

# The National Health Service Corps: Rapid Growth and Uncertain Future

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**T**HE NATIONAL HEALTH SERVICE CORPS(NHSC)\* HAS grown rapidly since its inception in 1971. As the program has grown in size, there have been profound changes in its operation and administration. Concomitant with this rapid evolution have come major shifts in policy, shifts determined as much by far-reaching administrative decisions as by legislative mandate. The addition of a scholarship component—begun in 1973 and expanded in 1976—increased the federal commitment, insured a steady stream of potential assignees for the future, and greatly increased the complexity of the program. Evaluation of the program—both as a tool to maintain accountability to legislative intent and as a mechanism for improving program operations—has lagged behind the rapid changes in the way the program functions.

The major purpose of this paper is to describe the history and operation of the NHSC, to review previous research related to the program, to identify the major policy issues, and to discuss the future of the NHSC.

\* A key to the acronyms used in this paper appears on page 285.

## History of the NHSC Program

The creation of the National Health Service Corps in the last seconds of 1970 was inauspicious: the bill was signed reluctantly by a beleaguered president and sluggishly implemented by his administration. The intention of PL 91-623, the Emergency Health Personnel Act of 1970, was laudable but couched in generalities, its aim being "to improve the delivery of health services to persons living in communities or areas of the United States where health personnel and services are inadequate to meet the health needs of the residents of such communities and areas." The approach to these goals was unique: the creation of a cadre of federal employees—physicians and other health care providers—to be sent to provide health care to communities of need, under federal auspices.

The first administrative effort to translate the legislation into a workable program was confused at best. Discussions with some of the federal officials involved with the implementation of the Corps legislation reveal considerable dissension in the executive branch concerning the program, and only under the prodding of Congress was the Department of Health, Education, and Welfare (DHEW) instructed to implement the program. Regulations were written defining critical health manpower shortage areas (CHMSAs), the designation required to permit deployment of federal personnel, and the first cohorts of NHSC physicians—groups of idealistic, activist, medical students and those seeking an alternative to the Vietnam doctor draft—were sent to the field.

The first assignees reached their communities in the spring and summer of 1972, communities ranging in type from an isolated and dying town of 500 in rural Oregon, to a newly founded and struggling urban Indian clinic in Seattle. The bewilderment of the first physicians sent to these sites was matched by the confusion within the sponsoring community boards and the federal regional offices charged with administering the program.

The first year of actual operation was disorganized; the program was amorphous and lacked unity. When Dr. Edward Martin became the third director of the Corps in 1974, he moved forcefully to give the Corps definition. Choosing the private practice model, and targeting

## Key to Acronyms

ARC	Appalachian Regional Commission
BCHS	Bureau of Community Health Services
BCRR	BCHS Common Reporting Requirements
CHMSA	Critical Health Manpower Shortage Area
DHEW	Department of Health, Education, and Welfare
GAO	General Accounting Office
HMEIA	Health Manpower Education Initiative Award
HMSA	Health Manpower Shortage Area
HPEAA	Health Professions Educational Assistance Act
HRA	Health Resources Administration
HSA	Health Services Administration
HSMHA	Health Services and Mental Health Administration
NHSC	National Health Service Corps
RHI	Rural Health Initiative

the rural areas severely depleted of physicians, he shaped the Corps into a federal mechanism by which medical practices could be established in areas that at one time had supported private practices, and had the potential to support private physicians in the future. Thus, the NHSC fostered what was considered the relatively straightforward solution of deploying health personnel in areas that lacked an adequate supply of health providers. With increasing experience, recruitment and placement were substantially improved.

In 1972, with relatively little discussion, Congress established the Public Health and National Health Service Corps Scholarship Training Program when it modified PL 91-623, the bill that created the National Health Service Corps. Little noticed at the time, the act provided scholarships for junior and senior medical students in return for their promise to serve in the Corps when they had completed their training. The amount appropriated was trifling, and the future impact of the program was not apparent to those running the Corps. But it had an enormous symbolic importance, for the first time explicitly tying together the financing of medical education and

the delivery of health services, and had immediate and far-reaching administrative consequences.

When the Corps was created, it was organized within the Bureau of Community Health Services (BCHS), then a component of the Health Services and Mental Health Administration (HSMHA). The mission of BCHS was to make grants to community-based groups who, in turn, delivered health services to certain defined categories of persons, such as migrants and women in need of family planning services. The Corps was similar to BCHS in being targeted at identifiable underserved population groups. It differed, however, in not giving out grants but rendering assistance through personnel who retained their status as federal employees.

Soon after the Corps was made part of BCHS, there were attempts on the part of a companion agency, the Health Resources Administration (HRA), to gain control of the program. Traditionally, the HRA has been responsible for programs that had an impact on the nation's medical manpower, and was the major conduit through which DHEW was expanding the supply of physicians, mostly through capitation grants to medical schools, loans to medical students, and support of the newly emerging primary-care discipline of family medicine. HRA argued that the Corps was simply another manpower program, but its service aspects were dominant and the NHSC remained within the BCHS bailiwick. An intra-agency body suggested a compromise by giving HRA the function of defining and designating health manpower shortage areas (HMSAs), a task it performed for other federal health programs. In addition, the small scholarship component of the NHSC that began in 1972 was made an HRA responsibility. This symbolic division of labor emerged as an organizational problem that later threatened the functioning of the entire program and is now undergoing intense scrutiny and change.

In addition to the apparently inconsequential administrative realignment catalyzed by the 1972 amendments, the act signaled the view of the Congress that the Corps should serve as a vehicle to accomplish other major federal objectives in the health sphere. Thus, when Congress decided in 1972 to combine support for medical education with service in medically underserved areas, the NHSC was implicitly being used to attempt to improve, and perhaps even transform, American medicine.

The 1972 amendments were of little direct significance except as bellwethers for future program changes. The NHSC underwent a steady growth in appropriations and field size (see Table 1), regional offices were organized and reorganized, and the staff gained experience in selecting both recipient communities and appropriate physicians. With this steady growth in size came a change in direction and philosophy, a change that was accelerated but is not entirely attributable to PL 94-484, the Health Professions Educational Assistance Act (HPEAA) of 1976. With this change, the NHSC has become a significant part of overall federal health policy, and has become immersed in potentially crippling controversy.

The 1976 manpower legislation, coupled with a major reorganization within the Bureau of Community Health Services, completed the transition of the Corps from its first demonstration phase to becoming a major support of the entire BCHS strategy. As a result of the passage of PL 94-484, the little-noticed 1972 scholarship provision was expanded into a massive scholarship program with an appropriation that exceeded the amount set aside for the program's field operations. The appropriation level appeared arbitrary, and was determined more by the notion that a significant proportion of all medical students should perform public service than by a conscious decision that 3,000 new physicians a year were needed for underserved areas. The law set in motion an educational tidal wave that would deliver a large group of physicians three to seven years later, without setting out a clear prescription of what they would do or where they would do it.

The other element of the 1976 legislation that transformed the NHSC was an explicit broadening of the spectrum of population groups eligible for NHSC assistance. The legislation singled out for assistance some federal programs, such as the Indian Health Service and the federal prison system, and also opened the door for applications from specific segments of the population or ethnic groups that could make a convincing case showing they were relatively deprived of medical services.

These policy options were for the most part implicit in the original legislation. However, the new legislation generated a major revision in the process by which areas were designated as eligible, a process now much more susceptible to political pressure and artful statistical manipulation and presentation than the cut-and-dried methods by

TABLE 1  
Growth of the NHSC Program

Item	Year									
	1971	1972	1973	1974	1975	1976	1976*	1977	1978	1979
NHSC field appropriations (\$ millions)	3	12.6	11	13	15	20	9	25	41	65
NHSC scholarship appropriations (\$ millions)	—	—	—	3	23	23	23	40	60	75
Designated health manpower shortage areas	—	—	—	—	1,128	1,412	—	1,544	1,811	2,800†
Total federal assignees in field	—	34	150	338	470	611	—	724	1,289	1,725†
Number of people served (thousands)	—	—	—	—	510	574	—	670	1,362	1,644†
Number of new scholarship recipients	—	—	—	1,870	871	885	—	2,089	3,346	2,379
Percent assignees in free-standing NHSC sites	—	62	77	73	65	60	—	53	41	—

\*Transitional quarter.

†Estimated.

which earlier areas were designated. It became possible to declare all pre-existing federal grantees as eligible for Corps assistance. The NHSC, rather than being viewed as a relatively autonomous program designed to establish free-standing sites, became an assured staffing mechanism for other federal projects (see Table 1). NHSC assignees were increasingly being deployed to settings enmeshed in the complexities of federal grants, where self-sufficiency or independence in the private practice model was highly unlikely, a major departure from earlier policy.

This change was partially a response to legislation that permitted it, and an administrative commitment to coordinated programming that encouraged it. On the one hand, BCHS sought to create comprehensive health care systems in underserved areas, with the NHSC representing an in-kind manpower contribution to existing federal grantees, thus releasing grant dollars for other uses. On the other hand, the realities of large numbers of obligated assignees being delivered at the end of the educational pipeline, with no significant increase in the resources needed to manage the program, required that some ready-made placements be created in order to have functioning sites to which assignees could be sent.

In summary, the NHSC has seen a vast expansion and change in the number and direction of its program objectives. Because of rapid budgetary growth, particularly in an era of contracting federal expenditures for social programs, the NHSC has become a centerpiece of federal strategy for underserved areas. The scholarship program has emerged as a major mechanism for financing medical students, and has the potential to cause major changes in medical education and its products. In this process, the original program objectives have been modified and sometimes supplanted by additional objectives that derive from the various settings to which Corps assignees are being deployed. Table 2, based on a review of the administrative documents and the published literature, summarizes the chronological evolution of the major objectives, which combine both legislative and program goals. The objectives are not listed in order of importance, and later objectives do not necessarily supplant earlier ones. The purpose of this summary is to include the wide range of objectives that the NHSC program has embraced during its history.

TABLE 2  
Evolution of the Major Program Objectives of NHSC

Period*	Objectives
1970-1974	<p>Improve the delivery of health services in HMSAs.</p> <p>Assign federal health providers to HMSAs to remedy access problems created by poor distribution of physicians.</p> <p>Develop independent medical practices that will persist in HMSAs after withdrawal of federal support.</p> <p>Retain medical providers in underserved areas after they have completed NHSC service.</p>
1975-1976	<p>Integrate NHSC providers into existing and new rural and urban grant programs in underserved areas.</p> <p>Develop integrated systems of health care in underserved areas.</p> <p>Encourage the provision of preventive and promotive health services in underserved areas and throughout the United States.</p> <p>Develop cost-effective models of primary health care delivery within federal programs.</p>
1977-1979	<p>Increase the number of available NHSC assignees by providing scholarships to students in the health professions.</p> <p>Develop a manpower pool to ensure adequate staffing of BCHS programs.</p> <p>Create a national cadre of health professionals to assist diverse federal goals.</p> <p>Provide an alternative to the private practice of medicine in underserved areas.</p>

\*The temporal scale is approximate and represents the years in which the indicated cluster of objectives became generally accepted.

## Operation of the NHSC Program

The NHSC program consists of several interlocking administrative processes. For an NHSC placement to be made successfully, community development, provider recruitment, and a federal granting mechanism must come together in time and place. In order to understand previous research findings and identify salient policy issues concerning



the NHSC, it is necessary to understand the way in which these simultaneous administrative processes operate and interact with each other.

One can look at the NHSC program as having three major clients: the provider, the community, and the central federal bureaucracy. Each of these clients imposes certain requirements on the program, each is essential to the creation of a successful setting for practice, and each introduces its particular complexities into the administrative process. We will briefly explore the major temporal landmarks that are critical in the program implementation for each of these clients.

The typical NHSC provider at the present time is a physician who received a National Health Service Corps scholarship in order to pay for a medical education. His (or her) association with the NHSC begins before he enters medical school and continues until he leaves the Corps. The critical junctures for this type of provider occur when he is matched to his operational site, and when he ends the period of required service. Often the decision to seek the scholarship is based on financial need rather than on any clear concept of the content of future service. The typical scholarship recipient has relatively little contact with the NHSC until after he concludes residency training, when he enters into a complex matching process and competes for the assignment of his choice. Once assigned to a site, the provider completes his required service, which ranges from two to four years in length. At the conclusion of this period, he may elect to continue with the NHSC, either in the same or at a different location; may leave the NHSC, remaining in the community as a private practitioner or employee; or may move to another setting.

The community's involvement with the NHSC follows a parallel course. To become eligible for NHSC assistance, communities must be designated as health manpower shortage areas. They are so designated on the basis of the relative health manpower resources available to a given geographic or demographic population. Designation is made by the Health Resources Administration, but involves the formal input of local and state planning agencies, governmental agencies, and professional associations.

The next step is a formal application, handled at a regional office. Applicants range from community groups in rural towns to agencies of state government. An approved community goes through a period of

community development that varies greatly, depending on the type of organization into which the assignee will be absorbed, and on the previous administrative experience of the grantee. Technical assistance is available from the NHSC itself as well as from federal contractors hired for this purpose, although the relative amount of available assistance has decreased as the program has expanded. The communities first encounter the potential assignees as they get involved in the national matching process, and the ultimate selection and deployment of the assignees may take from months to years, depending upon the size of the current budgetary allocation of the Corps, the pool of assignees, and the relative attractiveness of the site.

Opening the site and its continued administration are the responsibilities of the community sponsor. The quality of this process varies greatly and is extremely important to the relative success of the site. When the assignee ends the required term of service, the community also confronts the problem of finding a replacement, and may attempt to persuade the provider to extend his commitment, or to remain in the community in private practice.

The third major actor in the NHSC process is the federal government itself, acting through the Public Health Service. The NHSC field program is largely decentralized, run by the ten federal regional offices. Thus, to a large extent, the centralized administrative apparatus of the Public Health Service is the third client of the program, attempting to balance the needs of the field program against budgetary limitations, national health initiatives, and regional competition for available resources. The process is made more complex because the program is divided between two large central agencies, the Health Services Administration (HSA) and the Health Resources Administration (HRA), each of which is responsible for different aspects and different phases of the program.

The process by which communities are designated and through which scholarships are awarded is the responsibility of HRA. Thus HRA has control over the early phases of what ultimately constitutes both the demand and the supply aspects of the NHSC program. In the past they have generally been carried out as separate activities, with little explicit attempt to link the number of scholarships awarded to the future need for health providers in underserved communities. Representatives from HSA participate in the scholarship selection,

but there is relatively little regional participation in this phase of the process.

Health students during the training phase are the responsibility of HRA, with limited assistance from HSA. HSA assumes responsibility for the matching of assignees to sites, which is a difficult and delicate process. Historically, those regions with the greatest need for health workers are those least attractive to those in the provider pool. Thus in the process of allocating assignees to regions, there is intense competition for those areas seen as attractive.

Once assignees are deployed to the field, they become the direct administrative responsibility of the regional offices. Because assignees are federal employees assigned to community organizations, all assignees have two masters. The situation is made more complex by the two very different systems by which Corps assignees are hired, the Commissioned Corps and the Civil Service system. Assignee supervision thus is a fairly delicate process of balancing between sometimes competing demands, and it requires sensitive leadership from the regional office if it is to succeed.

In its role as client, the federal government also imposes a range of additional requirements on the regional offices managing the program. Federal initiatives ranging from family planning to immunization are promulgated periodically by executive and legislative branches of government. In most cases, these are translated into an expectation that Corps assignees will assist the federal effort.

This brief summary of the program's operation, seen from three different perspectives, shows that the NHSC is an extremely complex organizational entity, subject to the pushes and pulls of many forces both within and outside government. As we review past research and evaluations of the Corps, we must remain aware of the difficulty of identifying exactly which forces are responsible for the observed results.

### Earlier Research on the NHSC and Identification of Major Issues

Our review of past research on the NHSC suggests several problems that analysts have had to face: 1) Program objectives have been broad,

ill-defined, and have changed rapidly, with considerable disagreement among policy makers as to their relative importance (see Table 2). 2) At the same time that the NHSC program has been implemented, other massive interventions have been made into the health care delivery system that have had major impacts on the provision of services to underserved areas. Since all these programs were developing simultaneously, it becomes extremely difficult to isolate the impact of the NHSC alone. 3) The early Corps operations were marked by erratic and deficient reporting systems. The introduction in 1976 of a unified reporting system, the Bureau of Community Health Services Common Reporting Requirements (BCRR), has provided a potentially improved data source, but the process of implementing and validating the system has proceeded slowly.

Despite these problems, numerous studies have been made of the NHSC program. We have organized our discussion into five major sections, according to content, to focus attention on key areas for future studies: designation of health manpower shortage areas, the educational continuum, site development and management, provider productivity, and provider retention. In each section the relevant literature is discussed briefly and the major unresolved issues are raised.

### *Designation of Health Manpower Shortage Areas*

The major legislative objective of the NHSC scholarship program is to provide the manpower needed by the NHSC service program in underserved rural areas. Thus, from a logical standpoint, the number of scholarships awarded should be explicitly related to the projected future requirement for NHSC assignees; this, in turn, derives from the number of HMSAs and the manpower required to reduce or eliminate inequities in the distribution of or access to providers. The process of designating HMSAs should thus be strongly related to the future growth and operation of the NHSC.

The NHSC has begun to grapple with the problem of linking scholarship allocation to future need for personnel. Geomet (1977a) developed a computer simulation to estimate the number of CHMSAs

for the period 1973 to 1985 and the number of physicians required in those areas to eliminate shortages. Using that model, an NHSC task force estimated the need for personnel over the next decade. Michelsen and Cronquist (1979) estimate that, to eliminate inequities in the distribution of physicians, 20 percent of the medical school graduates in 1984 should be part of the scholarship program. The Geomet model represents a first attempt to assign scholarships rationally on the basis of future need.

The problem of identifying areas of need has been analyzed extensively. A review of the literature shows that currently there is no simple unambiguous answer to the problem. Lee (1979) discussed the history of HMSA designation and the progress and problems in implementing the language of PL 94-484. In the original 1970 law, the criteria were relatively unambiguous: a ratio of 1 physician to a population of 4,000 within a medical service area was sufficiently restrictive to allow little debate about the need for additional resources in these areas. Yet, even in these settings, the General Accounting Office (GAO) (Comptroller General, 1978) has been extremely critical of DHEW for overestimating future demand. Lee suggests that the major problems of the designation process before the enactment of PL 94-484 were the existence of multiple lists of manpower shortage areas, the use of county data, the excessive dependence on physician-population ratios, and the inability to adequately handle the problem of contiguous areas.

Under PL 94-484, the criteria have been made much more flexible. Population characteristics unrelated to physician supply may greatly modify the designation process, and the categories of population groups that can receive NHSC assistance have been expanded to incorporate such disparate structures as prisons or specific population groups. Although this has allowed the NHSC program to be used in a wider range of circumstances, it makes it difficult to project with any assurance the number of HMSAs that will exist at any given time in the future.

The effort to assign scholarships rationally, on the basis of future need, is still in its infancy. The early effort by Geomet (1977a) pointed out some of the current barriers that limit the degree of sophistication with which needy areas can be designated. The first is that conven-

tional geopolitical units do not usually encompass logical areas of medical service. Yet data are aggregated by geopolitical unit, and the cost of studying small areas is usually prohibitive. In addition, the data that do exist are often out of date. There is little agreement as to which population characteristic is the most important in the designation of need. Hence, we see the dependence on provider-population ratio rather than on measures of health status, disability, or future demand.

Work must continue in this area if we are to avoid the situation of the past two years, when the number of scholarships awarded has depended primarily on the size of the congressional appropriation. The number of scholarship recipients should be a function of future need in underserved areas, as well as of the administrative capacity of the program to absorb larger numbers of personnel.

In summary, to improve the method of designating health manpower shortage areas will require extensive work. Among the questions that have been raised by past research are: 1) Does the dual administration of the NHSC and the scholarship program by HSA and HRA hinder the development of a rational process to link the number of scholarship recipients with the number of assignees needed for future service in shortage areas? 2) How can we set up designation criteria that will produce a better measure of real need than an adjusted ratio of providers to population? How can the criteria incorporate the difference between needs and demands? 3) How effective has the NHSC been in assisting communities that want to be designated as HMSAs and to develop a NHSC site? 4) How can priorities be set for staffing rural areas, urban areas, and institutions that have been designated as health manpower shortage areas?

### *The NHSC Pipeline: The Progression from Education to Service*

The provider pipeline created by the NHSC scholarship program has implications for program operation that have not undergone systematic evaluation, although Madison and Shenkin (1978a, 1978b) have framed the question. Briefly, they outline the dimension of the problem and the opportunity created by a massive scholarship program linked to future service; identify the critical points in the process of

medical education where intervention is possible; and argue for effective steps to interact meaningfully with scholarship recipients throughout their medical education.

At present, only two studies have focused on the process by which students apply for and are selected for NHSC scholarships. The Association of American Medical Colleges (1977a, 1977b) is using its extensive information system to assist HRA in testing the validity of the medical student's response to the scholarship application. The major goal of this continuing effort is to identify factors that may discourage applications for the scholarship program. The study should shed light on how well informed the potential applicants are about the program.

Michelsen and Cronquist (1979) have made a detailed summary of the current status of the scholarship program. They cite a projected field strength of 15,000 physician assignees in 1990, and conclude that for the scholarship program to supply this number of physicians could involve recruiting up to 20 percent of each medical school class into the program.

The most recent discussion with relevance to the progression from education to service is that prepared by LeRoy and Brown (1979) of the Health Services Policy Analysis Center at the University of California, San Francisco. They raise a number of the major policy questions that relate to the growth of the scholarship program and its integration with the service program. The major issues include the difficulty introduced by placing the administrative responsibility for the scholarship component within HRA and the service component in HSA; the potential conflict between using the scholarship program as a vehicle for financing medical education and as a source of manpower for the NHSC service program; and the potential effects on the program of switching from volunteer health professionals to those who are obliged to serve in return for their medical education.

The addition of a large scholarship program has greatly altered the size and the character of the NHSC. There are no studies that evaluate the impact of this change on program operations or success. The policy issues cited above stress that the size and length of the scholarship program present major problems for program administration that should be confronted.

A number of questions are suggested by a review of the program and the available discussion papers: 1) How successful has the program been in attracting potential applicants to the scholarship program? 2) How well do scholarship recipients understand the requirements of the program in which they will be serving? 3) Is the education given scholarship recipients during their professional school and residency years appropriate to the conditions of their future service? Does the program adequately acclimate them to the NHSC during their educational years? 4) What is the effect of changing the personnel of the NHSC from volunteers to those obliged to serve?

### *Site Development and Management*

Site development is a function of a regional office. This complex process begins with identifying possible areas for future NHSC assistance and involves consulting with other involved groups, organizing community efforts, establishing management systems, recruiting and matching assignees, and assisting and monitoring the project. Given the wide range of sites currently receiving NHSC personnel, the process varies greatly from project to project. In a free-standing rural site, the major efforts may revolve around raising funds to build a clinic. In an urban setting, the major efforts may be devoted to creating a consortium of community-based groups to sponsor the project.

Although site development and management are central to the whole NHSC program, there are no evaluation studies that focus on the competence of the regional office in carrying them out, and on the use of technical assistance contractors throughout the process. No studies have attempted to identify those organizational structures that seem to be best for NHSC sponsorship. Two reasons seem to account for the paucity of relevant studies. First, the program has evolved and changed so rapidly that it is difficult at any one time to focus an evaluation question that will be of use once the study has been completed. Second, it is very difficult to devise appropriate methodologies to study such issues as community organization and technical assistance. These areas, critical to the success of the program, are usually the product of the work of individual project officers, are



extremely sensitive to local conditions and customs, and often defy quantification.

The few available studies and discussions focus on an analysis of the types of community settings and manpower configurations that appear to encourage the success of NHSC projects. The conclusion one draws from these studies (Woolf, 1978; Nighswander, 1977) is that those settings with the greatest general social and economic deprivation are also the most difficult in which to establish a successful NHSC site.

A series of studies performed in DHEW Region X (Rosenblatt and Moscovice, 1978a; Moscovice and Rosenblatt, 1979) examines the impact of different manpower configurations and community settings on project growth and success. The studies demonstrate that site maturation is the most important factor in determining the relative productivity of a NHSC site. Larger settings with more providers and greater health resources, such as hospitals, grew more rapidly, approaching financial equilibrium in two to three years. Sites without hospitals, and those staffed by physician extenders alone, grew more slowly and appeared unlikely to achieve financial independence.

The GAO (Comptroller General, 1978) focused explicitly on the site development strategy of the NHSC. They were highly critical of the establishment of sites in areas where utilization did not reflect the supposed level of underservice. They suggested that the NHSC was remiss in doing inadequate market surveys and needs assessments before establishing new sites. Although the issue is of great importance, the conclusion reached may not follow from the evidence. First, underserved areas have difficulty translating need into effective demand. As Kane et al. (1978) have shown, underserved populations are slow to change their allegiances and patterns of seeking health care. Second, comparisons with data from the private sector are unfair. There is no reason to assume that a federally sponsored practice in an area chronically deficient in health resources should demonstrate utilization patterns that resemble those experienced by long-settled private practitioners in well-served areas.

The studies cited above are for the most part tangential to the central issues; no one has adequately addressed the problem of site development. A number of questions suggest themselves: 1) How

adequately do state governments, HSAs, and the NHSC cooperate in the identification, designation, and development of NHSC sites? 2) How effective has the regional office staff been in administering the NHSC program? 3) Which organizational structures make the most effective sponsoring agencies for NHSC assignments? 4) To what extent has BCHS been successful in logically integrating diverse grant and personnel programs and in increasing the amount of available health services in underserved areas? 5) To what extent have NHSC providers formed meaningful clinical linkages and working relations with other federal and state programs and with the private sector in their medical service areas?

### *Productivity*

The issue of the productivity of NHSC physicians and mid-level practitioners has probably captured as much attention as all the other issues combined. Although it is certainly important both for assessing the attainment of program goals and as a management tool, productivity per se is but one measure of NHSC performance; concentrating on this measure to the exclusion of others cannot yield a complete picture of the NHSC program.

Virtually all productivity studies of NHSC providers have shown relatively low productivity values of physicians and mid-level practitioners at NHSC sites (Comptroller General, 1978; Emery, Calvin, and Dobson, 1976; Geomet, 1977b; Heuley and Enger, 1978; Moscovice and Rosenblatt, 1979; Rosenblatt and Moscovice, 1978a; Woolf, 1978; Calvin, 1978; Nighswander, 1977). This is true independent of the measure of productivity used (annual encounters per provider full-time equivalent, quarterly encounters per provider full-time equivalent, patient encounters per clinic hour).

A series of studies by the Office of Planning, Evaluation, and Legislation, HSA, and Geomet (Emery, Calvin, and Dobson, 1976; Geomet, 1977b; Geomet, 1979) found marked regional variations in productivity at NHSC sites, slow but increased growth with site maturity, lower productivity than in the private sector, and no significant differences in physician productivity between sites with one and those with several physicians. They raise the question of whether

it is fair to compare physician productivity rates in NHSC and in the private sector without adjusting for the age of the practice, the modifications imposed by working in an underserved area, and potential differences in the case mix.

A group of studies by Rosenblatt and Moscovice (1978a, 1978b) focused on the productivity of NHSC sites in the Pacific Northwest. They found slow but steady growth in provider productivity over the first three years of operation. Financial independence was largely dependent on the number of people living in the medical service area; physician practices required 4,000 persons, and mid-level providers required 1,500, to generate adequate utilization levels.

Nighswander (1977) and Woolf (1978) examined a wide range of variables potentially affecting NHSC site productivity, and concluded that fixed community environmental characteristics (e.g., age, educational level, and wealth of the residents and the population density of the area) are the most important factors.

Finally, Heuley and Enger (1978) have studied the "marginal productivity" of adding a physician or mid-level provider to an existing NHSC site. They defined the term as the change in number of annual encounters per provider full-time equivalent, and found that the marginal productivity of a mid-level provider was 79 percent that of a physician. This result led them to question the cost benefit of employing an additional physician rather than a mid-level provider at an existing site.

What can we conclude from these studies? Certainly productivity is an important indicator of management, and low levels point to program difficulties. Yet comparing NHSC sites with established private practices does not seem fruitful. Rather, the results of these studies should be used as pointers to further in-depth analysis of program operations. Such an effort could suggest a direct strategy for improving the productivity of NHSC providers.

These studies on the productivity of NHSC physicians and mid-level providers raise a series of questions for future study. Among them are: 1) Is the low productivity experienced at NHSC sites inherent to practices in health manpower shortage areas or are there factors that can be controlled by the NHSC to improve productivity? 2) Can NHSC sites of low productivity be predicted in advance? If so,

what can be done to improve their productivity? 3) How has the use of mid-level providers and the dual physician placement strategy affected the productivity at NHSC sites? 4) What is the optimal health manpower configuration for NHSC sites? 5) Can comparable data be collected on fledgling private sector practices in health manpower shortage areas so that fair comparisons can be made between NHSC and private sector sites?

### *Provider Retention*

Provider retention and independence have been major dependent variables in many studies of the NHSC and are among the earliest and most persistent objectives of the program. The definition of retention has undergone changes, however, and with the maturation of the program it is difficult to compare data based on different criteria. Retention, in its broadest form, includes cases in which assignees make the transition to independence from the NHSC while remaining in their original sites, and cases in which assignees extend their period of service in the NHSC and remain in their sites as federal employees. It can also be argued that cases in which assignees move to another HMSA, either independently or as a Corps assignee, represent another kind of retention.

A number of studies have examined different aspects of retention. Family Health Care (1977) specifically attempted to determine which assignee characteristics were correlated with the decision to remain in the NHSC community after the first tour of duty. They were unable to identify any that could reliably predict retention.

Woolf (1978) examined the characteristics of communities in which the site became independent of NHSC support. He found that communities where assignees achieved independence had higher ratios of population to number of physicians, more hospital beds per capita, and higher educational levels. Although the number of sites analyzed was small, this suggests that communities that already have extensive pre-existing health care systems are the more likely to incorporate NHSC physicians into the existing matrix. Conversely, those sites with the greatest need for services may have the most difficulty retaining physicians.

Rosenblatt and Moscovice (1978b) came to similar conclusions in a

study of all NHSC physician sites started in Region X over a six-year period. Those assignees who remained in the community as independent practitioners, or who had extended their original commitment to the NHSC, tended to have finished formal residencies, particularly in the field of family medicine, and to be working in communities with hospitals and group practices. Communities with service area populations of fewer than 4,000, particularly those without hospitals, appeared very unlikely to retain physicians.

Geomet (1979), in evaluations of NHSC, Rural Health Initiative (RHI), and Appalachian Regional Commission (ARC) sites, found that sites that made the decision to become independent did not appear to do so for financial reasons. At the point of independence, these sites were recovering approximately two-thirds of their costs. The observation that most of these sites were in the Northeast and the West, the two regions most sought after by NHSC volunteers, suggests that lifestyle and geographic preferences play an important role in the assignee's determination to remain in a community.

Two major methodological problems muddy these discussions of NHSC retention. First, there is no clear agreement on what constitutes retention. Different observers use different definitions, and even the program has altered its definitions with time, making the comparisons difficult. Second, there is no agreement on what constitutes optimal retention, and we have no reliable data from the private sector indicating the patterns and length of practice of private physicians in comparable settings. Until there is some resolution of these issues, it will be impossible to use retention as a meaningful evaluation measure.

A number of questions remain: 1) What constitutes retention in NHSC practices? How can the measure be defined so as to be a useful indicator of program performance? 2) Given an agreed-upon definition of retention, what retention rates should be adopted as performance standards? What constitutes an acceptable rate? 3) How successful is the NHSC program in eliminating HMSAs through the retention of primary care providers in settings that do not have federal support? 4) What effect do clinical support systems, in-service education, assignee networks, and other professional linkages have on the retention rate? What effect does the scholarship program have?

In summary, the NHSC program has evolved rapidly. Evaluation

efforts, by their very nature, tend to lag behind rapidly changing program objectives. The majority of the studies performed to date have been creditable attempts to explain specific aspects of the program. In general, however, the choice of topics for study has been limited by the incomplete, and often unreliable, data bases, a frequently encountered characteristic of a program that is growing and changing. Future analysis, if possible, should anticipate the directions in which the program is moving so as to provide information that will allow managers and policy makers to control and direct this crucial federal initiative.

## The Future of the NHSC

The NHSC is at a critical juncture in its development. It continues to represent a major source of discretionary money within the federal establishment for improving the delivery of health services and potentially acting as a lever to reform medical education and services within the United States. The conflicts inherent in the rapidly changing legislative background, multiple missions, and new interpretations of mission and process threaten the program's viability. In our opinion, the major actors with a stake in the NHSC program need to collaborate in resolving the questions that remain unanswered. The NHSC has grown so large that it can no longer be viewed as innocuous by certain power groups whose dominance of or mode of business it threatens. At the heart of the problem is what should be the role of the NHSC and its companion scholarship program in a time of apparent oversupply of physicians.

Congress made the decision to support medical education by providing scholarships to students rather than by capitation grants to medical schools. Its reasoning was that the students thus obligated could be deployed in a flexible manner to meet national needs. The government now faces the prospect of being unable to utilize the health professionals in whom they have made large investments, or of using them inappropriately in ways that further distort an already irrational delivery system, and unnecessarily heighten the confrontation between competing elements in the medical market place.

The federal government must develop a stance toward the private sector of medicine and relate this to the impending growth of the NHSC program. To date, private medicine and the federal establishment have evolved a mutual distrust that impedes meaningful collaboration at many levels. The NHSC, at first warmly welcomed by private medicine, is now viewed with suspicion as it begins to acquire responsibility for the future of a growing proportion of graduating physicians, and is forced to place these people in practices that at the margin compete for patients with private physicians.

The forthcoming era of access to health services will be characterized by increased numbers of physicians, pressures for containing costs, and a large flow of students leaving medical schools to be placed in federal settings. It appears that the NHSC can be used as a catalyst to help transform American medicine to respond more appropriately to the world of the future, and as a ground for experimenting with novel forms of delivery and new payment mechanisms. However, if the NHSC continues to ignore the qualitative changes that have been caused by the increase in the size and visibility of the program, the NHSC will face dissension and discord in the ranks, unmet expectations among the people to be served, and political confrontations with those who see their interests threatened.

From our analysis of the literature and our close association with the NHSC program,<sup>1</sup> we see three steps as the best of the potential future options for the NHSC:

1. The NHSC needs to become administratively unified and given sufficient autonomy. The division of the program between HSA and HRA is a major problem. Reuniting the program would make possible a concerted attempt to identify appropriate students for scholarships and prepare them through their training so that they will be able and willing when they enter the NHSC. This will require meticulous attention to every phase of their training. This approach would also

<sup>1</sup> Dr. Rosenblatt was director of the NHSC in DHEW Region X from 1976 to 1977 and is currently involved as a consultant to the NHSC. Dr. Moscovice has worked closely with DHEW Region X, as a consultant and grant recipient, on matters related to the NHSC.

provide an opportunity to influence medical education, particularly at the institutions that, because of their high tuition fees, have the highest percentage of NHSC scholarship recipients.

The NHSC should also be removed from BCHS. Although the aims of BCHS, to create comprehensive health care systems in underserved areas, are laudable, the means are restricted by the extremely detailed reporting and regulatory requirements of the enabling legislation. The NHSC is not so encumbered legally and should not be so burdened administratively. For the NHSC to be effective, it should be able to forge its own future. We suggest a central administrative component with at least Bureau status, and a meaningful decentralization of the program with a commitment to recruit the best administrative staff in sufficient quantity at the regional level to give the program true meaning on a regional basis.

2. The number of scholarships awarded must relate to an accurate prediction of the number of assignees who will be needed and can be appropriately deployed. Forecasting methods, based on the ratio of physicians to population in medical service areas, are now being employed to project the future number of assignees required to eliminate areas of underservice in the United States. Although these methods are based on essentially normative assumptions about what constitutes adequate health services, the technique provides at least the kernel of a rational approach to the problem.

3. The National Health Service Corps should be used flexibly to experiment with new ways of improving the delivery of health services. The merger of the scholarship and service components of the program would afford the opportunity to intervene creatively in the way students are trained for the health professions, and to modify the traditional settings in which they practice when they finish training. Schools with scholarship students should be firmly prodded to incorporate into their curricula material that will make future generations of physicians aware of the existence and nature of underserved communities; in this way, the NHSC scholarship program can be used as a catalyst to improve medical education. Residency programs should be urged, and their members rewarded for working with medically underserved communities within their medical service areas; residents with scholarship obligations can be incorporated into NHSC settings



as part of their training. The entire program should be meaningfully decentralized so that site development and physician preparation are handled at the local and regional levels, and the process of matching the provider and the community begins far before the date of projected assignment. In this way, the NHSC can become not just a stop-gap program intended to patch temporary holes in the medical care delivery system, but a mechanism through which the entire medical system can be made more responsive to the people it serves.

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*Acknowledgments:* We wish to acknowledge the assistance of the following persons in obtaining the manuscripts and materials upon which this paper is based: Fitzhugh Mullan and his staff at the National Health Service Corps, Marian Solomon, Gary Wold, Anthony Pollitt, Dan Calvin, Richard Bohrer, Don Madison, Mary Brown, and Lauren LeRoy. This paper does not necessarily reflect the opinions of these persons or of the organizations with which they work.

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