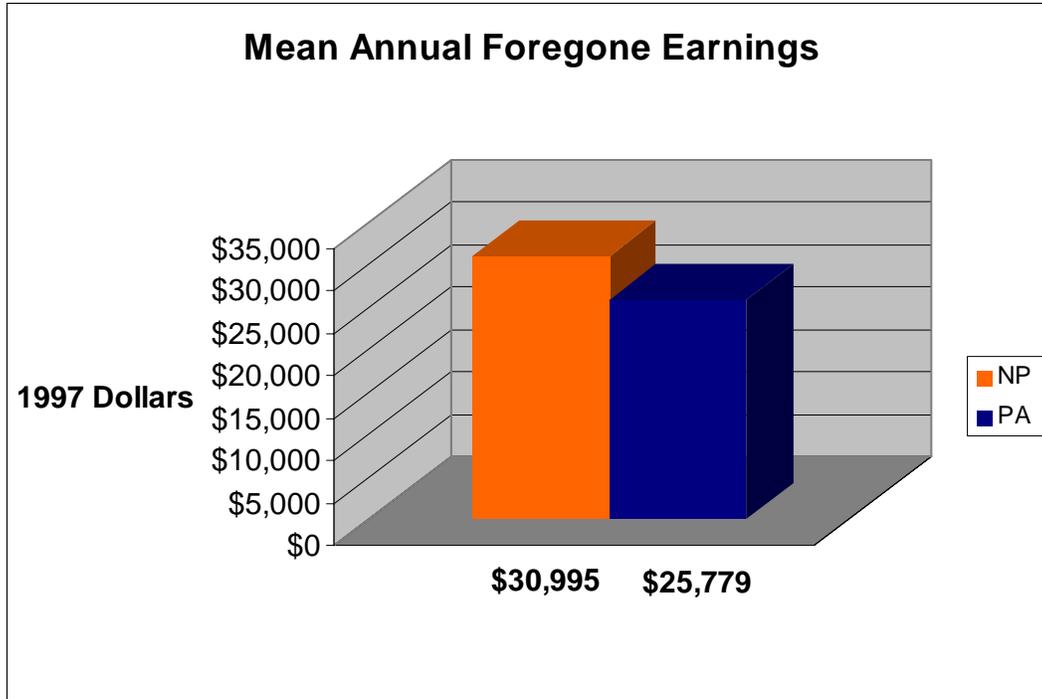


Figure 4-4. Foregone Income by Nurse Practitioners and Physician Assistants

An independent-samples t-test was conducted to compare the foregone earnings for nurse practitioners and physician assistants. There was a statistically significant difference in foregone earnings for nurse practitioners ($M = \$30,995.21$, $SD = 12,095.82$) compared to physician assistants [$M = \$25,779.10$, $SD = \$11,321.73$, $t(185) = 2.993$, $p = .004$]. The magnitude of the differences in the means was small (eta squared = .046).

Research Question 5—Effect of Training on Salary. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program? To answer this question the pre-training and post-training salaries for each of the two professions was compared using a split-plot analysis of variance. The mean pre-training annual salary for PAs and NPs combined was \$31,120. Figure 4-5 illustrates a comparison of pre-training and post-training wages among NPs and PAs. Nurse practitioner applicants earned \$35,502 during the year prior to starting their training while physician assistant applicants earned \$28,874. After

training, the average nurse practitioner salary increased by \$14,191 to \$49,743. The average physician assistant post-training annual salary was \$49,586, an increase of \$20,681. The increase in income for PAs is at least \$6,500 per year greater than that realized by NPs.

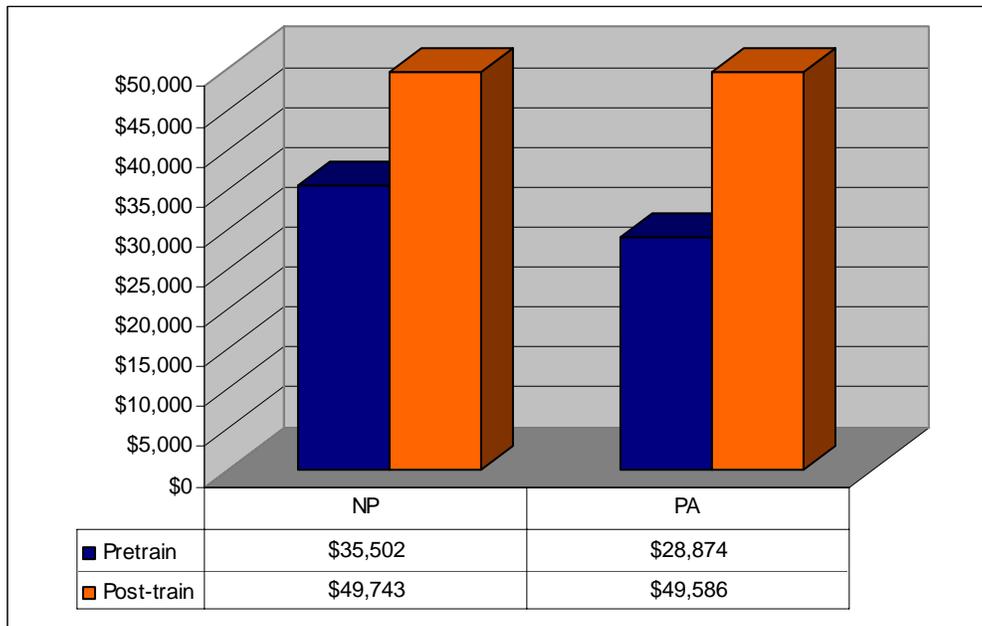


Figure 4-5. Comparison of Pre-training and Post-training Wages

A split-plot analysis of variance was conducted to determine which variable (training or discipline) had a greater influence on salaries and whether there was an interaction effect. (Table 4-6).

Table 4-6. Split-plot ANOVA of Training and Discipline on Salaries

Factor	Significant	DF	F	p	Effect Size (partial eta ²)
Training	Yes	(1, 185)	194.18	<.0005	.51
Discipline	Yes	(1, 185)	7.21	.008	.038
Interaction*	No	(1, 185)	6.778	.010	.035

*Wilks' Lambda = .49

Subjects were divided into two groups according to their discipline (NPs and PAs). For both groups there was a statistically significant main effect for training [F (1, 185) = 194.18, p < .0005]; and the effect size was large (partial eta squared = .51). There was

also a statistically significant main effect for discipline [$F(1, 185) = 7.21, p = .008$]; however, the effect size was small (partial eta squared = .038). This implies that training has a greater influence on salaries than discipline.

The interaction effect [$F(1, 185) = 6.778, p = .010$] was not statistically significant and the effect size (partial eta squared = .035) was small.

Summary

This chapter has presented a comparison of annual salaries and scholarship costs for nurse practitioner and physician assistant NHSC scholars. In this research, the survey was distributed to PA and NP recipients of the NHSC scholarship who would have completed their service obligation between the years 2003 and 2006. The responses were compared to data collected from the NHSC through Freedom of Information Act requests (DHHS, 2004), from the Bureau of Labor Statistics (BLS, 2003), and from census data provided by the American Academy of Physician Assistants (AAPA, 2003a, 2003b, 2003c, 2004), and the American Academy of Nurse Practitioners (AANP, 2004).

Research Question 1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards? Additional Federal taxes generated after training were projected for each the “scholarship” and “no investment” groups to determine the number of years required to repay society for the cost of scholarship support. The scholarship group generated enough total tax revenue to repay the average scholarship debt in about 10 years. Another 9 years would have been required to repay the debt with “value added” taxes. The “no investment” group needed 13 years to generate the same amount of tax revenue.

Research Question 2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the

time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards? A comparison of payback projections for scholars with minimum and maximum social debt ratio factors showed the time to repay the scholarship debt ranged from 3 to 49 years.

Research Question 3. Are there differences in payback potential between nurse practitioners and physician assistants? A comparison of scholarship costs, debt ratio and starting salaries for NP and PA scholars suggested significant differences in payback potential between the two disciplines. Statistically significant differences in scholarship costs were found between NPs and PAs. Projection of additional tax revenues generated over a 35-year period compared to scholarship debt suggested 15 years of service would be required for physician assistants to repay their debt while nurse practitioners require 20 years.

Research Question 4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants? Comparisons of mean foregone earnings data suggest a statistically significant difference between the two groups. Foregone earnings experienced by NPs were \$5,216 greater than for PAs. This suggests that there may also be significant differences in the personal costs of education between the two groups.

Research Question 5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program? Comparison of annual salaries before and after training showed a significant return on the scholars' personal investment in their education. Analysis of the effects of

training and discipline (NP vs. PA) suggested that, while both had an effect on salaries, the effect of training was greater.

Chapter 5 presents a discussion of the findings of this study. Also, recommendations are made for further research in the related fields of health care workforce analysis and education finance. The differences between Federal support for the NHSC scholarship and the benefits to society and to the individual were examined in terms of conclusions that may be drawn from this study and implications for these conclusions to impact research, policy, and funding decisions for future programs.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS FOR RESEARCH

Introduction

The purpose of this study was to examine the investment return to society and the individual for the National Health Service Corps (NHSC) scholarship recipients from physician assistant (PA) and nurse practitioner (NP) programs in the United States who would have completed service obligations between the years 2003 and 2006. One hundred and eighty seven scholars chose to participate by completing a mail survey. Other data were obtained from the NHSC through a series of Freedom of Information Act requests (DHHS, 2004), from the Bureau of Labor Statistics (BLS, 2003), and from census data provided by the American Academy of Physician Assistants (AAPA, 2003a, 2003b, 2003c, 2004), and the American Academy of Nurse Practitioners (AANP, 2004).

While a number of researchers have studied medically underserved populations (Hart, 2000; COGME, 1998; Dill et al., 1996) and characteristics of clinicians who serve in Health Profession Shortage Areas (Gamm, Castillo, & Pittman, 2003; Fowkes, Gamel, Wilson & Garcia, 1994; Rabinowitz et al., 2001; Matherlee, 2003; Shi et al., 1991) there is a paucity of literature that examines the fiscal returns to the programs aimed at provision of medical care to these populations.

Perhaps the most objective and transparent analysis of the overall effectiveness of the NHSC was done in 2004 by the Office of Management and Budget (U.S. Congress, 2004). In August 2001 the President announced an ambitious agenda for reforming the management of government and improving the performance and efficiency of a number

of Federal programs. The agenda aimed to improve the government's performance and correct long-standing problems. One of the five elements of his agenda stressed the integration of budget decision making and performance results. In order to effectively measure government programs a new instrument called the Program Assessment Rating Tool (PART) was introduced. The PART is an accountability tool that consists of approximately thirty questions, depending on the type of program being evaluated. It uses a four-point scale to indicate partial achievement of results. The instrument is divided into four sections:

1. Program purpose and design
2. Strategic planning
3. Program management
4. Program results and accountability

The NHSC received an overall rating of "Moderately Effective". The report describes the program as effective in increasing health care access and points to the fact that roughly half of program providers remain in service for a long period of time after the end of the Federal service contract. Although the program has shown some efficiency improvements by shifting resources, the OMB states that greater flexibility in allocation of funds between scholarships and loans could further improve efficiency.

The efficiency of workforce contingent financial aid programs similar to the NHSC scholarship have been studied (Schmidt, 2004; USGAO, 2000) and found to be poorly administered and less than effective in many cases. Measurement of fiscal returns to society's investment in such programs provides a reasonable framework for evaluation of policy and funding decisions. This chapter explores the extent to which this study's findings contribute to a greater understanding of the relationship between NHSC

scholarship support, costs of training and enhanced productivity of income and tax revenues generated by the scholar. Specifically, the researcher addressed the following five questions:

1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship awards?
2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards?
3. Are there differences in payback potential between nurse practitioners and physician assistants?
4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants?
5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program?

Findings

This study focused on Physician Assistant and Nurse Practitioner scholarship recipients of the National Health Service Corps scholarship who completed training between 2001 and 2004. One hundred and eighty-seven scholars chose to participate by completing a mail survey regarding pre-training and post-training annual salaries. Other fiscal data were obtained from the National Health Service Corps through a series of Freedom of Information Act requests (DHHS, 2004), from the Bureau of Labor Statistics (BLS, 2003), and from census data provided by the American Academy of Physician Assistants (AAPA, 2003a, 2003b, 2003c, 2004), and the American Academy of Nurse Practitioners (AANP, 2004).

Research Question 1. Is the difference in the amount of Federal taxes generated between the pre- and post-training wages sufficient to equal the cost of scholarship

awards? For the first research question, it was hypothesized that the amount of Federal taxes generated between pre- and post-training wages would not be sufficient to equal the cost of the students' scholarship award. The average projected income for the scholars was compared to the scholarship debt value indexed to 1997 dollars. Additional Federal taxes generated after training were projected for each of the "scholarship" and "no investment" groups to determine the number of years required to repay society for the cost of scholarship support. The scholarship group generated enough total tax revenue to repay the average scholarship debt in about 10 years. Another 9 years would have been required to repay the debt with "value added" taxes. The "no investment" group needed 13 years to generate the same amount of tax revenue.

This is important because the mean length of time required to repay the scholarship debt far exceeded the obligated service agreement period. The primary mission of the NHSC is not to educate health care providers, but to place health care providers in shortage areas. Perhaps the money could be more efficiently spent on loan repayment programs and incentive bonuses to practicing clinicians.

Society's fiscal investment in the scholarship also varied greatly from one scholar to the next. The minimum investment was \$36,616 and the maximum investment was \$164,678. The number of years of service obligation also varied from 2 to 4 years. If there is any expectation that the NHSC will receive a return on its investment there must be a correlation between the amount of Federal dollars spent on education and the societal benefit received.

Research Question 2. How does the social debt ratio factor (the ratio of total scholarship costs to tax revenue generated during the obligated service period) change the

time required to generate enough Federal taxes sufficient to equal the cost of scholarship awards? For this research question it was hypothesized that the magnitude of the social debt ratio would delay the repayment of the scholarship. From the data, a social debt ratio factor, or the ratio of total scholarship debt to aggregate tax revenue generated during the service obligation period, was calculated for each of the scholars. Comparisons using the minimum and maximum social debt ratio factors suggested that the times required to repay scholarship funds through the generation of tax revenue were directly related to the amount of social debt carried by the scholar. The payback periods ranged from 3 to 49 years.

The primary reason for such large variations in social debt ratio factors was the difference in costs from one training program to the next. Total scholarship costs were not considered when the payback requirements were determined for each scholar.

This is important because scholarship funding and service obligations were, in no way, contingent on the amount of funding required for tuition, books and supplies. Therefore a scholar who received 2 years of training at a very expensive institution incurred the same service obligation as a scholar who trained at a very inexpensive school. Measurable outcomes should be a reflection of Federal dollars invested in a health care provider's education.

Research Question 3. Are there differences in payback potential between nurse practitioners and physician assistants? Payback potential is a measure of how efficiently a subject can generate enough additional tax revenue to pay for the total cost of the scholarship. For this research question it was hypothesized that large differences in payback potential would not exist between NP and PA scholars.

Projection of additional tax revenues generated compared to scholarship debt suggested 15 years of service would be required for physician assistants to repay their debt while nurse practitioners require 20 years.

Differences in payback potential may have resulted from differences in social debt ratio factors, scholarship costs, and starting salaries. The PA and NP scholars in the study were compared based on these three factors by using independent-samples t-tests.

The analysis suggested a statistically significant difference in mean scholarship costs for PAs. The magnitude of the differences in the means, however, was small.

The difference in social debt ratio factors between PAs and NPs was not statistically significant. The magnitude of the differences in the means was small.

The mean starting salaries for PAs and NPs are almost identical. But because payback is measured by additional tax revenues generated as a result of the scholarship-funded training, differences in payback potential between nurse practitioners and physician assistants may also be influenced by this factor. The difference in starting salaries between PAs and NPs was not statistically significant. The magnitude of the differences in the means was small.

This is important because it suggests that the payback potential for physician assistant scholars in this study was significantly greater than for nurse practitioner scholars due to the lower pre-training salaries reported by the physician assistants. If measurable outcomes are to reflect Federal dollars invested in education, variables such as scholarship costs and payback potential must be considered when determining payback requirements.

Research Question 4. Are there differences in foregone earnings during training between nurse practitioners and physician assistants? Differences in foregone earnings directly impact the individual's cost of education. Monies that would have otherwise been earned would need to be, somehow, replaced. In many cases this was probably done through reliance on savings or by borrowing additional funds.

Without scholarship and stipend support, students would have had numerous other education-related expenses. In this study the assumption was made that the generous scholarship and stipend support was adequate to meet the costs of attending most institutions of higher learning. Expenses beyond these amounts were assumed to be the same for both PAs and NPs.

The hypothesis for this question was that the nurse practitioner scholars were required to forego more income than the physician assistant scholars during their training period. Most, if not all, nurse practitioner students were employed as nurses prior to matriculation. Physician assistant students, on the other hand, came from a variety of backgrounds including lower wage medical-technical jobs. Most (76%) were students during the year prior to training and only 8% were nurses (AAPA, 2003a). The mean annual salary for NPs was \$30,995 compared to \$25,779 for PAs.

An independent-samples t-test was conducted to compare the foregone earnings for nurse practitioners and physician assistants. There was a statistically significant difference in foregone earnings for nurse practitioners compared to physician assistants. The magnitude of the differences in the means was small.

While this suggests that nurse practitioners experienced more foregone earnings, the study did not examine factors such as spousal support, part-time or PRN income.

According to Hooker, (2003) 96% of NPs were female. Among PAs only 54% are typically female (AAPA, 2003a). These gender differences may have afforded nurse practitioners a greater potential to rely on spousal income to replace foregone earnings.

This is important because it provides an estimate of individual costs of training. Scholarship stipends were provided for the purpose of offsetting these individual costs. A better understanding of individual costs associated with education could affect funding decisions.

Research Question 5. Do NHSC PA and NP scholars who complete training receive more or less income after graduation than before completion of their training program? Annual salary differences were used as a means of estimating the amount of additional tax revenue a scholar could produce as a result of the scholarship-funded training.

This analysis examines the effect of this training on annual salaries as a way to measure increases in tax revenue generated. The hypothesis for this question was that physician assistant scholars would experience a greater increase in mean annual salary as a result of training than the nurse practitioner scholars. Even though mean starting salaries were very similar (\$49,586 for PAs compared to \$49,743 for NPs), the differences in mean pre-training salaries results in a better return on the investment for PAs than for NPs.

A split-plot analysis of variance was conducted to determine which variable (training or discipline) had a greater influence on salaries and whether there was an interaction effect. For both groups there was a statistically significant main effect for training and the effect size was large. There was also a statistically significant main effect

for discipline. However, the effect size was small. The interaction effect was not statistically significant and the effect size was also small.

This implies that training had a greater influence on salaries than discipline. This finding is important because it suggests that even though the return on investment was greater for PAs than for NPs, scholars from both disciplines benefited significantly as a result of the investment in education.

Conclusion

Previous studies on the investment returns of the NHSC scholarship have been nonexistent. This study focused on the ability of the NHSC physician assistant and nurse practitioner scholars to produce enough additional tax revenues to repay society for the costs of the scholarship. It was hypothesized that the amount of Federal taxes generated between pre- and post-training wages would not be sufficient to equal the cost of the students' scholarship award during the service period.

This study found that the average PA or NP scholar would have needed 10 years and 8 months of service to generate enough additional tax revenue to repay society's investment in the scholarship. One of the factors that influenced the ability to repay the scholarship amount was the social debt ratio. Further analysis revealed large variations in the years of service required to pay back the debt based on the magnitude of the social debt ratio factor. The number of years required to pay back the social debt ranged from 3 to 39 years.

This research study suggested that significant differences existed between physician assistants and nurse practitioner scholars' ability to generate enough additional tax revenue to repay the scholarship costs. This was mainly due to significant differences

in foregone earnings and in salary increases as a result of training. Mean annual starting salaries were not statistically different between the two groups.

One of the most important findings of this study was that there was very little connection between measurable outcomes and the amount of monies invested in scholarships. Unlike the loan repayment program which defined an annual benefit ceiling, the NHSC scholarship program relied on the schools to determine the amount of tuition to be paid by the government.

The findings of this study are consistent with findings of a 2004 analysis done by the Office of Management and Budget (U.S. Congress, 2004) which emphasized the integration of budget decision-making and performance results. While the report described the NHSC scholarship program as effective in increasing health care access, it called for improved efficiency through greater flexibility in allocation of funds between scholarships and loans.

Indeed, the General Accounting Office (1995) concluded that loan repayment programs cost the government one-half to one-third less than the scholarship program. Further, the report stated that loan repayment program recipients were not only more likely to complete their service obligation, but they were more likely to stay beyond the end of their commitment.

The implications of this study are also consistent with the Congressional testimony of Janet Heinrich (USGAO, 2000) who recommended that more dollars should be shifted from the NHSC scholarship programs to loan repayment programs.

Recommendations for Future Research

Few studies have been published that investigate the return on investment for scholarship and workforce contingent financial aid (WCFA) programs for health care

professionals. Yet millions of Federal dollars were spent each year for scholarship programs that are politically appealing. There are several recommendations for future research that stem from this study.

Recommendation 1: As with most studies, replication of the original research is valuable. This will not only confirm or refute the original findings but may uncover reasons why the original research should be questioned.

Recommendation 2: Similar studies should be conducted to examine NHSC programs for physicians and nurses. Analysis of these programs may uncover factors leading to policy change and more efficient placement of these clinicians in HPSAs. A 2004 OMB report found little evidence that the NHSC has incentives and procedures in place to improve the efficiency and cost-effectiveness of program execution (U.S. Congress, 2004).

Recommendation 3: Comparisons of NHSC scholars and non-scholars should be done to investigate characteristics which increase the likelihood that a scholar will continue to serve in a HPSA beyond their initial service obligation. Further, this type of analysis could help identify factors that cause clinicians to leave HPSAs.

Recommendation 4: Research should be done to explore the characteristics and efficiency of other types of scholarships, loan repayment and WCFA programs. Incentive programs for seasoned clinicians to stay in HPSAs may prove to be more efficient than continually pumping dollars into a pipeline of scholars. Further, studies should explore clinician attitudes and interest regarding different types of WCFA programs and lengths of service commitment.

Recommendation 5: The costs of training for NHSC health care providers as well as supplemental sources of income during training should be explored. A 2004 OMB analysis found that the NHSC does not capture all direct and indirect costs borne by the agency and that the program does not have a procedure for splitting overhead costs between outputs, including scholarships and loan repayment. The agency also fails to include informational displays in the budget that present the full costs of outputs (U.S. Congress, 2004). Thorough investigation of all of the costs of training will facilitate future rate of return analyses and result in improved cost accounting practices.

Summary

The results of this study suggested that, from a purely fiscal standpoint, the NHSC scholarship program was an inefficient way to place clinicians into medically underserved areas. The overwhelming social debt ratio, high costs, meager payback potential and limited service period made this an investment that was nearly impossible to pay back during the service period.

Although the limited cost-effectiveness of the scholarship program compared to the loan repayment program has been well understood, Jennifer Burke, acting director of the NHSC, emphasized that the scholarship program should not be eliminated altogether. She stated, "Keeping both programs in our portfolio gives us a strong advantage. It allows us to react to what is going on in the field" (J. Burke, personal communication, July 29, 2005).

Indeed, the scholarship program has been a powerful tool to take promising students from medically underserved areas, provide them with the resources to obtain an education they may not have otherwise been able to get, and return them to their home communities. While the mission of the NHSC did not necessarily include the provision of

financial aid to target financial need, this particular strategy for scholarship award has been widely believed to result in better clinician retention. But even with the employment of this strategy, scholar placement decisions did not always reflect the magnitude of society's investment.

Analysis of the literature review for this study suggested that the obligated service period was, in no way, contingent on the amount of money spent on the scholarship. Unlike the loan repayment program which specified a benefit ceiling for each year of service, the scholarship service obligation is only contingent on the number of years of scholarship support. Scholars were required to serve at a site with a HPSA score above a specified threshold. The score was considered the program's primary indicator of medical need at a service site. But above the minimum threshold for service sites, the HPSA score was not contingent upon the amount of money spent on the scholarship.

One of the new key performance goals of the NHSC in 2004 was to increase the average HPSA score of areas receiving NHSC clinicians (U.S. Congress, 2004). This could be an important first step toward linking areas of greatest need to Federal dollars spent.

Finally, the results of this study suggested that individual and social rates of return were, in general, higher for physician assistant scholars than for nurse practitioners during the years studied. This was due to higher total scholarship costs and foregone earnings by the NP scholars. Mean annual starting salaries did not differ between the two groups.

APPENDIX A
ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms were used in this study:

AAPA- American Academy of Physician Assistants

AANP- American Academy of Nurse Practitioners

ARC-PA- Accreditation Review Commission on the Education of Physician Assistants

AHEC- Area Health Education Center

ANCC- American Nurses Credentialing Center

BLS- Bureau of Labor Statistics

BOP- Federal Bureau of Prisons

COGME- Council on Graduate Medical Education

DHHS- Department of Health and Human Services

EDA- Early Decision Alternative

FOIA- Freedom of Information Act

FQHC- Federally Qualified Health Center

GAO- General Accounting Office

GME- Graduate Medical Education

HEAL- Health Education Assistance Loan

HPSA- Health Professional Shortage Area

HRSA- Health Resources and Services Administration

IHS- Indian Health Services

IMU- Index of Medical Underservice

INS- Immigration and Naturalization Service

IRB- Institutional Review Board

IRR- Internal Rate of Return

MGMA- Medical Group Management Association

MUA- Medically Underserved Area

NCBPN/N- National Certification Board of Pediatric Nurse Practitioners and Nurses

NDSL- National Direct Student Loan

NHSC- National Health Service Corps

NP- Nurse Practitioner

NPC- Non-Physician Clinician

NPV- Net Present Value

OMB- Office of Management and Budget

ORC- Other reasonable costs

PA- Physician Assistant

PANCE- Physician Assistant National Certifying Examination

PHSA- Public Health Service Act

PPA- Private Practice Assignment

SEOG- Supplemental Educational Opportunity Grant

WCFA- Workforce Contingent Financial Aid

APPENDIX B
SURVEY MAILED TO NURSE PRACTITIONERS

SURVEY

Here's your chance to help a struggling graduate student and donate to charity at the same time! Please complete the following short survey and return in the envelope provided. Your assistance is greatly appreciated.

1. What was your profession prior to NP training? _____

2. How many years are you required to serve to pay back your NHSC scholarship?

_____ 2yrs _____ 3 yrs _____ 4 yrs

3. How many dependents (including yourself) did you claim on your last tax return? _____

4. Please estimate your annual salary prior to NP training.

_____ <\$10,000	_____ \$10,000- \$12,499	_____ \$12,500- \$14,999
_____ \$15,000- \$17,499	_____ \$17,500- \$19,999	_____ \$20,000- \$22,499
_____ \$22,500- \$24,999	_____ \$25,000- \$27,499	_____ \$35,000- \$37,499
_____ \$37,500- \$39,999	_____ \$40,000- \$42,499	_____ \$42,500- \$44,999
_____ \$45,000- \$47,499	_____ \$47,500- \$49,999	_____ \$50,000- \$52,499
_____ \$52,500- \$54,999	_____ \$55,000- \$57,499	_____ \$57,500- \$59,999
_____ \$60,000- \$62,499	_____ \$62,500- \$64,999	_____ \$65,000- \$67,499
_____ \$67,500- \$69,999	_____ \$70,000- \$72,499	_____ \$72,500- \$74,999
_____ \$75,000- \$77,499	_____ \$77,500- \$79,999	_____ \$80,000- \$82,499
_____ \$82,500- \$84,999	_____ \$85,000- \$87,499	_____ \$87,500- \$89,999
_____ \$90,000- \$92,499	_____ \$92,500- \$94,999	_____ \$95,000- \$97,499
_____ \$97,500- \$99,999	_____ \$100,000- \$102,499	_____ \$102,500- \$104,999
_____ \$105,000- \$107,499	_____ \$107,500- \$109,999	_____ >\$109,999

5. Please estimate your starting annual salary at your scholarship repayment site

_____ <\$40,000	_____ \$40,000- \$42,499	_____ \$42,500- \$44,999
_____ \$45,000- \$47,499	_____ \$47,500- \$49,999	_____ \$50,000- \$52,499
_____ \$52,500- \$54,999	_____ \$55,000- \$57,499	_____ \$57,500- \$59,999
_____ \$60,000- \$62,499	_____ \$62,500- \$64,999	_____ \$65,000- \$67,499
_____ \$67,500- \$69,999	_____ \$70,000- \$72,499	_____ \$72,500- \$74,999
_____ \$75,000- \$77,499	_____ \$77,500- \$79,999	_____ \$80,000- \$82,499
_____ \$82,500- \$84,999	_____ \$85,000- \$87,499	_____ \$87,500- \$89,999
_____ \$90,000- \$92,499	_____ \$92,500- \$94,999	_____ \$95,000- \$97,499
_____ \$97,500- \$99,999	_____ \$100,000- \$102,499	_____ \$102,500- \$104,999
_____ \$105,000- \$107,499	_____ \$107,500- \$109,999	_____ >\$109,999

Thank you for your help!

For each completed survey received I will make a \$1.00 donation to one of the charities listed below. Please choose one.

_____ American Cancer Society

_____ Children's Miracle Network

_____ St. Jude's Children's Hospital

**APPENDIX C
SURVEY MAILED TO PHYSICIAN ASSISTANTS**

SURVEY

Here's your chance to help a struggling graduate student and donate to charity at the same time! Please complete the following short survey and return in the envelope provided. Your assistance is greatly appreciated.

1. What was your profession prior to PA training? _____

2. How many years are you required to serve to pay back your NHSC scholarship?

_____ 2yrs _____ 3 yrs _____ 4 yrs

3. How many dependents (including yourself) did you claim on your last tax return? _____

4. Please estimate your annual salary prior to PA training.

_____ <\$10,000	_____ \$10,000- \$12,499	_____ \$12,500- \$14,999
_____ \$15,000- \$17,499	_____ \$17,500- \$19,999	_____ \$20,000- \$22,499
_____ \$22,500- \$24,999	_____ \$25,000- \$27,499	_____ \$35,000- \$37,499
_____ \$37,500- \$39,999	_____ \$40,000- \$42,499	_____ \$42,500- \$44,999
_____ \$45,000- \$47,499	_____ \$47,500- \$49,999	_____ \$50,000- \$52,499
_____ \$52,500- \$54,999	_____ \$55,000- \$57,499	_____ \$57,500- \$59,999
_____ \$60,000- \$62,499	_____ \$62,500- \$64,999	_____ \$65,000- \$67,499
_____ \$67,500- \$69,999	_____ \$70,000- \$72,499	_____ \$72,500- \$74,999
_____ \$75,000- \$77,499	_____ \$77,500- \$79,999	_____ \$80,000- \$82,499
_____ \$82,500- \$84,999	_____ \$85,000- \$87,499	_____ \$87,500- \$89,999
_____ \$90,000- \$92,499	_____ \$92,500- \$94,999	_____ \$95,000- \$97,499
_____ \$97,500- \$99,999	_____ \$100,000- \$102,499	_____ \$102,500- \$104,999
_____ \$105,000- \$107,499	_____ \$107,500- \$109,999	_____ >\$109,999

5. Please estimate your starting annual salary at your scholarship repayment site

_____ <\$40,000	_____ \$40,000- \$42,499	_____ \$42,500- \$44,999
_____ \$45,000- \$47,499	_____ \$47,500- \$49,999	_____ \$50,000- \$52,499
_____ \$52,500- \$54,999	_____ \$55,000- \$57,499	_____ \$57,500- \$59,999
_____ \$60,000- \$62,499	_____ \$62,500- \$64,999	_____ \$65,000- \$67,499
_____ \$67,500- \$69,999	_____ \$70,000- \$72,499	_____ \$72,500- \$74,999
_____ \$75,000- \$77,499	_____ \$77,500- \$79,999	_____ \$80,000- \$82,499
_____ \$82,500- \$84,999	_____ \$85,000- \$87,499	_____ \$87,500- \$89,999
_____ \$90,000- \$92,499	_____ \$92,500- \$94,999	_____ \$95,000- \$97,499
_____ \$97,500- \$99,999	_____ \$100,000- \$102,499	_____ \$102,500- \$104,999
_____ \$105,000- \$107,499	_____ \$107,500- \$109,999	_____ >\$109,999

Thank you for your help!

For each completed survey received I will make a \$1.00 donation to one of the charities listed below. Please choose one.

_____ American Cancer Society

_____ Children's Miracle Network

_____ St. Jude's Children's Hospital

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BIOGRAPHICAL SKETCH

Bob Philpot grew up in Keystone Heights, Florida. At age 18 he enlisted in the U.S. Army as a medic. He served on a helicopter ambulance in Hawaii. After his enlistment, Bob received a Bachelor of Science degree in interdisciplinary sciences from Belhaven College in Jackson, Mississippi. During this time he worked nights as an Operating Room Technician. Upon graduation he returned to active duty, completed Officer Candidate School and was assigned to a tour of duty at Ft. Richardson, Alaska. In 1990, he served as an instructor at the U.S. Army Aviation Center and School. He went on to command the 260th Field Artillery Detachment at Ft. Rucker, Alabama. During this time he earned a Master of Science degree in counseling psychology from Troy State University at Dothan.

Bob left active duty in 1992 to attend Emory University Physician Assistant Program; he was subsequently awarded a National Health Service Corps scholarship. In 1994 he earned a Master of Medical Science degree. Bob was assigned to a rural health clinic in Parrish, Florida, to pay back his scholarship obligation. During his service period he practiced pediatrics, internal medicine and family practice.

After 4 years with Manatee County Rural Health Services Inc., Bob was presented with another opportunity to teach. He began as a Clinical Assistant Professor at the University of Florida College of Medicine Physician Assistant Program. In 2003 Bob's doctoral studies were interrupted when he was called to service with the Florida Army

National Guard in support of Operation Iraqi Freedom. Upon his return he resumed his studies and began a fellowship program in medical education.