Effectiveness of Educational Strategies Preparing Physician Assistants, Nurse Practitioners, and Certified Nurse-Midwives for Underserved Areas

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Synopsis

A study of physician assistant, nurse practitioner, and certified nurse midwifery programs was undertaken to identify and assess the effectiveness of recruitment, educational, and deployment strategies that programs use to prepare practitioners for medically underserved areas. The 51 programs studied were those having mission statements or known track records relating to this goal. A total of 170 interviews were conducted with faculty, students, graduates, and employers from 9 programs visited onsite and 42 programs surveyed by telephone.

All programs had some recruitment and training activities in underserved sites. Only about half of the programs were able to submit data on their graduates' practice settings and specialties. These data suggest that older students who have backgrounds in underserved areas and clearly identified practice goals are more likely to practice in underserved areas. Programs that actively promote service to the underserved do so through publicly stated missions and recruitment and educational strategies that complement these missions. Such programs also are more likely to evaluate and document their success than programs that lack strategies.

PHYSICIAN ASSISTANTS (PAs), nurse practitioners (NPs), and certified nurse-midwives (CNMs) are health professionals with the potential to improve the access of medically underserved populations to primary medical care. Studies have documented the impact, quality of care provided, cost effectiveness of care, and patient satisfaction with the services of each of these types of practitioners (*1*). A number of studies have supplied evidence of the roles they perform as primary care providers in underserved sites such as community and migrant health centers, homeless clinics, AIDS clinics, or county facilities serving the poor (*2*).

Training programs for all three professions focus on health promotion, substance abuse, geriatrics, home health care, and prenatal care (*3,4*), and most are designed to prepare health professionals to provide primary care services. Many settings employ both PAs and NPs, posting the same job descriptions for either and utilizing the same mechanism for physician collaboration and supervision. Thus, the functions of PAs and NPs within the same setting may be very similar. Other similarities can be seen in goals and curriculums of PA and NP training programs.

Although PA, NP, and CNM professions share many similarities, there are also differences. For example, all NPs and CNMs are licensed, registered nurses whereas PAs enter training with a variety of backgrounds (*5*). PA training programs have close relationships with academic medicine, while educational preparation for NPs and CNMs typically takes place within schools of nursing. The majority of PA programs are at the baccalaureate level and students enter professional training at the junior year level, while the majority of NP education now occurs at the master's level. Each discipline has its own educational and professional organizations, accrediting body, and certification procedures.

Legal differences also exist among the three

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groups; licensure requirements, reimbursement, and authorized activities differ substantially from State to State. However, PAs usually practice under some provision of a State's Medical Practice Act and under the direct supervision of physicians; NPs and CNMs practice under nursing licensure and provisions of their State's Nurse Practice Act. CNMs often practice according to legislation that is separate from NPs.

Political differences also exist between the PA and NP professions generated by their disparate origins, by conflicts between organized medicine and nursing, and by differences in the educational assumptions of training programs. These differences are accentuated locally by competition for employment sites or conflict over practice privileges, reimbursement, or prescribing authority.

Although a large body of research exists on factors affecting practice location of physicians, little has been reported about influences on the successful preparation of PA, NP, or CNM practitioners for underserved areas. Minority PAs are reported to be more likely than nonminority PAs to work in public institutions and clinics and in primary care specialties, and they care for a greater percentage of patients who are nonwhite and from low-income families (*6,7*).

Minority PA graduates represent an average of about 14 percent of all PA graduates (*8*) and minority CNMs about 5–10 percent (*9*). Proactive recruitment with outreach strategies can produce significant increases in minority enrollment. Some minority students require academic support to graduate. Recruitment and retention of minority faculty can also influence a program's ability to enroll and graduate minority students (*7*).

Studies also suggest that PAs and NPs tend to practice in communities of the same type or similar to the one where they attended high school (*10–13*) or where they received preclinical and terminal training (preceptorship) (*14,15*). Family NPs are reported to be more likely to practice in small towns than other NP specialty types. Fewer of these nurses have master's degrees (*16,17*).

This study was undertaken to identify and evaluate strategies used by PA, NP, and CNM training programs to prepare trainees for practice with underserved populations. The study was a qualitative investigation designed to provide descriptive data on organizational features of the programs and the recruitment, retention, education, and deployment strategies associated with location of their graduates in medically underserved areas.

Method

The study was conducted between July 1, 1992, and March 30, 1993. An advisory panel, consisting of national leaders from the educational and professional organizations of the three disciplines, guided the study design, participated with a member of the research team in site visits to programs (outside of their own disciplines), and assisted in interpreting study results and formulating recommendations.

National directories identified a total of 132 primary care NP programs, 49 primary care PA programs, and 30 CNM programs. Of these, 51 programs (22 NP, 20 PA, 2 combined PA–NP, and 7 CNM) were identified as currently operational and having mission statements, strategies, or track records indicating that they were preparing graduates to practice in medically underserved areas. For this purpose, "medically underserved" was defined broadly to include Federal and State designations, community and public health facilities, community or migrant health centers, homeless clinics, correctional facilities, and special populations needing services, for example, minority groups, refugees, those with human immunodeficiency virus-acquired immunodeficiency syndrome (HIV–AIDS), or the poor.

Data were gathered from 42 programs through hour-long telephone interviews and document reviews; the other 9 programs—4 NP, 3 PA, and 2 CNM—were visited on site. They were selected to provide regional diversity and to include both rural and urban locations, public and private school auspices, and new and old programs. Most of these nine programs had training activities in the most underserved areas of the nation—major cities, rural States with large isolated areas, and the U.S.-Mexico border. In addition, the sample was designed to include programs associated with historically black institutions, a federally sponsored Area Health Education Center (AHEC) project, an interdisciplinary training project, a Medex-type PA program

(Medex programs usually have student-preceptor preselection arrangements), and programs at a variety of academic levels.

Protocols, keyed to specific study questions defined by the funding agency, were used to review documents and conduct a total of 170 interviews with institution administrators, program faculty, trainees, and graduates. To determine the nature and extent of the strategies used and the presence of other factors that might influence deployment of students and graduates to underserved sites, information was gathered about student and faculty backgrounds, program structure, recruitment and retention strategies, curriculum development, educational process, deployment mechanisms, and practice data about program graduates.

When presenting results describing program features by type of program (PA, NP, or CNM), each of the two combined PA–NP programs is counted twice, once as a PA program and again as an NP program. However, each is counted only once when all programs are considered together or when combined programs are considered separately.

The study sample of 51 programs was the universe believed to be focused on training persons for practice in underserved areas; by intent, the results do not necessarily generalize to all PA, NP, and CNM training programs. Further, it was determined during the study that many programs lacked data on the background characteristics, current practice locations, and patient populations served by their graduates. This gap left indeterminate the success of many programs in deploying their graduates to underserved areas and limited the extent to which a meta-analysis of these data could be carried out.

Results

Characteristics of programs. One-third of the 51 programs were located in rural States or counties and had a rural focus, and 20 percent, located in urban areas, had an urban focus. The other 47 percent had no dominant practice location or special population focus and trained students for rural, urban, and suburban areas. Five programs (three PA, one NP, and one CNM) were based at minority institutions in large cities.

Most programs (89 percent) prepared primary care, family-oriented specialists. The others trained women's health, pediatric, or adult practitioners. Directors of some NP programs noted that the family track option was the most popular or that many students or graduates practicing in another primary care specialty eventually added the family component.

The 22 PA programs typically were part of schools of medicine (36 percent) or schools of health science or allied health (36 percent). The remainder were located in hospitals (18 percent), liberal arts colleges (4 percent), and schools of public health (4 percent). The majority (64 percent) offered a baccalaureate degree, and 14 percent offered a master's degree, with others having certificate and associate or baccalaureate degree options. Class sizes ranged from 10 to 50 students with a mean of 31. All PA programs required college experience, usually the equivalent of 2 years or more, and nearly half required clinical experience prior to admission. Two programs required the student to have a commitment for training from a preceptor or clinical site. Almost all PA programs (95 percent) provided more than 1,500 hours of clinical training with 45 percent providing more than 2,000 hours. All 12 PA programs that did not require clinical experience prior to admission were among those that provided more than 1,500 hours of clinical training.

Nineteen of the 22 PA programs reported data on characteristics of students in their three most recent classes. About half of these programs indicated that most matriculants were in the 20–29-year age range; the other half reported most in the 30–39-year age range. Three programs reported that more than 80 percent of their student body were ethnic minorities, and the remaining 16 programs averaged 14 percent. The proportion of women ranged from 39 percent to 90 percent in various programs. Anywhere from 5 to 100 percent of matriculants already had a baccalaureate degree or higher, and up to 12 percent had a master's degree. The mean number of years of prematriculation clinical experience ranged from 2.4 to 11 years.

The majority of NP (83 percent) and more than half (57 percent) of CNM programs were at the master's level. Others offered both graduate and undergraduate degree options, and two were certificate programs. Class sizes in NP and CNM programs were smaller than in PA programs. They ranged from fewer than 10 students to more than 49 with mean class sizes of 23 for NP programs and 24 for CNM programs. More than two-thirds (67 percent) of the NP and 86 percent of CNM programs required a baccalaureate in nursing at admission, 71 percent of both types required prior clinical experience, and two NP programs required acceptance by a preceptor or site.

NP programs offered significantly fewer hours of clinical training than PA programs ($P<.001$ Fisher's exact test). One-third of the NP programs provided

fewer than 500 clinical hours (mean 674 hours); almost two-thirds provided 500–1,000 hours. Of the six NP programs that did not require previous clinical experience beyond the 1,500 hours required in nursing school, five provided fewer than 1,000 hours of clinical training. Eighty percent of the CNM programs had 1,000–1,500 hours of clinical training, and only one had fewer than 1,000.

The majority of NP and CNM students in the 21 programs that reported student characteristics ranged in age from 30 to 39 years. Seventy-two percent of programs reported their minority representation. One NP and one CNM program at historically black institutions had 62 percent and 100 percent minority enrollment, respectively. Of the remaining programs that reported data, NP programs averaged 17 percent ethnic minority students and CNM programs, 4 percent. The majority of NP and CNM students were women. Academic preparation varied depending on the requirements of the program. For NPs, the average years of prior clinical experience ranged from 2.6 to 9; for CNMs, previous clinical experience was not reported.

Faculty. All PA programs had PAs on their core faculty as well as a physician medical director, and more than half had a multidisciplinary faculty, whereas faculty in NP and CNM programs were almost exclusively within their respective disciplines. Very few NP and CNM programs used core faculty from disciplines other than nursing. In the majority of programs of all three types, more than 80 percent of the faculty were in part-time clinical practice, and at least half had a current or past practice with underserved populations.

Nearly two-thirds of the PA programs had ethnic minority faculty members. The range was from 10 to 100 percent of the core faculties, with five programs having more than one-third minority faculty, including all faculty in two programs associated with historically black institutions. Among the NP programs, only 29 percent had minority faculty. These programs had one to four ethnic minority members each, making up 9 percent to 67 percent of the core faculties. Five of the seven CNM programs had no minority faculty; one had 25 percent and another, 50 percent.

All programs required good clinicians as faculty. Both NP and CNM programs reported difficulty finding NPs with doctoral degrees, necessary for tenure track appointments and parity with other nursing programs. They experienced even more difficulty in recruiting doctorally prepared NPs who had clinical experience. Salaries for faculty were sometimes too low for doctoral level practitioners and were seldom competitive with the higher salaries in clinical practice. As a partial solution, some programs encouraged half-time teaching positions, allowing faculty to practice in the community at a higher salary.

Rigorous expectations that tenured appointees would practice, teach, and conduct research were reportedly extremely taxing to these faculty members. When asked about problems they experienced being part of a particular type of institution, five of the nursing program directors expressed concern about the lack of acceptance among other nursing faculty in their own institutions who lacked interest in and understanding of NP or CNM training. Program directors experienced competition for resources with other nursing programs.

Program funding. Federal and State funds were important resources for all three types of programs, and 82 percent of PA, 46 percent of NP, and 71 percent of CNM programs received Federal funding. Two PA programs and nine NP programs had received Federal funds in the past that did not continue. In another study, which surveyed 147 NP programs, 97 (66 percent) had received Federal funding that began in 1969 and continued for an average of 7 years. As of 1990, only 62 (42 percent) were receiving Federal support (*18*).

Twenty percent of the programs received more than half of their support from the Federal Government, raising concern about their stability in the event of a funding reduction. Others relied heavily (and perhaps more securely) on student tuition and fees, State resources, or their sponsoring institutions. Approximately half of all the programs (59 percent of the PA, 46 percent of the NP, and 14 percent of the CNM programs) had State support. Other sources were tuition or fees, the sponsoring college or university, hospitals, local sources, private foundations or industry, and faculty practice plans. Only a few programs had a faculty practice plan that provided training funds through a percentage of fees, although more were in the planning stages.

Strategies

Most of the programs studied used a variety of strategies to deploy students and graduates to underserved areas. However, one-fourth of them, including 10 NP programs, did not report any special strategies related to the location of training or to other structural features that might be expected to affect the deployment of students to underserved areas.

Mission statements. Almost half (41 percent) of the 51 programs had a published mission statement that indicated a purpose of training students for underserved populations—nine PA programs, six NP programs, both of the combined PA–NP programs, and four CNM programs. Target populations they intended to serve, for example, specific rural or inner-city areas, minorities and refugees, particular age groups, or women were identified by 86 percent of the programs.

Location of training. For 31 percent of the programs, the fact that the program was located in an underserved area or site assured that all or most student training would occur in a target area and increased the potential for retaining graduates to practice in such areas. Locations included inner cities, public (county) or minority institutions, and remote rural areas, such as Appalachia. Some programs (16 percent) had decentralized or community-based faculty positions to assist local training activities. Community-based recruitment of students, coupled with training in or near their home communities, was another strategy used by 12 percent of programs.

Seven programs (14 percent) had student-preceptor preselection arrangements, and three, one PA, one NP, and one PA–NP, required this commitment for admission. These were Medex-type programs—the students received most of their clinical training with the preceptor in a community practice, with subsequent employment by the preceptor as the desired outcome. In the other four programs, hospitals or private practices gave students financial support and clinical training onsite in return for an employment commitment upon graduation.

Almost half (41 percent) of PA programs (including one of the PA–NP programs) required a 1- to 3-month preceptorship in an underserved site. No NP or CNM programs required such experiences. Other deployment strategies mentioned were use of a terminal preceptorship in an underserved site or financial support from the site for trainee travel and lodging.

Although all programs offered some clinical training in underserved sites, they reported widely varying amounts. More than half had some underserved training sites, and the rest had many or all of their clinical training sites in underserved areas. Almost half of the latter programs were located in a large inner-city institution or a remote rural area, and almost all had mission statements compatible with the goal of training students for practice in underserved areas. PA programs offered the most training in underserved sites.

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Educational process. The programs reported many curriculum changes over time—adding or reorganizing curriculum content (for example, health promotion, cultural issues) in response to new local or national needs, adding required experiences with underserved sites or other clinical experiences, and shortening or lengthening the program. Programs in rural States, with a strong rural focus, had cohesive strategies that linked rural faculty role models on and off campus, provided most of their training in rural sites, and emphasized rural issues in classroom instruction. Most programs reported that instruction about cultural issues was a theme throughout the curriculum. Two programs provided a medical Spanish course.

Both the PA and NP programs reported the increasing lure of subspecialties for their graduate practitioners. To counter this influence, they employed strategies to emphasize the primary care mission, such as selecting older, experienced students whose career goals were clear, clarifying those goals during the admissions process (that is, students' understanding of the role or their ties to rural or underserved populations), and identifying training sites that supported these goals.

Typical problems associated with training sites were competition for sites with other training programs, lack of master's-prepared NP preceptors, overuse of certain sites, and staff of sites in underserved areas being too busy to supervise students appropriately.

Recruitment and retention. Approximately one-fourth of PA programs and half of NP programs offered a part-time or extended curriculum, or both, to accommodate students who were unable to attend school full time because of family or financial responsibilities or to give students who had academic difficulty extended time for remediation. Seven NP

Table 1. Responses of PA, NP, and CNM students and graduates regarding factors contributing to their decisions to practice in underserved areas

Factors	PAs (N=18)		NPs (N=18)		CNMs (N=7)		Totals (N=43)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Background or prior experience in underserved areas	12	67	6	33	4	57	22	51
Social-political interests	3	17	1	6	2	29	6	14
Minority, language background	0	0	6	33	0	0	6	14
Preceptor role model	0	0	3	17	0	0	3	7
Clinical rotations in underserved areas	3	17	0	0	0	0	3	7

NOTE: PAs = physician assistants, NPs = nurse practitioners, CNMs = certified nurse-midwives.

Table 2. Deployment strategies of PA, NP, PA-NP, and CNM programs by level of success in deploying graduates to primary care practice in underserved areas

Deployment strategies	Successful programs		Programs with limited success		Programs with no outcome data		Totals	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
None apparent	...	...	...	...	3	100	3	100
Location only	...	...	...	...	2	100	2	100
Isolated strategies	...	...	3	30	7	70	10	100
Isolated strategies and location	...	...	4	33	8	67	12	100
Comprehensive strategies	8	57	3	21	3	21	14	100
Comprehensive strategies and location	7	78	1	11	1	11	9	100
Totals	15	30	11	22	24	48	[1] 50	100

[1] One CNM program had no graduates.

NOTE: PAs = physician assistants, NPs = nurse practitioners, CNMs = certified nurse-midwives.

programs had flexible training schedules, that is, offering courses in the evenings or weekends to fit with the schedules of working students.

Some NP and CNM master's level programs were associated with completion programs for the baccalaureate degree in nursing, which allowed applicants to achieve the degree required for admission. Some programs assisted students from target areas or populations by giving them preferential admission or by relaxing admission requirements. Targeted students with low scores on entrance examinations received conditional admission.

Other strategies to recruit and retain students from target areas or populations included financial aid, extra academic support, use of ethnic minority program graduates to recruit and mentor students, housing assistance, outreach, minority staff and lecturers, counseling support, clinical sites in students' home communities, and child-care assistance. One PA–NP program increased its annual minority enrollment from 1 to 19 students over 7 years by adding a PA track.

Costs of training and associated loss of employment income and benefits were identified as the greatest barrier to student admissions, according to officials of three-fourths of the programs. Other barriers were inadequate academic preparation, especially for rural and minority students; life circumstances, for example, family responsibilities; distance; lack of minority faculty; and lack of housing.

Students used a variety of financial aid plans to overcome money-related barriers. Half the programs offered scholarships or traineeships. Other assistance came from National Health Service Corps (NHSC) scholarships (in 41 percent of programs) and hospital or clinic sponsorships (32 percent). Federal traineeships were used by students in NP and CNM programs, and Commissioned Officer Student Training and Extern Program (COSTEP) funds by one or two students in 60 percent of PA programs. However, very few students used the NHSC or COSTEP resources.

Student and graduate perceptions. The 43 students and graduates interviewed during site visits reported several factors influencing their decisions to practice in underserved areas. As noted in table 1, most cited

personal characteristics, such as their backgrounds or experiences in underserved areas (51 percent), social or political interests (14 percent), or minority and language backgrounds (14 percent) rather than the influences of the program itself (preceptor role models 7 percent and clinical rotations 7 percent). However, both students and graduates identified clinical experience in underserved areas, curriculum on other cultures and on public health, faculty role models, and the program's emphasis on primary care as providing the preparation they needed for practice in underserved areas.

Successful Deployment of Program Graduates

Only 60 percent of the PA, 36 percent of NP, 57 percent of CNM, and the two combined PA–NP programs could provide data about their graduates' practice settings and specialties. (One CNM program did not yet have graduates.) Overall, 49 percent of the programs did not have or submit these data, and only five programs had published results.

The existence of data on the practice locations of graduates, as well as the rate of success among programs that had such data, proved to be related to whether the program had a mission statement and to its recruitment and educational strategies. Almost three-fourths (71 percent) of the programs with clear statements about preparing health professionals to work with underserved populations conducted most or all student training in underserved sites and had outcome data on their graduates' practice.

Conversely, those without such mission statements reported less training in underserved sites or had no graduate deployment data. For all PA and NP programs, there was a statistically significant relationship between the program having a mission statement relating to underserved populations and providing graduate practice data ($P<.01$ chi-square). There was also a statistically significant relationship between the existence of a mission statement and the use of special recruiting or admission strategies to attract rural or ethnic minority students ($P<.01$ chi-square).

These associations suggest that a clear, focused, and publicly stated mission guides the development of training in compatible sites, the recruitment of students who are likely to carry out the mission, and the motivation to evaluate success and follow the practices of graduates.

If data were available, programs were categorized according to their success in deploying graduates in primary care roles and to underserved areas, and according to whether their strategies for producing this outcome were comprehensive. Comprehensive strategies were those appearing in most aspects of program activities—for example, recruitment, curriculum, and training. Limited or isolated strategies were single factors or events intended to influence student interest in underserved areas, for example, locating a clerkship or preceptorship in such an area. In addition, programs were classified according to whether they were located in their underserved target area.

The PA and NP programs were defined as successful if more than 60 percent of their graduates were in primary care practices, and a substantial number were in medically underserved areas (that is, at least 25 percent in Health Professional Shortage Areas (HPSAs), or more than 25 percent in towns of less than 10,000 population, or a total of more than 60 percent in a variety of types of underserved areas). PA and NP programs with limited success were those with fewer than 20 graduates or fewer than 60 percent of their graduates in primary care or in underserved areas. In addition, many programs classified as having limited success were missing data on the numbers of graduates in primary care or the numbers practicing in underserved areas. It is possible that some or all of those programs may be more successful than was indicated by their limited data. CNM programs classified as successful were those reporting more than 50 percent of graduate practitioners in underserved areas; those with limited success had less than 50 percent of their graduates in such areas.

In table 2, 15 programs (30 percent) were classified as successful by the criteria mentioned earlier. All 15 had comprehensive strategies, and 7 of these were located in an underserved area. Of the 11 programs with limited success, only 4 had comprehensive strategies; the other 7 had isolated strategies. Twenty-four programs did not submit any graduate data, and of these, only four had comprehensive strategies. Programs having comprehensive strategies were significantly more likely than others to be classified as successful ($P<.001$ Fisher's exact test). These associations suggest that programs actively promoting service to the underserved through their recruitment, training, and linkage with community practices are those most likely to document successful outcomes. Being located in an underserved area, but lacking other relevant recruitment and educational strategies, was not significantly related to success.

Interviewees perceived the conversion of NP programs to the master's degree level as a barrier for rural and minority students, many of whom were prepared in associate degree nursing programs and lacked the bachelor of science in nursing required for

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admission. Further analysis was done to examine the effect of the graduate level programs on success in deploying graduates to underserved areas. Only 3 (or 14 percent) of the 22 graduate-level NP programs were classified as successful, and all 3 used comprehensive strategies and were located in their target areas. The two nongraduate level NP programs were both successful. In this analysis, only two of the five graduate-level CNM programs demonstrated success.

Certificate programs were significantly more likely than graduate-level programs ($P<.01$ Fisher's exact test) to be able to demonstrate successful deployment, and Medex-type programs were significantly more likely to be successful than non-Medex types ($P<.01$ Fisher's exact test). Among the successful PA and NP programs, 56 percent of PA and 60 percent of NP programs had certain features typically associated with the Medex model—a mission statement oriented to underserved areas, community-based clinical training in preceptorships (often in or near the student's home), students who had clinical experience as well as academic training prior to matriculation, and often a student-preceptor commitment as an admissions requirement.

Barriers to Practice

The barriers reported by interviewees were similar across disciplines and also similar to those reported in other studies. Most frequently mentioned were restrictive practice laws, lack of prescribing and dispensing privileges, low salaries, lack of adequate reimbursement for services, lack of physician acceptance, lack of hospital privileges, institutional restrictions, professional infighting between PAs and NPs, lack of community knowledge about the practitioners, conservative nurses, practitioners' limited skills in non-English languages, lack of family (generalist) NP practitioners, lack of ethnic minority practitioners due to academic requirements of training programs, and safety problems in inner-city areas.

The barrier mentioned most frequently by NP program interviewees was low salaries. Salaries in primary care settings, particularly in underserved areas, were lower than pay for work in hospitals. Some nurses, therefore, returned to their previous roles. Also, the salaries in subspecialties were higher than in primary care. Higher salaries in subspecialties, coupled with increasing student debts associated with costs of training, tended to lure graduates away from primary care.

Discussion and Conclusion

The 51 programs we studied reveal important information about the existence and success of strategies designed to increase the numbers of PA, NP, and CNM practitioners in areas of severe need. All three professions have acknowledged the importance of this goal; our study included all programs in this country that made this goal in any sense part of their mission. Some programs offer lessons learned from training in the nation's most underserved areas.

All 51 programs used some strategies for recruiting and training practitioners for underserved areas, although the range of the numbers of such activities was considerable, as was the range in ability to document successful outcomes. Programs with a strong commitment to underserved communities were found to have several distinctive features:

1. They have publicly stated this commitment in a mission statement.
2. They have made substantive changes in recruitment procedures, curriculum, or educational structure and process to support this mission.
3. They are community oriented, with strong linkages between education and service.
4. They are more likely than other programs to collect data on their graduates, to use special recruiting or admission strategies to attract rural and ethnic minority students, and to require training in underserved areas.

The most successful programs have comprehensive strategies interwoven throughout their activities. Our findings suggest that a single strategy—for example, the fact that a program is located in an underserved area or has a required training component—is not sufficient to significantly influence the practice choices of graduates. Rather, comprehensive strategies are more effective. These strategies include recruiting students who are committed to underserved populations, providing classroom and clinical experiences that support their goals and prepare them appropriately for work in these communities, and

hiring faculty who model similar practice.

Answering the question about who will practice in underserved areas is a continuing challenge. Findings in this study suggest that older students with well-conceived practice goals of working and living in underserved areas and background experience in such areas are the most likely candidates. Financial aid programs are necessary to make training possible for many students from such backgrounds. Programs need to recruit ethnic minorities actively and to have retention strategies to help students surmount academic barriers.

National and State plans for health care reform have increased emphasis on managed care plans and are awakening new interest in PA, NP, and CNM practitioners. In some States, the revision of Medicaid plans increases the need for these providers in the public sector. This study included the programs most likely to prepare these practitioners for underserved areas.

Estimates from class sizes reported in this study suggest that approximately 700 PAs, 500 NPs, and 150 CNMs will graduate from these programs each year. A certain percentage of these graduates will not go to underserved areas, leaving relatively few practitioners to respond to an increasing array of primary care service needs.

The attention of Federal and State governments is needed if the programs with track records in deploying graduates to underserved areas are to be augmented. Investing additional resources in programs without track records has less certain outcomes. Government attention is also required to remediate barriers to practice in underserved areas, such as lack of prescribing privileges and lack of financing mechanisms that favor primary care.

Preparing students to work in underserved sites requires an academic milieu that supports this mission in terms of the type of faculty, structure of the program, and the curriculum or educational process. Faculty can provide both professional and ethnic role models for students. In this study, administrators recognized that the absence of ethnic minority faculty members hindered efforts to recruit minority students.

PA, NP, and CNM faculty are important role models for students training in these respective programs. PA programs have the additional benefit of a multidisciplinary faculty. Exposure to educators including, but not limited to, both medicine and nursing offers a potentially broader educational experience and may be particularly useful in preparing for work with underserved populations. Lack of available and appropriate faculty compromises programs' abilities to expand enrollments. Mechanisms to recruit, retain, and enhance the skills of faculty committed to underserved populations are necessary.

Medex-type PA and NP programs have a clear mission and track record. These programs have academic homes in a variety of settings (for example, schools of medicine or public health or hospitals) and usually offer a certificate of clinical proficiency and degree options. They are not wedded to a single professional school, and therefore, they do not compete with other discipline-specific programs for resources, which allows flexibility and innovation in their educational process.

The Medex-style educational process supports the underserved mission goal by recruiting students who live in areas of need and making it possible for them to train in preceptorships in or near their home communities. The preceptor-student preselection match required by some programs has the advantage of a commitment that may grow into future employment. This and other types of student-community partnerships, for example, a hospital sponsor requiring a 2-year service payback, are probably the most effective strategies to encourage graduates to practice in a specific site.

To be truly creative and employ innovative outreach activities such as community-based training or community-related courses, such as rural and cross-cultural medicine, programs require extramural funding from State or Federal sources. While this may seem costly in the short term, the resulting successful deployment of graduates to underserved areas offers long-term rewards.

In response to the National League for Nursing and American Nurses Association requirements, many NP programs have converted from certificate to the master's level. Programs in this study experienced this change as a barrier to enrolling certain types of students, such as nurses in rural areas and those who are members of minority groups; these may also be the nurses most likely to practice in underserved areas.

The conversion process has also compromised time allotted to clinical training, replacing clinical hours with courses in administration and research that may be less relevant to the substantial demands of clinical practice in underserved areas. To be comfortable and cost-effective practicing in underserved areas, practitioners need more rather than fewer skills. Rural practitioners consistently saw a need for generalist skills and emergency medicine training that would enable them to function as independently as possible in isolated areas.

The duration of clinical training must be sufficient to develop providers who are clinically competent

and, equally important, confident in their new roles. Some NP programs studied, especially those with limited requirements for prematriculation clinical experience, may not provide a sufficient amount of clinical training for practice in underserved areas.

Findings in this study also have potentially broad implications for graduate and undergraduate medical education and support the results of other studies. Simply increasing the numbers of trainees does not necessarily increase the deployment of graduates to underserved areas. Recruitment strategies that take into account candidates' background experiences and practice goals, coupled with multiple educational strategies that support students' training in underserved areas, offer the greatest potential for successful outcomes.

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