The Urban Medicine Program: Developing Physician–Leaders to Serve Underserved Urban Communities

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Abstract

Purpose

Medical school graduates are poorly prepared to address health care inequities found in urban, underserved communities. The University of Illinois College of Medicine developed the Urban Medicine Program (UMed) to prepare students for the roles of advocate, researcher, policy maker, and culturally competent practitioner through a four-year curriculum integrating principles of public health with direct interventions in local, underserved communities. This study assessed the program's effectiveness and evaluated early outcomes.

Method

The authors analyzed data for UMed students (graduating classes 2009–2013) from pre- and postseminar assessments and longitudinal community project progress reports. They also compared UMed and non-UMed outcomes from the same classes, using graduation data and data from two surveys: Medical Students' Attitudes Toward the Underserved (MSATU) and the Intercultural/Professional Assessment.

Results

UMed students were more likely than non-UMed students to endorse MSATU constructs ("Universal medical care is a right" [$P = .01$], "Access to basic medical care is a right" [$P = .03$], "Access is influenced by social determinants" [$P = .03$]); to be selected for the Gold Humanism Honor Society ($P < .0001$); to complete joint degrees ($P < .0001$); and to enter primary care residencies ($P = .002$).

Conclusions

Early outcomes reveal that a longitudinal, experiential curriculum can provide students with competencies that may prepare them for leadership roles in advocacy, research, and policy making. Contact with diverse communities inculcates—in medical students with predispositions toward helping underserved populations—the self-efficacy and skills to positively influence underserved, urban communities.

Calls for the integration of public/population health content into medical education have come from influential organizations and agencies.[1–3] The consensus is that lasting improvements in the health of populations necessitate the application of both clinical care and established public health principles.[1] Medical schools are in a key position to bridge the paradigms of public health and clinical care.[3] Curricular approaches that integrate community-based components represent one potential way to link the two traditions.

The Institute of Medicine[1] defined several principles for successful integration of primary care medicine and public health, principles that are applicable to clinical care in general. They include the following:

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a common goal of improving population health; engagement of community members in defining and addressing their own needs; aligned leadership that bridges disciplines, programs, and jurisdictions; sustainability; and collaborative use of data and analysis.[1] Medical school curricula may also embrace these principles. Community-based curricula in medical schools offer students new perspectives and insights; these curricula not only afford students the opportunity to view the individuals they serve in a holistic manner but also emphasize the effects of social and environmental determinants on health. Furthermore, establishing long-term collaborations between communities and academic institutions enables medical students to work with community members during all developmental phases of health programs, interventions, and initiatives, including instrument development, implementation, data analysis, evaluation, and dissemination.

Currently, few medical schools provide community-based education that spans all four years.[4–17] Among these, the majority focus on serving underserved *rural* communities[5,8,9,12,16] and increasing the number of *primary care* physicians in underserved areas.[11–14,16] We identified only two schools that require community-based education for all medical students.[7,15] Most of the four-year community-based programs incorporated didactic and experiential learning, whereas a few required students to develop and implement community projects.[4,10,12,13,16] Further, few required students to evaluate the outcomes and impact of their projects on the community served.[10,12,14,17] The purpose of this study was to evaluate the effectiveness of the Urban Medicine Program (UMed), which incorporates all of these elements—a four-year, longitudinal, experiential curriculum; community-based projects; and evaluations of these projects—and to assess early student outcomes.

Background

The University of Illinois College of Medicine is the largest medical school in the United States, graduating an average of 300 medical doctors per year from its four campuses (Chicago, Peoria, Rockford, and Urbana-Champaign). Of these, about 35% consistently choose primary care

fields; one-fourth self-identify as members of ethnic/racial groups underrepresented in medicine (URM), and one-third locate their practices in rural and urban underserved communities.[18] The University of Illinois College of Medicine at Chicago (UI-COMC) is among a limited number of MD-granting medical schools that has created an experiential, community-situated longitudinal curriculum that focuses on educating physician–leaders to work with underserved populations located in urban centers. UMed at UI-COMC was launched in 2005 with a mission *to prepare physician–leaders to serve underserved urban communities.* UMed takes advantage of UI-COMC's diverse student population and its location in inner-city Chicago to address not only the challenges of practicing in an urban setting but also the larger issues of community disparities.

Program Description

UMed provides a nonclinical, urban population health focus that spans all four years of medical school and is supplementary to the regular curriculum experienced by all UI-COMC students. The principal long-term objective of UMed is to graduate physicians equipped with the knowledge, skills, and attitudes to fulfill the roles of advocate, researcher, policy maker, and culturally competent practitioner. Notably, UMed does not focus on any particular specialty pathway. The premise is that physicians of all specialties can positively contribute to the health and well-being of people living in underserved, urban communities. To be effective leaders, UMed graduates need to understand the social determinants of health and how they contribute to health disparities. They require specific skills including those related to community-based collaborative program planning and evaluation, multidisciplinary teamwork, culturally appropriate communication, and conducting research. Furthermore, they must develop cross-cultural skills pertinent to conditions in the urban environment that adversely affect health (e.g., affordable, accessible pharmaceuticals and medical care, healthy foods, transportation, exposure to environmental toxins). The curriculum meets these educational objectives through time and instruction devoted to four themes: (1) diversity in the community and intercultural communication, (2) disparities in health care access and outcomes, (3) community-based participatory research (CBPR), and (4) advocacy and policy.

Student selection and admission process

Each year, UMed accepts 24 students from a pool of 100 to 110 students admitted to UI-COMC who also choose to apply to UMed. Admission into UMed is based not only on academic promise but also on the applicant's track record of service in urban settings and applied leadership skills. Fluency in a second language is given some preference. Successful candidates combine unique personal experiences and interests related to the practice of urban medicine.

Curriculum design

Theoretical framework. The UMed curriculum is informed by the experiential learning theory (ELT), which emphasizes experience as the central component in the learning process.[19–21] According to ELT, four iterative stages constitute the learning cycle. First, learners grasp information through real, tangible experiences (*concrete experience*). Learners then observe and reflect on this new knowledge or experience (*reflective observation*) and form *abstract conceptualizations* which they can use to create new ideas and implications for action. Next, learners act on and test the ideas and implications (*active experimentation*), which leads to creating or perfecting new knowledge and skills.[20,21]

This cycle of experiencing, reflecting, thinking, and acting is synonymous with action learning.[22] Experiential or action learning makes knowledge more explicit and encourages creative, innovative thinking[22] to be applied to new situations and complex problems. UMed students learn, develop, and apply new concepts to challenges in designing, implementing, and evaluating their longitudinal work. We have noted components of this process in our logic model (Figure 1).

Curriculum components. The curriculum comprises the following distinct components that together facilitate the achievement of intended program outcomes: (1) a seminar series, (2) a Web-based learning curriculum, (3) a longitudinal community project (LCP), and (4) a Policy and Advocacy Forum.

Seminar series. The seminar series addresses the four curricular themes and enables students to engage in all stages of the learning cycle. Students attend eight 2-hour seminars over the course of their first and second years of medical school (M1

and M2 years). The seminars are student centered: approximately 40 minutes of didactic learning followed by breakout sessions during which the students, in their LCP teams, look at the practical applications of the didactic information as it relates to their community site. The 24 students constitute a learning community; they participate in UMed together and share with one another their community rotation experiences as well as their progress on the LCPs. A multidisciplinary faculty, including faculty members from the College of Medicine, the College of Nursing, the College of Social Work, and the School of Public Health, among others, facilitate the seminars.

Web-based curriculum. UMed, in collaboration with the Department of Medical Education (DME), has developed an online curriculum that requires participating students to complete, during their M3 and M4 years, three modules that cover cultural competency, leadership, and communication skills. DME faculty review student responses to online assignments and are available to provide one-on-one feedback. Consistent with ELT, the students complete the modules during their clerkship years, when patient experiences and team-based learning predominate, so that they may reflect and apply what they are learning in their daily interactions in a variety of environments and with patients of varying cultural backgrounds.

The LCP. The LCP provides direct, long-term, team-based collaborative engagement with community agencies in underserved urban neighborhoods. The LCP employs the educational principles of experiential, self-directed learning and naturally integrates all ELT stages. Each fall, UMed holds a Community Partner Fair during which participating community agencies meet M1 students. After the fair, students individually rank their top three choices, and we match as many students as possible to their first choice. Agencies review the potential assignments before they are released to students so as to be involved in the decision-making process. After the teams form, the team members complete an asset mapping assignment, which includes a group observation of the community, interviewing members of the community, and assessing both strengths and weaknesses of their community of focus. Community agency mentors, students, and community members identify projects that are of greatest need to the community,
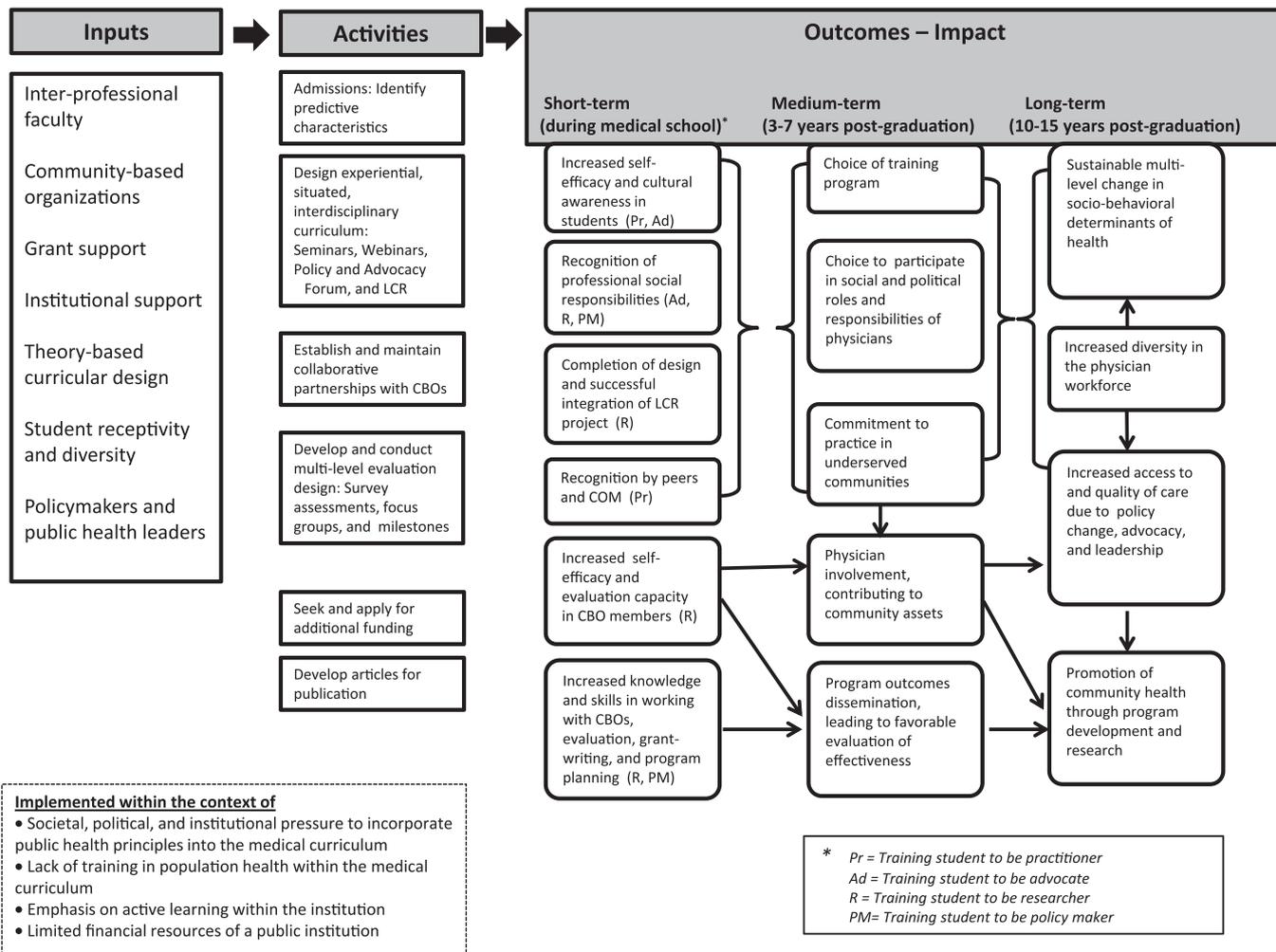
Figure 1 Logic model for the Urban Medicine Program at the University of Illinois College of Medicine. LCR indicates longitudinal community rotation; CBO, community-based organization; COM, college of medicine.

and—together with UMed faculty—agency mentors evaluate student progress through quarterly updates. We make an effort to involve the community in all aspects, and during all stages, of education and training. Upper-class students become mentors as other UMed students join the community partner in related projects. Projects continue through the M4 year and culminate in a final project evaluation paper, a CBPR grant application, or a program proposal. Agency mentors may be physicians, social workers, community organizers, community health workers, public health administrators, or program directors, and this diversity enhances the interprofessional experience of the UMed students.[23] Table 1 presents sample projects.

Policy and Advocacy Forum. During the M4 year, UMed students participate in a two-week Policy and Advocacy Forum, during which local health care leaders, physician activists, faculty, and community activists

make didactic presentations and invite students to discuss emergent issues openly. Additionally, the forum gives students the opportunity to present their own projects or a policy tool (legislative testimony, letter to editor, fact sheet, etc.) that they have developed, which others can, in turn, use in their own advocacy efforts. The forum requires students to reflect on the knowledge they have gained, to discover how current policies affect community partners, and to cultivate new ideas for policy reform.

Credit for participation in UMed

At the end of the four years, students who have completed all elements of the program receive six credit hours and a certificate for their participation in UMed.

Method

The UMed curriculum was launched in fall 2005, and from that point until

academic year 2012–2013, 180 students enrolled in the program. In 2011, to evaluate program effectiveness as accurately as possible, we began both to develop de novo surveys and to use instruments validated in previous studies, the results of which we report here.

The present study covers the UI-COMC entering classes of 2005–2009. We obtained institutional review board approval (protocols #2008-1037 and 2014-0530) to use the surveys and assessments described here. All students gave informed consent, and we offered no incentives for participation. To assess the effectiveness of the program on the development of student attitudes, knowledge, skills, and behaviors, we used the following instruments:

1. The Medical Students' Attitudes Toward the Underserved (MSATU) survey and the Intercultural and Professional Assessment (IPA) survey.

Table 1

Sample of Longitudinal Community Projects, Conducted by Students Enrolled in the Urban Medicine Program at the University of Illinois College of Medicine at Chicago (2009–2013)

Organization focus	Urban Medicine–Longitudinal Community Project
At-risk high school youth health and education	A wellness course for high school students covering mental health, sexual and reproductive health, and domestic violence
Diabetes	A four-week nutrition and wellness program for diabetic and prediabetic women
Domestic violence	A course in Spanish offered to local hairstylists to identify domestic violence in their clients and connect them with local services
HIV/AIDS	An education program for youth in the juvenile system on healthy decision making including prevention of HIV/AIDS
Homeless women	A peer nutrition educator program that brings together students, researchers, and community activists to discuss issues of food access, healthy food choices, and advocacy around food systems in Chicago
Pipeline to health careers	An after-school program at a Chicago high school to support and inspire students who are interested in pursuing a health career
Refugee women's health	A health care information library for Somali women that includes a resource manual for culturally aware health services in the area
Sickle cell disease	A mentorship and support program for adolescent sickle cell patients as they transition from pediatric to adult care

The MSATU is a validated survey[24] that assesses student attitudes related to the perceived roles of medical students, physicians, charitable organizations, and the government in providing health care. The IPA survey, developed by UMed faculty, is a method to compare differences between UMed and non-UMed UI-COMC medical students. The IPA asks students to self-assess, using Likert-type scales, their level of comfort when interacting with patients of various cultural and social backgrounds. Between August and November 2012, we invited all (M1–M4) UI-COMC medical students—both UMed and non-UMed (n = 819)—to participate in an intercultural and professionalism assessment (using the MSATU and IPA). We analyzed categorical variables using Pearson chi-square tests.

2. UMed pre/post assessments. We developed these assessments for M1 and M2 students completing UMed. They are based on seminar learning objectives and developed in collaboration with each seminar speaker. Each survey includes four to six multiple-choice direct knowledge questions (e.g., "What is the purpose of a program theory?") and three to four self-efficacy questions (e.g., "How confident are you in identifying a high-quality interview guide?"), which students respond to using a Likert-type scale. We invited UMed students

(n = 48) to participate during the 2012–2013 academic year, and we analyzed responses using a paired t test.

3. UMed LCP progress report. This team-based report includes both qualitative data (not reported here) and quantitative data to assess program objectives, measurable outcomes, evaluation tools, and stage of project evaluation. Each student team completes a report four times each year. UMed faculty use the reports to track students' acquisition of UMed competencies and LCP progress. We invited all UMed students during academic year 2012–2013 (n = 96) to participate as teams.

Finally, to examine early program outcomes, we compared UMed and non-UMed students from the graduating classes of 2009–2013 (n = 887) using data obtained for all UI-COMC students. We analyzed the following characteristics of each graduating student: gender, original state of residency, age at matriculation, self-reported URM status, graduation outcomes (i.e., graduation with honors, Gold Humanism Honor Society, Alpha Omega Alpha Honor Society, and joint degrees), state of residency placement, and residency type (primary care, including family medicine or nonprimary care). We used Pearson chi-square tests to analyze categorical variables, using SAS Version 9.3 (SAS Institute, Cary, North Carolina).

We set significance at $P < .05$.

Results

MSATU and IPA surveys

Of the 819 M1–M4 students invited to complete the IPA/MSATU surveys (in the autumn of 2012), 297 students completed both IPA/MSATU (a response rate of 36%). Of these, 64 (22%) were completed by UMed students and 233 (78%) by non-UMed students. Analysis of MSATU data showed that overall, the UI-COMC student body strongly endorsed the four predictors of care to the indigent; however, UMed students were significantly more likely to endorse all four constructs than non-UMed students. Further, after adjusting for age, gender, self-reported ethnicity, involvement in projects for the needy, and the IPA uncomfortableness ranking assigned in the multivariate model, UMed students remained significantly more likely to adhere to three constructs: "Universal medical care is a right" ($P = .01$), "Access to basic medical care is a right" ($P = .03$), and "Access is influenced by social determinants" ($P = .03$). The fourth—"Students/physicians have a social responsibility to serve the needy"—was also endorsed more frequently by UMed students than non-UMed students, though this difference did not reach significance ($P = .16$).

The IPA survey indicated that the vast majority of students do not report feeling uncomfortable interacting with various types of patients, and we noted little difference between UMed and non-UMed students. When program year was included in the multivariable analyses, first year students had significantly higher levels of discomfort than other students ($P = .04$), and in the final multivariable model, Asian/Pacific Islander students showed higher levels of discomfort ($P = .05$). According to our multivariable analyses, no other characteristics were associated with significant levels of discomfort in dealing with patients of different backgrounds.

Pre/post seminar assessment

For the 2012–2013 academic year, there was a 96% response rate from both the M1 and M2 UMed students (n = 23/24 for both cohorts) on the six pre- and postseminar assessments. M1 students showed a gain in knowledge and confidence in implementing skills and information learned in the seminars. They seemed to especially learn from the Community Partner Fair and the seminars focused on evaluation, determinants of health, qualitative

assessment, and CBPR. M2 students showed a gain in knowledge and confidence related to evaluation, qualitative assessment, community epidemiology, and community disparities. The M1 class showed greater gains overall for all seminars. We noted a statistically significant difference in levels of confidence between overall pre- and overall postseminar participation ($P < .001$; not shown).

LCP progress report

In academic year 2012–2013, a total of 96 UMed students (M2–M4) were working with 19 separate organizations on 22 individual LCP projects (see Table 1 for examples). On average, these organizations had worked with UMed students for 2.5 years, and 8 (42%) had worked with UMed students for 3.5 years or more. Student projects took place in 12 underserved neighborhoods throughout the city of Chicago. According to their most recent quarterly progress reports, M2 students spent an average of 40 hours at their site over three months, whereas M3 and M4 students spent, respectively, 20 and 22 hours over three months at their community sites. Five of the 22 teams (23%) changed the objectives of their projects. All but 1 of the teams (95%) had developed evaluation measures to assess the impact of their project on community recipients. The most common evaluation tools used by all student teams were surveys (n = 16; 73%), focus groups (n = 11; 50%), activity logs (n = 8; 36%), and organizational records (n = 8; 36%).

Early program outcomes

The first five graduating cohorts of UMed (2009–2013) totaled 99 graduates and represented 11% of all UI-COMC graduates for those years (n = 887). We compared the UMed graduates and the non-UMed graduates (n = 788) to evaluate the outcomes of the program at graduation, using the following variables: graduation with honors, Gold Humanism Honor Society membership, Alpha Omega Alpha Honor Society membership, conferral of joint degrees, state of residency placement, and residency type (primary care, nonprimary care). We also compared other characteristics of the two groups: gender, Illinois residence at entry, age at matriculation, race/ethnicity, and self-designated URM status.

We found significant differences in gender and Illinois residence at entry between UMed and non-UMed students. More

females participated in UMed than males (UMed: n = 67 [68%]; non-UMed: n = 389 [49%]; $P = .0006$). A significantly greater number of non-Illinois residents were in the UMed group (UMed: n = 29 [29%]; non UMed: n = 148 [19%]; $P = .01$). We observed no significant differences between the two groups in age at matriculation, race/ethnicity, or URM status. Slightly over one-third of UMed students (36%, n = 36) self-identified as URM students compared with 27% (n = 213) of non-UMed students ($P = .0711$). In both groups, the majority of students identified as white (UMed: n = 27 [27%]; non-UMed: n = 300 [38%]), and for both the second largest ethnicity group was Hispanic (UMed: n = 22 [22%]; non-UMed: n = 123 [16%]).

In terms of graduation outcomes, we noted significant differences in several

measures. Nearly one-third (31%, n = 31) of UMed students were inducted into the Gold Humanism Honor Society compared with 7% (n = 57) of non-UMed students ($P \le .0001$). In addition, 12% (n = 12) of UMed students graduated with a joint degree (i.e., MD/MPH, MD/MBA) compared with approximately 2% (n = 14) of non-UMed students ($P \le .0001$). A greater proportion of UMed students chose residencies in primary care (UMed: n = 54 [54%]; non-UMed: n = 319 [41%]; $P = .02$), in particular family medicine (UMed: n = 19 [19%]; non-UMed: n = 68 [9%]; $P = .002$). Although more UMed students were from out of state, the proportion that remained in Illinois for residency was similar (UMed: n = 43 [43%]; non-UMed: n = 355 [45%]; $P = .61$). Table 2 shows the complete results.

Table 2

Comparison of Educational Outcomes, Urban Medicine (UMed) Versus Non–Urban Medicine (non-UMed) Graduates[a]

Characteristic	UMed graduates, no. (% of 99)	Non-UMed graduates, no. (% of 788)	Chi-square value[b]	P value[c]
Sex			11.81	.0006
Male	32 (32.3)	399 (50.6)		
Female	67 (67.7)	389 (49.4)		
Legal state at entry			6.08	.0136
Illinois	70 (70.7)	640 (81.2)		
Other	29 (29.3)	148 (18.8)		
Age at matriculation			0.4462	.8000
23 and under	71 (71.7)	565 (71.7)		
24 to 27	22 (22.2)	162 (20.6)		
28 and over	6 (6.1)	61 (7.8)		
Race/ethnicity			6.73	.2415
Asian[d]	17 (17.2)	107 (13.6)		
Asian Indian[e]	13 (13.1)	111 (14.1)		
Black or African American	14 (14.1)	90 (11.4)		
Hispanic	22 (22.2)	123 (15.6)		
White	27 (27.3)	300 (38.1)		
Other[f]	6 (6.1)	57 (7.2)		
Self-designated underrepresented minority			3.26	.0711
Yes	36 (36.4)	213 (27.0)		
No	63 (63.6)	575 (72.9)		
Graduated with honors			2.48	.1151
Yes	4 (4.0)	68 (8.6)		
No	95 (96.0)	720 (91.4)		
Inducted into Gold Humanism Honor Society			57.06	< .0001
Yes	31 (31.3)	57 (7.2)		
No	68 (68.7)	731 (92.8)		

(Table continues)

Table 2
(Continued)

Characteristic	UMed graduates, no. (% of 99)	Non-UMed graduates, no. (% of 788)	Chi-square value[b]	P value[c]
Inducted into Alpha Omega Alpha Honor Society			0.34	.5578
Yes	15 (15.2)	138 (17.5)		
No	84 (84.9)	650 (82.5)		
Graduated with joint degree			33.08	*< .0001*
Yes	12 (12.1)	14 (1.8)		
No	87 (87.9)	774 (98.2)		
Remained in Illinois for residency			0.26	.6079
Yes	43 (43.4)	355 (45.1)		
No	56 (56.6)	414 (52.5)		
Missing	0	19 (2.4)		
Residency program type			27.43	*.0169*
Anesthesiology	4 (4.0)	58 (7.4)		
Emergency medicine	9 (9.1)	78 (9.9)		
Family medicine	19 (19.2)	68 (8.6)		
Surgery	9 (9.1)	57 (7.2)		
Internal medicine	20 (20.2)	140 (17.8)		
Neurology	0	31 (3.9)		
Medicine–pediatrics	4 (4.0)	15 (1.9)		
Pediatrics	3 (3.0)	53 (6.7)		
Psychiatry	6 (6.1)	38 (4.8)		
Obstetrics–gynecology	8 (8.1)	43 (5.5)		
Ophthalmology	5 (5.1)	16 (2.0)		
Orthopedic surgery	3 (3.0)	28 (3.5)		
Pathology	1 (1.0)	23 (2.9)		
Radiation/radiation–oncology	4 (4.0)	64 (8.1)		
Other[g]	4 (4.0)	48 (6.1)		
Missing	0	28 (3.6)		
Primary care[h]			5.63	*.0176*
Yes	54 (54.5)	319 (40.5)		
No	45 (45.5)	441 (56.0)		
Missing	0	28 (3.6)		
Family medicine			10.10	*.0015*
Yes	19 (19.2)	68 (8.6)		
No	80 (80.8)	692 (87.8)		
Missing	0	28 (3.6)		

[a]These data cover the 887 graduates from the University of Illinois College of Medicine at Chicago who graduated between 2009 and 2013, inclusive. Of these 887 graduates, 99 (11.2%) are UMed graduates and 788 (88.8%) are non-UMED graduates. Percentages may not equal 100 because of rounding.
[b]The chi-square calculations exclude the missing values (i.e., the data missing for non-UMed students in "Remained in Illinois for Residency," "Residency program type," "Primary care," and "Family medicine").
[c]The italicized P values are significantly different at P < .05.
[d]Individuals were categorized into the "Asian" race/ethnicity category if they self-identified as "Chinese," "Filipino," "Japanese," "Korean," "Other Asian," "Other Pacific Islander," or "Vietnamese."
[e]Individuals were categorized into the "Asian Indian" race/ethnicity category if they self-identified as "Asian Indian," "Indian," or "Pakistani."
[f]Individuals were categorized into the "Other" race/ethnicity category if they self-identified as "American Indian," "Alaska Native," "Multiple races/ethnicities," "No response," or "Unknown."
[g]Program types with fewer than 20 total students were placed in the "Other" category. Those programs include urology, physical medicine/rehab, dermatology, and otolaryngology.
[h]"Primary care" is defined as students who matched into residencies in family medicine, internal medicine, pediatrics, or obstetrics–gynecology.

Discussion

The purpose of this study was to evaluate the effectiveness of UMed in achieving program outcomes—namely, increasing student understanding of issues in urban, underserved communities and acquiring skills and knowledge to address these issues as practicing physicians. Further, we aimed to evaluate early outcomes of the first five program cohorts. We used several instruments to evaluate outcomes and to compare the social values and level of comfort with working with diverse populations of UMed and non-UMed students. We developed surveys and progress reports to assess gains of UMed students in knowledge, attitudes, and behaviors from the didactic seminars and the LCPs. We also compared outcomes at graduation for UMed versus non-UMed students to better understand early career choices.

Our findings validate the results of studies such as those by Ko and colleagues[8,9] that indicate that medical education can play a positive role in nurturing and enhancing the skills of students already predisposed to serving underserved communities. Our results show that the general UI-COMC student body is open and receptive to working with diverse communities, yet UMed students express even greater cultural understanding and acceptance than their non-UMed UI-COMC peers. Our results align with those found by Stearns and colleagues[12] that indicate that outcomes improve when predisposition for service in underserved communities is paired with appropriate content during medical school.

We also found—as did Haq and colleagues[13]—that, on the basis of mission and goals, programs such as UMed are more difficult to evaluate because the attitudes and behaviors they are designed to instill within students may take time to manifest; however, interestingly, notable early trends in UMed graduates' residency choices suggest that UMed students from states other than Illinois are proportionally more likely than non-UMed students from states other than Illinois to stay in Chicago. Further, although UMed does not select for students who want to go into primary care, a significant number of UMed graduates choose primary care residencies.

Findings related to the acquisition of skills and behaviors that align with leadership roles in underserved urban communities are difficult to contextualize to previous work because most studies evaluate outcomes at the point of graduation—rather than later, during graduates' careers, when leadership roles would be more likely.[6,8,9,13] On the basis of the results of the pre/post assessments, we found that programmatic content in the seminars resulted in significant improvements in knowledge and self-efficacy by UMed students. On the basis of students' LCP progress reports, we believe that the LCPs have become the cornerstone of our program. Community collaboration can be challenging, demanding that students be flexible and continually examine context for their projects to remain relevant. UMed faculty feel that these are necessary skills, as they reflect the general principles of CBPR (i.e., centrality of community partnerships, community building)[25,26] and require students to use systems-level thinking to develop solutions to dynamic, complex, population-level problems. Regular communication between students and UMed faculty has been critical to the success of the LCPs, as are regular meetings between UMed faculty and community partner mentors. Our findings confirm the assertion made by Meyer and colleagues[23]: Partnerships between community organizations and academic health centers are not only feasible but also sustainable—if based on mutual respect and understanding.

This study adds to the knowledge base regarding the importance of student selection, nurturing predisposition, and educational content as means to increase interest in and to provide preparation for leadership roles in urban underserved communities. The low dropout rate (2 out of 180 students) and the number of hours dedicated to UMed outside of the basic curriculum show that students respond positively to a program based on experiential learning, and that they willingly accept the challenge of taking on the additional responsibilities required to work in underserved communities. Overall, the results reported here show that well-designed, longitudinal programs linking medical students and underserved urban communities hold promise; the academic medicine community may be hopeful as we grapple with the burden of continuing disparities that afflict urban communities across the United States.

Although our results are robust, we acknowledge some limitations. Our competitive, nonrandom selection process is part of our strategy to support preexisting student interest in helping underserved populations while capitalizing on academic talent and a social justice mindset; however, this preexisting interest confounds our ability to measure the influence of the UMed curriculum on student attitudes and motivations. We have no information on the students who apply but are not chosen. UMed acceptances are communicated to accepted students, who may or may not attend UI-COMC. Limitations related to the interpretation of the MSATU results include low response rate and the possibility that students with greater cultural awareness and positive attitudes may be more motivated to complete these surveys. This preexisting difference would make the difference between UMed students and the general UI-COMC medical student group smaller.

The major limitation to scaling up the program is the nature of the seminar sessions, which are intentionally interactive, experiential, and in the style of a workshop. Small groups work actively to solve problems during the sessions. The current number of students (24) allows six to eight small groups to work together, to receive input from the instructor, and to share conclusions and discuss topics as a larger group. Two-hour seminars barely allow time for such a format, and adding more seminars to adequately accommodate more students may be a burden on faculty.

Scheduled UMed sessions do not replace any core teaching time; rather, UMed students complete the required activities and projects as they go through the regular medical school curriculum. The six credits they receive for the course appear as "a longitudinally structured self-designed elective." The three course collaborators (J.A.G., G.L.L., J.L.M.) have broad public health and medical backgrounds, and all serve as instructors in seminar sessions as needed. We have been fortunate to consistently secure donated time from faculty members—many from other schools and departments—who appreciate the opportunity to educate medical students on population health issues. A limitation of the program is the lack of consistent funding for the faculty and staff, given the time needed for teaching, advising, evaluating, and administrating UMed. Small grants and teaching assistantships have been the main support mechanisms.

At this point, we cannot determine with certainty whether graduate outcomes are a result of the selection process into UMed or a direct consequence of taking part in UMed. Furthermore, a rigorous medical school curriculum requires that the UMed curriculum be front loaded in the M1 and M2 years; thus, we are not sure whether UMed students sustain their reported increases in knowledge and confidence throughout their medical school training and beyond.

Current data reflect early programmatic outcomes and residency choices. To assess long-term outcomes of UMed, we will be conducting research with UMed graduates to gain a retrospective look at the impact UMed has had on how and where they practice medicine. In our continued effort to compare UMed and non-UMed students, we have also added three Likert-style questions and one qualitative question to the college-wide Graduate Outcomes Survey used for longitudinal tracking and evaluation of UI-COMC graduates. The additional quantitative questions assess how alumni feel the medical school curriculum prepared them for the following: to work with and advocate for underserved communities; to evaluate the effects and impact of public health programs in a community setting; and to provide sensitive and empathetic care to patients of varying cultural, racial, and socioeconomic backgrounds. The additional qualitative question asks alumni to comment on any learning experiences at UI-COMC that gave them skills to address health disparities.

With regard to the LCP component, the UMed approach to community engagement continues to evolve. Program evaluation to date has focused mainly on the effect UMed has made on students. We have developed tools to measure the effect the LCP component has had on the agency and community partners, which we will present in future reports. We have also invited partner agencies to become more involved by providing case studies, facilitating seminar discussions, and serving as consultants to identify topic

areas and speakers for the Policy and Advocacy Forum.

Within a true CBPR paradigm, community members are an integral part of the partnership.[25,26] Two challenges of UMed have been (1) to capture long-term behavior change among the community participants in the LCP projects and (2) to include community stakeholders in LCP evaluation efforts. Consequently, a recent addition to our curriculum is the "Self Efficacy and Stage of Change Interview" assignment, which requires each student to use a template to develop and conduct an interview with a community member who has participated in his or her team's intervention. Evaluations of these interviews can serve as a proxy to measure UMed's overall impact on community members in Chicago. Community site mentors have also begun to complete yearly evaluations of their UMed students; these evaluations include a reflection on how their participation has affected the community as a whole, as well as information on if/how UMed has influenced agency program development and evaluation efforts.

Conclusions

Since its inception, UMed has consistently drawn on over 100 applicants for each entering class of 24 students, and it has developed a solid cadre of local community organizations that are willing and able to host student teams and create true partnerships. Through this four-year experience, UMed students learn the importance of continually reassessing community needs through evaluation and interaction with community members and mentors. Finally, students enjoy mentorship and the opportunity to develop leadership skills as subsequent cohorts work on projects developed by earlier students. Our hope is that UMed will serve as a model for medical school leaders who wish to implement community-based programs that prepare medical students to serve underserved populations.

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