

The **public well-being** quadrant represents outcomes related to the public good, defined primarily in non-financial terms. UC alumni contribute to the public good through working in a profession or industry that contributes to the well-being of others such as social work, teaching, or healthcare. Contributions to the public good may also come in the form of civic engagement like serving as a public official, voting or volunteering or by doing research to address California’s challenges. UC alumni make advances in medicine, agriculture, and disaster preparedness—through the use of technology and research. UC alumni involvement in these areas lead to greater quality of life and well-being for local communities and the state of California.

To assess the impact of UC alumni on public well-being, IRAP has enlisted several data sources, such as LinkedIn data (for alumni occupations and volunteering), California Department of Education (for teacher data), CA Department of State (for voter registrations), and CA Department of Consumer Affairs (for licensed doctors, nurses, and mental health professionals). LinkedIn data is useful to estimate percentages of alumni working in

certain professions, as it has coverage rates of about 31 percent of bachelor’s degree recipients, which is similar to an alumni survey. Other data sources like the state records can provide the number of registered voters, teachers and licensed health professionals in California. This brief shares the findings using these sources to dates that demonstrate the public well-being benefits of a UC degree.

UC Public Well-being Value Highlights:

- UC Humanities and Social Science alumni are more likely to work in public well-being professions than STEM graduates and four times more likely than business graduates.
- UC underrepresented and female alumni are slightly more likely to work in a public well-being industry
- 28,000 UC educated teachers serve in 77 percent of California’s K-12 schools.
- Over 1,600 UC alumni build infrastructure and preserve the environment in 177 California cities.
- 65 percent of UC Alumni registered to vote did so, compared to 48 percent of similarly-aged CA registered voters.
- UC alumni are more likely to volunteer for health-related causes, such as American Red Cross, the American Cancer Society, Kaiser Permanente and other medical centers.
- 89 percent of UC seniors reported that community-focused activity on campus influenced them to continue community-focused activities after graduation.

“We would lose a tremendous amount of society if each individual sets as his or her life goal maximizing lifetime income”

-College Board, Education Pays 2016

Public well-being professions

It is essential that UC alumni earn incomes that are sufficient for supporting oneself or family. 61 percent of UC undergraduates say an important factor in deciding their major is that it leads to a high paying job, but 89 percent said a major was important preparation for a fulfilling career¹. For many a fulfilling career contributes to the well-being of others.

While there may be some debate about which professions serve public well-being, the following professions are categorized as in service to public well-being for the purposes of this paper: teachers and principals, doctors and nurses and other health professionals, tutors, advisors and counselors, education support professionals, mental health professionals, community care and safety professionals, coaches, activities & physical education professionals, architects and civil engineers, epidemiologists, environmental experts, public officials, dentists, and veterinarians.

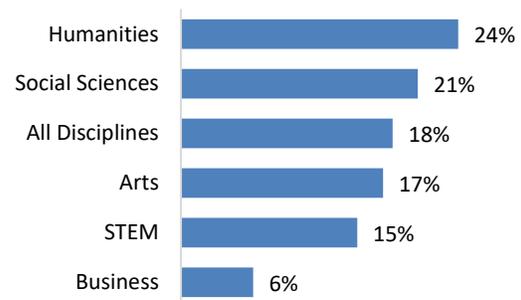
¹ UCUES Data Tables 2018, UC Information Center

² Source: CA Employment Development Department wage data

The value of professions that contribute to public well-being may not be reflected in earnings. For example, UC humanities alumni typically have lower earnings than UC STEM alumni (\$47,000 vs. \$72,000 at five years after graduation²), however, humanities and social science alumni are more likely to work in professions that contribute to public well-being.

Figure 1 shows the percentage of UC alumni working in public-well-being professions by discipline³. Approximately one in four humanities graduates and one in five social science graduates are working in professions that contribute to public well-being compared to one in six STEM graduates and one in sixteen business graduates.

Figure 1. Percentage of UC alumni working in public well-being professions by discipline, all degree types, 2000 to 2018 graduating cohorts.



Source: LinkedIn, UC Student data

Estimates using the LinkedIn data show approximately 80 percent of UC alumni working in public well-being professions are working in education or healthcare related professions: 24 percent are teachers or principals, another 21

³ Source: LinkedIn User Profiles, excludes self-employed, current students, and uncategorized jobs

percent are doctors and nurses, and the remaining 35 percent work as other broad health professionals (e.g. acupuncturists, pharmacists, nutritionists) or professions that support education, such as high school counselors and tutors or mental health professionals.

While LinkedIn provides estimates of the distribution of UC alumni in education and health related jobs, [data](#) from the California Department of Education (CDE) and [data](#) from the California Department of Consumer Affairs (DCA) can identify the number of UC-trained teachers and licensed health professionals in California. CDE show over 28,000 UC- educated teachers from all of UC graduating cohorts serve in 77 percent of California’s K-12 schools. from all of UC graduating cohorts (see figure 2).

Figure 2: UC-educated California public school teachers



Source: California Department of Education, UC Student data

DCA shows over 30,000 UC-trained doctors and nurses are caring for Californians; and UC-trained clinical psychologists; marriage and family therapists and social workers are strengthening interpersonal relationships and families in 32 of California’s 58 counties⁴.

Education and healthcare are areas that typically represent public service, but other professions contribute to the quality of daily life of the public. UC alumni work as community care & safety professionals, such as epidemiologists and public microbiologists ensuring public health and as emergency medical technicians (EMT) and firefighters. They help promote physical wellness by being coaches, lifeguards, and yoga instructors.

UC alumni preserve the quality of the environment. They are civil engineers who ensure the quality of roads, buildings, airports, tunnels, dams, bridges, and ensure systems for water supply and sewage treatment are safe and functioning properly. They serve as environmental experts for air quality, hydrology and geological engineering.

They are landscape architects that create public spaces to enjoy. UC Berkeley Alumnus and Professor, Walter Hood is known for creating “ecologically and sustainable urban spaces... that enrich the lives of current residents while honoring communal histories⁵” His firm, Hood Design, designed the new De Young Gardens in San Francisco’s Golden Gate Park and the Broad Museum plaza in downtown Los Angeles,

⁵ MacArthur Foundation, “Walter Hood, Landscape and Public Artist | 2019 MacArthur Fellow” September 25, 2019. <https://www.macfound.org/videos/644/>

California in addition to many other outdoor spaces.

Over 1,600 UC alumni serve in these roles in 177 cities throughout California (see figure 3).

Figure 3: California cities UC alumni work in as civil engineers, architects, and environmental experts all degree types, 2000 to 2018 graduating cohorts.



Source: LinkedIn, UC Student data

Note: Not all cities are labeled due to space constraints

Finally, UC alumni can also be faith leaders: Pastors, Imams, Rabbis, Ministers, and Chaplains. While, the estimated number of UC graduates who work as faith leaders are relatively small (about 150), an individual's impact may be high. Faith leaders support the public through life events through eulogies at funerals and marriage officiating. In addition, faith leaders, like Chaplains, can help guide those coming to the end of life in hospice care,

provide food and shelter to the homeless, offer counseling and guidance to mend relationships and families, and serve as community leaders for marginalized populations.

In addition to personal interactions of faith leaders—the houses of worship they oversee are sanctuaries, shelters, community gathering places, and venues for celebrations.

These are some of the many ways that UC alumni contribute to public well-being through their professions.

Jobs in public well-being industries

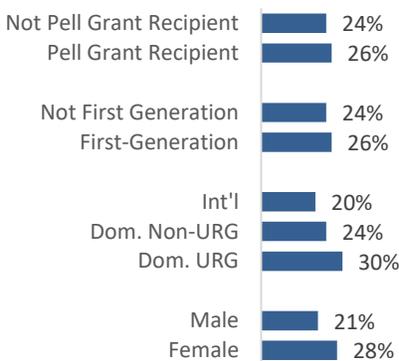
Alumni who are not in public well-being professions may still work to support public-serving industries, such as healthcare or education. One in five mid-career UC undergraduate alumni employed in California work in these sectors—ten percent work in education (five percent in K-12 education and five percent in higher education), seven percent work in healthcare and two percent work in social assistance⁶. These industries create a foundation for physical, mental, and intellectual well-being of society.

LinkedIn data show approximately half of alumni working in higher education are professors, scholars and lecturers and another 25 percent are researchers or scientists. For those working in hospital & healthcare, 33 percent are doctors or nurses and another ten percent are researchers & scientists, six percent also teach as professors, scholars & lecturers.

⁶ Alumni-at-work dashboard, UC Information Center

To see if there are differences in the likelihood of working in a public well-being industry by gender, race, or pell grant status, UC student data was matched to the LinkedIn data. Figure 5 shows female alumni are slightly more likely to work in a public well-being industry than male alumni, 28 percent compared to 21 percent. UC underrepresented groups (URG)⁷ alumni are also more likely than their domestic non-URG and international counterparts to work in public well-being industries.

Figure 5: Percentage of UC alumni working in public well-being industries by demographics, graduating cohorts 2000 to 2018



Civic Engagement UC Alumni Volunteering

National surveys find that college graduates are more likely to volunteer than those completing only a high school diploma.⁸ UC alumni work in public-serving professions or industries and they also volunteer.

UC students volunteer more on average than other college students. While enrolled at UC, 42 percent of students participate in community

⁷ Includes African-American, Native American and Latinx

⁸ Of those 25 years or older, 19% of high school graduates volunteered in 2017, compared to 42% of those with a bachelor's degree, Education Pays 2019, College Board

⁹ UCUES Data Tables 2018, UC Information Center

service⁹, which is twice the rate of college students volunteering in California (26 percent) and nationally (25 percent)¹⁰

For example, during the COVID-19 crisis, UC students joined the “Leave it to Us” effort in which students bought and deliver groceries to senior citizens unable to venture out during the shelter-in-place order. One UCLA molecular biology student volunteer, Eljie Bragasin, said “I think a lot of us at UCLA are pretty used to being involve[d] with the community...And not being able to do that, really affected us. And we just wanted to be able to offer what we had¹¹.”

Volunteering while on campus can encourage UC students to continue contributing after graduation. 89 percent of UC undergraduate seniors reported that community-focused activities on campus influenced them to continue community-focused activities after graduation¹²

Using data from UC alumni LinkedIn user profiles, it is estimated that 10 percent of UC undergraduate alumni volunteer. Figure 6 shows the top ten organizations in which UC alumni volunteer. Organizations are mainly focused in the fields of medicine, health, and overall humanitarian assistance. Data from LinkedIn show the American Red Cross, American Cancer Society, and the Boys & Girls Club, Habitat for Humanity along with medical center programs, as top places where UC alumni volunteer.

Many alumni volunteer in organizations within the UC system, such as UCLA UniCamp, UC Davis Medical Center, and UCLA Health (see figure 6).

¹⁰ Corporation for National Community Service (CNCS) Survey 2015

¹¹ Tobin, K. “College Students Shop for Senior Citizens Free of Charge with ‘Leave it to Us’ Program.”

¹² UCUES Data Tables 2018, UC Information Center

Figure 6: Top 10 organizations for UC alumni who volunteer

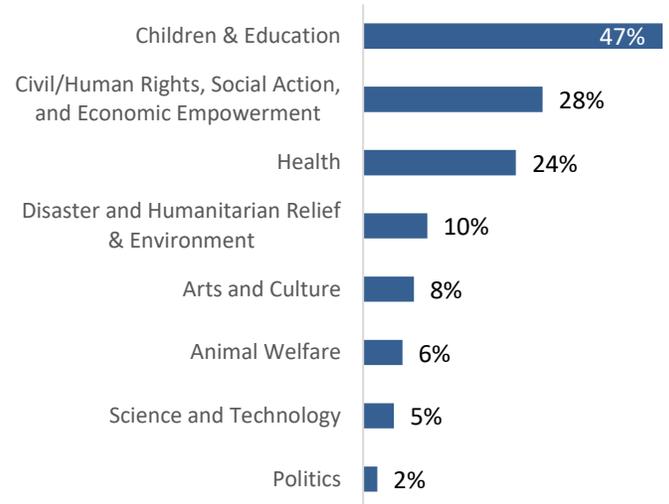
Volunteering Organization	Rank
American Red Cross	1
American Cancer Society	2
Kaiser Permanente	3
UCLA UniCamp	4
Boys & Girls Clubs of America	5
UC Davis Medical Center	6
Habitat for Humanity International	7
UCLA Health	8
Global Brigades, Inc.	9
Reading Partners	10

Source: LinkedIn data

UC alumni volunteer for a range of causes (see figure 7). 47 percent volunteer for children & education related causes, 28 percent for civil/human rights, social action, and economic empowerment and 24 percent for health. UC alumni volunteer causes align with other California volunteers¹³, as educational or youth service is the second highest cause for volunteers in California. However, UC alumni are more likely to volunteer for health causes than other California volunteers, hospital & health is ranked eighth most volunteered-for cause in California¹⁴, but is the third most volunteered-for cause by UC alumni.

UC alumni volunteer in a range of roles. The top 10 volunteering roles for UC undergraduates are volunteer, mentor, tutor, teaching, student volunteer, member, intern, counselor, board member, and hospital & emergency care giver. By volunteering in these roles, UC alumni are civically engaged and support public well-being.

Figure 7. Percentage of UC alumni volunteers by cause



Source: LinkedIn data

UC alumni public officials and voting

UC alumni play a significant role in state policy and legislation. One out of three California state-elected officials¹⁵ and one out of two state justices is a UC graduate¹⁶. Leaders like Lieutenant Governor Eleni Kounalakis, Senator Kamala Harris, State Controller Betty Yee, and Chief Justice Tani Cantil-Sakauye all graduated from a UC.

College graduates are also more likely to be civically engaged in other ways. UC alumni shape public policy by voting. The national voting rate of 25- to 44-year-olds with at least a bachelor’s degree is 73 percent, which is almost twice that of the voting rate of high school graduates, 41 percent, in the same age group.¹⁷

¹³ Corporation for National Community Service (CNCS) Survey 2015

¹⁴ Corporation for National Community Service (CNCS) Survey 2015

¹⁵ UC State and Government Relations

¹⁶ Leadership Directory

¹⁷ Ma, J. , Pender, M. & Welch, M. , “Education Pays 2019: The benefits of higher education for individuals and society” College Board retrieved April 27, 2019 from

UC Alumni living in California vote at higher rates than similarly-aged populations in the state. Matching 800,000 UC Alumni records from the graduating classes of 1999 to 2018 to California voter records from the California Secretary of State shows that 65 percent of UC Alumni ages 22 to 41 who were registered to vote participated in the 2018 midterm elections. For comparison, 48 percent of similarly-aged registered voters who voted in 2018¹⁸.

Public serving research

Finally, UC Alumni contribute to public well-being by doing research to address California's challenges, advancing technology for use in disaster preparedness, climate change and sustainability, agriculture, and health.

Disaster Preparedness

UC Alumni are redefining disaster preparedness. In October 2019, the MyShake app, developed by a team at UC Berkeley included Ph.D. alumnus Qingkai Kong. MyShake became the nation's first earthquake early warning system. Governor Newsom announced California's implementation of this tool, stating, "I encourage every Californian to download this app and ensure your family is earthquake ready."¹⁹

<https://research.collegeboard.org/pdf/education-pays-2019-full-report.pdf>

¹⁸ UCOP analysis of California voter registration data obtained from the California Secretary of State.

¹⁹Sanders, R. "California rolls out first statewide earthquake early warning system." Berkeley News,

UC alumni are preparing for the next pandemic. Jacob Glanville is a pandemic scientist who earned his Bachelor's in Genetics Genomics at UC Berkeley. Glanville and his company, Distributed Bio is featured on Netflix's Pandemic series. Distributed Bio uses computationally-guided immunoengineering methods to identify a universal flu vaccine that would prevent all future pandemics and any re-surfacing of historic flus. His team is also currently working on a cure for COVID-19.

Climate Change & Sustainability

The two largest California wildfires on record occurred within the last three years²⁰. These fires have claimed the lives and homes of California residents, and pose dangerous conditions for firefighters working to extinguish them. UC Irvine alumnus, Mark James, was a lead scientist for the Assistant for Understanding Data through Reasoning, Extraction and synthesis (AUDREY) system, developed at NASA Jet Propulsion Laboratory, and designed to keep first responders safe in situations like wildfires. AUDREY uses "AI" and machine learning to provide real-time positioning and hazard information to firefighters, EMTs and law enforcement personnel on the ground."

Increased intensity of wildfires is likely due to climate change. Professor LeRoy Westerling of

October 17, 2019,

<https://news.berkeley.edu/2019/10/17/california-rolls-out-first-statewide-earthquake-early-warning-system/>

²⁰ California Department of Forestry and Fire Protection, https://www.fire.ca.gov/media/5510/top20_acres.pdf

UC Merced, who received his bachelor's degree from UCLA and his Ph.D. from UC San Diego, co-directs the Center for Climate Communication and writes extensively on climate change and its effects on wildfires. In addition to his influential research on fires in the western United States, Westerling's work with the Center for Climate Communication elevates facts and debunks fictions in climate change research and news reporting.²¹

Other companies started by UC alumni to address climate change with sustainability include:

- Water Planet (UCLA) – next-generation water purification, reuse and desalination solutions
- Mosaic (UCSC) – a solar fin-tech company that offers financing for commercial and residential solar projects, democratizing the social and environmental benefits of clean energy
- Next Energy Technologies (UCSB) – cutting edge solar technology that transforms windows into energy producing assets
- Exergy Systems (UCB) – reduces material and resource consumption in manufacturing by providing revolutionary water and material recycling solutions and technologies
- Gridworks (UCSB) – convenes, educates and empowers stakeholders working to decarbonize electricity grids

²¹ Climate Feedback Website:
<https://climatefeedback.org/>

- CleanWorld (UCD) – a leading North American innovator in advance, high-solids anaerobic digestion (HSAD) technology

Agriculture

UC Davis Alumnus, Professor Michael Cahn, is innovating to adapt California's agriculture to climate change and water challenges. CropManage, developed at UC Cooperative Extension by Professor Cahn, is a software tool for optimizing farms' irrigation systems and fertilizersation, which boosts crop yields while reducing both water and fertilizer usage by 20 to 40 percent. This tool, which builds on years of UC agricultural research and modeling, is available for free to the public. According to Gabriel Youtsey, Chief Innovation Officer of UC Agriculture and Natural Resources (ANR), "CropManage could change how we grow food in California and the world... This is the University of California turning science into solutions at its finest."²²

Other agricultural advancing companies started by UC alumni include:

- Farm Sense (UCR) – a smart insect monitoring system that improves crop yields and hopes to reduce food insecurity
- Hip Chick Farms (UCSC) – a certified organic and humanely- raised chicken farm that distributes to 18,000 locations across California
- Planting Justice (UCSC) – an edible garden program that employs formerly

²² CropManage Website:
<https://cropmanage.ucanr.edu/>

incarcerated individuals to provide low-income families access to fresh food

Health and Medicine

UC Alumni also contribute lifesaving and groundbreaking research and development in health and medicine. UC Berkeley alumna, Jennifer Cook, leads, Grail, a company that aims to develop a blood test to detect cancer before symptoms appear. E, early clinical studies “demonstrate GRAIL’s multi-cancer early detection test is able to detect more than 50 cancer types across all stages, with a very low false positive rate of less than one percent.”²³

UC doctors use research to make a difference in the lives of families. In, 2019 Dr. Eliot Stieglitz (a former UCSF postdoc fellow) proposed a new treatment for a rare form of leukemia that saved the life of a four-month old baby boy named, Quincy. He correctly identified the cancer using an advanced molecular test known as the UCSF 500 Gene Panel developed by UCSF former postdoc fellow, Boris Bastian, founder and director of the Clinical Cancer Genomics Laboratory at UCSF. Reflecting on the “miracle treatment” that saved her son, Quincy’s mom, Lara, who is a registered nurse at another health care center said of the treatment ““We hit the geographical jackpot by having UCSF in our backyard”²⁴

Dr. Justin Barad, a UC Berkeley and UCLA alumnus, similarly operates at the intersection of technology and medicine for the public good.

His virtual reality platform is revolutionizing surgical training, dramatically improving surgeons’ performance and patient outcomes.²⁵

Innovations developed by UC-trained professional and academic researchers contribute invaluable to public well-being. Other companies started by UC alumni to improve healthcare are:

- Tradewind Bioscience (UCSF) – developing antibody therapeutics for ovarian cancer
- Tergis Technologies (UCM) –an improved infant respirator and an arterial catheter deployment device that prevents hospital-caused infection
- Aluna (UCSF) – a portable spirometer that helps kids manage asthma by measuring lung health anywhere and any time
- PillPack (UCB) – an online pharmacy distribution option that simplifies prescriptions

Conclusion

UC alumni contribute to public well-being through their professions, volunteering, civic engagement and by using research-based advances to enhance quality of life. UC alumni from all disciplines contribute to public well-being. The benefits of a UC education extend beyond the individual to other Californians, including those who do not attend UC.

²³ GRAIL. February 18, 2020 “GRAIL Initiates First Interventional Study Using its Multi-Cancer Early Detection Test to Guide Clinical Care”

²⁴ Goodrich, J. “Baby Diagnosed With Rare Blood Cancer Saved by Miracle Treatment”

²⁵OssoVR website: <https://ossovr.com/>

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<https://sanfrancisco.cbslocal.com/2019/09/26/baby-diagnosed-rare-blood-cancer-saved-miracle-treatment-leukemia/>

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