State Scholarship, Loan Forgiveness, and Related Programs

The Unheralded Safety Net

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Context In the mid-1980s, states expanded their initiatives of scholarships, loan repayment programs, and similar incentives to recruit primary care practitioners into underserved areas. With no national coordination or mandate to publicize these efforts, little is known about these state programs and their recent growth.

Objectives To identify and describe state programs that provide financial support to physicians and midlevel practitioners in exchange for a period of service in underserved areas, and to begin to assess the magnitude of the contributions of these programs to the US health care safety net.

Design Cross-sectional, descriptive study of data collected by telephone, mail questionnaires, and through other available documents, (eg, program brochures, Web sites).

Setting and Participants All state programs operating in 1996 that provided financial support in exchange for service in defined underserved areas to student, resident, and practicing physicians; nurse practitioners; physician assistants; and nurse midwives. We excluded local community initiatives and programs that received federal support, including that from the National Health Service Corps.

Main Outcome Measures Number and types of state support-for-service programs in 1996; trends in program types and numbers since 1990; distribution of programs across states; numbers of participating physicians and other practitioners in 1996; numbers in state programs relative to federal programs; and basic features of state programs.

Results In 1996, there were 82 eligible programs operating in 41 states, including 29 loan repayment programs, 29 scholarship programs, 11 loan programs, 8 direct financial incentive programs, and 5 resident support programs. Programs more than doubled in number between 1990 (n=39) and 1996 (n=82). In 1996, an estimated 1306 physicians and 370 midlevel practitioners were serving obligations to these state programs, a number comparable with those in federal programs. Common features of state programs were a mission to influence the distribution of the health care workforce within their states' borders, an emphasis on primary care, and reliance on annual state appropriations and other public funding mechanisms.

Conclusions In 1996, states fielded an obligated primary care workforce comparable in size to the better-known federal programs. These state programs constitute a major portion of the US health care safety net, and their activities should be monitored, coordinated, and evaluated. State programs should not be omitted from listings of safety-net initiatives or overlooked in future plans to further improve health care access.

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During the past 30 years, the federal government has played a key role in efforts to encourage primary care physicians and other health care practitioners to work in underserved areas. The most visible federal program has been the National Health Service Corps (NHSC), which supports students and young practitioners with scholarships and loan repayment incentives in exchange for a specified period of work in shortage areas.[1-4] The NHSC has supported some 20 000 health care practitioners and received wide recognition for its efforts.

States also have offered programs to encourage physicians and others to work in underserved areas, although their efforts have been much less visible.[5-10] Among the most common of these state safety-net efforts are those similar to the NHSC's programs, in which financial support is provided to students and practitioners of health care professions in exchange for a period of service in underserved communities.[9]

See also p 2112.

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State involvement in these programs dates to Arkansas' creation of a medical scholarship program with a service requirement in 1940, 30 years before US Congress created the NHSC.[8,11] By the mid-1980s, 26 states supported 29 programs that offered health care professionals financial support in return for service commitments.[9] From 1985 through 1992, the pace of program growth quickened, with 35 states enacting legislation to create physician scholarships and similar programs.[12,13]

Despite states' investments, little is known about their service-requiring programs. No national organization or central public agency monitors these programs. Partial lists of state programs have been assembled[9,10,14-19] but there has not been a complete enumeration of them.[20] These programs also tend not to formally evaluate themselves or document their successes, as they often lack the funds, expertise, and mandate to do so.[18,20] As a consequence, these state-level programs and their contributions have been hidden from national awareness, omitted from most listings of medical safety-net efforts,[2,21-24] and overlooked in national access-to-care policy discussions.

We aimed to describe these overlooked state programs and to begin to understand their role in remedying the geographic maldistribution of health care practitioners. We addressed both public and private programs that operate within states and provide financial support to physicians and nonphysician primary care practitioners and trainees in exchange for service in underserved areas. We calculated comparative information on similar federal programs to add a sense of perspective to the characterization of these state programs.

METHODS

Identifying Eligible State Programs

Eligibility criteria for programs were refined through the course of this study as we learned about the numerous and varied state programs that support young practitioners. Ultimately, eligible programs were designated as those that (1) provided financial support to students, resident or practicing physicians, physician assistants, nurse practitioners, or certified nurse midwives; (2) had a service requirement or option in a defined medically underserved setting; (3) supported practitioners with state public dollars, community funds, recurring program dollars, or funds from private nonprofit sources (eg, state medical societies) but did not have direct federal support; (4) placed practitioners in underserved areas across a given state rather than solely in 1 region or community within a state; (5) delivered financial support directly to practitioners or to an educational or financial entity on their behalf, such as to a medical school or commercial lender; and (6) were operating in 1996. The calendar year 1996 is the period for which this evolving group of state programs is described because it was the most recent year for which programs could report complete information when data collection for this study began in 1997.

We excluded the 29 programs sponsored jointly by states and the federal government—called "state loan repayment programs" by the NHSC[1,3]—because of their federal support and their differences under federal regulations from the fully independent and more varied programs created and managed solely by states. However, we included the nonfederal components of the few loan repayment programs that sponsored some practitioners with solely state funds under one set of contract terms and also supported other practitioners with combined state and federal funds under different contract terms. We also excluded programs with other types of federal support (eg, the Native Hawaiian Health Scholarship Program), programs run by individual employers and communities, and programs that provided funds directly to communities or other local entities for recruitment and retention activities even if used for loan repayment or other financial incentives. We further excluded service-requiring programs for registered nurses, dentists, pharmacists, and other health care workers if they were not open to physicians or midlevel practitioners or if these 2 latter groups did not compose a significant portion of obligated participants.

To identify all eligible programs, we augmented previous lists of relevant programs[9,10,14-19] with information from telephone calls to key contacts in every state from mid-1997 through mid-1999. Contacts included individuals and program offices named in prior compendia, officials in state offices of rural health, state public health offices, state higher education financial aid authorities, financial aid offices of individual medical schools, and, in some cases, state medical and specialty societies and relevant within-state foundations. Contacts were queried about potentially eligible programs run by their organizations or by others in their states. Contacts for potential new programs were then called, sometimes leading to further contacts. No additional calls were made when contacts indicated that we were aware of all potentially eligible programs and when we were confident of the eligibility and fate of every program listed in prior compendia. Typically, 4 to 6 individuals were interviewed in each state.

Data Collection

Detailed information about eligible state programs, including their mission, history, types of obligated practitioners, field strengths, and contract terms, was obtained through the initial and subsequent telephone interviews, typically with program directors. All programs provided enough information by telephone to ascertain eligibility and most provided virtually all of the information on program characteristics reported here. This information was then confirmed and supplemented with mailed questionnaires that were returned by 67.1% of the directors of eligible programs, and for all programs with information from Internet Web sites, brochures, application materials, texts of enacting legislation, or prior in-state evaluations and compendia.

Further follow-up contacts were made to program directors to clarify ambiguous and conflicting information. In the 17 cases in which sources could not—or, in a few cases, would not—provide exact counts of new practitioner contracts and program field strength in 1996, we generated estimates from all available information, typically by averaging or extrapolating data from earlier and subsequent years. When information about a program differed among various sources, we heeded information from programs' printed reports and program directors over other sources.

We calculated the comparative field strength of the NHSC's scholarship, federal loan repayment, and state loan repayment programs as of September 1996 with data from the NHSC on all of its current and past practitioners. Data on practitioners serving in the Indian Health Service (IHS) loan repayment program[25] were from the IHS Office of Management Services. We were unable to obtain needed practitioner counts for several smaller federal programs, such as the NHSC Community Scholarship Program and the IHS Health Professions Scholarship Grant Program.[3,26] However, with collectively fewer than 50 primary care practitioners at any point during the 1990s, we simply omitted these programs from the federal comparison data.

Analyses

We developed a classification of program types. Frequencies of eligible programs in 1996 were tabulated by type. Tallies of the numbers and types of programs in operation each year from 1990 to 1996 were based on the reported start and end dates of all current programs and those that ceased operation between 1990 and 1996. The distribution of state programs across the states and US regions was described. National tallies of 1996 new practitioner contracts and total field strength were estimated by summing data across programs. Last, basic features of programs were described, including their missions, funding sources, eligible service sites, and terms of contracts with practitioners.

RESULTS

Types of State Programs

Discussions with program directors revealed that there were no universally accepted terms for denoting the various types of programs. For example, the terms *bonus*, *incentive*, *grant*, and *tuition reimbursement* used in program titles all indicated funds given to practitioners and graduating residents to be used for any desired purpose. Some other programs blurred the distinctions between loan and scholarship programs by using both terms in their titles and in program descriptions they provided to applicants, reasoning that when a contractual loan debt was repaid with service, it in effect became a scholarship. Other loan-writing programs retained the term *loan* in their titles and descriptions of practitioners' obligations, regardless of how individuals settled their debt.

From the great variability in program features and labels, 5 program types were distinguished: scholarship, loan, resident support, loan repayment, and direct financial incentive programs (TABLE 1). These program categories were based on (1) the career stage of targeted eligible applicants (ie, students, junior residents, senior residents, or practitioners); (2) whether service was required or optional (from which many other program characteristics followed, such as the criteria for selecting practitioners and the buyout terms of practitioners' contracts); and (3) whether programs' financial support to practitioners was to be used solely for up-front training costs, after-the-fact repayment of educational loans, or for unrestricted use. This typology of programs captured the key differences across programs and reflected the underlying rationale of virtually all programs. It also was consistent with the classification and labels used for federal programs. Furthermore, this typology distinguishes among the program options that practitioners encounter at various career stages. For example, students could opt for either a scholarship or loan program where available, whereas graduating residents and practitioners could commit to loan repayment or direct financial incentive programs.

State Program Numbers and Flux

In total, 82 eligible programs were identified in 41 states in 1996, with 9 states and the District of Columbia not offer-

Table 1. Classification of Support-for-Service Programs

Program Type	No. in 1996	Eligible Individuals	Service	Use of Funds	Typical Design
Scholarship	29	Students	Required	Up-front training costs	Funds to students for tuition, fees, books, and living expenses, with service expected after training
Loan	11	Students	Optional	Up-front training costs	Loans to students for tuition, fees, books, and living expenses; loan is repaid after training either financially or by providing service
Resident support	5	Junior residents	Required	Variable	Unrestricted funds for junior and, occasionally, senior residents, with service expected after training
Loan repayment	29	Senior residents and practitioners	Required	Repayment of educational loans	Funds to repay outstanding educational loans of graduating residents and practitioners in exchange for service
Direct financial incentive	8	Senior residents and practitioners	Required	Unrestricted	Unrestricted incentive funds for graduating residents and practitioners in exchange for service

ing an eligible program. (States named 79 eligible programs, of which 3 were dual programs that maintained 2 components, each of which fit 1 of the 5 program types. For clarity, ease of presentation, and because all other states treated similarly distinct components as 2 different programs, we present these 3 dual programs as 6 separate programs in this article.) Alaska, California, Colorado, Connecticut, Delaware, Hawaii, Michigan, Rhode Island, and Wyoming had no qualifying programs.

There were many state programs that were similar to the 82 eligible programs but that failed to meet 1 or 2 of the eligibility criteria. These not-quite-eligible programs included 6 generally large programs in which obligated practitioners were restricted to work within their states' borders but not in underserved areas. Also ineligible were 3 very large loan and scholarship programs that supported individuals from a wide array of professions, of whom only a few were physicians or midlevel health care practitioners.

Loan repayment (n=29) and scholarship (n=29) programs were the most numerous in 1996, with fewer loan (n=11), direct financial incentive (n=8), and resident support types (n=5). Among all programs, 84% (n=69) were available to medical students, residents, and physicians, whereas 44% (n=36) supported student or practicing physician assistants, nurse practitioners, or nurse midwives. Twenty-eight percent (n=23) targeted both groups. Twenty percent (n=16) also supported other types of health care workers, such as registered nurses, dentists, and podiatrists.

Year-by-year tallies of operating programs, based on all sources of information on current and past programs, revealed that these state programs more than doubled in number from 1990 to 1996, increasing from 39 to 82 (FIGURE). Nearly all of this growth was due to the tripling of loan repayment programs and doubling of scholarship programs. The first resident support program was created in 1992. We learned of 3 programs that were terminated from 1990 through 1996 and another 3 that were transformed from one type of program into another (eg, a loan program created in 1965 became a scholarship program in 1995 when service changed from an option to a requirement and payback penalties were greatly increased).

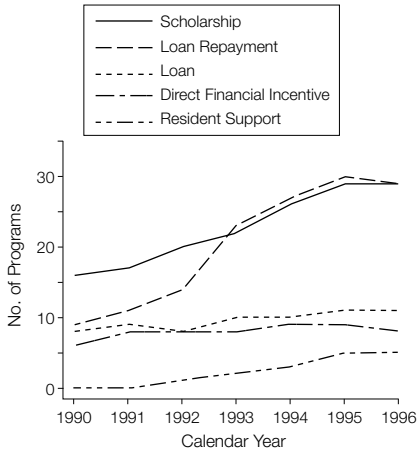
Of the programs in operation in 1996, 5 (6%) predated 1950, whereas 47 (59%) had been established or assumed their current form since January 1990. Among the newest programs in 1996 were 2 that had not yet signed a contract with a practitioner and another 5 programs that had signed contracts but had yet to place their first participating practitioner. At the other end of the program life span were 5 programs operating in 1996 that were being phased out. In nearly every case, program creations, eliminations, and transformations were undertaken at the initiative of state legislators, program officials, or local advocates in an effort to try newer and more promising program types, eliminate underperforming programs, or rectify perceived weaknesses in existing programs.

Distribution of Support-for-Service Programs Across States

Of the 41 states that offered eligible state-level support-for-service programs, 23 offered 2 or more such programs (TABLE 2). Twenty-four states offered both fully state-supported programs and programs with joint state and federal support. States that offered programs funded with purely in-state funds were no more or less likely to cosponsor joint state-federal programs (odds ratio, 1.07; $P=.93$). State-funded programs were somewhat less common among states in the West than in states in the South, Northeast, and North Central regions (61% vs 89%), whereas joint state-federal programs were more common among states in the Northeast than in other regions (100% vs 50%).

Some program director respondents working in offices that managed both state and joint state-federal loan repayment programs indicated that they first attempted to place practitioners through their jointly funded programs to save state costs. However, informants also indicated that positions in purely state-funded programs often were more popular with practitioners because they generally offered a wider choice of practice sites and greater flexibility, despite having less lucrative financial terms.

Figure. Number of State Support-for-Service Programs in the United States, by Type and Year



Program Workforce

Programs funded solely within states tended to be small, with a median number of 8 new contracts in 1996 and a median field strength of 11 practitioners serving their obligations. Some programs were substantially larger, including 12 that signed more than 25 new contracts (the largest had 112 contracts) and 16 that maintained field strengths of more than 35 practitioners (the largest had 120 practitioners).

In 1996, the 82 state programs collectively signed initial contracts with an estimated 1215 practitioners, of whom 959 (79%) were physicians (TABLE 3). In the same year, these programs maintained an estimated collective field strength of 1676 practitioners working to fulfill their obligations, of whom 1306 (78%) were physicians.

The estimated total field strength of physician and midlevel practitioners in both state and federal support-for-service programs in 1996 was 3876 in-

Table 2. Qualifying State and Joint State-Federal Support-for-Service Programs for All 50 States and by Type, 1996*

	State Programs					
State	Scholarship	Loan	Resident Support	Loan Repayment	Direct Incentive	Joint State-Federal Programs (Loan Repayment)
South						
Alabama	1					
Arkansas	1	2			1	
Delaware						
Florida	1			1		1
Georgia	1	1				1
Kentucky	1				1	
Louisiana	1					1
Maryland	1					1
Mississippi	1					
North Carolina		2	1	2	1	1
Oklahoma	1		1		1	
South Carolina			1		2	
Tennessee					1	
Texas	1			1		1
Virginia	2					1
West Virginia	1	1				1
West						
Alaska						
Arizona	1					1
California						1
Colorado						1
Hawaii						
Idaho				1		
Montana				1		
Nevada				1		1
New Mexico	2			1		1
Oregon				1		
Utah	1			2		1
Washington	1			1		1
Wyoming						
Northeast						
Connecticut						1
Maine		2				1
Massachusetts		1				1
New Hampshire				1		1
New Jersey				1		1
New York	3		1	2		1
Pennsylvania				1		1
Rhode Island						1
Vermont				1		1
North Central						
Illinois	3					1
Indiana	1					
Iowa	1			2		1
Kansas	2					
Michigan						1
Minnesota				3		1
Missouri		2	1			1
Nebraska	1			1		
North Dakota				2		
Ohio				1		
South Dakota					1	
Wisconsin				2		

*The District of Columbia had neither a qualifying state program nor a joint state-federal program.

dividuals (Table 3). Of this number, approximately 1700 were serving in state programs, a roughly comparable number were serving in federal programs, and another 489 individuals were serving in joint state-federal programs. State programs supported a larger physician workforce than federal programs, whereas federal programs supported a larger workforce of midlevel practitioners.

Features of State Programs

The primary or joint mission of all but 3 of the 82 state programs was to influence the distribution of the health care workforce. Programs were administered by a variety of organizations and offices, including individual medical schools, state offices of rural health, and a few private organizations (TABLE 4). Three of 4 state programs were funded entirely or partially by annual appropriations from state legislatures, and others had received state funds earlier in their history. Only 3 programs were supported completely or in part by private funds.

Reliable revenue figures were unavailable for many programs, typically because program-specific funds could not be separated from lump-sum appropriations allocated to administering offices for a variety of programs. Many programs indicated, however, that they operated under very modest budgets, with funds allocated almost entirely to meet the stipend or incentive needs of participating practitioners and with little additional funding available for practitioners' other needs or for program administration.

States used a variety of approaches to define sites where practitioners could serve their obligations. Most programs (55%) used unique criteria specified in their enacting legislation or devised by a shortage area designation office within the state. State-defined community eligibility criteria varied from complex combinations of need indicators, such as physician-population ratios, indicators of population health status, and travel distances to nearest physicians, to simple ceiling sizes of town or county populations (eg, all towns smaller than 10000 were

deemed eligible). Only 10% of programs used the federal Health Professional Shortage Area (HPSA) or Medically Underserved Area (MUA) criteria without modifications, and 35% of programs used the federal HPSA or MUA designations in combination with state-devised criteria. A sizable minority of programs (41%) placed practitioners exclusively or preferentially in rural areas. All but 1 of the 23 programs available to both physicians and midlevel practitioners used identical site eligibility designations for both groups.

Programs that supported physicians clearly targeted primary care physicians: all accepted family physicians and 93% accepted general internists and pediatricians. Far fewer programs accepted physicians of other specialties, and they sometimes accepted them only on a case-by-case basis to meet a particular community's needs.

In most programs, obligated practitioners were asked to identify their own practice opportunities within designated eligible communities, then seek approval from their program for their chosen site. Only 13 programs (16%) listed specific types of qualifying practice settings (eg, health departments, prisons, neighborhood health centers) or named specific practices where practitioners could fulfill their obligations.

Practitioners' contract terms varied greatly across programs. For physicians, financial support varied from $3000 to $38 000 per year and the minimum obligation term varied from 1 to 60 months. Costs for those who bought out of their obligations financially rather than through service varied from nothing (in several programs that paid physicians only after they completed their service and had no need for penalties) to 3 times the outstanding principal plus interest. Contract terms for nonphysician practitioners were typically the same as those for physicians.

COMMENT

The number of state-run programs that leverage financial incentives to entice physicians and other primary care practitioners into underserved area practices began to grow in the mid-1980s.[8,12] This study demonstrates a continued and remarkable growth in these programs through the mid-1990s. In 1996, nearly 1700 physicians and midlevel practitioners were serving in 82 identified state programs, comparable with the number serving in the better-known federal NHSC and IHS. States and the federal government cosponsored another 489 primary care practitioners.

Because of their relatively recent and rapid expansion and lack of central coordination, little has been known about the contributions of state programs to the health care needs of underserved communities. We found that most state programs have missions and structures similar to those of federal loan repayment and scholarship programs. States also offer 2 new program variants, the resident support and direct financial incentive types, as well as traditional loan programs with service options. As is common of state programs, support-for-service programs vary significantly in design and operations.[27] Variation arises from creative approaches to meet local needs and opportunities, or is a less deliberate outcome of political forces. In addition to wholly new program types, specific examples of innovation include a southern loan program that required its students to participate in a rural training curriculum, an Appalachian-region program in which financial benefits varied according to the level of need where physicians served, and a midwestern loan program for which acceptance into the program improved the chances of admission into in-state public medical schools. Some programs allowed practitioners to fulfill obligations with part-time work, an innovation now proposed for the NHSC.[28] Outcomes for these various program

Table 3. Number of Practitioners Signing First Contracts and Serving in State, Federal, and Joint State-Federal Support-for-Service Programs in 1996

Program Type	No. of Practitioners		
	Physicians	Nonphysicians*	Program Totals
Signing First Contract in 1996 (State Programs Only)			
Scholarship	368	113	**481**
Loan	175	58	**233**
Resident support	168	0	**168**
Loan repayment	209	76	**285**
Direct financial incentive	39	9	**48**
Total	**959**	**256**	**1215**
Serving in Programs in 1996			
State			
Scholarship	517	156	**673**
Loan	120	41	**161**
Resident support	65	0	**65**
Loan repayment	466	139	**605**
Direct financial incentive	138	34	**172**
Subtotal	**1306**	**370**	**1676**
Joint state-federal (NHSC state loan repayment programs)†	372	117	**489**
Federal†‡			
NHSC scholarship and federal loan repayment programs	1000	515	**1515**
Indian Health Professions loan repayment program	162	34	**196**
Subtotal	**1162**	**549**	**1711**
Total	**2840**	**1036**	**3876**

*Nonphysicians included nurse practitioners, physician assistants, and certified nurse midwives.
†NHSC indicates National Health Service Corps.
‡Several very small federal programs (collective field strength <50 individuals) for which we were unable to obtain discipline-specific data are not listed; specifically, the NHSC Community Scholarship Program and the Indian Health Service Scholarship Grant Program.

Table 4. Characteristics of State Support-for-Service Programs (n = 82)

Primary program mission, No. (%)	
To influence the size or distribution of the health care workforce	70 (85)
To make health care careers affordable	3 (4)
Both of the above equally emphasized	9 (11)
Administrating organization, No. (%)	
Individual medical school	20 (24)
State office of rural health	14 (17)
State higher education financial aid authority	13 (16)
Other state health department office	17 (21)
Other state office	14 (17)
Private organization	4 (5)
Program funding sources, No. (%)*	
State appropriations	62 (76)
Communities	10 (12)
Recurring program dollars	8 (10)
Fees and taxes on health care providers	5 (6)
Private	3 (5)
Miscellaneous	5 (6)
Eligible service sites, No. (%)	
Criteria for eligible underserved sites	
State-specific designation	45 (55)
Federal HPSA and/or MUA	8 (10)
State designation combined with HPSA and/or MUA	29 (35)
Rural vs urban site eligibility restrictions	
Solely rural locations	23 (28)
Preference for rural locations	11 (13)
No preference for rural or urban locations	47 (57)
Solely urban locations	1 (1)
Eligible medical specialties (among 69 programs for physicians), No. (%)	
Family practice	69 (100)
General internal medicine	64 (93)
General pediatrics	64 (93)
Obstetrics/gynecology	28 (41)
Psychiatry	16 (23)
General surgery	13 (19)
Other specialties (including exceptions)	13 (19)
Contract terms for physicians	
Annual financial support, $†	
Median and mode	10 000
Minimum	3000
Maximum	38 000
Minimum duration of service, mo	
Median	24
Mode	12
Minimum	1
Maximum	60
Financial buy-out costs	
Median and mode	Remaining principal plus interest
Minimum‡	None
Maximum	3 Times principal plus interest

*Some programs reported more than 1 funding source. HPSA indicates Health Professional Shortage Area; MUA, Medically Underserved Area.
†Maximum allowable annual support amount during the minimum service term.
‡Eight loan repayment and incentive programs provided support to practitioners only after they had provided service and did not assess fines if providers terminated participation early.

features are unknown and may vary from state to state. Such local innovations are interesting and promising but unproven.

Several factors prompt states to create their own support-for-service programs when federal programs are available. Program informants often indicated a belief that state-designed initiatives operating under state control better meet the needs of their communities, and that these locally tailored programs are more likely to yield lasting solutions for underserved areas.[10] States also recognized that their programs' smaller size make them more manageable, and their closer relationships with communities give them advantages in innovation and flexibility.[13,29,30] Indeed, the New Federalism doctrines in recent years have encouraged innovation by states as "policy laboratories."[27,29]

State support-for-service programs also grew to fill a workforce void left when NHSC staffing dwindled in the late 1980s and when President Clinton's health care workforce reform proposals were defeated in the early 1990s.[3,10,27,29] These experiences revealed states' vulnerability when relying completely on federal programs and leadership. States created their own programs as a solution that offered greater control and flexibility to meet their needs.[10] A mixture of state and federal financial enticement programs is now the chosen course for half of states.

There have been repeated calls to expand federal support-for-service programs and even proposals to create a universal, mandatory service requirement for all newly trained physicians.[2,22,27,31-35] Plans for such expansions and new initiatives must be mindful of all current types of support-for-service programs—including federal, state, community, and privately sponsored programs—which collectively field an obligated safety-net workforce more than double that generally recognized based on federal program data alone. If an expansion of federal programs is pursued, it should be coordinated with states' efforts. With fully informed considerations, perhaps a further

expansion of state programs will be found preferable. Continued uncoordinated growth in state programs and an unmindful broadening of federal efforts—whose requirements of practitioners always supersede those of states—raise the likelihood of conflicts between state and federal programs.[36] Some state programs already report competition for students and young practitioners willing to work in underserved areas, and some are now unable to fill all of their funded positions. Whether this is due to an exhausted pool of interested practitioners or unattractively designed programs is unclear. What is clear is that mutual recognition, communication, and coordination between federal and state initiatives in underserved areas is needed.[4,37]

Many state program directors voiced a need to communicate with and learn from other programs. Directors working in individual medical schools and those in higher education financial aid state offices most often voiced or demonstrated their need for more communications with others because they had little contact with programs based in state offices of rural health and other public health agencies and had little experience managing students' obligations other than loans. Among the few current models of national collaboration are the promising centralized electronic listings of support-for-service opportunities maintained by the National Rural Recruitment and Retention Network (3R Net[38]) and by the Association of American Medical Colleges.[39]

Changing Spectrum of State Programs

The growth of state programs from 1990 to 1996 occurred primarily in new loan repayment and scholarship programs. The growth in loan repayment programs is not surprising given that the first such programs were created in the mid-1980s and their growth had been documented for the late 1980s.[8,12] Loan repayment is perceived as a responsive mechanism to rapidly target needed specialties and practitioner types to specific underserved communities.[4,24] Loan repayment commitments, typically made as practitioners complete their training, come at a time in practitioners' careers when they can make informed practice commitments. The growing debt of today's young physicians also makes loan repayment assistance increasingly attractive to physicians and, thus, a stronger enticement mechanism for programs and communities.[40]

The explanation for the growth in scholarship programs is less evident. Perhaps as the only model for obligating practitioners at the student level (service in loan programs is optional), scholarships remain a requisite choice for states that believe it is important to offer service-requiring support at several career stages through a constellation of programs.[41] Paradoxically, while some states were creating new scholarship programs, others were replacing these programs with loan repayment incentives in an effort to decrease program costs and lessen the administrative and legal burdens that have been associated with programs that obligate individuals years in advance of required service.[4,24,42]

Direct financial incentives are a less familiar program approach, as these programs are newer and exist in only 8 states, and there is no comparable federal model. Respondents identified 2 advantages for these programs over loan repayment programs: (1) they relieve programs of the need to verify the eligibility of applicants' educational loans; and (2) they broaden the number of individuals eligible to participate. As a program director stated, there is no reason to assume that only those with educational loans are worth recruiting to underserved areas.

Resident support programs also are new and uncommon. They emerged to capitalize on the growing financial pressures on residents—who now carry a median debt amount of more than $75 000[40]—and to help fill in-state residency positions and retain physicians within the states where they train.

How the 5 types of programs differ in their outcomes for communities and for participating physicians and other practitioners remains to be documented.

Limitations

Despite careful efforts, we may have overlooked several eligible state programs. The addition of data from these omitted programs, however, would further substantiate the collective size and, thus, importance of states' efforts. It is also likely that practitioner counts for some programs are inaccurate because programs sometimes found it difficult to reconstruct complete field strength numbers from their records. We anticipate that practitioner count inaccuracies tend to be underestimates because it was easy for programs to overlook individuals as they tallied names for our study. We do not expect any program to have misjudged their practitioner strength so greatly as to significantly affect our findings and conclusions.

Although we demonstrated growth in program numbers from 1990 through 1996, we were unable to assess how much the collective field strength of these programs grew over time because many programs could not provide the requisite data for trend analysis on their workforce size in the early 1990s. We also did not document how state service-requiring programs changed in number, size, or characteristics since 1996. Similar state initiatives for nurses, dentists, and other non–primary care health care professionals also were not assessed.

CONCLUSIONS AND RECOMMENDATIONS

The tremendous growth in state loan repayment, scholarship, and related programs is one of the most important developments in the US health care safety net over the past 15 years. Remarkably, this growth occurred without fanfare or deliberate design at a national level. The expansion and innovation in state programs is good news, for without them the safety net would be thinner and more vulnerable than it now is. However, much remains to be learned about these state programs and their contributions to promoting uniform access to health care.

Without some degree of cross-state linkage, these programs will remain underappreciated and their lessons hid-

den.[27] As proposed recently by the Council on Graduate Medical Education,[21] we recommend establishment of a mechanism to track, evaluate, and offer coordination to the safety-net efforts of states and local communities, including their support-for-service programs. Joint evaluation and planning will help states and others clarify the optimal complimentary roles for federal, state, local, and private efforts. With coordination, programs can avoid duplication and harmful competition, address gaps in existing program coverage, and identify synergistic opportunities.[4]

Many program directors desired more contact with other programs. Beyond assistance and collaboration, however, directors were not looking for the imposition of uniform standards, restrictive requirements, or federal oversight. Whatever coordinating approach is pursued, it should have the consent and contributing leadership of states. An appropriate seat for a coordinating center might be 1 of the existing national resource organizations for states, such as the National Governors' Association or the National Conference of State Legislatures. Alternatively, a new national association of state safety-net programs might be established or responsibility might be placed on a capable state office experienced with support-for-service programs; in either case, support by federal or foundation funding should exist.

Beyond new coordination for states' efforts, we recommend that all future national safety-net descriptions and proposals incorporate state initiatives and, when possible, community efforts. Despite the challenges of acquiring complete information on states' programs, planning based on federal data and remedies alone is inadequate, as it overlooks half of the full picture and can envision only some of the options.

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REFERENCES

1. National Health Service Corps. Available at: http://www.bphc.hrsa.gov/nhsc. Accessed May 9, 2000.
2. Council on Graduate Medical Education. *Tenth Report: Physician Distribution and Health Care Challenges in Rural and Inner-City Areas*. Rockville, Md: Public Health Service, Health Resources and Services Administration; 1998.
3. National Health Service Corps. *Report to the Congress for Years 1990-1994*. Rockville, Md: National Health Service Corps. Undated.
4. US General Accounting Office. *Health Care Access: Programs for Underserved Populations Could Be Improved.* Washington, DC: US General Accounting Office; 2000. Publication GAO/T-HEHS-00-81.
5. Henderson TM, Fox-Grage W. *State Incentives to Improve the Practice Environment in Underserved Areas.* Washington, DC: Intergovernmental Health Policy Project, George Washington University; 1996.
6. Intergovernmental Health Policy Project. *A Review of State Legislation Related to Increasing the Training, Supply, Recruitment, and Retention of Primary Care Physicians (1985-1991).* Washington, DC: Intergovernmental Health Policy Project, George Washington University; 1993.
7. Carpenter ES, Seidman D. *National Compendium of Nonfederal Physician Distribution Incentive Programs*. Ann Arbor: University of Michigan; 1981.
8. Donohue EA. Physician distribution and rural health care in the states. *Acad Med*. 1990;65:S92-S113.
9. Office of Data Analysis and Management. *Compendium of State Health Professions Distribution Programs, 1986*. Rockville, Md: Bureau of Health Professions; 1986. Report 2-87.
10. US Congress, Office of Technology Assessment. *Health Care in Rural America*. Washington, DC: US Government Printing Office; 1990. Publication OTA-H-434.
11. Strosberg MA, Mullan F, Winsberg GR. Service-conditional medical student aid programs: the experience of the states. *J Med Educ*. 1982;57:586-592.
12. Rivo ML, Henderson TM, Jackson DM. State legislative strategies to improve the supply and distribution of generalist physicians, 1985 to 1992. *Am J Public Health*. 1995;85:405-407.
13. Weissert CS, Knott JH, Stieber BE. Education and the health professions: explaining policy choices among the states. *J Health Polit Policy Law*. 1994;19:361-392.
14. Association of American Medical Colleges. *State and Other Loan Repayment/Forgiveness and Scholarship Programs*. 2nd ed. Washington, DC: AAMC Division of Student Affairs and Education Services; 1995.
15. Williams JL, Gibbons SL, Winsberg G. *Short-term Evaluation of State Educational Service Conditional Support Programs for Allopathic, Osteopathic, and Dental Students*. Silver Spring, Md: Macro Systems Inc; 1980.
16. McCloskey AH, Luehrs J. *State Initiatives to Improve Rural Health Care*. Washington, DC: Health Policy Studies, Center for Policy Research, National Governors' Association; 1989.
17. Gibbens B. *Placement and Retention Issues in State Scholarship and Loan Programs.* Grand Forks: University of North Dakota Rural Health Resource Center; 1994.
18. Henderson TM, Fox-Grage W. *Evaluation of State Efforts to Improve the Primary Care Workforce.* Washington, DC: National Conference of State Legislatures; 1997.
19. Henderson TM. *State Efforts to Increase Community-Based Medical Education*. Washington, DC: Intergovernmental Health Policy Project, George Washington University; 1994.
20. Weissert CS, Knott JH. *The States' Role in the Reform of Health Professions Education*. East Lansing: Michigan State University; 1992.
21. Council on Graduate Medical Education. *Fourteenth Report: Recent Developments and Remaining Challenges in Meeting National Goals.* Rockville, Md: Public Health Service, Health Resources and Services Administration; 1999.
22. Hughes RG, Barker DC, Reynolds RC. Are we mortgaging the medical profession? *N Engl J Med*. 1991;325:404-407.
23. Siegel S. *Access to Primary Care: Tracking the States*. Washington, DC: Health Policy Tracking Services, National Conference of State Legislatures; 1998.
24. Special Committee on Aging, US Senate. *The Rural Health Care Challenge* Washington, DC: US Government Printing Office; 1988. Serial No. 100-N.
25. Indian Health Service, Office of Management Services, Public Health Service. Available at: http://www.ihs.gov. Accessed May 9, 2000.
26. US General Accounting Office, Indian Health Service. *Efforts to Recruit Health Care Professionals*. Washington, DC: US General Accounting Office; 1994. Publication GAO/HEHS-94-180FS.
27. Sparer MS. Laboratories and the health care marketplace. *J Health Polit Policy Law*. 1997;22:789-814.
28. Marwick C. National Health Service Corps faces reauthorization during a risky time. *JAMA*. 2000;283:2641-2642.
29. Leichter HM. *Health Policy Reform in America*. Armonk, NY: ME Sharpe Inc; 1992.
30. National Governors' Association. *Rural Health Care Policy Statement.* Washington, DC: National Governors' Association; 1989.
31. Pew Health Professions Commission. *Primary Care Workforce 2000: Federal Policy Paper*. San Francisco: University of California, San Francisco, Center for Health Professions; 1994.
32. Mullan F. The muscular samaritan. *Health Aff (Millwood)*. 1999;18:168-175.
33. Johns MME. Mandatory national health service. *JAMA*. 1993;269:3156-3157.
34. Avery CH. Educational implications of a National Health Service Corps. *JAMA*. 1971;218:1194-1197.
35. Reynolds RC. Make health care reform work. Draft doctors. *New York Times*. June 1, 1993:A17.
36. Swanson AG. Mandatory requirement versus voluntary opportunity for service in the National Health Service Corps. *J Med Educ*. 1975;50:406-408.
37. US Congress, Office of Technology Assessment. *Rural America at the Crossroads: Networking for the Future*. Washington, DC: US Government Printing Office; 1991.
38. National Rural Recruitment and Retention Network. Available at: http://www.3rnet.org. Accessed May 31, 2000.
39. State and other loan repayment/forgiveness and scholarship programs. Available at: http://www.aamc.org/about/gsa/stloan/start.htm. Accessed May 31, 2000.
40. Beran RL, Lawson GE. Medical student financial assistance, 1996-1997. *JAMA*. 1998;280:819-820.
41. Advisory Council of the National Health Service Corps. *Proposed Strategies for Fulfilling Primary Care Manpower Needs: A White Paper.* Rockville, Md: National Health Service Corps; 1989.
42. Helms LB, Helms CM. Forty years of litigation involving medical students and their education, II: issues of finance. *Acad Med*. 1991;66:71-76.