

# **Health** Issue Brief

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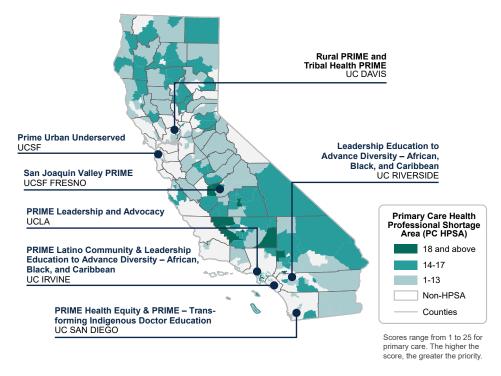
# University of California Programs in Medical Education

# California is battling a physician shortage

Of the nine regions in the state, only four have the recommended number of primary care physicians, and two regions lack the recommended number of specialists.¹ The Inland Empire and San Joaquin Valley have the fewest number of doctors per 1,000 population served in the state. Furthermore, the racial and ethnic composition of California's physician workforce is not aligned with the state's overall population. In 2020, only 6% of physicians reported being Latinx and 3% reported being

Black despite the state census showing that these groups represent 37% and 6% of the general population, respectively.<sup>2</sup> In 2019, the California Future Health Workforce Commission proposed action to eliminate the state's primary care provider shortage, nearly eliminate the shortage of psychiatrists by 2030, and simultaneously train a workforce that is representative of the community it serves. One of its top 10 recommendations to advance these goals was to "sustain and expand the University of California Programs in Medical Education (UC PRIME) program across University of California (UC) campuses."<sup>3</sup>

Figure 1. University of California programs in medical education



#### What is UC PRIME?

UC PRIME is a specialty track program within each of the six UC medical schools developed to meet the needs of California's medically underserved population and increase the diversity of medical school classes. Currently, multiple PRIME programs run across the six UC medical schools (Table 1). Each UC PRIME program has a particular focus, whether it is on a geographic region, such as rural or urban underserved people, or on a particular population, such as Native or Latinx populations. A specialized curriculum and training experiences supplement standard medical school training. UC PRIME programs include unique curricular content and dedicated faculty mentorship throughout the entire medical school program. Program leaders actively recruit students with backgrounds consistent with the program's focus. For example, applicants to the San Joaquin Valley PRIME program are actively recruited from the San Joaquin Valley, and applicants to the Rural PRIME program are actively recruited from rural California.

All UC PRIME programs have some common requirements. All applicants must receive admission to the host medical school before they can apply to a PRIME program, and they then must participate in a secondary admissions process that might have requirements particular to that PRIME program. Most UC PRIME programs also include a summer introduction immersion experience, a seminar series and site visits specific to the program focus, a community engagement program, clinical placements in underserved settings, a capstone course, a leadership program, a master's degree or research fellowship, a mentorship and support program, and an outreach program. Often, some funding is available to UC PRIME students to help offset the cost of tuition.

Karla Garcia, MD, MPH, graduated from the PRIME-LC program at UC Irvine and credits this program for guiding her decisions on where to practice and whom to serve. She knew first-hand the struggles Latinos with low incomes face as she herself grew up poor, living on both sides of the Mexican border. She now practices family medicine and helps train residents at San Ysidro Health, which serves San Diego County through a network of clinics near the border.

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UC PRIME programs have primarily been funded from the support budget of each UC campus, with sporadic support from the state's general fund that is earmarked for the UC PRIME programs. The year after the launch of the first UC PRIME at UC Irvine, state funding explicitly for UC PRIME was made available to support the programs and set associated enrollment targets. The state paid \$15,000 per student from 2005-2006 to 2010-2011. After the 2010-2011 fiscal year, the state discontinued explicit PRIME funding for several years. During the 2015–2016 fiscal year, the state designated \$1.9 million (\$38,646 per student for 48 students) to the San Joaquin Valley PRIME program, and in 2021, \$12.9 million in state funding was approved for UC PRIME at \$35,600 per medical student across multiple programs.

Jirayut Latthivongskorn, MD, MPH, became the first undocumented medical student to enroll at UCSF when he began in 2013 in the PRIME-US program. After graduating in 2019, he began his residency in family medicine in downtown San Francisco and has remained an advocate for underserved groups, particularly undocumented immigrants. In 2021, Latthivongskorn received the Vilcek-Gold Award for Humanism in Healthcare.

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Table 1. University of California programs in medical education

Program name	Affiliation	Year started	Enrollment (2021–2022)	Planned enrollments <sup>a</sup>	Dedicated area of focus
PRIME-LC <sup>b</sup>	UC Irvine	2004	66	60	Latinx health issues
Rural PRIME	UC Davis	2007	32	60	Telemedicine and rural health care
PRIME-HEq	UC San Diego	2007	57	60	Health disparities and minority health issues
PRIME-US	UC San Francisco; UC Berkeley	2007	75	75	Urban underserved
PRIME-LA <sup>b</sup>	UC Los Angeles; UC Riverside; Charles R. Drew University of Med- icine and Science	2008	99	90	Leadership and advocacy
San Joaquin Valley PRIME	UC Merced; UC Davis; UC San Francisco	2011	37	48	Expanding the San Joaquin Valley physician workforce
PRIME-LEAD-ABC	UC Irvine	2020	0	24ª	Public service, social justice, and advocacy within the African, Black, and Caribbean communities
PRIME-LEAD-ABC	UC Riverside	2022	0	24ª	Public service, social justice, and advocacy within the African, Black, and Caribbean communities
PRIME-TIDE	UC San Diego	2022	0	24ª	Native populations and tribal health care
Tribal Health PRIME	UC Davis	2022	0	24ª	Indigenous communities in California's rural, urban, and valley communities
TOTAL		16	366	489	

Source: UC PRIME program websites and Drake, 2022.

<sup>&</sup>lt;sup>a</sup> Planned enrollment varies by campus. Programs from before the establishment of the San Joaquin Valley program were originally established as five-year programs that included a master's/research year (for example, 12 students over five years is 60 total students for Rural PRIME compared with 12 students per year over four years totaling 48 San Joaquin Valley PRIME students). In all, 48 slots are split between LEAD programs. At UC Riverside and UC Irvine, an additional 48 slots are split between Tribal Health programs and UC Davis and UC San Diego.

<sup>&</sup>lt;sup>b</sup> Some campuses have students who remain in the program longer than five years in order to complete a two-year master's degree program or because they have taken a leave of absence, which reflects slightly higher enrollment numbers in 2021–2022.

#### The promise of UC PRIME

In 2020, only 23% of physicians practicing in California had graduated from a medical school in California.4 Increasing the number of medical school students trained in California provides a direct increase to the state's physician supply, particularly because California ranks first in the nation for physicians retained. In 2020, 82% of physicians who completed medical school and residency in California remained in California.<sup>5</sup> Research suggests that specialized programs running throughout the course of a student's training can affect their future practice decisions, and students are more likely to practice in settings similar to their long-term training environment, whether urban, rural, safety net, or traditional.6 Students with backgrounds similar to their training settings are even more likely to practice in those environments.7

### **Approach**

To understand UC PRIME's effect on California's physician workforce, we reviewed academic and gray literature as well as document repositories compiled by contacts at the California Health Care Foundation and the University of California Office of the President. We supplemented our environmental scan with a small number of key informant interviews.

# Social impacts of UC PRIME

The literature identified notable social benefits for Californians. First, UC PRIME contributes to the diversification of medical student classes by focusing recruitment efforts on individuals committed to serving underrepresented communities. In 2000, 16% of UC medical students were underrepresented in medicine. In 2021, 40% reported underrepresented in medicine status. This shift is largely attributable to UC PRIME; in all, 68% of UC PRIME students reported underrepresented in medicine status in 2021.8 Published studies noted that several UC PRIME programs also promoted other forms of diversity, including socioeconomic disadvantage.9 Second, UC PRIME could support the growth of the primary care workforce. Two peer reviewed publications noted that a high proportion of UC PRIME graduates pursued a primary care residency, including internal medicine, family medicine, and pediatrics.10 The third social impact tied to UC PRIME is its impact on the distribution of physicians to areas of need, although the published evidence is weak. One study reported graduates' intent to practice in underserved areas: 91% of Rural PRIME graduate intended to practice in underserved areas compared with just 38% of regular track graduates at UC Davis School of Medicine.<sup>11</sup> A second publication noted the difficulty of accurately tracking graduates' practice locations. According to a 2021 publication describing UC Davis's Community Health Scholars programs, which includes UC PRIME and several other community-focused special education tracks, 56.5% to 62.3% of graduates practiced in underserved communities, depending on the data source used.12 Table 2 describes these results and others.

Table 2. Peer-reviewed publications describing PRIME program outcomes

Publication title	Publication year	Selected outcomes
Addressing Health Care Needs of the Latinx	2007	Provides a qualitative assessment of PRIME-LC program. Students report:
Community: One Medical School's Approach <sup>13</sup>		· Strong, positive relationships between students
		<ul> <li>Spill-over impacts into the general medical school population as the PRIME-LC students shared their specific knowledge</li> </ul>
Are Disadvantaged and Underrepresented Minority Applicants	2012	Among the 4,414 applications to UC San Diego School of Medicine, students also applying to the PRIME-HEq program were more likely to be:
More Likely to Apply to		• from disadvantaged backgrounds (p < 0.0005)
the Program in Medical Education-Health Equity? <sup>14</sup>		<ul> <li>from racial and ethnic groups underrepresented in medicine (p &lt; 0.0005)</li> </ul>
		• female (p < 0.0005)
Evaluation of the	2015	Among 16 JMP PRIME-US students:
Program in Medical Education for the Urban		<ul> <li>75% were from socioeconomically disadvantaged backgrounds</li> </ul>
Underserved (PRIME-US)		• 44% were Latinx
at the UC Berkeley-UCSF Joint Medical Program		• 19% were African American
(JMP): The First 4 Years <sup>15</sup>		38% pursued family medicine residencies
		• 12% pursued internal medicine residencies
		<ul><li>12% pursued pediatric residencies</li><li>7% pursued psychiatry residencies</li></ul>
University of California	2016	Among 36 PRIME-HEq students:
San Diego's Program in Medical Education-		<ul> <li>70% pursued primary care residencies</li> </ul>
Health Equity (PRIME-		• 78% pursued residencies in California
HEq): Training Future		· 100% graduated within six years
Physicians to Care for Underserved		
Communities <sup>16</sup>		
Training Medical Students for Rural, Underserved Areas: A Rural Medical	2016	Among the 499 UC Davis School of Medicine students responding to the survey (76% response rate), Rural-PRIME students were:
Education Program in California <sup>17</sup>		<ul> <li>More likely to self-identify as disadvantaged (49% versus 27% of regular track students)</li> </ul>
		<ul> <li>More likely to have rural upbringing (66% versus 16% of regular track students)</li> </ul>
		<ul> <li>More likely to report intention to practice in underserved area (91% versus 38% regular track students)</li> </ul>
		<ul> <li>More likely to report intention to practice in rural area (82% versus 13% in regular track students)</li> </ul>

Publication title	Publication year	Selected outcomes	
Assessing Program Mission and Graduate Practice Outcomes: University of California,	2021	Among the Community Health Scholar (including Rural PRIME and San Joaquin Valley PRIME) graduates at UC Davis School of Medicine between 2011 and 2020:	
Davis School of Medicine Community Health Scholars (CHS) <sup>18</sup>		60.3% to 63.7% of CHS graduates practiced internal medicine, family medicine, or pediatrics depending on the secondary data source	
		56.5% to 62.3% of CHS graduates practiced in an underserved location depending on the secondary data source	

# **Economic impacts of UC PRIME**

Several gray literature sources offered insight into the economic impact of the UC PRIME programs. The most comprehensive of these sources is the Final Report of the California Future Health Workforce Commission issued in February 2019. The report estimates that funding UC PRIME would cost roughly \$35,000 per student per year.<sup>19</sup> Because many California medical students remain in the state to practice, a sizable portion of the investment in California medical students remains within the state.<sup>20</sup> Indeed, the literature suggests that UC PRIME has contributed to growth in the physician workforce. Since 2004, 40% of the growth in UC medical school enrollment is from UC PRIME. Another 40% of the growth is attributed to the addition of a new school of medicine at UC Riverside. The final 20% of class size growth is from regular enrollment.21 UC PRIME's growth exceeds the initial goal of achieving a 10% growth in class size across the UC medical schools at PRIME's launch. Although UC PRIME is widely perceived as a good value for Californians, no one has yet formally analyzed cost effectiveness or return on investment.

# Expanding UC PRIME: Challenges and opportunities

At the programs' current capacity, UC PRIME is too small to meet the needs of underserved populations in the state. To address this need, the California Future Health Workforce Commission recommends that the state fully fund all current PRIME students

and expand enrollment by 40 students annually.<sup>22</sup> Still, little is known about the capacity to expand class size at the medical schools and how expansion might affect the schools. More research is necessary to understand whether expansion is possible and, if so, how best to pursue and support it.

Challenges to expansion exist across the full medical educational continuum. Stable initial funding remains an issue for current admissions slots as well as those that might be added in the future. Increased class size also creates continuing resource demands for medical schools and their education partners in the community, which provide clinical education in students' third and fourth years.

The recommendation calls for the state to fully fund all 354 students and to increase enrollment by 40 students per year. The estimated cost of implementing the recommendation would be \$93.5 million over 10 years (\$35,000 per student per year). Over 10 years (2020 to 2029), \$79.8 million would be used to fund 228 of the existing slots in the UC PRIME program and would yield 570 graduates (\$140,000 per graduate). Over the same 10-year period, \$13.7 million would be used to increase the number of slots by 10 per year, which would yield 60 graduates (\$227,000 per graduate); the cost per graduate is higher initially because medical school takes four years to complete.

California Future Health Workforce Commission ▲

#### Need for further research

The California Legislative Analyst's Office has called for consistent reporting of PRIME outcomes, including residency placement and practice location. Our environmental scan affirms the need for more robust research on the long-term impacts of UC PRIME and its efficacy in addressing critical issues in California's physician workforce. To build this research base, investments are required, including (1) funding for a large formal program evaluation, (2) data systems to track graduates, and (3) local evaluation infrastructure at the individual medical schools. These investments are critical for assessing questions about PRIME, including the need, capacity, and best approach for expansion.

Little is known about the long-term outcomes of UC PRIME, such as practice location or specialty, in the absence of a longitudinal, summative program evaluation across all UC PRIME programs. Our review of the literature revealed that many of the studies undertaken assessed individual PRIME programs over a relatively short period of time. It is difficult to determine the overall value of UC PRIME based on these fragmented reports, many of which describe outcomes from nearly a decade ago. For example, one study described Rural-PRIME students' intentions to practice in rural or underserved areas, but without follow-up, we cannot determine whether students maintained these intentions through their residency and practice.<sup>23</sup> A formal assessment of all programs would provide a more complete view of UC PRIME's overall impacts and a more robust understanding of variation between programs and over time.

Our research also highlighted the difficulty of tracking UC PRIME graduates longitudinally, which hampers our ability to know where students ultimately practice. It is important to understand the extent to which UC PRIME graduates elect to practice in primary care settings, serve in underserved communities (for example, a

Health Resources and Services Administration Health Professional Shortage Area or Medically Underserved Area), practice in community health centers, or serve the Medi-Cal population. The systematic assessment of these outcomes is difficult, however, because of secondary data sources' challenges with completeness, accuracy, and timeliness.<sup>24</sup> Investment in a robust tracking system beyond publicly available data sources is necessary to measure the practice outcomes of medical education.

This research also recommends investing in local program evaluation infrastructure at the individual medical schools. The initial funding for each UC PRIME program focused on developing and implementing programs, with few resources for the UC campuses to internally assess the effectiveness of their curriculum or track and report practice outcomes for their students. These laborintensive activities are difficult without the proper resources, which is underscored by the sparse representation of the programs in peer-reviewed journals. Local formative evaluation infrastructure, including support for cross-campus evaluation activities, is critical to ensure the PRIME programs create effective recruitment strategies, curricular enhancements, and supports for students.

Marco Angulo, MD, grew up with immigrant parents in East Los Angeles and initially did not go to college. He decided to attend community college in his mid-twenties, eventually becoming the oldest student in his incoming PRIME-LC class at UC Irvine when he was 36. Angulo now practices family medicine and is the medical director of Serve the People Community Health Center, a Federally Qualified Health Center serving a predominantly working-class Latinx community in Santa Ana.

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#### Conclusion

The UC PRIME programs are well positioned to address important issues in California's physician workforce, including adequate supply, physician diversity, and geographic maldistribution. The results of our environmental scan demonstrate that more attention to research and evaluation is necessary to understand the broad impacts of PRIME on the desired workforce outcomes.

## Acknowledgement

This paper was made possible by a grant from the California Health Care Foundation.

**University of California Programs in Medical Education (UC PRIME)** works to recruit and train physicians to meet the needs of California's underserved populations by offering focused recruitment pathways into medical school, specialized coursework, structured clinical experiences, and leadership development and mentoring.

California is experiencing a physician shortage.

UC PRIME accounts for 40 percent of the growth in UC medical school enrollment since 2004.



The racial and ethnic composition of California's physician workforce is not aligned with the state's overall population.

Of 366 UC PRIME students enrolled in 2021, 68 percent are from groups that are underrepresented in medicine.



California's physician supply is not distributed equitably throughout the state.

UC PRIME recruits students from underserved areas and provides tailored clinical experiences in underserved communities.



The California Future Health Workforce Commission recommends the expansion of UC PRIME programs.

#### References

- <sup>1</sup> Janet Coffman, Emmie Calimlim, and Margaret Fix, "2021 Edition California Physicians: A Portrait of Practice," California Health Care Foundation (CHCF), March 5, 2021.
- <sup>2</sup> Coffman, Calimlim, and Fix, "2021 Edition California Physicians."
- <sup>3</sup> California Future Health Workforce Commission, "Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission," California Future Health Workforce Commission, February 2019.
- <sup>4</sup> Coffman, Calimlim, and Fix, "2021 Edition California Physicians."
- <sup>5</sup> Association of American Medical Colleges, "<u>California Physician Workforce Profile</u>," Association of American Medical Colleges, 2021.
- <sup>6</sup> Amanda Kost et al., "What Is the Impact of the Underserved Pathway Program on Graduates Entering an <u>Underserved Family Medicine Residency? Five-Year</u> Findings From the University of Washington School of Medicine," Academic Medicine 93, no. 7 (July 2018): 1042-7; S.P. Mennin et al., "A Survey of Graduates in Practice from the University of New Mexico's Conventional and Community-Oriented, Problem-Based Tracks," Academic Medicine 71, no. 10 (October 1996): 1079-89; Yeri Park et al., "Nurturing the Student, Sustaining the Mission: 20 Years of the International/Inner-City/Rural Preceptorship Program," Family Medicine 51, no. 10 (2019): 823-29; Howard K. Rabinowitz et al., "Increasing the Supply of Rural Family Physicians: Recent Outcomes From Jefferson Medical College's Physician Shortage Area Program (PSAP)," Academic Medicine 86, no. 2 (February 2011): 264–69; Howard K. Rabinowitz et al., "A Program to Increase the Number of Family Physicians in Rural and Underserved Areas," JAMA 281, no. 3 (January 20, 1999): 255-60; Howard K. Rabinowitz, "Recruitment, Retention, and Follow-up of Graduates of a Program to Increase the Number of Family Physicians in Rural and Underserved Areas," New England Journal of Medicine 328, no. 13 (April 1, 1993): 934-9; and John W. Sesney, Nancy E. Kreher, and Michael J. Potts, "Graduates' Reflections on Their Rural Medical Education: The Upper Peninsula Campus Experience," The Journal of Rural Health 10, no. 4 (1994): 279-85.
- <sup>7</sup> Ian T. MacQueen et al., "Recruiting Rural Healthcare Providers Today: a Systematic Review of Training Program

  Success and Determinants of Geographic Choices," Journal of General Internal Medicine 33, no. 2 (November 27, 2017): 191–9; Vibin Roy et al., "Urban Underserved Program: An Analysis of Factors Affecting Practice Outcomes," Family Medicine 47, no. 5 (May 2015): 373–77; and Howard K..

  Rabinowitz et al., "Retention of Rural Family Physicians After 20-25 Years: Outcomes of a Comprehensive Medical School Rural Program," The Journal of the American Board of Family Medicine 26, no. 1 (2013): 24–7

- <sup>8</sup> University of California Office of the President, The Medical Education Landscape in California.
- <sup>9</sup> Jacob Bailey and Lindia Willies-Jacobo, "Are disadvantaged and underrepresented minority applicants more likely to apply to the program in medical education-health equity?" Academic Medicine 87, no. 11 (Nov. 2012):1535-9. doi: 10.1097/ACM.0b013e31826d6220. PMID: 23018330; and Suzanne Eidson-Ton et al., "Training Medical Students for Rural, Underserved Areas: A Rural Medical Education Program in California," J Health Care Poor Underserved 27, no. 4 (2016): 1674-1688. doi: 10.1353/hpu.2016.0155. PMID: 27818431; and Karen Sokal-Gutierrez et al., "Evaluation of the Program in Medical Education for the Urban Underserved (PRIME-US) at the UC Berkeley-UCSF Joint Medical Program (JMP): The First 4 Years," Teach Learn Med, 27, no. 2 (2015): 189-196. doi: 10.1080/10401334.2015.1011650. PMID: 25893941.
- <sup>10</sup> Sokal-Gutierrez et al., "Evaluation of the Program in Medical Education for the Urban Underserved (PRIME-US) at the UC Berkeley-UCSF Joint Medical Program (JMP)."; and Tamara Powell et al., "University of California San Diego's Program in Medical Education-Health Equity (PRIME-HEq): Training Future Physicians to Care for Underserved Communities," J Health Care Poor Underserved 27, no. 3 (2016): 937-946. doi: 10.1353/hpu.2016.0109. PMID: 27524742.
- " Eidson-Ton, et al., "<u>Training Medical Students for Rural,</u> Underserved Areas: A Rural Medical Education Program in California."
- Melody Tran-Reina et al., "Assessing Program Mission and Graduate Practice Outcomes: University of California, Davis School of Medicine Community Health Scholars,"
   Academic Medicine 96, no. 11S (Nov. 2021):S198-S199. doi: 10.1097/ACM.00000000000004292. PMID: 34705699.
- <sup>13</sup> Alberto Manetta, et al., "<u>Addressing Health Care Needs of the Latino Community: One Medical School's Approach,</u>" Academic Medicine 82, no. 12(December 2007):1145-51. doi: 10.1097/ACM.0b013e318159cccf. PMID: 18046116.
- <sup>14</sup> Bailey and Willies-Jacobo, "Are disadvantaged and underrepresented minority applicants more likely to apply to the program in medical education-health equity?"
- <sup>15</sup> Sokal-Gutierrez et al., "Evaluation of the Program in Medical Education for the Urban Underserved (PRIME-US) at the UC Berkeley-UCSF Joint Medical Program (JMP)."
- <sup>16</sup> Powell et al., "University of California San Diego's Program in Medical Education-Health Equity (PRIME-HEq)."
- <sup>17</sup> Eidson-Ton, et al., "<u>Training Medical Students for Rural,</u> <u>Underserved Areas: A Rural Medical Education Program in</u> California."
- <sup>18</sup> Tran-Reina et al., "Assessing Program Mission and Graduate Practice Outcomes: University of California, Davis School of Medicine Community Health Scholars."

- <sup>19</sup> California Future Health Workforce Commission, "Meeting the Demand for Health."
- <sup>20</sup> University of California Office of the President to the Members of the Health Services Committee, The Medical Education Landscape in California and Context for Future Growth, December 15, 2021.
- <sup>21</sup> Legislative Analyst's Office, <u>The 2021-22 Budget: UC</u> Programs in Medical Education, 2021; Michael Drake, University of California's report to the Legislature on Programs in Medical Education (PRIME), University of California Office of the President, 2022, February 28.
- <sup>22</sup> California Future Health Workforce Commission, "Meeting the Demand for Health."
- <sup>23</sup> Eidson-Ton, et al., "Training Medical Students for Rural, Underserved Areas: A Rural Medical Education Program in California."
- <sup>24</sup> Tran-Reina et al., "<u>Assessing Program Mission and</u> Graduate Practice Outcomes: University of California, Davis School of Medicine Community Health Scholars."



