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# A Report on the National AHEC Program

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THE AREA HEALTH EDUCATION CENTER (AHEC) Program is one of the more substantial efforts to deal with problems of maldistribution of health manpower and services in the United States. The initial Federal investment in this effort will total some \$65 million over the first 5 years, 1972-77, and is likely to be expanded in the near future. A number of States have also devoted substantial sums to the maldistribution issue, either in cooperation with the Federal effort or independently, and others are considering similar undertakings.

The AHEC approach addresses maldistribution through educational interventions, based on the assumption that changes in educational programs and processes can provide effective incentives to encourage practitioners to locate and work in areas that currently have inadequate services. Changes in the pattern of education and the educational environment, it is believed, can contribute substantially toward overcoming barriers to recruiting and retaining health professionals and supporting personnel in certain communities. These interventions, it is assumed, are strengthened by sponsorship and execution by multidisciplinary groups.

To achieve desired changes in educational programs, the AHEC approach requires a network of cooperative relations between a health sciences center (HSC) or medical school, on the one hand, and community hospitals and other local educational and clinical resources in the "remote area," on the other.

A remote area is one with little access to adequate health manpower training and health care facilities, and it is deficient in key areas of health manpower needed in the community. Sharing of effort and resources between the HSC (or medical school) and community institutions is key to the AHEC concept.

By the summer of 1976, the Bureau of Health Manpower (BHM) of the Public Health Service assisted in the establishment of 26 AHECs in 11 States. They are located in areas ranging from Maine to California and from North Dakota to Texas. Other AHEC-related approaches have been undertaken with aid from the Veterans Administration

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(VA) and Regional Medical Programs (RMPs), as well as without Federal support (1).

Our following review of the development of the 11 projects—including 26 AHECs undertaken with BHM support—and a summary, from a national perspective, of their progress and problems after 3 years, 1972–75, is based on a survey carried out over approximately 18 months between the fall of 1974 and the spring of 1976 (2).

### Goals and Objectives

The National AHEC Program was inspired and stimulated by the report of the Carnegie Commission on Higher Education in 1970 (3). As part of a broad series of recommendations concerning medical and dental education, the commission recommended the establishment of 126 AHECs by 1980. The report envisioned that the HSC would be linked to affiliated community hospitals located in underserved areas at some distance from the HSC. The community hospital, in turn, would assume a regional responsibility for health manpower education, including cooperative relationships with institutions engaged in health professions education in its region. “. . . (AHECs) would be satellites of university or health science centers . . . their educational programs would be developed and supervised by the health science faculty, and their patient care functions would rely on the expertise of the health science center personnel” (3a).

The Carnegie Commission intended that the AHECs serve as regionally-based alternatives to university health science centers “. . . (they) would perform somewhat the same functions recommended for university health science centers . . .” (3b). The major emphasis would be on education for physicians and dentists. Dr. M. Gordon, a senior staff member of the commission, called further attention to these opportunities in 1971 (4).

The President's 1971 Health Message advocated Federal support for the development of AHECs. References to the Carnegie Commission recommendations were included in the testimony on the health manpower bill under consideration in the Congress in 1971 and in congressional reports and debates. The Comprehensive Health Manpower Training Act of 1971 (Public Law 92-157) established a program of Health Manpower Education Initiative Awards aimed at “improving the distribution, supply, quality, utilization and efficiency of health personnel and the health delivery system.” Under this authority, the then Bureau of Health Manpower Education of the Public Health Service issued a

“Request for Proposals” in June 1972 indicating the availability of Federal support for the establishment of AHECs. In September 1972, 11 contracts were awarded.

The “Request for Proposals” listed the following six “broad AHEC objectives . . . intended to provide a guide for those electing to initiate and implement an Area Education Center”:

- planning, establishing priorities, and relating education to the health manpower needs of the area;
- providing educational programs;
- improving the professional environment;
- coordinating health manpower education in the area;
- developing health careers, especially new careers, consistent with the target area's long-term needs; and
- improving and equalizing minority opportunities.

There are notable similarities among the statements of goals and objectives set forth by the Carnegie Commission and those articulated for the AHEC program funded by BHM and for the related programs supported by the VA and for the Health Services/Educational Activities (HS/EA) supported by RMPs. These statements are summarized in table 1. The most commonly cited concerns are (a) relating manpower strategies to service needs, (b) extending local clinical training opportunities, (c) improving continuing education, and (d) furthering new careers.

However, the three Federal programs emphasized different organizational approaches toward the achievement of certain similar purposes. Also, on several other dimensions—such as size, scope of activities, and assignment of responsibilities—there are important differences. In some cases, the efforts of the various programs have been joined at the local level (5).

Dr. Eugene Mayer, deputy director, North Carolina AHEC Program, has emphasized the social, educational, regionalization, and management purposes of the AHEC Program (personal correspondence, June 1976). The social thrust aims at redistributing the supply and geographic and specialty distribution of physicians so as to improve access to all types of primary care practitioners. The educational purposes are to decentralize medical, dental, pharmacy, and public health education and to regionalize nursing and allied health education as well as residency training and continuing education activities. The regionalization thrust encourages HSCs and community hospitals to (a) work together and (b) join with less well-endowed institutions in their service areas in

Table 1. Statements of goals or objectives for area health education centers (AHECs) and related programs

<i>Objectives</i>	<i>Carnegie Commission</i> <sup>1</sup>	<i>Bureau of Health Manpower AHEC</i> <sup>2</sup>	<i>Regional Medical Programs HS/EA</i> <sup>3</sup>	<i>Veterans Administration</i> <sup>4</sup>
<b>Planning</b>				
Relate manpower strategies to service needs .....	yes	yes	yes	yes
Strengthen linkages among institutions .....	yes	yes	.....	yes
Improve use of health services, especially ambulatory services .....	yes	yes	.....	yes
<b>Educational activities</b>				
Extend local clinical training opportunities for medical and dental students and residents .....	yes	yes	yes	yes
Improve continuing education .....	yes	yes	yes	yes
Extend new careers .....	yes	yes	yes	yes
Improve allied health training .....	yes	yes	.....	.....
Strengthen interdisciplinary training .....	.....	yes	yes	.....
Relate educational experiences to practice setting .....	yes	.....	yes	.....
Extend health education of public .....	.....	.....	yes	.....
<b>Community institutions</b>				
Strengthen community hospital programs .....	yes	yes	.....	yes
Create a more stimulating local professional environment .....	.....	yes	yes	.....
<b>Academic institutions</b>				
Increase primary care emphasis in the medical school curriculum .....	.....	yes	.....	.....
Improve medical school coordination .....	yes	yes	.....	.....
<b>Other</b>				
Increase training opportunities for local residents .....	.....	yes	yes	yes
Equalize training and employment opportunities .....	yes	yes	.....	.....
Encourage consumer participation in curriculum development .....	.....	.....	yes	.....

<sup>1</sup> Report of October 1970. <sup>2</sup> Statements of July 1972 and March 1974. <sup>3</sup> Statements of December 1971 and November 1974 (HS/EA—Health

Services/Educational Activities). <sup>4</sup> Statement of November 1972. NOTE: Leaders (...) indicate that item is not a major goal or objective.

order to (c) serve regional health manpower needs without compromising the primary responsibility of any of the institutions concerned. The management approach allows universities, hospitals, and the Federal Government to demonstrate that they can work together through a performance contract keyed to defined work statements with clear contractual accountability.

Chesney and Louis (6) believe that the following six inductive premises are basic to the AHEC concept:

1. Professionals have the ability to change and improve the nature of health care and educational processes in their own professions.

2. HSCs have something to gain by affiliating with decentralized training sites.

3. The development of professional support systems serves to augment other attempts at medical manpower redistribution and improved health care delivery.

4. The development of linkage . . . is critical to the process of decentralizing health care delivery.

5. Alternative health care systems are present in each of the AHECs . . . cooperation between these systems leads to more effective training of health professionals and delivery of health care, while competition between them may undermine the quality of local health care systems.

6. Training experiences in decentralized training sites will lead students to practice in those or similar settings.

The overall AHEC program goal might be summarized as the improvement of accessibility to needed health services—through changes in the distribution of health manpower (both by specialty and by geography)—as the result of changes in educational programs involving a network of educational and clinical resources. This statement encompasses the distributional, educational, and systems aspects of the program. It also indicates, in reverse order, the usual progression of development.

The "Request for Proposals" for contracts and other HEW statements recognized that diverse local conditions and needs meant that different approaches and activities inevitably would be more appropriate and feasible in particular areas. The initial BHM-supported AHEC undertakings were intended to test the concept in a multiplicity of circumstances. Flexibility was an essential and pervasive ingredient.

During the survey of AHECs in 1975, the 11 project directors at the HSCs were asked which objectives had been most important in the development of their programs. Their responses are shown in table 2. Although the distributional goals were universally accepted, the more specific items received varying degrees of priority.

### Systems Development

The 11 contracts were awarded to 10 public institutions and 1 private institution (table 3). Seven contracts were with medical schools and four with universities. In eight projects, the administrative unit is in the medical school; in three, the central staff reports to a vice president for health affairs or persons in comparable positions.

The HEW contracts called for 5 years of support. Federal aid for the total period averaged about \$6 million per project. Assistance to individual projects ranged from \$2.7 million to \$9.8 million. (In-depth descriptions of the 11 projects are available from National Technical Information Service, Springfield, Va., Nos. PB 245698/AS-PB 245708AS.)

In five projects, the HSC had been conducting a substantial number of similar activities before the Federal contracts, and these activities were incorporated into the AHEC effort. These projects had a substantial foundation of ongoing activities and relationships. As discussed later, these earlier activities sometimes had a notable impact on the nature of relationships and specific activities developed with Federal funds. In other projects, interest in establishing these types of programs was less well developed. In all projects, Federal funds appeared to reinforce existing trends and activities.

Among the 26 Bureau of Health Manpower AHEC sites, 14 are primarily focused on rural areas, 11 on small metropolitan areas, and 1 on a larger metropolitan area (table 3). Twelve are headquartered in cities suggested in the Carnegie Commission Report. The participating HSC is located in the AHEC area in two projects; in other projects it is up to 300 miles away.

As of 1975, there were AHECs or related programs in 51 of the 126 sites recommended by the

Table 2. Priority given to certain goals or objectives by staffs of 11 area health education center projects

Objectives	Priority			
	High	Medium	Low	None
<i>Planning</i>				
Increase the supply of certain types of health manpower in the AHEC area .....	11	..	..	..
Increase the numbers of graduates from AHEC training programs of all types who decide to practice in the area(s) .....	10	1	..	..
Relate training of health workers to local health manpower requirements ....	8	1	2	..
Strengthen linkages among groups and institutions concerned with manpower development in the AHEC area(s) .....	7	3	1	..
<i>Educational activities</i>				
Encourage implementation of innovations in the health education system .....	7	4	..	..
Train health workers in innovative techniques of interdisciplinary health care delivery .....	4	4	1	2
<i>Community institutions</i>				
Make the local communities served by the AHEC project more attractive places to practice .....	3	5	3	..
<i>Academic institutions</i>				
Increase attention to primary care training in the medical school or other curricula ....	4	5	1	1
Improve coordination between or with major academic departments .....	3	2	4	2
<i>Other</i>				
Increase training and employment of minorities, women, the disadvantaged, and local residents .....	5	4	1	1

1970 report of the Carnegie Commission. Overall, approximately 68 AHEC programs (including the 11 sponsored by BHM) or related arrangements are in 33 States. In its 1976 report, the Carnegie Council suggested development of 70 additional AHECs (7).

Different types of relationships were established by the projects with the remote areas to facilitate the development of the local centers (table 3). The

basic model, anticipated in the Carnegie Commission report, was a subcontract between the HSC and a hospital or consortium of hospitals in the local areas. The "regional hub model" is dominant in 6 of the 11 projects and 16 of the 26 AHECs. The regional hub organization, under subcontract from the HSC,

can be either the site or the sponsor for the AHEC program activities or it can delegate program responsibility to other organizations through "second tier" subcontracts or other arrangements.

Another organization approach, the "HSC hub model," is the development of multiple direct rela-

Table 3. Contractors and area health education centers

<i>Contractor, AHECs, and headquarters</i>	<i>Population type</i>	<i>Primary organization</i>	<i>Organizational structure</i>
Tufts University: <sup>1</sup>			
Maine Medical Center, Portland <sup>2</sup> . . . . .	Small metropolitan	Single community hospital or clinic . . . . .	Regional hub model
Eastern Maine Medical Center, Bangor <sup>2</sup> . . . . .	Rural . . . . .	do . . . . .	Do
University of West Virginia: <sup>1</sup>			
Charleston Area Medical Center, Charleston <sup>2</sup> . . . . .	do . . . . .	do . . . . .	Do
University of North Carolina: <sup>1</sup>			
Charlotte Memorial Hospital, Charlotte <sup>2</sup> . . . . .	Small metropolitan	do . . . . .	Do
New Hanover Memorial Hospital, Wilmington <sup>2</sup> . . . . .	do . . . . .	do . . . . .	Do
Health Education Foundation of Eastern North Carolina, Inc., 4 cities in Area L . . . . .	Rural . . . . .	Consortium of hospitals . . . . .	Do
University of South Carolina: <sup>1</sup>			
Greenville Hospital System, Greenville <sup>2</sup> . . . . .	Small metropolitan	Single community hospital or clinic . . . . .	Do
McLeod General Hospital, Florence . . . . .	Rural . . . . .	do . . . . .	Do
Spartanburg General Hospital, Spartanburg . . . . .	do . . . . .	do . . . . .	Do
Richland Memorial Hospital, Columbia <sup>2</sup> . . . . .	Small metropolitan	do . . . . .	Do
University of Illinois: <sup>1</sup>			
Rockford School of Medicine, Rockford . . . . .	do . . . . .	Subunit or affiliate of the health science center . . . . .	Do
Peoria School of Medicine, Peoria . . . . .	do . . . . .	do . . . . .	Do
School of Basic Medical Sciences, Urbana-Champaign <sup>2</sup> . . . . .	do . . . . .	do . . . . .	Do
Metropolitan Group of Hospitals, Chicago . . . . .	Large metropolitan	Consortium of hospitals . . . . .	Do
University of Minnesota:			
Central Minnesota Area Health Education Consortium <sup>3</sup> , St. Cloud <sup>2</sup> . . . . .	Rural . . . . .	Subunit or affiliate of the health science center . . . . .	Health science center hub model
University of Missouri:			
University of Missouri, Kansas City . . . . .	Small metropolitan	do . . . . .	Do
University of North Dakota:			
Northwest North Dakota AHEC: <sup>4</sup> Minot <sup>2</sup> . . . . .	Rural . . . . .	do . . . . .	Do
Southwest AHEC <sup>4</sup> , Bismark . . . . .	do . . . . .	do . . . . .	Do
Minn—Kota AHEC <sup>4</sup> , Grand Forks . . . . .	do . . . . .	do . . . . .	Do
Southeast AHEC <sup>4</sup> , Fargo <sup>2</sup> . . . . .	do . . . . .	do . . . . .	Do
University of Texas, Galveston:			
Pan American University, Brownsville . . . . .	do . . . . .	Educational or other nonclinical organization . . . . .	Do
Laredo Junior College, Laredo . . . . .	do . . . . .	do . . . . .	Do
Scott and White Clinic, Temple . . . . .	do . . . . .	Single community hospital or clinic . . . . .	Do
Driscoll Foundation Children's Hospital, Corpus Christi: <sup>2</sup> . . . . .	Small metropolitan	do . . . . .	Regional hub model
University of New Mexico:			
Navajo Health Authority, Window Rock, Ariz. . . . .	Rural . . . . .	do . . . . .	Do
University of California:			
Valley Medical Center, Fresno . . . . .	Small metropolitan	Subunit or affiliate of the health science center . . . . .	Health science center hub model

<sup>1</sup> Substantial earlier AHEC-type activity incorporated into AHEC program. <sup>2</sup> Recommended as site of AHEC by Carnegie Commission. <sup>3</sup> Initial institution; program became statewide in 1975, with University

of Minnesota as major institution. <sup>4</sup> Geographic area designation; University of North Dakota is the major institution.

tions between the HSC and numerous institutions in the remote area. This approach is dominant in 5 projects and 10 AHECs.

In 10 AHECs, the primary local organization is a single hospital and in 2 others it is a consortium of hospitals (table 3). In 11 AHECs, a subunit of the HSC is the principal organizational focus, and in 3, it is an educational or other nonclinical facility.

The environment of the remote area, that is, its resources, needs, and conditions, appears to be critical to the development of the AHEC. It can influence fundamentally the types of actions and activities undertaken. However, it is extremely difficult to define the relevant environmental factors, partly because of unclear boundaries of the area affected by specific activities and partly because those aspects that are directly and significantly effective are not identifiable. Since AHEC operations usually interact with only a small portion of the total environment, aggregate data (for example, physician to population ratios and per capita income) do not adequately measure the particular features that are important.

The difficulty is compounded by disparities between the formal and functional environments. Although staffs of many projects have identified multiple, potential target groups, including numerous professional and community agencies, they have not yet developed specific activities in all sections of the geographic area. In some instances, although students have been recruited from all parts of the area, educational activities have not been extended to peripheral locations.

Environmental variables may also affect organizational processes with different consequences over

time. That is, certain dimensions of the environment may have a positive influence at one point and a negative influence at another time. For example, resource scarcity may facilitate initial program development (since new programs are not perceived as threatening) but it may constrain long-term success of the program (since local resources may not be able to maintain established activities).

Nonetheless, it is clear that AHECs are developing generally under conditions of regional scarcity of resources. Dissatisfaction with these conditions and desires for a higher level and quality of health services have stimulated initiatives, both within the AHEC area and HSC. A lack of adequate health services has led numerous local groups and institutions to join in these efforts.

Local organizations in the remote area affiliated with the AHECs through subcontracts numbered 28 in the first year and 41 in the third year, an increase of almost 50 percent. In the third year, about 40 percent of the subcontractors were hospitals or other clinical facilities, 20 percent were 2-year colleges, and 10 percent were local health education agencies or consortiums. As work developed, several projects extended the scope of their formal contractual relationships in the remote area. The largest number of subcontracts to existing health or educational entities in a single project was eight. In general, however, there are relatively few second-tier subcontracts; in most projects, less formal means are used to involve remote area organizations.

In the third year, about 150 local organizations were actively engaged in the development of educational program activities (table 4). About 40 percent

Table 4. Number of specified sites and sponsors for preprofessional, undergraduate, and graduate education activities, third year, by project

Project	Hospital	Health clinic	4-year college or university	2-year college	Health professions school	Other education	Other
Total .....	63	16	28	12	9	7	9
Tufts/Maine .....	3	..	..	..	..	1	..
West Virginia .....	2	..	5	..	..	1	..
North Carolina .....	6	..	9	3	..	4	..
South Carolina .....	4	..	3	..	..	1	1
Illinois .....	20	11	7	..	3	..	3
Minnesota .....	5	2	..	..	..	..	1
Missouri .....	12	..	..	1	..	..	1
North Dakota .....	2	..	1	..	1	..	..
Texas .....	3	..	2	4	4	..	1
New Mexico .....	2	3	..	1	..	..	2
California .....	4	..	1	3	1	..	..

were hospitals, 20 percent 4-year colleges or universities, 11 percent health clinics, and 30 percent other types of organizations. Projects using a regional hub model type of organization seem to include fewer local organizations than those with an HSC hub model, possibly because more activities are undertaken by a major institution in the AHEC area when it is the subcontractor.

An average of about four schools and colleges within the HSCs participated in these projects (table 5). The scale of participation was relatively constant during the 3 years. In addition to medical schools, other commonly participating units were dental schools, nursing schools, and allied health, pharmacy and public health units. (Of course, not all 11 HSCs have such schools.) Mechanisms of participation varied, ranging from subcontracts to informal consultation.

The distribution of staff personnel varies by project. Altogether, more than two-thirds of total professional staff resources are located in the AHEC area, with a range from about 40 to 100 percent among the projects. The distribution of responsibility for carrying out activities indicates how responsibilities are shared among HSCs and AHECs. Joint responsibility for developing educational activities (excluding continuing education) was reported as the usual approach (about 60 percent of the projects). As the following percentages show, in a majority of projects, institutions in the remote area have a predominant operational role:

- No HSC role, AHEC role dominant, 19 percent;
- Minor HSC role, AHEC role dominant, 38 percent;
- Major role for both HSC and AHEC, 17 percent;
- Major HSC role, minor AHEC role, 6 percent;

Major HSC role, no AHEC role, 14 percent; and  
Minor or no role for HSC and AHEC, 6 percent.

### Program Development

The HSCs and AHECs have undertaken a substantial number of activities to deal with the maldistribution of health services and personnel. A diversity of approaches and actions has appropriately characterized these efforts. These activities are summarized here to provide an overall perspective of the activities of the 26 AHECs.

Many difficulties have been experienced in collecting and analyzing data on activities. Often it has been difficult to determine which activities to count. The AHEC activities aided with Federal funds are sometimes part of a broader undertaking. There are no standard criteria for determining which activities and costs not directly supported with Federal funds should be viewed and reported as part of the AHEC effort. In this report, we analyze only the use of Federal funds, thus sometimes giving an incomplete view.

Another problem is that procedures for collecting and reporting information were not standardized among the 11 projects. A single reporting system did not exist for the national program in the first 3 years. Thus, individual projects may have applied different definitions and interpretations. Nonetheless, the available data appear to present a pertinent general index of the nature and direction of the overall AHEC effort. They indicate the major thrusts of the AHEC program. A review of where identifiable resources (both staff and fiscal) are being concentrated reveals generally how the national program is proceeding.

Table 5. Health science center (HSC) units participating, third year, by project <sup>1</sup>

<i>Project</i>	<i>Medicine</i>	<i>Dental</i>	<i>Nursing</i>	<i>Allied health</i> <sup>2</sup>	<i>Pharmacy</i>	<i>Public health</i>	<i>Other</i>
<b>Total</b> .....	<b>12</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>
Tufts/Maine .....	1	1	..	..	..	..	1
West Virginia .....	1	..	..	..	..	..	..
North Carolina .....	1	1	1	1	1	1	..
South Carolina .....	1	1	1	1	1	..	..
Illinois .....	1	..	1	1	..	..	..
Minnesota .....	1	1	1	1	1	1	1
Missouri .....	1	1	1	..	1	..	1
North Dakota .....	1	..	..	..	..	..	..
Texas .....	1	..	1	1	..	1	..
New Mexico .....	1	..	..	..	..	..	..
California .....	2	2	1	1	1	1	..

<sup>1</sup> Includes HSC units from both the 11 contracting universities and from other universities.

<sup>2</sup> Includes activities not organized as a separate school.

The AHEC activities are broadly (a) educational activities, (b) other program activities, and (c) program management. During the first 3 years, almost \$30 million of Federal funds were spent. About two-thirds were devoted to educational activities, about one-eighth to other program activities, and one-fifth to program management. The percentages of the Federal expenditures were as follows:

Activities	First year	Second year	Third year	Total
Educational.....	63	65	67	65
Other program.....	13	13	13	13
Program management....	25	22	20	22

Because of the predominance of the educational effort and because many other activities as well as management were in support of education, our focus is on this aspect.

About half of the Federal dollars used for educational activities have been devoted to medicine. Allied health received about a fifth and nursing about a seventh of the total. As shown in the following table, between the first and third years the percentages of expenditures for medicine decreased while those for allied health and nursing education increased.

Discipline	First year	Second year	Third year	Total
Medicine.....	56	50	47	50
Dentistry.....	6	6	6	6
Nursing.....	11	13	15	14
Allied health.....	16	21	23	21
Other disciplines.....	8	7	7	7
Preprofessional and interdisciplinary.....	2	3	3	3

Almost all projects were participating in activities relating to undergraduate medicine and allied health and graduate medicine (table 6). More than half were

involved in nursing education and undergraduate dental education. Three projects supported preprofessional education.

About 40 percent of the educational expenditures were for undergraduate education, 30 percent for continuing education, and 25 percent for graduate education. In general, the percentage of expenditures for continuing education increased slightly during the 3 years, but the shares spent on undergraduate and graduate education declined somewhat. Undergraduate education funds primarily went to medicine and allied health (table 6). Spending for graduate education was highly concentrated in medicine, whereas expenditures for continuing education were more evenly distributed.

The proportion of total Federal expenditures devoted to educational activities by each project in the 3-year period and the proportion of educational expenditures devoted to the different disciplines are shown in table 7. As might be expected, there was considerable variation—4 projects spent more than 70 percent on education and 2 less than 50 percent, 4 spent more than 70 percent for medicine and dentistry, and 3 spent more than 50 percent for nursing and allied health.

Most of the educational activities were conducted in the AHEC areas. In the third year, about 90 percent of the reported activities were in AHEC areas; 6 of the 11 projects reported all such activities in AHEC areas.

The AHECs also participate in a variety of other programmatic activities. The most frequent have been evaluation, 11 projects; recruitment, 10 projects; development of communication resources, such as library and audiovisual resources, 7 projects; and consumer education, 6 projects.

Table 6. Number of projects participating and percentage of Federal expenditures on education, by discipline and level of education, third year

Discipline	Undergraduate		Graduate		Continuing	
	Number of projects <sup>1</sup>	Percent of expenditures <sup>2</sup>	Number of projects <sup>1</sup>	Percent of expenditures <sup>2</sup>	Number of projects <sup>1</sup>	Percent of expenditures <sup>2</sup>
Medicine.....	9	44	11	86	8	37
Dentistry.....	6	8	1	1	5	10
Nursing.....	7	7	6	8	7	28
Allied health.....	10	36	1	0	7	12
Other disciplines.....	4	5	1	5	7	14

<sup>1</sup> 11 projects are included.

<sup>2</sup> North Carolina and Illinois are not included because their expenditures were not reported by level of education.



**Table 7. Percentage spent on educational activities, by discipline, 3-year total**

Project	Education	Medicine and dentistry	Nursing and allied health	Other
Total	65	56	35	10
Tufts/Maine	71	90	5	5
West Virginia	60	69	26	4
North Carolina	68	73	15	12
South Carolina	68	87	10	3
Illinois	67	120	79	1
Minnesota	62	24	61	15
Missouri	76	30	43	26
North Dakota	248	100	0	0
Texas	82	32	63	5
New Mexico	18	41	33	26
California	76	44	36	20

<sup>1</sup> Does not include State and local expenditures for decentralized undergraduate education.

<sup>2</sup> Does not include medical faculty.

<sup>3</sup> Does not include student support, which is approximately 50 percent of the total.

## Students

Approximately 5,500 students participated in AHEC activities during the third year. About 90 percent were undergraduates—40 percent were in nursing and 35 percent in allied health. These percentages changed only slightly between the first and third years. The breakdown of students by discipline and level of education in the AHECs' third year was as follows:

Discipline	Undergraduate	Graduate
Medicine	649	568
Dentistry	140	4
Nursing	1,896	76
Allied health	1,778	1
Other disciplines	273	64
Interdisciplinary	39	5
Total	4,775	718

In the third year, more than 46,000 participant days of continuing education were reported. Four projects (in North Carolina, Illinois, Missouri, and California) accounted for more than four-fifths of the total. The largest percentage of participant days was in nursing (about 40 percent), followed by medicine (about 20 percent), interdisciplinary (about 15 percent), allied health (about 10 percent), and other disciplinary categories combined (about 15 percent).

Preceptorships for medical students were sponsored by all 11 projects. Those with medical residency programs in the AHEC area tended to have a larger number of student assignments. In all, more than 600 medical students received more than 10,000

weeks of education in the third year. Rotational assignments averaged about 7.7 weeks.

In the first and third years, about 80 percent of the graduate students were physicians and about 10 percent were nurses. As shown in table 8, 45 medical residency programs and 14 residency rotations were reported in the third year. Fifteen programs were in family practice (26 percent) and 19 (32 percent) in other primary care specialties.

Medical residencies in the primary care specialties accounted for more than 70 percent of the student weeks in the first year and more than 80 percent in the third year (27,000 of 32,000). The number of student weeks of residency training in primary care specialties increased more (158 percent) than the total for all medical residencies (126 percent). The greatest growth was in the family practice specialty, which accounted for about 30 percent of the total in the first year and more than 40 percent in the third year, with an increase in student weeks of more than 200 percent during the 3 years.

In summary, during its first 3 years, 1972–75, the national AHEC program focused on educational activities. The discipline of medicine accounted for most of the program's graduate education expenditures. Other major program emphases were undergraduate allied health education and undergraduate and continuing education for nurses. Certain activities affecting the education of physicians, dentists, and pharmacists were decentralized, and activities concerning education for nurses and allied health personnel were regionalized (8).

## Impact of Earlier Activities

An analysis of differences among projects suggests that the development of projects in which the Federal AHEC contract was an extension and elaboration of numerous existing activities differed notably from those in which the AHEC effort was largely new. Although there is considerable heterogeneity within both groups of projects, it appears that those with a substantial background in the types of activities included in the AHEC program (for example, hospital affiliation agreements, HSC faculty in the target area, and affiliated residency training programs) progressed differently over the first 3 years.

The HSCs approached the process of AHEC project development in many different ways, depending in part on their degree of previous experience with AHEC-like activity. Four projects—in Illinois, North Carolina, South Carolina, and West Virginia—had implemented or just initiated State-funded, multisite systems for decentralized medical education before

Table 8. Number of full medical residency programs (F), residency rotations (R), and internships, third year, by project

Project	Family practice		Pediatrics		Internal medicine		Obstetrics/gynecology		Surgery		Other		Total residency		Internships
	F	R	F	R	F	R	F	R	F	R	F	R	F	R	
	Total .....	14	1	6	1	7	5	6	2	5	1	7	4	45	
Tufts/Maine .....	2	0	1	0	..	..	..	..	..	..	0	1	2	1	..
West Virginia .....	1	0	1	0	1	0	1	0	..	..	1	0	5	0	1
North Carolina ...	1	0	1	0	2	2	2	2	2	1	4	0	12	5	1
South Carolina ...	3	0	2	0	1	0	2	0	3	0	2	0	13	0	3
Illinois .....	4	0	..	..	..	..	..	..	..	..	..	..	4	0	..
Minnesota .....	..	..	..	..	..	..	..	..	..	..	0	1	0	1	..
Missouri .....	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..
North Dakota .....	2	0	..	..	1	0	1	0	..	..	..	..	4	0	..
Texas .....	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..
New Mexico .....	..	..	..	..	0	1	..	..	..	..	0	1	0	2	..
California .....	1	1	1	1	1	2	..	..	..	..	0	1	3	5	..

receiving the AHEC contract. Furthermore, three of these were acting under mandates from their State legislatures to make use of statewide clinical resources.

Compared to the new projects, the more-developed projects, as a group, began operation with more than three times as many educational activities. In many cases, related planning had occurred years earlier and a strong base of inter-institutional relationships had been established. These older projects were more likely to adopt an organizational approach similar to the regional hub model and to assign stronger roles to remote area staffs. The less-developed projects, on the other hand, were more likely to adopt the HSC hub model; these projects have shown a stronger tendency to decentralize responsibilities over time.

Problems reported by the less-developed projects were developmental, compared with the operational problems of the more experienced group. The newer projects experienced frequent turnover of staff and difficulties in implementing activities according to planned schedules. Among the more-developed projects, on the other hand, the most frequently reported problem was maintaining student enrollment. By the third year, however, both types of projects were developing new activities at a similar rate.

The more-developed projects placed a greater emphasis on education in medicine and dentistry, decentralizing more HSC functions to hospitals in the remote areas and developing more full-residency programs. The other projects gave more attention to rotational residency programs and allied health and

nursing. Although both groups developed similar types of remote-site education for undergraduate medical students, the more-developed projects established more activities, perhaps as a result of the greater number of residency programs.

It appears that the existence in a remote area of a relatively sophisticated hospital with experience in professional education and in working with the HSC is a key factor. Where such an institution does not exist, it takes time to develop the necessary capabilities. As an alternative, the HSC may work more directly with local educational institutions or attempt to meet the needs of remote areas through the direct assignment of HSC resources.

State support for HSC decentralization is an important influence in the AHEC projects' current organization and program development. In the projects in Illinois, North Carolina, South Carolina, and West Virginia, State and local support far exceeds the funds provided through the Federal contracts. In addition, State support has led to a cohesive set of activities which share goals, budgets, administrative structure, and activities supported by the Federal contract. Several other projects share, to a somewhat lesser extent, the characteristic of being embedded within a broader program.

### Problems

The 11 project directors were asked to identify the most serious problems experienced in developing their AHEC work. The most frequently mentioned difficulties, according to the number of projects identifying them, were:

<i>Problem</i>	<i>Number of projects</i>
Staff or faculty recruitment.....	7
Delays in implementation.....	6
Dealing with Federal personnel.....	6
Maintaining student levels.....	4
Developing or maintaining intra-HSC mechanisms...	4
Developing or maintaining HSC-AHEC mechanisms...	3
Developing or maintaining intra-AHEC mechanisms...	3
Staff or faculty turnover.....	3
Community skepticism or resistance to change.....	3
Differences of opinion between HSC and AHEC participants regarding roles or priorities.....	3

### Federal Administration

A number of administrative actions within HEW probably had a significant impact on the development of the AHEC program. Although their effects are not readily measurable and are not likely to recur, they are important enough to identify.

First, the Federal contracting process was influential. There was only a 6-week period between the release of the "Request for Proposals" and the date for submission of proposals. This situation probably resulted in some advantage to applicants who were already involved in AHEC-type activities or who had more experience in working with HEW. It also is likely that, in other cases, much of the planning and organizational work that might have been done in advance was postponed to the post-award period; this situation may help to explain the substantial modifications in a number of the original contracts.

Limited response time may have contributed to the small number of approved projects in urban areas. Because of the complexity of conditions in such settings, it generally takes more time and effort to devise a strong proposal. The Congress has urged that more attention be given to metropolitan areas in the future Federal support of AHECs (9).

During the second year, responsibility for administration within HEW was transferred from the Central Office to the Regional Offices. This action caused some inevitable confusion and uncertainty because of the need to recruit and train new personnel and establish new relationships. It probably also added to the diversity of program development since it meant that eight, rather than one, Federal program offices participated in the monitoring and renegotiation of contracts.

On the other hand, the 5-year contractual arrangement expressed in the Federal contract appears to have had a positive effect on program development. In some instances, the long-term commitment and the defined responsibilities facilitated local support and the completion of agreements.

### Conclusion

Is there a national AHEC Program? This question has been raised frequently. It is a reasonable one. A variety of goals, objectives, organizational approaches, and programmatic activities have been adopted by different AHECs. It is evident that no single model accurately encompasses all of the 11 projects and 26 AHECs we have described.

Yet, there are important commonalities. Each AHEC is addressing similar problems. Each involves an HSC and community institutions in key relationships and roles. All are concentrating on expanding educational activities, especially for medical students and residents.

Few, if any, national programs undertaken in the United States follow a single model. This is true even of programs directly operated by a Federal department, such as the Department of Defense, the Veterans Administration, or the Public Health Service. Even more variation is inevitable when programs are administered by a multiplicity of local institutions. The diverse conditions and viewpoints of this country require adaptation and flexibility to meet diverse circumstances and conditions.

Is there more diversity among AHEC programs than other national programs? There is no simple standard to answer that question. If a scale of diversity were established to rank national programs, the AHEC program would probably be rated toward the end of greater diversity. However, most analysts of U.S. public administration would probably not judge it off the scale.

It is pertinent to review the nature and scope of activities undertaken by AHECs in terms of the goals or objectives originally articulated. As indicated in tables 1 and 2, there were many such aspirations; 14 were identified for AHECs (table 1). We have considered and judged the relative emphasis that appears to have been given these aims in the activities reported for the first 3 years (table 9); our ratings are based on an analysis of the reported data from an overall national perspective. It appears that major effort has been devoted to about half the items.

While educational activities have received the greatest attention, many of the planning and institutional development aspects also have been substantially advanced. For example, continuing linkages have been established among and between HSC and AHEC participants. Numerous community hospital programs have been strengthened, and important steps have been taken to create a more stimulating professional environment in the AHEC area and to increase emphases on primary care at the HSC.

Table 9. Rating of AHECs on relation of activities to statements of objectives after 3 years

Objectives	Intensity of effort			
	High	Medium	Low	Unclear
<b>Planning</b>				
Relate manpower strategies to service needs .....	..	yes	..	..
Strengthen linkages among institutions .....	yes	..	..	..
Improve utilization of health services .....	..	..	..	yes
<b>Education activities</b>				
Extend local clinical training opportunities .....	yes	..	..	..
Improve continuing education .....	yes	..	..	..
Extend new careers .....	..	..	yes	..
Improve allied health training .....	yes	..	..	..
Strengthen interdisciplinary training .....	..	..	yes	..
<b>Community institutions</b>				
Strengthen community hospital programs .....	yes	..	..	..
Create a more stimulating local professional environment .....	..	yes	..	..
<b>Academic institution</b>				
Increase primary care emphasis in medical school curriculum .....	..	yes	..	..
Improve intramedical school coordination .....	..	yes	..	..
<b>Other</b>				
Increase training opportunities for local residents ...	..	..	yes	..
Equalize training and employment opportunities .	..	yes	..	..

Anecdotal evidence suggests that these changes have often contributed to and benefited from modifications in perceptions and attitudes about what is desirable and feasible in both professional health education and health services delivery.

It is too soon to expect that these efforts will have approached the goal of improving accessibility to needed health services for residents of an AHEC area. Most of the students are still in training or very early in their work careers. The accomplishment of this goal requires sustained effort.

Some educational activities, of course, have a short-term impact on improving the availability of services. For example, medical residency programs entail direct provision of some services and can also facilitate referral arrangements for those in need of more specialized care. Continuing education activities and

consumer education activities can be beneficial in improving the quality and productivity of services; however, the data on the effect of these activities in modifying day-to-day behavior has usually been disappointing. The results of recent studies have also raised doubts about the effectiveness of medical preceptorships in affecting locational choice (10, 11). But, other recent analyses have confirmed the importance of graduate training institutions and the professional environment in influencing the location of physicians (12).

It is noteworthy that at several projects the Federal contract appears to have been a significant factor in enlisting other funds. Substantial State funds for AHEC activities have been appropriated in Illinois and North Carolina. State funding has also been allocated in North Dakota, South Carolina, and West Virginia. The California project was instrumental in securing funding for a medical education program. In New Mexico, the work of the AHEC (especially in the development of the administrative and management capabilities of the Navajo Health Authority) has been important in attracting significant financial assistance from several foundations.

A September 1976 report of the Carnegie Council on Policy Studies in Higher Education (7) stated that the formation of area health education centers has been one of the most encouraging and impressive developments under the 1971 Comprehensive Health Manpower Act. It further states that while the primary purpose of AHECs is to improve the quality of health care in their geographic areas, they can help, along with other policies that create incentives to practice in underdeveloped areas, for example, expansion of the National Health Service Corps and of the physician's assistant, nurse practitioner, and dental assistant programs, to substantially alleviate geographic maldistribution of health manpower. Area health education centers have a direct influence on training of health manpower for practice in underdeveloped areas because they provide an appropriate environment for a large part of the clinical training of primary health care personnel, especially dentists and physicians.

The Carnegie Council report states that no hard statistical data are available to measure the actual effect of the AHEC program on attracting or retaining health personnel for practice in underdeveloped area. However, extensive anecdotal evidence indicates that development of a high-quality residency program in a community hospital has been of substantial assistance in attracting physicians to communities with health personnel shortages. The Car-

negie Council suggests that 196 AHECs be developed, rather than the 126 suggested in the 1970 Carnegie Commission report. Overall, the council recommends allocation of Federal funds to States that are planning for AHECs and are prepared to match funds, and it requests that more extensive development of AHECs be a Federal policy, especially in urban areas (7).

Each of the 11 projects has undertaken evaluation efforts. Such assessments are being extended as operational activities are more firmly established. These efforts include a wide range of studies, such as evaluation by objectives of the output of certain activities, interviews of graduates of training programs, student feedback, analyses of student mobility, evaluation of attitudinal changes among students, review of test scores, longitudinal surveys of career plans, and studies of inter-institutional relations. A comprehensive inventory of these activities has been compiled (13).

Approaches to evaluation of the national program have also been considered. A number of analyses of the issues involved in such an undertaking have been prepared (14-16). Both systems development and program development aspects of the AHEC program might be analyzed in greater detail; for example, changes at the HSC and the roles of both the major institutions and other institutions in the AHEC. An important issue is the extent to which AHECs effectively serve specific shortage areas since the major institutions, including community hospitals, are often some distance from the areas of most serious need.

More detailed reviews might seek to identify the special characteristics of programmatic initiatives, their relationship to local conditions and needs, and their results. The relative quality of educational undertakings might be studied. The complexity and diversity of the national AHEC program and deficiencies of baseline data, however, indicate serious constraints and costs for a comprehensive evaluation.

Assessment of the AHECs must consider the extent to which program participants are influenced to locate so as to improve the availability and accessibility of services in problem areas. Such a longitudinal study will also involve many difficulties. Analysis of the achievement of this goal is confounded by the influences of other critical variables, such as the nature and quality of supporting financial systems (17).

A critical judgment on the extent to which progress is made in extending needed health services will be made by the residents of the AHEC areas themselves.

The quality of their lives, and sometimes the duration, can be affected by the nature of the services available to them. To advance those ends is the commitment and challenge of the AHEC program.

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