

Impact Assessments of Recommendations from the California Future Health Workforce Commission

Independent evaluators from Healthforce Center at the University of California, San Francisco (UCSF), and Health Management Associates assessed the information and data provided in each recommendation and created impact assessments for each. The primary objective of the impact assessments is to provide unbiased and realistic estimations of the possible impact should the recommendation be successfully implemented; assessment of operational feasibility and funding availability was out of scope. The impact assessments should be viewed as distinct from the recommendations and should not be viewed as endorsements of the recommendations.

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Healthforce Center at UCSF is an organization dedicated to helping health care organizations drive and navigate change. Healthforce is the leading source for research insights into the evolving health care workforce and for pioneering capacity-building programs that prepare leaders with the knowledge and skills to drive progress toward more effective health care delivery.

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Contents

3	Recommendation 1.1
8	Recommendation 1.2
11	Recommendation 1.3
14	Recommendation 1.4
17	Recommendation 1.5
20	Recommendation 1.6
23	Recommendation 1.7
27	Recommendation 1.8
30	Recommendation 1.9
33	Recommendation 2.1
37	Recommendation 2.2
43	Recommendation 2.3
47	Recommendation 2.4
56	Recommendation 2.5
59	Recommendation 2.6
62	Recommendation 2.7
64	Recommendation 2.8
66	Recommendation 3.1
69	Recommendation 3.2
71	Recommendation 3.3
75	Recommendation 3.4
79	Recommendation 3.5
87	Recommendation 3.6
91	Recommendation 3.7
95	Recommendation 3.8
98	Recommendation 3.9
101	Recommendation 3.10

Recommendation 1.1

AUTHOR Health Management Associates

TITLE Expand and scale pipeline programs to recruit and prepare students from underrepresented and low-income backgrounds for health careers.

DESCRIPTION Implement a four-component strategy to support model health pipeline programs, including efforts to build capacity through a business plan boot camp; sustain and scale programs with proven track records; establish a center of excellence for pipeline programs to disseminate, scale, and replicate best practices; and support the California Health Professions Consortium to sustain and grow a statewide pipeline network.

MAIN TAKEAWAY Implementation of the proposed four-component strategy could result in as many as 5,500 to 5,700 underrepresented minority (URM) professionals joining the California health care workforce during a 10-year period. The program will cost \$62 million over 10 years, including \$1.2 million for capacity building, \$50 million for program funding, \$3 million for administration, \$3.75 million for the Center for Pipeline and Inclusive Excellence, and \$2.25 million for the California Health Professions Consortium Statewide Network. If the target numbers are achieved, cost per person would be approximately \$11,000.

Impact Statement

The recommended activities are intended to support pipeline programs' ability to increase the participation of minorities in health professions. The combined activities have the potential to increase the number of minority health care professionals practicing in California. The program cost of \$62 million over 10 years funds capacity building (\$1.2 million), direct program funding (\$50 million), program administration (\$3 million), the Center for Pipeline and Inclusive Excellence (\$3.75 million), and the California Health Professions Consortium Statewide Network (\$2.25 million).

Research has shown that well-run and adequately funded pipeline programs help students from disadvantaged backgrounds aspire to and achieve successful careers

as health care professionals. There is also evidence suggesting that some members of minority communities prefer practitioners who share their race/ethnicity and/or language. Research shows that over a 20-year period, a pipeline program can increase college graduation rates for black students by 62%, for Hispanic students by 73%, and for Native American students by 72%. The expanded programs supported by the Center for Pipeline and Inclusive Excellence and the California Health Professions Consortium Statewide Network together have the potential to achieve the results suggested in the recommendation. In a program scaled to the extent envisioned by the recommendation, graduation rates for underrepresented minorities could be as high as 78% to 82% overall, which, assuming that about 7,000 URM students are in the program over the envisioned 10-year period, the California health care workforce could see an increase of about 5,500 to 5,700 URM professionals. Such an increase could improve access for patients in minority communities, as minority providers are more likely to treat minority patients and more likely to serve in poor and rural areas. The correlation between race/ethnicity concordance and improved outcomes is much weaker, suggesting other factors impact outcomes as much as race/ethnicity concordance.

Key Assumptions

- ▶ It will be possible to identify effective pipeline programs and scale them to the degree proposed with little loss of effectiveness.
- ▶ The program will last at least 10 years, with an average yearly cost of \$5 million for years 2 to 5, an average yearly cost of \$6 million for years 6 to 10, and a \$1 million evaluation cost.
- ▶ California's population growth and demographic changes will continue according to current projections.
- ▶ Over a 10-year period, about 7,500 students (participating in 50 pipeline programs) would gain the benefits of comprehensive support.

Data Notations and Context

By 2030, California’s population is projected to reach 44 million. Annual growth rates are expected to be 0.8% over the coming decade, similar to growth experienced from 2008 to 2018. Even so, average annual increases between now and 2030 will exceed 333,000.

The inland areas of California have experienced faster growth rates than the coastal areas for many decades, but coastal counties are still home to most of the state’s population. That pattern is projected to continue, with the Inland Empire, the San Joaquin Valley, and Greater Sacramento projected to grow faster than other areas of the state.

In 2015, Hispanics replaced non-Hispanic white people as the state’s largest ethnic group. By 2030, 41.5% of the state’s population will be Hispanic, and 35.8% will be white. Hispanics already make up 52% of children age 17 and younger.

Population. Public Policy Institute of California, January 2018. www.ppic.org (PDF).

California Population, Residents Without Personal Physician, and Medical School Graduates, by Race/Ethnicity, 2017

	POPULATION	ADULTS REPORTING NOT HAVING A PERSONAL DOCTOR	MEDICAL SCHOOL GRADUATES*
African American	6.5%	17.3%	4.2%
Asian	15.2%	18.9%	34.2%
Hispanic (non-white)	39.1%	35.5%	9.7%
Native American / Native Hawaiian / Pacific Islander	2.1%	Not enough data reported	0.1%
White (non-Hispanic)	37.2%	17.8%	35.4%

*Does not include osteopathic medical schools.

Sources: “Distribution of Medical School Graduates by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org; and “Percent of Adults Reporting Not Having a Personal Doctor by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org.

Data Sources and References

Marrast, L. M., et al. "Minority Physicians' Role in the Care of Underserved Patients: Diversifying the Physician Workforce May Be Key in Addressing Health Disparities." *JAMA Intern Medicine* 174, no. 2 (2014): 289–91. doi:10.1001/jamainternmed.2013.12756.

- ▶ The study found that non-white physicians cared for 53.5% of minority and 70.4% of non-English-speaking patients surveyed.
- ▶ With the exception of those who were uninsured, patients from underserved groups were significantly more likely to see non-white physicians than white physicians. Patients of black, Hispanic, and Asian physicians were more likely to have Medicaid; patients of Hispanic physicians were more likely to be uninsured.
- ▶ Higher proportions of black physicians' patients were obese, had self-reported fair or poor health, and used the emergency department.
- ▶ Patients of Asian and Hispanic physicians exhibited several health status measures that were better than those of patients of white physicians, but many of those patients self-reported fair or poor health.

National Standards for Culturally and Linguistically Appropriate Services in Health Care. US Department of Health and Human Services, March 2001. minorityhealth.hhs.gov (PDF).

This study identified several advantages to recruiting health professionals from underrepresented minority groups:

- ▶ Minority health professionals disproportionately serve minority populations.
- ▶ Minority patients tend to receive better care from providers who are demographically similar or of the same racial and ethnic background.
- ▶ People for whom English is a second language, or who do not speak English at all, communicate better with providers who speak their primary language and are more likely to keep follow-up appointments when treated by professionals who speak the same language.

Williams, S. D., et al. "Using Social Determinants of Health to Link Health Workforce Diversity, Care Quality and Access, and Health Disparities to Achieve Health Equity in Nursing." *Public Health Reports* 129, no. 2 (Jan.–Feb. 2014): 32–36. doi:10.1177/003335491412915207.

Health care professionals from underrepresented groups are more likely to serve in poor or rural communities.

Meghani, Salimah H., et al. "Patient-Provider Race-Concordance: Does It Matter in Improving Minority Patients' Health Outcomes?" *Ethnicity & Health* 14, no. 1 (Feb. 2009): 107–30. doi:10.1080/13557850802227031.

- ▶ The researchers examined 27 studies (including 56,276 patients and 1,756 providers) that met the inclusion criteria. White people (37.6%) and African Americans (31.5%), followed by Hispanics/Latinos (13.3%) and Asians / Pacific Islanders (4.3%) comprised the majority of the patient sample. The median sample of providers was only 16 for African Americans, 10 for Asians, and 2 for Hispanics.
- ▶ The review presented mixed results. Of the 27 studies, patient-provider race concordance was associated with positive health outcomes for minorities in only 9 studies (33%), while 8 studies (30%) found no association of race concordance with the outcomes studied, and 10 (37%) presented mixed findings.
- ▶ The researchers' analysis suggested that having a provider of the same race did not improve "receipt of services" for minorities.
- ▶ No clear pattern of findings emerged in the domains of health care utilization or patient-provider communication, preference, satisfaction, or perception of respect; further research is needed to understand what health outcomes may be more sensitive to cultural proximity between patients and providers, and what patient, provider, and setting variables may moderate or mediate these outcomes.

Katz, Janet R., et al. "Measuring the Success of a Pipeline Program to Increase Nursing Workforce Diversity." *Journal of Professional Nursing* 32, no. 1: 6–14.

- ▶ This study showed that students might not have an accurate view of the demands of college and of the benefits of a career in nursing. Some participants realized that they may need more support in attending college than they previously thought. They also came to see that as a nurse they could live in their community, make enough money to reach financial goals, and that nursing was a profession with autonomy, respect, and honor.
- ▶ Pipeline programs provide an imperfect but viable option for increasing the number of American Indian / Alaska Native, African American, and Hispanic students who enter and graduate college and become health professionals.
- ▶ Programs should be based on the strengths of the community, students, and parents, in addition to offering social and educational experiences and support. This can be accomplished through community-engaged comprehensive pipeline programs for high school and prenursing or pre-professional students. These students might be more likely to fill workforce needs, reducing health disparities of the communities in which they serve.

Winkleby, Marilyn A., et al. "Increasing Diversity in Science and Health Professions: A 21-Year Longitudinal Study Documenting College and Career Success." *Journal of Science Education and Technology* 18, no. 6 (Dec. 2009): 535–45.

- ▶ This study analyzed the effectiveness of the Stanford Medical Youth Science Program (SMYSP), a five-week summer residential program for low-income high school students.
- ▶ A total of 476 high school students participated between 1988 and 2008, with 61% from under-represented ethnic minority groups. Overall, 78% of African American, 81% of Latino, and 82% of Native American participants earned a four-year college degree (among those admitted to college, and excluding those currently attending college).

In contrast, at the time of the study, among 25- to 34-year-old California adults, 16% of African Americans, 8% of Latinos, and 10% of Native Americans earned a four-year college degree. Among SMYSP's four-year college graduates, 47% were attending or completed medical or graduate school, and 43% were working as (or training to become) health professionals.

- ▶ SMYSP offers a model that expands inquiry-based science education beyond the classroom, and recognizes the role of universities as "high school interventionists" to help diversify health professions.

Altering the Course: Black Males in Medicine. Assn. of American Medical Colleges, 2015.

www.aamc.org (PDF).

- ▶ While many initiatives and programs supported by foundations, medical schools, and government have contributed to increasing diversity in the physician pipeline, the number of black male applicants in 2014 (1,337) has not increased above the number of black applicants from 1978 (1,410). A similar trend is observed for first-time matriculants: In 1978, there were 542 black male matriculants to MD-granting institutions, and in 2014, there were 515.
- ▶ Of all racial and ethnic groups, the proportion of applicants to medical school who were male compared with female is lowest for African Americans — despite an overall increase in the number of black male college graduates.
- ▶ Continued support and development of premedical programs were noted as critical to developing the next generation of physicians, including black males in particular. Institutionalizing programs and focusing on sustainability were noted as critical tasks for academic medicine leadership.

Condon, Vaneta M., et al. "A Program to Enhance Recruitment and Retention of Disadvantaged and Ethnically Diverse Baccalaureate Nursing Students." *Journal of Transcultural Nursing* 24, no. 4 (Oct. 1, 2013): 397–407. doi:10.1177/1043659613493437.

- ▶ The study followed a population of 77 disadvantaged and ethnically diverse students who were accepted into a prenursing program preparation quarter. The program included six pre-entrance classes; academic, social, and financial support; and seven faculty development workshops. Program outcomes were studied using student records, survey results, and interviews.
- ▶ Following the pre-entrance quarter, all 77 students were accepted into the baccalaureate nursing program, 90.9% graduated with either a bachelor in science degree (75.3%) or associate in science degree (15.6%), and 98.6% of the graduates passed the state board registered nursing examination.
- ▶ The researchers stressed that educators and recruiters for nursing practices should hire culturally diverse students and nurses to expand the ethnic diversity of the nursing workforce to meet the needs of culturally diverse clients. Further research is needed to determine the classes/ components and length of the pre-entrance preparation program to successfully enhance success.

Duffus, Wayne A., et al. "Training Racial and Ethnic Minority Students for Careers in Public Health Sciences." *Amer. Journal of Preventive Medicine* 47, no. S3 (Nov. 2014): S368–S375. doi:10.1016/j.amepre.2014.07.028.

- ▶ This study indicated that in 1982–2010, a large number of Project Imhotep Summer Interns (a health care pipeline program held at Morehouse College) graduated from college, pursued graduate school, and most became employed in the public health sector. During its 28 years of operation, Imhotep has prepared approximately 481 college graduates (92% of whom are non-Hispanic black students) to earn the advanced degrees necessary to be public health scientists and practitioners in the public health workforce.

- ▶ The study measured evidence of the contribution of Imhotep to the public health workforce, including an association between selected student attributes at entry into Imhotep and earning a graduate or professional degree subsequently, as well as reporting a history of ever being employed in the public health sector. The 100% rate of college graduation in this group of non-Hispanic black students exceeds the national average of college completion in six years in four-year institutions for such students overall (38.9%–42.1%), public colleges (36.8%–40.8%), nonprofit colleges (44.6%–45.9%), and for-profit colleges (16.1%–34.9%). In addition, of all students enrolled in Imhotep, 70.9% completed graduate degrees; of these, 59.6% pursued public health science careers.
- ▶ However, the scope and methods of this study did not enable researchers to quantify the impact of Imhotep graduates on the racial and ethnic diversity of the US public health workforce. For context, however, of the 7,585 students who graduated in 2010 with master's and doctoral degrees from US schools of public health and public health programs that were members of the Association of Schools of Public Health, 800 (10.5%) were black / African American.

Recommendation 1.2

AUTHOR Health Management Associates

TITLE Recruit and support college students, including community college students, from underrepresented regions and backgrounds to pursue health careers.

DESCRIPTION The recommendation is to fund and establish a California Health Career Opportunity Program and associated HCOP partnerships, which will support more than 4,800 prehealth college students annually at institutions across California, providing comprehensive academic enrichment, career development, mentorship, and advising. Students from Health Professional Shortage Areas, low-income and first-generation backgrounds, and groups underrepresented in the health professions will be targeted for inclusion.

MAIN TAKEAWAY The California Health Career Opportunity Program (CAHCOP) and associated HCOP partnerships have the potential to add at least 25,500 new California health care workers, including 20,000 to 23,000 from underrepresented minority communities. Proposed 10-year funding is \$159 million, with \$100 million to support the 20 HCOP pilots, \$45 million for fellowships and internships, and the remaining \$14 million supporting the CAHCOP office and the administration of internships and fellowships.

Impact Statement

The CAHCOP and associated HCOP partnerships have the potential to add underrepresented minority (URM) providers to California's health care workforce. The effort would be funded at \$159 million over 10 years (\$100 million supporting 20 HCOP pilots, \$45 million for fellowships and internships, and \$14 million supporting the CAHCOP office and the administration of internships and fellowships). If deployed on the scale proposed (about 48,000 students over 10 years) with training course completion rates similar to those in Health Profession Opportunity Grants (HPOG) (74%), at least 35,500 students would complete occupational training over a 10-year period. At least 72% of those students (25,500) would be expected to be employed in a health care position after completing training.

As current research does not identify the long-term rate of workforce participation for similarly situated students, it is not clear how many such health care professionals would remain in the workforce over 10 or more years. Research from the biology diversity program at the University of California, Berkeley (UC Berkeley), does not show consistent results among all participating students but has found improved grade point average results for minority students. Research also has shown that students who complete health care training programs and achieve occupational licensing earn as much as \$4,500 more than students in a control group over a two-year period. Students completing certification through programs such as CAHCOP might have slightly greater earning power, at least in the early years of their careers. If CAHCOP targets the same students as do other federal programs, 80% to 90% of the funded students would be from URMs, for a 10-year increase in URM health care professionals of about 20,400 to 23,000. Additionally, the program envisions 5,000 internships and fellowships in addition to the 48,000 students participating in CAHCOP.

Key Assumptions

- ▶ The CAHCOP will consist of 20 five-year HCOP pilot programs, which would be extended a further 5 years (for a total of 48,000 over 10 years).
- ▶ One program will be located on five campuses in each of the California State University, University of California, and California Community College systems, plus up to five programs at private universities for a total of more than 4,800 students annually.
- ▶ The programs would maintain roughly the same size and enrollment for a 10-year period.
- ▶ Short-term CAHCOP impact rates will be similar to, or at least as good, as the short-term occupational success rates of the HPOG recipients (about 74%).
- ▶ After the initial five-year pilot program, the program would continue for an additional five years at a cost of \$15.9 million per year.

- ▶ The CAHCOP would have demographic statistics similar to the national HCOP statistics published by the Health Resources and Services Administration / Bureau of Health Workforce.
- ▶ As it is unknown whether former CAHCOP participants could participate in the fellowship and internship programs; to avoid double counting, we have not included projections for those programs.

Data Notations and Context

By 2030, California’s population is projected to reach 44 million. Annual growth rates are expected to be 0.8%, similar to growth experienced in the last decade of this century. Even so, average annual increases between now and 2030 will exceed 333,000 — equivalent to adding the population of a city the size of Santa Ana each year.

The inland areas of California have experienced faster growth rates than the coastal areas for many decades, but coastal counties are still home to most of the state’s

population. That pattern is projected to continue, with the Inland Empire, the San Joaquin Valley, and Greater Sacramento projected to grow faster than other areas of the state.

In 2015, Latinos replaced non-Hispanic white people as the state’s largest ethnic group. By 2030, 41.5% of the state’s population will be Latino, and 35.8% will be white. Latinos already make up 52% of children age 17 and younger.

Population. Public Policy Institute of California, January 2018. www.ppic.org (PDF).

California Population, Residents Without Personal Physician, and Medical School Graduates, by Race/Ethnicity, 2017

	POPULATION	ADULTS REPORTING NOT HAVING A PERSONAL DOCTOR	MEDICAL SCHOOL GRADUATES*
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*Does not include osteopathic medical schools.

Sources: “Distribution of Medical School Graduates by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org; and “Percent of Adults Reporting Not Having a Personal Doctor by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org.

Data Sources and References

Werner, Alan, et al. *Literature Review: Career Pathways Programs*. OPRE Report #2013-24. US Dept. of Health and Human Services, 2013.

Maguire, S., et al. *Tuning In to Local Labor Markets: Findings from the Sectoral Employment Impact Study*. Public/Private Ventures, 2010.

- ▶ This was a two-year, randomized control trial evaluating three sectoral programs that train workers for skilled positions in various industries, including health care, manufacturing, information technology, and construction. The study assessed impacts on employment, earnings, hourly wages, and access to work-related benefits and considered variation in impacts for a number of subgroups, including welfare recipients and people with a criminal background and other variations associated with participant demographics, employment experience, and educational background.
- ▶ Program participants were employed an average of 1.3 months more than control group members and were more likely to receive benefits at their jobs.
- ▶ Program participants earned about \$4,500 more than control group members over a two-year period, with most of the increases occurring in the second year.

Peck, Laura R., et al. *Health Profession Opportunity Grants (HPOG 1.0) Impact Study Interim Report: Program Implementation and Short-Term Impacts*. OPRE Report 2018-16a, May 2018.

- ▶ At the time of the follow-up survey (about five calendar quarters), 67.6% of the HPOG program group had completed training (or was currently enrolled) versus 60.3% of the control group, a 12% increase.
- ▶ The impact on educational progress seems to have been driven largely by an increase in the completion of occupational training. As of the survey follow-up, 50% of the treatment group had obtained a certificate, license, or credential versus 40% of the control group. This 10 percentage point increase represents a 25% relative impact.

- ▶ The HPOG cohorts experienced increased employment in the health care sector by about one-fourth (27%) and increased access to employer-sponsored health insurance by 4%.

Matsui, J., R. Liu, and C. M. Kane. "Evaluating a Science Diversity Program at UC Berkeley: More Questions Than Answers." *Cell Biology Education* 2 (2003): 117–21.

- ▶ Founded in 1993, a diversity program at UC Berkeley — the Biology Scholars Program — has attempted to increase the participation and success of students majoring in the biological sciences.
- ▶ A quantitative comparison of students inside and outside of the Biology Scholars Program indicates that students in the program graduate with a degree in biology at significantly higher rates than students not in the program regardless of race/ethnicity.
- ▶ Students who are in the Biology Scholars Program have statistically lower high school grade point averages and Scholastic Achievement Test (SAT) scores than students not in the program.
- ▶ African American and Hispanic students who join the Biology Scholars Program graduate with significantly higher grade point averages in biology than African American and Hispanic students not in the program.
- ▶ Asian and white students in the Biology Scholars Program graduate with statistically similar biology grade point averages, despite having lower SAT scores, than non-program white or Asian students.

Health Careers Pipeline and Diversity Programs: Academic Year 2016-2017. National Center for Health Workforce Analysis, n.d. bhw.hrsa.gov (PDF).

In the 2016–17 academic year, HCOP programs associated with 17 funded entities included 1,234 funded trainees (83.8% were URM and 97.2% disadvantaged), of whom 908 completed the program.

Recommendation 1.3

AUTHOR Healthforce Center at UCSF

TITLE Support scholarships for qualified students who pursue priority health professions and serve in underserved communities.

DESCRIPTION The proposed action — to develop and implement a new Emerging California Health Leaders Scholarship Program (ECHLSP) — would cover full tuition for 10% of students enrolled in eligible California health professions education programs (more than 1,000 students per year at current enrollment levels) to enable more Californians to pursue degrees in high-need health professions and practice in underserved communities. Scholarships would be available to low-income, first-generation, and underrepresented students pursuing MD/DO, nurse practitioner (NP), registered nurse (RN), physician assistant (PA), master’s in public health (MPH), and master’s in social work (MSW) degrees in return for a three-year service commitment after graduation. A subset of recipients would also receive support to prepare for graduate programs.

MAIN TAKEAWAY The development and launch of the Emerging California Health Leaders Scholarship Program (ECHLSP) is estimated to cost \$480 million over 10 years and would result in thousands of students receiving tuition scholarships (one to four years) in exchange for service agreements of one to four years in underserved regions in California. Assuming the program is designed to maximize the length of service agreement years by providing as many full-tuition scholarships as possible, approximately 3,810 (1,707 MD/DOs, 696 nurse practitioners, 152 physician assistants, 325 public health professionals, and 930 social workers) would be supported over the next 10 years at a per-student cost of \$126,000. This would increase the number of health professionals working in underserved communities (assuming all fulfilled their service agreements) and diversify the health care workforce.

Impact Statement

The proposed action — to develop and implement a new Emerging California Health Leaders Scholarship Program (ECHLSP) — would annually cover tuition for 10% of all students enrolled in eligible California health professions education programs (1,032 students per year at current enrollment levels) to enable more Californians to pursue degrees in high-need professions and practice in underserved communities. Scholarships would be available to low-income, first-generation, and underrepresented students committed to primary care practice and pursuing nurse practitioner (NP), registered nurse (RN), physician assistant (PA), master’s in public health (MPH), master’s in social welfare (MSW), and MD/DO degrees. Scholarship recipients would agree to serve in underserved communities for each year of tuition funding they received.

The program is estimated to cost \$41 million to fund the first year of tuition for the first cohort, plus start-up and administrative costs. Assuming 10% of students in eligible degree programs receive scholarships each year, the program would cost about \$480 million over 10 years. The exact number of scholarships provided in exchange for service agreements will vary depending on when in their program students receive support and for how many years of their program, as well as other program design variables. A scenario that maximizes the length of service agreement years by providing as many full-tuition scholarships (ranging from two to four years depending on degree program) as possible would support 3,810 students from various programs (1,707 MD/DOs, 696 NPs, 152 PAs, 325 MPs, and 930 MSWs over 10 years) at a per-student cost of about \$126,000. Assuming all students complete their degree programs and fulfill their service agreements, all of these students would go on to work for one to four years in underserved communities in California. And given that these would be low-income, first-generation, and underrepresented students, this recommendation would diversify the health care workforce. This increase in health professionals may in turn lead to expanded access to care in underserved communities and may increase the number of Californians with access to a provider of similar social, ethnic, and linguistic background, which may improve patient satisfaction.

Key Assumptions

- ▶ Educational debt is a major deterrent to entering primary care and other high-need specialties, particularly for first-generation, bilingual, and under-represented minority students.
- ▶ Although a number of existing and new programs are providing scholarships to low-income health care students, they are not sufficient to meet projected needs or to adequately diversify the health care workforce. California already faces shortages of and lack of ethnic and language diversity among health care workers, as well as regional disparities in access to care. California overall has 50 primary care physicians and 104 specialists per 100,000 residents. On the other hand, the corresponding values for the San Joaquin Valley are 39 and 65, and for the San Francisco Bay Area, 64 and 138. Experts recommend that a given region should have 60 to 80 primary care physicians and 85 to 105 specialists per 100,000 residents.
- ▶ People who are awarded a scholarship would not otherwise work in high-need health professions and practice in underserved communities (and might not earn a health professions degree at all) if the scholarship were not available.
- ▶ Estimated scholarship costs are based on a specific scenario in which 10% of students in each targeted degree program (based on current enrollments) receive tuition scholarships each year (see Appendix C of the recommendation).
- ▶ The scenario presented in the impact statement assumes the intent is to maximize the number of full-tuition scholarships (i.e., funding for all years of a student's degree program) to maximize the length of service agreements.
- ▶ Costs and benefits are based on the assumption that all available scholarships are actually awarded, and that all awardees complete their degree programs and fulfill their service commitments.

Data Notations and Context

UNCERTAIN EFFECTIVENESS The background document for this policy presents evidence that is equivocal about the extent to which scholarships will attract more low-income/minority students into health care or high-need fields and high-need regions specifically. The article cited in support presents an analysis of the career net present value of various medical specialties under various scenarios (e.g., with and without scholarships) but doesn't present data or modeling on the real-world effect of scholarships (or other potential programs or policies) on people's actual choices. Presumably, making medical education cheaper will attract at least some people, but expected lifetime earnings in different specialties and practice locations might have much larger effects.

Since the scholarship funds would only be spent to the extent that the program attracts people willing to make the commitment to practice in certain specialties and serve in high-need regions, there's likely not much financial downside in offering the scholarship. If many people take advantage of it, then the scholarship will have fulfilled its purpose. If not, the funds won't be spent. As a result, the risk of the money being squandered is probably low.

However, if the policy doesn't attract many students, the problem it's trying to solve (shortages of providers in certain specialties and regions) won't improve as much as desired, and time and political capital will have been wasted on an ineffective policy. As a result, it would be helpful to marshal more evidence on how effective this policy is likely to be, and whether there are specific design factors that could make it more likely to have its intended effects.

Data Sources and References

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Recommendation 1.4

AUTHOR Healthforce Center at UCSF

TITLE Increase postbaccalaureate program slots for students reapplying to medical school from underserved communities.

DESCRIPTION This recommendation proposes that from 2021 to 2030, an additional 100 postbaccalaureate slots per year would be funded for qualified people from underrepresented minority (URM) and disadvantaged backgrounds who applied to health professions school previously but were not admitted. The 100 additional postbaccalaureate reapplicant slots would be prioritized for qualified URM students from designated Health Professional Shortage Areas (HPSAs). Priority would also be given to students with demonstrated interest in the Commission's three priority areas — primary care, behavioral health, and aging. Scholarships would be provided to cover 100% of tuition charged by postbaccalaureate programs.

MAIN TAKEAWAY The recommendation would provide training and guidance to enable 795 Californians to graduate from medical school, 581 of whom would be members of racial/ethnic groups that are underrepresented among physicians. Estimated to cost \$26 million over 10 years, this recommendation would cost approximately \$32,700 per participant graduated from medical school.

Impact Statement

Over 10 years, this recommendation would enable 1,000 additional California medical school reapplicants from underrepresented or disadvantaged backgrounds to obtain additional training and guidance that would increase their likelihood of admission to medical school. If participants are admitted to and graduate from medical school at the same rates as alumni of the University of California (UC) Postbac Consortium, 820 participants (82%) would be admitted to medical school, and 795 (79.5%) would graduate from medical school; 599 of those admitted to medical school and 581 of those who graduate from medical school would be URMs. Data provided to the Commission suggest that the cost associated with this recommendation would be \$2.6 million per year and \$26 million over 10 years. The estimated cost per participant graduated would be \$32,700.

Findings from a study of alumni of the UC Postbac Consortium indicate that alumni who practice in California are more likely than other California physicians who attended the same medical schools during the same time period to practice in communities with high rates of poverty and in communities with high percentages of Latino or African American residents. Thus, the recommendation may increase the supply of physicians in these communities, which could reduce travel times and wait times for appointments. Data on alumni of the UC Postbac Consortium suggest that 60% of participants who are admitted to medical school (estimated at 477 of the physicians produced by this recommendation) would practice as primary care physicians, a percentage that is substantially higher than the percentage of all US physicians (34%). Increasing the number of URMs who participate in reapplicant postbaccalaureate programs similar to those of the UC Postbac Consortium would also increase the number of Californians with access to a physician of the same race/ethnicity, which may improve patient trust and satisfaction.

Key Assumptions

- ▶ Funds would be provided to support 100 additional slots per year for 10 years.
- ▶ All slots would be utilized.
- ▶ All participants would be from underrepresented or disadvantaged backgrounds who had previously applied to medical school but were not accepted.
- ▶ All postbaccalaureate programs at which slots would be funded would prepare participants for admission to medical school. None would focus on preparing students for admission to other types of health professions schools.
- ▶ The percentage of participants in postbaccalaureate programs who are URMs is 73%.
- ▶ The percentage of participants in postbaccalaureate programs who are accepted to any medical school is 82%.
- ▶ Existing postbaccalaureate programs would be able to expand to provide additional slots.

- Medical school enrollment and residency positions would be sufficient to absorb the projected number of additional medical students. Four new medical schools, including one in California, have applied to the Liaison Committee on Medical Education for accreditation. Two additional universities in California have announced plans to open medical schools and apply for accreditation by the Liaison Committee on Medical Education and the Commission on Osteopathic College Accreditation.

Data Notations and Context

The assumption that the number of URM Californians who apply to medical school would not change between 2017 and 2030 may not be realistic. Future analyses should attempt to get historical data on numbers of URM Californians who apply to medical school to build in a growth-rate assumption.

URM applicants could not be disaggregated into specific racial/ethnic groups due to limitations in the data supplied by Robert Montoya. Future analyses should ask the AAMC for more-specific data.

Healthforce is unaware of studies that demonstrate that investment in postbac programs would generate cost savings for government and private health care payers. Investing in postbac programs for people from underrepresented racial/ethnic groups could increase the number of consumers who have race-concordant providers (and potentially linguistically concordant providers), which studies suggest could improve patient trust and satisfaction. Higher levels of trust and satisfaction may lead to better compliance with treatment regimens, which might reduce use of acute care and improve health outcomes among consumers from racial/ethnic groups that are underrepresented among physicians. Similarly, postbac programs may increase the number of primary care physicians in underserved areas, which may improve access to primary care, which could also reduce use of acute care services and improve health outcomes. However, Healthforce knows of no studies that have tested these assumptions. Moreover, even if these assumptions are correct, the cost of care is affected by many other factors, including the level of concentration in the health care market.

The source of the data used to estimate costs is not indicated in the recommendations document.

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Recommendation 1.5

AUTHOR Health Management Associates

TITLE Expand funding for educational capacity, stipends, and scholarships to strengthen the size, distribution, and diversity of the behavioral health workforce.

DESCRIPTION Increase and make permanent the level of funding available for investment in behavioral health scholarships, stipends, and educational capacity. This initiative includes three areas of activity: (1) increase support for loan forgiveness and stipend programs for psychiatrists, clinical psychologists, marriage and family therapists, and licensed professional clinical counselors, and add eligibility for substance abuse counselors; (2) expand education and training capacity in social work and other professions currently turning away qualified, diverse applicants; and (3) fund scholarships for bilingual candidates.

MAIN TAKEAWAY Increasing the availability of financial support to offset the costs of graduate and other professional education has the potential to increase the supply of providers in underserved areas and to address the growing demand for behavioral health services. The total program cost, \$341.5 million over 10 years, would increase the number of behavioral health (BH) providers over 10 years: \$314.5 million in loan forgiveness and stipends for 25,000 providers (\$12,580 per provider); and \$25 million in scholarships for 1,000 total bilingual BH providers (\$25,000 per provider). Although most of the literature on loan forgiveness and other financial incentives focuses on physician programs and behaviors, one can infer that stipends for nonphysician BH providers and scholarships for bilingual BH providers would positively influence retention of these providers in underserved areas. Challenges to implementation reduce the potential positive impacts to the supply of health professionals and improved access to care.

Impact Statement

Increase loan forgiveness and stipend programs for behavioral health providers: Addressing educational debt for BH providers is an important undertaking, justified in part by numerous studies indicating that physicians (and presumably other health professionals) with lower levels of debt are more likely to practice in underserved areas. Dedicating an average of \$13,000 (including the proposed annual adjustment) per potential BH licensee as a one-time allocation toward stipends, scholarships, or loan repayment is likely to support about 12,500 BH providers over five years (62.5% of the projected 20,000 BH provider increase). Over 10 years at the same dollar amount, nearly 25,000 BH licensees could be supported (at a cost of \$316.5 million). While there is limited literature showing the effectiveness of these types of financial incentives in retaining and sustaining non-physician BH providers in underserved areas, based on the evidence for physicians, non-physician BH providers accessing this program would be 20% to 30% more likely to remain in practice in underserved areas.

Develop large-scale scholarship programs for bilingual candidates: There are now several programs in California and elsewhere in the US targeting and developing bilingual BH workers for degree studies and work in underserved areas, but no useful evaluations to date. Based on anecdotal data on program costs and outcomes, they tend to be resource intensive due to the need for more support to prepare “faculty” in agencies and other community settings. The sooner that programs such as these are replicated, the sooner the costs of such programs will be reduced. Program implementation (one-time \$25,000 scholarships each year for 10 years for 100 non-physician, degree-seeking, bilingual BH providers, for a total of \$25 million) is likely to have higher costs in the first 5 to 10 years of implementation. A rigorous evaluation would be informative for future endeavors in support of BH workforce development.

Key Assumptions

- ▶ Investments of \$27.7 million in year 1 and \$341.5 million over 10 years are needed to implement this proposal. Specific investments include:
 - ▶ \$314.5 million for stipends, loan forgiveness, educational capacity, and pipeline development to replace sunsetting WET funding. \$25 million would be provided in year 1 plus 5% annual increases to accelerate progress toward target workforce goals.
 - ▶ \$2 million for program evaluation and tracking at \$200,000 annually to support annual and cumulative outcomes reporting.
 - ▶ \$25 million in scholarship funding for bilingual students to pursue graduate training in social work, nursing, psychology, and therapist professions.
- ▶ Scholarships of \$25,000 per year for 100 students would be provided annually. For the scholarships, stipends, loan repayment program (Component 1) described above, average amounts of \$10,000 are proposed as onetime incentives to eligible, licensed BH workers. This would result in 2,500 BH workers assisted each year (larger average amounts would result in fewer assisted each year: 1,667 @ \$15,000; 1,000 @ \$25,000).
- ▶ All funds included in the estimated costs for this recommendation are entirely directed to the programs described, and administrative funds for program management are to be borne elsewhere. If those costs are to be covered in this budget, that will reduce the overall dollars available for BH workforce development.

Data Notations and Context

While loan repayment programs (LRPs) and stipends may encourage retention, several literature reviews and studies indicate that for BH providers in particular, retention be increased by including professional development and quality supervisory opportunities.

As described above, no administrative/program management costs are included in this analysis. The assignment of only one agency or organization to be responsible for the overall management of these programs (in much the same way that OSHPD currently manages the MHSA Work Force Education and Training [WET] Program) will reduce expenditures needed for program management.

Although not addressed in this recommendation, creating clinical training opportunities in underserved areas and with exposure to low income patients also increases the likelihood that providers will select and remain in those practice settings.

While there is some data on what influences physicians to work in underserved areas, and to choose to work with patients of minority race/ethnicity, there is limited data on what influences other behavioral health workers' practice decisions. Still, there is strong data indicating that providers (physicians, in particular) are more likely to practice in the area where they trained, or in practice settings similar to those to which they were exposed during their training.

The authors of this Recommendation were thoughtful in including a budget for evaluation of the stipend and LRP is program. It is noteworthy that the documentation of outcomes from the existing MHSA Workforce Education and Training is extremely limited to date (and available largely through MHSA expenditure reports that include variable amounts of data from one report to the next). Data capture and more transparent reporting of outcomes is highly recommended.

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Recommendation 1.6

AUTHOR Health Management Associates

TITLE Expand and strengthen loan repayment programs for primary care physicians practicing in safety-net settings and underserved communities.

DESCRIPTION This recommendation proposes a three-part strategy: (1) conduct an assessment to identify ways to address structural issues with current loan repayment programs (LRPs) — for example, simplify applications, reduce matching requirements, increase annual awards, expand pool of LRP-eligible professionals; (2) increase funding for current and new LRPs tied to achieving targeted staffing levels; and (3) pilot efforts to promote LRPs and to market safety-net job opportunities to program participants in three high-need regions.

MAIN TAKEAWAY Increasing the availability of loan repayment programs (LRPs) to primary care providers (PCPs) would increase the supply of PCPs in underserved areas and increase access to care as measured by outpatient visits, although not at the levels proposed in the recommendation. Using conservative calculations, by year 5 of the program, 727 new PCPs (750, adjusted down for attrition) would be participating in the LRP. Assuming an attrition rate of 2% to 3%, the LRP participants would provide 7.08 million total additional visits during the first 5 years, and close to 28 million cumulative after 10 years of the program. There is limited literature and data to assess the impact of marketing and placement services for these programs. The total program cost would be \$353.75 million, including \$350 million for loan repayment over 10 years, along with \$3.65 million for placement in years 1 to 3 and \$100,000 for a year-1 program assessment.

Impact Summary

This analysis addresses the three elements of this recommendation.

Identify ways to address structural issues with current loan repayment programs. In the face of ongoing disparities in access to, and the distribution of, primary care physicians in California and across the US, there is a pressing need to identify effective incentives to encourage primary care providers (PCPs) to practice in underserved areas. Addressing educational debt for PCPs is an important undertaking, justified in part by numerous, mostly observational studies indicating that physicians (and presumably other primary care professionals) with lower levels of debt are more likely to practice in underserved areas. Understanding the true effect of LRPs is somewhat complicated by what appears to be a self-selection bias that occurs in choosing practice locations in underserved areas (i.e., for many providers the choice to serve in high-needs areas would have occurred regardless of a financial debt reduction incentive). Importantly, providers participating in certain LRPs tend to remain in underserved areas even after their service obligations are completed, compared to providers without an LRP option or those who participate in other incentivized loan forgiveness programs. Some debt relief programs still have additional challenges, and it may be useful to identify ways to improve the administrative and structural aspects of these programs. This evaluation would cost \$100,000.

Increase funding for LRPs tied to achieving targeted staffing levels. Although the recommendation does not identify specific strategies for the funding of the proposed expansion of current and new LRP programs, a large number of PCPs who applied for LRP support could not be funded through California, federal, or other loan repayment programs. Should funding be made available, there would surely be a ready supply of willing PCPs to take advantage of the generous LRP package being made available to 150 to 200 applicants each year beginning in program year 1 (using a service obligation that targets Health Professional Shortage Areas). Total 10-year funding for these LRP slots would be \$350 million. Most of the literature on LRPs indicates a short-term retention

benefit from these programs (i.e., 1 to 2 years after the end of the service obligation), and we would expect to retain more participating PCPs in underserved areas than those not involved in LRPs. Using conservative calculations, by year 5 of the program, 727 new PCPs (750, adjusted down for attrition) would be participating in the LRP. Assuming an attrition rate of 2% to 3%, as indicated in Health Resources and Services Administration (HRSA) reporting, the LRP participants provide 7.08 million total additional visits during the first 5 years, and close to 28 million cumulative after 10 years of the program. This is not as large or as rapid as proposed, but still a significant contribution to health care access. It is difficult to quantify total benefit to underserved communities from the program, as some (although likely not all) PCPs would act similarly with or without participation in an LRP.

Pilot efforts to strengthen the marketing of LRPs and the provision of safety-net job placement assistance.

There is very little, and only observational, information on the effectiveness of marketing and of job placement or job matching efforts among safety-net LRP programs. While this strategy is worth testing, a well-planned evaluation would be a significant contribution to this proposed pilot effort. Three-year costs would be \$3.65 million.

Key Assumptions

- ▶ Funding for the new and current LRPs (Proposition 56 funds are proposed to fund 50 participants per year for five years; another source would fund 150 participants per year for five years, then 200 participants for years 6 thru 10) would be readily available through mechanisms suggested by the authors (e.g., from managed care plans, health systems, medical groups, and private industry who could contribute to a safety-net loan recruitment fund either prospectively or relative to the number of PCPs they recruit during the year) or via other means.
- ▶ Proposition 56 funds will be available for allocation to the LRP at 50 participants per year for years 1 to 5.
- ▶ Attrition rates from the LRP are assumed at the HRSA level of 2% to 3% during the service obligation period (these adjustments were made at year 5 and year 10 as a means of acknowledging a small amount of attrition at the end of the service period). The data are based on short-term evaluations of the National Health Service Corps LRP only, and may not be accurate for all programs, or for forecasting long-term retention of safety-net providers. Long-term retention data are quite varied and complicated by self-selection bias.

Numbers of Loan Repayment Participants (Unadjusted) by Funding Source

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Funded by CA Prop 56	50	50	50	50	50	0	0	0	0	0
Proposed by commission recommendation	150	150	150	150	150	200	200	200	200	200
Proposed by commission (cumulative)	150	300	450	600	750	950	1,150	1,350	1,550	1,750

Adjusted Numbers of Loan Repayment Participants and Projects Outpatient Visits

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5*	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10*
Number of commission-proposed slots, adjusted for attrition	150	300	450	600	727.5	927	1,127	1,327	1,527	1,675.19
Visits by commission PCPs	480 K	960 K	1.44 M	1.92 M	2.28 M	2.966 M	3.606 M	4.246 M	4.886 M	5.36 M

*3% attrition adjustment.

- ▶ Retention rates for nonphysicians in loan repayment programs are similar to other behavioral health providers in LRPs.
- ▶ The projected outcome of additional visits provided by these PCPs appears overstated, as it assumes all 1,750 LRP recipients are retained for five years and are available to provide ambulatory care from the start of the program. The program would not serve its 1,750th applicant until the 10th year.

Data Notations and Context

Although not addressed in this recommendation, creating clinical training opportunities in underserved areas and with exposure to low-income patients also increases the likelihood that providers will select and remain in those practice settings.

While there is some data on what influences physicians to work in underserved areas, and to choose to work with patients of minority race/ethnicity, there is limited data on what influences other behavioral health workers' practice decisions. Still, there are strong data indicating that providers (physicians, in particular) are more likely to practice in the area where they trained, or in practice settings similar to those to which they were exposed during their training.

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Recommendation 1.7

AUTHOR Health Management Associates

TITLE Create a California Health Corps to engage students, health workers, and retirees in addressing health workforce gaps.

DESCRIPTION This recommendation seeks to create a California Health Corps to identify and recruit talent from California's communities, encouraging them to pursue health career and service opportunities on a massive scale. Planned activities include social media and community-level campaigns encouraging Californians to pursue health careers in their communities; an online educational platform to connect and prepare corps members for jobs, service learning, and health training opportunities; efforts to mobilize employers, health professionals, and educators to support corps members and prepare them for relevant careers; the tracking and engaging of students to encourage employment in California; and related activities to promote participation.

MAIN TAKEAWAY Although the innovative nature of the proposal could succeed in increasing California's total health care workforce over time (as well as increasing the numbers of underrepresented minorities in the workforce), the three-year planning and program development period does not include sufficient time for significant program impacts to be felt. Current research makes it difficult to predict the impact that the California Health Corps would have. The program would cost \$4 million over three years (\$750,000 to develop a business plan and prepare to launch the program, \$3.1 million for initial operations, and \$150,000 to evaluate the program and develop a sustainability plan).

Impact Statement

The recommended activities would cost \$4 million over three years, including \$750,000 to develop a business plan and prepare to launch the California Health Corps Program, \$3.1 million for corps operations in years 2 to 3, and \$150,000 to evaluate the program and develop a sustainability plan. The cost per participant is unknown, as an estimate of total participants is not part of the recommendation.

Recognizing that career decisionmaking can begin to take form as early as middle school and that students tend to prefer ongoing programs that link outside interests with health care–related topics and that provide rewards for participation and achievements in the program, the planned components of the California Health Corps may increase interest in participation and add underrepresented minorities (URMs) to California's health care workforce. If the program fosters educational achievements on par with the results seen in the AmeriCorps program, participants would see a 20% increase in four-year college degrees and a 26% increase in graduate degrees compared to the general US population. However, for full program impact, corps participants would need to stay in health care professions past the program. Sixty percent of two-year Teach for America (TFA) participants remain teachers for a third year, but just over a quarter of TFA members are still in the profession after five years. The corps and TFA have program differences that may impact corps participants' workforce longevity. Research on best practices related to social media platforms used to entice adolescents and students to engage with their health is incomplete, and research into the use of social media among disadvantaged populations to create social capital is mixed. These shortcomings make it difficult to give specific predictions related to the impact of the California Health Corps as currently envisioned.

Key Assumptions

- ▶ The California Health Corps would take shape as envisioned after the three-year planning and start-up period.
- ▶ The California Health Corps would, after its planning and start-up phase, eventually help participants, including URMs, to achieve education goals on par with those experienced by AmeriCorps alumni.
- ▶ California's population growth and demographic changes would continue according to current projections.
- ▶ The synthesis of the various components of the California Health Corps would give rise to programmatic effectiveness.

Data Notations and Context

By 2030, California’s population is projected to reach 44 million. Annual growth rates are expected to be 0.8% over the coming decade, similar to growth experienced from 2008 to 2018. Even so, average annual increases between now and 2030 would exceed 333,000.

The inland areas of California have experienced faster growth rates than the coastal areas for many decades, but coastal counties are still home to most of the state’s population. That pattern is projected to continue, with the Inland Empire, the San Joaquin Valley, and Greater Sacramento projected to grow faster than other areas of the state.

In 2015, Hispanics replaced non-Hispanic white people as the state’s largest ethnic group. By 2030, 41.5% of the state’s population would be Hispanic and 35.8% would be white. Hispanics already make up 52% of children age 17 and younger.

Population. Public Policy Institute of California, January 2018. www.ppic.org (PDF).

The directional nature of this impact statement is due to the scope of the recommendation covering merely the planning and start-up phases. Additionally, the lack of additional incentives, in the form of scholarships and grants for students seeking to pursue careers in the health care workforce, seems to weaken the overall proposal. Increases to California’s State Loan Repayment Program or new scholarships for those seeking to pursue a career in health care might be a missing component to the success of the overall program. When planning the final version of the California Health Corps, it also might be beneficial to look at the successes and shortcomings of the National Health Corps, which offers loan repayment in addition to stipends for its plan participants.

Donaldson, Morgaen L., and Susan Moore Johnson. “TFA Teachers: How Long Do They Teach? Why Do They Leave?” *Education Week*, October 4, 2011. www.edweek.org.

California Population, Residents Without Personal Physician, and Medical School Graduates, by Race/Ethnicity, 2017

	POPULATION	ADULTS REPORTING NOT HAVING A PERSONAL DOCTOR	MEDICAL SCHOOL GRADUATES*
African American	6.5%	17.3%	4.2%
Asian	15.2%	18.9%	34.2%
Hispanic (non-white)	39.1%	35.5%	9.7%
Native American / Native Hawaiian / Pacific Islander	2.1%	Not enough data reported	0.1%
White (non-Hispanic)	37.2%	17.8%	35.4%

*Does not include osteopathic medical schools.

Sources: “Distribution of Medical School Graduates by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org; and “Percent of Adults Reporting Not Having a Personal Doctor by Race/Ethnicity,” Kaiser Family Foundation, n.d., www.kff.org.

Data Sources and References

Bennett, Keisa L., and Julie P. Phillips. "Finding, Recruiting, and Sustaining the Future Primary Care Physician Workforce: A New Theoretical Model of Specialty Choice Process." *Academic Medicine* 85, no. 10 (Oct. 2010): S81–S88. doi:10.1097/ACM.0b013e3181ed4bae.

- ▶ Rural-born, lower-socioeconomic-status, and older and married students are more likely to enter primary care specialties; working with communities and undergraduate institutions, including community colleges, to find, support, and recruit these students can be a successful tactic to find the right students for primary care positions.
- ▶ Experts have suggested that recruitment through the premedical pipeline begins very early in the educational process because broad career categories are chosen by the middle-school years.
- ▶ Some researchers are concerned that the same medical school aspirants most likely to choose primary care may not have the academic background to be competitive for admission when medical schools' reputations rest on Medical College Admissions Test (MCAT) and United States Medical Licensing Exam scores.
- ▶ Several studies have suggested that the tactic of blinding interviewers to GPA and MCAT scores for all candidates achieving a threshold level can be effective in changing recruitment patterns and would be an obvious area for further research and likely increased primary care recruitment.
- ▶ Researchers have not been able to identify best practices to accurately find at an early stage students with uncommitted attitudes toward primary care (and those who are truly undecided at matriculation) and steer them toward primary care.

Barr, D. A., M. E. Gonzalez, and S. F. Wanat. "The Leaky Pipeline: Factors Associated with Early Decline in Interest in Premedical Studies Among Underrepresented Minority Undergraduate Students." *Academic Medicine* 83, no. 5 (May 2008): 503–11. doi:10.1097/ACM.0b013e31816bda16.

- ▶ This was a longitudinal study of 362 incoming Stanford freshmen (23% of whom were underrepresented minorities) who indicated on a freshman

survey that they hoped to become physicians. The authors measured the change in students' levels of interest in continuing premedical studies between the beginning of freshman year and the end of sophomore year. Follow-up interviews were conducted with 68 participants, approximately half of whom had experienced decreases in interest in continuing as premeds, and half of whom who had experienced increases in interest.

- ▶ Underrepresented minority students showed a larger decline in interest than did other students; women showed a larger decline than did men, independent of race or ethnicity. The authors found no association between scholastic ability as measured by SAT scores and changes in level of interest. The principal reason given by students for their loss of interest in continuing as premeds was a negative experience in one or more chemistry courses. Students also identified problems in the university's undergraduate advising system as a contributor.

Holden, Lynne, et al. "Promoting Careers in Health Care for Urban Youth: What Students, Parents and Educators Can Teach Us." *Information Services and Use* 34, no. 3–4 (2014): 355–66. doi:10.3233/ISU-140761.

- ▶ This study was based on responses from focus groups composed of students, parents, and educators. While the data cannot be projected to a universe of similar respondents as may be possible in a scientifically derived sample survey, the method allows for probing of respondents' views on specific questions in addition to an ability to observe the extent to which such views are held and supported by other participants in the focus group.
- ▶ Student respondents stated that the views of their peers and friends were crucial in their decision-making. The researchers also found that student respondents used the internet to research health care careers and saw such careers to be more "cool" than did their parents.
- ▶ Student respondents also did not think that one-time health care career promotion events were effective.

- ▶ Students would continue with ongoing programs if there is a relatively short-term reward, such as a stipend or trip associated with participation; otherwise, there is strong competition for the students' time.
- ▶ The students preferred internet-related activities that can connect them with others and provide resources that are engaging and related to things in which they are already interested. An example would be to show how a health care career relates to the sports or entertainment industries.

Friedman, E., et al. *New Methods for Assessing AmeriCorps Alumni Outcomes: Final Survey Technical Report*. Cambridge, MA: Abt Associates, 2016.

AmeriCorps alumni showed increases in four-year college and postgraduate degrees as compared to the US population at large and even compared to incoming members of AmeriCorps (2016 assessment below):

	NO 4-YEAR COLLEGE DEGREE	4-YEAR COLLEGE DEGREE	GRADUATE DEGREE
US Population	67%	21%	12%
Parents of AmeriCorps Volunteers	38%	30%	31%
Incoming AmeriCorps Volunteers	38%	57%	5%
AmeriCorps Alumni	21%	41%	38%

The vast majority of AmeriCorps alumni respondents to the study reported high satisfaction levels with AmeriCorps:

- ▶ 87% of alumni were satisfied or very satisfied with their overall service experience.
- ▶ More than 90% of alumni agreed or strongly agreed with the statements "I felt I made a difference in the life of at least one person," "I felt I made a contribution to the community," and "I gained an understanding of the community(s) where I served."
- ▶ Alumni who were in an individual placement had a slightly less positive service experience than alumni performing team-based service or in some other arrangement — an average score of 3.9 versus 4.1, a finding that held up when controlling for the AmeriCorps program.

Matthews, Peter. "Social Media, Community Development and Social Capital." *Community Development Journal* 51, no. 3 (July 1, 2016): 419–35. doi:10.1093/cdj/bsv040.

- ▶ This research project found that social media does not offer immediate opportunities for community development in deprived communities. While the technologies can clearly make social engagement easier and cheaper, particularly with the widespread availability of such technology even in deprived neighborhoods, it is more difficult to achieve greater activist engagement.
- ▶ Effective use of social media technologies for activism is likely to be easier and more productive for more affluent communities already engaged in such activities.

Wong, C.A., R. M. Merchant, and M. A. Moreno. "Using Social Media to Engage Adolescents and Young Adults with Their Health." *Healthcare (Amsterdam)* 2, no. 4 (2014): 220–24. doi:10.1016/j.hjdsi.2014.10.005.

- ▶ Further research is needed to develop evidence-based frameworks to better engage young people with their health through social media.
- ▶ Creation of successful health-related social media sites requires identifying features that resonate with adolescents and young adults and then more systematically defining and measuring their impact on health, including patient-centered outcomes.
- ▶ The study proposed studying social media use in chronic disease management by identifying social media affordances for patients, surveying patients on their perceptions of social media use in health care, piloting an online intervention to better target individual needs, and using patient-reported outcomes as empirical evidence of health outcomes.
- ▶ The study analysis suggested improving social media platforms through collaboration with adolescents and young adults to provide the patient perspective, health experts to inform content, technological experts to develop software, and research teams to measure effectiveness with data collection tools built into social media platforms.

Recommendation 1.8

AUTHOR Health Management Associates

TITLE Assess, treat, and improve college student mental health and promote behavioral health careers.

DESCRIPTION Through a three-year pilot, this recommendation aims to (1) implement and evaluate ICare, an evidence-based, guided, internet-based cognitive behavioral therapy (iCBT) intervention adapted specifically for college students and designed to treat depression and anxiety across diverse populations; (2) launch a program to expose students on the same campuses to behavioral health careers; and (3) implement a policy change to require colleges and universities to meet minimum staffing ratios of mental health counselors to students.

MAIN TAKEAWAY This recommendation would likely increase access to behavioral health services for college students and may have a positive directional impact on college students choosing behavioral health careers and the number of jobs for mental health professionals in California. Given California's significant workforce shortages, ICare may be an effective way to increase access to behavioral health assessment and treatment services for college students. The cost would be \$8.56 million over three years, not including the anticipated budget impacts related to mental health counselor staffing ratios.

Impact Summary

ICare model. Given California's significant workforce shortages, ICare may be an effective way to increase access to behavioral health assessment and treatment services for college students. Increased access may decrease depression, anxiety, and role impairment in students, and therefore may have positive impacts on student academic performance and graduation rates. Both internet-based tailored, guided, self-help treatments and internet-based standardized treatments have been shown to significantly reduce depression, anxiety, and distress symptoms. A systematic review demonstrated that the internet is an effective medium for the delivery of interventions designed to reduce the symptoms of depression and anxiety disorders, with effect sizes at least as large as standard psychological treatment and comparable to the treatment of depression with antidepressant

medication. Based on the World Health Organization's World Mental Health International College Student Initiative project data of 3,240 students who start internet-based treatment, 1,620 would improve/remit with internet-based treatment, and the severe cases (840 of the 1,620) would improve with concurrent face-to-face psychotherapy/counseling. Internet-based cognitive behavioral therapy (iCBT) may address many barriers to adequate care, including geographic distance, prohibitive cost, lack of clinician availability, and perceived stigma, as well as enable treatment delivery to a large number of patients while minimizing costs and clinician time. With its potential to be delivered in a scalable, cost-efficient manner, iCBT is a promising strategy to enhance access to effective care.

Behavioral health career exposure and training. The Behavioral Health Career Exposure Program (BHCEP) is likely to have a positive impact on encouraging college students to choose behavioral health careers. Over the three-year period approximately 12,000 undergrad students would be exposed to behavioral health careers, with at least 2,800 students receiving advising and 500 getting paid behavioral health internships. In addition, it is estimated that 60% to 70% of the BHCEP students would be members of underrepresented minorities, suggesting the program could increase the diversity of California's health professions workforce. Similar behavioral health training programs, such as the Health Resources and Services Administration's Behavioral Health Workforce Education and Training (BHWET) program, have successfully graduated students from degree and certificate-bearing programs to enter the behavioral health workforce. Upon completion of BHWET, 62% of students intended to pursue training and/or employment to serve at-risk children, adolescents, and youth.

Staffing ratios of mental health counselors to students. The International Association of Counseling Services recommends a full-time equivalent mental health counselor to every 1,000 to 1,500 students. A required staffing ratio of 1:1,500 would increase access to prevention, early detection, and treatment services for the over 2.7 million college students throughout California. The recommendation would increase the number of jobs for mental health professionals in California; however, it

would concurrently have a significant impact on state budget outlays. While the University of California system already meets the counselor-to-student threshold (1:1,156), the California State University system (1:2,176) would need to hire approximately 177 professionals at an approximate cost of \$17.7 million annually. In addition, the California Community College (CCC) system would need to make significant financial investments to meet the threshold, given their current systemwide ratio of 1:7,667.

Key Assumptions

- ▶ Mental disorders are associated with significant student role impairment (e.g., inability to attend class, maintain relationships, hold a job), and providing access to treatment would increase likelihood that students lead healthier lives.
- ▶ Access to treatment may facilitate better outcomes in school, which would lead to improved graduation rates.
- ▶ Applying estimates from the World Health Organization's World Mental Health International College Student project data, if we include 12 colleges or universities in California (assuming each college has 20,000 students), there would be 240,000 students surveyed; 72,000 would respond to the survey, 18,000 would meet criteria for a behavioral health disorder, 3,240 would accept/start internet-based treatment, 1,620 would improve/remit with internet-based treatment, and 840 of those would improve/remit with concurrent face-to-face psychotherapy/counseling.
- ▶ Given the limited description in the proposal, it is assumed the BHCEP intervention framework would be similar to the BHWET program.
- ▶ CSU estimates it would need to hire about 177 professionals. The estimate assumes a cost per hire of roughly \$100,000 for salary and benefits annually, totaling approximately \$17.7 million annually.

Data Notations and Context

Numerous studies and randomized controlled trials (RCTs) of internet-based CBT exist, including several specific to the ICare model. Recommendation authors may want to clarify what unique contribution an additional RCT would bring to the field beyond an evaluation of the effectiveness of the model in the California college system.

2017 ratios of mental health staffing to students for California college campuses are UC, 1:1,156; CSU, 1:2,176; and CCC, 1:7,667.

While the UC system meets the proposed ratio requirements for mental health counselors to students systemwide, individual campuses may not meet the ratio. UC also indicates that anticipated student enrollment growth over time would require campuses to hire additional professionals.

The governor vetoed Senate Bill 968 on September 25, 2018, stating "Investing greater resources in student mental health is an understandable goal. Such investments, however, should be actively considered and made within the budget process. Moreover, specific ratios should remain within the purview of the boards or with local campuses, rather than dictated by the state." Anticipated budget impacts are not currently factored into the recommendation proposal.

Data Sources and References

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Auerbach and Kessler, manuscript in preparation.

Cuijpers, P., et al. "Is Guided Self-Help as Effective as Face-to-Face Psychotherapy for Depression and Anxiety Disorders? A Systematic Review and Meta-Analysis of Comparative Outcome Studies." *Psychological Medicine* 40, no. 12 (Dec. 2010): 1943–57. doi:10.1017/S0033291710000772.

Department of Health and Human Services, Fiscal Year 2019: Justification of Estimates for Appropriations Committees. Health Resources and Services Administration, retrieved November 20, 2018. www.hrsa.gov (PDF).

Donker, T., et al. "Economic Evaluations of Internet Interventions for Mental Health: A Systematic Review." *Psychological Medicine* 45 (2015): 3357–76.

Rosso, I. M., et al. "Internet-Based Cognitive Behavior Therapy for Major Depressive Disorder: A Randomized Controlled Trial." *Depression and Anxiety* 34, no. 3 (March 2017): 236–45. doi:10.1002/da.22590.

Saddichha, Sahoo, et al. "Online Interventions for Depression and Anxiety — a Systematic Review." *Health Psychology and Behavioral Medicine* 2, no. 1 (2014): 841–81. doi:10.1080/21642850.2014.945934.

"SB 968 Postsecondary Education: Mental Health Counselors — Senate Floor Analyses." California Legislative Information, retrieved November 20, 2018. leginfo.legislature.ca.gov.

Recommendation 1.9

AUTHOR Health Management Associates

TITLE Implement a statewide prevention and early intervention mental health and workforce development model for K–12 students.

DESCRIPTION This recommendation seeks to fund a five-year initiative (three-year pilot and evaluation) of the California Health Occupations Students of America and Prevention and Early Intervention (Cal-HOSA PEI) Mental Health and Workforce Development Model. A consortium of 30 schools would adopt this framework to train educators and students in identifying and addressing social determinants and other risk factors associated with behavioral health issues. To encourage youth interest in the mental health field, this project would train 150 teachers and 300 Cal-HOSA youth leaders in mental health first aid and to serve as behavioral health advocates.

MAIN TAKEAWAY Over five years, 30 school-based pilots would train 150 teachers and 300 youth leaders, who would engage 3,000 to 4,000 students in the peer-to-peer mental health network. This could have a positive short-term effect on student mental health. Of 300 youth leaders trained during this period, 270 Cal-HOSA-Future Health Professionals (formerly known as Health Occupations Students of America) students can be expected to pursue a career in health professions. This group would include 121 to 197 minority students overall, which could marginally increase the diversity of California's health professions workforce. Total cost of the recommendation over five years is \$2.5 million, which includes training and an evaluation. If the program is successful at encouraging 270 new health professionals, cost per professional would be approximately \$9,300.

Impact Statement

Increase supply of students entering health professional training. Over 90% of HOSA students continue to pursue careers in the health professions after high school, meaning that participating Cal-HOSA students would likely demonstrate high levels of postsecondary enrollment and retention in the health professions. Because the high school years are a time in which students commonly plan their careers or postsecondary educational pursuits, the high school setting is an effective location

for recruitment into the allied health field. In addition, studies suggest recruitment initiatives may be equally effective if conducted prior to high school, meaning engagement of the middle school population may also have an impact. Students involved in career technical education programs like Cal-HOSA make gains in their experience and knowledge related to health care careers, with effect sizes indexing the growth for the experience and knowledge measures were 0.38 and 0.37.

Increase the diversity of students entering health professional training. Nationally, approximately 45% of HOSA students are minorities. The California percentage is 73%. Therefore, it can be assumed that at least 121 of the estimated 270 Cal-HOSA program leaders who go on to pursue a career in health professions would be minorities, but this number could be closer to 200.

Increase access to behavioral health services. The Cal-HOSA program may have a positive effect on the early detection of youths' mental health issues and treatment, especially in the short term. Schools are a logical place for the delivery of mental health programs because most young people attend school regularly and are more likely to seek help from people with whom they already have some established and trusted relationships. The literature on evaluating student mental health (SMH) programs suggests that such programs can be effective in improving short-term and intermediate changes in mental health awareness. Evaluations of short-term changes in knowledge, skills, and attitudes resulting from SMH programs consistently show that such programs can improve staff, faculty, and student knowledge of mental illness; skills for identifying and referring students with symptoms; and attitudes toward mental illness. A number of studies show that SMH programs can result in intermediate positive changes in staff, faculty, and student behaviors. However, the evidence of long-term program effectiveness, safety, and cost-effectiveness in this area is somewhat insufficient, mostly due to the lack of rigorous research designs, the heterogeneity of school environments, and the complexities of interventions that require multisector collaboration. Evaluation of the long-term effects (e.g., student mental health service use, improved student mental health, lower dropout rates) of SMH programs on mental health are less common, but the programs that do show effects are commonly more comprehensive and intensive, of longer duration, are well structured, and attend to key components of implementation.

Key Assumptions

- ▶ HOSA data indicate that secondary and postsecondary students apply at the same rate as middle and high school students.
- ▶ HOSA data indicate that health professions students apply at the same rate to students with an interest in behavioral health.
- ▶ HOSA students pursue careers in health professions after high school at 90%.
- ▶ The Cal-HOSA program rates of minority student participation is the same as the national rates.
- ▶ The Cal-HOSA program would follow a similar intervention framework as other nationally recognized student mental health programs.

Data Notations and Context

The assumption that the national HOSA rates directly translate to the Cal-HOSA program may not be realistic. Future analyses should attempt to get historical data specific to California.

The assumption that the national HOSA rates directly translate to behavioral health training may not be realistic. Future analyses should attempt to get historical data specific to behavioral health professions.

The data points for HOSA impact (i.e., pursuit of health professions education and minority data) was found in a sole source and is not verified by peer-reviewed literature. No other impact data on HOSA was available.

The impact of the Cal-HOSA program on early identification and treatment of mental health issues assume a certain level of intervention that is not included in the recommendation proposal. The analysis is based on a rigorous framework that would be implemented and maintained, which Cal-HOSA may not meet.

Calculations for number estimates include these:

- ▶ Total students continue into behavioral health professions: 270 (300×0.9)
- ▶ Total minority students: 121 (270×0.45)

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Recommendation 2.1

AUTHOR Healthforce Center at UCSF

TITLE Sustain and expand the PRIME program across UC campuses.

DESCRIPTION This recommendation calls for permanent dedicated state funding to enable University of California (UC) Programs in Medical Education (PRIME) to enroll the number of medical students originally planned (393) and eliminate the need for UC medical schools to use their own funds to support PRIME students. Each of the six PRIME programs aims to train physicians committed to practicing in the state’s underserved communities. Currently, state funds support only 126 of the 354 medical students enrolled in UC PRIME programs.

MAIN TAKEAWAY This recommendation would provide more stable funding for the UC PRIME programs and increase the number of graduates of UC medical schools. The state funds only 126 of the 354 students currently enrolled in UC PRIME programs. 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 (\$228,000 per graduate); the cost per graduate is higher initially because medical school takes four years to complete. Most new PRIME graduates are likely to be from racial/ethnic groups that are underrepresented in medicine, likely to practice in California, and more likely to care for underserved populations than physicians who do not participate in similar programs during medical school. The impact of the recommendation would be maximized if implemented in conjunction with the recommendation on increasing the number of primary care medical residents in California.

Impact Statement

This recommendation would increase stability of funding for the UC PRIME programs and increase the number of graduates of UC medical schools, at an estimated cost of \$93.5 million over 10 years. State funds currently support only 126 of 354 students enrolled in PRIME programs. Program directors negotiate with leaders of their medical schools to obtain funds to cover the cost of educating the remaining 228 PRIME students. Securing dedicated state funds to support the number of students that UC originally planned to enroll in the PRIME programs — 393 medical students — would enable program directors to focus on educating PRIME students.

The recommendation would also generate small increases in the number of graduates of UC medical schools and therefore physicians entering practice. If the first cohort of new first-year students is enrolled in 2020, the number of graduates would increase by 10 graduates per year between 2024 and 2029, resulting in an increase of 60 graduates over six years. The addition of 10 graduates per year would constitute a 0.4% increase over the number of graduates of medical schools in California in 2016–17, the most recent year for which data are available. Given that residency training in physician specialties takes at least three years (more for some specialties), at most half (30) of the additional graduates would begin practicing by 2029.

The estimated cost of implementing the recommendation would be \$93.5 million over 10 years (\$35,000 per student per year based on UC’s marginal cost support formula). 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 (\$228,000 per graduate). The cost per additional graduate during this 10-year period is higher because medical school takes four years to complete. Only six classes of 10 additional graduates each would graduate during this time period.

Most new PRIME graduates are likely to be from racial/ethnic groups that are underrepresented in medicine because data from the UC Office of the President indicate that 64% of students enrolled in PRIME programs in 2018 are from underrepresented racial/ethnic groups.

The majority of underrepresented students are Latino (66% of underrepresented students, 43% of total students enrolled), the racial/ethnic group that is the most underrepresented in medicine in California. These percentages are higher than the percentages of underrepresented minorities and Latinos among all graduates of California medical schools in 2016–17 (12% and 8%, respectively). The majority of PRIME graduates are likely to practice in California (data from the American Medical Association’s Masterfile indicate that 68.7% of all graduates of UC medical schools practice in California). PRIME students are also more likely to care for underserved populations. The UC Office of the President reports that over 60% of graduates of UC Davis’s Rural PRIME program practice in rural areas of California. In addition, the high percentage of students from underrepresented racial/ethnic groups suggests that a higher than average percentage of graduates would care for underserved populations because physicians from underrepresented groups are more likely to practice in urban or rural underserved areas. Expansion of PRIME may also increase the number of primary care physicians and psychiatrists in California because the UC Office of the President reports that the majority of PRIME graduates train in specialties in which shortages have been identified, such as primary care, psychiatry, general surgery, and emergency medicine.

The recommendation indicates that UC would consider further expansion of existing PRIME programs or establishment of new PRIME programs that would focus on primary care or behavioral health. If sufficient funds were available, UC would increase the number of students enrolled by 8 to 10 students per year (a 20% to 25% increase). If UC’s marginal cost support formula of \$35,000 per UC medical student is used to estimate cost, this proposed expansion of UC PRIME would cost \$2.8 to \$3.5 million per year. The impact of this proposal on the total number of graduates of California medical schools between 2020 and 2029 is unknown because the recommendation does not indicate when UC would begin enrolling medical students into new PRIME programs.

The impact of this recommendation would be maximized if it were implemented in tandem with the recommendation on increasing the number of primary care residents trained in California by 20%, and if the funded residency programs prioritized admission of graduates of California medical schools.

Key Assumptions

- ▶ All data about UC PRIME provided in the recommendation statement are accurate.
- ▶ An additional 40 medical students would be enrolled in UC PRIME programs per year as a result of the additional funding. The impact model assumes 40 students instead of the exact number of 39 to simplify the model and due to both numbers being used in the recommendation.
- ▶ To achieve an increase in UC PRIME enrollment of 40 students per year, 10 additional first-year students would enroll in 2020. New cohorts of first-year students (10 each) would be added in 2021, 2022, and 2023 to bring total new enrollment to 40 students in 2023.
- ▶ The first 10 additional students would graduate in 2024 because UC PRIME students complete a four-year medical school curriculum.
- ▶ All UC PRIME students graduate in four years, which is the standard length of medical school. However, some PRIME students take longer to graduate because they take time off to obtain a master’s degree, often an MPH. This assumption could be further refined if data were available about the percentage of PRIME students who earn a master’s degree.
- ▶ All 10 additional slots per year would be filled. The number of applicants to medical schools in the United States is much larger than the number of slots available. UC medical schools could easily identify 10 additional qualified applicants per year.
- ▶ Findings from the literature on the relationship between physician race/ethnicity and practice in underserved rural or urban areas can be generalized to PRIME graduates. The impact statement describes the provision of the recommendation that states that UC would consider expanding PRIME programs or establishing new PRIME programs, the number of additional medical students that would be enrolled each year, and the annual cost, but does not quantify the impact on the number of students who graduate from California medical schools within the 10-year period under consideration because the recommendation does not indicate when UC would begin enrolling additional medical students.

Data Notations and Context

If information were available about the timing of expansion of existing UC PRIME Programs and establishment of new PRIME programs that focus on primary care or behavioral health, future versions of this impact statement could provide a more complete estimate of the impact of this part of the recommendation.

The recommendation statement contains inconsistent information about the number of additional medical students that would need to be enrolled in UC PRIME programs to enroll the number of medical students originally planned. In several places, the recommendation states that the originally planned enrollment level was 393 students. The “Estimated Cost” section and the table in Appendix B indicate that 354 students are enrolled in fall 2018, which would indicate that 39 additional students would need to be enrolled to achieve the originally planned level of enrollment. For purposes of estimating impact, we assumed that 354 students are currently enrolled in PRIME programs and that enrollment would increase by 40 students. We did this because 40 students can easily be divided into four “classes” of 10 students.

If UC has more precise data on the practice locations of PRIME graduates, future versions of the impact statement could include a more precise statement about the percentage of graduates who are likely to practice in California.

If UC has more precise data on the specialties of PRIME graduates, future versions of the impact statement could include a more precise statement about the percentage of graduates who provide primary care or psychiatry. The recommendation document only states that “the majority of all PRIME graduates have trained in residency programs serving designated health workforce shortage specialties (e.g., primary care, psychiatry, general surgery, emergency medicine).” In addition, some physicians who train in general internal medicine or general pediatrics go on to obtain subspecialty training and practice as specialists. Others practice as hospitalists and do not provide primary care services.

As stated in the summary, this recommendation would be maximized if it were implemented in tandem with the recommendation on increasing the number of primary care residents trained in California by 20%, and if the funded residency programs prioritized admission of graduates of California medical schools. Physicians who complete both medical school and residency in California are more likely to practice in the state than physicians who only complete either medical school or residency in California. Estimates from the American Medical Association suggest that 81% of physicians who complete both medical school and residency in California remain in the state to practice versus 70.4% of physicians who only complete residency in California and 62.8% of physicians who only complete medical school in California. In 2017, the ratio of first-year residency positions in California offered in the National Resident Matching Program per California medical school graduate was 1.7, which suggests that additional graduates could be accommodated without expanding primary care residency programs. However, residency programs vary in the extent to which they prioritize admitting graduates of California medical schools. Increasing the number of first-year primary care residency positions in California by 20% would increase the likelihood that additional graduates of UC PRIME programs who wish to complete a primary care residency in California would be able to do so. The impact would be even greater if the primary care residency programs funded were required to prioritize admission of graduates of California medical schools.

Data Sources and References

Number of UC PRIME students supported by state funds. UC Office of the President internal reports cited in the recommendation statement.

Number of graduates of medical schools in California in 2016–17. *Table B-2.2: Total Graduates by U.S. Medical School and Sex, 2012–2013 Through 2016–2017.* Assn. of Amer. Medical Colleges (AAMC). www.aamc.org (PDF); and *Graduates by Osteopathic Medical College and Race and Ethnicity, 2000–2017.* Amer. Assn. of Colleges of Osteopathic Medicine (AACOM). www.aacom.org.

Percentage of UC PRIME students who are underrepresented minorities. UC Office of the President internal reports cited in the recommendation statement.

Percentage of graduates of all California medical schools in 2016–17 who are underrepresented minorities. *Table B-6: Total Graduates by U.S. Medical School and Race/Ethnicity, 2016–17.* AAMC. www.aamc.org (PDF); and *Graduates by Osteopathic Medical College and Race/Ethnicity, 2000–2017.* AACOM. www.aacom.org.

Percentage of UC PRIME graduates who practice in California. American Medical Assn. (AMA) Masterfile data from 2016 on graduates of public medical schools in California as cited in *2017 State Physician Workforce Data Book*, AAMC, November 2017, www.aamc.org.

Percentage of UC Davis Rural PRIME graduates who practice in California. UC Office of the President internal reports cited in the recommendation statement.

Physicians from underrepresented groups more likely to practice in underserved rural or urban areas. Goodfellow, A., et al. "Predictors of Primary Care Physician Practice Location in Urban or Rural Areas of the United States: A Systematic Review." *Academic Medicine* 91 no. 9 (2016): 1313–21.

Physicians who participate in medical school programs aimed at preparing physicians to care for underserved populations more likely to practice in underserved areas. Ko, M., et al. "The Role of Medical Education in Reducing Health Care Disparities: The First Ten Years of the UCLA/Drew Medical Education Program." *Journal of General Internal Medicine* 22 (2007): 625–31; and Rabinowitz, H.K., et al. "A Program to Increase the Number of Family Physicians in Rural and Underserved Areas: Impact After 22 Years." *JAMA* 281 (1999): 255–60.

Percentage of UC PRIME graduates who train in primary care. UC Office of the President internal reports cited in the recommendation statement.

Number of first-year (postgraduate year 1) residency positions offered in the national resident matching program in 2017. *2017 NRMP Main Residency Match: Match Rates by Specialty and State.* National Resident Matching Program. kinstacdn.com (PDF).

Recommendation 2.2

AUTHOR Healthforce Center at UCSF

TITLE Expand the number of primary care and psychiatric residency positions.

DESCRIPTION The recommendation calls for both the expansion of primary care and psychiatry residency programs and the establishment of new programs. Start-up funds would be awarded to sponsoring institutions, including universities, hospitals, and clinics, that have not previously operated residency programs. Funds would also be used to provide ongoing support for residency training in facilities that are not eligible to obtain Medicare funding for graduate medical education (i.e., residency training).

MAIN TAKEAWAY This recommendation would increase the number of first-year residents in primary care residency programs in California by 20% (337 residents per year) between 2018 and 2024 and the increase would be maintained from 2024 to 2029. This would yield an increase of 1,872 graduates of primary care residency programs in California by 2029. Implementing this recommendation could eliminate the projected shortage of primary care physicians in California in 2030, if it is implemented in conjunction with the recommendation that would increase the number of primary care nurse practitioners trained in California. The number of first-year residents in psychiatry residency programs would increase by 152 to 527, which would yield a 247% (375 residents per year) increase in graduates of psychiatry residency programs between 2018 and 2025. The increase would be maintained from 2025 to 2029, which would yield an increase of 2,202 graduates of psychiatry residency programs by 2029. This increase would meet 75% of demand for additional psychiatrists; 25% of demand would be met by psychiatric-mental health nurse practitioners, other mental health professionals, primary care providers, and by early intervention via online or telehealth technologies. The impact of this recommendation would be maximized if implemented in tandem with the recommendations that would increase the number of medical students in California. This recommendation is estimated to cost \$1.562 billion in total. Providing start-up funds for new primary care and psychiatry residency programs would use \$122.4 million, \$703 million

would be used to support operating costs of psychiatry residency programs and \$6.1 million would fund a single GME governance structure that would provide oversight of residency programs in primary care, psychiatry, and other specialties.

Impact Statement

Implementing this recommendation, at an estimated cost of \$1.562 billion, could eliminate the projected shortage of primary care physicians in California, if implemented in conjunction with the recommendation that would increase the number of primary care nurse practitioners trained in California. The recommendation would increase the number of first-year residents in primary care residency programs in California by 20% between 2018 and 2024 and maintain that increase from 2024 to 2029. The number of first-year residents would increase from 1,708 in 2018 to 2,045 in 2024 and hold steady through 2029, yielding an increase of 1,872 graduates from 2024 to 2029. (Medical educators refer to first-year residency positions as postgraduate year 1 [PGY1] positions because physicians typically enter these positions immediately after they graduate from medical school.) This increase in the number of graduates of primary care residency programs, coupled with migration of primary care physicians from other states to California, would result in an increase in the number of full-time equivalent (FTE) primary care physicians in California in 2030 from 19,289 to 22,501 (an increase of 3,212 FTE primary care physicians).

The recommendation would also meet 75% of projected demand for psychiatrists in 2030. The number of first-year residents in psychiatry residency programs would increase by 152 to 527 per year, which would yield a 247% (375 residents per year) increase in graduates of psychiatry residency programs between 2018 and 2025. The increase would be maintained from 2025 to 2029, which would yield an increase of 2,202 graduates of psychiatry residency programs by 2029. This increase in the number of graduates of primary care residency programs, coupled with migration of psychiatrists from other states to California, would result in an increase in the number of psychiatrists in California in 2030 from 3,609 to 4,962 (an increase of 1,353 psychiatrists). The recommendation

assumes that 25% of demand for psychiatrists would be met by psychiatric-mental health nurse practitioners, other mental health professionals, primary care providers, and by early intervention via online or telehealth technologies.

The recommendation is estimated to cost \$1.562 billion in total. The costs directly associated with producing additional graduates of California primary care residency programs are \$400 million in Proposition 56 funds. In fiscal year 2018–19, plans call for allocating \$30.4 million of Prop. 56 funds to primary care residency programs at a cost of \$75,000 per resident per year. Maintaining funding for the Song-Brown program, which funds primary care residency programs, would cost \$330 million, at \$33 million per year. Producing additional graduates of psychiatry residency programs would cost \$703.3 million. Providing start-up funds for new primary care and psychiatry residency programs would use \$122.4 million, and \$6.1 million would fund a GME governance structure that would provide oversight of residency programs in primary care, psychiatry, and other specialties.

The recommendation would increase the supply of primary care and psychiatric services in the communities in which the additional primary care and psychiatry residents are trained. Evidence suggests that the 337 additional primary care residents who would enter training in 2024 would generate 202,200 primary care visits per year (600 visits per resident per year). Residents in family medicine, general internal medicine, and general pediatrics would generate 606,600 visits during their three-year residency programs. Residents in obstetrics/gynecology would generate 808,800 visits during their four-year residency program. Psychiatry residents provide outpatient and inpatient care for persons with mental health needs as part of their training.

Training additional primary care residents, and additional nurse practitioner students as proposed in another recommendation, could eliminate a projected statewide shortage of 4,103 primary care clinicians, which could increase access to care. The magnitude of the increase in access will depend on the extent to which these primary care residents remain in California, provide primary care exclusively after they complete residency, and practice in urban or rural communities in California that have shortages of primary care clinicians or practice in settings in which they care for underserved populations.

The recommendation assumes that 80% of additional residents would be trained in primary care residency programs in which 100% of graduates would go on to practice primary care exclusively. If a smaller percentage of funds are awarded to residency programs in which 100% of graduates provide primary care exclusively, the shortage would not be eliminated.

The recommendation documents the existence of 260 GME-naïve hospitals in California (as of 2015), but an evaluation of the readiness for and interest level in either is beyond the scope of this analysis. There are currently four THCs with psychiatry residency programs in the entire country, suggesting that operating a psychiatry residency in a THC is a significant undertaking. Literature review, key informant interviews with psychiatry training program directors, and evaluator expertise identified multiple barriers to successful implementation of this recommendation at this scale. In contrast, nationwide THCs in 24 states operate 57 primary care residency programs. Six are in California and additional clinics in California have expressed interest in operating primary care residency programs.

Given the inadequacies of funding, and in the absence of a federated approach to financing physician GME, the decision to devote medical training resources to any particular specialty, is presently determined by the sponsoring institution. Commitments will need to be secured to achieve the target number of primary care and psychiatry residency spots without other incentives or creative negotiation. A GME governance council could address these challenges by providing centralized oversight, coordination, guidance, and accountability for new or expanded residency programs and monitoring the adequacy and distribution of physicians in primary care specialties, psychiatry, and other specialties.

The proposed level of psychiatry residency throughput, however ambitious, would still fall short of the 6,616 psychiatrists needed to meet demand by 2030. The recommendation proposes that additional clinical psychiatric positions be filled by recruiting psychiatrists from outside of California (assume 1,000 over ten years), and by training additional psychiatric-mental health nurse practitioners (PMH-NPs). Although there are currently only 10 PMH-NP programs in California, NP programs tend to have greater flexibility to increase “class size” than residency programs do. Tuition and the cost of operating

such programs are also less than those associated with psychiatry residency programs. If approximately 3,000 PMH-NPs were trained over 10 years (and care delivery were augmented with tele-behavioral health and other innovative methods), the pool of providers moves closer to meeting patients' needs, but still does not completely address the demand for psychiatry.

Maximizing the number of graduates of California primary care and psychiatry residency programs who work in underserved areas of the state or care for underserved populations will depend on the extent to which entities that fund primary care and psychiatry residency training prioritize funding (1) existing primary care and psychiatry residency programs that have a strong track record of preparing graduates who practice in underserved areas or that have high percentages of underserved people in their practices (e.g., low-income people, Medi-Cal beneficiaries) and (2) new residency programs sponsored by hospitals or clinics that are in underserved areas or that serve underserved populations, such as California Teaching Health Centers or Medicare GME-naive hospitals (i.e., hospitals that have not previously received funding from Medicare for residency programs) in areas with shortages of primary care and mental health clinicians. Characteristics of residents are also important to increasing the supply of primary care and mental health clinicians who care for underserved Californians. Multiple studies have found that physicians from racial/ethnic groups that are underrepresented in medicine and physicians who grow up in rural areas are more likely to practice in underserved communities.

The impact of this recommendation would be maximized if it were implemented in tandem with the recommendations that would increase the number of students enrolled in California medical schools by 18% to 20%, and if the funded residency programs prioritize admission of graduates of California medical schools. Physicians who complete both medical school and residency in California are more likely to practice in the state than physicians who only complete either medical school or residency in California. Estimates from the American Medical Association suggest that 81% of physicians who complete both medical school and residency in California remain in the state to practice versus 70.4% of physicians who complete only residency in California and 62.8% of physicians who complete only medical school in California.

Key Assumptions

- ▶ The recommendation that calls for graduates of nurse practitioner education programs in California to increase by 20% per year from 2020 through 2022 would be implemented simultaneously. If that recommendation is not implemented, additional primary care residents would need to be trained to eliminate the projected shortage of 4,103 primary care clinicians in 2030.
- ▶ Primary care specialties consist of family medicine, general internal medicine, general pediatrics, and obstetrics/gynecology. This definition is consistent with definitions used by the Song-Brown Healthcare Workforce Training Program and by the partnership between Physicians for a Healthy California and the University of California that is administering Proposition 56 funds for residency training.
- ▶ Average annual costs of educating medical residents ranges from \$130,000 to \$210,000 depending on the size of the program and the availability of community-based teaching sites.
- ▶ Primary care residents provide 600 patient visits per year during training, per a press release from the California Academy of Family Physicians.
- ▶ Forecasts of demand for primary care clinicians and psychiatrists in 2030 that Joanne Spetz, PhD, of Healthforce Center at UCSF developed in 2017 are accurate.
- ▶ The number of newly licensed physicians in California would grow at the average rate between fiscal year 2004–5 and fiscal year 2015–16 if no action is taken to increase the number of primary care residents trained in California.
- ▶ Seventy-five percent of additional new licensees needed in California complete residency in California. This estimate is derived by applying an estimate of the number of physicians that California imported between 2009 and 2015 that is derived from American Medical Association (AMA) data to AMA data on the change in the number of active physicians in California from 2009 to 2015.
- ▶ Based on the literature, assumes 52% of first-year residents in primary care residency programs in 2018 would provide primary care after completing residency. This estimate is the weighted average of

estimates of the percentage of graduates who provide primary care after completing a family medicine (100%), general internal medicine (21.5%), general pediatrics (55.8%), or ob/gyn residency program (80.5%). The weights reflect the number of first-year residents in each specialty in 2018. The weighted average skews toward the percentage of graduates of general internal medicine residency programs who provide primary care exclusively because it has the largest number of first-year residents (861 of 1,708). The percentages for each specialty are derived from the literature.

- ▶ Estimates of retention of physicians who completed medical school and/or residency in California as of 2016 can be generalized to graduates of residency programs funded per this recommendation.
 - ▶ Eighty percent of new funding is distributed to existing primary care residency programs from which 100% of graduates go on to become primary care physicians or to new residency programs with characteristics that suggest that 100% of graduates would provide primary care (e.g., family medicine residency programs, primary care internal medicine residency programs).
 - ▶ The remaining 20% of funding would go to residency programs from which 34% of graduates go on to become primary care physicians. Thirty-four percent is the weighted average providing primary care after completing a general internal medicine (21.5%), general pediatrics (55.8%), or
 - ▶ ob/gyn residency program (80.5%). Percentages for each specialty are derived from the literature. The weights reflect the number of first-year residents in each specialty in 2018.
 - ▶ Assumes that all residents in primary care residency programs funded under this recommendation complete residency in three years because residency programs in family medicine, general internal medicine, and pediatrics are three years long.
 - ▶ There would be a onetime increase in primary care residents between 2021 and 2024 and that the increase in residents would be maintained through 2029. Assumes that the first additional residents enroll in 2021 because fiscal year 2020–21 is the first year in which any state funds could be awarded and because recipients would need a year to obtain the
- approvals necessary to open a new residency program or expand an existing residency program.
- ▶ Thirteen Medicare GME-naive hospitals and five California Teaching Health Centers would receive start-up funds in 2020 to begin enrolling primary care residents in 2021. Assume that an additional 12 Medicare GME-naive hospitals and five California Teaching Health Centers would receive start-up funds in 2021 and begin enrolling primary care residents in 2022. As a consequence, the increase in the number of primary care residents would not be fully phased in until 2024.
 - ▶ The number of FTE physician assistants who provide primary care in California in 2030 is the average of four forecasts generated by Spetz (4,893 FTEs). The estimate of the number of additional primary care residents needed is predicated on this assumption about the number of FTE primary care physician assistants in California in 2030 and the assumption that the recommendation that calls for an increase in nurse practitioners educated in California would be implemented at the same time.
 - ▶ Assumes that all residents in psychiatry residency programs funded under this recommendation complete residency in four years because residency programs in psychiatry are four years long.
 - ▶ There would be a onetime increase in psychiatry residents between 2021 and 2025 and that the increase in residents would be maintained through 2029. Assumes that the first additional residents enroll in 2021 because fiscal year 2020–21 is the first year in which any state funds could be awarded and because recipients would need a year to obtain the approvals necessary to open a new residency program or expand an existing residency program.
 - ▶ Five Medicare GME-naive hospitals and three California Teaching Health Centers would receive start-up funds in 2020 to begin enrolling psychiatry residents in 2021. Assume that an additional five Medicare GME-naive hospitals and three California Teaching Health Centers would receive start-up funds in 2021 and begin enrolling psychiatry residents in 2022. As a consequence, the increase in the number of psychiatry residents would not be fully phased in until 2025.

Data Notations and Context

The source of the estimate of the number of patient care visits provided per primary care resident per year is a press release from the California Academy of Family Physicians (CAFP) that does not indicate the source from which CAFP obtained this information.

Although the estimate of the number of additional primary care residents needed assumes that 80% of the primary care residency positions funded would be residency programs from which 100% of graduates provide primary care exclusively, there is no guarantee that funds would be allocated in this manner.

No studies of the impact of medical schools' emphasis on rural practice and on the impact of training residents in rural areas or in outpatient clinics that care for underserved populations are randomized controlled trials. Lack of comparison groups limits confidence that differences in where primary care physicians and psychiatrists practice are due to characteristics of medical schools and residency programs and not to other factors.

Because most psychiatric training programs are small (the average size is seven per PGY), and because recruiting physicians in later postgraduate years is an unpredictable process that occurs outside of the residency match, a phased approach to increasing training spots is recommended.

Although not addressed in this recommendation, creating clinical training opportunities in underserved areas and with exposure to low-income patients also increases the likelihood that providers will select and remain in those practice settings.

While there is some data on what influences physicians to work in underserved areas, and to choose to work with patients of minority race/ethnicity, there is limited data on what influences other behavioral health workers' practice decisions. Still, there is strong data indicating that providers (physicians, in particular) are more likely to practice in the area where they trained, or in practice settings similar to those to which they were exposed during their training. Consequently, the Commission should strongly

consider locating psychiatric residency programs or slots in regions where there are currently few or no such programs. The Central Coast, San Joaquin Valley, and the area north of Sacramento are particular areas where there are no or few psychiatric residency slots.

Funding for Graduate Medical Education is complex, and there is no federated approach to that funding. Medicare GME is the largest federal contributor to GME, and the main source on which most, but not all, residency programs rely (because Medicare GME is directly related to the Medicare patient load in a sponsoring institution, residency programs at children's hospitals, which have a relatively smaller Medicare patient load, access other funding sources including, but not limited to, the Health Resources and Services Administration's Children's Hospital GME program). In 1997, in response to a report forecasting physician oversupply, Congress included in the Balanced Budget Act language that capped the Medicare residency spots and payments to GME sponsoring institutions. That cap, referred to as the Medicare Cap, has never been removed, despite numerous reports of physician undersupply since that time.

Regarding the addition of psychiatric residency positions, it is important to note that many institutions already have reached their Medicare Cap (1997 Medicare Cap on GME dollars) for federally supported residency training spots. Consequently, funding of these programs would be "above the cap" and require new funding, of which the dollars in this recommendation would be only a portion. Training programs are generally left to their own devices to secure long-term additional funding.

Data Sources and References

Number of first-year (PGY-1) primary care and psychiatry medical residents in California in 2018.

NRMP Program Results 2014–2018 Main Residency Match. National Resident Matching Program. kinstacdn.com (PDF).

Number of additional graduates of primary care residency programs needed to alleviate the projected shortage of primary care physicians in California.

Private tabulation prepared for the Commission derived from forecasts of supply and demand generated by Joanne Spetz and colleagues at Healthforce Center at UCSF. Spetz, Joanne, Janet Coffman, and Igor Geyn. *California's Primary Care Workforce: Forecasted Supply, Demand, and Pipeline of Trainees, 2016–2030*. Healthforce Center at UCSF, August 15, 2017. healthforce.ucsf.edu.

Number of additional graduates of psychiatry residency programs needed to alleviate 75% of the projected shortage of psychiatrists in California.

Private tabulation prepared for the Commission derived from forecasts of supply and demand generated by Joanne Spetz and colleagues at Healthforce Center at UCSF. Janet Coffman et al., *California's Current and Future Behavioral Health Workforce*, Healthforce Center at UCSF, February 12, 2018, healthforce.ucsf.edu (PDF).

Average rate of growth in newly licensed MDs between fiscal year 2004–5 and fiscal year 2015–16.

"Annual Reports." Medical Board of California. www.mbc.ca.gov.

Percentage of newly licensed MDs in California who are graduates of California residency programs.

"DocFlows." University of North Carolina. docflows.unc.edu; and *State Physician Workforce Data Book*, 2009 Update and 2017 editions. Assn. of Amer. Medical Colleges (AAMC).

Percentage of graduates of primary care residency programs who practice exclusively as primary care physicians.

Leyenaar, J. K., and M. P. Frintner. "Graduating Pediatric Residents Entering the Hospital Medicine Workforce, 2006-2015." *Academic Pediatrics* 18, no. 2 (2018): 200–7; Rayburn, W.F., et al. "Pursuit of Accredited Subspecialties by Graduating Residents in Obstetrics/Gynecology,

2000-2012." *Obstetrics and Gynecology* 120, no. 3 (2012): 619–25; and West, C. P., and D. M. Dupras. "General Medicine vs. Subspecialty Career Plans Among Internal Medicine Residents." *JAMA* 308, no. 21 (2012): 2241–47.

Number of patient visits per primary care resident per year.

"California's Primary Care Shortage to Worsen as New Family Medicine Residents Are Forced to Leave the State." Press release. California Academy of Family Physicians, March 19, 2015. www.familydocs.org (PDF).

Percentages of medical students and residents trained in California who remain in the state to practice.

"2017 State Physician Workforce Data Book." AAMC, November 2017. www.aamc.org.

Factors associated with primary care physician practice in underserved areas.

Goodfellow, A., et al. "Predictors of Primary Care Physician Practice Location in Urban or Rural Areas of the United States: A Systematic Review." *Academic Medicine* 91, no. 9 (2016): 1313–21; Parlier, A.B., et al. "The Road to Rural Primary Care: A Narrative Review of Factors That Help Develop, Recruit, and Retain Rural Primary Care Physicians." *Academic Medicine* 93, no. 1 (2018): 130–40; and Verma, P., et al. "A Systematic Review of Strategies to Recruit and Retain Primary Care Doctors." *BMC Health Services Research* 16 (2016): 126–50.

Number of FTE physician assistants who provide primary care in California.

Spetz, Joanne, Janet Coffman, and Igor Geyn. *California's Primary Care Workforce: Forecasted Supply, Demand, and Pipeline of Trainees, 2016-2030*. Healthforce Center at UCSF, August 15, 2017. healthforce.ucsf.edu.

Recommendation 2.3

AUTHOR Healthforce Center at UCSF

TITLE Recruit and train students from rural areas and other underresourced communities to practice in community health centers in their home region.

DESCRIPTION This recommendation would develop a Hometown Scholars Program in health professions schools at the University of California and other universities in California that would consist of (1) a program under which leaders of community health centers nominate highly qualified students to medical, nursing, NP, and PA programs; (2) establish new community medicine tracks at California medical schools modeled after the UC PRIME program; (3) provide scholarships to students who agree to practice as primary care physicians, psychiatrists, or geriatricians; and (4) establish a Safety-Net Professionals Workforce Institute that would create more clinical placements and residencies for health professions students in participating community health centers by reducing the administrative burden associated with training health professionals in community health centers.

MAIN TAKEAWAY This recommendation would increase the number of graduates from California medical schools by 280 to 560 between 2023 and 2030. One hundred eight medical students would receive a full-tuition scholarship for all four years of medical school in exchange for practicing as a primary care physician, psychiatrist, or geriatrician in an underserved area of California for four years. The recommendation also could establish more opportunities for training health professions students and residents in community health centers (CHCs). The estimated costs associated with this recommendation are \$64.35 million over 10 years. Operating costs associated with educating students and providing scholarships (\$89,018 to \$178,035 per graduate) would total \$49.85 million (\$11.5 million would go to CHCs to support training) and \$14.5 million would be used to support the Endorsed Applicant Program and the Safety Net Professionals Workforce Institute. The impact of the recommendation would be maximized if implemented in conjunction with the recommendation to increase the number of primary care medical residents throughout California.

Impact Statement

This recommendation would establish new community medicine tracks at 10 California medical schools at a cost of \$64.35 million over 10 years. The increase in the number of first-year students enrolled in California medical schools would be phased in between 2019 and 2023. When the increase is fully implemented in 2026, 200 to 480 additional medical students would be enrolled in California medical schools per year, an increase of 3% to 7%, depending on whether enrollment at medical schools other than UC Davis increases by 30 or 100 students.

The first class of 20 additional students would graduate from medical school and enter residency training in 2024. A total of 280 to 560 additional physicians would graduate from California medical schools and enter residency between 2024 and 2030. Students who graduate in 2024 and complete a residency in a primary care specialty would enter practice as early as 2027.

The estimated costs associated with this recommendation are \$64.35 million over 10 years. Operating costs of \$49.85 million are associated with educating students and providing scholarships (\$89,018 to \$178,035 per graduate) depending on whether enrollment at medical schools other than UC Davis increases by 30 or 100 students per year). Support for the Endorsed Applicant Program and the Safety Net Professionals Workforce Institute would cost \$14.5 million.

The majority of additional graduates are likely to practice in California, because data from the American Medical Association's Masterfile suggest that 62.8% of graduates of California medical schools practice in the state. At least 108 of these additional medical students would practice in an underserved area of California for four years following residency because they would receive a full-tuition scholarship for all four years of medical school in exchange for practicing as a primary care physician, psychiatrist, or geriatrician in an underserved area of the state for four years. The scholarships, which are valued at \$50,000 per year (\$200,000 over four years of medical school), would substantially reduce students' educational debt. In 2017, 73% of students at MD-granting medical schools had educational debt, and the average amount

of debt was \$190,694. In addition, students who are endorsed by CHCs may be especially likely to practice in rural or urban underserved areas over the long term because these students will have grown up in underserved areas and will have demonstrated interest in practicing in the areas served by the CHCs that endorse them. Studies have consistently found that physicians who grow up in rural areas are more likely to practice in rural areas and that physicians who grow up in underserved urban areas are more likely to practice in those areas.

The percentages of additional graduates who would be from disadvantaged backgrounds or racial/ethnic groups that are underrepresented in medicine is unknown but is likely to be higher than the percentages of all California medical school graduates. Students who are endorsed by CHCs are more likely to come from a disadvantaged background because people raised in medically underserved communities often experience high rates of poverty. Students endorsed by urban CHCs and some rural CHCs are more likely to be from underrepresented racial/ethnic groups because underserved communities in urban areas of California have high percentages of African American and Latino populations and because some rural areas have high percentages of Latinos or Native Americans community members.

The recommendation may also increase training opportunities for health professions students and residents in CHCs. The recommendation also proposes to establish a Safety Net Professionals Workforce Institute that would facilitate coordination between CHCs and health professions schools, which could reduce the administrative burden associated with training health professionals in CHCs and encourage more CHCs to provide training.

The impact of this recommendation would be maximized if it were implemented in tandem with the recommendation to increase the number of primary care residents trained in California by 20%, and if the funded residency programs prioritized admission of graduates of California medical schools.

Key Assumptions

- ▶ The recommendation calls for the first 10 additional students to be enrolled in community medicine tracks in 2019. Assuming that most medical students graduate in four years, the first group of 10 students are expected to graduate in 2023.
- ▶ All additional slots would be utilized because the number of applicants to medical schools in the United States is much larger than the number of slots available.
- ▶ The scholarship awards are structured so that students would receive full-tuition scholarships for all four years of medical school.
- ▶ All students who receive scholarships in exchange for practicing in an underserved area will practice in these areas for four years.
- ▶ The percentages of the additional students who remain in California to practice would be similar to the percentage of all graduates of California medical schools who remain in California to practice.
- ▶ All students who enroll in the new community medicine tracks are medical students.
- ▶ No assumptions are made about Safety Net Professionals Workforce Institute and the Endorsed Applicant Program due to the lack of information in the recommendation.

Data Notations and Context

We assumed that all students who enroll in the community medicine tracks are medical students because the cost table only includes costs associated with establishing community medicine tracks at medical schools.

- ▶ Although we assume that all students who receive full-tuition scholarships would receive these scholarships for four years, the recommendation does not state this explicitly. And although the recommendation statement indicates that scholarships would be provided to medical students who go on to practice in specific specialties (i.e., primary care specialties, psychiatry, geriatrics), it does not indicate whether these community medicine tracks would admit students who are interested in practicing in other specialties. This is an important consideration because some students in the UC PRIME program, which does not consider specialty plans in admission decisions, have gone on to practice in other specialties. Although some underserved areas of California need more physicians in all specialties, the Commission has prioritized enhancing the workforce in primary care, public health, mental health, and aging.
- ▶ The recommendation statement does not indicate whether physicians who receive the scholarship but do not practice in an underserved area would be required to repay the scholarship. Some scholarships are converted to loans if a student does not fulfill the obligation to practice in an underserved area. This requirement gives scholarship recipients a financial incentive to fulfill the obligation to practice in an underserved area and ensures that the medical school recoups funds from graduates who do not do so that can be used to award scholarships to other students in the future. If the proposed scholarships included a loan conversion requirement we could make a stronger directional statement about the recommendation's impact on the number of physicians who practice in underserved areas of California.
- ▶ As stated in the summary, this recommendation would be maximized if it were implemented in tandem with the recommendation on increasing the number of primary care residents trained in California by 20%, and if the funded residency programs prioritized admission of graduates of California medical schools. Physicians who complete both medical school and residency in California are more likely to practice in the state than physicians who only complete either medical school or residency in California. Estimates from the American Medical Association suggest that 81% of physicians who complete both medical school and residency in California remain in the state to practice vs. 70.4% of physicians who only complete residency in California and 62.8% of physicians who only complete medical school in California. In 2017, the ratio of first-year residency positions in California offered in the National Resident Matching Program per California medical school graduate was 1.7, which suggests that additional graduates could be accommodated without expanding primary care residency programs. However, residency programs vary in the extent to which they prioritize admitting graduates of California medical schools. Increasing the number of first-year primary care residency positions in California by 20% would increase the likelihood that additional graduates of UC PRIME programs who wish to complete a primary care residency in California would be able to do so. The impact would be even greater if the primary care residency programs funded were required to prioritize admission of graduates of California medical schools.

Data Sources and References

Number of additional graduates of the proposed new community medicine tracks. Per the recommendation statement.

Number of graduates of medical schools in California in 2016–2017: Association of American Medical Colleges (AAMC). Table B-2.2: Total Graduates by U.S. Medical School and Sex, 2012–2013 through 2016–2017. www.aamc.org; American Association of Colleges of Osteopathic Medicine. Graduates by Osteopathic Medical College and Race/Ethnicity, 2000-2017. www.aacom.org.

Percentage of graduates of University of California medical schools who practice in California. AMA Masterfile data from 2016 on graduates of California medical schools as cited in *2017 State Physician Workforce Data Report*, Association of American Medical Colleges (AAMC), November 2017, www.aamc.org.

Percentage of allopathic (MD) medical students with educational debt and the average amount of debt. Grischkan, J., et al., "Distribution of Medical Education Debt by Specialty, 2010–2016." *JAMA Intern Med*, 2017. 177(10): p. 1532–1535.

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Recommendation 2.4

AUTHOR Healthforce Center at UCSF

TITLE Expand medical school enrollment at public institutions for the benefit of medically underserved areas.

DESCRIPTION This recommendation would (1) expand the existing three-year MD program at UC Davis, provide full-tuition scholarships to graduates of the UC Davis program who agree to practice in underserved areas, and establish two three-year medical school programs in rural areas of California; 2) establishment and expansion of a branch campus of the UCSF School of Medicine in the San Joaquin Valley that would build on the existing UCSF Fresno program; 3) secure increased, permanent operating resources to increase enrollment at the UC Riverside (UCR) School of Medicine and the residency program affiliated with UCR.

MAIN TAKEAWAY This recommendation to **expand three-year MD programs** would increase the number of students in three-year medical school programs in California, which would result in 498 additional graduates of California medical schools between 2023 and 2029. When fully implemented, the recommendation would yield a 6% increase in the number of people graduating from California medical schools per year. One hundred forty-seven medical students would receive a full-tuition scholarship for all three years of medical school in exchange for practicing as a primary care physician, psychiatrist, or geriatrician in an underserved area of California. And, it would also increase the numbers of physicians from groups that are underrepresented in medicine, from disadvantaged backgrounds, or who speak a language other than English. The estimated costs associated with this recommendation are \$117.8 million over 10 years. Operating costs of \$35.3 million for the 248 graduates at UC Davis (including 147 full-tuition scholarships) would be \$142,339 per graduate; an additional \$2.5 million is allocated for a consortium to share best practices and accelerate evaluation of three-year programs. The recommendation also includes \$80 million to establish two new three-year medical schools in rural areas but does not indicate the proportion of these expenditures allocated for operating and capital expenses, so the operating cost per graduate for the estimated 250 graduates is not provided. The impact of the

recommendation would be maximized if implemented in conjunction with the recommendation on increasing the number of primary care medical residents throughout California.

Expand the San Joaquin Valley branch campus of UCSF Fresno. This recommendation would establish a branch campus of the University of California, San Francisco (UCSF) School of Medicine in the San Joaquin Valley that would graduate 66 medical students between 2023 and 2028, many of whom are likely to be from racial/ethnic groups that are underrepresented in medicine. Implementing this recommendation would cost \$167.5 million over 10 years, which would consist of \$20 million in capital costs and \$147 million in operating costs (\$2.2 million per graduate). Thereafter, the annual operating cost would be \$21.5 million to produce 50 graduates each year (\$430,000 per graduate). The impact of providing educational opportunities to high school and college students in the region cannot be estimated due to limited information in the recommendation. The impact of this recommendation would be maximized if implemented in conjunction with the recommendation to increase the number of primary care medical residents in California.

Expand the UC Riverside School of Medicine. This recommendation would increase the number of first-year medical students at the University of California Riverside (UCR) School of Medicine from 70 students in 2019 to 125 students annually from 2023 to 2028. As a result, the number of graduates of California medical schools would increase by 110 to 130 graduates by 2028. The recommendation would also increase the number of medical residents by 240 per year. The additional medical residents at UCR would provide 144,000 patient visits per year, which could increase availability of medical care in the Inland Empire, the region of California with the largest shortage of physicians. Some of the additional medical school graduates are likely to practice in the Inland Empire after graduation. Implementing this recommendation would cost \$445 to \$470 million over 10 years: \$370 million in operating costs and \$75 million to \$100 million in capital costs. The impact of the recommendation would be maximized if implemented in conjunction with the recommendation on increasing the number of primary care medical residents throughout California.

Impact Statement

The three proposed actions would improve in-state retention of physicians, cultural competence, and the likelihood of underrepresented physicians practicing in underserved areas. The impact of the three proposed actions would be maximized if implemented in tandem with Recommendation 2.2 to expand primary care and psychiatric residencies.

Expand Three-Year MD Programs

The recommendation to expand three-year MD programs would increase the number of California medical school graduates by 498 between 2023 and 2029, 147 of whom would receive a full-tuition scholarship for all three years of medical school in exchange for practicing as a primary care physician, psychiatrist, or geriatrician in an underserved area of California. The increases are the result of four additional students a year graduating from UC Davis's three-year program in 2023, 24 additional students in 2024, and 44 additional students per year from 2025 to 2029 (total = 248) plus 50 students per year graduating from two new rural three-year medical school programs from 2025 to 2029 (total = 250). These changes would yield a 6% increase in the number of people graduating from California medical schools per year over the number of graduates in 2016–17.

The estimated costs associated with this recommendation are \$117.8 million over 10 years. These costs include operating costs of \$35.3 million to train and provide full-tuition scholarships to students at UC Davis (\$142,339 per graduate) and \$2.5 million for a consortium to share best practices and accelerate evaluation of three-year programs. The recommendation also includes \$80 million to establish two new three-year medical schools in rural areas but does not indicate the proportion of these expenditures allocated to operating and capital expenses.

Given that UC Davis's three-year medical school program partners with residency programs in family medicine, primary care internal medicine, pediatrics, psychiatry, and geriatrics, most graduates of the first UC Davis class would enter practice in 2026 or 2027. These medical students would enter practice one year sooner than graduates of other medical school programs in California because they would complete medical school in three years instead of four years.

The majority of additional graduates at UC Davis and the two three-year rural campuses are likely to practice in California, because data from the American Medical Association's Masterfile suggest that 68.7% of all graduates of UC medical schools practice in the state. At least 147 of these additional medical students would practice in an underserved area for some period of time following residency because they would receive a full-tuition scholarship for all three years of medical school in exchange for practicing as a primary care physician, psychiatrist, or geriatrician in an underserved area of the state. These scholarships, each valued at \$50,000 per year (\$150,000 over three years of medical school), would substantially reduce students' educational debt. In 2017, 73% of students at MD-granting schools had educational debt, and the average amount of debt was \$190,694. In addition, studies of medical school programs in rural areas have found that graduates of these programs are more likely to practice in rural areas.

The majority of additional graduates from UC Davis's three-year medical school program are also likely to be from racial/ethnic groups that are underrepresented in medicine. According to data from UC Davis, 60% of enrolled students to date are from underrepresented racial/ethnic groups. This percentage is higher than the percentages of underrepresented minorities and Latinos among graduates of all California medical schools in 2016–17 (12% and 8%, respectively). In addition, nearly 80% of students enrolled in UC Davis's three-year medical school program are from disadvantaged backgrounds, and 75% speak a language other than English.

Thus, increasing the number of medical students in UC Davis's three-year program could result in the graduation of 149 additional students from underrepresented racial/ethnic groups from California medical schools from 2023 to 2029, which could increase the number of Californians who have access to a physician of the same race/ethnicity and/or speaks the same language, which may improve patient trust and satisfaction, and in turn affect willingness to engage in care their physicians recommend. The demographic characteristics of medical students who enroll in the two new rural three-year medical school programs cannot be estimated because there are currently no similar programs in California.

Supporting a small staff to coordinate sharing of best practices and evaluation of three-year medical school programs in California could facilitate more rapid dissemination of information regarding the outcomes of these programs and best practices.

Expand the San Joaquin Valley Branch Campus of UCSF Fresno

The recommendation to establish a branch campus of UCSF School of Medicine in the San Joaquin Valley would enroll 6 students in 2019 and grow to a class size of 50 students per year in 2025. A total of 66 students would graduate from the branch campus between 2023 and 2028. By 2029, the branch campus would graduate 50 students per year, an increase of 3.2% over the number of graduates of California medical schools in 2016–17. Implementing this recommendation would cost \$167 million over 10 years, which would consist of \$20 million in capital costs and \$147 million in operating costs (\$2.2 million per graduate). Thereafter, the annual operating cost would be \$21.5 million (\$430,000 per graduate).

The first class of six graduates would enter residency training in 2023. Given that residency training in physician specialties takes at least three years (more for some specialties), 2026 would be the earliest year in which any of these graduates would enter practice.

The majority of graduates of the UCSF Fresno San Joaquin Valley branch campus are likely to be from racial/ethnic groups that are underrepresented in medicine, because the race/ethnicity of graduates of the new branch campus is likely to be similar to that of students enrolled in the San Joaquin Valley PRIME program. Both programs have a shared goal of preparing physicians who will practice in the San Joaquin Valley. According to data from the UC Office of the President, in 2018 70% of students enrolled in the San Joaquin Valley PRIME program were from underrepresented racial/ethnic groups. Forty percent were Latino, the racial/ethnic group that is the most highly underrepresented in medicine in California and constitutes a high percentage of San Joaquin Valley residents. These percentages are higher than the percentages of underrepresented minorities and Latinos among graduates of all California medical schools in 2016–17 (12% and 8%, respectively). The majority of graduates of the new branch campus are likely to practice in California, because data from the American Medical Association's Masterfile suggest that 68.7% of all

graduates of UC medical schools practice in the state. Thus, the branch campus is likely to increase the number of Californians who would have access to a physician of the same race/ethnicity, which may improve patient trust and satisfaction and may in turn affect willingness to engage in the care their physicians recommend. The percentage of graduates who would practice in the San Joaquin Valley is unknown because the program would be new and because the impact would depend in part on whether the branch campus gives preference for admission to qualified applicants who are from the region, are underrepresented minorities, or have an interest in practicing in underserved areas. Studies have consistently found that underrepresented minorities are more likely to practice in an underserved area and that people who grew up in a rural area are more likely to practice in a rural area.

The impact of providing educational opportunities to high school and college students in the region to help them become competitive applicants for admission to the new branch campus cannot be estimated due to limited information, including a lack of data about costs associated with such efforts.

Expand the UC Riverside School of Medicine

This recommendation would expand the UC Riverside School of Medicine from 70 first year students in 2019 to 125 students annually from 2023 to 2028. Implementing this recommendation would cost \$445 to \$470 million over 10 years: \$370 million in operating costs and \$75 million to \$100 million in capital costs.

The recommendation presents two scenarios, one in which the annual number of first-year students at UCR remains at 70 students through 2022 and one in which five additional students would be admitted per year from 2019 through 2022. Depending on the scenario, 110 to 130 additional students would graduate from California medical schools. The total number of students enrolled in California medical schools would increase by 246 students per year from 2026 to 2028, an increase of 3% above the number enrolled in 2017–18.

If five additional first-year medical students are enrolled at UCR in 2019, these students would be expected to graduate in 2023. Depending on the specialty in which they train, these students could complete residency and enter practice as early as 2026. The largest increase in

graduates would occur in 2027 and 2028 because they would be the first students to graduate after the size of the first-year class is increased to 125 students.

The majority of additional graduates are likely to practice in California. Eighty-four percent of medical students who have graduated from UCR to date have entered residency programs in California. If the new additional graduates at UCR are similar, 92 to 109 would remain in California for residency. (The number varies depending on whether class size increases by five students between 2019 and 2022.) Data from the American Medical Association suggest that 81% of graduates who complete residencies will remain in California to practice and that 68.7% of those who move to other states for residency will return to California to practice, yielding a net increase of 87 to 103 physicians. Some of these physicians are likely to practice in the Inland Empire due to ties to the region. Among students who entered UCR in the fall of 2016, 26.7% attended high school in the Inland Empire. If a similar percentage of additional medical students attend high school in the Inland Empire, a substantial number of the additional graduates will have ties to the region that could lead them to practice there. The likelihood that they will practice in the region would be strengthened if they complete residency in the region and receive scholarships or loan repayment in exchange for practicing there after completing residency.

If the additional graduates are similar to students who graduated from UCR in 2016–17, 52.5% will enter a residency program in a primary care specialty, and 12.5% will enter a residency program in psychiatry. This would yield an increase of 58 to 68 California medical school graduates who enter a primary care residency program between 2019 and 2028 and an increase of 14 to 16 graduates who enter a psychiatry residency program.

If the additional graduates are similar to first-year medical students who enrolled at UCR in 2017–18, 37% would be from a disadvantaged background (defined as English as a second language, first in family to complete college, socioeconomically and/or educationally disadvantaged), and 21.4% would be from racial/ethnic groups that are underrepresented in medicine. Studies consistently suggest that physicians from underrepresented racial/ethnic groups are more likely to practice in underserved areas.

The recommendation would also increase the number of medical residents trained in programs affiliated with

UCR from 260 to 500 residents per year. The 240 additional medical residents at UCR would provide 144,000 patient visits per year (600 visits per resident per year), which could increase availability of medical care in the Inland Empire, the region of California that has the largest shortage of physicians. The increase would likely be phased in over time because residency programs typically expand by increasing the size of the first-year class. When fully phased in, the total number of medical residents in California would increase by 2% above the total number of medical residents in the state in 2016. The recommendation does not indicate how the additional residency positions would be distributed across medical specialties. If the distribution is similar to that of first-year residency positions in UCR-affiliated programs in 2018, 67% of the additional positions would be in primary care residency programs (i.e., family medicine, internal medicine, obstetrics/gynecology, and pediatrics).

Key Assumptions

Expand Three-Year MD Programs

- ▶ The first ten additional students enrolled in UC Davis' three-year medical school program would enroll in 2019 and graduate in 2022.
- ▶ The first students enrolled at the two new, rural three-year medical school programs would enroll in 2022 and graduate in 2025.
- ▶ All additional slots would be utilized because the number of applicants to medical schools in the United States is much larger than the number of slots available.
- ▶ The scholarship awards are structured so that students would receive full-tuition scholarships for all three years of medical school.
- ▶ All students who receive scholarships to practice in an underserved area as a primary care physician, psychiatrist, or geriatrician will do so.
- ▶ The percentages of the additional students who enroll in UC Davis' three-year medical school program who are underrepresented minorities, are from disadvantaged backgrounds, or speak a language other than English would be similar to that of students who have enrolled in the program to date.
- ▶ The percentage of additional graduates of UC Davis' three-year medical school program who remain in

California to practice is similar to the percentage of all persons who complete both medical school and residency in California and who remain in practice in the state.

Expand the San Joaquin Valley Branch Campus of UCSF Fresno

- ▶ The first six additional students enrolled at the San Joaquin Valley branch campus would graduate in 2023 because the recommendation calls for these students to enroll in 2019 and students usually complete medical school in four years.
- ▶ All students enrolled at the San Joaquin Valley branch campus would graduate in four years.
- ▶ All additional slots would be utilized because the number of applicants to medical schools in the United States is much larger than the number of slots available.
- ▶ The race/ethnicity of students who enroll at the San Joaquin Valley branch campus would be similar to that of students currently enrolled in the San Joaquin Valley PRIME program.
- ▶ The percentage of graduates of the San Joaquin Valley branch campus who remain in California to practice is similar to the percentage of graduates of public medical schools in California (i.e., University of California medical schools).

Expand the UC Riverside School of Medicine

- ▶ Under a “low” scenario the number of first-year medical students at UCR would remain at 70 students from 2019 through 2022 (same as the number of first-year students enrolled in the 2018–2019 academic year).
- ▶ Under a “high” scenario, five additional first-year medical students would be admitted to UCR from 2019 through 2022.
- ▶ Under both scenarios, the number of first-year medical students at UCR would increase to 125 from 2023 through 2028.
- ▶ All students would graduate in four years, which is the typical length of medical school.
- ▶ All additional slots would be utilized because the number of applicants to medical schools in the United States is much larger than the number of slots

available. And in the case of UCR, demand for the UCR program specifically is far greater than supply. According to the recommendation statement, UCR received applications from 5,633 persons for admission in fall 2018 and admitted 140 (acceptance rate = 2.5%).

- ▶ The percentages of the additional graduates who remain in California for residency would be the same as that of students who graduated from UCR in 2016–2017 and 2017–2018.
- ▶ The percentage of the additional graduates who remain in California to practice would be the weighted average of the percentage of physicians who complete both medical school and residency in California and who practice in the state, and the percentage who only complete medical school in California and who practice in the state.
- ▶ The percentage of additional graduates who attend high school in the Inland Empire would be similar to the percentage among students who entered UCR in 2016.
- ▶ Primary care specialties consist of family medicine, general internal medicine, general pediatrics, and obstetrics/gynecology. This definition is consistent with definitions used by the Song-Brown Healthcare Workforce Training Program and by the partnership between Physicians for a Healthy California and the University of California that is administering Proposition 56 funds for residency training.
- ▶ The percentages of additional graduates who enter residency programs in primary care specialties or psychiatry are similar to the percentages among physicians who graduated from UCR in 2016–2017.
- ▶ The percentage of additional graduates who are from disadvantaged backgrounds or are from under-represented racial/ethnic groups will be the same as the percentages among current first-year students at UCR in 2018–2019.
- ▶ Primary care residents provide 600 patient visits per year during training, per a press release from the California Academy of Family Physicians.
- ▶ The distribution of additional residents across medical specialties could be similar to the distribution of first-year (post-graduate year 1) residency positions in residency programs affiliated with UCR in 2018.

Data Notations and Context

As stated in the summary, all three components of this recommendation would be maximized if it were implemented in tandem with recommendation 2.2 to increase primary care and psychiatric residency training, and if the funded residency programs prioritized admission of graduates of California medical schools. Physicians who complete both medical school and residency in California are more likely to practice in the state than physicians who only complete either medical school or residency in California. Estimates from the American Medical Association suggest that 81% of physicians who complete both medical school and residency in California remain in the state to practice vs. 70.4% of physicians who only complete residency in California and 62.8% of physicians who only complete medical school in California. In 2017, the ratio of first-year residency positions in California offered in the National Resident Matching Program per California medical school graduate was 1.7, which suggests that additional graduates could be accommodated without expanding primary care residency programs. However, residency programs vary in the extent to which they prioritize admitting graduates of California medical schools. Increasing the number of first-year primary care and psychiatry residency positions in California would increase the likelihood that additional graduates of three-year MD programs, an expanded San Joaquin Valley branch campus of UCSF-Fresno, and an expanded UC-Riverside campus who wish to complete a primary care or psychiatry residency in California would be able to do so. The impact would be even greater if the primary care and psychiatry residency programs funded were required to prioritize admission of graduates of California medical schools.

Expand Three-Year MD Program

- ▶ We assumed that all students who enroll in the two new three-year rural campuses are medical students.
- ▶ The recommendation statement does not indicate whether physicians who receive the scholarship but do not practice in an underserved area would be required to repay the scholarship. UC-Riverside's medical school provides scholarships that are converted to loans if graduates decide not to practice in the Inland Empire after completing residency. This requirement gives scholarship recipients a financial incentive to practice in the Inland Empire and ensures that the medical school recoups funds from graduates who do not fulfill their obligation that can be

used to award scholarships to other students in the future. If the proposed scholarships included a loan conversion requirement we could make a stronger directional statement about the recommendation's impact on the number of physicians who practice in underserved areas of California.

Expand the San Joaquin Valley Branch Campus of UCSF Fresno

- ▶ The impact of the proposal to provide educational opportunities to high school and college students in the San Joaquin Valley to help them become competitive applicants for the new branch campus was not estimated because the recommendation statement does not provide any information about the number of students who would be served and the cost table does not contain a budget for this work.
- ▶ If data on the practice locations and specialties of graduates of the San Joaquin Valley PRIME program were available, these data could be used to approximate the percentage of graduates of the new San Joaquin Valley branch campus who would remain in the region to practice and the percentage who would practice in specialties facing shortages (e.g., primary care, psychiatry).

Expand the UC Riverside School of Medicine

- ▶ The number of graduates who practice in underserved areas of California cannot be estimated quantitatively because the UCR School of Medicine has only graduated two classes of students. None of these students have completed residency yet because residency programs take three or more years to complete. Thus, there is no historical data on practice locations of graduates of this medical school. In addition, the recommendation does not indicate the percentage of students who grew up in the Inland Empire region. This data point may be important because medical students with ties to the region may be more likely to practice there after they complete residency.
- ▶ If information about the proposed distribution of additional residency positions across medical specialties were available, future versions of this impact statement could estimate the number of additional residents who would graduate each year and the percentage who would practice as primary care physicians or psychiatrists.

Data Sources and References

Expand Three-Year MD Programs

Number of additional graduates of UC-Davis' three-year medical school program and number of graduates of the two new rural three-year medical school programs. Recommendation statement for recommendation 2.1.e.

Number of graduates of medical schools in California in 2016–2017. Association of American Medical Colleges (AAMC). Table B-2.2: Total Graduates by U.S. Medical School and Sex, 2012–2013 through 2016–2017. www.aamc.org; American Association of Colleges of Osteopathic Medicine. Graduates by Osteopathic Medical College and Race/Ethnicity, 2000–2017. www.aacom.org.

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Percentage of additional students in UC-Davis' three-year medical school program who are underrepresented minorities, are from a disadvantaged background, or speak a language other than English. UC-Davis internal reports cited in the recommendation statement for Recommendation 2.1.e.

Percentage of graduates of University of California medical schools who practice in California. AMA Masterfile data from 2016 on graduates of California medical schools as cited in *2017 State Physician*

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Number of First-Year (Postgraduate Year 1) Residency Positions Offered in the National Resident Matching Program in 2017. National Resident Matching Program (NRMP). 2017 Main Residency Match: Match Rates by Specialty and State. kinstacdn.com (PDF).

Expand the San Joaquin Valley Branch Campus of UCSF Fresno

Number of graduates of medical schools in California in 2016–2017. *Table B-2.2: Total Graduates by U.S. Medical School and Sex, 2012–2013 through 2016–2017.* Association of American Medical Colleges (AAMC). www.aamc.org; *Graduates by Osteopathic Medical College and Race/Ethnicity, 2000–2017.* American Association of Colleges of Osteopathic Medicine. www.aacom.org.

Percentage of San Joaquin Valley PRIME students who are underrepresented minorities. UC Office of the President internal reports cited in the recommendation statement regarding UC PRIME programs.

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Expand the UC Riverside School of Medicine
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Percentage of persons who complete both medical school and residency in California who practice in California. AMA Masterfile data from 2016 on graduates of California medical schools as cited in *2017 State Physician Workforce Data Report*, Association of American Medical Colleges (AAMC), November 2017, www.aamc.org.

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Percentage of graduates of UCR medical school in 2016–2017 who entered a residency program in a primary care specialty or psychiatry. *University of California, Riverside School of Medicine. Year in Review, 2016–2017.* medschool.ucr.edu (PDF).

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Number of medical residents in California in 2016. AMA Masterfile data from 2016 on graduates of California medical schools as cited in *2017 State Physician Workforce Data Report*, Association of American Medical Colleges (AAMC), November 2017, www.aamc.org.

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Recommendation 2.5

AUTHOR Healthforce Center at UCSF

TITLE Develop a four-year medical education program at Charles R. Drew University of Medicine and Science.

DESCRIPTION This recommendation calls for an unspecified entity to fund a planning grant to position Charles R. Drew University of Medicine and Science (CDU) to offer an independent four-year MD program, with a first class of 60 students to start in September 2023. The program would supplement two existing programs at CDU, the UCLA-CDU Medical Education Program and the UCLA-Drew PRIME MD program.

MAIN TAKEAWAY This recommendation would provide funding, approximately \$1 million, for a three-year planning grant for an independent four-year MD program at Charles R. Drew University of Medicine and Science that would graduate 180 students between 2027 and 2029, the majority of whom would be from racial/ethnic groups underrepresented in medicine and would provide care to underserved populations. The impact of the recommendation would be maximized if implemented in conjunction with the recommendation aimed at increasing the number of primary care medical residents in California.

Impact Statement

This recommendation would provide funding, approximately \$1 million, for a three-year planning grant to develop an independent four-year MD program at Charles R. Drew University of Medicine and Science (CDU). If the planning grant is successful, the program would admit its first class of students in 2023. Assuming the new four-year MD program is launched, there would be a resultant increase in graduates of California medical schools and the number entering residency training. The number of graduates of California medical schools would increase by 60 graduates per year, an increase of 3.8% over the 2016–17 academic year. If the first cohort of new first-year students enrolls in 2023, the number of graduates would increase by 180 between 2027 and 2029. Given that residency training in physician specialties takes at least three years (more for some specialties), 2030 would be the earliest year in which any of the new graduates would enter practice.

The majority of graduates of the new four-year CDU program are likely to be from racial/ethnic groups that are underrepresented in medicine. During the 2017–18 academic year, 80% of students enrolled in the UCLA-CDU Medical Education Program were from such groups — 42% were African American, 37% were Latino, and 1% were Native Hawaiian / Pacific Islander. These percentages are higher than the percentages of underrepresented minorities, African Americans, Latinos, and Native Hawaiian / Pacific Islanders among graduates of all California medical schools in 2016–17 (12%, 4%, 8%, and 0.2%, respectively). The findings from the UCLA-CDU Medical Education Program are likely generalizable to graduates of a new four-year CDU program because both programs aim to enroll medical students interested in caring for underserved populations and provide them with longitudinal clinical training in an underserved area of Los Angeles aimed at reinforcing their interest. If the racial/ethnic diversity of students enrolled in the new four-year program is consistent with that of students enrolled in the UCLA-CDU Medical Education Program in 2017–18, of the 180 students who graduate between 2027 and 2029, 76 would be African American, 67 would be Latino, and 2 would be Native Hawaiian / Pacific Islander.

The majority of graduates of the new CDU program are likely to practice in California, because data from the American Medical Association’s Masterfile suggest that 62.8% of all graduates of MD-granting medical schools in California practice in the state. Graduates of the new CDU program would also be more likely to care for underserved populations than physicians who do not participate in similar programs. A study of graduates of the UCLA-CDU Medical Education Program from 1985 to 1995 found that they were twice as likely to practice in an underserved area as graduates of UCLA’s medical school who did not participate in the program (53% vs. 26%).

Increasing the number of medical school graduates who are from racial/ethnic groups underrepresented in medicine would also increase the number of Californians who would have access to a physician of the same race/ethnicity, which may improve patient trust and satisfaction and may in turn affect willingness to participate in care their physicians recommend.

The impact of this recommendation, if successful in launching a four-year medical school, would be maximized if it were implemented in tandem with the recommendation aimed at increasing the number of primary care residents trained in California by 20%, and if the residency programs funded prioritized admission of graduates of California medical schools.

Key Assumptions

- ▶ The program would supplement two existing programs at Charles R. Drew University of Medicine and Science (CDU), the UCLA-CDU Medical Education Program and the UCLA-Drew PRIME MD program.
- ▶ The first 60 additional students would graduate in 2027 because these students would enroll in 2023 and the program would take four years to complete.
- ▶ All CDU students graduate in four years, which is the common duration of medical school.
- ▶ All 60 additional slots per year would be fully utilized because the number of applicants to medical schools in the United States is much larger than the number of slots available.
- ▶ The race/ethnicity of students who enroll in the proposed new four-year CDU program would be similar to that of students currently enrolled in the UCLA-CDU Medical Education Program.
- ▶ The percentage of graduates of the proposed new four-year program at CDU who remain in California to practice is similar to the percentage of graduates of all California medical schools.
- ▶ Findings from historical studies of the community-based four-year UCLA-CDU Medical Education Program can be generalized to graduates of the proposed new four-year program at CDU. Although these findings are based on data that are over 20 years old, they are likely still generalizable, as the goals of the proposed new program at CDU are similar.
- ▶ Findings from the literature on the relationship between physician race/ethnicity and practice in underserved rural or urban areas can be generalized to graduates of the proposed four-year program at CDU.

Data Notations and Context

If current data were available on the practice locations of graduates of the CDU/UCLA Medical Education Program and the CDU/UCLA PRIME MD program, future versions of the impact statement could more accurately estimate the percentage of graduates of the proposed new four-year program at CDU who would practice in California and in underserved areas of California or other states.

As stated in the summary, this recommendation would be maximized if it were implemented in tandem with the recommendation on increasing the number of primary care residents trained in California by 20%, and if the funded residency programs prioritized admission of graduates of California medical schools. Physicians who complete both medical school and residency in California are more likely to practice in the state than physicians who only complete either medical school or residency in California. Estimates from the American Medical Association suggest that 81% of physicians who complete both medical school and residency in California remain in the state to practice versus 70.4% of physicians who only complete residency in California and 62.8% of physicians who only complete medical school in California. In 2017, the ratio of first-year residency positions in California offered in the National Resident Matching Program per California medical school graduate was 1.7, which suggests that additional graduates could be accommodated without expanding primary care residency programs. However, residency programs vary in the extent to which they prioritize admitting graduates of California medical schools. Increasing the number of first-year primary care residency positions in California by 20% would increase the likelihood that additional graduates of UC PRIME programs who wish to complete a primary care residency in California would be able to do so. The impact would be even greater if the primary care residency programs funded were required to prioritize admission of graduates of California medical schools.

Data Sources and References

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Recommendation 2.6

AUTHOR Healthforce Center at UCSF

TITLE Bring together schools and programs of public health and local health departments to train the next generation of public health professionals and advance health equity.

DESCRIPTION This recommendation would support partnerships between local health departments and public health schools and programs to create 15 academic health departments (AHDs) that build public health practice and research capacity. Over seven years, AHDs would increase the number of nonclinical public health students exposed to, and prepared for, governmental public health positions in California.

MAIN TAKEAWAY The implementation of 15 academic health department (AHD) pilots would result in 674 nonclinical public health professionals joining the government public health workforce in California. AHDs would also increase public health practice capacity and academic research through the collaboration between local health departments and public health schools and programs. This recommendation is estimated to cost \$15.5 million over seven years. The portion allocated to the AHD pilots (\$12 million, or \$800,000 per AHD pilot) translates into approximately \$17,800 per professional.

Impact Statement

Supporting the implementation of 15 academic health departments (AHDs) — partnerships between local health departments (LHDs) and public health schools and programs — would increase the number of nonclinical public health students exposed to, and prepared for, governmental public health positions in California. An estimated 674 nonclinical professionals would be added to the local public health workforce after three AHD pilot cycles at an estimated cost of \$17,800 per professional entering the government public health workforce. These professionals would serve underserved communities and advance health equity. The successful implementation of this recommendation would also support joint research and practice collaboration to build public health capacity, providing competitive awards for innovation in education, research, and service. AHDs would also engage

the broader health care sector in addressing population health and the social determinants of health. This recommendation is estimated to cost \$15.5 million in total over seven years.

These estimated costs and benefits do not address the value gained through the LHD and public health school (or program) relationships, joint research, service relationships, or the benefits of an AHD community of practice.

Key Assumptions

- ▶ The demand for public health professionals is growing as the workforce has decreased. The demand for new public health professionals and leaders is growing, as a large percentage of current leaders are slated for retirement. Since 2008, the number of LHD employees has decreased nationally by 23% (NACCHO, 2016). Many LHDs report challenges in recruiting and retaining well-qualified workers, citing a lack of tools for recruiting, limited options for advancement, and instability of funded positions. Only a small minority of public health graduates choose a career in government public health.
- ▶ A qualified public health workforce is essential to an effective system. The California Conference of Local Health Officers 2017 Policy Platform includes human resources as a foundational capability. The platform identifies funding and resources as priorities to support the training and workforce development of community health/outreach workers, case managers, public health nurses, midlevel providers, epidemiologists, laboratory directors and staff, physicians, and others.
- ▶ Academic health departments provide hands-on training to the future public health workforce. AHDs help to create a pipeline of well-trained professionals who are dedicated to serving the public and who are interested in pursuing employment in local health departments. A recent survey on the effectiveness of AHDs found that both sides of the collaboration valued the contributions to “improve education and training, support public health accreditation, enhance

LHD credibility, enhance LHD technological capabilities, and improve research and evidence-based practice.” Moreover, respondents noted that AHDs advanced workforce development goals for LHDs and the education and training goals of public health school programs. Research shows that AHDs provide hands-on training to the future public health workforce while simultaneously improving the quality of participating departments.

- ▶ This recommendation focuses on nonclinical public health students and professionals only.
- ▶ This recommendation does not comment on the capacity of existing LHD staff to participate in this effort.
- ▶ This recommendation addresses one of several factors contributing to the decline in the public health workforce (prepared pipeline of workers) but does not address other factors (e.g., opportunities to advance and funding instability).

- ▶ Converting student engagement in AHD pilots and sustainability phases into employment in local health departments would depend on the nature and duration of their “engagement.” Funding at the planned level would engage at least 50 additional nonclinical public health students per year in LHDs during the pilot period. During the two-year sustainability phase to follow, the number of engaged students wanes, with 45 total in the two subsequent years (see table below). In detail:
 - ▶ Each AHD pilot engages 100 students during two-year pilot and 45 during the two-year sustainability phase for a total of 145.
 - ▶ Across five AHDs, this totals 725 engaged students.
 - ▶ For three cycles of AHD pilot and sustainability phases, this totals 2,175 engaged students, resulting in 674 students available to enter employment.

Relevant Assumptions About the Type/Length of Engagement and Associated Conversions into Government Employment

TYPE/LENGTH OF ENGAGEMENT	PERCENTAGE ENTERING PUBLIC HEALTH WORKFORCE	NUMBER PER PILOT CYCLE + SUSTAINABILITY PHASE	INCREASE IN SUPPLY
One-year internship	66%	100	66
One-semester internship	50%	125	63
Summer internship	33%	200	66
Single class project	10%	300	30
Totals		725	225
Percentage per pilot & sustainability cycle entering government public health	31%		
Total entering supply over 15 AHDs in seven years		674	

Note: Local health departments would be the fund recipients, and would allocate funds, as appropriate, for faculty and student academic health department (AHD) activities at public health schools and programs.

Data Notations and Context

The estimated total budget for the statewide academic health department is \$15.5 million over seven years. Of this total, \$7.5 million would support three sequential two-year pilots of five AHDs, or \$500,000 per AHD, and \$4.5 million would be used for \$300,000 grants to support two-year sustainability phases for each of the 15 AHDs. The remaining \$3.5 million would support \$2.1 million for AHD program administration and \$1.4 million for evaluation. Detailed cost information per recommendation author Kevin Barnett.

The costs break down to \$800,000 per AHD pilot, consisting of a two-year pilot phase (\$500,000) and two-year sustainability phase (\$300,000). This can also be calculated as approximately \$5,500 per engaged student and \$17,800 per nonclinical public health professional entering the government public health workforce via the AHD.

These estimated costs do not address the value gained through the LHD and public health school relationships, joint research, service relationships, or the benefits of an AHD community of practice.

The recommendation does not address the types of public health professions that would be prioritized for training and placement. For example, nearly 20% of FTEs in LHDs are registered nurses, and their FTEs have been dropping steadily over the past 10 years (NACCHO 2016 profile). In addition, LHDs in large cities (over 500,000 population) have experienced the greatest decline in FTEs. Per the recommendation author, Kevin Barnett, this recommendation focuses on nonclinical public health professionals only.

Data Sources and References

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Recommendation 2.7

AUTHOR Healthforce Center at UCSF

TITLE Integrate training on social determinants into all health professions training programs.

DESCRIPTION This recommendation seeks to integrate the study of social determinants of health into schools of medicine, pharmacy, dentistry, nursing, and public health through (1) an assessment of the current status of education and training on the social determinants of health in all California health professions education institutions and clinical training facilities, including curricula, partnerships with external stakeholders, and faculty competencies; (2) targeted data and technical assistance to support the tailored redesign of the curricula of California health professions education institutions to fully integrate the social determinants of health at all stages of the education and training process; and (3) building a community of practice that supports implementation.

MAIN TAKEAWAY Integrating social determinants of health curricula in health professions training programs would increase clinicians' understanding of cultural, environmental, and contextual factors affecting patient health. Expanding awareness of social determinants of health creates the potential for more comprehensive and effective clinical care, with the ultimate goal of improving long-term health outcomes and lowering costs. Expected costs for this recommendation are \$21.8 million over four years.

Impact Statement

In the short term, conducting an assessment on the current status of social determinants of health (SDH) in health care education and training, accompanied by technical assistance and convening a community of practice, is likely to result in the implementation and integration of SDH curricula into schools of medicine, pharmacy, dentistry, nursing, and public health. SDH-integrated curricula would increase clinicians' understanding of cultural, environmental, and contextual factors affecting patient health. While evidence is still needed to substantiate expected outcomes, it is widely believed that expanded awareness of SDH can result in more comprehensive and effective clinical care, ultimately leading to

improved long-term health outcomes and lowered costs. Graduates would also develop the knowledge and skills to work with diverse stakeholders and disciplines. Some evidence also suggests that medical students introduced to SDH may be more likely to select careers in primary care. Expected costs for this recommendation are \$21.8 million over four years.

Key Assumptions

- ▶ Educational and training exposure to SDH influences clinician knowledge and skills to address them. Research by the Centers for Disease Control and Prevention and the World Health Organization found direct impacts of social factors (such as education, economic stability, and environmental factors) on health outcomes. Thus, professional health care and training programs throughout the United States have started to more fully incorporate SDH education into curricula to increase future clinicians' ability to address SDH in patient care. Early outcomes from a University of Illinois College of Urban Medicine (UMed) Program with a four-year focus on nonclinical urban population health showed increased knowledge and confidence among graduating students working in urban, underserved communities.
- ▶ Medical students exposed to SDH may be more likely to choose primary care careers. Research also suggests that a higher percentage of students choose primary care positions when exposed to SDH in training. For example, a greater proportion of UMed cohort students selected primary care residencies when compared to their non-UMed counterparts.
- ▶ Addressing SDH can lead to increased prevention and lower costs of care. More evidence is also starting to show a link between SDH-focused education and increased patient utilization of preventive services. At Florida International University's Herbert Wertheim College of Medicine, students participating in an interdisciplinary household visitation program to address SDH among patients saw increased use of preventive services by patients a year into the program. Finally, achieving SDH-focused clinical practice

through the implementation of SDH-focused curricula could lead to reductions in overall health care costs. When Indianapolis, Indiana, primary care providers partnered with nonmedical wraparound service providers (consisting of social workers, behavioral health professionals, and other team members) to address SDH, researchers estimated significant annual cost savings resulting from decreased hospitalizations and emergency department visits.

- ▶ While additional research is needed to observe long-term health impacts, existing literature suggests that increased knowledge of SDH among health care professionals may lead to improved practice, lower costs, and an increase in primary care practitioners.
- ▶ Health professions schools would participate in integrating the resulting SDH content in their curriculum.

Data Notations and Context

The recommendation includes a \$21.8 million estimate for undertaking SDH curricular redesign over four years. This process includes a \$1.5 million statewide assessment of curricula, faculty, and research priorities to develop an implementation plan within the first year. There is an additional \$2.25 million over the next three years for curricular technical assistance and building communities of practice at 20 sites. The cost estimates are not grounded in specific budgets or identified organizational cost structures.

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Recommendation 2.8

AUTHOR Healthforce Center at UCSF

TITLE Expand the role of the California Community College system and new online college in training the future health workforce.

DESCRIPTION This recommendation calls for the California Community Colleges Chancellor's Office to (1) continue and expand its existing statewide and regional health workforce initiatives, and engage with health employers, labor unions, other university and health training providers, and K–12 schools to strengthen pathways to priority health careers for students and incumbent workers; (2) support development of the California Medical Scholars Program, a new statewide coalition of health educators, health professions schools, and employers committed to scaling and sustaining a direct pathway from community college to medical school; and (3) explore the need for and options for increasing production of bachelor of science in nursing graduates in collaboration with California State University and UC.

MAIN TAKEAWAY Expanding pathways for California Community College (CCC) students and California residents has the potential to increase the number and diversity of students who earn certificates and degrees in allied health fields and secure jobs in priority health professions. Since CCC already has the resources required to implement most of the proposed actions, only \$100,000 (for the California Medical Scholars Program) is needed in the short term to implement this recommendation.

Impact Statement

Expanding pathways for CCC students and California residents not currently accessing the CCC system has the potential to increase the number and diversity of students who earn certificates and degrees in allied health fields and secure jobs in priority health professions. The CCC in 2016 implemented the Strong Workforce / Doing What Matters program, which aims to expand enrollment in certificate and degree programs in priority industries, including health care, and ensure that CCC programs align with regional workforce needs. The program is in its early stages, but recent data on enrollment and certificate and degree awards in health-related fields suggest that the CCC pipeline for health-related programs is beginning to expand. The California Medical Scholars Program, with its focus on scaling and sustaining a direct pathway from community college to medical school, has the potential to increase the supply of physicians in California. And bringing together public higher education partners to collaborate on nurse training could lead to strategic, data-informed higher education planning that would improve coordination in nursing training programs to meet state needs. Such planning efforts could result in a stronger BSN-prepared nursing pipeline for California.

Minimal funds (approximately \$100,000 for the California Medical Scholars Program) are needed in the short term to implement this recommendation, as CCC has most of the resources required to implement the planned activities. Future resource requirements for the recommended actions would be determined through future planning efforts.

Key Assumptions

The CCC Strong Workforce / Doing What Matters program will continue to expand health care certificate and degree programs in priority health fields and expand the pipeline of community college students transferring to four-year degree programs in health professions, resulting in an increasing supply of workers in high-need health care fields. This impact statement assumes that the CCC may see similar gains in other efforts to strengthen pathways for health professional students.

Data Notations and Context

The background document for Recommendation 2.5 (develop a four-year medical education program at Charles R. Drew University of Medicine and Science) would benefit from augmentation to include data and analysis on current and expected future workforce shortages by health profession and region over the next decade and more detail on CCC plans for expanding health career offerings. Analysis should be performed both for a baseline without implementation of this recommendation and with implementation of this recommendation.

The California Community Colleges Strong Workforce Program (SWP), which was implemented in 2016, aims to expand enrollment, increase certificate and degree completion, and reduce equity gaps in 10 priority workforce sectors, including health care. The state budget included \$200 million in funding for the SWP in 2016–17 and \$248 million in each of 2017–18 and 2018–19.

As part of the SWP, the CCC has been awarding grants to strengthen regional collaboration and support alignment between CCC career education programs and the needs of industry sectors; about 14% of these funds (\$1.85 million in 2016–17) was awarded for health care–related initiatives.

Data Sources and References

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Recommendation 3.1

AUTHOR Healthforce Center at UCSF

TITLE Maximize the role of nurse practitioners as part of the care team to help fill gaps in primary care.

DESCRIPTION This recommendation has three components: (1) expanding nurse practitioner (NP) education to increase the supply of primary care providers in underserved communities, (2) maximizing full use of NP skills within current scope of practice regulations, and (3) reforming scope of practice regulations to give NPs full practice authority after a transitional period of collaboration with a physician or experienced NP.

MAIN TAKEAWAY The estimated total costs of this three-part recommendation are \$460 million over 10 years. Implementation of the education expansion component is estimated to cost \$454 million and would increase the total number of nurse practitioners (NPs) in California to 44,000 by 2028 — approximately 7,000 more NPs than without this recommendation (a per-NP cost of approximately \$65,000). Of these NPs, approximately 14,360 would work in primary care. This growth in the primary care NP workforce complements the recommendation related to increasing the number of primary care physician residencies, and together these recommendations would fill the projected shortage of primary care clinicians. The implementation of the three parts of this recommendation would result in approximately 17,000 NPs working in primary care, with more NPs working in rural communities. Full practice authority for NPs would result in cost savings to Californians from reduced avoidable emergency department stays and hospitalizations, and the lower costs of retail clinic use and primary care, totaling \$7.2 billion or more by 2028.

Impact Statement

Expanding nurse practitioner education to increase the supply of primary care providers. Growth in the number of NP graduations is projected to result in California having 44,000 certified NPs in 2028, producing 14,360 primary care NP FTEs in 2028. Together with a recommendation on increasing primary care physician residencies, this would eliminate the shortage of primary care clinicians in California projected by Healthforce Center at UCSF. The primary care residency recommendation details the impact on access to care of implementing both recommendations.

Promoting the full utilization of NP skills within current scope of practice regulations. The impact of this element of the recommendation cannot be estimated because there is no existing literature to support an impact model.

Reforming scope of practice regulations. Removing scope of practice restrictions would increase the growth rate of the NP supply by 25%. Between 2010 and 2017, California's NP supply grew 39%; with full practice authority the growth rate would have been 49%, and the state would have 1,500 NPs more than it does today. If full practice authority is achieved by 2020:

- ▶ The share of NPs working in primary care would increase by about four percentage points above baseline projections, increasing the number of primary care NPs from a baseline of 8,513 in 2020 to 9,169. By 2028, the number of NPs in primary care would reach 15,466, which is about 1,100 more than the baseline forecast based on education growth alone. If combined with education expansion, there would be 17,000 primary care NPs.
- ▶ The share of NPs in rural areas would rise between 60% and 350%, drawing 132 to 550 additional NPs to rural California in 2020, above the 220 projected based on education expansion alone. By 2028, full practice authority would lead to 223 to 928 more NPs in rural areas than education expansion alone (371).

- ▶ Full practice authority would increase the share of Californians receiving annual adult checkups by 5%. It would increase the share of adults rating their health care as excellent by 8.6%.
- ▶ There would be nearly 50,000 fewer revisits to emergency departments for ambulatory care–sensitive conditions, resulting in cost savings of more than \$58 million per year. If full practice authority is achieved in 2020, total cost savings would be \$522 million by 2028.
- ▶ There would be a decrease in avoidable hospitalizations of dual-eligible Californians of nearly 64,000, saving \$512 million per year, totaling \$4.6 billion by 2028.
- ▶ There would be a decrease in hospitalization of dual-eligible nursing home residents of approximately 18,000, saving more than \$202 million per year and totaling \$1.8 billion between 2020 and 2028.
- ▶ Cost savings would arise from reduced retail clinic costs at approximately \$35 million per year, totaling \$315 million by 2028.
- ▶ There also would be lower costs of well-child visits (3% to 16% reduction), and lower malpractice payments by physicians (up to 31%). Baseline costs for these items were not available for computations of total cost savings to California.

The estimated total cost of this three-part recommendation is \$460 million.

Key Assumptions

- ▶ The benefits on population health of increasing primary care physician supply also apply to expanding the number of NPs if NPs have full practice authority.
- ▶ There are now approximately 9,327 NPs working in primary care (45.9% of all NPs).
- ▶ About 2.4% of NPs lived in rural areas in 2017.
- ▶ There were 136.9 million emergency department (ED) visits nationally in 2016, and 14.6 million visits in California (10.7%). Traczynski and Udalova report there were approximately four million ED revisits associated with ambulatory care–sensitive conditions nationally; if California accounts for 10.7% of these, then the state had 428,000 such visits. There would be an 11.6% decrease in the number of these visits (49,648). Traczynski and Udalova report that the cost of an ED visit for an ambulatory care–sensitive condition is \$1,174. Thus, cost savings in California would be \$58,286,752.
- ▶ California had approximately 1.4 million dual eligibles in 2013 (www.kff.org). If avoidable hospitalizations of dual eligibles decrease from 145.85 to 100.18 per 1,000 person-years, as estimated by Oliver et al., that is a decrease of 63,938.
- ▶ There are approximately 370,000 nursing home residents in California (www.cahf.org), and five-eighths are covered by Medicaid (231,250) (kff.org). Oliver et al. estimate reduction in hospitalization of dual-eligible nursing home residents from 25.9% to 18.1%, which would be a total of 18,037 fewer hospitalizations of nursing home residents per year.
- ▶ In 2011, costs of potentially avoidable hospitalizations for dual eligibles were approximately \$8,000 each (www.cms.gov (PDF)).
- ▶ Hospitalizations of nursing home residents had an average cost of \$11,255 in 2013 (oig.hhs.gov (PDF)).
- ▶ 4.3% of retail clinics are assumed to be in California (oig.hhs.gov (PDF)).
- ▶ For costs savings associated with well-child visits, calculations used the national average of \$360 per general primary care preventive visit, as data specific to California or well-child could not be found.

Data Notations and Context

- ▶ Only papers that had estimates that could be used to extrapolate impact for California were considered for the impact analysis.
- ▶ Total number of NPs resulting from the proposal was calculated to craft the impact statement — based on the model developed by Coffman and Spetz.

Data Sources and References

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Recommendation 3.2

AUTHOR Healthforce Center at UCSF

TITLE Establish and scale a universal home care worker family of jobs with career ladders and associated training.

DESCRIPTION The proposed action is to adopt a new job category for universal home care workers, who provide personal care services. The job category would have three levels based on the types of services provided to the client and the skills needed to deliver those services. The recommendation outlines a process to define the necessary competencies for each level, training requirements, compensation expectations, and amendments of the Nurse Practice Act to authorize greater delegation.

MAIN TAKEAWAY At an estimated cost of \$7 million over four years, this recommendation is likely to increase home care worker job satisfaction, client satisfaction, and worker retention. The recommendation may reduce nursing home use, but such an effect cannot be quantified. The training program that would result from this recommendation could reduce spending on unnecessary emergency department visits and hospitalizations by more than \$2.7 billion over 10 years.

Impact Statement

The establishment of the universal home care worker job family, with training requirements, increasing pay scale, and expanded delegation of tasks by licensed nurses to home care aides is intended to increase the supply of home care workers and to better enable them to meet the care needs of Californians living with disabilities in the community. Implementing this recommendation is estimated to cost \$7 million over four years. The recommendation involves execution of a Health Workforce Pilot Project (HWPP) to test training and expanded delegation and evaluation impact.

The HWPP would contribute important knowledge in this area, as there are only a few studies that quantify the impact of home care aide training and/or expanded nurse delegation. Studies generally focused on worker satisfaction (improved), client satisfaction (improved), and adverse events (no change), but not worker turnover, client outcomes, or costs. A small body of research indicates that home care worker pay and job satisfaction is

associated with lower turnover, which would result in a higher supply of home care aides; the existing research does not allow for quantification of the numeric or geographic increase. Nurse delegation of medication administration and other tasks to home care aides would reduce time demand per client on licensed nurses and thus enable them to work with a larger number of clients in home and community settings. Existing research documents that home care aides feel better prepared to meet clients' needs and communicate with care providers when they have received training, suggesting that job quality and worker confidence would improve. Studies have found that client satisfaction is greater when home care aides have received training and are able to perform more tasks. One evaluation found that training of home care aides in California reduced emergency department visits and inpatient stays. If the results of that evaluation were applied to all agency-employed home care aides in California after the HWPP and an implementation phase, savings would be more than \$2.7 billion by 2028.

Key Assumptions

- ▶ The process outlined in this recommendation would lead to both training requirements for home care aides and expanded ability of licensed nurses to delegate tasks to home care aides.
- ▶ The recommendation for training would apply only to agency-employed home care aides.
- ▶ This recommendation would not apply to In-Home Support Services (IHSS) workers, who now have a large number of paramedical tasks they are specifically permitted to perform.
- ▶ Approximately 5% of all personal/home care aides work in agencies. This is a rough estimate from Pourat's estimate that there were 30,075 agency-employed aides in 2011, and the Employment Development Department (EDD) estimate that there was a total of 671,600 home care aides in 2016. Other plausible estimates are that 2.5% of aides work in agencies, based on EDD data that this share of aides works in "employment services," up to more than 25% of home care aides work outside IHSS. This latter number is too high, however, because many home care aides are directly employed by households.

- ▶ It was assumed that all home care aides work with one client only for the purposes of calculating decreases in ED visits and hospitalizations.
- ▶ Cost savings would not begin until 2023, after one year of planning (2019), two years of the HWPP (2020–21), and one year of implementation (2022).
- ▶ Average costs of ED visits and inpatient visits from the Health Care Cost Institute were inflated at the average 2012–16 inflation rate.
- ▶ Rates of decline of ED visits and hospitalizations were calculated using the California Long-Term Care Education Center evaluation data. The rate of change for the intervention group was subtracted from the rate of change of the comparison group to get a “net” change for each of the three sites for which there was a comparison group. These net changes were averaged and applied to the number of home care aides in California each year.

Data Notations and Context

California Long-Term Care Education Center pilot project educated IHSS workers serving 6,375 clients in three counties. The education focused on the IHSS workers serving in an enhanced caregiving role and communicating effectively with health care providers. The training included 17 weekly modules. Ninety-nine percent of surveyed providers felt better prepared to perform their job, and a greater share reported they communicated with the care team post-training as compared with pre-training. Emergency room (ER) visit rates declined in the study population, but also declined in the comparison group. Repeat ER visit rates declined more in the study versus comparison population. Inpatient stays decreased significantly among the study population versus the comparison population.

Lee et al. study is from Australia and found that a greater share of aides’ visits included medicine support, and a lower share of licensed nurse visits included medicine support. There were no significant changes in medication errors and patient safety issues.

Other studies have found no adverse patient safety events when delegating medication administration to home care aides, but these studies did not quantify any changes in cost of care delivery, changes in nursing home or hospital admission, or changes in ED visits.

Data Sources and References

“2016 Health Care Cost and Utilization Report.” Health Care Costs Institute, 2016. www.healthcostinstitute.org.

Care Team Integration and Training of Home Care Workers - Impact Study. California Long-Term Care Education Center, May 2016.

“Employment Projections.” California Employment Development Department. www.labormarketinfo.edd.ca.gov.

“In Home Support Services (IHSS) Program.” California Dept. of Social Services. www.cdss.ca.gov.

Lee, Cik Yin, et al. “Evaluation of a Support Workers Role, with a Nurse Delegation and Supervision Model, for Provision of Medicines Support for Older People Living at Home: The Workforce Innovation for Safe and Effective (Wise) Medicines Care Study.” *BMC Health Services Research* 15 (2015): 460.

Pourat, Nadereh. *Home Care Quality and Safety: A Profile of Home Care Providers in California*. UCLA Center for Health Policy Research, August 2013.

Reinhard, S. C., et al. “Nurse Delegation of Medication Administration for Older Adults in Assisted Living.” *Nursing Outlook* 54: 74–80.

Stone, R., et al. “Predictors of Intent to Leave the Job Among Home Health Workers: Analysis of the National Home Health Aide Survey.” *Gerontologist* 57, no. 5 (Oct. 1, 2017): 890–99.

Young, H. M., J. Farnham, and S. C. Reinhard. “Nurse Delegation in Home Care: Research Guiding Policy Change.” *Journal of Gerontological Nursing* 42, no. 9.

Recommendation 3.3

AUTHOR Health Management Associates

TITLE Develop a psychiatric nurse practitioner program that recruits from and trains providers to serve in underserved rural and urban communities.

DESCRIPTION Three UC schools of nursing (UCSF, UCLA, and UC Davis) would prepare nurse practitioners with post-master's training to practice as psychiatric-mental health nurse practitioners, using an online and classroom-based program, along with supervised clinical training in specified settings. The program is intended to be self-supporting and would be incorporated into ongoing operational and financial plans of the schools of nursing.

TAKEAWAY A psychiatric-mental health nurse practitioner (PMH-NP) program would prepare 300 advance practice RNs to practice as PMH-NPs. Over five years, they would treat approximately 377,600 patients with mental health conditions. PMH-NPs would be able to address gaps in access because compared to physicians, NPs are more likely to serve rural and underserved populations. The total program cost is \$24.6 million over five years or \$82,000 per student, of which \$36,000 is a stipend and \$46,000 is education and marketing costs. Program costs and increased mental health treatment would be partially offset by decreased overall health care utilization for many of the 377,600 patients with mental health conditions treated by these providers. This is a nine-month program, and demand is dependent on the existing nurse workforce finding it attractive.

Impact Statement

Over five years, establishing a psychiatric-mental health nurse practitioner (PMH-NP) program would cost \$24.6 million and prepare 300 advance practice registered nurses to also practice as PMH-NPs. The program would cost \$82,000 per student, of which \$36,000 is a stipend and \$46,000 is for education and marketing costs. A portion of the program cost and subsequent expenditures on new mental health treatment are anticipated to be offset by decreased overall health care utilization and increased economic productivity. This is a nine-month program, and demand is dependent on the existing nurse workforce finding it attractive.

Over five years, these PMH-NPs would treat approximately 377,600 patients with mental health conditions. PMH-NPs would be able to address gaps in access because compared to physicians, NPs are more likely to serve rural and underserved populations. PMH-NPs have demonstrated similar prescribing compared to psychiatrists and a whole-person approach to treatment; as a result this program would generate health and economic returns by providing quality behavioral health treatment access to underserved populations. People with mental health conditions tend to have higher overall health care costs and are more likely to have chronic health conditions. Behavioral health treatment is associated with medical cost savings of 20%–30%. Overall, treatment of depression is associated with gains in health returns and economic returns with a benefit-to-cost ratio of 5.3 to 1, and similar treatment of anxiety is associated with a benefit-to-cost ratio of 4.0 to 1. Medical savings accrue from decreases in inpatient length of stay and emergency department visits, along with the potential for a reduced cost-per-service compared to care by MDs. In addition, the overall economy benefits from decreased absenteeism and increased productive work time for those receiving appropriate behavioral health treatment.

Key Assumptions

- ▶ Students enroll in the program and work on average 90% of their normal hours during the nine months of class, student self-fund the full cost of tuition, and do not receive compensation for the required 500 hours of supervised clinical training or work other jobs for that quarter.
- ▶ The program is developed in year one and enrollment begins in year two. Enrollment in year two would total 64. In each subsequent year the enrollment would be 60 students.
- ▶ PMH-NPs practice treat the same 1,600 patient panel as a physician.
- ▶ PMH-NPs would only be seeing patients relating to mental health care conditions and provide optimal behavioral health care to their patients.
- ▶ Applies two inflation rates provided by the Bureau of Labor Statistics: (1) annual inflation over the prospective five-year period equaling the average inflation over the last five years for the “Technical and business school tuition and fees” to scholarships and (2) the Consumer Price Index for All Urban Consumers (CPI-U) applied to non-tuition-based budget items.

Data Notations and Context

Unknowns. Impact of training on provider’s salary, extent to which a PMH-NP provides the services otherwise provided by a physician and what the cost differential is between the two for the same service.

Data Sources and References

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- ▶ Comorbid conditions affect treatment outcomes, health care costs, and mortality rates.
 - ▶ Mental illness, certain lifestyles, and related behaviors (such as excessive drinking, smoking, illicit drug use, and poor nutrition) have all been linked to physical illnesses and increased morbidity and mortality rates.
 - ▶ Sixty-eight percent of adults with mental illness also have at least one chronic physical illness (38). Patients with a mental illness are more likely to have high blood pressure, heart disease, diabetes, obesity, and asthma than those with no mental illness (38). Mental health comorbid conditions can undermine adherence to diabetes treatment, which can lead to future complications, such as blindness and reduced quality of life (39).
- Chisholm, D., et al. “Scaling-Up Treatment of Depression and Anxiety: A Global Return on Investment Analysis.” *The Lancet Psychiatry* 3, no. 5 (May 1, 2016): 415–24. doi:10.1016/S2215-0366(16)30024-4.
- ▶ Treatment of depression and anxiety is associated with gains in healthy life expectancy, value of

health returns, and economic productivity with a return on investment of 4.0:1 to 5.3:1.

- ▶ Compared with adults without common mental disorders in a range of low-income, middle-income, and high-income countries participating in the World Mental Health Survey, 4 to 15 more days out of role per year were recorded because of depression and 8 to 24 days because of generalized anxiety disorders; additional time lost per year due to presenteeism was 11 to 25 partial disability days for depression and 12 to 26 for generalized anxiety disorders.
- ▶ Two US studies reported a 6% increase in employment retention in patients with depression whose care was monitored and managed closely. Findings of another US study of patients in primary care showed that, at six months, employment rates were 52.5% for patients with no care versus 72.2% for patients with care.
- ▶ However, some treatment trials done in the US, Korea, and India have estimated the effect of intervention on productivity loss. The decrease in absenteeism reported in these studies was close to one day per month. Only two studies reported the findings for presenteeism separately from days lost because of absenteeism: In the Korean study, treated patients had 24 more productive hours per month, whereas in the Indian study, patients receiving the collaborative care had four fewer partial days lost than controls.

Focus on Health. OECD, July 2014.
doi:10.1787/22257985.

- ▶ Those with a mild-to-moderate condition are two to three times more likely to be unemployed.

Medical Cost Offsets Associated with Mental Health Care: A Brief Review. Washington State Dept. of Social and Health Services, December 2002.
www.dshs.wa.gov (PDF).

Chiles, J. A., M. J. Lambert, and A. L. Hatch. "The Impact of Psychological Interventions on Medical Cost Offset: A Meta-Analytic Review." *Clinical Psychology: Science and Practice* 6, no. 2 (June 1999): 204–20. doi:10.1093/clipsy.6.2.204.

- ▶ Of the 91 studies analyzed, 90% reported a decrease in medical utilization following some form of psychological intervention.
- ▶ Indicate that the average treatment group exhibited a reduction in utilization across all dependent variables within a study by 15.7%, while the control group utilization rate increased an average of 12.27%. Dollar savings for one of the dependent measures — length of hospital stay — were estimated based on an average reduction of 2.52 hospital days per person. The savings per person were then estimated to be \$2,205.
- ▶ Savings of 20% to 30% were reported across cost-offset articles. Furthermore, of the 28 articles that report dollar savings, 31% reported savings after the cost of mental health treatment was subtracted from the original savings figure.

Buerhaus, Peter, et al. "Practice Characteristics of Primary Care Nurse Practitioners and Physicians." *Nursing Outlook* 63, no. 2 (Mar.–Apr. 2015): 144–53. doi:10.1016/j.outlook.2014.08.008.

- ▶ Primary care NPs are more likely than primary care MDs to practice in urban and rural areas, provide care in a wider range of community settings, and treat Medicaid recipients and other vulnerable populations.

Chapman, Susan A., et al. "Utilization and Economic Contribution of Psychiatric Mental Health Nurse Practitioners in Public Behavioral Health Services." *Amer. Journal of Preventive Medicine* 54, no. 6 (June 2018). doi:10.1016/j.amepre.2018.01.045.

- ▶ A recent analysis of community health center data from the National Ambulatory Medical Care Survey found that NPs were more likely than physicians to provide mental health services to women, racial minorities, rural populations, and people with substance use disorders.
- ▶ As in previous literature, study findings indicated that PMH-NPs are able to address gaps in access to behavioral health care, particularly in public and rural delivery systems.
- ▶ Because of their whole-person approach, PMH-NPs are more likely to focus on preventing and minimizing the adverse health effects of lifestyle factors and treatment effects in this population.

- ▶ The positive net contribution of PMH-NPs is not surprising given that they provided similar services to psychiatrists and billing and productivity were similar.

Delaney, K. R., et al. *Journal of Behavioral Health Services and Research* 45 (2018): 300–9. doi:10.1007/s11414-017-9555-x.

- ▶ In the last 10 years, primary care providers have been encouraged to implement integrated models of care where patients' medical and mental health needs are addressed holistically. Many integrated models use psychiatric-mental health (PMH) nurses as case managers and select exemplars use PMH advanced practice nurses as providers.

Feldman, Saul, et al. "Advanced Practice Psychiatric Nurses as a Treatment Resource: Survey and Analysis." *Administration and Policy in Mental Health and Mental Health Services Research* 30, no. 6 (2003): 479–94. doi:10.1023/A:1025025600989.

- ▶ The analysis of prescribing practices between advanced practice psychiatric nurses and psychiatrists, and a retrospective clinical record review, showed that with a few exceptions, there were no differences between the groups.

Fung, Y. L., Z. Chan, and W. T. Chien. "Role Performance of Psychiatric Nurses in Advanced Practice: A Systematic Review of the Literature." *Journal of Psychiatric and Mental Health Nursing* 21, no. 8 (2014): 698–714. doi:10.1111/jpm.12128.

- ▶ In this review, the role performance of psychiatric nurses in advanced practice was categorized into three themes: (1) the provision of psychosocial interventions, (2) the provision of nurse-directed services in health care contexts, and (3) the provision of psychiatric nursing consultation services. The results document that psychiatric nurses in advanced practice perform multifaceted roles and provide mental health care services in various contexts. This systematic review reveals that the nurses obtain significant results in managing clients with depression and psychological stress and demonstrates their value when developing partnerships with non-mental health service providers.

Baker, J., et al. "An Efficient Nurse Practitioner–Led Community-Based Service Model for Delivering Coordinated Care to Persons with Serious Mental Illness at Risk for Homelessness." *Journal of the American Psychiatric Nurses Assn.* 24, no. 2 (2018): 101–8. doi:10.1177/1078390317704044.

- ▶ The St. Paul's Center was developed, managed, and staffed by board-certified psychiatric/mental health nurse practitioners, offering comprehensive mental health services and coordinated interventions.
- ▶ All clients were housed and none incarcerated. From 2008 to 2010, only 3% of clients were hospitalized, compared with 7.5% of adults with serious mental illness. Clinical, academic, and community partnerships increased value, but Medicaid reimbursement was not available.

Recommendation 3.4

AUTHOR Healthforce Center at UCSF

TITLE Scale the engagement of community health workers, *promotores*, and peer providers through certification, training, and reimbursement.

DESCRIPTION This recommendation proposes: (1) a three-year pilot project to create a formal certification process for CHW/P training programs, expand CHW/P training programs, and modify reimbursement mechanisms to increase employment opportunities for CHW/Ps; and (2) to increase the use of peer providers in California through creation of a certification program and Medi-Cal reimbursement (legislation would be required). Peer providers use lived experience of recovery from mental illness and/or addiction, plus skills learned in formal training, to deliver services in behavioral health settings.

MAIN TAKEAWAY Implementation of this recommendation is estimated to cost \$68 million, which includes \$4.8 million over three years for a pilot to plan and evaluate three strategies (certification of training programs, expand and strengthen trainings, change reimbursement) to stimulate and increase the supply of CHW/Ps. It also includes \$63.2 million over 10 years to create a peer provider certification and reimbursement mechanism. The peer provider recommendation has the potential to help address the behavioral health workforce shortage in California and contribute to improved outcomes and cost savings. However, there are other barriers (e.g., job quality, pay, stigma, and recognition of the contribution of the role) that may limit the ability to grow the peer provider workforce. Although positive impacts cannot be accurately quantified, it is reasonable to assume that should the certification and reimbursement methods be successfully implemented, California would likely experience positive gains in the supply of and demand for peer providers, which should lead to improved outcomes.

Impact Statement

Certification and Expansion of Training Programs for Community Health Workers and *Promotores*

The first component of this recommendation is likely to stimulate demand for and increase supply of community health workers and *promotores* (CHW/Ps) in California. Conditions in California, such as delivery system reform, emerging alternative payment methods, and a focus on addressing social determinants of health create an especially timely opportunity to scale the engagement of CHW/Ps. The recommendation, estimated to cost \$4.8 million over three years, proposes three actions that together are intended to increase the use of CHW/Ps. The peer-reviewed literature indicates substantial evidence that CHW/Ps can have an impact on health outcomes for specific diseases and conditions, in a variety of settings, with differing populations. California has several waiver and related programs for systems reform, some intentionally inclusive of a key role for CHW/Ps, which makes efforts to scale this workforce timely and potentially beneficial in increasing demand for CHW/Ps and improving health outcomes for Californians. Implementing the actions in this recommendation could also be valuable in increasing the supply of CHW/Ps.

The first action, creating and piloting a formal certification process for CHW/P training programs, includes an assessment of existing capacity and development of consensus on key competencies for training. The goal of the certification process is to standardize curricular core content and competencies. About 10 states currently have a wide array of standardized training or certification programs, most of them voluntary. The second action, expanding and strengthening CHW/P training programs, would likely directly increase supply of CHW/Ps by providing tuition and stipend support. The third action, modifying reimbursement mechanisms, is likely to impact the demand for CHW/Ps. Previous efforts to scale the involvement of CHW/Ps in the community and health care delivery systems have been hampered by the short-term nature of grant funding and the lack of a sustainable funding source for CHW/P roles, particularly in fee-for-service settings. Alternative payment models

could alleviate the concern about billing for services performed by CHW/Ps. Return on investment models that identify the unique contribution of CHW/Ps may lead to more investment in CHW/P roles.

In the last eight years, the state and foundations have supported several task forces, reports, strategy documents, stakeholder convenings, and pilot efforts to reach the goal of scaling the engagement of CHW/Ps in the state. New efforts to support the engagement of CHW/Ps, such as those proposed in this recommendation, need to be carefully designed to include and use what was learned from past efforts in California.

Peer Provider Certification and Reimbursement

There is also a well-documented shortage and maldistribution of existing behavioral health providers in California. As care moves toward a model that is team-based, integrated, and recovery-focused, a greater demand for peer providers is expected. The second component of this recommendation, estimated to cost \$63.2 million over 10 years, proposes increasing the use of peer providers in California through creation of a peer provider certification (via legislation) and Medi-Cal reimbursement (via a State Plan Amendment). Although some studies lack rigor, there is peer-reviewed evidence of the effectiveness of peer providers and their impact on outcomes, such as rehospitalization and recidivism in the criminal justice system.

Peer providers have lived experience in mental health and/or substance use disorder and add to the diversity of care team skills. There is evidence that peer providers, due to their unique connection to patients or clients, increase patient-client satisfaction in treatment and recovery. California lags behind other states in standardizing peer provider competencies and training, which may impact demand and employability. There are no reliable estimates of the number of peer providers trained or employed in the state, nor the demand to hire peer providers. A certification program that establishes standardized competencies and training is likely to grow the peer provider workforce. Equally important is the establishment of the proposed State Plan Amendment to allow reimbursement for these services, which may also enhance the sustainability of employment of peer providers and is likely to increase the demand for these workers. Some stakeholders note that certification may deny entry to the field to some qualified peers who may not be able

to meet certification requirements. It is important to note that certification and a pathway to reimbursement alone may not be sufficient to grow the workforce. Addressing issues of job quality, pay, stigma, and recognition of the contribution of the role will likely also be needed to grow this role in California.

Key Assumptions

- ▶ EDD workforce data utilize a Standard Occupational Code that does not capture all CHW/P employment due to many different titles and positions under the umbrella of “community health worker.” Thus, while standardized workforce data show only 6,700 CHWs in California, these data are a vast undercount.
- ▶ The CHW/P role described in the literature is very broad and describes many job titles and roles. Examples include health care navigation, home visits, help addressing social determinants of health, and health education using study protocols.
- ▶ Several Medi-Cal 2020 waiver and related programs offer existing opportunities to include CHW/Ps on the care team or outreach team. These include Whole Person Care, Health Homes for Patients with Complex Needs, and the Coordinated Care Initiative.
- ▶ Formal, inclusive advisory groups and stakeholder groups would be engaged as components of this action plan. Alignment among diverse stakeholders is needed to increase the state’s capacity to comprehensively implement these actions.
- ▶ Certification of training programs, expanding training programs, and modifying reimbursement are all important in addressing demand and supply.
- ▶ Certification leads to greater standardization of the peer support role, which results in increased utilization of peer providers:
 - ▶ 41 states plus the District of Columbia have existing certification for peer specialists (2016 data).
 - ▶ These programs standardize training and peer provider competencies, but the certification processes vary by state.

Data Notations and Context

The data limitations of standard occupational data on CHW/Ps, nationally and in California, means that the state does not have adequate data to support demand and supply models and thus to accurately gauge workforce shortages and opportunities. The levels of evidence that support the likelihood of this recommendation resulting in the identified impacts are informed by the literature and knowledge and experience from being in the field. There are not sufficient data to model supply and demand based with the degree of certainty that is possible for other professions.

The costs associated with this recommendation are estimates for the activities outlined and are not grounded in specific budgets or identified cost structures in existing organizations.

The levels of evidence that support the likelihood of this recommendation resulting in the identified impacts are informed by the literature and knowledge and experience from being in the field. There are not sufficient data to model supply and demand based with the degree of certainty that is possible for other professions.

Data on state certification programs for peer providers/specialists: utexas.edu (PDF).

Data Sources and References

"Support for Community Health Workers to Increase Health Access and to Reduce Health Inequities," Amer. Public Health Assn., November 10, 2009, www.apha.org.

Kyounghae Kim et al., "Effects of Community-Based Health Worker Interventions to Improve Chronic Disease Management and Care Among Vulnerable Populations: A Systematic Review," *Amer. Journal of Public Health* 106, no. 4 (April 1, 2016): e3–28, doi:10.2105/AJPH.2015.302987; and Lisa J. Trump and Tai J. Mendenhall, "Community Health Workers in Diabetes Care: A Systematic Review of Randomized Controlled Trials," *Families, Systems & Health* 35, no. 3 (Sept. 2017): 320–40, doi:10.1037/fsh0000283.

Roberto Cardarelli et al., "Reducing 30-Day Readmission Rates in a High-Risk Population Using a Lay-Health Worker Model in Appalachia Kentucky," *Health Education Research* 33, no. 1 (Feb. 1, 2018): 73–80, doi:10.1093/her/cyx064.

Andrew Broderick and Kevin Barnett, *Community Health Workers in California: Sharpening Our Focus on Strategies to Expand Engagement*, California Health Workforce Alliance, January 2015, 11, calfutureworkforce.files.wordpress.com (PDF).

Community Health Worker Integration: Issues and Options for State Health Departments, Assn. of State and Territorial Health Officials, August 2017, www.astho.org; and Meryl Schulman and Caitlin Thomas-Henkel, "Integrating Community Health Workers into Care Teams: Lessons from the Field," Center for Health Care Strategies, March 17, 2017, www.chcs.org.

"State Community Health Worker Models," Natl. Academy of State Health Policy, n.d., nashp.org; and Katharine London, Margaret Carey, and Kate Russell, *Community Health Worker Certification Requirements by State*, Connecticut Health Foundation, February 17, 2016, www.cthealth.org.

- Ellen Albritton, *How States Can Fund Community Health Workers Through Medicaid to Improve People's Health, Decrease Costs, and Reduce Disparities*, Families USA, July 2016, familiesusa.org; and Katharine London, Kelly Love, and Roosa Tikkanen, *Sustainable Financing Models for Community Health Worker Services in Connecticut: Translating Science into Practice*, June 2017, www.cthealth.org.
- Diane Johnson et al., "Community Health Workers and Medicaid Managed Care in New Mexico," *Journal of Community Health* 37, no. 3 (June 2012): 563–71, doi:10.1007/s10900-011-9484-1; Sally Findley et al., "Community Health Worker Integration into the Health Care Team Accomplishes the Triple Aim in a Patient-Centered Medical Home: A Bronx Tale," *Journal of Ambulatory Care Mgmt.* 37, no. 1 (Jan.–Mar. 2014): 82–91, doi:10.1097/JAC.000000000000011; Carl H. Rush, "Return on Investment from Employment of Community Health Workers," *Journal of Ambulatory Care Mgmt.* 35, no. 2 (April–June 2012): 133–37, doi:10.1097/JAC.0b013e31822c8c26; and Holly C. Felix et al., "Medicaid Savings Resulted When Community Health Workers Matched Those with Needs to Home and Community Care," *Health Affairs* 30, no. 7 (July 2011): 1366–74, doi:10.1377/hlthaff.2011.0150.
- Andrew Broderick et al., *Taking Innovation to Scale: Community Health Workers, Promotores, and the Triple Aim*, California Health Workforce Alliance, August 2013, www.phi.org (PDF). Lisel Blash, Krista Chan, and Susan Chapman, *The Peer Provider Workforce in Behavioral Health: A Landscape Analysis*, UCSF Health Workforce Research Center on Long-Term Care, November 9, 2015, healthworkforce.ucsf.edu (PDF).
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- Susan Chapman, Lisel Blash, and Joanne Spetz, *California Peer Providers in Transitions of Care*, Healthforce Center at UCSF, March 16, 2018, healthforce.ucsf.edu.
- Peer Specialist Workforce: State-by-State Information on Key Indicators, and Links to Each State's Peer Certification Program Web Site*, University of Illinois at Chicago, www.center4healthandsdc.org (PDF).
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- Dennis G. Smith (director, Center for Medicaid and State Operations) to state Medicaid directors, August 15, 2007, www.integration.samhsa.gov (PDF).
- Emily Heller, "Using Peers to Improve Mental Health Treatment," *Legisbrief* 24, no. 10 (March 2016), www.ncsl.org (PDF); CMS' Clarifying Guidance on Peer Services Policy from May 2013 states that any peer provider must "complete training and certification as defined by the state" before providing billable services.
- Karin Lettau, *History of Peer Certification*, California Assn. of Mental Health Peer Run Organizations, February 25, 2016, mhsaac.ca.gov (PDF).
- Lucinda Dei Rossi and Debra Brasher, *Certification of Peer Support Specialists in California: Engaging State-Level Agencies*, California Inst. for Mental Health, June 2014, www.cibhs.org (PDF).
- SB 906, 2017–18, Reg. Sess. (Cal. 2018), leginfo.legislature.ca.gov.
- Kirsten Barlow (County Behavioral Health Directors Assn. of California) to Karen Baylor (DHCS), August 17, 2016, camphro.files.wordpress.com (PDF).

Recommendation 3.5

AUTHOR Health Management Associates

TITLE Strengthen training for primary care providers on behavioral health and wellness using train-the-trainer modalities.

DESCRIPTION This recommendation calls for expanded participation in two train-the-trainer (TNT) programs focused on expanding the capacity of primary care providers to meet behavioral health needs: the UC Irvine / UC Davis Train New Trainers Primary Care Psychiatry Fellowship Program (TNT Psych) and the UC Davis Train-the-Trainers Primary Care Pain Management Fellowship (T3 Fellowship). The recommendation would fund scholarships, expand program capacity, and target qualifying providers from safety-net institutions and underserved communities for participation in the programs.

MAIN TAKEAWAY Expanding the Train New Trainers Primary Care Psychiatry Fellowship program will increase primary care clinicians' ability to address behavioral health needs by adding 100 trainers over 10 years, leading to an additional 1,640 providers trained. This will cost \$26.5 million over 10 years (\$16,159 per trained provider). The training is expected to reduce overall health care utilization and improve patients' economic productivity. Over 10 years, these fellows will treat approximately 294,000 patients with mild-to-moderate mental illness, an anticipated 185,000 of whom previously received no treatment for mental health.

The \$17.5 million Train-the-Trainers Primary Care Pain Management Fellowship will add 1,100 primary care pain management trainers over 10 years and lead to an additional 11,900 primary care providers getting trained on pain management, at a cost of \$1,470 per trained provider. A total of 145,000 fewer chronic pain patients will be treated with opioids, positively impacting health care costs, utilization, and patient work productivity. Costs could be reduced by \$203 million.

Impact Statement

Expanding the Train New Trainers Primary Care Psychiatry Fellowship program will increase the total number of trainers by 100. This is anticipated to increase the number of primary care clinicians trained to address behavioral health needs by 1,640 providers at a cost of \$26.5 million over 10 years, although it is expected that a portion of the program cost and subsequent expenditures on new mental health treatment will be offset by decreased overall health care utilization and increased economic productivity. The cost per trained provider would be \$16,159. Over 10 years, these fellows will treat approximately 294,000 patients with mild-to-moderate mental illness, an anticipated 185,000 of whom previously received no treatment for mental health. The 2016 cohort of fellows had statistically significant changes in their knowledge and practice patterns, including increased knowledge of psychiatry, increased self-efficacy in treating depression, and reduced stigma of behavioral health conditions. Fellows also reported being more confident in treating mental illness and depression after completing the fellowship. By targeting providers from and serving the most underserved populations, this program can increase the marginal impact of each fellow in improving behavioral health care to populations with unmet mental health care needs. Assuming fellows are newly equipped to provide appropriate screening, treatment, and referrals, this program will generate health and economic returns. People with mental health conditions tend to have higher overall health care costs and are more likely to have chronic health conditions. Behavioral health treatment is associated with medical cost savings of 20% to 30%. Overall, treatment of depression is associated with gains in health returns and economic returns with a benefit-to-cost ratio of 5.3 to 1, and similar treatment of anxiety is associated with a benefit-to-cost ratio of 4.0 to 1. Medical savings accrue from decreases in inpatient length of stay and emergency department visits. In addition, the overall economy benefits from decreased absenteeism and increased productive work time for those receiving appropriate behavioral health treatment.

Expanding the Train-the-Trainers Primary Care Pain Management Fellowship program is expected to cost \$17.5 million over 10 years and will increase the number of primary care pain management trainers by 1,100 providers over 10 years — targeting safety-net and underserved communities with limited prior access to pain management curriculum. These trainers will in turn train approximately 11,900 (between 4,600 and 19,800) of their primary care colleagues on pain management within that 10-year timeframe. Including fellowship participants and the providers they train, the cost per trained provider is \$1,346. During the 10-year period, the trainers and their trainees will treat over 4.2 million patients with chronic pain. Evidence indicates that there is no statistically significant difference between trainer-led and expert-led sessions in improving knowledge of pain management. Primary care providers receiving pain care education change their opioid prescribing habits, in one instance reducing the share of patients with chronic pain treated with opioids from 56.2% to 50.5%. Providers also increased referrals to behavioral health and to physical therapy, and decreased referrals to orthopedic and neurosurgery specialists. Chronic pain and opioid abuse both are associated with higher health care costs and utilization and reduced worker productivity. Chronic pain is associated with a \$4,500 to \$7,700 annual increase in health expenditures, while opioid abuse is associated with \$15,000 annually in higher health care costs. People with chronic pain are twice as likely to have a hospital admission compared to those without chronic pain and miss 2.1 to 4.7 more days of work per year. People who misuse opioids are 12 times more likely to have a hospital admission compared to opioid users without opioid use disorder (OUD), missing 15.6 more days of work per year. Improved use of effective pain management can improve utilization trends and outcomes. It is estimated that the T3 Fellowship program will reduce the number of patients treated with opioids by at least 145,000 over 10 years and reduce health care spending associated with opioid abuse as much as \$203 million.

Key Assumptions

Train New Trainers Primary Care Psychiatry Fellowship

- ▶ After completing the fellowship program, clinicians provide optimal behavioral health care to patients with mild-to-moderate behavioral health conditions.
- ▶ Providers may refer those with serious mental illness (SMI) to appropriate providers but are unable to appropriately address those patients' behavioral health conditions themselves.
- ▶ The program can triple enrollment in one year without negative impacts on educational quality.
- ▶ Health Professional Shortage Areas (HPSAs) count psychiatrists only, so these fellows will not impact the HPSA designation.
- ▶ Any impact is from \$18.1 million in new funds, not from old funds continuing to support this program.
- ▶ Assumes no self-funded fellowship enrollees from California.
- ▶ Applies two inflation rates provided by the Bureau of Labor Statistics: (1) annual inflation over the prospective 10-year period equaling the average inflation over the last five years for the "Technical and business school tuition and fees" to scholarships and (2) the Consumer Price Index for All Urban Consumers (CPI-U) applied to non-tuition-based budget items.
- ▶ Based on multiple literature sources, this analysis assumes a panel size of 1,600.
- ▶ Assumes that the panel for these providers reflects adult California residents on average, although if fellows disproportionately serve underserved/high-need patients, there would be greater mental health and unmet mental health needs on their panel, with a commensurately higher benefit overall.
- ▶ Assumes no systematic difference between patients who already interact with primary care providers and those who do not, although we would expect the population not in contact with primary care to have greater unmet needs.

- ▶ Assumes that patients with serious mental illness and mild-to-moderate mental illness receive treatment at the same rate.
 - ▶ In California, 11.2% of adults have mild-to-moderate mental illness (15.4% with any mental illness, 4.2% with serious mental illness)
 - ▶ In California, 62.8% of adults with any mental illness did not receive any mental health services.

Train-the-Trainers Primary Care Pain Management Fellowship

- ▶ Assumes no self-funded enrollees from California (scholarship enrollment is total program impact in California).
- ▶ Applies two inflation rates provided by the Bureau of Labor Statistics: (1) annual inflation over the prospective 10-year period equaling the average inflation over the last five years for the “Technical and business school tuition and fees” to scholarships and (2) the Consumer Price Index for All Urban Consumers (CPI-U) applied to non-tuition-based budget items.
- ▶ Assumes this represents new pain management education without duplication — program is targeting areas not yet reached by the Extension for Community Healthcare Outcomes or T3 program.
- ▶ Assumes that a subset of trainers (range informed by literature) will share the curriculum with their colleagues within the same practice or clinic and that the number of people they share with is equal to the number of primary care clinicians of the average Federally Qualified Health Center in California.
 - ▶ Assumes that primary care physicians include family physicians, general internists, general pediatricians, and general practitioners.
- ▶ Assumes that 20.4% of adults have chronic pain, and the patient panel of 1,600 reflects these same proportions.
- ▶ Assumes people seeing the primary care provider three or more times per year (53.5%) are receiving treatment for their chronic pain and assumes that avertable opioid abuse is present in 9% of those using opioids based on the share who receive more than a 30-day supply.

- ▶ The impact on health (measured by opioid prescriptions or use of alternative pain management techniques) is difficult to discern without program-specific data, but also without a comprehensive understanding of the various initiatives being implemented concurrently that interact to achieve the same ends (for instance, prior authorization).
- ▶ Expect significant changes in the prevalence of OUD over the next 10 years, so this analysis does not try to estimate the number of patients with OUD that the trainers and trainees will be interacting with.

Data Notations and Context

Much of the literature regarding the costs, savings, health, and mortality impacts of mental health treatment relate to high-cost / SMI users. This is not the same population who will be impacted by this primary care–based clinician population.

Without an evaluation linking the fellowship program to improved treatment practices resulting in improvements in peoples’ mental health, it is difficult to specifically apply the health and economic impacts of improved mental health to the magnitude of the program.

Data Sources and References

Train New Trainers Primary Care Psychiatry Fellowship

“Designated Health Professional Shortage Areas Statistics: First Quarter of Fiscal Year 2019 — Designated HPSA Quarterly Summary.” Health Resources and Services Administration. [ersrs.hrsa.gov](https://www.hrsa.gov/ersrs/hrsa.gov).

Crowley, R. A., and N. Kirschner. “The Integration of Care for Mental Health, Substance Abuse, and Other Behavioral Health Conditions into Primary Care: Executive Summary of an American College of Physicians Position Paper.” *Annals of Internal Medicine* 163, no. 4 (2015): 298–99. doi:10.7326/M15-0510.

- ▶ Mental illness, certain lifestyles, and related behaviors (such as excessive drinking, smoking, illicit drug use, and poor nutrition) have all been linked to physical illnesses and increased morbidity and mortality rates.

- ▶ Comorbid conditions affect treatment outcomes, health care costs, and mortality rates. Sixty-eight percent of adults with mental illness also have at least one chronic physical illness (38). Patients with a mental illness are more likely to have high blood pressure, heart disease, diabetes, obesity, and asthma than those with no mental illness (38). Mental health comorbid conditions can undermine adherence to diabetes treatment, which can lead to future complications, such as blindness and reduced quality of life (39).

Chisholm, D., et al. "Scaling-Up Treatment of Depression and Anxiety: A Global Return on Investment Analysis." *The Lancet Psychiatry* 3, no. 5 (2016): 415–24. doi:10.1016/S2215-0366(16)30024-4See.

- ▶ Treatment of depression and anxiety is associated with gains in healthy life expectancy, value of health returns, and economic productivity with a return on investment of 4.0:1 to 5.3:1.
- ▶ Compared with adults without common mental disorders in a range of low-income, middle-income, and high-income countries participating in the World Mental Health Survey, 4 to 15 more days out of role per year were recorded because of depression and 8 to 24 days because of generalized anxiety disorders; additional time lost per year due to presenteeism was 11 to 25 partial disability days for depression and 12 to 26 for generalized anxiety disorders.
- ▶ Two US studies reported a 6% increase in employment retention in patients with depression whose care was monitored and managed closely. Findings of another US study of patients in primary care showed that, at six months, employment rates were 52.5% for patients with no care versus 72.2% for patients with care.
- ▶ However, some treatment trials done in the US, Korea, and India have estimated the effect of intervention on productivity loss. The decrease in absenteeism reported in these studies was close to one day per month. Only two studies reported the findings for presenteeism separately from days lost because of absenteeism: In the Korean study, treated patients had 24 more productive hours per month, whereas in the Indian study, patients receiving the collaborative care had four fewer partial days lost than controls.

Focus on Health. OECD, July 2014.
doi:10.1787/22257985.

- ▶ Those with a mild-to-moderate condition are two to three times more likely to be unemployed.

Medical Cost Offsets Associated with Mental Health Care: A Brief Review. Washington State Dept. of Social and Health Services, December 2002.
www.dshs.wa.gov (PDF).

Chiles, J. A., M. J. Lambert, and A. L. Hatch. "The Impact of Psychological Interventions on Medical Cost Offset: A Meta-Analytic Review." *Clinical Psychology: Science and Practice* 6, no. 2 (June 1999): 204–20. doi:10.1093/clipsy.6.2.204.

- ▶ Of the 91 studies analyzed, 90% reported a decrease in medical utilization following some form of psychological intervention.
- ▶ Indicate that the average treatment group exhibited a reduction in utilization across all dependent variables within a study by 15.7%, while the control group utilization rate increased an average of 12.27%. Dollar savings for one of the dependent measures — length of hospital stay — were estimated based on an average reduction of 2.52 hospital days per person. The savings per person was then estimated to be \$2,205.
- ▶ Savings of 20% to 30% were reported across cost-offset articles. Furthermore, of the 28 articles that report dollar savings, 31% reported savings after the cost of mental health treatment was subtracted from the original savings figure.

Clarke, R. M., et al. "Delivering on Accountable Care: Lessons from a Behavioral Health Program to Improve Access and Outcomes." *Health Affairs* 35, no. 8 (2016): 148–93. doi:10.1377/hlthaff.2015.1263.

- ▶ After receiving Behavioral Health Associates treatment, patients had a 13% reduction in emergency department use.
- ▶ The IMPACT model was evaluated through a randomized controlled trial and was associated with a 10.3% reduction in total health care costs as paid by health plans over four years.

McCarron, Robert M., et al. *UC Irvine/UC Davis Train New Trainers (TNT) Primary Care Psychiatry (PCP): Fellowship*. Presentation. steinberginstitute.org (PPT).

- ▶ On average, fellow knowledge in psychiatry increased by 9.5 percentage points every six months in the program. This increase was statistically significant at $p < .001$.
- ▶ On average, fellow self-efficacy in treating depression increased by 1.9 points every six months in this program. This increase was statistically significant at $p < .001$.
- ▶ On average, fellow stigma decreased by 1.7 points on the stigma scale for every six months in the program. This decrease was statistically significant at $p < .05$.

TNT PCP Fellow Training Attitudes, 2016 Cohort

	PRETEST	POSTTEST
I am satisfied with my overall knowledge base in the area of psychiatry.		
Strongly agree	0%	26%
Agree	6%	65%
Neutral	24%	5%
Strongly disagree or disagree	70%	2%
I feel confident treating patients who have mental illness.		
Strongly agree	0%	24%
Agree	24%	74%
Neutral	61%	0%
Strongly disagree or disagree	15%	2%
I feel comfortable treating depression.		
Strongly agree	12%	85%
Agree	64%	15%
Neutral	15%	0%
Strongly disagree or disagree	9%	0%

Train-the-Trainers Primary Care Pain Management Fellowship

Dahlhamer J., et al. "Prevalence of Chronic Pain and High-Impact Chronic Pain Among Adults — United States, 2016." *Morbidity and Mortality Weekly Report* 67 (2018): 1001–6. doi:10.15585/mmwr.mm6736a2.

- ▶ An estimated 20.4% (50.0 million) of US adults had chronic pain, and 8.0% of US adults (19.6 million) had high-impact chronic pain.

Segre, L. S., et al. "Disseminating Perinatal Depression Screening as a Public Health Initiative: A Train-the-Trainer Approach." *Maternal and Child Health Journal* 15, no. 6 (2011): 814–21. doi:10.1007/s10995-010-0644-1.

Tanabe, P., et al. "Evaluation of a Train-the-Trainer Workshop on Sickle Cell Disease for ED Providers." *Journal of Emergency Nursing* 39, no. 6 (2013): 539–46. doi:10.1016/j.jen.2011.05.010.

BLS Inflation Series CUUR0000SEEB04 - Technical and business school tuition and fees and CUUR0000SAO – CPI-U, Annual averages 2013–2017. US Bureau of Labor Statistics. LABSTAT. data.bls.gov.

Coffman, Janet M., Margaret Fix, and Michelle Ko. *California Physician Supply and Distribution: Headed for a Drought?* California Health Care Foundation, June 2018. www.chcf.org.

"Table 5A – Tenure for Key Staff: California Data." Health Resources and Services Administration. bphc.hrsa.gov.

Zisblatt, L., et al. "Safe and Competent Opioid Prescribing Education: Increasing Dissemination with a Train-the-Trainer Program." *Substance Abuse* 38, no. 2 (2017): 168–76. doi:10.1080/08897077.2016.1275927.

- ▶ During 9 months (May 2013 to February 2014), 89 trainers were trained during nine TTT workshops in nine states. Over 24 months (May 2013 to April 2015), 33% of the trainers conducted at least one training, with a total of 79 trainers training 1,419 participants from the target group. The average number of trainings of those that conducted at least one training was 2.8, with a range

of 1 to 19. At the same time, Boston University School of Medicine conducted 20 live expert-led meetings in 17 states educating 1,742 participants from the target group.

- ▶ The average proportions of correct responses in the immediate post-program (IMMED) were 92% for the expert-led group and 91% for the trainer-led group, whereas in the two months post-program (2MO) they were 77% for the expert-led group and 78% for the trainer-led group. The differences between the two groups were not significant (IMMED, $p = .091$; 2MO, $p = .538$).
- ▶ Between one third and two thirds of respondents for both the expert-led and trainer-led groups reported having either partially or fully implemented or improved the implementation of the nine specific clinical practice changes at 2MO.

Anderson, D., et al. "Improving Pain Care with Project Echo in Community Health Centers." *Pain Medicine* 18, no. 10 (2017): 1882–89. doi:10.1093/pm/pnx187.

- ▶ Findings demonstrate a statistically significant increase in pain care knowledge in intervention providers ($N = 10$), from baseline (mean = 160.20) to postintervention (mean = 172.84; $p < .001$). The intervention group increased by 12.64 points (7.9%) on the KP50 pre- versus post-, compared with a 4.60-point increase (2.9%, $p = .119$) in the control group. (The total possible KP50 score is 250 points.)
- ▶ There were no significant differences at baseline between intervention and control group providers in response to a range of questions about the attitudes, beliefs, and approach to managing patients with opioids.
- ▶ PCPs in the intervention group had a statistically significantly greater reduction in the percentage of patients with chronic pain treated with an opioid medication compared with providers in the control group (from 56.2% to 50.5% compared with 50.1% to 50.3%; $p = .002$). In addition, the average number of opioid prescriptions written per patient with pain increased significantly less for providers in the intervention compared with

their colleagues in the control group (from 4.89 to 5.00 compared with 3.05 to 3.97; $p = .001$) Furthermore, in the year following ECHO, providers in the intervention had a greater increase in referrals to behavioral health than their colleagues in the control group. Referrals to surgical subspecialties (orthopedic and neurosurgery) decreased in the intervention group and increased in the control group, while referrals to physical therapy increased in the intervention group and decreased in the control group. These differences in referrals were all statistically significant.

Florence, C., et al. "The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013." *Medical Care* 54, no. 10 (2016): 901. doi:10.1097/MLR.0000000000000625.

- ▶ The cost differences for all three types of insurance are large and statistically significant. Medicare has the largest cost difference at over \$17,000. Private insurance has a cost increase of \$15,500, and Medicaid is over \$13,700.
- ▶ The percentage reduction in productivity attributable to drug abuse/dependence (17% for males and 18% for females) (24).

Strassels, S. "Economic Burden of Prescription Opioid Misuse and Abuse." *Journal of Managed Care Pharmacy* 15, no. 7 (2009): 556–62. doi:10.18553/jmcp.2009.15.7.556.

- ▶ One study of commercially insured beneficiaries in the United States found that mean per capita annual direct health care costs from 1998 to 2002 were nearly \$16,000 for abusers of prescription and nonprescription opioids compared with approximately \$1,800 for nonabusers who had at least one prescription insurance claim.
- ▶ Abusers were 78 times more likely to have had an episode of nonopioid poisoning; 36 times more likely to have hepatitis A, B, or C; 43 times more likely to have other substance abuse diagnoses; 21 times more likely to have had pancreatitis; and 8.5 times more likely to have a psychiatric diagnosis compared with nonabusers.

White, A. G., et al. "Direct Costs of Opioid Abuse in an Insured Population in the United States." *Journal of Managed Care Pharmacy* 11, no. 6 (2005): 469–79. www.ncbi.nlm.nih.gov.

- ▶ Opioid abusers, compared with nonabusers, had significantly higher prevalence rates for a number of specific comorbidities, including nonopioid poisoning, hepatitis (A, B, or C), psychiatric illnesses, and pancreatitis, which were approximately 78, 36, 9, and 21 ($p < .01$) times higher, respectively, compared with nonabusers. Opioid abusers also had higher levels of medical and prescription drug utilization. Almost 60% of opioid abusers had prescription drug claims for opioids compared with approximately 20% for nonabusers. Prevalence rates for hospital inpatient visits for opioid abusers were more than 12 times higher compared with nonabusers ($p < .01$). Mean annual direct health care costs for opioid abusers were more than 8 times higher than for nonabusers (\$15,884 versus \$1,830, respectively, $p < .01$). Hospital inpatient and physician-outpatient costs accounted for 46% (\$7,239) and 31% (\$5,000) of opioid abusers' health care costs, compared with 17% (\$310) and 50% (\$906), respectively, for nonabusers. Mean drug costs for opioid abusers were more than 5 times higher than costs for nonabusers (\$2,034 vs. \$386, respectively, $p < .01$), driven by higher drug utilization (including opioids) for opioid abusers. Even when controlling for comorbidities using a multivariate regression model of a matched control of depressed patients, the average health care costs of opioid abusers were 1.8 times higher than the average health care costs of depressed patients.

Ruetsch, C. "Empirical View of Opioid Dependence." *Journal of Managed Care Pharmacy* 16, no. 1B (Feb. 2010): S9–S13. www.ncbi.nlm.nih.gov.

- ▶ A recent study showed that patients who abuse opioids generate mean annual direct health care costs 8.7 times higher than nonabusers. The National Survey on Drug Use and Health, conducted by the Substance Abuse and Mental Health Services Administration, found that patients who report opioid abuse miss more than

2.2 days of work monthly, compared with the 0.83 days per month reported for the average person. Presenteeism and productivity are also affected by misuse and dependence on opioids.

Oderda, Gary M., et al. "Economic Burden of Prescription Opioid Misuse and Abuse: A Systematic Review." *Journal of Pain & Palliative Care Pharmacotherapy* 29, no. 4 (Dec. 2015): 388–400. doi:10.3109/15360288.2015.1101641.

- ▶ The final review process resulted in 16 publications for inclusion that examined cost from the payer perspective. Mean costs to the payer for abusers were \$23,000 to \$25,000 per year, and excess costs approximately \$15,000 per patient.

Phillips, C. J. "The Cost and Burden of Chronic Pain." *Reviews in Pain* 3, no. 1 (2009): 2–5. doi:10.1177/204946370900300102.

- ▶ An Australian study has also shown that chronic pain was associated with increased hospitalization and primary care consultations in the last 12 months (a twofold increase) and with the numbers of ED visits in the last 12 months (a fivefold increase) compared with no chronic pain, even after adjusting for known predictors.

Stewart, W. F., et al. "Lost Productive Time and Cost Due to Common Pain Conditions in the US Workforce." *JAMA* 290, no. 18 (2003): 2443–54. www.ncbi.nlm.nih.gov.

- ▶ Thirteen percent of the total workforce experienced a loss in productive time during a two-week period due to a common pain condition. Headache was the most common (5.4%) pain condition resulting in lost productive time. It was followed by back pain (3.2%), arthritis pain (2.0%), and other musculoskeletal pain (2.0%). Workers who experienced lost productive time from a pain condition lost a mean (SE) of 4.6 (0.09) hours per week. Workers who had a headache had a mean (SE) loss in productive time of 3.5 (0.1) hours per week. Workers who reported arthritis or back pain had mean (SE) lost productive times of 5.2 (0.25) hours per week. Other common pain conditions resulted in a mean (SE) loss in productive time of

5.5 (0.22) hours per week. Lost productive time from common pain conditions among active workers costs an estimated \$61.2 billion per year. The majority (76.6%) of the lost productive time was explained by reduced performance while at work and not work absence.

Kronborg, C., G. Handberg, and F. Axelsen. "Health Care Costs, Work Productivity and Activity Impairment in Non-Malignant Chronic Pain Patients." *European Journal of Health Economics* 10, no. 1 (2009): 5–13. doi:10.1007/s10198-008-0096-3.

- ▶ On average, chronic pain meant that participants in work missed 19.4% of the time they could have worked (SD = 32.93). During the time they actually worked, productivity was reduced by an average of 51.1 (SD = 23.49) — that is, 31 minutes of every hour were not productive due to chronic pain. Out of the total number of work hours available to the respondent, 41.0% were lost due to chronic pain (SD = 23.00).

Gaskin, D. J., and P. Richard. "The Economic Costs of Pain in the United States." *Journal of Pain* 13, no. 8 (2012): 715–24. doi:10.1016/j.jpain.2012.03.009.

- ▶ A review of 15 studies of chronic pain among adults found that prevalence estimates ranged from 2% to 40%, with a median of 15%.
- ▶ Adults with pain reported higher health care expenditures than adults without pain. Based on the SF-12 pain measures, a person with moderate pain had health care expenditures \$4,516 higher than those of someone with no pain. People with severe pain had health care expenditures \$3,210 higher than those with moderate pain.
- ▶ Adults with pain reported missing more days of work than adults without pain. A person with moderate pain, based on the SF-12 pain measures, missed 2.1 days more than someone with no pain. Adults with severe pain missed 2.6 days more than those with moderate pain.

Vogt, M. T., et al. "Analgesic Usage for Low Back Pain: Impact on Health Care Costs and Service Use." *Spine* 30, no. 9 (2005): 1075–81. physicaltherapy.typepad.com (PDF).

- ▶ 9% received more than a 30-day supply of opioids.
- ▶ Other primary care patient studies have found that 10% to 15% of patients with lower back pain receive opioids, and about 60% receive nonselective NSAIDs.

Vowles, K. E., et al. "Rates of Opioid Misuse, Abuse, and Addiction in Chronic Pain: A Systematic Review and Data Synthesis." *Pain* 156, no. 4 (2015): 569–76. doi:10.1097/01.j.pain.0000460357.01998.f1.

- ▶ Across most calculations, rates of misuse averaged between 21% and 29% (range, 95% confidence interval [CI]: 13%–38%). Rates of addiction averaged between 8% and 12% (range, 95% CI: 3%–17%). Abuse was reported in only a single study.

National Ambulatory Medical Care Survey: 2015 State and National Summary Tables. Centers for Disease Control and Prevention. Table 10. www.cdc.gov (PDF).

Recommendation 3.6

AUTHOR Health Management Associates

TITLE Establish a California Health Workforce Technology and Data Center to support the adoption of technologies that increase access to quality care.

DESCRIPTION This recommendation would establish an advisory council to assess existing and emerging technologies to advance virtual care modalities. The council would also develop an organizational strategy and plans for the development and operations of the California Health Workforce Center for Technology and Data, which would be established based on the council's work.

MAIN TAKEAWAY The \$2 million cost associated with establishing an advisory council, assessing technologies for advancing virtual care, and developing an organizational strategy and plan for a future California Health Workforce Center for Technology and Data does not have a direct impact on the cost of or access to care in the state. The cost of establishing and administering the center is unknown. If the center is successful at increasing the rate of technology-enabled virtual care adoption, a 40% or greater impact could be seen on some specialist care costs, particularly in rural and underserved areas.

Impact Statement

The two years of the recommended effort would cost \$2 million (\$500,000 to support the advisory council, \$1 million for an assessment of standard and emerging technologies to advance virtual care, and \$500,000 to develop an organizational plan for the California Health Workforce Center for Technology and Data). The recommendation would not have any measurable impacts on workforce capacity, access to care, or cost in the two-year assessment period (2019–21), as the efforts outlined in the recommendation are focused on important but initial research and planning steps to promote telehealth adoption. Due to the lack of details on the center's scope or its development or operational costs, it is not possible to quantify the exact financial impacts of operating the center.

Telehealth implementation and adoption could be advanced by a dedicated organization that implements a comprehensive strategy, leveraging expertise across the

public and private sector and targeting innovations to the areas of greatest need. To the extent that the center's efforts target populations and geographies with lower provider access, the potential for telehealth adoption is strong. Other factors that make it impossible to quantify 10-year financial impacts include a lack of information on the types of telehealth that would be included in center promotion and dissemination efforts, any council operational costs, and the fact that no entity is identified as responsible for the development and operations of the council or the center. A lack of clear funding sources and responsible entities also reduce the overall likelihood of positive cost, access, and care coordination impacts. Telehealth can reduce care costs in some settings but may be more expensive than in-person care, depending on the telehealth modality and care specialty. Research has found that for specialty care such as psychiatry, provision of care via telehealth can save 40% or more compared to in-person care. For underserved areas, however, the reduced per-unit cost must be considered in light of the likely increase in overall units provided when telepsychiatry is made widely available. The same holds true for other difficult-to-access services in rural and other underserved areas. While some data exist on the ability of telehealth to increase access — particularly in rural areas — without additional specificity, the positive impact is only directional.

Key Assumptions

- ▶ Funded in early 2019. Establishment of an advisory council is predicated on funding being in place, and the council's timing impacts the establishment of budgets and operational plans by the end of 2020. Assessment occurs mid-2019 to mid-2020, finishing in time for the council to use the findings to create the center's budget, operational plan, recommendations, and other foundational materials.
- ▶ Council recommendations would not be finalized until 2021 at the earliest, at which time funding for the center can be secured.
- ▶ Cost for first two years is \$1 million; future costs (including for establishment of a center) are to be determined by the advisory council.

- ▶ Council would meet virtually in addition to at a hosted location, every other month. Assumed “bimonthly” here means every two months.
- ▶ Council staff — 0.5 FTE SME/knowledgeable facilitator with 0.5 FTE research assistant support, 0.25 FTE administrative support.
- ▶ There would be costs for years 3 and beyond that are not included in the cost estimates.
- ▶ The recommendation notes that the advisory body would build budgets and descriptions of investment plans in infrastructure and workforce development priority areas through 2030.
- ▶ By 2020, the statewide advisory body would provide budgets and detailed descriptions of investment plans in infrastructure and workforce development priorities for the systemwide transformation to virtual care that would inform the resource requirements to establish, staff, and operate the center through 2030.
- ▶ Likely cost to hire an outside entity to build the organization based on the council’s principles, etc., is \$1 million.
- ▶ Operations cost for the center is unknown. It would be very challenging to estimate the cost, as there is limited information on the cost for operating such a center. Most similar organizations are private organizations and do not release their operating budgets. In addition, until the center’s scope is defined, staffing and other elements of cost estimation would be impressionistic at best.
- ▶ Anticipated 10-year impacts are influenced by the center’s ability to accelerate take-up of telemedicine and other technology-supported remote care. Analysis assumes the center is successful in this effort.
- ▶ Expected impacts are access (especially to specialty care in underserved areas); quality of care (improved communications with care team, continuity, increased patient engagement, availability of patient information electronically); cost (virtual care avoids costs from missed appointments and preventable care); and improved population health.
- ▶ Greater understanding of telehealth increases patients’ willingness to receive care by telehealth. Lack of insurance and lack of a regular primary care provider are also drivers of telehealth acceptance.

Data Notations and Context

The assumptions that underlie this recommendation are not reasonable. The embedded assumption that financing would be available in early 2019 is not realistic for a recommendation that is finalized in early 2019. This assumption underlies the entire impact assessment, so it was kept rather than stating that there were little to no impacts over 10 years, but this undermines the assessment.

A council that meets every two months would not be able to conduct the anticipated tasks in the expected timeframe. The results of the research would be available mid-year 2, giving the council at best four sessions to review the results, develop a specific plan for the center, and develop budgets and operational plans for the center. From past experience with similar bodies, this is not likely to happen in the timeline assumed in the recommendation.

There would be costs for the years after 2020, but no estimates for these costs are included in the cost estimates. Limited information on the center’s expected size (staffing, scope) makes it very challenging to project point-in-time or long-term costs. The advisory council is tasked with developing budget and operational plans for the center.

Another limiting factor for the analysis of impact on cost of care is the small sample sizes of many telehealth and telemedicine studies.

Take-up of telemedicine is limited by technology constraints and inconsistent reimbursement and licensure requirements for remote care.

It is challenging to identify costs and savings and to access impacts without information on the type of telehealth that would be provided and populations targeted. It is understood that the council would identify these parameters in its development of the center, but without this information it is not possible to quantify savings or other impacts.

Data Sources and References

Deslich, Stacie, et al. "Telepsychiatry in the 21st Century: Transforming Healthcare with Technology." *Perspectives in Health Information Management* (Summer 2013): 1f.

- ▶ Mixed results on cost: Some studies found 40% to 70% reduction in cost using telepsychiatry instead of in-person psychiatric care; one study found it cost more per hour to use telepsychiatry.
- ▶ Telepsychiatry has been shown to have a significant benefit on access, particularly in rural areas.

Papanagnou, Dimitrios, Shoshana Sicks, and Judd E. Hollander. "Training the Next Generation of Care Providers: Focus on Telehealth." *Healthcare Transformation* 1, no. 1 (2015): 52–63. doi:10.1089/heat.2015.29001-psh.

Adler-Milstein, Julia, Joseph Kvedar, and David W. Bates. "Telehealth Among US Hospitals: Several Factors, Including State Reimbursement And Licensure Policies, Influence Adoption." *Health Affairs* 33, no. 2 (Feb. 2014): 207–15.

Polinski, Jennifer M., et al. "Patients' Satisfaction with and Preference for Telehealth Visits." *Journal of General Internal Medicine* 31, no. 3 (Mar. 2016): 269–75. doi:10.1007/s11606-015-3489-x.

- ▶ In pilots where telehealth was offered as an immediate alternative to an on-site provider (with potential wait), 70% of patients offered the telehealth option took it.
- ▶ Of 1,734 respondents, a third reported a preference for telehealth over a traditional visit, 57% said telehealth was as good as a traditional visit, and 95% of patients were very satisfied with the care.
- ▶ In the multivariate model, those with no medical insurance had 21% increased odds of preferring a telehealth visit to a traditional visit (odds ratio [OR] = 1.21; 95% confidence interval [CI], 1.02–1.43). Several variables predicted whether patients liked telehealth. Female patients had 1.75 odds of liking telehealth (95% CI, 1.05–2.86).

Patients also had greater odds if they were very satisfied with their overall understanding of telehealth (OR = 2.80; 95% CI, 1.81–4.32), the quality of care they received (OR = 2.38; 1.47–3.87), or the convenience of using telehealth (OR = 2.85; 1.06–7.65). Conversely, patients who were very satisfied with the capability of the assisting nurse had reduced odds of liking telehealth (OR = 0.48; 95% CI, 0.29–0.80).

Projecting the Supply and Demand for Primary Care Practitioners Through 2020. US Department of Health and Human Services, 2013.

- ▶ 25% of US patients do not have a primary care provider or complete access to one.

Brewer, Rena, GiGi Goble, and Paula Guy. "A Peach of a Telehealth Program: Georgia Connects Rural Communities to Better Healthcare." *Perspectives in Health Information Management* 8 (Winter 2011): 1c.

Lambert, David, et al. "Understanding the Business Case for Telemental Health in Rural Communities." *Journal of Behavioral Health Services and Research* 43, no. 3 (July 2016): 366–79. doi:10.1007/s11414-015-9490-7.

Stingley, Shelley, and Heidi Schultz. "Helmsley Trust Support For Telehealth Improves Access to Care in Rural and Frontier Areas." *Health Affairs* 33, no. 2 (Feb. 2014): 336–41.

Ashwood, J. Scott, et al. "Direct-to-Consumer Telehealth May Increase Access to Care but Does Not Decrease Spending." *Health Affairs* 36, no. 3 (Mar. 2017): 485–91. doi:10.1377/hlthaff.2016.1130.

Kruse, Clemens Scott, et al. "Telemedicine Use in Rural Native American Communities in the Era of the ACA: A Systematic Literature Review." *Journal of Medical Systems* 40, no. 6 (June 2016): 1–9. doi:10.1007/s10916-016-0503-8.

Rae, Matthew, and Cynthia Cox. "More Employers Are Paying for Telemedicine, but Enrollee Take-Up Has Been Relatively Low." Kaiser Family Foundation, October 3, 2018. www.healthsystemtracker.org.

Adler-Milstein, Julia, Joseph Kvedar, and David W. Bates. "Telehealth Among US Hospitals: Several Factors, Including State Reimbursement and Licensure Policies, Influence Adoption." *Health Affairs* 33, no. 2 (Feb. 2014): 207–15.

- ▶ Adoption is variable by state policies regarding reimbursement and regulation; hospital features (such as its teaching mission, its affiliations with other institutions, and its technological capabilities); and market factors, including rurality and degree of competitiveness. Hospitals in more rural areas have access to federal funds to improve care accessibility, and as a result they may be more likely to provide telehealth than hospitals in more urban areas. Hospitals in more competitive markets may see telehealth as a way to distinguish themselves.

Recommendation 3.7

AUTHOR Health Management Associates

TITLE Assess the well-being of health professions students and providers and develop a statewide action plan to proactively address burnout.

DESCRIPTION This recommendation calls for funding of an assessment of the causes of, costs of, and potential interventions for burnout in the health professions in California. The assessment results would be used to develop an action plan to proactively address the issue in the full spectrum of delivery settings and of training and education programs.

MAIN TAKEAWAY The proposed assessment would not have a direct impact on costs of, access to, or quality of care. Although the research (funded at \$850,000, including administration costs) does not have impacts, one or more programs based on the research findings could benefit California providers and health care over time.

Impact Statement

The recommendation to fund research has no direct impact on health care costs, improved access, and quality of care. The proposed \$750,000 in research and \$100,000 in administration costs would increase knowledge but would not change practice patterns or otherwise benefit providers. However, assuming the assessment and strategy developed based on the results lead to the implementation of effective programs and policies, the recommended research and strategy document could lead to change that increases the supply and retention of health care workers, reduces the rate of provider distress and turnover, and improves patient care.

Research on provider burnout has found a negative relationship between burnout and health care quality and patient safety. A reduction in provider burnout could improve quality of care and patient safety by as much as 20%, although it would be difficult to directly measure the impact of happier/less stressed providers given the confounding variables. Recognizing that provider burnout is a cause for providers to leave active practice early, reducing burnout can reduce costs associated with replacing these providers. Significantly reducing the number of

physicians and nurses who leave practice could save the health care system \$2 billion per year. This savings more than offsets the cost of determining effective methods for limiting provider burnout, developing a plan based on this information, and implementing strategies. Reducing provider burnout can have a disproportionately positive benefit on clinical settings serving low-income patients or those with complex care needs, as these settings are associated with greater provider burnout. Assessment of the indirect impact of the recommendation is limited because there is no organization tasked with acting on strategies identified in the research.

Key Assumptions

Provider stress shortens the years providers will actively practice their profession. Reducing the active years in practice adversely impacts provider supply without reducing demand. Demand is assumed to continue increasing due to population growth, aging of the population, and increase of chronic illness in the population at large. The average career for physicians is in the range of 30 to 35 years.

The care setting impacts likelihood of provider burnout. Providers working in primary care and emergency departments, those in safety-net institutions with limited resources, and those in underserved areas with limited primary and specialty care access are more likely to suffer from burnout.

Providers do not spend all their time seeing patients. How much time depends on the provider type and other factors and can be a confounding variable for burnout.

Based on studies cited below:

- ▶ Half of physicians show significant signs of burnout, 43% of nurses have emotional exhaustion.
- ▶ Frontline providers (such as primary care and ED physicians) are more likely to suffer burnout than other physicians.
- ▶ There are 108,860 currently active physicians and 423,248 active nurses in California.
- ▶ 56,220 of the physicians are specialists, leaving 52,640 in primary care / family medicine. Adding 5,755 ED doctors to the nonspecialists brings the total to 58,395 (2018 data).

- ▶ The cost of replacing/retraining a physician is \$350,000 to \$1 million, depending on the training and specialization of the provider, along with the reimbursement associated with certain specialties.

The group conducting the analysis would also lead the development of strategies to address the problem of provider burnout. This group would be informed by the technical advisory committee.

The technical advisory committee is not paid. The committee would incur administrative and staffing costs, as even a volunteer commission would have one or more staff associated with it in order to ensure a product is developed. No staffing costs were included in the recommendation; we estimate \$100,000 per year, which was added to the total proposed cost.

Data Notations and Context

This impact statement should be seen as directional for a few reasons:

- ▶ **Data limitations.** There are relatively few studies on the impact of provider burnout on health care quality and safety. The meta-analyses include a small number of studies, including observational studies and other qualitative analyses.
- ▶ **Other issues.** The stated goal is to reduce provider stress/burnout, but the proposal only maps out the first part of the work (assessment of the issue) without addressing the cost of planning or implementation efforts. It is not clear what is intended for these pieces of the proposal, making it more difficult to quantify either the costs or benefits of the proposal.
- ▶ **Unclear responsibility.** In addition, the recommendation does not identify the entity that would receive or act upon the study results or strategies developed based on those results. Without an organization tasked with responsibility for acting on the research and recommendations, it is difficult to imagine that one or more of the strategies would be implemented. The expected benefit of the work is limited by a lack of defined entity/entities responsible for the development or implementation of efforts based on the research findings.
- ▶ **Context.** The proposed work is already underway by other entities. Most notably, the National Academy of Sciences, Action Collaborative on Clinician Well-Being and Resilience has five working groups meeting over four years to identify evidence-based strategies to improve clinician well-being at the individual and systems levels. The working groups have developed an online knowledge hub and a series of discussion papers and will develop an overall conceptual model reflecting the domains affecting clinician well-being. Rather than duplicate this work, building on it could be more effective and time-efficient.
- ▶ **Incomplete cost analysis.** The cost of malpractice associated with burnout-associated medical errors wasn't evaluated. There is assumed to be a cost, but the amount could not be calculated for this analysis.
- ▶ Using the conservative-end estimate of \$350,000 to replace or retrain a physician, the cost to California would be \$15.5 billion over 10 years. For nurses, an estimated cost would be \$4.4 billion over the same period (based on \$100,000 cost per replacement). The combined cost that could be averted with successful efforts to reduce provider burnout is \$19.75 billion over 10 years (\$1.975 billion per year).
- ▶ This amount would be reduced by the cost of the burnout-reduction efforts. This cost is very difficult to calculate without knowing what the efforts may include.

Estimate of California's Physicians and Nurses Impacted by Provider Burnout

	NUMBER	PERCENTAGE IMPACTED		TOTAL IMPACTED		ALL DOCS/ NURSES	
		LOW	HIGH	LOW	HIGH	LOW	HIGH
PC Doctors	58,395	50%	60%	29,198	35,037		
Specialists	50,465	30%	50%	15,140	25,233	128,988	242,267
Nurses	423,248	20%	43%	84,650	181,997		

Data Sources and References

Poghosyan, Lusine. "Clinician Burnout: New Times, Old Issue." *Nursing Economics* 36, no. 3 (May/June 2018): 109–55.

Salyers, Michelle P., et al. "The Relationship Between Professional Burnout and Quality and Safety in Healthcare: A Meta-Analysis." *Journal of General Internal Medicine* 32, no. 4 (Apr. 2017): 475–82. doi:10.1007/s11606-016-3886-9.

Fletcher, Kathlyn E., Darcy A. Reed, and Vineet M. Arora. "Patient Safety, Resident Education and Resident Well-Being Following Implementation of the 2003 ACGME Duty Hour Rules." *Journal of General Internal Medicine* 26, no. 8 (Aug. 2011): 907–19. doi:10.1007/s11606-011-1657-1.

Dewa, Carolyn S., et al. "An Estimate of the Cost of Burnout on Early Retirement and Reduction in Clinical Hours of Practicing Physicians in Canada." *BMC Health Services Research* 14 (June 13, 2014): 254. doi:10.1186/1472-6963-14-254.

- ▶ The total cost of burnout for all physicians practicing in Canada is estimated to be \$213.1 million (\$185.2 million due to early retirement and \$27.9 million due to reduced clinical hours). Family physicians accounted for 58.8% of the burnout costs, followed by surgeons for 24.6% and other specialists for 16.6% (used 2007–2008 data, 2012 physician Masterfile).

Butcher, Lola. "Is There a Cure for Burnout?" *Trustee* 70, no. 9 (Oct. 2017): 8–12.

- ▶ Atrius Health estimates that the cost of replacing a physician, including recruitment and training, runs between \$500,000 and \$1 million.
- ▶ A Stanford Medicine WellMD Center analysis showed that burned-out physicians were twice as likely to leave Stanford within two years as colleagues reporting low levels of burnout.

Dyrbye, Lotte N., et al. "Burnout Among Health Care Professionals: A Call to Explore and Address This Underrecognized Threat to Safe, High-Quality Care." National Academy of Medicine, July 5, 2017.

nam.edu.

- ▶ More than half of US physicians are experiencing substantial symptoms of burnout. Physicians working in the specialties at the front lines of care (e.g., emergency medicine, family medicine, general internal medicine, neurology) are among the highest at risk of burnout.
- ▶ In a 1999 study of more than 10,000 registered inpatient nurses, 43% had high degrees of emotional exhaustion. A subsequent study of approximately 68,000 registered nurses in 2007 reported that 35%, 37%, and 22% of hospital nurses, nursing home nurses, and nurses working in other settings had high degree of emotional exhaustion.

"State Health Facts: Providers & Service Use." Kaiser Family Foundation, n.d. www.kff.org.

Professionally Active Physicians

- ▶ Currently active physicians in California: 108,860.

Professionally Active Specialist Physicians by Field. Special data request on State Licensing Information from Redi-Data Inc., March 2018.

- ▶ Currently (March 2018) active specialists (MDs and DOs): 56,220, plus 5,755 ER docs.

Total Number of Professionally Active Nurses

- ▶ Total number of professionally active nurses (Oct. 2018): 423,248.

Miller, Catherine. "Understanding and Preventing Physician Burnout." *Healthcare Financial Management* 71, no. 7 (July 2017): 36–41.

- ▶ When a physician decides to give up practicing medicine and leave, finding a replacement can cost as much as \$350,000 in signing and recruiting fees, orientation costs, and lost productivity during onboarding and training.

- ▶ In a study of 7,900 surgeons, major medical errors were strongly related to the surgeon's degree of burnout. The same study found that incremental increases in self-reported symptoms of burnout correlated with increases in self-reported errors from 5% to 11%.
- ▶ After the Accreditation Council for Graduate Medical Education limited the number of hours a resident could work in 2003, studies have shown improvements in patient mortality. (Based on a meta-analysis of studies, the pooled odds ratio [OR] is 0.9, 95% CI). These results were significant for medical (OR 0.91; 95% CI: 0.85, 0.98) and surgical patients (OR 0.86; 95% CI: 0.75, 0.97). However, significant heterogeneity was present (I² 83%).

Recommendation 3.8

AUTHOR Healthforce Center at UCSF

TITLE Establish primary care spending targets and requirements for public and private payers.

DESCRIPTION This recommendation calls for the formation of a statewide collaborative to (1) build consensus in defining what is reported as primary care, (2) establish standards for what is included and reported, (3) explore options to establish benchmarks and increase expenditures (including legislative and/or executive action to support increased investment), and (4) document annual primary care expenditures and associated impacts on access and overall medical care costs.

MAIN TAKEAWAY Establishing a statewide collaborative to measure and then set primary care spending benchmarks has promise to increase demand for primary care providers and use of primary care services and to reduce overall health care costs. The number of unknowns (e.g., future increases in primary care spending as a result of the collaborative) do not allow for precise measurement of potential cost savings, but results from a Commonwealth Fund report suggest savings in California could be several billion dollars annually. The anticipated cost of the proposed collaborative is \$1.1 million over four years.

Impact Statement

Research finds that increased investment in primary care can improve access to care and can lower overall health care costs. Such investments would increase the demand for, and supply of, health care professionals focused on primary care. This recommendation proposes measuring and communicating the extent of primary care spending in California to provide a baseline from which to set primary care spending targets. A statewide collaborative would address primary care reporting definitions, assess spending benchmarks, and report on impacts. The anticipated cost of the proposed collaborative is \$1.1 million over four years. Assuming the collaborative was successful, in the short term, California stakeholders would better understand what expenditures are being reported as primary care, including the overall distribution of health care expenditures and the proportion spent on primary care.

To the extent these efforts contribute to a redistribution of health care resources to primary care, longer-term impacts of this recommendation could include increased demand for primary care providers and use of primary care services, with potentially lower overall health care costs. The precise extent of the reduction in health care costs is not currently possible to measure and would depend on several unknown variables, including the magnitude of the increase in primary care spending resulting from the yet to be established spending targets, as well as how the increased primary care spending might be invested (e.g., higher payments for primary care services, higher payments to primary care providers, higher primary care salaries). An issue brief from the Commonwealth Fund reported that a 10% increase in payments for primary care services is expected to result in a nearly 2% decrease in overall spending for the Medicare program. Applying these results to California (and assuming that the overall population would experience results similar to those in the Medicare program) suggests that the state could experience an overall reduction in health care costs of several billion dollars annually.

Key Assumptions

- ▶ **Other states' focus on primary care spending shows promise for California.** Findings from Rhode Island's recent primary care spending reforms suggest that establishing such targets is associated with increases in primary care spending. Rhode Island's efforts to use primary care spending benchmarks show early promise in lowering overall medical costs through increased primary care utilization. Rhode Island's Office of the Health Commissioner created affordability standards in 2009 to identify targets for total primary care spending. By 2012 primary care spending had increased by 37% and total medical spending had decreased by 14%, although the beginning of these trends predated the establishment of the program. The state also implemented the Care Transformation Advisory Committee, which acts as an oversight board to ensure that health insurers meet yearly targets for primary care spending.

- ▶ **A similar program in Oregon also establishes primary care spending targets.** Specifically, legislation requires all health insurance carriers with annual premium income over \$200 million to report primary care spending and to spend a minimum percentage of premium revenue on primary care. Although research on the effectiveness of Oregon’s program is not available, the state prepares a public report on the proportion of total medical spending assigned to primary care. Oregon also convenes a Primary Care Payment Reform Collaborative to share and develop best practices for facilitating primary care innovation and improvement.
- ▶ **Increased primary care spending generally can lead to reduced overall costs.** A Commonwealth Fund study reported that estimated overall increases in payments to primary care providers were expected to lead to lower Medicare costs for services including inpatient and postacute care, with an overall net decrease in Medicare costs. However, due to uncertainty of several factors (e.g., the definition and nature of primary care spending in California, how that might change in response to spending targets, as well as the impact of increased primary care spending on health care costs overall), it is not possible to estimate precise cost reductions. Potential savings in California could amount to several billion dollars annually.
- ▶ **Increased spending on primary care could lead to increased supply of primary care providers.** The current, widening gap between the incomes of physicians in specialty care fields and those in primary care fields contributes to discouragement among medical school graduates selecting primary care careers. Increased spending in areas such as salary, private insurers, and reimbursement approaches could address this income gap and prevent a shrinking primary care workforce.
- ▶ **Increased numbers of primary care physicians contributes to lower health care costs and improved health.** Increasing the number of primary care physicians (PCPs) is associated with lower mortality rates, more effective delivery of preventive care, and overall improved health across populations. Additionally, health care markets with a larger percentage of PCPs within the United States have experienced lower spending and higher quality of care.
- ▶ **Extent and type of primary care spending may impact the results.** While research suggests that increased primary care spending can lead to important benefits, no research has established a direct connection between primary care spending targets and overall improvements in health outcomes. As noted above, results from Rhode Island show some early association between increase primary care spending and the reduction of overall health care spending. And the Commonwealth Fund results suggest that increased primary care spending may result in lower inpatient and postacute care expenditures. The resulting impacts could result in changes in health care delivery and improved health care, changes in the allocation of health care spending that do not improve care, or even accounting changes that reclassify existing care as primary care but do not meaningfully alter the delivery of care. However, it would remain difficult to directly attribute reductions in overall spending, or acute care and inpatient spending, solely to increases in primary care spending.

Data Notations and Context

The \$1.1 million cost estimate in this recommendation focuses exclusively on a proposed collaborative tasked with assessing primary care reporting and spending. The costs include convening and administering the collaborative, as well as conducting studies and publishing reports. The cost estimates are not grounded in specific budgets or identified organizational cost structures.

The recommendation does not estimate the impact of additional primary care spending on the supply of specific professions in the health care workforce.

Potential savings in California could reach \$6 billion annually. This amount was estimated by applying the Commonwealth Fund’s model estimate of 2% savings to California’s 2014 overall reported health spending. Applying these findings to California spending, however, is speculative at best.

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Recommendation 3.9

AUTHOR Health Management Associates

TITLE Build capacity of local public health agencies to support collaborative community health improvement through state-hospital matching funds.

DESCRIPTION This recommendation calls for development of a state fund that would issue three-year grants to 40 regions (or counties) in California to support comprehensive community health needs assessments, identify and align additional cross-sector resources, engage local stakeholders to design targeted community-level health improvement strategies, monitor progress and outcomes, and facilitate a quality-improvement process to increase effectiveness and reduce inequities. The state fund would require regional hospital matching funds.

MAIN TAKEAWAY There is insufficient literature to analyze the impact of this recommendation on the many proposed community-level health outcomes. This is in part because there are limited, rigorous approaches to evaluating the effects of community-level health improvement activities. Over a three-year period, the recommendation would cost \$33.5 million across the three components. The bulk of the funds (\$20 million over three years) would fund the matching fund pool, while fund pool administration would cost \$500,000 for this period. Another \$3 million would support administration, a state advisory body, local public health agency assessment, and an Office of Statewide Health Planning and Development (OSHPD) GIS analysis. Evaluation would cost \$10 million.

The Commission should not be discouraged from pursuing this recommendation, particularly in light of the general gains to be had from stakeholder engagement, cross-sector partnerships, and policy changes that may be realized from these efforts and that are vital to any future community-focused programs. Importantly, however, significant attention and resources also should be devoted to designing effective evaluation methodology and data collection before grantees implement their efforts and to allow timely and useful assessments of the impact of community-level improvement activities.

Impact Statement

There is insufficient literature to analyze the likelihood that the proposed community health needs assessments (CHNAs) and resultant prevention activities will result in changes in utilization patterns (i.e., emergency department visits, hospitalizations); concomitant reductions in the prevalence of chronic conditions such as asthma, cardiovascular disease, diabetes; and impact on overall costs of health care. Similarly difficult to quantify is the impact that improved health and well-being would have on community members who could more actively contribute to society and realize increases in workplace productivity and decreases in criminal activity and social welfare costs. Over a three-year period, the recommendation would cost \$33.5 million across the three components, funding the matching fund pool (\$20 million); fund pool administration (\$500,000); the combined costs of administration, a state advisory body, local public health agency assessment, and an Office of Statewide Health Planning and Development GIS analysis (\$3 million); and evaluation (\$10 million).

While the literature is not sufficient to analyze the impact of this recommendation on community-level health outcomes, there are important lessons to be learned from the planning and early stages of several important community-level prevention and population health endeavors in the US and in other countries. The Commission should not be discouraged from pursuing this recommendation, particularly in light of the general gains to be had from stakeholder engagement, cross-sector partnerships, and from policy changes that may be realized from these efforts, and that are vital to any future community-focused programs. Importantly, however, significant attention and resources also should be devoted to designing effective evaluation methodology and data collection before grantees implement their efforts and to allow timely and useful assessments of the impact of community-level improvement activities.

Despite the increased focus and resources directed to community-level health improvement activities in recent years, the literature points out the glaring lack of rigorous evaluation methodology in this area. Most such evaluations rely on process measures (e.g., number of patients receiving a screening test, number of community education events held, or policy changes that resulted from the

intervention), or simple pre-post study designs with the individual — not the population — as the unit of analysis and fail to employ appropriate comparison populations or communities. The rare studies with more rigorous evaluation approaches were mostly conducted in other countries whose health systems are too dissimilar to be pertinent to this analysis (e.g., Ethiopia and sub-Saharan Africa). One well-designed US study demonstrated improvements that were not statistically significant. The Social Interventions Research and Evaluation Network, a national collaborative convened to catalyze and strengthen research, and other research groups, have made recommendations about what advances in methodology are needed for evaluations to more effectively assess the impact of community-level health improvement interventions.

Key Assumptions

- ▶ Tax-exempt hospitals use their community benefit dollars to make the state fund match. Policy change supporting this use of funds would be granted.
- ▶ There is a sufficient supply of appropriately trained, population-focused “epidemiologists” to support community-level CHNAs and improvement activities, or that the resources required to support further development of this workforce and other staff needed to support community assessments would come from elsewhere (see also, note below).
- ▶ Additional public and private sector investment would be made available for workforce training, technology, and deployment (i.e., other than for OSHPD GIS analysis), and those dollars are not included in the resources expenditure of this proposal.
- ▶ Institutional systems (i.e., local public health agencies, hospitals, clinics, other health care delivery sites, and community-based organizations) would integrate care delivery with comprehensive approaches to community health improvement implemented through the grantees.
- ▶ \$500,000 over three years (~\$167,000 per year) would be spent on nonpersonnel direct costs associated with the community assessment and improvement activities, while personnel and indirect costs would be either in-kind or would be borne through another funding source.

Data Notations and Context

Literature reviewed included that for impact of community health needs assessments, community-level quality improvement, community-based participatory research, and information on Accountable Health Communities.

There are several efforts in other countries and in the US beginning to grapple with the challenges inherent in evaluating the impact of community improvement activities on community population health. Some are obvious in references above.

Finally, the decision to deploy epidemiologists as key facilitators in this process presumes a level of practical population health and collaborative quality-improvement (QI) expertise that may be aspirational. Indeed, some would argue that the available funding opportunities, new biomedical technologies, the historic alignment of epidemiology with medicine, and existing epidemiologic methodologies (e.g., the devaluing of ecological methodologies) have driven many epidemiologists to favor medical rather than community- or population-level applications of epidemiology. Moreover, it is a rare epidemiologist who is well prepared to support significant QI initiatives. While there is most certainly a need to engage public health in all stages of CHNAs and other community-level interventions, more focus should be paid to readying these resources to lead community improvement initiatives.

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Recommendation 3.10

AUTHOR Health Management Associates

TITLE Engage health plans in regional workforce partnerships and initiatives.

DESCRIPTION This recommendation would establish a new matching grant program to provide annual grants to Medi-Cal managed care plans, to allow the plans to support local efforts to meet health workforce needs.

MAIN TAKEAWAY The recommendation is likely to have a positive impact on local community workforce resources. The impact would depend on how Medi-Cal plans decide to spend the matching funds and on the interests and needs of the health plans and their local communities as they relate to workforce. An allocation of \$140 million annually, \$1.401 billion over 10 years, would be matched by health plans to generate a total of \$2.66 billion for health workforce development through 2030. Without knowing how fund resources would be spent, it is not possible to do a cost-benefit analysis or to estimate savings or other impacts over the 10-year period.

Impact Summary

The recommendation is likely to positively impact local community workforce resources. The effort would be funded at \$140 million per year over 10 years (\$133 million per year for program funding and \$7–\$8 million per year for administration costs). The program would require matching support from participating Medi-Cal plans and would generate a total of \$2.66 billion for health workforce development over the period. The impact would depend on how Medi-Cal plans decide to spend the matching funds and the interests and needs of the health plans and their local communities as they relate to workforce. Numerous, disparate initiatives throughout the state, without coordination between health plans, likely would not be the most effective use of resources. Without knowing how fund resources would be spent, it is not possible to do a cost-benefit analysis or to estimate savings or other impacts over the 10-year period.

Plans have a range of program and policy levers that could positively impact the composition of California's health care workforce, its training and education, geographic distribution, and a plan's ability to experiment with new delivery system and payment models. For example, studies have demonstrated the effectiveness of workforce pipeline enhancement programs in strengthening students' academic records, improving test scores, and helping minority and disadvantaged students pursue careers in the health professions. Research also shows that health care professionals from underrepresented groups are more likely to serve in poor or rural communities. Initiatives that provide education and training experiences in community-based settings, coupled with students, residents, and faculty working directly with vulnerable populations, may increase the likelihood that participants seek out careers in underserved communities or care for vulnerable populations. For example, approximately 85% of federal loan repayment participants continue to provide care to the underserved up to two years after their obligation is completed, while 55% continue to provide care to the underserved 10 years after having completed their obligations.

Key Assumptions

- ▶ Data from national workforce development programs may not have the same outcomes when applied at the state level in California. Analysis is directional only.
- ▶ Fund would likely require significant state budget outlay costs in the Medi-Cal program (approximately \$1.4 billion over 10 years). We recommend seeking diverse funding sources.

Data Notations and Context

Matching grant funds would likely count toward plan administrative costs and factor into Medi-Cal managed care rate development. As such, it would be important to provide further clarity on how potential rate increases impact the state and other payers. Additionally, the proposal could run afoul of Medicaid limits on nonmedical spending, as it is not focused on direct health care.

While helping to address areas of weakness, matching grants to noncompliant health plans could be perceived as rewarding poor performers and may disadvantage Medi-Cal managed care plans that currently meet network adequacy requirements but could still benefit from assistance in developing their health care workforce.

Given that a number of plans are already investing in workforce initiatives (e.g., L.A. Care, Inland Empire Health Plan, Partnership HealthPlan, Central California Alliance for Health, and Kern Health Systems) the need for a one-to-one state match is unclear. Authors may want to consider implementing another type of need-based system for distributing funds as suggested on the first page of the proposal.

While a workforce shortage in California is clearly documented, especially for specialty and rural providers, it is not clear that workforce shortages are the primary cause for health plans not meeting network adequacy standards. Other reasons include poorly negotiated payment rates, unwillingness of facilities to contract, and state licensure rules.

It is unclear if local health plans that serve the Medi-Cal population have the expertise and experience to invest funds in health workforce development effectively. Numerous, disparate initiatives throughout the state, without coordination between health plans, likely would not be the most effective use of resources.

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