

Community-based distributive medical education: Advantaging society

Tracy J. Farnsworth, MHSA, MBA¹, Alan C. Frantz, PhD^{2*} and Ronald W. McCune, PhD³

¹Department of Health Care Administration, Idaho State University, Pocatello, USA; ²Graduate Department of Educational Leadership & Instructional Design, Idaho State University, Pocatello, USA; ³Department of Biological Sciences, Idaho State University, Pocatello, USA

This paper presents a narrative summary of an increasingly important trend in medical education by addressing the merits of community-based distributive medical education (CBDME). This is a relatively new and compelling model for teaching and training physicians in a manner that may better meet societal needs and expectations. Issues and trends regarding the growing shortage and imbalanced distribution of physicians in the USA are addressed, including the role of international medical graduates. A historical overview of costs and funding sources for medical education is presented, as well as initiatives to increase the training and placement of physicians cost-effectively through new and expanded medical schools, two- and four-year regional or branch campuses and CBDME. Our research confirms that although medical schools have responded to Association of American Medical Colleges calls for higher student enrollment and societal concerns about the distribution and placement of physicians, significant opportunities for improvement remain. Finally, the authors recommend further research be conducted to guide policy on incentives for physicians to locate in underserved communities, and determine the cost-effectiveness of the CBDME model in both the near and long terms.

Keywords: *issues and trends; cost-effective medical education; distributive medical education model; community-based; organizational model*

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Over the past few years there has been growing recognition of an impending national physician shortage in the United States (1). This shortage could likely be exacerbated in response to the recently enacted healthcare reform bill: H.R. 3590 – Patient Protection and Affordable Care Act. The shortage has been attributed to a number of factors, notably the aging of the US population (2) and the lack of growth in the production of new physicians, resulting in a relatively diminished and aging physician workforce. Accordingly (and well before the recent and dramatic advent of healthcare reform), the American Association of Medical Colleges (AAMC) in June 2006 called for a 30% increase (from 16,488 to 21,434) in first-year allopathic US medical school enrollment by 2015, compared to the enrollment benchmark of 2002 (3). Based on its fall 2010 survey of the 133 Liaison Committee on Medical Education (LCME) accredited or preliminarily accredited US medical schools, the AAMC estimated that first-year US

medical school enrollment would grow to 21,041 by 2015 – an increase of 27.6% above 2002. While acknowledging this significant and encouraging step, these results fall short of the AAMC target – now projected to be met by 2016 or 2017 (4). Thus while existing medical schools aggressively attend to matters of expanded student enrollment, it is evident that additional medical education programs leading to the MD and/or osteopathic physician (DO) degree are required. While the US healthcare industry has grown to exceed 17% of the nation's economy in an era of increasing economic instability, there has never been a more urgent need to expand medical education in an efficient and cost-effective way.

In 2001 the Florida State University medical school was founded, becoming the first new allopathic medical school in the USA in 20 years (5, 6). Since then some 20 organizations from at least 11 states have publicly announced their intent to initiate medical schools of

their own, while a number of others have explored the merits of doing so but elected not to proceed at the present time.

Writing for the Josiah Macy Jr Foundation, Whitcomb (6) observed:

These ... institutions [formally and not yet formally recognized by the LCME] vary in a number of ways ... [several] are private ... [several] are public ... Three of the proposed schools are being established as partnerships between a comprehensive university and a major healthcare system. One of the new schools ... is a free-standing private institution ... [Others] are private institutions that have degree-granting authority, although they are not traditional universities.

Institutions with developing medical education programs that have formally applied for preliminary accreditation by the LCME (as of 20 Dec 2011) are presented in Table 1.

According to Mallon (7):

The first two decades of the 21st century may well be viewed by future generations as the second great expansion of post-Flexnerian medical education in the United States ... The first era occurred in the 1960s and 1970s, when the number of medical

schools accredited by the ... LCME increased by half and the number of medical school graduates doubled.

Allopathic medical school enrollment projections by institutional control (public versus private) and geographic region are presented in Table 2.

In addition to its call for an expanded physician workforce, the AAMC wants medical school curricula to ‘further embrace innovative instructional approaches ... and to sponsor clinical training and clerkships that result in healthcare services delivered in a manner that better meets societal needs and expectations’ (8). Others, including the American Medical Association, the Institute of Medicine, the Macy Foundation and the Carnegie Foundation, have likewise called for substantive ‘medical school innovation with the arrival of the 21st century’ (9). Interestingly, national calls for growth in medical education come at a time when ‘curricular approaches to medical education are undergoing significant change’ (1). For example, in recent years there has been a move toward providing earlier clinical exposure for medical students during the first two years of medical school (10). Further, there are increasing calls for more flexible and practical clinical exposure in community-based settings – separate and away from the ivory-tower-like experience of

Table 1. Institutions with developing medical education programs: LCME status

State	Medical school name	Location	LCME status
Arizona	University of Arizona College of Medicine, Phoenix	Phoenix, AZ	Applicant school
California	California Northstate University College of Medicine	Rancho Cordova, CA	Applicant school
California	University of California, Riverside School of Medicine	Riverside, CA	Applicant school
Connecticut	Quinnipiac University School of Medicine	North Haven, CT	Applicant school
Florida	Florida International University College of Medicine	Miami, FL	Provisional accreditation
Florida	University of Central Florida College of Medicine	Orlando, FL	Provisional accreditation
Florida	Charles E. Schmidt College of Medicine at Florida Atlantic University	Boca Raton, FL	Preliminary accreditation
Florida	Palm Beach Medical College	Palm Beach, FL	Applicant school
Michigan	Central Michigan University School of Medicine	Mount Pleasant, MI	Candidate school
Michigan	Oakland University William Beaumont School of Medicine	Rochester, MI	Preliminary accreditation
Michigan	Western Michigan University School of Medicine	Kalamazoo, MI	Applicant school
New Jersey	Cooper Medical School of Rowan University	Camden, NJ	Preliminary accreditation
New York	Hofstra University School of Medicine	Hempstead, NY	Preliminary accreditation
South Carolina	University of South Carolina School of Medicine, Greenville	Greenville, SC	Preliminary accreditation
Pennsylvania	The Commonwealth Medical College	Scranton, PA	Preliminary accreditation
Texas	Texas Tech University Health Sciences Center Paul L. Foster School of Medicine	El Paso, TX	Provisional accreditation
Virginia	Virginia Tech Carilion School of Medicine	Roanoke, VA	Preliminary accreditation

Source: Liaison Committee on Medical Education. Overview: Accreditation and the LCME. Available from: www.webcitation.org/644ynwOR6 [cited 20 Dec 2011].

Table 2. Distribution of growth by sponsorship and region, 2002/03–2014/15 (current 132 allopathic medical schools)

	Baseline enrollment 2002–2003	Planned increase 2013–2014	% increase from baseline
Institutional control			
Private	6,217	983	15.8
Public	10,271	2,188	21.3
Region			
Central	3,826	945	24.7
Northeast	4,551	476	10.5
South	5,863	1,133	19.3
West	2,248	617	27.4
All schools	16,488	3,171	19.2

Source: 'Results of the 2009 medical school enrollment survey: Report to the Council of Deans,' p. 6. Reproduced with original submission. © 2011 Association of American Medical Colleges. All rights reserved. Reproduced with permission.

conventional medical school academia (9, 11–13). Finally, student-centered learning and highly sophisticated educational technology are playing increasingly important roles in modern-day medical school curricula (14–16), thereby enabling even greater innovations in the content, structure and delivery of medical education.

The purpose of this paper is to summarize recent literature on current and evolving approaches to expanding medical education at a time when public officials and schools of medicine everywhere are seeking innovative, cost-effective ways not only to meet the ongoing demand for more and better-trained physicians, but to do so in a manner that better meets evolving societal needs and expectations – including the training and placement of physicians in areas that remain both clinically and geographically underserved. Understanding and advancing creative and cost-effective approaches to medical education are significant not only because of the nation's current and increasing deficit of physicians, but also because recently enacted healthcare reform could result in tens of millions of Americans being added to government or private-sponsored health insurance plans, all of whom must be cared for by our increasing undersupply of physicians.

This paper presents a narrative summary of an increasingly important trend in medical education. It briefly summarizes the growing US shortage of physicians and calls from the AAMC to increase enrollment in US medical schools substantively. In a review of selected literature, we address central trends and strategies (including their associated barriers) which medical schools are adopting to increase class size quickly and substantively. We discuss the emergence and merits of a

relatively new, creative and cost-effective approach to teaching and training physicians: community-based/distributive medical education (CBDME). We also address the nation's history regarding the funding of medical education – notably the remarkable ebb and flow between federal, state and other funding sources – and why new and creative approaches to financing and delivering medical education in a more cost-effective and community-oriented way must be the shared mandate for the future.

Literature review

Physician supply

During the 1980s and 1990s most US healthcare policy-makers and advisers concluded that the nation would experience a substantial excess of physicians by the year 2000. Because of these predictions, the total enrollment at US allopathic medical schools during this period remained essentially flat. More recent analytical work has shown these forecasts to have been inaccurate. Most experts agree the key assumption of these predictions – that managed care would change the delivery and organization of healthcare – never materialized (17). At the same time (between 1980 and 2005) the US population increased by over 75 million people. With Americans living longer – requiring additional and more extended periods of care – the concurrent and increasing demand for physicians became apparent. As earlier noted, the March 2010 healthcare reform bill will, in all likelihood, further exacerbate physician undersupply in the USA – likely within the already much-needed and understaffed areas of family and general medicine.

Strategies for expanding physician supply

When the AAMC called for a 30% increase in US medical school enrollment by 2015, it was expected that such an increase would be accomplished by increasing enrollment at existing medical schools and, where appropriate, establishing new schools of medicine (18). A review of literature indicates that strategies for expanding class size at existing medical schools typically follow one of two paths: 'in place' expansion, or development/expansion of the 'distributed education' model using new regional campuses. Table 3 outlines the basic models and methods for increasing and expanding medical school enrollment outlined in current literature (1, 11, 16, 17, 19).

For schools expanding 'in place' (that is, on the existing campus and at nearby facilities), AAMC research reveals that 'limited infrastructure capacity appears to constrain the magnitude of the expansion in all but a few select cases, even when existing facilities are renovated. Schools with plans to expand their class size through new and enlarged regional campuses face similar challenges in

Table 3. Model and methods for expanding medical education

Model	Description	Example and scope
New medical schools (traditional model)	Includes construction of/ attachment to on-site academic medical center	No known examples
New medical schools (community-based/distributive model)	Medical school contracts with existing community hospitals/clinics to provide clinical education	10+ proposed new schools/programs
Existing 'in place' medical school class expansion	Adding faculty, staff and facilities to existing campuses and nearby facilities	More than 50% of existing medical schools expanding class size by 10–50%
Regional two-year campus	Branch campus at distance from main medical school offering basic science and/or clinical training	28 existing medical schools operate total of 50 regional campuses; 4 medical schools operate total of 9 basic science campuses
Regional four-year campus	Branch/regional campus offers all four years of medical education; operates under accreditation umbrella of medical school at main campus	3 existing medical schools; 4+ schools proposed

terms of infrastructure and facilities' (17). In its April 2008 report on medical school enrollment plans, the AAMC (18) cited as the most common barriers or concerns to 'in place' expansion the (limited) capacity of existing clinical sites, as well as challenges in finding new sites; identifying and securing additional space for classrooms, laboratories, equipment/simulation and physical-plant-related requirements; insufficient numbers of basic science and clinical faculty; and limited funding – especially 'lack of adequate state funding for current medical education activities, making unrealistic any expectation of additional resources to fund expansion activities.' By late 2010 an increasing number (52%) of AAMC-surveyed schools indicated concern with their ability to maintain or increase enrollment due to economic conditions (4). Thus while the majority of US medical schools have made measured strides toward modestly, if not appreciably, increasing student enrollment, the barriers to meaningful and sustained 'on-site' expansion remain significant.

Community-based distributive medical education

The past two decades have seen the emergence of a new model of medical education that is loosely termed *community-based distributive medical education* (1, 8, 20). This has occurred for at least three reasons: the often cost-prohibitive nature of building (or rebuilding) traditional medical school complexes; the increasing imbalance of medically overserved versus underserved communities; and the historic 'medical school versus community' disconnect between how and where new physicians are trained. Essentially, the community-based distributive model involves providing basic science (years one and two) and/or clinical training (typically years

three and four) in sites separate from the main medical school campus. Clinical training is increasingly being provided in sites well beyond traditional large teaching hospitals, including both urban and rural-based ambulatory clinics and physician offices (13, 15). As of 2007, 16 of the 22 most recently accredited medical schools (including Florida State University) have embraced CBDME (1), and a number of recently announced allopathic medical schools, including programs at the University of California, Riverside (8) and the University of California, Merced (20), likewise plan to adopt this model. Note also that the community-based/distributive model is consistent with counsel rendered in a 1971 report by the AAMC Committee on the Expansion of Medical Education: 'effective utilization of clinical resources *already existing* [emphasis added] ... must be encouraged in order to minimize the need for additional teaching hospitals and other clinical facilities, which are notoriously costly' (21).

As noted, the most conspicuous difference under the CBDME approach is that clinical training occurs in a wider variety of community-based settings. Indeed, 50–70% of clinical/clerkship experiences may occur outside the conventional hospital setting (1). Mennin and Petroni-Mennin (22) wrote persuasively on the merits of community-based medical education (CBME):

Medical education – based predominantly in hospital environments ... with increasing specialization and a rapid turnover of patients who represent a narrow spectrum of health problems – is being reexamined in the light of contemporary realities. A significant reorientation is needed in medical education ... It is no longer appropriate to regard the role of the community in medical education as an add-on to a curriculum dominated by biology

and technology ... where biology rules to the exclusion of most of the other social, political, economic and psychological factors that play important roles in the determining of health.

CBME consists of activities that use the community extensively as a learning environment, where students, teachers, community members and representatives of other sectors are actively engaged throughout the educational experience in providing medical education that is *relevant to community needs*. CBME has come to be seen by some as a means of providing aspects of the curriculum for an expanded intake of medical students in *general practice* placements. Other perceptions of CBME include the exposure of students to practices in the community, with the intention of *encouraging more students to locate their own practices there*. [Emphasis added.]

In recent years a number of authors have extolled the advantages of CBDME: in summary, these include at least the following.

- Student exposure to practice settings more typical of places in which they will eventually practice.
- Student access to a wider variety of patients, with more opportunity to develop and practice clinical skills with greater continuity across a broader continuum of care.
- More enjoyable educational experiences, with teachers more likely to model positive teaching attitudes.
- For students, professors and the larger medical/business community, the economic engines of research are expanded and 'distributed' into the community.
- Sponsoring organizations avoid the expense of duplicating costly medical/technical infrastructure common to tertiary teaching hospitals.
- Finally (and for many most important), communities are better able to access the 'up and coming' physi-

cian workforce and thus better able to address local physician shortages – to recruit and retain medical graduates.

Discussion

Funding medical education

As discussed, medical schools are just now beginning to increase class size appreciably for only the second time in 100 years. Mallon's literature review from that initial period (the 1960s and 1970s) indicates that medical educators shared similar concerns as today, including the excessive costs of expansion and the evolving, compelling case for community-based clinical education (7). Yet Mallon continues: 'while many concerns about medical school expansion from fifty years ago are with us today, one of the most significant responses from the 1960s and 1970s – a large influx of federal funding – does not appear on today's horizon.' Although reports and commentaries from the 1960s and 1970s address the excessive cost of creating new medical schools, university presidents and planners pressed ahead with the clear expectation that the federal government would subsidize their efforts and associated costs. Indeed, federal legislation in 1963 (the Health Professions Education Assistance Act), followed by complementary legislative measures in 1965, 1968 and the early to mid-1970s, provided added incentive to medical schools to increase class size. Looking back, it is clear these federal subsidies – reaching as high as 54% of total US medical school revenues during the mid-1960s – combined with significant support from the states played a major role in doubling the number of medical school graduates of that era (see Table 4).

Medical schools today are facing almost universal reductions in their historically diverse funding streams (23), while the cost of medical education has been rising

Table 4. US medical school revenue by source (\$ million/%)

Revenue source	1965–1966		1970–1971		1975–1976		2008–2009	
	Amount	%	Amount	%	Amount	%	Amount	%
Federal government	\$480	54	\$779	45	\$1,249	37	\$17,559	21
State/local government	\$144	16	\$388	23	\$958	28	\$6,362	8
Non-government*	\$109	12	\$210	12	\$412	12	\$8,944	11
Medical school/university activities†	\$149	17	\$336	20	\$770	23	\$50,513	61
Total	\$882	100	\$1,713	100	\$3,389	100	\$83,378	100

Source: Rowe S, Wisniewski S. AAMC data book: Medical schools and teaching hospitals by the numbers; 2011, p. 49. Reproduced with original submission. © 2011 Association of American Medical Colleges. All rights reserved. Reproduced with permission.

*Includes revenue from non-government grants and contracts, gifts and endowments.

†Includes revenue from practice plans and other medical service, tuition and fees, parent university support, hospital support and miscellaneous.

at more than twice the rate of inflation in recent years (24). In the absence of significant financial assistance from both federal and state government sources, current and potential medical schools must rely ever more on revenues from increased tuition – notwithstanding the growing number of medical students with education-related debts exceeding \$200,000 (9). In addition, medical schools will necessarily rely on institutional funds, clinical cross-subsidies and private support to fund new or expanded education. In recent years some states have provided one-time start-up funding to increase class size, but ongoing operating costs have been excluded (17, 25). Collins and Davis (26) outlined a number of inherent challenges and corresponding opportunities/solutions that today's community-based medical schools, in particular, might profitably pursue during this era of diminished state and federal support.

Community-based models

In view of the growing undersupply of physicians, exacerbated by the March 2010 healthcare reform bill, medical schools in the USA and beyond must boldly face the challenge of rapidly educating an expanded physician workforce in ways that are not only more cost-effective, but better meet societal expectations – including balancing the (future) physician workforce to address community needs. Four or five decades ago, medical leaders and planners observed how community hospitals could supplement the clinical experiences of third- and fourth-year medical students. Clearly, part of the impetus for the community-based medical school movement of the 1960s and 1970s was a growing desire to move the clinical/medical education experience from the ivory tower of conventional med-school academia to the community clinic (13). As noted in Mallon's 2004 *Handbook of Academic Medicine*, 'this challenge has continued, especially because patients admitted to academic medical center hospitals increasingly have very complex, highly specialized, acute illnesses that represent a *skewed distribution of medical conditions* [emphasis added] that students will confront later in practice' (15).

Arguably, most medical students want training experiences that expose them to the broadest and deepest (perhaps even extreme) array of clinical medicine. Yet medical schools do not, and perhaps should not, have exactly the same purpose. Hays (11) contended that:

The traditional view of medical education for the last several decades has been dominated by the biomedical research paradigm ... Medical students are taught by elite academic practitioners who generate this research, work only in very specialized facilities, and act as role models that inspire them to follow similar pathways ... Such a model is an important part of medical

education and future medical care. However, the community (in the broadest sense) needs medical practitioners who will provide a range of medical services in many hospital and community settings, in a wide range of urban, regional, rural and remote communities.

There is therefore a need for medical schools that aim to produce different kinds of graduates to those of the more traditional model. Advances need to be made to educate students more in generalist and primary care settings, including rural practice settings. Here, successful medical practice may depend more on broader knowledge and skills ... Graduates of such medical schools can still become academic biomedical subspecialists, but more may be inspired to become academic generalists, primary care, public health and rural practitioners ... A combination of ... medical schools, each with different graduate outcomes, arguably serves better the needs of the whole community.

Surprisingly, less than 1% of medical care is delivered in tertiary care hospitals, yet for many medical students this remains the major site of their medical education (27). No doubt this decades-long discrepancy speaks to matters inferred by Wilson's reference to the AAMC's 2004 report, which calls for medical schools to 'embrace innovative curricula ... and sponsor clinical training and clerkships that result in healthcare services delivered in a manner that better meets societal needs and expectations' (8).

Distribution/placement of physicians

Do medical schools have an obligation or responsibility to help steer physicians toward areas which, historically, have been clinically or geographically underserved? Rowe and Wisniewski (28) documented a significant downward trend over the last decade in the percentage of US medical students opting for careers in the much-needed and understaffed areas of family and general medicine. Indeed, the percentage of medical students preparing for futures in family practice, general internal medicine or general pediatrics plummeted from nearly 30% in 1985 to under 17% in 2007, but returned to the 30% level by 2010 (see Table 5).

Moreover, it is evident that most medically underserved communities continue to have much difficulty gaining access to medical students and residents – which, of course, severely handicaps their ability ultimately to recruit these same physicians. Research is clear that physicians tend to practice in states where they attended medical school. The AAMC reports (as cited in MGT of America, 2007) that, on average, 39% of those who graduated from allopathic or osteopathic programs in a given state remain in that state to practice. Nearly 48% of MD/DOs who complete (allopathic) graduate medical education (GME) training programs in a state are

Table 5. Graduating US medical students' specialty certification plans (%)

Specialty group	1985	1995	2005	2007	2010
General*	29.9	27.6	19.6	16.9	30.5
Medical	22.2	27.1	26.4	28.3	7.5
Surgical	30.6	27.1	29.8	27.6	23.0
Support	17.3	18.2	25.1	26.1	26.5

Source: Brandenburg K et al. AAMC data book: Medical schools and teaching hospitals by the Numbers; 2008, p. 37. Reproduced with original submission. © 2011 Association of American Medical Colleges. All rights reserved. Reproduced with permission.

*General specialties include family medicine, general internal medicine and general pediatrics.

practicing in that state (1). Other reports suggest GME-related retention levels as high as 70% (29). As expected, retention of physicians is strongest when they receive both medical school training and their residency in the same state. According to the AAMC's director for workforce studies, 80% of medical students who complete both their schooling and residency in the same state remain there to practice (30).

In response to growing concerns in the health policy community regarding the distribution and placement of physicians, nearly 75% of US allopathic medical schools are now instituting or considering initiatives to encourage primary care – including new or expanded extracurricular opportunities, modified clinical rotations and changed pre-clinical curricula and admission criteria (4). Results of these efforts are encouraging, as evidenced by the significant increase in medical students choosing general specialties: up to 30.5% in 2010 compared to 16.9% in 2007 (see Table 5). Furthermore, 40% of expanding medical schools are targeting their expansionary efforts to meet the needs of rural and underserved communities (31). We applaud these efforts and encourage medical schools, clinicians and policy-makers to sustain and enhance incentives that effectively steer newly trained physicians toward underserved communities.

Impact of IMGs on the US physician workforce

Although this paper focuses on education of MDs, the total physician workforce in the USA actually comprises US MDs trained in US medical schools, osteopathic physicians (DOs) also trained in the USA and international medical graduates (IMGs), who are MDs trained in non-US medical schools. IMG physicians may be further subdivided into those who are US citizens and those who are not.

Recent data from the Division of Graduate Medical Education of the American Medical Association (32) provide information about the current numbers of residents in programs accredited by the American Council for

Graduate Medical Education (ACGME) in the USA from these three primary sources. As of 2010–2011, approximately 65% of ACGME residents were US MDs, about 27% were IMGs (about 18% of whom were native US citizens and about 29% were either naturalized citizens or permanent residents) and approximately 7% were DOs. These percentages have been relatively stable for the past five years, although there has been a slight decrease in the percentage of US MDs among ACGME-certified residency programs as a consequence of more rapid growth of DO medical school graduates and increasing numbers of IMGs successfully competing for ACGME residency positions.

Data in a recent report from the AAMC Center for Workforce Studies indicate that of 799,442 active physicians in the USA, 24% are IMGs and 6.9% are DOs (33). The percentage of IMGs among active physicians is slightly less than the percentage of IMGs among residents currently in ACGME-certified residency programs.

Others have recognized that continuation of the current relatively rapid expansion of numbers of graduates of US MD and DO medical schools will likely lead to a bottleneck in the number of available residency seats in ACGME-certified programs (23). Consequently, maximum utilization by the healthcare delivery system of such expansion will necessarily require a concomitant expansion of residency openings. Should expansion of availability of residency positions not match expansion of US MD and DO graduates, it is expected that the first source of residents to feel the effects of a limitation of residency positions will be non-US citizen IMGs (34). Sufficient recent expansion of available residency openings has occurred to prevent that from happening to date.

Conclusion

As medical education policy advisers and leaders in the USA and beyond seek to grow the physician workforce in ways that are cost-effective and sustainable, provide clinical training more appropriate to common community needs, and balance the distribution of newly trained physicians toward areas both clinically and geographically underserved – it is clear they are favoring the model and associated merits of community-based/distributive medical education. Because the model relies on a non-duplicated, broadly distributed base of existing hospitals and community providers to deliver clinical training historically reserved for the more elite academic medical centers, many universities and legislative bodies across the nation are concluding that the financial and other required resources needed to embrace this model are indeed within reach.

The State of Idaho's situation reflects the broader national picture, yet it is more severe and serves as an example of a state that soon needs to address its

physician shortage in some manner. The state has been well served for over 35 years by WWAMI, a five-state decentralized medical education program based in some measure on the principles of CBDME (1, 35), yet its national ranking of physicians per capita has fallen to 49th (1, 28). Although Idaho may yet purchase ‘additional seats’ from the host medical school – the University of Washington – or a similar arrangement with the University of Utah School of Medicine, state officials (in consultation with the LCME and others) have been exploring the merits of an Idaho-based medical degree-granting institution of its own – evaluating whether such a course may more effectively address the state’s chronic low supply of physicians. Of course, the introduction of a new medical program in rural Idaho is not without controversy. Advocates, however, argue that Idaho – largely motivated by its remarkably low physician-to-population ratio – has reached both current and projected population thresholds to consider such bold action. Similar to the back and forth, 40-plus-years political saga leading to the eventual Phoenix-based (regional) medical school in Arizona in 2007 (36), Idaho officials have long wrestled with matters related to both the timing and approach of an Idaho-based medical degree program.

Medical school planning process

Recent experience from the University of California-Riverside (37) and others (36, 38) reminds yet again that efforts of this magnitude require extraordinary planning, including work on the enormous academic and staffing-related issues associated with accreditation; the administrative and student services financial structure; relationships with local medical facilities; the required campus classrooms and offices; research activities; and the clinical and clerkships program. A review of the initiatives undertaken by the handful of institutions presently advocating or aggressively planning new medical schools makes it clear that ‘the development of a new medical school is a costly undertaking that can take years to complete ... [and the institution will] almost certainly face a number of unexpected challenges during the course of the planning process’ (6). Whitcomb’s comprehensive survey detailing events that unfolded during the planning process of these future medical schools is described in robust case-study format and presented under the title ‘New and developing medical schools: Motivating factors, major challenges, planning strategies’ (6).

Recommendations for future research

Although the scope of this paper was limited to a review and analysis of current and evolving approaches to expanding medical education, with a particular focus on CBDME, our results invite three recommendations for

further research. First is a critical look at new and evolving incentives to steer newly trained physicians toward underserved communities, including an assessment of the roles medical schools, policy-makers and others might assume in this regard. As noted, 16 of the 22 most recently accredited medical schools have embraced the community-based distributed model (1). Second is an analysis of cost-effectiveness that would provide some near-term insights into likely advantages of the CBDME model. Third is a thorough financial analysis of the cost-effectiveness of the distributive/community-based versus traditional medical school model. Such an analysis should probably be delayed for several years to allow time for a track record to be established after full implementation of new CBDME programs.

Call for leadership

Great challenges require courageous and innovative solutions. Although we are building upon lessons from the last great era of medical school expansion, there are new avenues and novel strategies unfolding. According to Mallon (7), those stories are now being told, and will yet need to be told. Furthermore, lessons may be learned from the rapidly expanding osteopathic medical schools, many of which have been innovative and flexible in their evolving approaches to medical education (6).

One conclusion of the October 2008 conference sponsored by the Josiah Macy Jr Foundation and entitled ‘Revisiting the Medical School Education Mission at a Time of Expansion’ was this compelling observation:

This period of expansion in [medical school] enrollment must not result in more of the same. Failing to take advantage of the opportunity afforded ... [to rethink and reconstruct] the mission of medical education for the benefit of the public would be tragic. (6)

The Macy Foundation and others have put forth recommendations ‘on ways to improve the educational programs of all [current and future] medical schools to better align them with the needs of society’ (6). Time will tell if US medical schools and related political establishments will muster sufficient courage and community-mindedness to act. Understanding and implementing community-based models of distributive medical education will surely advantage society.

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References

- MGT of America. Medical education study final report. Submitted to the Medical Education Study Committee, Idaho State Board of Education; 2007. Available from: www.webcitation.org/5zpguXqqG [cited 30 June 2011].
- Sultz HA, Young KM. Health care USA: Understanding its organization and delivery, 6th edn. Sudbury, MA: Jones and Bartlett Publishers; 2008.
- Association of American Medical Colleges. AAMC statement on the physician workforce. Washington, DC: AAMC; 2006. Available from: www.webcitation.org/5zph4bd6V [cited 30 June 2011].
- Association of American Medical Colleges. Results of the 2010 medical school enrollment survey: Report to the Council of Deans. Washington, DC: AAMC; 2011. Available from: www.webcitation.org/60IVMzVPI [cited 19 July 2011].
- Hurt M, Harris O. Founding a new college of medicine at Florida State University. *Acad Med* 2005; 80: 973–9.
- Whitcomb ME. New and developing medical schools: Motivating factors, major challenges, planning strategies. NY: Josiah Macy Jr Foundation; 2009. Available from: www.webcitation.org/5zpfWXdCc [cited 30 June 2011].
- Mallon W. Medical school expansion: *Déjà vu* all over again? *Acad Med* 2007; 82: 1121–5.
- Wilson S. Professional correspondence regarding the California Postsecondary Education Commission's review of a proposal to establish a medical school at the University of California-Riverside. 2 July 2008. Available from: www.webcitation.org/5zpg2oAiz [cited 30 June 2011].
- Skochelek SE. Commentary: A century of progress in medical education: What about the next 10 years? *Acad Med* 2010; 85: 197–200.
- Mennin S, Kaufman A, Urbina C, McGrew M. Community-based medical education: Toward the health of the public. *Med Educ* 2000; 34: 503–4.
- Hays R. Community-oriented medical education. *Teaching and Teacher Education* 2007; 23: 286–93.
- Irby DM, Cooke M, O'Brien BC. Calls for reform of medical education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010. *Acad Med* 2010; 85: 220–7.
- Sanazaro P. An agenda for research in medical education. *JAMA* 1996; 197: 979–84.
- Association of American Medical Colleges. Effective use of educational technology in medical education. Washington, DC: AAMC; 2007.
- Mallon W. The handbook of academic medicine: How medical schools and teaching hospitals work. Washington, DC: AAMC; 2004.
- Snadden D, Bates J. Expanding undergraduate medical education in British Columbia: A distributed campus model. *CMAJ* 2005; 173: 589–90.
- Bunton SA, Sabalis RF, Sabharwal RK, Candler C, Mallon WT. Medical school expansion: Challenges and strategies. Washington, DC: AAMC; 2008.
- Association of American Medical Colleges. Medical school enrollment plans: Analysis of the 2007 AAMC survey. Washington, DC: AAMC; 2008.
- Bunton SA, Mallon WT. Challenges and strategies of medical school expansion. AAMC Analysis in Brief 2008; 8. Available from: www.webcitation.org/60cHWnJTK [cited 1 August 2011].
- University of California, Merced School of Medicine. Governor endorses UC Merced School of Medicine. *Milestones* 2008; 1. Available from: www.webcitation.org/5zpi8WIUy [cited 17 June 2011].
- AAMC Committee on the Expansion of Medical Education. A bicentennial anniversary program for the expansion of medical education. *J Med Educ* 1971; 46: 105–116.
- Mennin S, Petroni-Mennin R. Community-based medical education. *Clin Teach* 2006; 3: 90–6.
- Albanese M, Mejicano G, Gruppen L. Perspective: Competency-based medical education: A defense against the four horsemen of the medical education apocalypse. *Acad Med* 2008; 83: 1132–9.
- Adeshi EY, Gruppuso PA. Commentary: The unsustainable cost of undergraduate medical education: An overlooked element of U.S. health care reform. *Acad Med* 2010; 85: 763–5.
- Manetta A, Stephens F, Rea J, Vega C. Addressing health care needs of the Latino community: One medical school's approach. *Acad Med* 2007; 82: 1145–51.
- Collins C, Davis M. Community-based medical schools: Challenges and opportunities in a class of their own. *Insight* 2007. Available from: www.webcitation.org/61Kfy0Jt2 [cited 30 August 2011].
- McGrew M, Solan B, Hoff T, Skipper B. Decentralized medical education in rural communities: The circuit rider connection. *Fam Med* 2008; 40: 321–325. Available from www.webcitation.org/63uUhXjoi [cited 13 Dec 2011].
- Rowe S, Wisniewski S. AAMC data book: Medical schools and teaching hospitals by the numbers. Washington, DC: AAMC; 2011.
- Rosenblatt S. UC Riverside seeks OK for medical school. *Los Angeles Times*, 16 May 2006. Available from: www.webcitation.org/5zpiLCIpK [cited 17 June 2011].
- Snyder J. Missouri University plans a Mesa medical school. *The Arizona Republic*, 3 June 2005.
- Association of American Medical Colleges. Results of the 2009 medical school enrollment survey: Report to the Council of Deans. Washington, DC: AAMC; 2010. Available from: www.webcitation.org/5zphKO2Ir [cited 30 June 2011].
- Brotherton SE, Etzel SI. Graduate medical education, 2010–2011. *JAMA* 2011; 306: 1015–30.
- Association of American Medical Colleges. 2011 state physician workforce data book. Washington, DC: AAMC; 2011.
- Jolly P, Boulet J, Garrison G, Signer MM. Participation in US graduate medical education by graduates of international medical schools. *Acad Med* 2011; 86: 559–64.
- Schwarz R. The WWAMI program: 25 years later. *Med Teach* 2004; 26: 211–4.
- Joiner JA, Schloss EP, Malan PT, Flynn SD, Chadwick JA. Phoenix rises, with Tucson's help: Establishing the first four-year

allopathic program in the nation's fifth largest city. *Acad Med* 2007; 82: 1126–38.

37. University of California, Riverside School of Medicine, Business Plan Work Groups. What it takes to establish a medical school. Available from: www.webcitation.org/5zpkcYmew [cited 17 June 2011].
38. Hamad B. Establishing community-oriented medical schools: Key issues and steps in early planning. *Med Educ* 1999; 33: 382–9.

***Dr Alan C. Frantz**

Graduate Department of Educational Leadership & Instructional Design

Mail Stop 8059, Idaho State University

Pocatello, ID 83209, USA

Tel: (208) 282-2285

Fax: (208) 282-5324

E-mail: franalan@isu.edu