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Postbaccalaureate premedical programs to promote physician-workforce diversity

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Abstract

There is a critical need for enhanced health-professions workforce diversity to drive excellence and to improve access to quality care for vulnerable and underserved populations. In the current higher education environment, post-baccalaureate premedical programs with a special focus on diversity, sustained through consistent institutional funding, may be an effective institutional strategy to promote greater health professions workforce diversity, particularly physician-workforce diversity. In 2014, 71 of the 200 programs (36%) in a national post-baccalaureate premedical programs data base identified themselves as having a special focus on groups underrepresented in medicine and/or on economically or educationally disadvantaged students. Three post-baccalaureate premedical programs with this focus are described in detail and current and future challenges and opportunities for post-baccalaureate premedical programs are discussed.

Keywords

Underrepresented minorities; students; post-baccalaureate premedical programs; diversity

There is a well-articulated need for a diverse health-professions workforce, in general (The Sullivan Commission, 2004; McGee, Saran, & Krulwich, 2012; American Association of Colleges of Nursing, 2014; Urban Universities for Health, 2014), and a diverse physician workforce, in particular, that will provide culturally competent care to all segments of the

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U.S. population, advance our nation's research agenda, and train future physicians (Association of American Medical Colleges [AAMC], 2010; Health Resources and Services Administration, 2010; Institute of Medicine [IOM], 2003; Marrast, Zallman, Woolhandler, Bor, and McCormick, 2014; Saha, 2014). The responsibility of medical schools and their affiliated institutions to promote the development of a physician workforce that reflects our increasingly diverse U.S. population is recognized by the Liaison Committee for Medical Education (LCME), the accrediting body for medical doctor (MD)-degree programs, in accreditatio standards that address physician workforce diversity (LCME, 2014a, 2014b, 2014c). The Medical Student-8 (MS-8) standard pertains to broadening diversity of the national pool of qualified applicants for medical-school admission (LCME, 2014a). The Institutional Setting-16 (IS-16) standard pertains to diversity at a specific institution; factors considered by a given institution in its definition of diversity may include economic, educational, racial, ethnic, and geographic diversity, among other factors (LCME, 2014b). The revised framework for LCME-accreditation standards effective July 1, 2015 (LCME, 2014c) will retain these key aspects of MS-8 and IS-16 (LCME, 2014d). Post-baccalaureate premedical programs (PBPPs) that focus on diversity are among the approaches institutions may take to meet these LCME-accreditation standards.

Overview of PBPPs

As of August 2014, there were 200 PBPPs (including programs at institutions both with and without medical schools) listed at the AAMC PBPPs web site (AAMC, 2014a) that provide opportunities for college graduates to complete pre-medical coursework required for medical-school admission ("career changer" [CC]) and/or for college graduates who have completed required coursework, to strengthen their academic credentials ("academic record-enhancer" [ARE]) (AAMC, 2014a). Annually, several thousand participants in PBPPs subsequently enroll in U.S. LCME-accredited medical schools. Of all 14,779 medical–school matriculants who responded to the 2013 AAMC Matriculating Student Questionnaire (MSQ), 6.6% reported participation in an ARE PBPP, and 10% reported participation in a CC PBPP (AAMC, 2013a). Nationally, PBPP participants who subsequently entered medical school in 1993–2000 comprised a diverse group of medical-school matriculants (Andriole & Jeffe, 2011). At medical-school graduation, PBPP participants were significantly more likely than their non-participant peers to plan to practice in underserved areas, with ARE-PBPP participants being 1.14 times more likely and CC-PBPP participants 1.48 times more likely to plan to practice in underserved areas (Andriole & Jeffe, 2011). These observations about PBPP participants were cited in the Amicus Brief filed by the AAMC et al. in the Supreme Court of the United States: Abigail Noel Fisher, Petitioner, v. University of Texas at Austin, et al., Respondents (Brief for Amicus Curiae, 2012). This case challenged the school's use of race in its undergraduate admissions process. The Amicus Brief, in support of the Respondents, argued that diversity is a vital component of the educational mission of U.S. medical schools. The value of PBPPs to participants and their post-medical-school career intentions reported by Andriole and Jeffe (2011) provided supporting evidence for current medical-education initiatives "to help achieve a diverse and culturally-competent student body and physician workforce" (Brief for Amicus Curiae, 2012).

At the AAMC's PBPP website (AAMC, 2014a), viewers can search the AAMC PBPP database for program characteristics provided by PBPP representatives at each school (AAMC, 2014a). The number of PBPPs listed nearly doubled in eight years, from 117 programs in 2006 (Ceccati & Hunter, 2006) to 200 programs in August 2014 (AAMC, 2014b). Programs listed in the AAMC database vary widely in terms of curriculum, duration, and program goals. Of the 200 programs listed, 120 (60 %) were private and 80 (40 %) were public institutions. All three major types of PBPPs were represented: 60 programs (30%) were CC-only programs, 65 (32%) were ARE-only programs, and 63 (32%) were CC & ARE programs. Twelve programs (6%) were not characterized as CC and/or ARE. In addition, 71 (36%) PBPPs characterized themselves as programs (hereafter referred to as "diversity-focused programs") with a special focus on groups underrepresented in medicine and/or on economically or educationally disadvantaged students (Brewer & Grbic, 2010; Grumbach, 2011). Diversity-focused PBPPs may be of particular value to higher-education institutions seeking to promote greater health-professions workforce diversity and to address diversity-related LCME-accreditation standards. The 71 diversity-focused programs included 36 of 80 (45%) programs in public institutions and 35 of 120 (29 %) programs in private institutions and included 28 of 65 (43%) ARE-only programs, four of 60 (7%) CC-only programs, 32 of 63 (50 %) CC & ARE programs and 7 of 12 (58%) programs not categorized as CC and/or ARE.

Diversity-focused PBPPs

Published studies about diversity-focused PBPPs include reports of individual programs (Lipscomb, Mullan, Zepeda and Price, 1993; Whitten, 1999 ; McGlinn, Jackson and Bardo, 1999; Giordani et al, 2001; Jackson , McGlinn, Rainey and Bardo, 2003; McDougle, Way and Yash, 2008; Lipscomb, Fowler, Green and Brooks, 2009; McDougle, Way and Rucker, 2010) and of groups of programs (Grumbach & Chen, 2006; Lupton, Vercammen-Grandjean, Forkin, Wilson, and Grumbach, 2012). Three of the most recently published single-program studies that included longitudinal observations of their PBPP-participants' characteristics and outcomes, tracked at least through medical-school graduation , describe programs at The Ohio State University (McDougle et al., 2010; The Ohio State University College of Medicine, 2014), Southern Illinois University (Jackson et al,, 2003; Southern Illinois University School of Medicine, 2014) and Michigan State University (Lipscomb et al., 2009; Michigan State University college of Human Medicine, 2014); these PBPPs are summarized in Table 1 and additional details for each program are described below.

Michigan State University Advanced Baccalaureate Learning Experience (ABLE) Program

Program intent—Program enrollees are restricted to students from disadvantaged backgrounds, including students from underrepresented groups in medicine, who applied to Michigan State University College of Human Medicine (MSUCHM), were not initially offered admission after interviews, and were subsequently referred by the MSUCHM Committee on Admissions as candidates for the ABLE Program (Lipscomb et al., 2009). This committee makes the referral to ABLE as a part of their holistic review process. They identify students from disadvantaged backgrounds who show promise academically and whose experiences align with the mission of the college. Students are referred who have

gone through the admissions application process and been deemed to have experiences and attributes aligned with the mission of the college, but who the committee believes would best benefit from an additional year of basic science coursework. The intent is to select for the ABLE Program those disadvantaged medical-school applicants whose experiences, attributes, and interests align with the mission of MSUCHM and who will benefit from a year of higher level basic science coursework to better prepare them for MSUCHM .

Curriculum—The ABLE curriculum provides an intensive learning experience in two phases: the ABLE Summer Institute (ASI) and the ABLE Academic Year Post-baccalaureate Experience; participation in both phases is required for program completion. Coursework in the advanced basic sciences is offered by MSU College of Natural Science; ABLE students are also enrolled in one medical-school course per semester selected by the medical-school faculty – gross anatomy (fall) and medical neuroscience (spring). Students are challenged to demonstrate new approaches to learning and to improve their study skills and strategies (Lipscomb, 2009). MSUCHM acceptance is offered to program completers who fulfill the following conditions: 1) an overall cumulative grade point average (GPA) in all classes of ≥ 3.2 during the post-baccalaureate year, 2) complete two first-year medical courses with a passing grade set for medical students, and 3) participate in required Educational Development seminars and academic support programming throughout the ABLE Program. (W. D. Lipscomb, personal communication, December 20, 2014).

Financial support—Currently, MSUCHM covers all costs associated with the ABLE Summer Institute, including student stipends for living expenses; ABLE students are provided academic-year stipends that cover at least 75% of tuition and fees for both semesters. Additional financial aid eligibility is determined on an individual basis (W. D. Lipscomb, personal communication, September 17, 2014).

Program outcomes—An 18-year retrospective analysis of short-term (program completion, medical-school entry) and intermediate-term (medical-school completion) outcomes was conducted for all 178 ABLE participants from 1991-2008. Of these 178 participants, 167 (94%) had successfully completed the program and matriculated at MSUCHM; five participants offered admission chose to attend a different medical school (there are no pay-back requirements for ABLE participants who do not matriculate at MSUCHM). Of the 167 ABLE participants who matriculated at MSUCHM, 93% completed medical school, similar to the 94% retention rate for non-ABLE-program participants who matriculated at MSUCHM; 54 of all 107 (50%) ABLE alumni who entered graduate medical education (GME) by 2008 chose primary-care specialties (Lipscomb et al., 2009). Long-term follow-up data regarding GME completion and clinical-practice settings for ABLE participants have not been published to date.

Southern Illinois University (SIU) Medical/Dental Education Preparatory Program (MEDPREP)

Program intent—The MEDPREP is intended for students from groups underrepresented in medicine and from economically and educationally disadvantaged backgrounds who have not been successful in their attempts to get accepted to health professions schools and who

seek to participate in a rigorous preparatory program to increase their likelihood of acceptance when they next apply (Jackson et al., 2003). The MEDPREP mission is “to increase the numbers of underrepresented minority and disadvantaged students from southern and central Illinois who will enter and graduate from health professions schools and who will serve in U.S. health professions shortage areas” (SIU, 2014).

Curriculum—Year one of the two-year curriculum is designed to emphasize content and skills covered by the Medical College Admissions Test (MCAT) with courses covering foundational concepts in the natural and social sciences. In addition, a faculty member specializing in critical-reasoning skills teaches verbal reasoning and academic-enrichment skills to help students “learn how to learn.” In year two, with the assistance of academic advisors, students tailor their academic programs to strengthen their preparation for medical school, and they are encouraged to take several courses, such as biochemistry, physiology, anatomy, and pharmacology. Throughout the two-year program, students have frequent contact with MEDPREP’s full-time, licensed clinical counselor who teaches life skills and professionalism and also provides emotional support (Jackson et al., 2003). MEDPREP has a formal agreement with SIU School of Medicine that allows for direct entry into the medical school. To qualify, students must achieve a criterion MCAT score (currently 24, the minimum score for all SIU School of Medicine applicants), fulfill the School of Medicine’s minimum GPA requirements (overall and science GPAs of 2.80) and be recommended by the MEDPREP Student Progress Committee (SPC) with “confidence” or “enthusiasm” (the two highest of five recommendation levels). The SPC consists of MEDPREP faculty, the program counselor, and faculty from the School of Medicine. While SPC review is holistic with weighting of both academic and non-academic factors, it is expected that students demonstrate their readiness for medical school via strong academic performance within the program (e.g., program GPAs of 3.5 or above, and/or MCAT scores above 24) to attain the two highest levels of recommendation (A. M. Metz, personal communication, December 19, 2014).

Financial support—SIU-Carbondale, where MEDPREP is located, awards 24 tuition waivers annually to help offset costs of participation (SIU College of Medicine, 2014). In addition, the MEDPREP program itself awards approximately twelve $500 to $1000 scholarships funded by donors annually (A. M. Metz, personal communication, December 19, 2014).

Program outcomes—A 30-year retrospective analysis of MEDPREP short-term and intermediate-term outcomes was reported in 2003 (Jackson et al., 2003). Of 1,059 students who enrolled in MEDPREP from 1972-2002, 668 (63%) had been accepted to professional schools (MD-degree granting medical schools, DO-degree granting medical schools, dental schools, and other health professions schools), of whom 612 (92%)had been accepted to medical school. Of all 668 students who were accepted to professional schools, 662 (99%) had enrolled (Jackson et al., 2003). Of all students tracked in the last decade of this study, 92% had graduated, or were on track to graduate, from their health professions school (Jackson et al., 2003), which compares favorably with the 94% 5-year graduation rate for all U.S. medical students nationally (Caulfield, Redden, and Sondheimer, 2014). From

2003-2012, an additional 334 students have enrolled in MEDPREP; of these students, 270 were admitted to medical school and six were admitted to dental school (A. M. Metz, personal communication, December 19, 2014). Long-term data about GME specialty training, completion of GME and clinical practice setting for these MEDPREP participants who subsequently enrolled in medical school are not available.

The Ohio State University College of Medicine (OSUCOM) Medical Careers Pathway Post Baccalaureate Program (MEDPATH)

Program intent—The intent of MEDPATH is to increase the number of medical-school graduates from groups underrepresented in medicine and from economically and educationally disadvantaged backgrounds. Eligibility for MEDPATH enrollment is limited to students who had included the OSUCOM among the medical schools to which they applied via the American Medical College Application Service and who were not admitted to another medical school (McDougle et al., 2008).

Curriculum—MEDPATH begins with a two-week science review and assessment to help create a personalized curriculum. In addition, students are taught learning strategies, problem solving and test taking skills. Courses that students may take during the academic year (autumn and spring semesters, and summer term) are taught by undergraduate faculty and include, but are not limited to, biochemistry, histology, genetics, physiology, medical terminology, medical ethics, pharmacology and microbiology. Facilitated review sessions are provided for the most challenging courses. Community service projects, a mentoring program, and professional development sessions are integral components of MEDPATH. The final six-week summer component (Pre-Entry Program) is taught by faculty in the OSUCOM anatomy department and consists of instruction in human anatomy and immunology (McDougle et al., 2008). Conditional acceptance to OSUCOM is offered to MEDPATH completers with a GPA ≥ 3.0 in the MEDPATH curriculum and an MCAT score ≥ 25 during the MEDPATH spring semester (L McDougle, personal communication, December 18, 2014).

Financial support—Most enrolled students are provided need-based tuition support by OSUCOM (McDougle et al., 2008; The OSU College of Medicine, 2014).

Program outcomes—To evaluate long-term outcomes (post-completion of all GME training), a 2008 survey was administered to 47 MEDPATH graduates (two lost to follow-up) in the 1996-2002 OSUCOM graduating classes and to a stratified (by graduation year), randomly selected control group of 56 non-MEDPATH participant OSUCOM graduates. Surveys were completed by 73 of the 103 graduates (71%), including 34 (72% of 47) MEDPATH participants and 39 (70% of 56) non-participants. Compared with non-MEDPATH graduates at follow-up, greater proportions of MEDPATH graduates reported practicing in a federally designated underserved area (29% versus 5%, $P < .009$), providing services where 40% or more of the patients were medically indigent or poor (68% versus 33%, $P < .003$), and volunteering services to indigent patients (47% versus 10%, $P < .001$) (McDougle et al, 2010).

Commonalities and Differences among ABLE, MEDPREP, and MEDPATH

Several common features of these PBPPs should be emphasized, as they inform our understanding of components of successful, long-standing diversity-focused PBPPs. Each program includes at least one year of full-time study and rigorous academic preparation. All three programs are multi-faceted, with components focusing on participants' professional development and personal well-being; having strong student support services is an integral part of all these programs. The institutional commitment to each program's sustainability is displayed through consistent institutional funding for program administration and for financial support of program participants. Notable differences among these PBPPs include differences in program size, criteria for program eligibility and selection, and specific coursework options for participants. Finally, it is important to note that other institutional efforts undertaken to promote diversity and inclusion may also contribute to the success of these PBPPs and their participants.

Challenges and opportunities ahead for diversity-focused PBPPs

Challenges identified by the authors that face diversity-focused PBPPs are challenges faced by many different types of educational programs and may include financial sustainability, keeping participant costs manageable, and ensuring continued success of program participants after program completion. As illustrated by the three programs described here, addressing the challenges of maintaining PBPPs' financial sustainability and keeping students' costs manageable requires a strong institutional commitment. Programmatic curricula that include not only basic-science coursework but also components for the development of life-long learning skills are intended to help participants meet challenges they are likely to face in medical school and beyond.

Recent changes in federal regulations have implications for many educational programs, including PBPPs. Currently, there are degree-granting and non-degree-granting PBPPs. Of 71 diversity-focused PBPPs in the AAMC database, 23 (32%) are explicitly entitled as Masters-degree-granting programs (e.g., "Master of Science in Modern Human Anatomy" , "Master of Biomedical Sciences") (AAMC, 2014b). Non-degree-granting programs (but *not* degree-granting programs) at public and non-profit institutions participating in federally authorized student financial aid programs are now required to report programmatic- and student-level data to the federal government (Bergeron, 2011). Degree-granting PBPPs might be particularly advantageous for students who are undecided about attending medical school and who also may be considering employment opportunities or enrollment in a science PhD program after PBPP completion; the authors surmise that in the current regulatory environment, at least some non-degree granting PBPPs may consider changing to degree-granting PBPPs.

At the state level, recently enacted laws limiting the extent to which race/ethnicity may be considered in participant selection for educational programs supported by public funds are driving changes in admissions approaches in affected states (Coleman, Lipper, and Keith, 2012). Voter-initiated state restrictions have been implemented in California , Michigan, Nebraska, Arizona and Oklahoma; admissions-related bans have been adopted in Florida through administrative regulation and in New Hampshire and Washington through state

statutes (Education Counsel LLC, 2014). In response to such state-enacted limitations, higher education institutions in general have taken a variety of alternative admissions approaches, such as discontinuation of legacy preferences that provided an advantage to children of alumni (a group that is disproportionately wealthy and white) and enactment of programs to facilitate transfer from community colleges to four-year institutions, expansion of private financial aid programs, targeted-recruitment programs, and greater consideration of economic disadvantage, among other permissible factors, in a holistic admissions process (Kahlenberg, 2012). Health-professions schools, in particular, have adopted holistic admissions processes; the AAMC's "Advancing Holistic Review Initiative" provided critical initial steps to facilitate the adoption of holistic review by health-professions schools' admissions committees by aligning the legal and educational policies with specific, assessable practices for implementation (Urban Universities for Health, 2014; AAMC, 2014c). According to a recently completed national survey of 228 health-professions schools at 104 universities (survey response rate of 64% of the national sample), use of holistic review was reported by 93% of DDS/DMD, 91% of MD, 82% of MPH, 78% of PharmD, and 47% of BSN programs (Urban Universities for Health, 2014).

There are opportunities for individuals and organizations involved in PBPPs to collaborate nationally to address challenges and share "best practices" for program implementation and administration. In February 2010, the California Endowment sponsored a meeting convened by the University of California Davis involving many PBPP representatives, (Grumbach, 2011). Since this seminal meeting, a group of PBPP directors (including many of diversity-focused PBPPs) formed a National Post-baccalaureate Collaborative (NPBC) to collectively address ongoing programmatic challenges and to identify and nationally disseminate "best practices" in admissions, curriculum design and financial sustainability of PBPPs (including those with and without medical-school affiliations). In 2013, the AAMC Group on Student Affairs (GSA) identified the NPBC as an initiative of the GSA's Committee on Student Diversity Affairs . (AAMC, 2013b). It is anticipated that the NPBC will serve as a resource within the AAMC for individuals and institutions seeking to develop new PBPPs and to sustain and improve previously established PBPPs (particularly diversity-focused PBPPs).

Conclusions

About one-third of the 200 PBPPs included in a national post-baccalaureate premedical programs data base described themselves as having a special focus on groups underrepresented in medicine and/or on economically or educationally disadvantaged students ; such programs have the potential to promote greater physician workforce diversity. The evidence base for this role of PBPPs would be strengthened by national, multi-institutional studies that examine a shared set of short-term, intermediate and long-term outcomes. Analysis of such outcomes in the context of individual, PBPP-specific selection criteria, curricula, and goals could clarify key characteristics of those PBPPs that are meeting with the greatest success in promoting greater physician-workforce diversity. The authors note that similar efforts, involving the development and implementation of post baccalaureate programs are underway to address diversity in the biomedical-research workforce (McGee, Saran, and Krulwich, 2012). For example, the Postbaccalaureate Research Education Programs (PREPs), funded by the National Institutes of Health National

Institute of General Medical Sciences, encourage students from underrepresented groups who have already obtained science baccalaureate degrees to pursue research doctorates and to stimulate their interest in studying "health problems that disproportionately affect minorities and the medically underserved in the United States" (National Institutes of Health, 2014). Thus, a future direction for research is to examine whether there are successful aspects of diversity-focused post baccalaureate programs for one component of the health-professions workforce that can be translated to efforts to increase the diversity of other components of the health-professions workforce.

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Table 1

Characteristics of the Advanced Baccalaureate Learning Experience (ABLE), the Medical/Dental Education Preparatory Program (MEDPREP) and the Medical Pathways Post-baccalaureate Program (MEDPATH).

	ABLE	MEDPREP	MEDPATH
Initial year of program	1986[a]	1972[d]	1990[g]
Duration of program, years	1[b]	2[e]	1[g]
Number of enrollees	Up to 15[c]	Up to 72 (36/cohort)[e]	Up to 15[g]
In-state tuition & fees, 2013-14	$12,166[c]	$13,126/year[f]	$11,925[h]
Out-of-state tuition & fees, 2013-14	$28,886[c]	$26,974/year[f]	$31,575[h]
Program funding	Michigan State University College of Human Medicine[c]	Southern Illinois University School of Medicine[f]	The Ohio State University College of Medicine[h]
Institutional ownership	Public[c]	Public[d]	Public[h]
Degree granted for program completion?	No[c]	No[f]	No[h]

[a] Lipscomb et al., 2009.

[b] Michigan State University College of Human Medicine, 2014.

[c] W. D. Lipscomb, personal communications, September 2014.

[d] Jackson et al., 2003.

[e] Southern Illinois University School of Medicine, 2014.

[f] H. R. Bardo, personal communications, September 2014.

[g] McDougle et al., 2008.

[h] L. McDougle, personal communications, September 2014.