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Commentary

Building Medical Schools Around Social Missions: The Case of the University of California, Riverside

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CONTENTS

Introduction

Building a Medical School Around Social Missions

Progress to Date

Conclusion

References

Abstract—The University of California recently created the first new public medical school on the West Coast of the United States in nearly 50 years. It was built in a region of California with significant health challenges, including a marked physician shortage and very poor overall health outcomes. The region's population is racially and ethnically diverse and rapidly growing, with a particularly large population of Mexican American residents. It is also an area with high unemployment, low college-going rates compared to most other areas of California, and a large undocumented immigrant population. When the University of California Board of Regents authorized the creation of this new medical school, it charted unique social missions for the school that have particular relevance to the needs of its immediate region. This article presents a single case study of how the school was designed to accomplish these social missions and, ultimately, to improve the health of the people living in the region it serves. Many of the strategies used were adopted from developing countries that have far more serious workforce issues and health challenges. The authors believe these strategies and missions are unique among the 17 new medical schools created in the United States in the last decade. Furthermore, this model could have broader implications for the development of health policies and health system reform in other nations, such as Mexico.

INTRODUCTION

Building a new medical school at the University of California, Riverside (UCR), presented a rare opportunity to design a school around several unique social missions, with a focus on where health care in the United States is going rather than on what has existed in the past.

California's motivation to create a new medical school was slow in developing. There had not been a new public medical school in California since the late 1960s, and for much of the 1980s and 1990s, the general concern nationally was that there was a physician surplus. California's

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population, however, was expanding rapidly, and by 2013, among states with a medical school, California was third from the bottom in medical school slots per capita with only 17.8 positions per 100,000 residents compared with the national average of 32.7.¹ As a result, most Californians interested in becoming a physician had to go to private medical schools outside of California. The lead author was well aware of this situation in his previous position at the Medical College of Wisconsin where almost a third of medical students came from California. Fortunately, most Californians eventually return home after medical school and residency, but they return in general to the more affluent coastal cities to practice, creating a marked maldistribution of physicians within the state. In general, coastal counties from north of the San Francisco Bay Area to the US–Mexico border have physician supplies considered adequate to abundant, with many inland counties and counties in the far northern part of the state experiencing physician shortages. In primary care specialties, only 16 of California’s 58 counties have an adequate supply, defined as 60 to 80 primary care physicians per 100,000 population.² This maldistribution of physicians is a common problem in many countries, including Mexico.

The State of California first became concerned with the physician workforce issue in 2006, and the University of California (UC) Regents commissioned a study that suggested that the existing five state (University of California) medical schools should expand their classes and that the state should develop at least one new medical school, specifically identifying Inland Southern California at UC Riverside and the Central Valley at UC Merced in the San Joaquin Valley as areas with severe physician shortages.³ These two regions remain the areas of the state with the greatest physician shortages. Inland Southern California (also known as the Inland Empire) has 43 primary care physicians per 100,000 people and the San Joaquin Valley has 48 primary care physicians per 100,000 people; both regions also fall below the recommended supply for specialists.⁴

The University of California, Riverside, was the logical first campus to consider for a new medical school location, because for more than 30 years it had been a satellite campus of the UCLA School of Medicine, had already taught the first two years of the medical curriculum and had already hired a cadre of basic science and volunteer clinical faculty. As a result, in 2008 the UC Board of Regents approved the establishment of UC’s sixth medical school at Riverside and began pursuing new state funding to support the school.

The principal driving force for this site selection was the severe physician shortage found in the region near Riverside. Inland Southern California, at 27,263 square miles, is a land

area larger than the state of West Virginia. The population includes approximately 4.4 million people, more than 47% of whom are of Hispanic/Latino origin, primarily Mexican American. An estimated 259,000 are undocumented immigrants, according to the Center for the Study of Immigrant Integration at the University of Southern California.⁵ One of the region’s two counties, Riverside, was one of the fastest growing of California’s 58 counties in the year ending July 1, 2014.⁶ In 2010, it was estimated that the region had an overall 3,000-physician shortage, with a primary care supply of just 43 physicians for every 100,000 people as documented by the California HealthCare Foundation.⁴

In addition to addressing the workforce distribution issues, the new medical school at Riverside was envisioned to reflect the diversity of the undergraduate university, itself a reflection of Inland Southern California. UCR is a relatively new UC campus, established in 1954, but today it is a research-intensive university of more than 20,000 students. A major strength of the campus comes from the makeup of its students and the impact it has on their lives, which in turn contributes to the diversity goals of the School of Medicine, because almost half of enrolled medical students are drawn from UCR undergraduate alumni. Half of UCR undergraduates are first in their family to go to college. The campus consistently ranks among the most ethnically diverse undergraduate campuses in the nation by *US News & World Report*⁷ and is one of the very few federally designated Hispanic serving institutions classified as a research university (very high research activities) by the Carnegie Classification of Institutions of Higher Education.⁸ In fall 2014, underrepresented minorities (African American, Hispanic and Latino, and Native American) comprised more than 43% of UCR’s undergraduate student population. By far the largest underrepresented minority group among undergraduates is Hispanic/Latino, not surprising given the demographics of Inland Southern California and California itself.

More recently, UCR has gained national distinction not so much by its *US News & World Report* rankings but by new measurement criteria recently promoted by President Obama. A recent *Time Magazine* analysis ranked UCR first nationally based on three factors proposed by the Obama Administration (six-year graduate rate; percentage of full-time, first-time undergraduates receiving Pell grants; and net cost for students receiving aid and whose families’ annual incomes are below \$110,000; weighed equally), as well as data from the Department of Education’s Integrated Postsecondary Education Data System.⁹ According to *Washington Monthly*, UCR is ranked second in the United States in a measure of civic engagement, research, and social mobility.¹⁰

BUILDING A MEDICAL SCHOOL AROUND SOCIAL MISSIONS

The UC Regents wanted more than just additional physicians for the region; they wanted a medical school that would address social missions (see **Table 1**). They wanted more physicians to go into fields that society actually needs; that is, more family physicians, primary care internists, and pediatricians rather than subspecialists. They also wanted more physician diversity to better reflect the population of California and the population of the underserved region that is home to the Riverside campus. Diversity in medical education within the University of California had taken a turn for the worse after California voters passed Proposition 209 in 1996,¹¹ a constitutional amendment that ended race-conscious admissions in California’s higher education by prohibiting affirmative action in education, employment and contracting. Perhaps a less appreciated aspect of physician diversity is the fact that three quarters of current US medical students come from the top two quintiles of economic status. This lack of economic diversity among medical students is a trait we share with many developing countries. Additionally, the Regents endorsed a unique mission for the school, including the aspiration that it would improve the health of the community it serves. This is a particularly

challenging mission for the region surrounding Riverside, which is ranked in the bottom quartile in many health and wellness state measures, such as deaths due to diabetes and coronary heart disease, both largely preventable conditions.¹² Ultimately, the Regents wanted a medical school that ranked high on social missions rather than another medical school designed around traditional criteria. A ranking system based on social missions has already been published by *Annals of Internal Medicine*,¹³ and traditional medical schools had not performed particularly well according to these measures.

To design the new medical school at Riverside around this unique social mission, the lead author was recruited as founding Dean in 2010. Bringing an extensive background in international health, he applied lessons from developing countries to inform the design and operation of the UCR School of Medicine—a focus on grooming and preparing “home-grown” physicians and a curricular emphasis upon prevention and wellness that other countries, such as Costa Rica and the Philippines, have employed to improve the health of populations and reduce overall health care costs. Upon his arrival, the school immediately began recruiting a leadership team and charged school leaders with implementing a plan to carry out four specific social missions designed to achieve the aspirations of the mission statement.

Achieving the Missions of the UCR School of Medicine

Mission Statement	
The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.	
Objectives	Strategies
Retain UCR-educated physicians in Inland Southern California	<ul style="list-style-type: none"> • Expand and establish new student pipeline programs to produce more “home-grown” physicians • Give admissions preference to students with local ties
Produce doctors who go into the fields needed by society	<ul style="list-style-type: none"> • Establish new GME programs • Emphasize primary care and short supply specialties in new GME programs • Select students with this orientation • Appoint faculty in high-need specialties to serve as role models • Provide “mission” scholarships as incentive
Improve the diversity of the region’s physician workforce	<ul style="list-style-type: none"> • Recruit students from economically and educationally disadvantaged backgrounds • Employ innovative admissions methodology emphasizing disadvantaged status in selecting medical students
Improve the health of communities served	<ul style="list-style-type: none"> • Apply this methodology in the selection of residents as well • Partner with community-based providers—hospitals and clinics • Incorporate curricular experiences that stress prevention, wellness, chronic disease management, population health, cultural competency, quality, and process improvement • Establish Center for Healthy Communities

TABLE 1. Social Missions of the UCR School of Medicine. GME, Graduate Medical Education

The first challenge was to understand how to address the region's physician shortage. It is understood that doctors do not tend to practice where they go to medical school; other factors affect their decision on where to practice. Between 40% and 49% of medical school applicants with local origins (birth, high school graduation, college graduation, and local residence at time of application) practice locally at mid-career, according to one study.¹⁴ Another 40% of the decision about where doctors practice is based on where physicians complete their graduate medical education or residency training. This second factor appears to be an even greater determinant for physicians who decide to practice in rural areas. This factor was of particular relevance to UCR because much of Inland Southern California is rural. Simply building another California medical school in Riverside would not have much impact on the region's physician workforce.

Consequently, the UCR School of Medicine developed the strategy to preferentially select students from Inland Southern California. Implementing this strategy was a challenge because the region has among the state's lowest college attendance rates and lowest standardized scores. For instance, college enrollment for San Bernardino County is 64.7% and for Riverside County is 56.8%, significantly lower than the California average of 74.4%. This challenge was confirmed when the medical school started recruiting its first class in 2012, when less than 10% of the medical school-qualified California applicants came from the region.

These facts forced the school from the beginning to expand its multiple student pipeline programs to develop an applicant pool from the region, reaching, in some cases, back to kindergarten–12th grade in order to increase the pipeline of qualified students who could ultimately be selected for the medical school. The new school therefore expanded existing programs and developed new programs that actively stimulate an interest in medicine among the region's youth and help them become competitive medical school applicants.¹⁵ This strategy included expanding undergraduate programs not only at the UCR campus but also in other area colleges and universities with a high percentage of Inland Southern California students, such as California State University, San Bernardino. These programs have been successful. For instance, the medical school's expanded premedical postbaccalaureate program capitalizes on the past strong record of these programs in California in placing alumni in primary care specialties and in disadvantaged communities.¹⁶

In addition, in order to accomplish the first social mission of placing physicians in underserved areas, the school needed to develop new Graduate Medical Education (GME) programs in the region, including the more rural areas of

Riverside and San Bernardino counties. Because the second mission was to train doctors in the specialties most needed by society, the new school decided to develop new GME programs specifically in primary care and other critically short specialties. In short, just creating a new medical school would not accomplish the social mission of the institution to expand and diversify the region's physician workforce; meeting this goal required the construction of a complete continuum of programs that covered from kindergarten through residency.

The challenge of persuading UCR medical students to go into fields of clinical practice that society needs was also difficult, particularly because existing US medical schools have not been very successful with this challenge. We estimate that less than one in six graduates of existing California medical schools ultimately practice primary care medicine, although the US health system requires that number to be closer to 50% in order to work efficiently. Our approach to this challenge was first to define the short supply specialties for our region. Our conclusion was that the region lacks primary care doctors, including family physicians as well as general internists and primary care pediatricians. The region is both one of the fastest growing areas of the state and is estimated to have the largest proportional increase in newly insured as a result of implementation of the Affordable Care Act. Consequently, we estimate that Inland Southern California will have less than a quarter of the primary care doctors it will need within ten years. But family medicine, general internal medicine, and primary care pediatrics are not the only specialties in short supply. Psychiatry is as scarce as primary care, general surgery is desperately needed in the largely rural catchment area of Inland Southern California, and obstetrics and gynecology (OB/GYN) is critically needed because the two-county region has only an estimated 200 OB/GYNs actively practicing. The school's leadership therefore decided to focus on these six areas first.

To address the primary care and short-supply specialty issue, the school also decided to select students who were more likely to go into these fields. Some of our selection strategies are outlined in the next section. To increase the likelihood that students would graduate into these fields, the school selected the majority of clinical faculty from these six fields. They would serve as role models for students, rather than the usual makeup of medical school faculty coming from subspecialty-based teaching faculty. We also decided to move the teaching platform out of large university hospital tertiary facilities into the community and, whenever feasible, use outpatient clinical settings. Finally, the school introduced mission-based scholarships, conditional on student

commitment to practice in one of these six priority specialties for at least five years in Inland Southern California after graduation. In return, medical school tuition would be free. If recipients ultimately decide to enter a different field or practice elsewhere, they are required to pay back the scholarship as if it were a loan.

The third mission was to diversify the physician workforce, which is particularly challenging because of changes in California law. Traditional measures of diversity, such as self-reported ethnic and racial status, were prohibited from preference in the admission process under California's Proposition 209,¹⁷ and others are typically not measured (e.g., sexual orientation or religious diversity). As a result, the UCR School of Medicine established its own measures of diversity, all of which are measurable in the applicant pool. These criteria were also actionable as we moved forward. At UCR, the medical school specifically gives priority within the qualified applicant pool to geographic connection to the region with a particular emphasis on areas within our region with the greatest unmet medical needs. For example, the school gives preference to a qualified student from Coachella over one from Riverside, both cities in Riverside County. The school would give preference to a student from Riverside over Los Angeles and would not consider out-of-state students unless there was a compelling mission-driven reason to do so. The school also gives preference to students from socioeconomic and/or educational disadvantaged status. Very troubling is a recent statistic that more than 75% of the medical students in the United States come from the top two quintiles of family income and only 5.5% from the bottom quintile.¹⁸ It is not surprising that the sons and daughters of wealthy Americans often choose not to practice in underserved communities. In addition, we give credit to "distance traveled" (which can also include life circumstances outside of academics) in our admission strategy. We would argue that two students with identical 3.8 grade point averages (GPAs) at a UC campus, one a graduate of a high school without advanced placement and honors programs and the other from a high school with many of these programs, says something important about the quality of the former student's performance. Other qualities that the school seeks are English as a second language and first in family to go to college.

Our school also decided on a different approach to the interview and selection process. GPA and MCAT scores are used as threshold criteria. Once qualified by these criteria, the admissions process does not give added weight to those applicants with the absolute highest scores. Students with the highest GPA and standardized test scores do not necessarily have the "right stuff" to be a great physician. A recent

publication from the Association of American Medical Colleges showed that successful graduation from medical school is virtually identical for medical students who had MCAT scores ranging from 27 to 45.¹⁹ Our admissions process therefore seeks students with service-based learning experiences, particularly those that required significant investment of time such as the Peace Corps or VISTA. The admissions committee also uses the "multiple mini interview" technique²⁰ using questions specific to our unique social missions as an objective part of the selection process. This selection process identifies highly qualified students but also individuals who are more likely to help the school accomplish its missions. Students with these qualities are, in the opinion of the authors, more likely to be the type of doctor from which patients would prefer to receive medical treatment.

Perhaps the most challenging mission was to design a school that could improve the health of the community it serves. For this reason, the UCR School of Medicine was designed as a community-based school. This is in sharp contrast to the other eight allopathic medical schools in California that have built their own hospitals and employ their own salaried physicians. This hospital-based model makes it difficult for them to work across diverse and often competitive institutions within a region around common goals, such as improving health for everyone. In contrast, UCR uses many of the region's existing hospitals and clinics and currently practicing physicians as its teaching platform. When the university hires new doctors through the medical school, they are generally embedded in one of the numerous partnered institutions according to their clinical needs.

Sessions on population health and public health, wellness, and preventive and chronic disease management were also introduced into the curriculum. The school additionally designed and implemented a three-year longitudinal ambulatory clinical experience to have students not only take responsibility for the patients they see in the clinic but also adopt the community in which these clinics are located. They learn first-hand how to engage their community not just through the patients who come to their clinic. Academically, the school's research faculty not only do basic, clinical, and translational research but the school also recruits research faculty interested in population-based research, health disparity research, quality improvement research, and public health. We have created within the school the Center for Healthy Communities as the organizing infrastructure for faculty throughout the campus, in partnership with community stakeholders, to undertake community-engaged research leading to new health care innovations and improved health of people living in Inland Southern California. In this respect,

the school's faculty members look more like a blend of a traditional medical school and a school of public health.

PROGRESS TO DATE

Following the arrival of the lead author as founding Dean in 2010, it took three years to open the school, obtain accreditation, and solidify funding from the State of California. In addition to opening the medical school, we are now operating two family medicine residencies (one in a rural part of the region), a two-thirds ambulatory-based internal medicine residency, a primary care pediatrics residency, a psychiatry residency, and a general surgery residency. We have plans to establish two additional internal medicine residencies (including one rural internal medicine residency) and an OB/GYN residency within the next three years. This has been a period of tremendous institution-building to create a community-oriented medical school in California.

The third medical school class of 50 students will begin its training in summer 2015. In the first two classes, 54% of students have connections to Inland Southern California, 45% meet at least one of the school's four diversity criteria (socioeconomic and/or educational disadvantage, English as a second language, first in family to attend college, or grew up in a medically underserved community), and 56% speak Spanish. Perhaps most indicative of the long-term success, almost all of the students were accepted to other US medical schools, and a third by another UC medical school. Yet, UC Riverside has offered admission to less than 90 students a year in order to fill classes of 50. In essence, the school enrolled students with desirable academic and personal attributes—who also wanted to go to a school with the social missions of the UCR School of Medicine. In a sense, our students chose the school as much as the school chose them. It is perhaps this fact, more than the design of the pipeline, which leads the authors to believe that this medical school will accomplish its social missions.

CONCLUSION

In summary, the UCR School of Medicine has been uniquely designed to accomplish several distinctive social missions needed not only by the region but perhaps by health systems throughout the United States and abroad. Our proximity to the US–Mexico border and the demographic characteristics of the region served by the UCR medical school have presented the opportunity to educate physicians more responsive to the health care needs of individual patients and populations in a manner that is attuned to the cultural background of patients and focused on delivering more medically

effective and cost-effective care. The faculty and staff at the UCR School of Medicine also believe that if this model is successful in Inland Southern California, it can ultimately change the face of medical education nationally. All medical schools should be training doctors for where health care in our country is going rather than where it has been. If we in Riverside are successful, the school will become a model to be emulated elsewhere around the world, including our closest neighbor, Mexico.

DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

No potential conflicts of interest were disclosed.

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