Increasing the Pool of Qualified Minority Medical School Applicants: Premedical Training at Historically Black Colleges and Universities

DONNA DURANT ATKINSON, PhD
ERNELL SPRATLEY
CLAY E. SIMPSON, Jr., PhD

When this study was conducted, Dr. Atkinson was Project Director with Aspen Systems Corporation, Silver Spring, MD. She is now Staff Consultant, Birch and Davis Associates, Inc., Silver Spring, MD. Dr. Simpson is Director, and Ms. Spratley is Program Analyst, Division of Disadvantaged Assistance, Bureau of Health Professions, Health Resources and Services Administration, Rm. 8A-09, 5600 Fishers Lane, Rockville, MD 20857.
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Tearsheet requests to Ms. Ernell Spratley; tel. 301-443-3680.

Synopsis

Historically black colleges and universities have educated significant numbers of black students preparing for careers in medicine. These institutions have the potential to make even greater contributions to the pool of black medical school applicants and ultimately to the supply of black physicians.

The Division of Disadvantaged Assistance, Bureau of Health Professions, Health Resources and Services Administration within the Public Health Service, commissioned a study of the curriculums and other factors related to premedical education. The study was conducted at the historically black colleges and universities that graduate a large number of students who gain admission to medical school, and the historically black colleges and universities whose students are less successful in gaining admission to medical school.

Nine historically black colleges and universities participated in a self-assessment of their undergraduate premedical curriculums. The findings from schools with higher acceptance rates were compared with those of schools with lower acceptance rates to identify factors contributing to the production of significant numbers of successful medical school applicants.

Comparisons of data on these schools revealed several important factors that may be related to differences in acceptance rates:

- *Those schools that devoted greater effort to premedical training (for example, advising students about how to prepare for medical school, curriculum development, maintaining premedical or prehealth professions offices and clubs—the staff of these offices provide students with information on medical or other health professions schools—to identify and recruit students) tended to have higher acceptance rates.*
- *Schools with higher acceptance rates had larger proportions of biology and chemistry majors aspiring to medical and dental careers and stronger affiliations with medical schools than schools with lower acceptance rates.*
- *Institutions with higher acceptance rates offered a broader range of externally sponsored enrichment programs; the highest medical school acceptance rates were found among those schools with continuing Health Careers Opportunity Program projects that served significant percentages of students interested in careers in medicine.*
- *Mean Medical College Admission Test scores were somewhat lower for applicants from schools with lower acceptance rates, but the great variation in acceptance rates for these schools is not reflected in a comparable variation in the Medical College Admission Test scores.*

HISTORICALLY black colleges and universities (HBCUs) represent a small subset of degree-granting institutions in the United States, yet they graduate a substantial number of black students who receive degrees in areas that could prepare them for careers in medicine and other health professions. During the 1980s, HBCUs conferred about 30 percent of all bachelor degrees earned by black students and about 40 percent of the baccalaureates in the sciences by black students (table 1).

There are 107 HBCUs in the United States. Of these, about 35 are major potential resources for increasing the number of black applicants who gain admission to medical and other health professions

Table 1. Bachelor degrees awarded to black students in the sciences and in all fields by historically black colleges and universities (HBCUs) and by all undergraduate institutions, 1980–81 through 1988–89

Academic year	All fields			Biological and other life sciences			Physical sciences		
	All schools	HBCUs	Percent from HBCUs	All schools	HBCUs	Percent from HBCUs	All schools	HBCUs	Percent from HBCUs
1980–81	60,533	19,687	32.5	2,266	899	39.7	886	376	42.4
1982–83	57,129	17,482	30.6	2,073	842	40.6	839	341	40.6
1986–87	56,555	16,516	29.2	1,932	712	36.9	844	346	41.0
1988–89	58,016	15,448	26.6	1,944	674	34.7	708	310	43.8

SOURCE: National Association for Equal Opportunity in Higher Education: Factbook on blacks in higher education and in historically and predominately black colleges and universities, Vol. II, Washington, DC, 1991.

schools. Data from the Association of American Medical Colleges (AAMC) show that during the mid-1980s, nearly 30 percent of all black applicants to medical schools received their degrees from HBCUs (*1*). AAMC data for the years 1981 to 1987 showed that only a few HBCUs contributed significant numbers of black applicants and matriculants to medical schools each year; another group of HBCUs had significant numbers of applicants each year but only a small percentage of these applicants were accepted (unpublished data, AAMC, Washington, DC, 1989).

HBCUs continue to be the institutions of choice for many black students, and these institutions can potentially provide many more successful medical school matriculants than they currently do. For example, four HBCUs in Alabama produced an annual average of 70 applicants to medical schools during the years from 1981 to 1987, but only 17 of those applicants were successful matriculants (unpublished data, AAMC, Washington, DC, 1989). This matriculation rate of only 24 percent amounts to a substantial loss in the potential number of black physicians who may have practiced in Alabama or some other State where the shortages of black physicians are especially pronounced. Similar lost potential can be demonstrated for other States as well.

In June 1991 the Division of Disadvantaged Assistance (DDA), Bureau of Health Professions, Health Resources and Services Administration (HRSA) within the Public Health Service, completed a 2-year study of curriculums and other factors related to premedical education at nine HBCUs. This study focused solely on undergraduate training and not on any other segment of the academic pipeline. The curriculums and other factors at HBCUs that graduate a relatively large number of students who gain admission to medical school were compared with curriculums and other factors at HBCUs whose students are less successful in gaining admission to medical school. This research was an attempt to gain understanding of and to document those factors that contribute to successful premedical programs at HBCUs.

Selected characteristics of the schools participating in the study are summarized in table 2. The study was designed to identify institutional level factors affecting medical school acceptance rates and did not address those factors affecting individual student acceptance rates. The final report produced from that study provides details of its methodology, results, and recommendations (*2*).

The purpose of this article is to present the significant findings and highlights of that study, including selected recommendations for the improvement of premedical training at HBCUs. These findings and recommendations should be of particular interest to institutions that have made a commitment to provide their premedical students with a well-rounded educational experience designed to enhance their potential for medical school acceptance—and to institutions that have a broader commitment to training students for careers in the health professions.

This study may also be of use to institutions interested in developing premedical programs. The utility of these findings is not limited to HBCUs. They may be considered by other institutions because they focus on elements of premedical training that may benefit other undergraduate training programs.

Background

The scarcity of black, Hispanic, and American Indian health care practitioners continues to be a serious public health problem confronting this nation. This problem is particularly evident in the field of medicine. It is estimated that less than 10 percent of all physicians are from these racial and ethnic minority groups that constitute 22 percent of

the general population. Minority physicians give minority communities important access to health care. Black and Hispanic physicians are more likely than other physicians to practice in low-income, underserved areas. Findings of Keith and coworkers support the claim that these minority physicians generally serve more patients from their own racial or ethnic group than other physicians (*3*). And because minority physicians are in short supply, access to care for minority populations is often limited. The gap in health status between the minority and majority populations persists in part because of the shortage of these physicians. One way to narrow this gap is to increase the supply of minority physicians who in turn provide services in the black and other minority communities.

Underrepresentation of blacks and other minorities in the health fields has been a matter of national concern for a number of years. The Federal Government has supported efforts to improve access to health careers for minorities and other disadvantaged individuals for approximately 20 years. It has been joined in its efforts by private sector organizations as well as other public organizations. Most recently, "Healthy People 2000: National Health Promotion and Disease Prevention Objectives" (*4*) includes a specific objective for increasing the numbers of underrepresented minorities obtaining degrees in the health fields. Similarly, the AAMC has recently launched Project 3000 by 2000; its primary goal is to increase underrepresented minorities entering the first-year medical school class to 3,000 by the beginning of the next century.

The importance of training black and other underrepresented minority students for careers in medicine was also supported by the findings of the Secretary's Task Force on Black and Minority Health (*5*). One of the task force's recommendations addresses this need and calls for the development of innovative methods for attracting minorities into the health professions. One of seven critical areas identified by a National Symposium to Strengthen Support Networks for Minorities in Health Science Careers was the need to appreciate the role and importance of HBCUs and the need to address negative perceptions regarding the quality of their graduates (*6*).

The study on which this article is based grew out of the recognition of the current contributions of HBCUs to the black applicant pool for medical schools and their potential for greater impact. The DDA posed a number of research questions for this study. The following overarching question provided the framework: What characteristics of HBCUs facilitate higher medical school acceptance rates? Other questions generated from this framework concerned the characteristics of the premedical curriculum and the science curriculum and their overall importance in premedical training, the responsibility of the premedical advisor, and the relationship between HBCUs and the Health Careers Opportunity Program (HCOP) and medical schools.

Table 2. Selected characteristics of schools in study

Characteristics	Institutions								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Primary educational focus:									
Liberal arts	x	x	x		x	x	x	x	x
Research				x			x		
Technical								x	
Other				x					
Enrollment (full-time and part-time), 1989–90:									
Less than 2,000			x						
2,000–4,000	x	x					x	x	
4,001–6,000									
6,001–8,000					x	x	x		
8,001 or more				x					
Control:									
Public					x	x	x		x
Private	x	x	x	x				x	

The study team and advisory committee identified factors that they thought impacted the training of undergraduate students for medical careers, including institutional characteristics, advising premedical students (including networking), curriculum, enrichment programs, and faculty characteristics. These factors, then, set the parameters for this primarily qualitative study.

Method

An advisory committee played a significant role in the study, particularly in the recruitment of participating HBCUs and in the provision of overall direction for the study. Members of the committee were recruited in two phases. First-phase members were recruited as much for their expertise in designing and evaluating premedical training programs as for their established relationships with HBCUs. Second-phase members (usually the chair of the biology or chemistry departments or the premedical advisor) were recruited from the HBCUs that agreed to participate in the study.

In addition to the expertise of its members, the advisory committee was a mechanism for involving the participating HBCUs in the design and implementation of the assessment. This methodology

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helped to accelerate the institutions' acceptance of a voluntary evaluation of their premedical program, thus creating a self-evaluation methodology. In this way, the committee members could develop a sense of ownership in the project and "sell" it to other faculty members and administrators on their campuses. This approach would make it easier for the faculty to garner support for implementing recommendations resulting from the study.

A search for background data to support the study questions and the development of the instrument yielded little published documentation on curriculum evaluation at the undergraduate level. Such evaluations tend to be conducted as in-house studies, with the results remaining within the bounds of the department or certainly within the institution. There is a strong sense of privacy among faculty members concerning the evaluation of their curriculums. The information that was identified provided useful data for the development of the study and the review of science curriculums.

On a broader perspective, however, the American Chemical Society (ACS) is the only organization that approves curriculums at the undergraduate level in any of the sciences. The ACS uses guidelines for reviewing curriculums and approving departments for granting a degree in chemistry, thus ensuring some level of standardization of the chemistry curriculum.

A survey of the biology and zoology curriculums in U.S. colleges and universities identified the courses typically taken by students majoring in these fields, thus constituting a standard curriculum of sorts (*7*). Faculty members at the University of Rhode Island found that at least one semester each of introductory biology, genetics, cell biology, physics, chemistry, and organic chemistry was included in these curriculums (*7*). In effect, there exists an informal standard, providing science majors with the types of courses that may enable them to do well on standardized tests for admission to graduate or professional schools (for example, the Medical College Admission Test [MCAT]).

Telephone interviews were held with medical school admissions directors to ascertain the factors that they consider important when reviewing student applications. These interviews provided insight into what makes a successful candidate. Information was gathered from schools to which graduates from HBCU study participants applied most frequently. These schools admitted as few as 2 percent up to as many as 27 percent of the applicants from HBCUs that participated in the study (unpublished data, AAMC, Washington, DC, 1989).

The advisory committee (first-phase) recruited nine HBCUs to participate in the study based on the number of medical school applicants they had, their acceptance rates between 1981 and 1987, and the presence of a HCOP (unpublished data, AAMC, Washington, DC, 1989). HBCUs were selected if they had an average of at least 10 applicants during the 7 years' period.

Institutions with medical school acceptance rates over the midpoint for all schools in the study, 30 percent, were considered higher-ranked and those below were considered lower-ranked institutions. Five higher- and four lower-ranked institutions participated in the study. The medical school acceptance rates for participating HBCUs ranged from about 14 percent to 58 percent (see chart). (Medical school acceptance rates for all black applicants, including those from HBCUs, ranged from 39 percent in 1982 to 49 percent in 1987 [*8*].) All of the higher-ranked and two of the lower-ranked institutions had HCOPs on campus. DDA was interested in exploring the effect of the HCOP at HBCUs since its mission is to promote equity in access to careers in medicine and other health professions for minority and other disadvantaged students.

A coordinator from each institution, identified by the president of the institution, formed a team to assist with implementing the evaluation. Each team was responsible for completing an evaluation instrument. Teams were usually composed of faculty members from one of the science departments, an administrator, and a premedical advisor. The team approach permitted the coordinator to share the responsibility of the self-evaluation with others on campus, and it acted as a vehicle for other viewpoints and other stakeholders to have some input into the process.

A data collection instrument was developed for the assessment of curriculums for the 1989–90 academic school year. The instrument was based on

the factors deemed important for premedical training by the advisory committee. A section for each of nine areas of interest to the study was developed. The areas included institutional characteristics, premedical program, curriculum overview, curriculum objectives and course and student evaluation, curriculum objectives and the MCAT, premedical advising, extracurricular enrichment programs, faculty, and facilities and resources. The study was not designed to evaluate course content. The data collected from the instrument were qualitatively and comparatively analyzed.

Results and Discussion

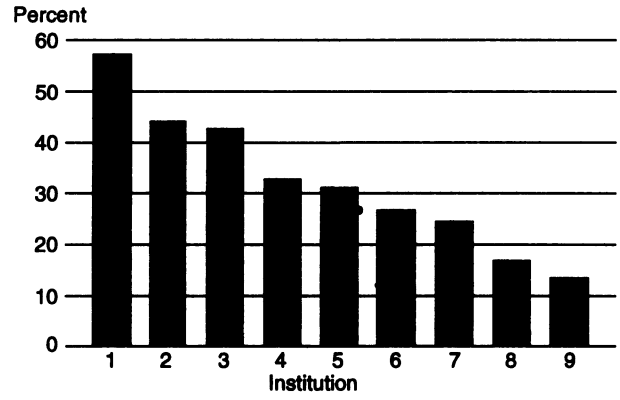
Differences were found between high and low acceptance rate schools in a number of factors identified early in the project as being important for training undergraduate students for entry into medical school. These factors include curriculum, institutional resources, enrichment programs, counseling premedical students, and teaching approaches.

There was a general relationship between the amount and type of effort devoted to premedical education and acceptance rates. Some schools devoted more effort to premedical training than others. (Among these efforts were advising premedical students, curriculum development, enrichment programs, and maintaining premedical-prehealth professions offices—staffed offices or clubs that assist students planning careers in these fields.) These schools tended to have higher acceptance rates. No single factor was found to play a prominent role in premedical training, but a combination of factors was found to be present at the HBCUs with higher medical school acceptance rates (MSARs).

Curriculum. There was little difference between the types of courses required for premedical students at HBCUs with higher MSARs and at HBCUs with lower MSARs. Students at all participating HBCUs were required to take the courses that were considered important for preparing for medical school. The premedical curriculum offered at all of the HBCUs is similar to the courses required by U.S. medical schools, and to the courses identified in the survey of courses in biology and zoology departments conducted by faculty at the University of Rhode Island (*7,9*).

Organic chemistry and physics were the only two courses required for premedical students by all of the medical schools surveyed in the AAMC study

Average medical school acceptance rate by institution, 1981-87



SOURCE: Association of American Medical Colleges.

and all of the participating HBCUs. Even though most institutions offered students the same basic curriculum, there were differences between institutions with higher and those with lower acceptace rates in the ways the curriculums were designed. Institutions with higher MSARs suggested reduced course loads in the freshman and sophomore years; the other institutions did not. In two of the lower acceptance rate institutions, students took biology, chemistry, and mathematics in the freshman year.

HBCU science faculty members at four of the five institutions with higher MSARs reported a commitment to laying the basic foundation for all students in the courses they teach. They taught the basic principles of biology and chemistry regardless of students' intentions to apply to graduate or health professions schools or their career aspirations. Institutions with lower MSARs, however, tended to tailor their curriculums to meet the needs of premedical students, and some institutions geared their curriculums to the MCAT. Faculty at HBCUs with higher MSARs reported being aware of its content, but the MCAT did not drive curriculum development. They made sure their curriculums included those topics.

In spite of a very wide range in acceptance rates for the schools participating in the study (from 14 percent to 58 percent as the chart illustrates), there was no comparable variation among the schools in the average MCAT scores for students who applied to medical school. For example, the average biology MCAT subscore for applicants to medical schools from these schools for the years 1985–89 ranged from 5.08 to 6.54, and the average chemistry MCAT subscore ranged from 4.96 to 6.28. Moreover, the schools with the lowest average subscores in these areas were not the schools with

the lowest acceptance rate. Similarly, the MCAT scores for students who were accepted differed very little, and the highest and lowest subscores were not necessarily found among the schools with the highest and lowest acceptance rates.

The grade point averages (GPAs) of medical school applicants from the participating HBCUs were relatively the same for all institutions. The science GPAs for applicants from all nine HBCUs ranged from 2.53 to 2.87 and overall GPAs ranged from 2.72 to 3.06.

The GPAs of students who were accepted into medical school differed only slightly. The science and overall GPAs of these students tended to be only slightly higher for students at institutions with higher MSARs than those of students from institutions with lower MSARs. The science GPAs for accepted students from all nine HBCUs ranged from 2.68 to 3.19 and overall GPAs ranged from 2.85 to 3.31.

Clearly, factors other than the academic qualifications, as measured by the MCAT scores and GPA, are involved in the differences in MSARs experienced by graduates from these schools. The reputation of the school producing the applicants may be one factor. Medical school admissions officers who were interviewed for this study repeatedly cited some of the study schools as having strong premedical programs. These assessments were based on experience with graduates and interaction with premedical advisors and not necessarily on direct knowledge of the curriculum or programs of these schools.

Institutional resources. Personnel and student resources differed at the higher and lower MSAR institutions. More successful institutions had larger biology and chemistry faculties. The larger programs in terms of majors and faculty tended to have more success in preparing their students for medical school.

Institutions with higher MSARs had larger numbers of students aspiring to careers in medicine and other health professions, but the total student body enrolled was small. Most of the biology majors, at least 95 percent, at three of the top-ranking institutions planned on these types of careers. In contrast, the percent of biology majors at the institutions with lower MSARs who were interested in these professions was no more than 45 percent. Similar institutional patterns were observed for chemistry majors.

Biology and chemistry were popular majors at the institutions with higher MSARs. Biology was by far the more common major in the sciences followed by chemistry and physics (with very small numbers). Biology majors at the higher MSAR institutions ranged from 12 to 27 percent of student majors identified. The corresponding figure for lower MSAR institutions was an average of about 5 percent. Chemistry, though having fewer majors, had a similar pattern across the nine institutions.

Four of five institutions with higher acceptance rates reported positive working relationships with medical schools. These relationships were stronger for those HBCUs with medical schools in their institutional systems (these were predominantly State schools). The opportunities they afford students to develop their understanding of the medical profession, medical school, and the hospital environment from the provider's perspective broaden the students' experiences. Although interactions varied considerably from institution to institution in the type of programs offered for students, they included summer, internship, and work programs; clinical and research experiences; and visits to medical schools and their affiliated hospitals.

HBCU undergraduate faculty members also benefit from the interactions with medical school faculty members through a professional exchange of information in the form of premedical advisors conferences and seminars relating to curriculum at both levels, current research topics, and medical school preparation.

Research and employment opportunities were more often reported by institutions with higher MSARs. Each of these institutions had programs established for their students. Both public and private sources fund these kinds of efforts. Alumni were also involved in offering students opportunities for employment. Sometimes, students served as mentors in these experiences while others were mentored by faculty or other supervisors.

Medical school admissions officers interviewed for this study considered participation in these opportunities a strength on students' applications. Overall, students gained from these experiences by developing their interpersonal and critical thinking skills, which are important in preparing for medical school.

Enrichment programs. All participating institutions provided academic enrichment programs for their students. A number of institutions had programs to assist students with sharpening their skills in the sciences and other subjects, but institutions with higher MSARs offered more than other institu-

tions, including enrichment courses in mathematics, physical sciences, and general education courses.

In addition to courses for currently enrolled students, pre-freshman courses were also offered to prospective students at seven of the nine participating institutions. The programs were generally directed toward high school juniors and seniors with some reaching out to junior high school students. The programs varied in their content and format but usually included instruction in biology, chemistry, engineering, English, mathematics (precalculus, calculus), problem-solving, reading, statistics, and test-taking skills.

Externally sponsored enrichment programs were more predominant at the institutions with higher MSARs. These programs served multiple purposes but predominantly were useful to students in broadening their experiences outside the classroom. They provided students with the opportunities that allowed them to grow professionally and personally. Students could develop mentors from these relationships, build their credentials as aspiring health professionals, and enhance their medical school applications.

These programs provided students with opportunities to engage in research during the academic year and during the summer. Students could develop research and critical thinking skills, which are important for doing well on the MCAT and in matriculating in medical school. For example, the HCOP is an externally sponsored program found on all campuses where larger numbers of students have been accepted into medical school. Two of the four lower MSAR institutions also had HCOPs, but they were focused on allied health and were not perceived as having an influence on premedical students. HCOP was a popular program with students and was rated as having more of an impact on premedical students than some of the other programs. One of the distinguishing factors of HCOP is that it is directed at students interested in clinical careers in the health professions. Other programs target students interested in research careers, and students interested in becoming physicians, for example, are discouraged from participation.

Other programs on HBCU campuses with higher MSARs included the Minority Biomedical Research Support Program, Minority Access to Research Careers Honors Undergraduate Research Training Program, Office of Naval Research Undergraduate Premedical Support Programs, and Undergraduate Biological Sciences Education Initiative Grants from the Howard Hughes Medical Institute. These programs were not found as frequently on campuses with lower medical school acceptance rates.

'One of the distinguishing factors of Health Careers Opportunity Program is that it is directed at students interested in careers in the health professions that include clinical careers. Other programs target students interested in research careers, and students interested in becoming physicians, for example, are discouraged from participation.'

Advising premedical students. All nine participating institutions believed advising was a strength of their program. Advising students is a critical component of all premedical training programs. The advisors' breadth of knowledge about medical school is invaluable to prospective applicants as they decide how to prepare themselves for medical school. Advisors' ability to network with colleagues at the undergraduate institution, with medical school faculty and recruiters, and with other premedical advisors strengthens their capacity to provide knowledgeable advice.

Many advisors perform their functions without much support from their institution, even though support from the institution facilitates their job and allows them to expand their program and offer more services to students. Among the institutions with lower MSARs, three of the five reported that no funds were allocated for an institutional or departmental premedical component. Similarly rated institutions also failed to provide support for the premedical advisor and in some cases gave no clerical or student support for these activities.

Premedical clubs were an important component of the program. Each of the institutions with higher MSARs had a club on campus. The two institutions with lower MSARs and no clubs reported that club-like activities were channeled through the Biology Club or premedical advisors.

The activity level of premedical advisors at institutions with higher MSARs was greater than that of advisors at other institutions. These advisors were more likely to belong to the National Association of Advisors for the Health Professions or the National Association of Medical Minority Educators and its regional affiliates. In addition,

these advisors were more likely to belong to national and professional organizations and attended the meetings throughout the year. Only one of the four institutions with lower MSARs had an advisor who actively participated in these organizations.

Teaching approaches. Faculty members at the majority of the institutions with higher MSARs, unlike those at institutions with lower MSARs, took a team approach to teaching the introductory biology course or rotated instructors for this course. In one institution, all sections of the introductory biology course were formalized so that any faculty member could teach the course. The same objectives, syllabuses, lecture outlines, and examinations were developed for each faculty member teaching the course. This provided all introductory course students with the same foundation. Consequently, faculty teaching intermediate and advanced courses could have legitimate expectations about the knowledge level of their students.

Similar patterns were found for chemistry departments. At the institutions with higher MSARs, team teaching or faculty rotations were reported for courses at all levels. The development of biology and chemistry course objectives was handled primarily at the department level rather than by individual faculty members at institutions with higher MSARs; this was not the case at institutions with lower MSARs. The consistency that this approach provides to faculty members as they develop their course syllabus and to students as they learn about the basic principles of the discipline seems to benefit students in their preparation for medical school.

Recommendations

A number of recommendations resulted from advisory committee and study team discussions of the study findings. Recommendations were generated for both institutions and Federal agencies (including the Bureau of Health Professions, HRSA) to improve premedical training at HBCUs in order to increase the MSARs of their students. Highlights from these recommendations are summarized.

The following recommendations were generated for academic institutions:

- *Continue to engage in self-assessments.* The study team recommended that institutions continue to engage in self-assessments on a routine basis. Though several HBCUs have effective premedical training programs, they need to monitor their programs to ensure that their success continues. For some of the HBCUs, it is important to identify areas requiring improvement to develop strategies for making changes. These actions, taken by HBCUs with a commitment to adequately prepare candidates for medical school, can improve their students' acceptance rate.
- *Develop relationships with medical institutions.* Developing strong relationships with medical schools, hospitals, and research laboratories is recommended to all HBCUs. The staffs of these institutions offer faculty opportunities to exchange information with medical school faculty and recruiters. These relationships also offer students opportunities to broaden their research, clinical, and personal experiences and build and expand their classroom experiences. In addition, they strengthen the students' medical school applications and open the door for medical schools to become familiar with students of HBCUs and their preparation for medical school. These interactions can help to counter some of the negative perceptions that officials of majority institutions have regarding graduates of HBCUs.
- *Review course sequencing.* The study team also recommended that the sequencing of science and mathematics curriculums and the course load for freshmen be reviewed. Students need to ease into the discipline of the college environment and adjust to the demands of the science and mathematics curriculums. The team recommended that freshmen take only one science and one mathematics course concurrently in the freshman year.
- *Develop academic enhancement programs.* Additionally, the study team recommended that institutions develop academic assistance programs for students who are not prepared for introductory courses. These programs can assist students in sharpening their skills and laying a good foundation for courses in the sciences, mathematics, and other subjects.
- *Support the premedical program.* Other recommendations to institutions focused on strengthening the premedical program by providing financial and institutional support for the premedical-prehealth professions office and designating an advisor. Obtaining external sources of funding or creating line items in the institution's budget would enable the premedical program to offer programs and provide release time for faculty and travel funds for premedical advisors.

Without question, the premedical advisor can be the dominating force in successful premedical train-

ing programs. In institutions with higher MSARs, outstanding premedical advisors made the system work for their students regardless of the amount of support received from the institution. These advisors need backing from the institution to continue to make their programs flourish.

• *Build partnerships with local school districts.* Finally, the study team recommended that institutions build partnerships with local school districts that can serve many purposes. It can open the lines of communication between undergraduate faculty and school teachers regarding science curriculums at all levels, stimulate students to learn about and become familiar with careers in the health professions, and provide opportunities for undergraduates to serve as mentors to younger students. Partnerships with the business community are also beneficial for establishing employment or internship opportunities for students (and possibly faculty members) and identifying corporate sponsors for undergraduate programs.

Selected recommendations for Federal agencies focus on disseminating the findings of this study to HBCUs, already reported by the DDA as a part of the White House Initiative on HBCUs agenda in October 1991.

• *Expand HCOP.* The study team recommended that HCOP be continued and expanded. The program exemplifies the kind of extracurricular support premedical students need to round out their classroom experiences. Unlike support programs that are directed to research careers, HCOP is particularly directed to students aspiring to clinical careers in medicine. This and other support programs can give HBCU students a chance to develop their research skills and develop relationships with faculty members outside the classroom.

• *Develop a clinical medicine opportunity program.* Based on the need to increase the supply of black physicians providing direct services to patients, the team recommended that a Clinical Medicine Opportunity Program be established. Such a program, dedicated to students who are interested in clinical careers in medicine, would focus on establishing relationships with medical schools and hospitals and developing courses, seminars, workshops, internships, and employment opportunities for undergraduate students.

• *Conduct another, larger self-assessment.* Another recommendation was that the Federal agencies conduct another self-assessment with a larger and more representative sample of HBCUs. Given that this study was conducted with only 9 HBCUs, the results are not generalizable to the total population of 107 HBCUs.

• *Develop a premedical training demonstration project.* Finally, the study team recommended that a demonstration project be developed based on the findings of this study. A number of factors were identified that are important for preparing students for acceptance into medical school. A model project incorporating these factors into one HBCU will help to determine their impact.

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