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Health Workforce Strategies for California:
A Review of the Evidence

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About the Foundation

The **California Health Care Foundation** is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

Introduction

California is facing a health workforce crisis. There are not enough health workers to meet the needs of its increasingly diverse, growing, and aging population, and the situation is worsening. Shortages exist across professions and geographies, with sizeable urban and rural underserved populations. Additionally, although the state population is becoming increasingly diverse, the current health workforce doesn't reflect these demographic shifts. For example, in 2019, 39% of Californians identified as Latinx, but only 14% of medical school matriculants and 6% of active patient care physicians in California were Latinx.[1]

> "[Although] California is one of the most racially and ethnically diverse states in the United States . . . Latinos, African-Americans, and American Indians . . . are underrepresented in most health professions that require an undergraduate or graduate degree."
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> Source: Christopher Toretsky, Sunita Mutha, and Janet Coffman, *Breaking Barriers for Underrepresented Minorities in the Health Professions*, Healthforce Center at UCSF, July 2018.

> "Seven million Californians, the majority of them Latino, African American, and Native American, already live in Health Professional Shortage Areas — a federal designation for counties experiencing shortfalls of primary care, dental care, or mental health care providers. . . . As a generation of baby boomers retires — including a large percentage of the health workforce — and as living costs rise and the state's production of health workers continues to lag growing demands, millions more Californians will find it difficult to access quality, affordable care."
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> Source: *Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission*, California Future Health Workforce Commission (CFHWC), February 2019.

Over the past two decades, studies have shown the importance of racial and social concordance between physicians and their patients as well as the need for intercultural competencies, which lead to increased trust and greater patient satisfaction. Particularly important, however, is the ability to speak the same language, which not only increases trust and patient satisfaction but simultaneously decreases poor clinical outcomes because of miscommunication.[2]

In addition to private sector investments in health workforce development, many federal and state health workforce policy interventions focus on increasing the number of health professionals and diversifying the health workforce. Interventions exist at different phases of the professional and educational journey, beginning with students in their precollege years and extending through health professional school and beyond. Although California has enacted many of these health workforce policies in an attempt to increase both the size and the diversity of the workforce, current public and private sector efforts have not been sufficient to alleviate the crisis. Without knowing how state programs impact California's health workforce, it is difficult to make objective, evidenced-based decisions about how to invest public resources to support these interventions. This summary of the evidence looks at these policy interventions with the goal of supporting California's policymakers and thought leaders as they

endeavor to prioritize workforce investments to realize the greatest impact.

The goal of this report is to review the evidence about the impact of key health workforce policy interventions (pipeline programs, scholarship programs, loan repayment programs, funding of graduate-level health profession training programs, residency funding) on the following:

- Increasing the availability of primary care, behavioral health, and dental providers in medically underserved areas ("access")[3]
- Increasing the diversity of primary care, behavioral health, and dental providers to better reflect California's population, particularly Latinx Californians ("diversity")
- Improving health care access for patients with limited English proficiency by increasing the number of primary care, behavioral health, and dental providers able to provide services in a language other than English ("language concordance")

Although health workers of all kinds are integral to California's health system, this report focuses on those in the health workforce that require an advanced degree (e.g., physicians, dentists, physician assistants, advanced practice nurses, psychologists, social workers, licensed marriage and family therapists, and licensed professional clinical counselors) — professions for which access, diversity, and language concordance are particular challenges.

"According to the US Census Bureau (2015), almost 44% of California households speak a language other than English, and nearly seven million Californians (19%) report speaking English 'less than very well.'"

Source: "Limited English Proficient Consumers," State of California Office of the Attorney General, n.d.

This publication is intended to complement the work done by the California Future Health Workforce Commission (Workforce Commission). The Workforce Commission, which was convened from 2017 to 2019, brought together experts across disciplines to develop recommendations to address the state's health workforce shortages and to meet the evolving needs of California's diverse residents. In 2019, the Workforce Commission issued its final report, *Meeting the Demand for Health*, which laid out those recommendations. Pursuant to that work, various stakeholders have referred to the Workforce Commission report to guide their decisionmaking on health workforce programming and investment. As they have done so, some have expressed a desire for a deeper understanding of the evidence as it relates to the recommendations to support informed decisionmaking. More specifically, stakeholders want to understand where they can have the largest impact when making trade-off decisions about public sector health workforce investments. This initial report addresses interventions under the auspices of the Office of Statewide Health Planning and Development (OSHPD), the state agency most focused on the health professions workforce.

Methods

The study team performed a scan of published academic literature and gray literature[4] and conducted key informant interviews to determine the impact of key health workforce policy initiatives on access, diversity, and language concordance. The literature review focused on impact evaluations of pipeline programs, scholarship programs, loan repayment programs, and programs to fund graduate-level health professional training programs and residencies. The team relied on systematic reviews of the literature when they were available. Interviews took place via online conferencing and included health workforce researchers and thought leaders. Interviews lasted 30 to 60 minutes. In total, the study team interviewed 19 experts from California, Georgia, Michigan, Nebraska, New York, North Carolina, Washington, Wisconsin, and the District of Columbia. See the appendix for detail.

Limitations of the Literature

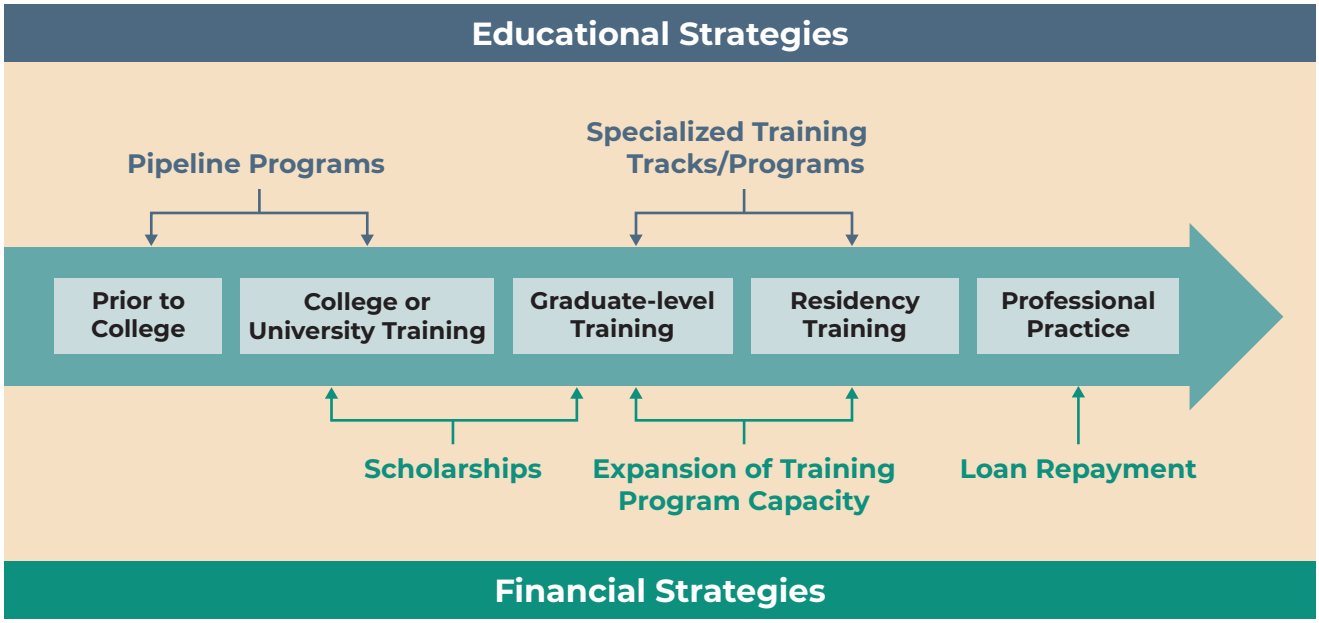
Overall, the published evidence for health workforce policy interventions is limited because there have been few formal evaluations of them. The interventions that have been more rigorously studied are financial incentive programs, including scholarship and loan repayment programs, and rural training tracks for physicians and dentists. Significant gaps in the evidence exist around impact on access to care for underserved populations and on workforce diversity; the authors found no studies that examined the specific impact of these key health workforce policy interventions on language concordance. In fact, several key informants reported that there are no data available on language proficiency among health professionals in California. (The Medical Board of California asks physicians to report languages they speak other than English but does not assess their proficiency in them). Overall, the health workforce policy research is limited by deficits in the following areas: lack of randomized controlled trials, inability to rule out selection bias as an explanation for findings, limited longitudinal tracking over time, and exclusion of the breadth of health professionals beyond physicians.

Review of the Evidence

Although there are many types of interventions to increase the size and diversity of California's health workforce, this report reviews five of the most often used: pipeline programs, scholarship programs, loan repayment programs, funding for graduate-level health professional training programs, and funding for residency programs. Figure 1 shows where these interventions impact students on their way to becoming health professionals. Above the arrow are educational strategies: those that impact the exposure, curriculum, and support of the students. Below the arrow are financial strategies. These strategies provide funding to directly increase the number of people in either an educational program or in a work setting.

The following sections of this report present, for each intervention: a definition of the intervention, examples currently operating in California, particularly through OSHPD, and a summary of the evidence, including specific points followed by citations. The report concludes with a discussion of the findings and options for health workforce policy in California.

Figure 1. Examples of Public Sector Strategies to Increase the Number and Diversity of Health Professionals



Pipeline to the Health Professions

Definition. For the purposes of this report, pipeline programs are those providing high school, college, and postbaccalaureate students with multifaceted support to enhance their readiness for graduate-level health professional training and to help them successfully pursue health careers. Programs often provide academic, career, and psychosocial support as well as mentorship. Some programs offer financial support as well.

Pipeline programs that provide mentoring and direct experiential activities also offer participants the opportunity to interact with role models who are academically and professionally successful. Mentoring and direct experiential activities enable participants to envision themselves as competent and successful health care professionals.

Pipeline programs most commonly serve students underrepresented in the health professions and students who are economically disadvantaged. Some programs also serve students from rural communities and immigrants.

PIPELINE PROGRAM SPONSORED BY OSHPD

Mini-Grants Program awards up to $15,000 to institutions to support conferences, workshops, or career exploration activities, exposing students to health careers.

Impact of Pipeline Programs on Access, Diversity, and Language Concordance

Summary of the evidence. Studies conducted over the past 40-plus years demonstrate that multicomponent pipeline programs for high school, college, and postbaccalaureate students underrepresented in the health professions positively impact a variety of outcomes with the potential to improve the diversity of the health care workforce. Although many pipeline programs are designed to promote interest and enrollment in a breadth of health professions, most impact evaluations are of pipeline programs specific to physicians and dentists. Positive program outcomes include changes in the attitudes and intentions of participants regarding careers in health care, their academic performance, and the likelihood they will enroll in health professional schools. Some studies also showed improvements in graduation rates from health professions schools, and studies of postbaccalaureate programs have shown that these programs increase the numbers of students underrepresented in the health professions who graduate from medical school, choose primary care careers, and work in health professional shortage and medically underserved areas.

SPOTLIGHT ON WORKFORCE POLICY

Health Resources and Services Administration's Health Careers Opportunity Program (HCOP)

HCOP is a federal grant program designed to increase the diversity of the health professions workforce in the United States and to offer high-quality culturally competent care in underserved communities. To do this, HCOP funds institutional collaborations between health professions schools, colleges, and high schools. These partnerships provide support and opportunities for students from disadvantaged and underrepresented backgrounds, helping them become more competitive applicants for health professions schools.

Federal funding for the program has varied widely since its inception in the early 1970s, and only one health professions school in California currently receives federal HCOP funding. Past internal program assessments of HCOP partnerships in California, however, indicate that programs have successfully helped students from disadvantaged backgrounds graduate from college and enroll in and complete graduate programs in the health professions. Developing and expanding HCOP programs in California holds promise as a way to increase diversity in the health professions and address provider shortages in underserved areas.

Source: *Health Careers Pipeline and Diversity Programs: Academic Year 2017–2018* (PDF), Health Resources and Services Administration, n.d.; and *Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission*, CFHWC, February 2019.

Postbaccalaureate premedical and predental programs for underrepresented students are a type of pipeline program designed to make participants more competitive applicants to health professional school. These one-year programs provide academic and enrichment experiences to college graduates, many of whom have previously applied unsuccessfully to medical or dental school.

"Among the continuum of educational pipeline programs, post-baccalaureate interventions are relatively high yield because they require only a single year of intervention, target students who have an explicit commitment to a career in medicine, and have a short timeline for achieving their payoff."

Source: Kevin Grumbach and Eric Chen, "Effectiveness of University of California Postbaccalaureate Premedical Programs in Increasing Medical School Matriculation for Minority and Disadvantaged Students," *JAMA* 296, no. 9 (2006): 1079–85.

What the Evidence Says

- A review of 24 evaluations of pipeline programs supported by the US Department of Health and Human Services resulted in 23 with positive outcomes. Outcome measures included improvements in academic performance and the likelihood of enrolling in a health professional school.[5]
- Multicomponent pipeline programs that employ a combination of interventions such as financial supports, social supports, mentoring, and intensive training opportunities for students and new professionals hold promise as a way to increase diversity in the health workforce.[6]
- Participation in postbaccalaureate premedical programs for students of color and those from disadvantaged backgrounds is an effective intervention to increase the number of such students entering medical school and increase the number of underrepresented students of color and those from disadvantaged backgrounds who graduate from medical school, choose primary care careers, and practice in medically underserved areas.[7]
- The UCSF School of Dentistry Dental Postbaccalaureate Program demonstrates improved short-, mid-, and long-term outcomes for students from economically and educationally disadvantaged backgrounds who were previously denied admission to dental school.[8]

Scholarship Programs

Definition. For the purpose of this report, scholarships are grants or payments made to support a student's health professional education in exchange for postgraduate service in a particular specialty or geography. Most commonly, these scholarships are provided in exchange for a commitment to provide primary care, behavioral health, or dental care in underserved rural or urban areas after graduation from health professional training. This report does not address scholarships that are not in exchange for service, such as need- or merit-based scholarships.

Scholarships are particularly advantageous for health professional students who are certain upon their entry to training that they are committed to working in a particular specialty or geographic area upon graduation. This level of certainty may be easier to achieve for students of health professions with a shorter pathway to practice, such as advance practice nursing and social work, compared with physicians, whose training takes a minimum of seven years. The primary benefit of a scholarship is that it removes the financial burden from recipients during their training so they can focus on academic success and personal well-being. Scholarships also allow students to graduate without the burden of high educational debt, which can affect choice of specialty and geographic area. Studies have shown that the amount of debt incurred by medical and dental students has grown by 172% in the last few decades.[9] Economically disadvantaged students, in particular, may lose confidence and their ability to visualize a successful career path in the health professions when faced with major financial stressors and accumulating educational debt.

SCHOLARSHIP PROGRAMS SPONSORED BY OSHPD

Advanced Practice Healthcare Scholarship Program improves access to health care in underserved areas by providing scholarships to health professional students and graduates who provide direct patient care in those communities. Eligible professionals include certified nurse midwives, certified nurse specialists, dentists, nurse practitioners, occupational therapists, pharmacists, physical therapists, physician assistants, and speech therapists.

Impact of Scholarship Programs on Access, Diversity, and Language Concordance

Summary of the evidence. Scholarships can be an effective way to increase the diversity of the health workforce by offsetting the financial burden of training, although it's important for students to understand the long-term requirements of the scholarship. This is easier when the length of training is shorter, allowing recipients to fulfill their responsibilities within a few years instead of a decade later (as can be the case with physicians). Increasing access through retention of practitioners in their service areas can vary greatly, often depending on the demographic of the recipient.

SPOTLIGHT ON WORKFORCE POLICY

National Health Service Corps (NHSC)

The NHSC is a program run by the Health Resources and Services Administration (HRSA). It was created in 1972 in response to the health care crisis in the 1950s and 1960s, with the goal to connect primary health care clinicians to people in the United States with limited access to health care. It provides scholarship and loan repayment programs in return for at least two years of service in Health Professional Shortage Areas. There are currently more than 16,000 NHSC members providing care to 17 million people, and the program is open to physicians, nurse practitioners, physician assistants, dentists, dental hygienists, health service psychologists, licensed clinical social workers, psychiatric nurse specialists, marriage and family therapists, and licensed professional counselors. HRSA offers one scholarship program and four loan repayment programs as well as funding for states to manage their own loan repayment program (called the State Loan Repayment Program). OSHPD administers California's State Loan Repayment Program.

Source: "HRSA National Health Service Corps," Health Resources and Services Administration, n.d.

For example, a recipient from a rural area is more likely to remain in a rural area after completing their service commitment. Efforts should be made to match scholarship recipients with compatible service locations to increase the likelihood that recipients will remain after completing the service commitment.

What the Evidence Says

- A systematic literature review found eight studies that demonstrated a positive association between participation in the NHSC scholarship program and urban or rural underserved practice location.[10]
- Scholarships have been shown to increase recruitment of physicians and dentists to rural areas, which benefits the community by increasing short-term supply but not necessarily long-term retention of these providers after their service obligation is complete.[11]
- A study of states' financial incentive programs for physicians found that retention rates in rural and medically underserved areas were lower for scholarship recipients than for loan repayment recipients.[12]
- One study of long-term follow-up of rural NHSC scholarship recipient physicians found that one-quarter were still practicing in the county to which they had been assigned by the NHSC an average of 6.1 years after the end of their obligation. Another 27% were still in rural practice. Of the entire group, less than 40% were in traditional urban private or managed care settings.[13]
- For scholarships, targeted recruitment of specific groups, such as those with existing ties to rural communities, has a positive effect on recruitment and retention in rural areas.[14]
- Trainees' geographic preference, such as urban or rural, must be considered in service placement.[15]
- Data from 2017 indicate that the majority of dental and medical school graduates incur debt during their education, with an average of $190,694 of debt for medical students and $287,331 of debt for dental students. Additionally, American Indian, Black, and Latinx graduates are more likely to have debt then White graduates.[16]

Loan Repayment Programs

Definition. Loan repayment programs provide external support to repay all or part of a health professional student's loans in exchange for postgraduate service in a predefined type of geographic area or setting. Most commonly, these programs are provided in exchange for a commitment to provide primary care, behavioral health, or dental care in underserved rural or urban areas.

Loan repayment programs are particularly advantageous for health professionals who have completed their training with substantial educational debt and are motivated to work in an underserved area. The primary benefit of loan repayment is that it mitigates financial burden from the recipients without obligating them to a particular professional path before they finish their training.

Impact of Loan Repayment Programs on Access, Diversity, and Language Concordance

Summary of the evidence. Most of the literature on the impact of loan repayment programs examines the physician workforce, particularly the performance of the NHSC. Impact evaluations often combine loan repayment and scholarship programs, so it can be difficult to attribute the impact of one in isolation.[17]

Loan repayment provides the most immediate impact on access because the health professional is ready to work, or already working, in the area of need to receive the benefit. Though results have been mixed, studies indicate that there may be higher workforce retention rates with loan repayment programs, compared to scholarship programs.

What the Evidence Says

- A review of peer-reviewed systematic reviews concluded that loan repayment programs increase recruitment of physicians and dentists to rural areas but not necessarily retention of these providers after their service obligation is complete.[18]
- One study found that NHSC loan repayment programs had a positive impact on recruiting primary care physicians, nurse practitioners, and physician assistants to rural areas in Oregon from 2010 to 2014. The same study found a positive but relatively minor impact on retention. The authors concluded that the impact of Oregon state loan repayment programs was at least as high — and potentially higher — than for the NHSC program, but the number of participants was too small for the data to reach statistical significance.[19]

LOAN REPAYMENT PROGRAMS SPONSORED BY OSHPD

Advanced Practice Healthcare Loan Repayment Program increases the number of advanced practice professionals practicing in areas of unmet need: physician assistant, physical therapist, occupational therapist, nurse practitioner, dentist, certified nurse midwife, certified nurse specialist, pharmacist, and speech therapist.

California State Loan Repayment Program increases the number of primary care physicians, dentists, dental hygienists, physician assistants, nurse practitioners, certified nurse midwives, pharmacists, and mental and behavioral health providers practicing in Health Professional Shortage Areas.

County Medical Services Program Loan Repayment Program increases primary care and dental services at an approved site located in one of the 35 County Medical Services Program counties — physicians (family medicine, psychiatry, internal medicine, obstetrics/gynecology), nurse practitioners, physician assistants, and dentists.

Licensed Mental Health Services Provider Education Program increases the number of mental health care professionals providing direct care in publicly funded mental health facilities, nonprofit mental health facilities, mental health professions shortage areas, and in the public mental health system — 13 professions qualify.

Steven M. Thompson Physician Corps Loan Repayment Program increases access to health care and promotes the retention of primary care physicians in medical underserved areas — physicians in family medicine, internal medicine, pediatrics, obstetrics/gynecology, gerontology, psychiatry, emergency medicine, surgery, and oncology.

Note: California state-financed loan repayment programs for physicians and dentists are also available through CalHealthCares, administered by Physicians for a Healthy California.

- A study of states' financial incentive programs for physicians found that retention rates in rural and medically underserved areas were higher for loan repayment recipients — 66% of whom remained in their service sites eight years after starting work there — than for scholarship recipients.[20]
- The US Government Accountability Office and NHSC concluded that the NHSC Loan Repayment Program achieved better outcomes — higher service-completion rates, greater satisfaction, and longer retention — than the NHSC Scholarship Program and did so at lower cost.[21]

Graduate-Level Health Professional Training Programs

Definition. Graduate-level health professional training programs include medical schools, nurse practitioner schools, physician assistant schools, as well as master's degree programs at universities.

Expanding and diversifying the workforce in California could be accomplished by expanding capacity at these training programs. A related health workforce policy intervention with the most evidence is the creation of specialized training tracks or programs within medical schools. These training tracks are supportive programs designed to increase access to care for underserved rural or urban populations in the state. Successful training tracks recruit students from the regions that they are aiming to serve, train them within those settings, and provide academic support and career planning throughout their training with the hope that graduates will choose to work in those regions after graduation, positively impacting access in those regions and overall diversity of the health workforce.

No literature was found on training program interventions that increase access or diversity for professions other than physicians, although evidence can be extrapolated to other professions. In addition, impact evaluations regarding nursing workforce interventions below the advanced degree level may provide lessons that apply to advanced degree professional training programs. Currently, OSHPD provides some funding to support nurse practitioner and physician assistant programs, with consideration given to programs working to increase diversity.

HEALTH PROFESSIONAL TRAINING PROGRAMS AT OSHPD

Song-Brown Family Nurse Practitioner Training Program and Primary Care Physician Assistant Training Program (PDF) provides one-year grants to support institutions training family nurse practitioners and physician assistants.

Workforce Education and Training Programs provide funding to increase the numbers of psychiatric mental health nurse practitioners training in the public mental health system.

Table 1. Examples of Specialized Medical School Training Programs in California

UC PRIME — six distinct programs: - PRIME (rural California), UC Davis - PRIME-LC, UC Irvine - PRIME (leadership and advocacy), UCLA - PRIME (San Joaquin Valley), UC Fresno - PRIME-HEq, UC San Diego - PRIME-US, UCSF	Serves as a training track at each of the University of California (UC) medical schools that supplements standard training with additional curriculum tailored to meet the needs of various underserved populations. Each program has a dedicated area of focus, supplemental criteria for admission, relevant curricular content, and dedicated faculty mentorship. These programs also prioritize recruitment of underrepresented minority students and those from underserved communities.
UC Davis ACE-PC	In partnership with Kaiser Permanente Northern California, a three-year physician pathway program for students committed to primary care. Upon completion, students are placed into a partner residency program and enter the primary care workforce one year earlier than through traditional medical school programs. This accelerated program lessens the financial burden for students pursuing primary care medicine.

Acronym definitions: *PRIME*: Program in Medical Education; *ACE-PC*: Accelerated Competency-based Education in Primary Care; *LC*: Latino community; *HEq*: health equity; *US*: urban underserved.

Impact of Training Programs on Access, Diversity, and Language Concordance

Summary of the evidence. Many studies have looked at how much exposure students are given to certain training environments and how that exposure impacts the students' practice choices. Programs that offer brief periods of exposure demonstrate no impact. However, longitudinal programs, or programs that run throughout the length of the students' training, do impact future practice decisions. Students are more likely to practice in settings similar to their long-term training environment, whether urban, rural, safety net, or traditional. Students who grew up in areas similar to their training environment have an even higher likelihood of remaining in those settings in their future practice. Some evidence indicates that strategies to expand educational capacity cost less than offering financial aid and academic support.

What the Evidence Says

- A systematic review of the literature reported that growing up in a rural community is a key determinant and consistently associated with choosing rural practice. The review looked at other program characteristics and found mixed results, ultimately determining that it could not identify specific program characteristics associated with program success.[22]
- Constant exposure to underserved patients could be one reason a higher percentage of longitudinal pathway program graduates end up practicing in underserved settings. Many of these programs require students to apply or opt in. This self-selection is also a positive indicator that graduates will practice in similar settings after graduation.[23]
- Retention of health professionals in rural locations after graduation or service commitment is higher for graduates of the rural-focused longitudinal pathway programs, even many years later. Seventy percent of one program's graduates who started practicing in rural locations were still practicing in rural locations 25 to 33 years after graduating.[24]

SPOTLIGHT ON WORKFORCE POLICY

International Medical Graduates

The UCLA International Medical Graduate Program began in 2006 with the goal to improve health access to underserved communities with a bilingual and bicultural family medicine physician workforce. The program admits "Latinx or Hispanic" physicians who have already completed medical training outside the United States but legally live in the United States and prepares them for the US Medical Licensing Examination while simultaneously teaching them the culture of medicine in the United States, including hands-on clinical training. The program has several components and can take varying amounts of time, depending on how much support the physician needs to prepare for residency training, but it is often around one year. There is no cost to the physician while in the program, or for the examinations, and physicians also receive a small monthly stipend. The estimated average cost per physician to complete the program is $55,000. In return, they agree to enter a family medicine residency program, preferably in California, and then to work in a medically underserved community for at least two to three years, depending on the amount of support they received during the program.

Since the program began, it has graduated 160 international medical graduates who have gone on to family medicine residency training in the United States, 155 of them in California, in return for a two-year commitment to provide primary care in a California Health Professional Shortage Area after graduation from residency. Because of their bicultural background, these physicians are uniquely positioned to care for the increasing multicultural population in California and help to diversify the current physician workforce. They have cultural competency and language concordance, and their medical skills are often underutilized because there are many barriers to getting accepted into residency programs required for licensure in California.

This program is spotlighted because it is effective at increasing access, diversity, and language concordance. It does not fit neatly into the categories of interventions reviewed in this report. Rather, it is a hybrid — very similar to a postbaccalaureate program but occurring just before residency training.

Source: "International Medical Graduate (IMG) Program," UCLA David Geffen School of Medicine, n.d.

- From 2002 to 2010, California's Pipeline, Profession & Practice: Community-Based Dental Education (Dental Pipeline) program successfully demonstrated that increasing exposure to FQHCs through community-based dental education increased the likelihood that graduates would treat underserved populations.[25]
- Evaluation of the Nurse Workforce Initiative, a California initiative announced in 2002, indicated that it was a successful program, exceeding its goal to increase the supply of nurses in California. Although all the strategies used were effective in increasing the nursing supply, strategies that expanded education capacity appeared to have a lower cost per new nurse than offering financial aid and academic support.[26]

Programs Funding Residencies

Definition. Workforce policy interventions aimed at residency training programs occur at the institutional level and primarily involve funding for increased trainee capacity.

> "California does not have the educational capacity to produce enough health professionals to meet current and projected needs. Capacity challenges in California are particularly acute in medicine, where new physicians are insufficient to replace those who are retiring."
>
> Source: *Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission*, CFHWC, February 2019.

All physicians must complete a minimum of three years of graduate medical education (GME), also known as residency, to be licensed in California. GME usually occurs in a hospital but can also include training in safety-net settings, such as teaching health centers, community clinics, or tribal health centers. Currently, more physicians are applying to residency programs in California than available training positions. Although the federal government often subsidizes existing GME programs, current federal subsidies do not provide for any GME program expansion. Hospitals that have never had a residency program can launch a new program that will eventually receive federal support, but there is a very large upfront investment, and it often takes many years to reach a point when financial losses are manageable or eliminated. State GME training grants ease the financial burden on the training hospital or health center and can allow for GME expansion. State training grants can also include requirements targeting growth in specialties and geographic regions to meet the state's health workforce requirements.

Creating GME positions in California will increase the supply of physicians in California. California ranks highest in the nation in retention of GME graduates: Almost 70% of graduates from California residencies remain in the state to practice medicine. This proportion is even higher if graduates have also attended medical school in California. Establishing and expanding GME programs in underserved areas of the state, and prioritizing the care of underserved populations, will expand access to care in those areas and for those populations — residents provide patient care as part of their training and they tend to practice near where they completed residency. OSHPD supports the training of primary care physicians, physician assistants, and nurse practitioners through the Song-Brown program.[27]

RESIDENCY FUNDING PROGRAMS AT OSHPD

New Primary Care Residencies Program provides funding to offset the costs associated with achieving accreditation by the Accreditation Council for Graduate Medical Education and starting a new residency program.

Primary Care Residencies Expansion Slots provide funding disbursed over a three-year period to support a primary care residency program permanently expanding the number of categorical primary care residency slots.

Primary Care Residencies Existing Slots (teaching health center) provide funding disbursed over a three-year period to support at least one resident of an existing recognized Teaching Health Center.

Primary Care Residencies Existing Slots (hospital) provide funding disbursed over a three-year period to support at least one resident of an existing primary care residency program.

Grant Program Psychiatry Residency provides funding to increase the number of psychiatry residents training in the public mental health system.

Note: California funding for GME expansion of residency programs in family medicine, internal medicine, pediatrics, obstetrics/gynecology, and emergency medicine is also available through CalMedForce, administered by Physicians for a Healthy California.

Sources: *Primary Care Residency (PCR) Training Programs Grant Guide for Fiscal Year 2021–22* (PDF), OSHPD; "Workforce Education and Training Programs (WET)," OSHPD.

Impact of Residency Funding Programs on Access, Diversity, and Language Concordance

Summary of the evidence. Multiple studies have suggested that residents who train in safety-net or rural settings are much more likely to work in those settings after residency, suggesting that new or increased residency training could be targeted in locations of highest need. Other states that have made a significant investment in expanding residency have reported meeting or exceeding the goals of that investment. Expanding existing programs that have proven track records for producing high-quality graduates is an effective, yet expensive, way to build capacity, as the state would need to provide funding in perpetuity. Creating new programs in hospitals that have never had teaching programs can be riskier, as they have no track record of success. However, new programs have the potential for both increasing geographic diversity as well as eventually qualifying for federal contributions, decreasing the long-term financial burden on the state.

What the Evidence Says

- GME expansion funding must be ongoing. Expansion of existing programs from time-limited grants produces time-limited results because most programs revert to original program levels after the grant funding ends.[28]
- Strategic state spending can increase the number of residency positions and tie those positions to the workforce needs of the state. Various states have had different yet successful approaches. For instance, Georgia chose to invest in onetime start-up funding for new teaching hospitals, with future, ongoing funding from the Centers for Medicare & Medicaid Services.[29] Texas chose to invest in start-up funding for new hospitals but also commit direct, long-term funding to positions in existing programs.[30]
- Many studies suggest a correlation between where residents train and where they work, both geographically and with the populations they serve. As an example, those who train in safety-net settings, such as Teaching Health Centers or Federally Qualified Health Centers (FQHCs), are more likely to work in those settings.[31]
- The relationship between where residents train and where they work is stronger when the resident also has certain characteristics, such as a background in the same geographic area as the training. For example, medical residents training in rural programs are more likely to work in rural areas after graduating and are much more likely to do so if they grew up in a rural area.[32]

SPOTLIGHT ON WORKFORCE POLICY

Behavioral Health

The Behavioral Health Education Center of Nebraska (BHECN) was established by the state legislature in 2009 to recruit, retain, and increase competency of the state's behavioral health workforce and to address the workforce shortage. Its efforts fall into three broad categories: engage and recruit, prepare and train, and retain and support. BHECN works to expose students, beginning in high school, to careers in behavioral health. Its Ambassador Program connects students, particularly those in underserved rural and urban areas, with resources and mentors. BHECN has strengthened partnerships among the 16 academic institutions providing graduate- or doctorate-level behavioral health education to collaborate on training and workforce retention. It also funds training, such as psychiatric residency positions and internships for behavioral health professionals. During and after training, BHECN provides conferences for interprofessional development, networking, and support as well as resources for behavioral health professionals, such as a free job board.

In the 10 years since the inception of BHECN, Nebraska has increased the number of behavioral health professionals able to prescribe (psychiatrists, nurse practitioners, and physician assistants) by 17% and the number of nonprescribers (psychologists, licensed independent mental health practitioners, and licensed alcohol and drug counselors) by 16%. In particular, the number of advance practice registered nurses has increased by 59% and the number of physician assistants by 67%. Of the psychiatrists graduating from Nebraska medical schools in 2019, 82% are completing their residency in Nebraska. In partnership with the Monroe-Meyer Institute, BHECN has established 25 rural and 18 urban integrated behavioral health and primary care clinics, increasing local access to behavioral health resources and providing training sites for students.

Source: *Behavioral Health Education Center of Nebraska: Legislative Report, FY 2018 & 2019* (PDF), Behavioral Health Education Center of Nebraska.

SPOTLIGHT ON WORKFORCE POLICY

Dentistry

In 2002, the Robert Wood Johnson Foundation began funding the first round of the Dental Pipeline Program with the goal of helping 11 dental schools nationally increase access to dental care for underserved populations and increase the enrollment of students underrepresented in dentistry. One California school, UCSF, was selected to be a grant recipient. The California Endowment decided to partner in this program and awarded grants to four additional California dental schools, beginning in 2003. Grant awards were up to $1.5 million each over five years. A minimum of 25% of the grant was allocated to recruitment, which often included pipeline programs. In addition, programs were required to establish community-based clinical education programs and to revise the school curricula to support community-based education programs. Schools took one year to build the academic and clinical infrastructure for the program and then four years to run the program. The California Endowment and the W.K. Kellogg Foundation also provided funds for scholarships and loans for the program. In 2008, the California Endowment provided a second round of funding of $200,000 for 27 months, though the program office was still with the Robert Wood Johnson Foundation. The goal of this second round was to build on the best practices discovered from round one. The program ended in 2010.

Though some of the goals of the program ended up being too difficult to implement in so short a time, improvements were made in all the goal areas. All the dental schools increased the length of time that senior students spent in community-based rotations. The number of community sites that had agreements with dental schools increased, and most of the patients served whose race and ethnicity was known were from underserved minority groups. Individual schools were free to decide how to implement curriculum changes, but all schools made changes to prepare students for their community-based rotations. Finally, applications from and enrollment of underrepresented minorities increased.

Sources: Margie R. Arnett and Ron Forde, "Increasing Student Diversity and Cultural Competence as Part of Loma Linda University School of Dentistry's Service Mission," *Journal of Dental Education* 76, no. 6 (June 2012): 721–7; Pamela L. Davidson et al., "Influence of Contextual Environment and Community-Based Dental Education on Practice Plans of Graduating Seniors," *Journal of Dental Education* 71, no. 3 (March 2007): 403–18; and *Pipeline, Profession & Practice: Community-Based Dental Education*, Robert Wood Johnson Foundation, last updated August 27, 2013.

SPOTLIGHT ON WORKFORCE POLICY

Medicine

UC Irvine School of Medicine's Program in Medical Education for the Latino Community (PRIME-LC) was established in 2003 to address the increasing demand for culturally and linguistically competent physicians better prepared to address the health needs of the Latinx population. It is a five-year program that combines a traditional medical school curriculum with education and experiences that increase familiarity with the sociocultural values, health beliefs, and lifestyles of Latinx patients while also increasing Spanish language proficiency. Though Spanish fluency is not a requirement for admission, some Spanish language knowledge is required. Supplementing the curriculum are its Summer Immersion Program, occurring the summer before students begin medical school and exposing students to Latinx health conditions and communities in California, as well as a four-week clinical rotation in Peru after students' third year of medical school. In addition, PRIME-LC students must obtain an additional graduate degree, though not necessarily at UC Irvine. Most students complete a master of public health degree, though students have also pursued master of business administration and master of public policy degrees. The program admits roughly 12 students per year, and in 2020, 76% of the enrollment consisted of underrepresented minorities in medicine. PRIME-LC graduated its first class in 2009. Since then, more than 90% of students have chosen to go into specialties of need. Data from 2009–18 show that 64% of graduates have chosen a primary care specialty (family medicine, pediatrics, or internal medicine), with 40% of students choosing to pursue family medicine. Another 15% have gone into emergency medicine, 7% into psychiatry, 7% into obstetrics/gynecology, and 4% into general surgery. Of those who have completed their residency and are now working, 89% are working in California. Of those working, 63% work with a patient population more than 50% Latinx, and 70% work with a patient population more than 50% low income.

Sources: Efforts by UC Medical Schools to Help Meet the Needs of Medically Underserved Communities (PRIME): Legislative Report (PDF), University of California, September 2012.

Discussion of Findings

This report reviews evidence for health workforce policy interventions under the auspices of OSHPD, the California state agency most focused on the health professions workforce. The evidence review focuses on those professions in the health workforce that require an advanced degree — professions for which access, diversity, and language concordance are particular challenges. Policy interventions discussed here include pipeline programs, scholarship programs, loan repayment programs, graduate-level health professional training programs, and residency funding programs. A summary of our findings is displayed in Table 2 (see page 16) and discussed below.

Extrapolating from available evidence, the authors found that the most immediate way to recruit existing primary care, behavioral health, and dental professionals into medically underserved areas of California is to provide financial incentives such as loan repayment. Direct incentive payments that simply pay physicians a cash incentive to work in an underserved area are a viable option that were not studied, but per our key informants some states have employed them with success. Long-term retention of health professionals in underserved rural and urban areas is likely to be greatest among professionals who originate from those areas, and interventions with outreach to those professionals will likely have the greatest impact. Longer-term strategies to address access to physicians includes establishing new residency programs, or paying for additional positions in existing residency programs.

To increase the diversity of primary care, behavioral health, and dental providers to better reflect California's population, particularly Latinx Californians, requires recruiting more diverse students into health professional training programs. In California, the college and university student populations are quite diverse, and a substantial proportion of these students begin their college years with an interest in the health professions. For various reasons, including poor academic and career counseling and perceived educational expense, many of these students lose confidence in their ability to pursue a career in the health professions.[33]

Evidence demonstrates that pipeline programs can be successful in further developing students' interest in the health professions and the confidence to enter and complete health professions educational programs. One-year postbaccalaureate programs that recruit college graduates from historically underrepresented communities and prepare them for admission to health professional schools have demonstrated a positive impact on access to care in underserved areas and on workforce diversity.

Increasing the language diversity of the students entering and graduating from health professional schools is one important step toward increasing health care access for patients with limited English proficiency. Primary care, behavioral health, and dental trainees who claim proficiency in these languages are not necessarily prepared to communicate effectively with patients in a clinical encounter and many could benefit from a high-quality medical language program.[34] The University of California, Irvine,

Table 2. Impact of Key Health Workforce Policy Interventions on Access, Diversity, and Language Concordance

	IMPACT ON ACCESS	IMPACT ON DIVERSITY	IMPACT ON LANGUAGE CONCORDANCE
Residency or Training Program	▸ Increasing program capacity increases access. For residency, this works in two ways. First, residents provide care as part of their training. Second, California retains over 70% of all residents trained, which increases physician supply. ▸ Studies show that residents are more likely to practice in locations similar to where they trained.	Increases diversity only if funding is tied to requirements that relate to diversity needs.	No available evidence.
Loan Repayment Programs	▸ Increases access in the short term. ▸ Retention often depends on the personal characteristics of the recipients; for example, health professionals from rural areas are more likely to remain in rural practice over the long term.	Impact on diversity is less than it is on access, unless funds are targeted to underrepresented populations.	No available evidence, but there is potential to increase language concordance if opportunities are targeted to underrepresented populations that speak languages other than English.
Service-Contingent Scholarship Programs	▸ Increases access, although retention of professionals over the long term is less certain. ▸ More effective for shorter career pathways (e.g., physician assistants, licensed clinical social workers) than longer ones (e.g., physicians).	Impact on diversity is less than it is on access, unless scholarships are targeted to underrepresented populations.	No available evidence, but there is potential to increase language concordance if scholarships are targeted to underrepresented populations that speak languages other than English.
Pipeline Programs	▸ Increases access in the long term. ▸ Health professionals from underrepresented backgrounds are more likely to care for underserved populations and will often choose to return to the areas they grew up to practice.	Increases diversity by recruiting and supporting students underrepresented in the health professions.	Can increase language concordance by recruiting and supporting students from underrepresented populations that speak languages other than English. May need upskilling to be able to communicate effectively in a patient care setting.

Notes: Darker shading indicates shorter-term solutions with more immediate impact. *Access* is the availability of primary care, behavioral health, and dental providers in medically underserved areas. *Diversity* is the diversity of primary care, behavioral health, and dental providers to better reflect California's population, particularly Latinx Californians. *Language concordance* is the number of primary care, behavioral health, and dental providers able to provide services in a language other than English. *Pipeline programs* are those providing high school, college, and postbaccalaureate students with multifaceted support to enhance their readiness for graduate-level health professional training and to help them successfully pursue health careers. Programs often provide academic, career, and psychosocial support as well as mentorship. Some programs offer financial support as well. *Service-contingent scholarships* are grants or payments made to support a student's health professional education in exchange for postgraduate service in a particular specialty or geography. *Loan repayment programs* provide external support to repay all or part of a health professional student's loans in exchange for postgraduate service in a predefined type of geographic area or setting. Workforce policy interventions aimed at residency or training programs occur at the institutional level and primarily involve funding for increased trainee capacity.

PRIME-LC program is an example of a program that aims to ensure that all participating students leave the program capable of communicating effectively with patients in Spanish. International medical graduates who are effective communicators in clinical settings using their heritage language might or might not have limited English proficiency. The UCLA International Medical Graduate Program is an innovative one-year program that successfully prepares international medical graduates from Latin America for primary care residency in exchange for service in underserved areas of California.

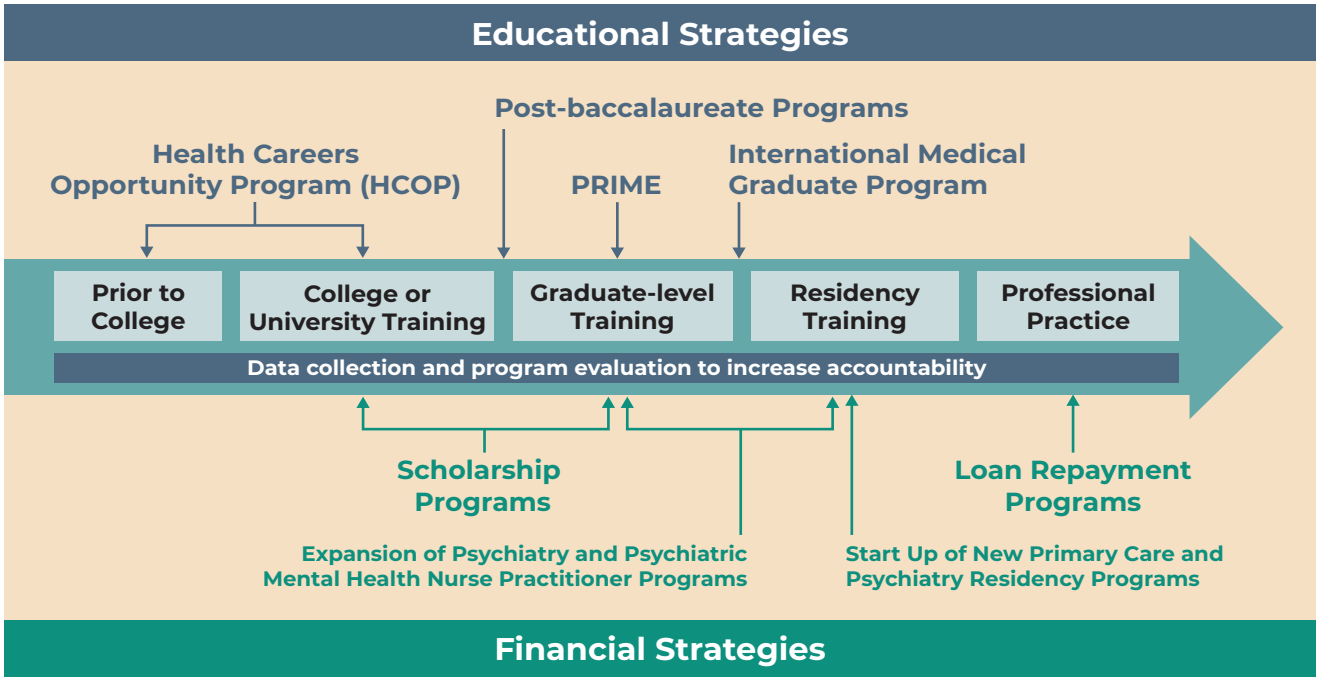
Looking to the Future: Health Workforce Policy Options for California

As leaders in California consider their options for improving health workforce policy, consideration should be given to the need for more evidence on the impact of policy interventions on access, diversity, and language concordance; the immediate need for improvements in the diversity and distribution of the health workforce in addition to long-term needs; workforce deficits in both rural and urban underserved areas of the state; current state health workforce policy investments; and the recommendations of the California Future Health Workforce Commission. California's health professional pipeline programs; scholarship programs; loan repayment programs; graduate-level health profession training programs; and residency funding programs will be most effective if they are coordinated and integrated into a cohesive workforce strategy so that there is increased synergy resulting in higher impact on access, diversity, and language concordance. Examples of these workforce policy options are displayed in Figure 2 and described in detail below. Cost estimates for these policy options are provided in Table 3 (see page 18).

Pipeline Programs

This review of the evidence demonstrates that multicomponent pipeline programs for high school, college, and postbaccalaureate students underrepresented in the health professions positively impact a variety of outcomes that have the potential to improve the diversity of the health care workforce. The only

Figure 2. Options for Public Sector Investments to Increase the Number and Diversity of Health Professionals in California



Note: The outcomes of all interventions are enhanced when recruitment is targeted.

Table 3. Health Workforce Strategies for California: Examples of Potential Interventions, Associated Costs, and Outcomes

INTERVENTIONS (EXAMPLES)	FUNDING AMOUNT (EXAMPLES)	OUTCOME	COST PER NEW HEALTH CARE PROFESSIONAL	ASSUMPTIONS
Pipeline Programs Source: *Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission*, CFHCW, February 2019.				
Establish a statewide Health Career Opportunities Program (based on Recommendation 1.2 of CFHCW).	$15.9M annually $159M over 10 years	25,500 new CA health care workers over 10 years, including 20–23,000 from under-represented groups	$6,235 per health care worker	Would increase health care workers at all levels, not just advanced care professionals.
Increase postbaccalaureate program positions for students reapplying to medical school from underserved communities (based on Recommendation 1.4 of CFHCW).	$3.6M annually	Applicants annually: ▶ 100 medical school ▶ 40 dental school	$25,714 per applicant to medical or dental school	
Scholarship Programs Source: "Advanced Practice Healthcare Scholarship Program (APHSP)," OSHPD.				
Fully fund the Advance Practice Healthcare Scholarship program and prioritize awards to students who are low income, first generation, or from historically underserved communities.	Sufficient to fund 75% of eligible applicants annually	Dependent on number of applicants	$25,000 per health professional per one-year commitment	Dollar amounts are current OSHPD numbers. Administrative costs not included.
Loan Repayment Programs Source: "Advanced Practice Healthcare Loan Repayment Program (APHLRP)," OSHPD.				
Fully fund the Advance Practice Healthcare Loan Repayment program and the Steven M. Thompson Physician Corps Loan Repayment Program, and prioritize awards to trainees who are low income, first generation, or from historically underserved communities.	Sufficient to fund 90% of eligible applicants annually	Dependent on number of applicants	$105,000 per physician per three-year commitment $25,000 per other health professional per two-year commitment	Dollar amounts are current OSHPD numbers. Administrative costs not included.
Graduate-Level Health Profession Training Programs Sources: Based on research conducted by Healthforce at UCSF for the CFHWC and interview with Patrick Dowling, MD.				
Increase the amount of funding that OSHPD has available to fund primary care and psychiatric mental health nurse practitioner positions (based on Recommendations 3.1 and 3.3 of CFHWC).	$454M over 10 years	7,000 additional nurse practitioners over 10 years	$65,000 per nurse practitioner	Assumes current programs can absorb enrollment increases. Offsets from tuition received by programs not included, so actual costs would be lower.
Provide ongoing funding for the UCLA International Medical Graduate (IMG) program.	$550,000 annually ($5.5M over 10 years)	100 new family medicine residents over 10 years	$55,000 per new family medicine resident	
Residency Programs Source: CFHWC.				
Increase funding for OSHPD to fund the start-up of new residency programs in GME naive hospitals and community health centers (based on Recommendation 2.2 of CFHWC).	$48M over 10 years	One-time start-up costs would enable 20 new primary care and psychiatry GME programs to produce a minimum of 160 new physicians per year in perpetuity	Average $2.4M per institution	160 assumes eight residents graduating per institution annually. Actual number would likely be much higher.
Increase funding for OSHPD to support psychiatry GME positions (based on Recommendation 2.2 of CFHWC).	$100,000 per new position annually	Dependent on number of positions funded	$400,000 per psychiatrist	Dollar amount does not cover the full cost of training, which is closer to $600,000 per psychiatrist.

pipeline program that OSHPD currently administers is the Mini-Grants Program that awards up to $15,000 to institutions to support conferences, workshops, or career exploration activities, exposing underrepresented and/or disadvantaged students to health careers. Recent data indicate that a diverse student population enters California's 2- and 4-year colleges with interest in the health professions. However, for a variety of reasons, including poor academic and career advising and high educational expenses, many of these students lose confidence in their ability to pursue a career in the health professions.[35] Supporting these students through college and providing an opportunity for postbaccalaureate support will result in a more diverse health professional workforce in California.

Establishing a California Health Career Opportunity Program and associated Health Career Opportunity Program partnerships, as recommended by the Workforce Commission, would support more than 4,800 pre-health college students annually at institutions across California, providing comprehensive academic enrichment, career development, mentorship, and advising. Students from Health Professional Shortage Areas and other designated shortage areas, low-income and first-generation backgrounds, and groups underrepresented in the health professions could be prioritized for inclusion.

In addition, adding 140 postbaccalaureate positions annually over 10 years for qualified California students from disadvantaged backgrounds, designated shortage areas, and underserved communities could help to improve the diversity of the medical and dental school populations in California. Priority could be given to students who applied to medical school or dental school previously but were not admitted. Because accumulating debt is a major burden for these students, consideration should be given to providing tuition assistance as well.

Scholarship Programs

This review of the evidence demonstrated that payments made to support a student's health professional education in exchange for postgraduate service in a particular specialty or geography are an effective means to diversify the health professional workforce and to increase access to care in underserved areas. Retention of health professionals in underserved areas after the completion of their service obligation is enhanced if the student originates from a similar underserved area. Scholarship programs are a better option for students of health professions with a shorter pathway to practice, such as advance practice nursing and social work, compared to physicians, whose training takes a minimum of seven years.

OSHPD currently administers the Advanced Practice Healthcare Scholarship program that provides scholarships to health professional students who provide direct patient care in underserved areas after graduation. Eligible health professionals include certified nurse midwives, clinical nurse specialists, dentists, nurse practitioners, occupational therapists, pharmacists, physical therapists, physician assistants, and speech therapists. However, this program has no regular and reliable source of funding. Providing permanent funding for this program would advance California's ability to improve access to care in underserved communities.

Loan Repayment Programs

This review of the evidence demonstrated that repayment of all or part of a health professional student's loans in exchange for postgraduate service in a predefined type of geographic area or setting is an effective means to increase access to care in underserved areas. Loan repayment programs are particularly advantageous for health professionals who have completed their training with substantial educational debt and are motivated to work in an underserved area. The primary benefit of loan repayment is that it mitigates financial burden from the recipient without obligating them to a particular professional path before they have finished their training.

Retention of health professionals in underserved areas after the completion of their service obligation is enhanced if the student originates from a similar underserved area.

OSHPD currently administers six separate loan repayment programs. The Steven M. Thompson Physician Corp Loan Repayment Program and the Advance Practice Healthcare Loan Repayment Program, taken together, include physicians, dentists, dental hygienists, physician assistants, nurse practitioners, physical therapists, occupational therapists, certified nurse midwives, clinical nurse specialist, pharmacists, and speech therapists. These programs do not receive sufficient base funding and therefore rely on intermittent special appropriations to meet demand. Consideration should be given to providing these programs with permanent, reliable funding at a level that would fund 90% of applicants. Additionally, these programs should be reviewed to increase administrative simplicity and minimize barriers to entry.

Graduate-Level Health Profession Training Programs

This review of the evidence demonstrated that increasing capacity in health professional training programs can have a positive impact on the number of health professionals practicing in California. In addition, training students in underserved urban or rural settings increases the chance they will choose to work in those settings. OSHPD currently administers the Song-Brown Family Nurse Practitioner / Physician Assistant Training Program and the Psychiatric Education Capacity Expansion Grant Program for Psychiatric Mental Health Nurse Practitioners.

Increasing capacity at any of the model training programs discussed earlier, including UC PRIME, would improve access in underserved areas of California. Increasing funding for primary care and psychiatric mental health nurse practitioner positions, as recommended by the Workforce Commission, would help to alleviate California's primary care and behavioral health workforce shortages, in particular.

An innovative graduate-level training program that could have an immediate impact on access, diversity, and language concordance is the UCLA International Medical Graduate Program. Available evidence demonstrates that this program is a cost-effective way to increase the Latinx primary care physician workforce in California. It increases language concordance for Spanish-speaking patients because the participating physicians are already fluent in medical Spanish. In addition, it increases access in underserved areas of California because of the requirement that participants practice in a Health Professional Shortage Area for at least two years following graduation.

Residency Funding Programs

This review of the evidence demonstrated that increasing residency positions for primary care and psychiatry in California will increase the number of physicians practicing primary care and psychiatry in the state. Two of the most effective strategies are (1) establishing new primary care and psychiatry residency programs, especially prioritizing underserved areas and underserved populations, with an emphasis on community-based settings and (2) expanding existing primary care and psychiatry residency programs.

OSHPD currently administers the Song-Brown program, which funds positions for the training of primary care physicians, and the Workforce, Training, and Education program, which funds residency positions for psychiatrists. There is a need to greatly increase the number of psychiatry residency positions funded while maintaining current funding levels for primary care positions. In addition, start-up funding is needed for new primary care and psychiatry programs in California hospitals and community health centers that have never sponsored a residency program. Using start-up funds to establish new teaching centers in California could produce hundreds of new primary care physicians and psychiatrists to serve the needs of Californians for decades to come.

Conclusion

This report reviews evidence for health workforce policy interventions under the auspices of OSHPD, the California state agency most focused on the health professions workforce. The evidence review focuses on those professions in the health workforce that require an advanced degree — professions for which access, diversity, and language concordance are particular challenges. The findings indicate that each of the policy interventions discussed here — pipeline programs, scholarship programs, loan repayment programs, graduate-level health professional training programs, and residency funding programs — has a unique role to play in improving access, diversity, and language concordance in the state. These interventions are synergistic and can work together to address the health professional workforce shortages in California. Likewise, California's health workforce crisis will not be resolved by quick-fix interventions alone. Instead, short-term solutions are needed in conjunction with longer-term investments to meet the needs of California today, tomorrow, and into the future.

Appendix. Methods

This rapid review of the evidence was conducted over a three-week period in March and April 2021. The team began by searching Ovid MEDLINE, CINAHL, and SCOPUS databases using MeSH terms identified from seminal articles. This initial search resulted in over 100 peer-reviewed journal articles, which were then screened for relevance. During the same period, the authors searched Google Scholar, focusing on the four workforce policy interventions, and searched websites belonging to relevant organizations such as the Health Research and Services Administration, the National Governor's Association, the National Academy of State Health Policy, and several national workforce policy centers. The authors used a snowball approach: As they identified key articles and reports, they conducted targeted hand-searching with reference mining. Authors relied on expert opinion of their team and key informants (see Table A1 on page 23) to identify additional impact evaluations.

The authors removed duplicates and entered all the resulting peer-reviewed and gray literature into an Excel spreadsheet, noting titles, authors' names, and years of publication. They then conducted a full-text review of each resource to determine study design, study population, and whether it contained impact data for one of our key workforce policy interventions on our outcomes of interest — access, diversity, or language concordance.

Key informant interviews were conducted over the same time period with 19 experts across eight states and the District of Columbia. Interviews were conducted via online conferencing and lasted 30 to 60 minutes. Key informants included researchers and thought leaders in health workforce. The purpose of the interviews was to identify seminal work relevant to the evidence review, including prior literature reviews and impact evaluations in academic or gray literature. Additionally, the authors aimed to identify innovative programs with unpublished data that might be relevant to this review.

Table A1. Key informants included the following:

	TITLE	ORGANIZATION
Angela J. Beck, PhD, MPH	Associate Dean for Student Engagement and Practice; Clinical Assistant Professor; Director, Behavioral Health Workforce Research Center Director, Public Health Training Center	School of Public Health, University of Michigan
David M. Carlisle, MD, PhD	President and CEO	Charles R. Drew University of Medicine
Janet Coffman, PhD, MA, MPP	Professor, Institute for Health Policy Studies	UCSF
Patrick T. Dowling, MD, MPH	Kaiser Permanente Endowed Professor of Community Medicine; Chair, UCLA Department of Family Medicine	School of Medicine, UCLA
Marley A. Doyle, MD	Assistant Professor, Department of Psychiatry; Director, Behavioral Health Education Center of Nebraska	University of Nebraska Medical Center
Tonya L. Fancher, MD, MPH	Associate Dean, Workforce Innovation and Community Engagement	School of Medicine, UC Davis
Katherine A. Flores, MD	Director, UCSF Fresno Latino Center for Medical Education and Research; Associate Clinical Professor; Associate Clinical Professor in Family Medicine	School of Medicine, UCSF
Bianca K. Frogner, PhD	Associate Professor, Department of Family Medicine; Director, UW Center for Health Workforce Studies; Deputy Director, Primary Care Innovation Lab	School of Medicine, University of Washington
Christy Ledford, PhD, FACH	Professor; Research Director, Department of Family Medicine	Medical College of Georgia, Augusta University
Elizabeth Mertz, PhD, MA	Professor, Department of Preventive and Restorative Dental Sciences, and Department of Social and Behavioral Sciences	School of Dentistry and School of Nursing, UCSF
Bob Montoya, MD	Medical Consultant	California Office of Statewide Health Policy and Development (retired)
Jean Moore, DrPH, FAAN	Director, Center for Health Workforce Studies	School of Public Health, SUNY Albany
Cathryn Nation, MD	Vice President, Health Sciences	University of California Office of the President
Donald Pathman, MD, MPH	Professor; Director, Program on Primary Care, Cecil G. Sheps Center for Health Services Research	School of Medicine, UNC
Davis G. Patterson, PhD	Research Assistant Professor; Director, Collaborative for Rural Primary Care Research, Education, and Practice; Deputy Director, Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center	Department of Family Medicine, University of Washington
Julie Phillips, MD, MPH	Professor of Family Medicine	Michigan State University College of Human Medicine
Robert Phillips, MD, MSPH	Executive Director, Center for Professionalism and Value in Health Care	American Board of Family Medicine
Joanne Spetz, PhD	Director, Philip R. Lee Institute for Health Policy Studies; Brenda and Jeffrey L. Kang Presidential Chair in Healthcare Finance; Associate Director for Research, Healthforce Center	UCSF
Arturo Vargas Bustamante	Associate Professor, Department of Health Policy and Management	UCLA Fielding School of Public Health

Endnotes

1. Alana Pfeffinger et al., "Recovery with Limited Progress: Impact of California Proposition 209 on Racial/Ethnic Diversity of California Medical School Matriculants, 1990 to 2019," Healthforce Center at UCSF, December 2020; and Janet M. Coffman, Emmie Calimlim, and Margaret Fix, *California Physicians: A Portrait of Practice*, California Health Care Foundation, March 2021.

2. Richard L. Street Jr. et al., "Understanding Concordance in Patient-Physician Relationships: Personal and Ethnic Dimensions of Shared Identity," *Annals of Family Medicine* 6, no. 3 (May 2008): 198–205; Lisa A. Cooper et al., "Patient-Centered Communication, Ratings of Care, and Concordance of Patient and Physician Race," *Annals of Internal Medicine* 139, no. 11 (2003): 907–15; Rachel L. Johnson Thornton et al., "Patient-Physician Social Concordance, Medical Visit Communication and Patients' Perceptions of Health Care Quality," *Patient Education and Counseling* 85, no. 3 (Dec. 2011): e201–8; and Alicia Fernandez and Eliseo J. Pérez-Stable, "*¿Doctor, Habla Español?* Increasing the Supply and Quality of Language-Concordant Physicians for Spanish-Speaking Patients," *Journal of General Internal Medicine* 30 (Oct. 2015): 1394–96.

3. Health Professional Shortage Areas (PDF) can be geographic areas, populations, or facilities. These areas have a shortage of primary, dental, or mental health care providers. Medically underserved areas (MUAs) are areas designated by HRSA as having too few primary care providers, high infant mortality, high poverty, or a high elderly population.

4. *Gray literature* refers to materials and research produced by organizations outside the traditional commercial or academic publishing and distribution channels. Common gray literature publication types include reports (annual, research, technical, project, etc.), working papers, government documents, white papers, and evaluations.

5. *Pipeline Programs to Improve Racial and Ethnic Diversity in the Health Professions: An Inventory of Federal Programs, Assessment of Evaluation Approaches, and Critical Review of the Research Literature*, US Dept. of Health and Human Services, April 2009.

6. Cyndy R. Snyder, Bianca K. Frogner, and Susan M. Skillman, "Facilitating Racial and Ethnic Diversity in the Health Workforce," *Journal of Allied Health* 47, no. 1 (Spring 2018): 58–65.

7. Kevin Grumbach and Eric Chen, "Effectiveness of University of California Postbaccalaureate Premedical Programs in Increasing Medical School Matriculation for Minority and Disadvantaged Students," *JAMA* 296, no. 9 (2006): 1079–85; Anneke M. Metz, "Medical School Outcomes, Primary Care Specialty Choice, and Practice in Medically Underserved Areas by Physician Alumni of MEDPREP, a Postbaccalaureate Premedical Program for Underrepresented and Disadvantaged Students," *Teaching and Learning in Medicine* 29, no. 3 (2017): 351–59; and Herbert C. Smitherman et al., "Impact of a 50-Year Premedical Postbaccalaureate Program in Graduating Physicians for Practice in Primary Care and Underserved Areas," *Academic Medicine* 96, no. 3 (Mar. 2021): 416–24.

8. Cynthia D. Wides et al., "Long-Term Outcomes of a Dental Postbaccalaureate Program: Increasing Dental Student Diversity and Oral Health Care Access," *Journal of Dental Education* 77, no. 5 (May 2013): 537–47.

9. Christopher Toretsky, Sunita Mutha, and Janet Coffman, *Reducing Educational Debt Among Underrepresented Physicians and Dentists, Healthforce Center at UCSF*, August 2019.

10. Amelia Goodfellow et al., "Predictors of Primary Care Physician Practice Location in Underserved Urban or Rural Areas in the United States: A Systematic Literature Review," *Academic Medicine* 91, no. 9 (Sept. 2016): 1313–21.

11. *What Are Effective Approaches for Recruiting and Retaining Rural Primary Care Health Professionals?* (PDF), AcademyHealth, December 2017; and Miranda Werts, Ginachukwa Amah, and Elizabeth Mertz, *How Evidence-Based Is US Dental Workforce Policy for Rural Communities?* (PDF), Oral Health Workforce Research Center, September 2020.

12. Donald E. Pathman et al., "Outcomes of States' Scholarship, Loan Repayment, and Related Programs for Physicians," *Medical Care* 42, no. 6 (June 2004): 560–68.

13. Roger A. Rosenblatt et al., "Beyond Retention: National Health Service Corps Participation and Subsequent Practice Locations of a Cohort of Rural Family Physicians," *Journal of the American Board of Family Medicine* 9, no. 1 (January 1996): 23–30.

14. AcademyHealth, *What Are Effective*.

15. Donald E. Pathman and Thomas R. Konrad. "Minority Physicians Serving in Rural National Health Service Corps Sites," *Medical Care* 34, no. 5 (May 1996): 439–54.

16. Toretsky, Mutha, and Coffman, *Reducing Educational Debt*.

17. Sebastian Negrusa et al., *National Health Service Corps — An Extended Analysis* (PDF), The Lewin Group, September 27, 2016; and Donald E. Pathman et al., "National Health Service Corps Staffing and the Growth of the Local Rural Non- NHSC Primary Care Physician Workforce," *Journal of Rural Health* 22, no. 4 (Fall 2006): 285–93.

18. AcademyHealth, *What Are Effective*; and Werts, Amah, and Mertz, *How Evidence-Based*.

19. *Data Analysis, Evaluation, and Recommendations Concerning Health Care Workforce Incentives in Oregon* (PDF), Lewin Group, August 12, 2016.

20. Pathman et al., "Outcomes."

21. Pathman et al., "Outcomes."

22. Ian T. MacQueen et al., "Recruiting Rural Healthcare Providers Today: A Systematic Review of Training Program Success and Determinants of Geographic Choices," *Journal of General Internal Medicine* 33, no. 2 (Feb. 2018): 191–9.

23. Amanda Kost et al., "What Is the Impact of the Underserved Pathway Program on Graduates Entering an Underserved Family Medicine Residency? Five-Year Findings from the University of Washington School of Medicine," *Academic Medicine* 93, no. 7 (July 2018): 1042–47; Stewart P. Mennin et al., "A Survey of Graduates in Practice from the University of New Mexico's Conventional and Community-Oriented, Problem-Based Tracks," *Academic Medicine* 71, no. 10 (October 1996): 1079–89; Yeri Park et al., "Nurturing the Student, Sustaining the Mission: 20 Years of the International/Inner-City/Rural Preceptorship Program," *Family Medicine* 51, no. 10 (2019): 823–29; and Vibin Roy et al., "Urban Underserved Program: An Analysis of Factors Affecting Practice Outcomes," *Family Medicine* 47, no. 5 (May 2015): 373–77.

24. Howard K.. Rabinowitz et al., "Retention of Rural Family Physicians After 20–25 Years: Outcomes of a Comprehensive Medical School Rural Program," *Journal of the American Board of Family Medicine* 26, no. 1 (Jan. 2013): 24–27; Howard K. Rabinowitz et al., "Increasing the Supply of Rural Family Physicians: Recent Outcomes from Jefferson Medical College's Physician Shortage Area Program (PSAP)," *Academic Medicine* 86, no. 2 (Feb. 2011): 264–69; Howard K. Rabinowitz et al., "A Program to Increase the Number of Family Physicians in Rural and Underserved Areas: Impact After 22 Years," *JAMA* 281, no. 3 (Jan. 20, 1999): 255–60; Howard K. Rabinowitz, "Recruitment, Retention, and Follow-Up of Graduates of a Program to Increase the Number of Family Physicians in Rural and Underserved Areas," *New England Journal of Medicine* 328, no. 13 (April 1, 1993): 934–39; and John W. Sesney, Nancy E. Kreher, and Michael J. Potts, "Graduates' Reflections on Their Rural Medical Education: The Upper Peninsula Campus Experience," *Journal of Rural Health* 10, no. 4 (Sept. 1994): 279–85.

25. Margie R. Arnett and Ron Forde, "Increasing Student Diversity and Cultural Competence as Part of Loma Linda University School of Dentistry's Service Mission," *Journal of Dental Education* 76, no. 6 (June 2012): 721–27; Pamela L. Davidson et al., "Influence of Contextual Environment and Community-Based Dental Education on Practice Plans of Graduating Seniors," *Journal of Dental Education* 71, no. 3 (Mar. 2007): 403–18; and Mary B. Geisz, *Pipeline, Profession & Practice: Community-Based Dental Education*, Robert Wood Johnson Foundation, August 27, 2013.

26. Susan Chapman et al., *California Nurse Workforce Initiative: Final Report*, Healthforce Center at UCSF, November 2007.

27. Diane Rittenhouse, Alexandra Ament, and Kevin Grumbach, *Graduate Medical Education Funding in California — The Song-Brown Program* (PDF), California Health Care Foundation, February 2019.

28. Rossan Melissa Chen et al., "Are Time-Limited Grants Likely to Stimulate Sustained Growth in Primary Care Residency Training? A Study of the Primary Care Residency Expansion Program," *Academic Medicine* 90, no. 9 (Sept. 2015): 1278–83; and Thomas J. Staff et al., "HRSA's PCRE Grant Recipients' Plans for Continuation After Funding Ends," *Family Medicine* 47, no. 1 (Jan. 2015): 51–55.

29 Michelle A. Nuss, Ben Robinson, and Peter F. Buckley, "A Statewide Strategy for Expanding Graduate Medical Education by Establishing New Teaching Hospitals and Residency Programs," *Academic Medicine* 90, no. 9 (Sept. 2015): 1264–68; and Denise Kornegay, *GME in Georgia: Growth, Funding, and Sustainability* (PDF), Augusta University, October 18, 2016.

30. *The Graduate Medical Education (GME) Report: An Assessment of Opportunities for Graduates of Texas Medical Schools to Enter Residency Programs in Texas* (PDF), Texas Higher Education Coordinating Board, October 2020.

31. Robert L. Phillips, Stephen Petterson, and Andrew Bazemore, "Do Residents Who Train in Safety Net Settings Return for Practice?," *Academic Medicine* 88, no. 12 (Dec. 2013): 1934–40; Zohray Talib et al., "Primary Care Residents in Teaching Health Centers: Their Intentions to Practice in Underserved Settings After Residency Training," *Academic Medicine* 93, no. 1 (Jan. 2018): 98–103; and Zachary Levin et al., "Practice Intentions of Family Physicians Trained in Teaching Health Centers: The Value of Community-Based Training," *Journal of the American Board of Family Medicine* 32, no. 2 (Mar. 2019): 134–35.

32. Davis G. Patterson et al., *Family Medicine Rural Training Track Residencies: 2008-2015 Graduate Outcomes* (PDF), WWAMI Rural Health Research Center, February 2016; and Marcella M. S. Kwan et al., "The Rural Pipeline to Longer-Term Rural Practice: General Practitioners and Specialists," PLOS ONE 12, no. 7 (July 7, 2017).

33. Christopher Toretsky, Sunita Mutha, and Janet Coffman, *Breaking Barriers for Underrepresented Minorities in the Health Professions*, Healthforce Center at UCSF, July 2018.

34. Pilar Ortega et al., "Medical Spanish in US Medical Schools: A National Survey to Examine Existing Programs," *Journal of General Internal Medicine* (March 29, 2021).

35. Toretsky, Mutha, and Coffman, *Breaking Barriers.*