

**UCLA**

Latino Policy &  
Politics Initiative

# CALIFORNIA'S PHYSICIAN SHORTAGE DURING COVID-19

A POLICY ROADMAP TO EXPAND ACCESS TO CARE



**LAURA E. MARTINEZ, PH.D., YOHUALLI BALDERAS-MEDINA ANAYA, MD, M.P.H.,  
ARTURO VARGAS-BUSTAMANTE, M.P.P, PH.D., CLAUDIA V. MARTINEZ, MD,  
SEIRA SANTIZO-GREENWOOD, STEPHANIE HERNANDEZ, GISELLE D. HERNANDEZ,  
BRANDY LOPEZ; SONJA A. DIAZ, J.D., M.P.P., AND DAVID E. HAYES-BAUTISTA, PH.D.**



# **CALIFORNIA'S PHYSICIAN SHORTAGE DURING COVID-19**

**A POLICY ROADMAP TO EXPAND ACCESS TO CARE**

<sup>1</sup> Laura E. Martinez, Ph.D.\* , <sup>2</sup> Yohualli Balderas-Medina Anaya, M.D.\* , M.P.H., <sup>3</sup> Arturo Vargas-Bustamante, M.P.P, Ph.D.\* , <sup>4</sup> Claudia V. Martinez, M.D., <sup>1</sup> Seira Santizo-Greenwood\* , <sup>1</sup> Stephanie Hernandez, <sup>1</sup> Giselle D. Hernandez, <sup>1</sup> Brandy Lopez; <sup>5</sup> Sonja F. Diaz, J.D., M.P.P., and <sup>1</sup> David E. Hayes-Bautista, Ph.D.

<sup>1</sup> Center for the Study of Latino Health and Culture, David Geffen School of Medicine, University of California, Los Angeles; <sup>2</sup> Department of Family of Medicine, David Geffen School of Medicine, University of California, Los Angeles; <sup>3</sup> Fielding School of Public Health, Department of Health Policy and Management, University of California, Los Angeles; <sup>4</sup> St. Francis Medical Center, Lynwood, CA; <sup>5</sup> Latino Policy & Politics Initiative, Luskin School of Public Affairs, University of California, Los Angeles.

\*Contributed equally as first-authors.

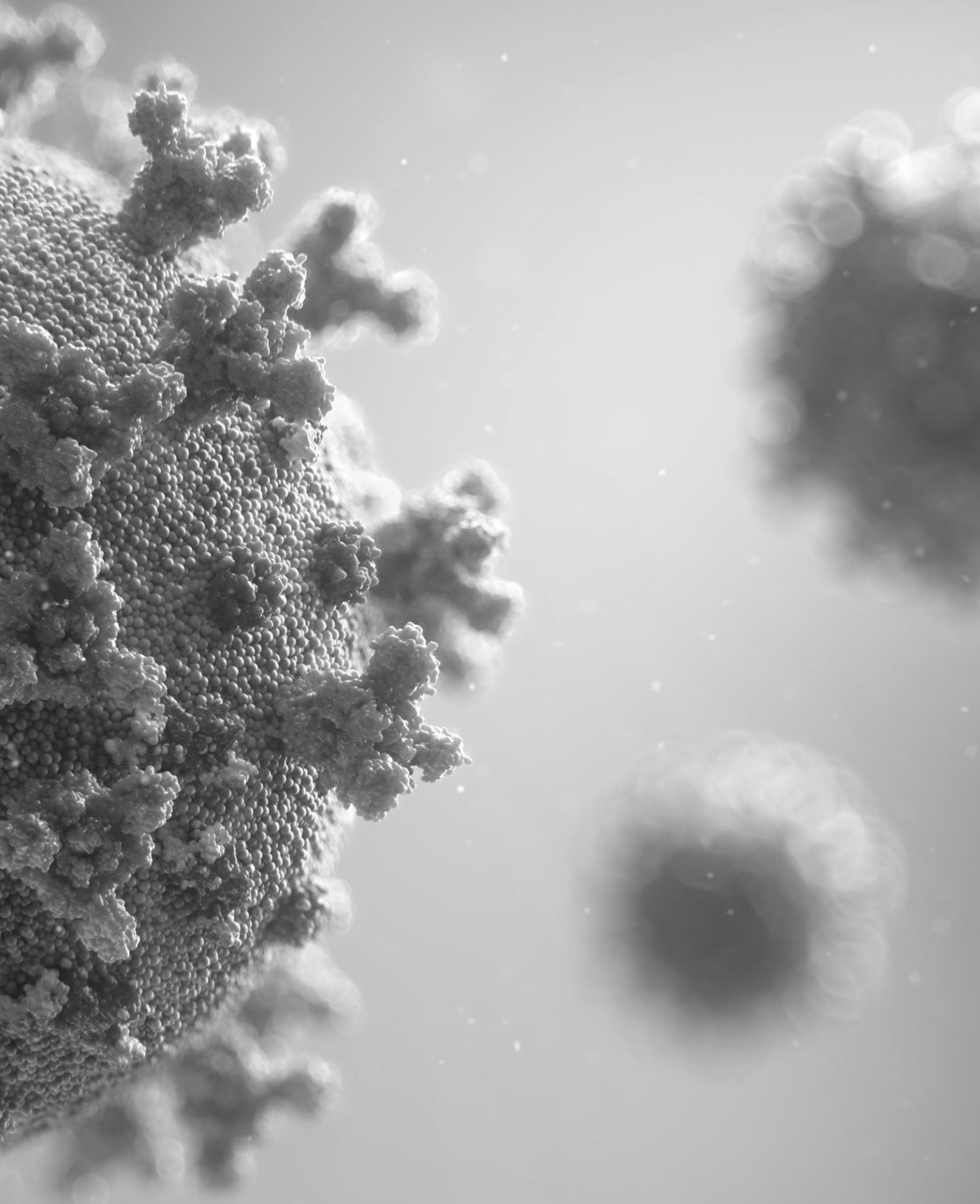
## TABLE OF

# CONTENTS

04	<b>EXECUTIVE SUMMARY</b>
06	<b>INTRODUCTION</b>
06	<b>DISPARATE IMPACTS OF THE COVID-19 PANDEMIC AMONG VULNERABLE POPULATIONS</b>
06	<i>Alarming novel coronavirus infection rates among people of color nationwide</i>
07	<i>Reported COVID-19 positive cases and related deaths among the health care workforce</i>
08	<b>CALIFORNIA'S PHYSICIAN SHORTAGE AND THE DEMAND FOR PRIMARY CARE CLINICIANS</b>
08	<i>California's Latino physician shortage in the face of the pandemic</i>
10	<i>Skilled international medical graduates and medical students with DACA status should form part of California's physician workforce</i>
11	<i>The impact of the physician shortage in rural California</i>
14	<b>CONCLUSION</b>
15	<b>POLICY RECOMMENDATIONS</b>
15	<i>Top priority recommendations for expanding California's physician workforce long-term</i>
16	<i>Immediate, high impact priorities</i>
17	<i>Long-term policy recommendations</i>

## EXECUTIVE SUMMARY

For a few decades now, California has been grappling with a severe physician crisis. Since the first COVID-19 diagnosis in the United States<sup>a</sup> [1], the health, economic well-being, and daily lives of all Americans have undergone dramatic shifts. The responses from national and state leaders have exposed not just a system challenge, but also how this pandemic is leaving our most vulnerable populations at risk: essential workers in the public and private sectors, uninsured and immigrant populations, homeless populations, people with underlying chronic health conditions, and communities of color already facing long-standing disparities in health and health care access. The impacts a patient surge places on a hospital system put a heavy strain on the existing primary care health force, which is aggravated by the shortage of access to testing needed to track infections and reduce community spread accurately. As a result, most hospitals and clinics are limiting patient visits to help mitigate new infections, and providers are implementing telehealth practices. Therefore, COVID-19 provides an opportunity to expand the state's primary care capacity, both to deal with the pandemic in the short term and to ensure that medically and linguistically underserved communities will have healthcare access in the long term. This report summarizes California's physician crisis and the shortage of primary care clinicians and proposes policy recommendations for steps to mitigate the current COVID-19 pandemic, a potential second wave, and future public health crises that jeopardize the health of the workforce that sustains the world's fifth-largest economy.



## INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is caused by a novel coronavirus named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), identified at the end of 2019 and originating in Wuhan, China [2]. The rapidly communicable nature of this novel coronavirus resulted in an epidemic in China and was later declared a global pandemic by the World Health Organization (WHO) on March 11, 2020 [3].

To mitigate the spread of the novel coronavirus, most U.S. states have enacted policies mandating stay-at-home orders for all non-essential workers and activities. Through “social and physical distancing” practices [4], the orders aim to limit the rapid transmission of the virus and to reduce the number of patients going to the hospital or outpatient settings, which could otherwise severely impact the fragile health care system.

Public health experts have warned about the possibility of a novel pandemic for years. While infection control practices have been implemented in most states, the U.S. health care system was ill-prepared for this pandemic, and the effects of this lack of preparation have become evident in the death rates of vulnerable populations and individuals with underlying medical health conditions.

## DISPARATE IMPACTS OF THE COVID-19 PANDEMIC AMONG VULNERABLE POPULATIONS

### ***Alarming novel coronavirus infection rates among people of color nationwide***

Amidst this pandemic, data on how the novel coronavirus affects populations of color have been alarmingly sparse. Although only partial information has been released on the racial and ethnic composition of reported COVID-19 cases and mortality rates, early data suggests that communities of color have been disproportionately affected [5]. Preliminary data shows that Black Americans, Latinos, and Native Americans are disproportionately facing higher infection and hospitalization rates, and devastating COVID-19-related deaths [6-13]. In the majority of COVID-19 positive cases (90%), the patients have at least one reported underlying medical condition, the most common being hypertension, obesity, chronic metabolic disease, and cardiovascular disease [14].

The California Department of Public Health has released partial race and ethnicity data on COVID-19 cases and related mortalities. This data sheds light on the alarming and disproportionately higher death rates of Latinos, Native Hawaiian or Pacific Islanders, and Black Californians among adults 18 years of age and older<sup>b</sup>, and most strikingly for Latinos aged 18-49 [15]. Californians of this age group comprise an essential proportion of today's labor and work force, further driving California's economy.

It is essential that comprehensive, complete data be available in order to fully evaluate trends of confirmed cases and mortality rates among different communities and by city region to inform future action<sup>c</sup>. In addition, current estimates may only reflect the first wave of COVID-19 disease and/or sociodemographic differences across different race and ethnicities.

### ***Reported COVID-19 positive cases and related deaths among the health care workforce***

The COVID-19 pandemic has placed enormous strains on our nation's healthcare system, especially for physicians and providers on the front lines of care. Long before this pandemic, our country had a need for more primary care physicians, and now novel coronavirus infections are on the rise among front line physicians and other healthcare workers. As of April 23rd, the CDC has reported 865,585 COVID-19 cases and 48,816 related deaths in the U.S. [16]. Reports have released limited information on the infection rates of health care personnel, but so far, 9,282 cases have been confirmed [17].

In California, as of April 23rd, a total of 39,254 COVID-19 positive cases and 1,562 related deaths have been reported [18], and among these estimates, over 3,000 health care workers have been infected [19]. At UCLA Health, 203 health care workers have tested positive [20]. Protecting physicians and healthcare personnel should be a priority of the nation's response to COVID-19, especially as we prepare for potential second or third waves of COVID-19 cases [21]. These may be driven by transmission and infection dynamics of essential health care and service workers, some of whom have been on the front lines without proper personal protective equipment (PPE) or access to testing and care. In the coming weeks, as more testing and data become available, it will be necessary to evaluate trends in confirmed COVID-19 cases among physicians and other health care providers by hospital or healthcare facility and by geographic area.

# CALIFORNIA'S PHYSICIAN SHORTAGE AND THE DEMAND FOR PRIMARY CARE CLINICIANS

## California's Latino physician shortage in the face of the pandemic

As California's population has multiplied in number and diversity, the state's physician supply has declined, and now inaccurately reflects the state's changing demographics. This trend amplifies health care disparities during a health crisis, such as the current pandemic. While preliminary data shows that COVID-19 affects vulnerable communities at a disproportionately higher rate necessitating access and care, at the moment, there are 7 million Californians, mainly Latinos, African Americans, and Native Americans, living in an area experiencing a healthcare provider shortage [22]. California has a severe shortage of primary care physicians: pediatricians, internists, family practice physicians, and obstetrics and gynecologists [22-26]. Moreover, a third of physicians currently practicing are over the age of 55 and will be retiring soon [27].

Over the past 30 years, the rate of non-Hispanic white (NHW) physicians per 100,000 NHW population has risen by 49% [28]. Conversely, during the same period, the rate of Latino physicians in the Latino population has steadily declined (Figure 1). In 2010, the Latino physician rate was 67% lower than the NHW physician rate [28].

**Figure 1.** A 30-year trend of non-Hispanic white (NHW) physicians per 100,000 NHW population and Latino physicians per 100,000 Latino population in the United States.

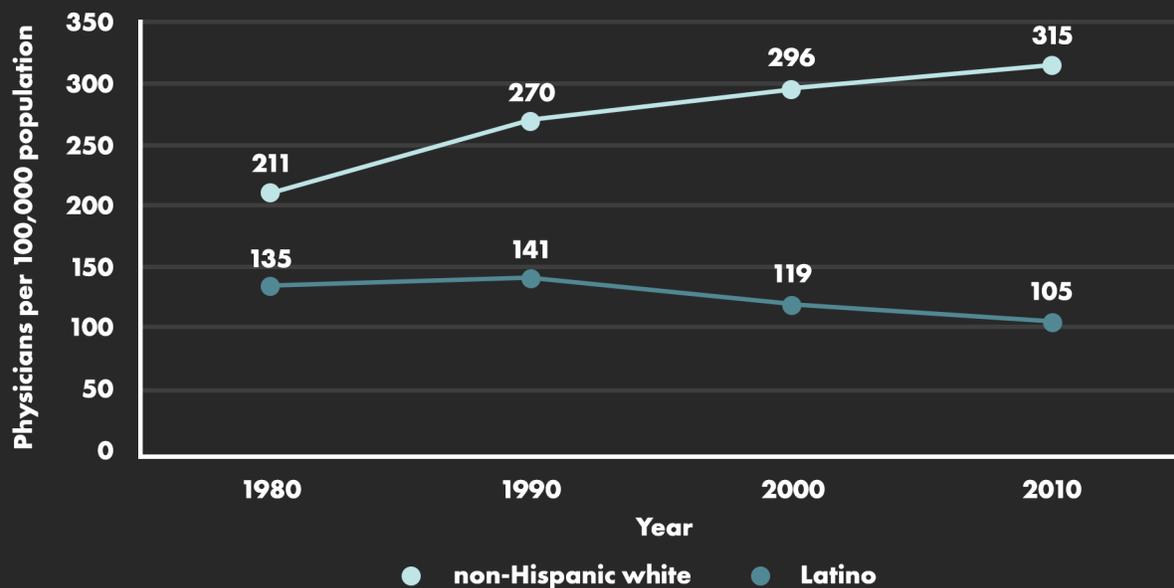


Figure from Sanchez, et al. (2015) Acad. Med. [28]. Image has been reillustrated, recolored, and modified.

Research by the Center for the Study of Latino Health and Culture (CESLAC) at UCLA Health estimates the magnitude of California's Latino physician shortage by projecting the number of years it would require, under present conditions, to close this disparity gap between Latino and NHW physicians. If current trends continue, it would take **five centuries** to fully address this disparity [29].

California's existing physician shortage crisis is exacerbated by processes taking place at all levels of the medical education journey [30-32]. The number of Latinos currently graduating from medical school is not enough to meet the demands of the growing Latino population. According to the Association of American Medical Colleges (AAMC), underrepresented minority (URM) students are more likely to go into primary care residencies [33]. Yet the number of available residency slots are not enough to meet the California Future Health Workforce Commission's recommendation of an increase of 1,872 primary care physicians by 2030 [22]. Not only did the physician supply not meet California's critical health demands before the COVID-19 pandemic, but it also has no chance of meeting the demand in this current pandemic crisis or future pandemics, unless we act now. This physician shortage has long impacted historically marginalized and underserved communities, who continue to be affected by patient-provider and racial/ethnic discordance [32, 34].

Latinos are at the forefront of this pandemic. They comprise a large proportion of California's service and industrial workers: farmworkers, meat and poultry farm workers, cooks, grocery store clerks, truck drivers, mechanics, construction workers, and health care providers (e.g., home health aides, nursing home care assistants), all of whom are classified as essential workers under the state's COVID-19 executive actions. They are essential to California's economy. These workers are extremely vulnerable, as the conditions of their essential work further increase their risk of exposure to the novel coronavirus. The current Latino physician shortage is having a negative impact on these essential workers on the front lines, many of whom lack access to a doctor if they become infected or require testing.

Spanish-speaking physicians are the most underrepresented in the state, with only 62.1 providers per 100,000 Spanish-speakers (**Figure 2**) [35]. Studies show that quality of care can be determined by the provider’s linguistic and cultural competency [36]. In other words, when a Spanish-speaking patient has a provider who also speaks Spanish, the patient is more likely to report improved interpersonal processes, satisfaction, and greater health outcomes [37, 38]. Conversely, the present shortage of Spanish-speaking physicians will contribute to worse health outcomes during this pandemic.

**Figure 2.** California physicians per 100,000 population, by language.

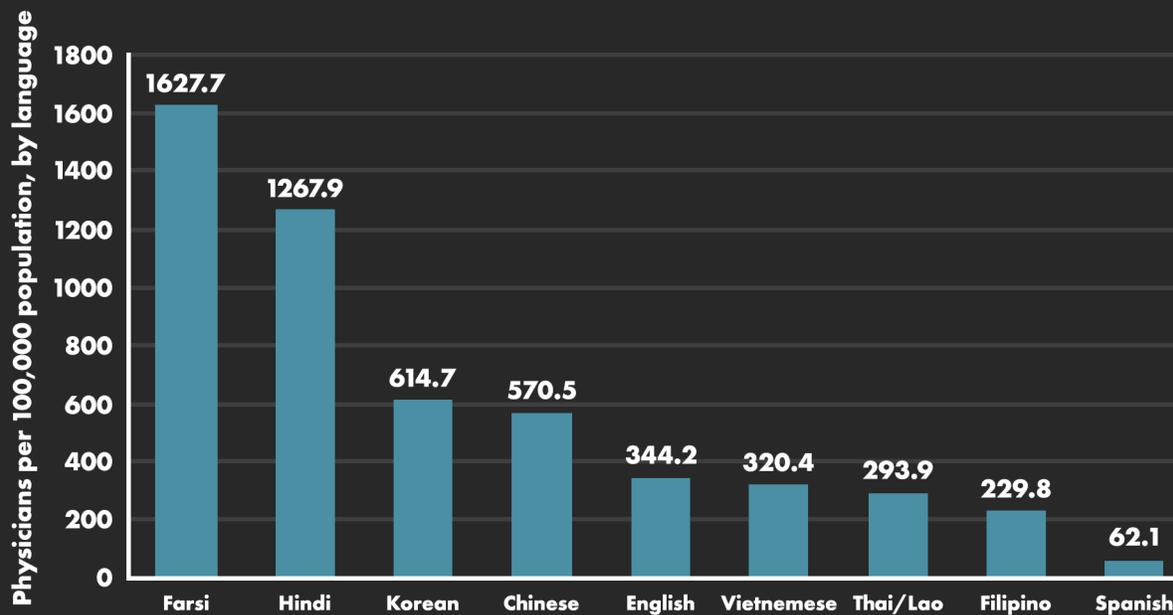


Figure from Hsu, et al. (2015), UCLA Latino Policy & Politics Initiative (LPPI) Policy Brief [35]. Image has been reillustrated, recolored, and modified.

**Skilled international medical graduates and medical students with DACA status should form part of California’s physician workforce**

One in six health care professionals are foreign-born, and about one in twenty are non-U.S. citizens [39]. They provide health care in rural and underserved communities, risking their lives daily in the current pandemic. International medical graduates (IMGs), many of whom are not U.S. citizens, play an essential role in delivering health care across our nation.

In the U.S., IMGs comprise 39% of active practicing physicians in internal medicine, 31% of neurologists, 30% of psychiatrists, and 25% of pediatricians [40]. But California lags in the number of IMGs practicing in primary care [41], due to policy decisions made in the 1980s and 1990s, which reduced medical resident training capacity and residency slots to try to avoid a predicted “physician surplus” that, in fact, never materialized [42].

In the U.S., an estimated 27,000 young undocumented immigrants with Deferred Action for Childhood Arrivals (DACA) status work in health care, and many are serving on the front lines of this pandemic [43]. Nearly 200 undocumented immigrants are medical students, residents, or physicians [44]. California has the largest number of DACA recipients working in health care occupations. In the state, 15% of all DACA recipients are working in health care, education, or food-related jobs, at the forefront of the COVID-19 response [43]. The case now before the U.S. Supreme Court seeking to rescind the DACA program, if successful, would enact a catastrophic loss of essential health care workers and endanger the health of all Americans [45].

In the face of both this pandemic and California’s longer-term physician shortage, IMGs and DACA recipients must form part of our healthcare system.

### ***The impact of the physician shortage in rural California***

The COVID-19 pandemic crisis is challenging U.S. rural health care providers, as COVID-19 cases increasingly appear in rural communities. People living in most rural areas have limited sources of critical medical care, which makes them vulnerable during the pandemic [46].

In the U.S., only 11% of physicians currently practice in rural areas. In the coming decades, more primary care providers will be needed to meet rural population growth. Research shows that medical students from underserved areas are more likely to practice in rural communities [47]. Moreover, physicians from traditionally underrepresented minority groups are more likely to practice in underserved areas and provide care to these populations [47].

Rural and inner-city residents of California’s Central Valley, Central Coast, and southern border regions may be doubly impacted by the pandemic and the shortage of physicians. In 2015, the San Joaquin Valley had 45 primary care physicians (MDs) for every 100,000 individuals [24], which is 15 to 35 fewer physicians than needed [22,48]. In addition, the percentage of Latino MDs (8%) is significantly smaller compared to the percentage of Latinos residing in the San Joaquin Valley (about 41%) [49]. The Inland Empire region has an even lower number: 35 primary care physicians per 100,000 population [22, 27].

In the face of this physician shortage, it has been proposed that nurse practitioners be given more authority to treat patients, in place of physicians, in community clinics in both rural and inner-city areas [50]. On the other hand, some argue that this may create a two-tiered system of treatment, and still might not guarantee that practitioners will work in underserved or rural areas. A shortage of providers in those areas who can treat complex COVID-19 related respiratory illness in elders or people with chronic disease conditions is a significant concern. If a large number of patients should become severely ill due to COVID-19, the hospital facilities in some of California's rural counties are not equipped to handle that surge [51].

Immediate attention must be given to primary and rural care. Stopgap approaches, such as those initiated by California's Health Corps [52], can help by recruiting retired or inactive physicians (MDs or DOs) and medical residents to fill these health care shortages. Such actions may address the current crisis but are not a long-term solution to California's physician shortage.



## CONCLUSION

As California's population continues to undergo a demographic transformation, the state's declining physician supply is insufficient to treat all Californians during a health crisis. The current physician supply is also too homogeneous to meet the primary care needs of the state's medically and linguistically underserved communities. Preliminary data already indicates that COVID-19 affects vulnerable communities at a disproportionately higher rate, and California's physician shortage will only exacerbate the effects of COVID-19 on these populations. It is imperative that we act to mitigate risks to our most vulnerable residents: our medically and linguistically underserved communities. The health and economic well-being of California depend on a healthy workforce, who are drawn increasingly from youthful and growing communities of color.

## POLICY RECOMMENDATIONS

In light of the current state of the COVID-19 pandemic and the physician shortage, we propose the following policy recommendations:

### ***Top priority recommendations for expanding California's physician workforce long-term:***

- 1.** Increase recruitment and training of linguistically capable students and medical residents likely to practice in underserved and Latino communities.
  - a.** Expand medical school enrollment at public institutions for the benefit of medically underserved areas [25].
  - b.** Expand the existing pool of linguistically-capable or Spanish-speaking IMGs in California, and support IMG training programs that bolster match competitiveness.
  - c.** Encourage trainees and IMGs to practice in linguistically underserved communities.
- 2.** Prioritize training and incentivize medical students and residents to pursue primary care and practice in underserved populations.
  - a.** Prioritize policies and education programs to help students in rural areas enter a pathway into medicine.
  - b.** Ensure funding for programs like UCLA's Family Medicine Bridging the Gap [53], MEDPEP (Médicos, Enfermeros y Dentistas Para el Pueblo/Medical Education Preparation) [54], and the Summer Urban Health Fellowship at the Harbor-UCLA Medical Center [55], which are designed to prepare URM students to pursue careers in medicine and health sciences.
- 3.** Protect the ability of active physicians, medical students, and residents who depend on the Deferred Action for Childhood Arrivals (DACA) program to study and practice medicine in the U.S.
  - a.** Ensure medical schools continue to consider students for admission regardless of undocumented or DACA status.
  - b.** Advocate against the termination of DACA.

### ***Immediate, high impact priorities:***

- 4.** Expand the health professional work force and expedite licensing for eligible health professionals.
  - a.** Continue efforts to recruit active and retired medical professionals and/or health professional students in behavioral health, dentistry, nursing, medicine, and pharmacy for the California Health Corps, who may practice at the level of their completed education [52].
  - b.** Allow licensed Spanish-speaking international medical graduates (IMGs) who can help address California's unmet language needs to form part of the California Health Corps.
- 5.** Gather resources and create interventions for at-risk populations.
  - a.** Collect race and ethnicity data for all individuals, including health care workers, being tested for COVID-19.
  - b.** Mandate that reporting of COVID-19 cases and outcomes include race/ethnicity, age, sex, socio-economic status, and specific information of any underlying medical condition(s) [56].
- 6.** Provide training, guidance, and administrative flexibility to ensure physicians can provide the necessary care during this pandemic and future public health crises.
  - a.** Expand educational training opportunities to support primary care physicians during the pandemic, through virtual Continuing Medical Education (CME).
  - b.** Encourage all board certification organizations and licensing boards to extend deadlines for credentialing, certification activities, and CME requirements, to ensure that physician board certification/licensing does not lapse as a result of patient-care demands from COVID-19.

- 7.** Expand telehealth for virtual care of patients in low-resource, underserved communities, as the COVID-19 pandemic evolves and we prepare for second or third waves of the pandemic.
  - a.** Implement nurse-directed triage protocols to determine what kind of patient appointment is necessary.
  - b.** Maximize team-based primary care workflows to optimize the shift from care delivery to virtual care.
  
- 8.** Expand home health care visits to patients with underlying medical conditions or those requiring chronic disease management (e.g., coronary heart disease, hypertension, diabetes, asthma, autoimmune disorders, and cancer, or other immunocompromised conditions).
  - a.** Consider the deployment of physician's assistants (PAs), certified nursing assistants (CNAs), licensed vocational nurses (LVNs), nurse-midwives (NMs), and nurse practitioners (NPs) into home health settings, to continue chronic disease management under the supervision of primary care physicians.
  - b.** Prioritize safety during home visits by making available appropriate disposable PPE for all home health providers.

***Long-term policy recommendations:***

- 9.** Develop community-oriented regional education in primary care (CORE-PC) programs, as recommended by the California Future Health Workforce Commission [22, 57].
  
- 10.** Implement specific protections for vulnerable populations and health care professionals.
  - a.** Invest in the National Institutes of Health research that aims to understand COVID-19-related health disparities.



## ENDNOTES

- a. The first confirmed case of COVID-19 in the U.S. was a 35-year-old man diagnosed in Snohomish County in Washington state on January 20, 2020 [1]. This individual was released from the hospital on February 3 and fully recovered. New autopsy reports show that two individuals residing in California died of novel coronavirus on February 6 and February 17, 2020 [58].
- b. According to the California Department of Public Health Department, and as of April 23rd, 2020, Latinos make up 43.5% of the state's population aged 18-49 and comprise 48.9% of COVID-19 cases, but 66.0% of related deaths. Non-Hispanic whites, who make up 31.2% of the population aged 18-49, comprise 24.0% of cases and 9.0% of deaths. Asians make up 15.9% of the population aged 18-49 and comprise 11.6% of cases and 9.0% of deaths. African-Americans or Blacks make up 6.3% of the population aged 18-49 and comprise 5.7% of cases, but 15.0% of deaths. Multiracial groups make up 2.2% of the population aged 18-49 and comprise 1.0% of cases and 0% of deaths. American Indian or Alaska Natives are 0.6% of the population aged 18-49 and comprise 0.2% of cases and 1.0% of deaths. Native Hawaiian or Pacific Islanders are 0.4% of the population aged 18-49 and comprise 1.4% of cases and 0% of deaths, but they comprise 1.4% of deaths among individuals aged 50-64 [15]. Of the total confirmed COVID-19 cases aged 18-49 (18,954), 35% have been designated unknown for race/ethnicity. Of 107 total confirmed deaths (aged 18-49), 7% have been designated unknown for race/ethnicity [15].
- c. Preliminary results from a first round of serology tests examining the presence of antibodies generated against the novel coronavirus, suggests that infections in L.A. County are far more widespread than recent documented cases [59]. Studies were conducted by collaborative scientific teams at USC and the Los Angeles Department of Public Health. These new studies will help gather insight on the pandemic's trajectory; gain clarity on actual infection rates; help with modeling and predictions of future infections; and inform the design of new prevention and control efforts.

## REFERENCES

1. Holshue, M.L., et al., *First Case of 2019 Novel Coronavirus in the United States*. *N Engl J Med*, 2020. 382(10): p. 929-936.
2. Li, Q. et al. *Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia*. *N Engl J Med*, 2020. 382(13): p. 1199-1207.
3. Cucinotta, D. and Vanelli, M. *WHO Declares COVID-19 a Pandemic*. *Acta Biomed*, 2020. 91(1): p. 157-160.
4. Menjivar, C., Foster, J.G. and Brand, J.E. *Don't call it 'social distancing'*. CNN Opinion Political Op-Eds, Social Commentary 2020 [cited April 14, 2020]; Available at: <https://www.cnn.com/2020/03/21/opinions/physical-distancing-menjivar-foster-brand/index.html>
5. Kendi, I.X. *What the Racial Data Show - The pandemic seems to be hitting people of color the hardest*. 2020, The Atlantic.
6. *COVID-19 in Indian Country*. Coronavirus updates from Indianz.com 2020 [cited April 15, 2020]; Available at: <https://www.indianz.com/covid19/?p=2768>
7. Aubrey, A. and Neel, J. *The Coronavirus Crisis - CDC Hospital Data Point to Racial Disparity in COVID-19 Cases*. NPR 2020 [cited April 8, 2020]; Available at: <https://www.npr.org/sections/coronavirus-live-updates/2020/04/08/830030932/cdc-hospital-data-point-to-racial-disparity-in-covid-19-cases>
8. della Cava, M. *Latinos disproportionately dying, losing jobs because of the coronavirus: 'Something has to change'*, in USA TODAY, 2020.
9. Garg, S., Kim, L., Whitaker, M. et al. *Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 - COVID-NET, 14 States, March 1 - 30, 2020*. 2020, U.S. Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (MMWR).
10. Rios, E. and Rangarajan, S. *COVID-19 Has Infected and Killed Black People at Alarming Rates. This Data Proves It. (It's time for "an ethical reckoning")*, in Coronavirus Updates, Mother Jones. 2020.
11. Scott, D. *Covid-19's devastating toll on black and Latino Americans, in one chart*. Vox 2020; Available at: <https://www.vox.com/2020/4/17/21225610/us-coronavirus-death-rates-blacks-latinos-whites>
12. Tuchman, G. *Navajo Nation has lost more to coronavirus than 13 states*. 2020: CNN.
13. Warren, D. *COVID-19: A "Perfect Storm" for Indian Country*. Native American Health And Education, NPQ Nonprofit Quarterly 2020 [cited April 10, 2020]; Available at: <https://nonprofitquarterly.org/covid-19-a-perfect-storm-for-indian-country/>
14. *COVIDView - A Weekly Surveillance Summary of U.S. COVID-19 Activity*. Coronavirus Disease 2019 (COVID-19), U.S. Centers for Disease Control and Prevention [cited April 18, 2020]; Available at: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html#hospitalizations>
15. *Cases and Deaths associated with COVID-19 by Race and Ethnicity in California - April 23, 2020*, California Department of Public Health 2020. Available at: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Race-Ethnicity.aspx>

16. Coronavirus Disease 2019 (COVID-19) Cases in the U.S. U.S. Centers for Disease Control and Prevention 2020 [cited April 24, 2020]; Available from: <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>
17. Characteristics of Health Care Personnel with COVID-19 - United States, February 12 - April 9, 2020, in *Morbidity and Mortality Weekly Report (MMWR)*. U.S. Centers for Disease Control and Prevention (CDC) COVID-19 Response Team. 2020. p. 477-481.
18. COVID-19 Updates (Coronavirus Disease 2019). California Department of Public Health 2020 [cited April 24, 2020]; Available at: <https://www.cdph.ca.gov/covid19>
19. Deruy, E. More than 3,000 California health care workers have coronavirus. But that figure may be obscuring some good news. *The Mercury News* 2020.
20. Cherry, R. and Grimley, K.A. Latest COVID-19 information. UCLA Health Data Updates. 2020.
21. Xu, S. and Y. Li, Beware of the second wave of COVID-19. *Lancet*, 2020.
22. Meeting the Demand for Health: Final Report of the California Future Health Workforce Commission. Available at: <https://futurehealthworkforce.org/our-work/finalreport/>. February 2019.
23. Bustamante, A.V., Martinez, L.E., and Balderas-Medina Anaya, Y. *California's Physician Shortage, White Paper - Full Report*, 2019. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
24. Coffman, J., Geyn, I., and Himmerick, K. *California's Primary Care Workforce: Current Supply, Characteristics, and Pipeline of Trainees*. Research Report, Healthforce Center at UCSF, 2017.
25. Coffman, J., Bates, T., and Spetz, J. *California's 2019-20 Budget and the 10 Priority Recommendations of the California Future Health Workforce Commission*. Healthforce Center at UCSF, 2019.
26. *The Big Shortage: The Future of California's Health Workforce - California's health workforce faces major shortages. The good news? There's no shortage of workable solutions*. California Health Care Foundation.
27. Aguilera, E. *Paging more doctors: California's worsening physician shortage*. CalMatters, 2019. [cited April 16, 2020]; Available at: <https://calmatters.org/projects/californias-worsening-physician-shortage-doctors/>
28. Sanchez, G., et al. *Latino Physicians in the United States, 1980-2010: A Thirty-Year Overview From the Censuses*. *Acad Med*, 2015. 90(7): p. 906-12.
29. Hsu, P., Balderas-Medina Anaya, Y. and Hayes-Bautista, D.E. *5 Centuries to Reach Parity: An Analysis of How Long it Will Take to Address California's Latino Physician Shortage*. California's Latino Physician Crisis Policy Brief, 2018. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
30. Martinez, L.E., Solis, G., Gomez, V., Mendez-Vargas, J., Diaz, S.F. and Hayes-Bautista, D.E. *The Current State of the Latino Physician Workforce: California Faces a Severe Shortfall in Latino Resident Physicians*. California's Physician Crisis Policy Brief, 2019. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.

31. Bustamante, A.V., Martinez, L.E. and Balderas-Medina Anaya, Y. *California's Physician Shortage, White Paper - Brief*, 2019. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
32. Bustamante, A.V. and Beltran, L.F. *Latino Physician Shortage in California: The Provider Perspective*. California's Latino Physician Crisis Policy Brief, 2019. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
33. AAMC, *Analysis in Brief - Primary Care Physicians Who Graduated from U.S. Medical Schools: Trends in Specialty, Gender, and Race and Ethnicity*. Association of American Medical Colleges. Available at: <https://www.aamc.org/system/files/reports/1/october2015primarycarephysicianswhograduatedfromusmedicalschoools.pdf>. October 2015 15(9).
34. Bustamante, A.V., Beltran, L.F., and Gonzalez-Figueroa, E. *Latino Physician Shortage in California: The Patient Perspective*, Policy Brief, 2019. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
35. Hsu, P., Balderas-Medina Anaya, Y., Anglin, L. and Hayes-Bautista, D.E. *California's Language Concordance Mismatch: Clear Evidence for Increasing Physician Diversity*. California's Latino Physician Crisis Policy Brief, 2018. Latino Policy & Politics Initiative (LPPI) at the University of California, Los Angeles.
36. Powe, N.R. and Cooper, L.A. *Disparities in patient experiences, health care process, and outcomes: The role of patient-provider racial, ethnic, and language concordance*. The Commonwealth Fund, 2004.
37. Laveist, T.A. and Nuru-Jeter, A. *Is doctor-patient race concordance associated with greater satisfaction with care?* *J Health Soc Behav*, 2002. 43(3): p. 296-306.
38. Schenker, Y. et al. *The impact of limited English proficiency and physician language concordance on reports of clinical interactions among patients with diabetes: the DISTANCE study*. *Patient Educ Couns*, 2010. 81(2): p. 222-8.
39. Patel, Y.M. et al. *Proportion of Non-US-Born and Noncitizen Health Care Professionals in the United States in 2016*. *JAMA*, 2018. 320(21): p. 2265-2267.
40. Ahmed, A.A. et al. *International Medical Graduates in the US Physician Workforce and Graduate Medical Education: Current and Historical Trends*. *J Grad Med Educ*, 2018. 10(2): p. 214-218.
41. NRMP, *2019 Main Residency Matching Program, Results and Data*. National Resident Matching Program. Washington, DC. Available at: [https://mkOnrmp3oyqui6wqfm.kinstacdn.com/wp-content/uploads/2019/04/NRMP-Results-and-Data-2019\\_04112019\\_final.pdf](https://mkOnrmp3oyqui6wqfm.kinstacdn.com/wp-content/uploads/2019/04/NRMP-Results-and-Data-2019_04112019_final.pdf)
42. Jacobsen, S.J. and Rimm, A.A. *The Projected Physician Surplus Reevaluated*. *Health Aff* , 1987. 6(2): p.48-56.
43. Svajlenka, N.P. *A Demographic Profile of DACA Recipients on the Frontlines of the Coronavirus Response*. Center for American Progress. 2020.
44. Harris, P.A. *AMA to Supreme Court: Rescinding DACA would harm health care* 2019; Available at: <https://www.ama-assn.org/about/leadership/ama-supreme-court-rescinding-daca-would-harm-health-care>
45. Liptak, A. *'Dreamers' Tell Supreme Court Ending DACA During the Pandemic Would Be 'Catastrophic'*. *New York Times*, 2020

46. Prusaczyk, B. *Strategies for Disseminating and Implementing COVID-19 Public Health Prevention Practices in Rural Areas*. *J Rural Health*, 2020.
47. Shipman, S.A., Wendling, A., Jones, K.C., Kovar-Gough, I., Orłowski, J.M., and Philips, J. *The Decline in Rural Medical Students: A Growing Gap in Geographic Diversity Threatens The Rural Physician Workforce*. *Health Affairs: Rural Health*, 2019.
48. Tobias, M. *Fresno area is sicker and has a doctor shortage. So the coronavirus poses a huge threat, experts warn*. [cited April 8, 2020]; Available at: <https://calmatters.org/california-divide/2020/03/doctor-shortage-coronavirus-fresno-area-experts/>
49. Coffman, J., Bates, T., and Geyn, I. *Current & Future Health Professions Workforce Needs in the San Joaquin Valley*. July, 2017. Healthforce Center at UCSF. Available at: [https://www.ucop.edu/uc-health/\\_files/sjv-health-workforce-report-july-2017.pdf](https://www.ucop.edu/uc-health/_files/sjv-health-workforce-report-july-2017.pdf)
50. Aguilera, E. *Facing doctor shortage, will California give nurse practitioners more authority to treat patients?* CalMatters 2020 [Cited April 16, 2020]; Available at: <https://calmatters.org/projects/doctor-shortage-nurse-practitioners-california/>
51. Caiola, S. and Zentner, E. *'We Are Not Prepared For Surges': Rural California Hospitals On High Alert For Coronavirus Outbreaks*. CapRadio 2020 [cited April 17, 2020]; Available at: <https://www.capradio.org/articles/2020/04/15/we-are-not-prepared-for-surges-rural-california-hospitals-on-high-alert-for-coronavirus-outbreaks/>
52. *California Health Corps*. California Coronavirus (COVID-19) Response 2020; Available at: <https://covid19.ca.gov/healthcorps/#top>
53. *Family Medicine Bridging the Gap - UCLA Pipeline Project*. UCLA Family Medicine Residency - Training the Next Generation of Family Physicians 2020; Available at: <http://www.gouclafamilymed.org/family-medicine-bridging-gap/>
54. *MEDPEP*. UCLA Center for the Study of Latino Health and Culture (CESLAC); Available at: <https://www.uclahealth.org/ceslac/medpep>
55. *Summer Urban Health Fellowship*. Harbor-UCLA Medical Center; Available at: <https://www.harbor-ucla.org/family-medicine/community-activity/summer-urban-health-fellowship/>
56. Owen Jr., W.F., Carmona, R. and Pomeroy, C. *Failing Another National Stress Test on Health Disparities*. *JAMA*, 2020.
57. *A New Approach to Growing the Workforce Pipeline into Community Health Centers: Community-Oriented Regional Education in Primary Care (CORE-PC)*. California Future Health Workforce Commission - Fact Sheet. 2019.
58. Hanna, J., Moon, S. and Chan, S. *2 Californians died of coronavirus weeks before previously known 1st U.S. death*. CNN [cited April 24, 2020]; Available at: <https://www.cnn.com/2020/04/22/us/california-deaths-earliest-in-us/index.html>
59. *USC-LA County Study: Early Results of Antibody Testing Suggest Number of COVID-19 Infections Far Exceeds Number of Confirmed Cases in Los Angeles County*. L.A. County Department of Public Health 2020. Available at: <http://publichealth.lacounty.gov/phcommon/public/media/mediapubhpdetail.cfm?prid=2328>



**UCLA** Health | Center for the Study of  
Latino Health and Culture

[uclahealth.org/ceslac/](https://uclahealth.org/ceslac/)

**UCLA** Latino Policy &  
Politics Initiative

[latino.ucla.edu](https://latino.ucla.edu)