



The Social Mission in Medical School Mission Statements: Associations With Graduate Outcomes

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BACKGROUND AND OBJECTIVES: Mission statements of medical schools vary considerably. These statements reflect institutional values and may also be reflected in the outputs of their institutions. The authors explored the relationship between US medical school mission statement content and outcomes in terms of graduate location and specialty choices.

METHODS: A panel of stakeholders (medical school deans, faculty, medical students, and administrators) completed a Web-based instrument to create a linear scale of social mission content (SMC scale), scoring the degree to which medical school mission statements reflect the social mission of medical education to address inequities. The SMC scale and targeted medical school outputs were analyzed via OLS regression, controlling for allopathic/osteopathic and public/private school designation. The medical school outputs of interest included percent physician output in primary care specialties (family medicine, pediatrics, and general internal medicine), as well as percent physician output in designated Health Professional Shortage Areas (HPSA) and Medically Underserved Areas/Populations (MUA/P).

RESULTS: SMC scale was a statistically significant, positive predictor of the percent of physician graduates entering primary care ($\beta=2.526$, $P=.001$). When examining the specialties within primary care, the SMC scale only significantly predicted percent of graduating physicians entering family medicine ($\beta=1.936$, $P=.003$). SMC scale was also a statistically significant predictor of several measures of physician output to work in underserved areas and populations, the strongest of which was the percent of graduating physicians working in MUA/Ps ($\beta=4.256$, $P\leq.01$).

CONCLUSIONS: Mission statements that are diligently utilized by leaders in medical education may produce a higher degree of alignment between institutional structure, ideology, and workforce outcomes.

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Graduation from an accredited medical school is a requirement for entry into the medical profession in the United States, and US allopathic and osteopathic institutions are responsible for the education of the vast majority of physicians that care for the health of the US population. The unique position of these medical schools as the gateway to the medical profession, paired with their considerable public financing, demands an accountability among these institutions to be responsive to the health needs of the population.^{1,2} Many have recently made the case that medical schools should be more socially accountable for the production of physicians who will improve health care access and

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equity through a focus on primary care and service to underserved areas and populations, such as rural or low-income communities.³⁻⁷

US allopathic (MD-granting) medical schools have been expanding rapidly over the last decade, since the 2005 Council on Graduate Medical Education (COGME) 16th Report heralding a shortfall in the nation's physician supply.⁸ Osteopathic (DO-granting) institutions' outputs, meanwhile, have nearly tripled since 1995.⁹ Absent a funded national body to coordinate workforce expansion, however, the association between medical school expansion and population need has, meanwhile, been limited.¹⁰ Health insurance expansion provisions of the Patient Protection and Affordable Care Act of 2010 have suggested that a heavy emphasis on primary care workforce expansion is required, as primary care physicians serve as the point of entry to the health care system for many individuals.^{11,12} However, this increased emphasis on access to primary care is mismatched with the current workforce supply. Only 30% of US physicians practice in primary care, a proportion that falls short of the 40% recommended by the COGME 20th Report advising the US Congress on the minimum proportion required to provide appropriate care to the nation's diverse, aging and chronically ill population.^{11,13,14} Only 8.4% of US medical school graduates from June 2010–June 2011 specifically entered family medicine residency training.¹⁵ Further, the distribution of primary care physicians in the United States is unequal across rural communities and areas of measurable social deprivation,¹⁶ and black, Hispanic, and Native American groups remain underrepresented in the physician workforce.³

In order to bridge these gaps in the primary care workforce and provide adequate care to underserved communities and diverse populations, medical schools must be prepared to train more physicians who

are willing and able to provide care that meets the needs of the nation.

One might logically expect to gain insight into an institution's commitment to achieving a high degree of responsiveness to societal needs from its mission statement. Lewkonia describes the functions of mission statements as “giving a sense of purpose, motivating employees to identify with the organization, giving recognition to the interests of external stakeholders, and to improve the resource allocation process.”¹⁷ Medical school mission statements are highly variable but often reflect the underlying values held by institutions as they produce new physicians. Common values described in the mission statements of US medical schools reflect a tripartite focus to train future physicians, serve as research institutions, and provide medical care through affiliated hospitals and clinics.^{3,18,19} Several authors have argued, however, that the equilibrium of this tripartite mission of medical education has become unbalanced, with a shift away from training physicians capable of meeting the needs of society and toward increasing scientific knowledge through research.^{3,20,21} Many universities struggle to maintain a balance in their tripartite focus as they face the economic challenges of budget cuts and decreasing revenue. A considerable amount of funding is made available for medical research through federal grants and private foundations, increasing the attraction of this focus for medical universities. This phenomenon has been described in the literature as a mission drift, and some medical schools have developed programs, procedures, and research centers to counter this drift.²²

We paired extensive mission statement content analysis and a unique graduate outcomes data set to explore and report for the first time on the relationship between US medical school mission statement content and graduate career choices. Previous research has investigated the degree to which medical school mission

statements reflect the values and social responsibility of medical education,¹⁷ as well as the performance of medical schools in producing physicians who enter primary care and provide care to underserved populations.^{3,18,19} Our research builds on the findings of these investigations by linking mission statement content to targeted outcomes.

Methods

The methods of this research investigation can be grouped into two stages: the creation of a linear scale of the social mission content (SMC scale) of medical school mission statements and the examination of the relationship between SMC scale scores and targeted outputs for medical schools. This research was granted an exemption from review by the Institutional Review Board of SUNY Upstate Medical University (FWA #00005967, IRB Registration #00000391).

Social Mission Content Scale

An initial list of allopathic medical school mission statements was obtained from a group of investigators who had previously examined mission statements in an earlier study.¹⁸ This seed list was then updated for accuracy using the public Web pages of 136 allopathic US medical schools and the mission statements of 31 osteopathic US medical schools to create a dataset of mission statements that was up to date as of August 2013. To the extent possible, school-specific identifiers were removed from the mission statements in order to reduce potential response bias. The mission statements were then incorporated into an online instrument via the SurveyMonkey™ Web-based service, and distributed to a stakeholder panel of faculty, administrators, and students at US medical schools and related organizations. The panel was selectively constructed to incorporate representation of faculty across ranks, at both allopathic and osteopathic medical schools. Stakeholders were recruited through several means:

1. General faculty, medical students, and administrative staff were recruited through medical education listserves hosted by the Society of Teachers of Family Medicine and via snowball sampling from the investigators.

2. Medical school deans and presidents were selected and targeted for recruitment through cultivated lists of these positions and were targeted to ensure balance across allopathic, osteopathic, public, and private schools.

Panel members were asked to rate the degree to which each medical school mission statement contained content that reflected or recognized a social mission of medical education. We defined social mission content for the participants using the following description:

“Any language that reflects a goal of medical education to train practitioners capable of matching the needs of society and vulnerable populations or for the institution itself to serve vulnerable populations or regions.”

Each of the 167 mission statements were rated by each panel member using a 5-point Likert scale with a low value of 1 (no social mission content) and high value of 5 (high social mission content). Interrater reliability statistics were calculated to identify any issues with outliers among the panel responses. The mean of all panelist ratings of each medical school mission statement was then calculated in order to create a linear Social Mission Content (SMC) scale. Demographic characteristics were also collected from panel members.

Analysis

Ordinary Least Squares (OLS) regression was utilized to assess the relationship between the SMC scale and the following targeted medical school outputs, provided by the Robert Graham Center²³ and the American Medical Association (AMA) Masterfile:²⁴

- Percent physician output in primary care, family medicine, pediatrics, and general internal medicine for each medical school

- Percent physician output in designated Health Professional Shortage Areas (HPSA), Medically Underserved Areas/Populations (MUA/P), and rural areas for each medical school

- The percent of student body listed as coming from an Under-Represented Minority (URM) in the paper by Mullan et al.³

Data from the 2009 AMA Masterfile was used to calculate the percentage of graduates practicing primary care and located in HPSAs and MUA/Ps, in line with an approach utilized by Mullan et al.³ Physicians listed as residents or fellows, employed as administrators, primarily engaged in research or teaching, or who were no longer active were excluded from these calculations. The models assessing physician workforce outputs controlled for allopathic/osteopathic and public/private school designation as categorical dummy (1/0) variables. Significance was defined at the .05 level, and analyses were conducted using IBM SPSS Statistics 21.0 (IBM, New York, NY).

Results

A total of 37 raters contributed to the SMC scale development by fully completing the panel instrument. There were 22 female (59.5%) and 15 male (40.5%) raters, ranging in age from 24 to 69 years. The majority of raters self-reported as white/Caucasian (84%) and non-Hispanic (89%). The majority of raters held a MD or DO degree (65%) and worked in the Department of Family Medicine at their respective institutions (76%). A more complete account of the demographic characteristics of the raters can be found in Table 1.

A total of 167 mission statements from medical schools in the United States were used in this analysis; of the included schools, 136 (81%) were allopathic schools, and 31 (19%) were osteopathic schools. There were more

public schools than private schools in the sample, with 93 (56%) of the schools being public; the majority of the public schools were allopathic. The SMC scale developed from the rating of medical school mission statements had high internal consistency (Cronbach's $\alpha=0.972$). The SMC scale scores ranged from a high of 4.6 (out of a maximum 5) to a low of 1.08, with a mean score of 2.47 (SD=0.85), with median and mode scores of 2.24.

Data regarding physician output were not available for all of the 167 medical schools included in the SMC scale; physician output information was only available for 145 allopathic (n=126) and osteopathic (n=19) medical schools. The total N for the regression-based analyses was therefore 145, with the exception of URM student percentage at each school (n=163).

The SMC scale was a statistically significant, positive predictor of the percent of graduate physicians entering primary care, defined as entering family medicine, general internal medicine, or general pediatrics ($\beta=2.526, P=.001$). When examining each individual primary care specialty, however, the SMC scale was only a statistically significant predictor of the percent of graduate physicians entering family medicine ($\beta=1.936, P=.003$). The SMC scale was not a statistically significant predictor of the percent of graduate physicians entering general internal medicine and was marginally nonsignificant as a predictor of the percent of graduate physicians entering pediatrics ($\beta=0.279, P=.066$). The SMC scale was also a statistically significant predictor of two measures of physician output to work in underserved areas and populations: the percent of graduating physicians working in MUA/Ps ($\beta=4.256, P<.01$) and the percent of graduating physicians working in combined MUA/P-HPSA areas ($\beta=3.627, P<.01$). The only measures of physician output to underserved areas and populations with which the SMC scale did not have a significant association was

Table 1: Demographic Characteristics of 37 School Mission Statement Raters, United States, 2014

Demographic Category	Number of Raters (n=37)
Sex	
Male	15
Female	22
Race	
White/Caucasian	31
Black/African American	5
Asian	2
Native American/Alaska Native	1
Two or more	1
Ethnicity	
Hispanic	4
Non-Hispanic	33
Job role (Panel members could select multiple roles)	
Dean of a medical school	3
Professor	3
Associate professor	12
Assistant professor	9
Instructor/lecturer	1
Tenured faculty	5
Tenure-track faculty	1
Non-tenure track faculty—clinical	10
Course director	11
Course coordinator	2
Educational evaluation professional	2
Researcher	10
Medical student	4
Primary department at institution	
Family medicine	28
Internal medicine	3
Pediatrics	1
Basic science department	2
Medical education	3
Degrees and credentials (Panel members could select multiple degrees and credentials)	
MD/DO	24
Clinical/behavioral doctorate	1
Non-clinical doctorate	3
MPH	7
MA	3
MS	5
BS/BA	6

the percent of graduating physicians working in HPSAs, as the model assessing this relationship was not significant overall ($F=1.765$, $P=.16$). For illustrative purposes, a comparison of the bottom and top five scoring medical schools on the SMC scale on several variables of interest is included in Table 2.

The allopathic/osteopathic and public/private designation of medical schools were also statistically significant predictors for several medical school outputs. Similar to the SMC scale, osteopathic school designation and public school designation were positive, statistically significant predictors of the percent of graduate physicians entering primary care and family medicine; however, osteopathic school designation was negatively associated with the percent of graduate physicians entering general internal medicine ($\beta= -2.283$, $P=.003$) and pediatrics ($\beta= -4.601$, $P<.01$). Osteopathic and public medical schools were also significantly and positively associated with the percent of graduate physicians working in rural areas. Finally, the SMC scale was predictive of URM student percentage, with each SMC point equating to an increase of 2.4% URM students per medical school ($\beta=2.374$, $P=.042$). Table 3 provides additional details about the results of the regression analyses.

Discussion

Our analyses indicate that medical schools whose mission statements include a higher degree of content reflecting the social mission of medical education appear to have increased output of physicians working in underserved areas and in primary care. Of particular interest is the strong association of the SMC scale to graduating physicians entering family medicine. Some argue that residencies in internal medicine and pediatrics do not accurately reflect the number of physicians entering primary care, as many physicians in these residencies later become subspecialists.²⁵ Thus, family physicians may provide a more accurate picture

Table 2: Comparison of Bottom Five and Top Five Mission Statements (as Measured on Social Mission Score) From Schools With Usable Data

	Statement	SM Score	% HPSA + MUAP Output	% Rural Output	% Family Medicine	% Primary Care
Bottom 5	The [Medical School] is dedicated to training future physicians who excel and become leaders in their profession. This goal is met by fostering the knowledge, skills, attitudes, and behaviors of our students.	1.08	31.45	7.21	7.38	31.88
	Advancing health and wellness through education, research, and patient care.	1.11	32.92	8.04	16.59	37.35
	The mission of the [Medical School] is to provide and foster excellence, innovation, and scholarship in education, research, and medical care.	1.14	40.43	9.32	14.71	35.00
	To be a premier research-intensive medical school that improves health through leadership, diversity, and a collaborative approach to discovery and innovation in patient care, education, and research.	1.14	27.37	4.43	7.61	28.84
	To provide great care and great doctors. To provide breakthrough medicine and life-changing discoveries. To develop the next generation of health care leaders.	1.14	43.03	6.46	8.68	27.57
Top 5	To educate physicians and health professionals to meet the primary care and health care needs of rural and medically underserved areas of [State].	4.34	54.00	25.79	26.85	55.51
	The [Medical School] will educate and develop exemplary physicians who practice patient-centered health care, discover and advance knowledge, and are responsive to community needs, especially through service to elder, rural, minority, and underserved populations.	4.46	50.00	16.67	25.00	33.33
	[Medical School] is dedicated to improving the health and well-being of individuals and communities, increasing the diversity of the health professional and scientific workforce, and addressing primary health care needs through programs in education, research, and service, with emphasis on people of color and the underserved urban and rural populations in [State] and the nation.	4.51	42.41	9.27	24.46	55.62
	The [Medical School] pledges to offer a unique, quality, health science education to students of diverse origins, especially African Americans, with emphasis on addressing underserved populations. In addition, the [Medical School] will teach and monitor excellence in the delivery of primary or holistic care, provide a foundation for lifelong learning, and conduct research relevant to the health of the disadvantaged.	4.54	48.19	7.95	17.84	43.71
	[Medical School] provides students of high academic potential with a medical education of exceptional quality and prepares physicians and other health care professionals to serve the underserved. Particular focus is on the education of disadvantaged students for careers in medicine. Emphasis is placed on developing skills and habits of lifelong learning and producing world leaders in medicine. Special attention is directed to teaching and research activities that address health care disparities. The [Medical School] also seeks to improve the health of Americans and the global community through public health training programs and initiatives. Our mission also includes the discovery of new knowledge through research. Lastly, the [Medical School] supports the education and training of postgraduate physicians, other health care providers, and graduate students in the biomedical sciences.	4.60	40.39	5.92	14.13	40.18

Table 3: OLS Regression Results of Social Mission Content Scale Score and US Medical School Physician Output, 2013

Outcome	β -Coefficient (<i>P</i> Value)			Model Summary
	Social Mission Content Scale	Allopathic/Osteopathic	Private/Public	
Physician Output (n=145)				
% Family medicine	1.936 (0.003)	20.591 (0.001)	6.101 (≤ 0.001)	F=60.046 (≤ 0.001) R ² =.561
% General internal medicine	0.311 (0.288)	-2.283 (0.003)	-1.477 (0.004)	F=4.968 (0.003) R ² =.096
% Pediatrics	0.279 (0.066)	-4.601 (≤ 0.001)	0.030 (0.909)	F=24.372 (≤ 0.001) R ² =.341
% Primary care	2.526 (0.001)	14.247 (0.001)	4.655 (0.001)	F=40.572 (≤ 0.001) R ² =.463
% HPSA	1.737 (0.042)	-0.301 (0.889)	1.357 (0.356)	F=1.765 (0.157) R ² =.036
% MUAP	4.256 (≤ 0.001)	-1.055 (0.635)	0.473 (0.755)	F=8.009 (≤ 0.001) R ² =.146
% HSPA+MUAP	3.627 (≤ 0.001)	-0.517 (0.832)	1.031 (0.535)	F=4.998 (0.003) R ² =.096
% Rural	2.041 (≤ 0.001)	7.306 (≤ 0.001)	5.073 (0.000)	F=20.265 (≤ 0.001) R ² =.301
% URM students*	2.374(0.042)	-10.540(≤ 0.001)	-4.792(0.022)	F=6.040 (0.001) R ² =.102

n=163

of the number of graduating medical students who choose a career in primary care, and schools with a higher SMC scale score are associated with an increased percentage of graduating physicians entering family medicine careers. Further, the SMC scale was a strong predictor of graduating physicians working in MUA/Ps and of the percentage of a school's student body in terms of URM percentage.

It is not clear from these results if graduate career choice is influenced by the orientation of the institution, or if students who go on to work in these areas of medicine self-select into institutions because of a personal predilection to work in primary care or in underserved communities; however, it appears that medical schools with a proclaimed orientation toward producing physicians in primary care and/or physicians who provide care to underserved populations are achieving these missions.

Our results for the covariates included in our models also reflect and corroborate findings of previous investigations in the output of osteopathic and public medical schools. Osteopathic medical schools have traditionally held a strong focus on primary care and practice in rural areas, which is reflected in the positive, statistically significant results on physician output in these two areas from osteopathic schools in our sample.^{13,19,25} Further, previous research comparing the output of private versus public medical schools has found that public schools graduate a higher proportion of primary care physicians and physicians who work in underserved areas;³ our results support these conclusions with statistically significant, positive associations between public schools and the percent of graduates entering family medicine and practicing in rural areas.

The 20th Report of the COGME stated that "Optimal health care outcomes and optimal health system efficiency are demonstrated when at least 40%–50% of the physician workforce is composed of primary care physicians."¹³ Unfortunately, interest in primary care among new physicians is decreasing rather than increasing.^{13,25} If medical schools wish to address flaws in the distribution of primary care physicians or physicians who go on to practice in underserved communities,¹⁶ then they must be willing to think about the issues comprehensively; this includes decisions about whom to admit,^{26,27} how to educate and train those admitted, how to maintain student idealism over the course of training,^{28,29} how to reduce the debt burden of medical education,^{30–32} and how to reduce the impact of a "hidden curriculum," which has a net effect that moves students away from primary and underserved

care, and toward more lucrative or prestigious careers.^{33,34}

Given the relationships demonstrated in the study described here, as well as the institutionally comprehensive nature of a medical school mission statement, the careful crafting and use of mission statements may be one avenue through which institutions can galvanize the energy and focus needed to encourage decisions that will increase primary and underserved care placement among medical school graduates. Whether the original intent of the mission statement is to “justify the status quo” or to “cater...to stakeholders and thus serve internal political ends” as Krohe suggested some might;³⁵ whether they attract students who hold the values stipulated in the mission statement or whether they propel the institution to make an effort to pursue goals and instill values in students,³⁶ the fact remains that the incorporation of values, such as elements representing a social mission, into a mission statement is often measurably associated with outcomes in a variety of settings.³⁶⁻³⁸

Limitations

Our study has several limitations. First, the creation of the SMC scale utilized raters that primarily held positions in family medicine departments and who were primarily white/Caucasian; these raters may have different experiences or interpretations of school mission statements than other groups. Second, while we made a strong effort to use the most recent iterations of mission statements for each medical school, there is a possibility that not all mission statements used to create the SMC scale were the most up to date versions, as some schools may be engaged in strategic planning or other initiatives that modify mission statement content.

Data regarding physician output and faculty composition were not available for all of the 167 medical schools included in the SMC scale; physician output information was only available for 145 allopathic and

osteopathic medical schools. A higher proportion of osteopathic (12/31) than allopathic (10/136) schools were excluded from the main analysis due to missing physician outcome data ($\chi^2=21.701$, $P<.001$). While there was no statistically significant difference between included versus excluded schools in terms of their SMC scale score or in public/private designation, it is possible that missing data may skew the results.

Additionally, the data used to calculate the percentage of graduates practicing primary care and located in HPSAs and MUA/Ps is dated to 2009, while the social mission statements used to create the SMC scale are current as of August 2013. It is possible that school mission statements for several of the included medical schools have changed between these two measurement periods, and their influence on the career choices and locations of more recent graduates may not be fully reflected in these analyses.

Finally, it must be noted that our data were limited regarding whether physicians, and particularly those in general internal medicine or pediatrics, were actually working as subspecialists, hospitalists, or who were otherwise not truly engaged in the delivery of primary care. This uncertainty may be reflected in the weak individual hypothesis tests observed for these two specialties in the multivariate analyses.

Conclusions

Investigations into the impact of mission statements have suggested that positive results originate not from the mission statement itself but from the strategic planning and re-education of an institution's workforce that occurs in the formulation and production of the mission statement.^{35,36,38} Further, institutions with mission statements reflecting a strong orientation in areas such as ethics or social responsibility may attract individuals with a shared sense of purpose or character.³⁹ The crafting of a mission statement is by no means the complete answer

to any problem. However, mission statements that are diligently utilized by leaders in medical education may produce a higher degree of alignment between institutional structure, ideology, and workforce outcomes. Institutional commitment to a mission statement that reflects a social mission for medical education may therefore be a good starting point for institutional change. On the other hand, the absence of any reference to social justice, or to a social mission, in the public mission statement of a medical school may be equally as telling about the institutional values held within.

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