75

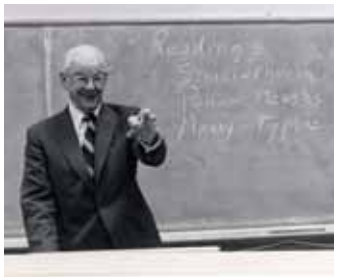
75th Anniversary Special Issue

BERKELEY HEALTH

The Magazine for Alumni and Friends













Celebrating 75 Years

OF DEFENDING HEALTH AS A HUMAN RIGHT IN OUR LOCAL AND GLOBAL COMMUNITIES

75

Support the School, Celebrate 75

As the School of Public Health celebrates 75 years of advancing health for all in California, the nation and around the world, there is no better time to invest in the future of our work. We invite you to be a part of marking this momentous milestone by making a gift to our 75th Anniversary fund in support of students, faculty, and research.

Not only will you forever be a part of our 75th Anniversary celebration, you will be supporting a dedicated community ready to defend health as a human right in our local and global communities for the next 75 years and beyond.

Fiat Lux!

Visit givetocal.berkeley.edu/publichealth or mail your gift in the enclosed envelope to help us build on our distinguished legacy in public health.

Berkeley Public Health

Dean's Message

75 Years of Public Health at Berkeley

Seventy-five years ago, a group of determined visionaries came together to create a school of public health for California. At the time, there were no schools of public health west of the Mississippi. These pioneers faced many obstacles. Nevertheless, with persistence and partnership between academics, community members, industry, and government, they succeeded in bringing public health education to the western states. Although they had to do it in an unusual way, by passing a bill through the California legislature to establish and fund the school.

These characteristics of the School's founders—vision, persistence, partnership, and innovation—have remained an integral part of our DNA from 1943 to 2018, even as the field of public health and the School's approach to it have evolved over time. In fact, many of our pioneering faculty and alumni are responsible for shaping this evolution, in areas including advancing research into the social determinants of health, proving the value of community-engaged science, bringing climate change into environmental health science, and innovating with technology for the greater good.

As you read our 75th Anniversary stories, you might be struck, as I was, by just how many different approaches there are to public health research and practice. Our community spans STEM fields such as biology, chemistry, medicine, and statistics; social sciences like anthropology, economics, political science, psychology, and sociology; humanities such as ethics, history, and philosophy; and the core interdisciplinary public health fields of epidemiology, environmental health, health management, infectious disease, nutrition, and more.

Underneath the different approaches and expertise areas, you will see the commonalities that lead us all to Berkeley and to public health—our shared commitment to going further upstream to address the root causes of health and illness for maximum population health impact. Our belief that research should engage with communities and policymakers so it will make a difference in people's lives, particularly the most vulnerable. Most of all, on every page, you will see our persistence. We have a vision of a better way to a healthier future and we flat-out refuse to let go of it, over months, years, and decades.

Luckily, our faculty and researchers are not alone in the long struggle to move the needle on complex public health problems. Because our primary mission is education, there is continuity to our work as we train students to follow and then surpass us. At the School, not only do we stand on the shoulders of giants, but we also rub elbows with current and future greatness, every day.

As interim dean during this milestone year, I am privileged to play a small part in guiding the School into the next 75 years and beyond. Our faculty has been very engaged in shaping our strategic vision and our research priorities as we continue to evolve to best train our students and meet the health needs of our communities in California and around the world. Together, we will hew to the School's pioneering spirit in the following three areas. Each aligns with the campus-wide signature initiatives, with the School playing a crucial role in scaling up from cellular-discovery to delivering society-level impact on population health.

Striving for greater health equity: Inequality is a defining issue of our time. We have a distinguished legacy as the birthplace of social epidemiology and as leaders in community-based participatory research. Our community continues to make groundbreaking progress in addressing inequality and advancing health as a human right.

Responding to health threats brought by global change: The next 75 years will be profoundly shaped by global forces such as climate change; infectious disease pandemics; food system transformations; and population changes such as migration, urbanization, and aging. At Berkeley, we will lead the way in advancing our society's understanding of these forces and learning how best to mitigate their adverse health effects.

Leveraging technology and innovation for better health: We are in the midst of massive advances in data science and technological innovation, and data science and social science are intersecting as never before. We have an unprecedented opportunity to lead the way in areas like machine learning and genomics, as well as collaborate with engineers, computer scientists, and others to help ensure that these technological advances benefit the health of our most vulnerable communities and not just an elite few.

If the founders of our School were to see us today, they might not recognize us as the small public health school that primarily aimed to better train health officers to serve the health needs of Californians and the other western states. But I have no doubt they would be proud of what we have become and how we have carried on their legacy of determination, ingenuity, and collaboration, in service of better health for all.

Sincerely,

William H. Dow PhD, *Interim Dean, School of Public Health*
Kaiser Permanente Endowed Chair in Health Policy and Management

BERKELEY HEALTH

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75th Anniversary Issue *The Magazine for Alumni and Friends*

FEATURES

BERKELEY PUBLIC HEALTH CELEBRATES 75

PARTNERS IN PUBLIC HEALTH

Our Berkeley Family of Global Citizens

Three lifelong Berkeley scholars train and inspire the next generation

BY STEPHEN ORNES

The legacy of a public health program is reflected in the mark it leaves on the world, not only in terms of the research it produces but the studies, discoveries, relationships, and innovations it inspires. Improving global health means asking, over and over, do we know enough about a problem to do something about it?

For three long-term faculty members, who together represent more than 80 years with the School of Public Health, answering that question has been a winding journey. They are committed to understanding complex challenges—the harm of air pollution, the molecular underpinnings of infections, the spread of vaccine-preventable diseases. At the same time, they train the next generation of passionate, curious souls to identify pressing global health problems, search for solutions, and ask the right questions.

KIRK SMITH FOLLOWS THE RISK

The biggest environmental health risk to people worldwide isn't sanitation, lack of access to clean water, or diseases like malaria—though all of those are heavy-hitters. It's air pollution, which the World Health Organization blames for about one in every eight deaths worldwide; it kills more people annually than smoking, diabetes, and car accidents combined.

"Air pollution is up there with the big boys," says Professor Kirk Smith, who knows more about the risk than almost anyone. For 40 years, Smith, a global environmental health expert, has been at the forefront of efforts to understand the causes and reach of deadly air pollution—and do something about it. But his research is only half the story: Smith has also trained more than a generation of researchers who have now gone on to help shape global health policy around the world.

"It's been a lifelong learning experience," says exposure scientist Jim Zhang at the Duke Global Health Institute, who worked with Smith as a postdoctoral researcher in the 1990s. "He made a profound impact on me in terms of how to really look at the world. What's the big picture?"

Sumi Mehta, an epidemiologist at Vital Strategies, a nonprofit charity organization, says Smith's approach invited students and advisees to be part of the research process. "It was always meant to be a collaboration," she says. "Realizing that the problems are so huge, we work together to solve them." She says Smith also worked to strengthen the role of their colleagues in middle- and low-income countries, to ensure that every project was an international collaboration.

Smith, who earned his MPH and PhD from UC Berkeley, started his career as a health scientist studying the risk associated with nuclear reactors, but in the late 1970s realized that air pollution posed a much bigger threat to human health.

"You could have a Chernobyl accident every month, and it still wouldn't produce one-tenth of the harm we find from air pollution," he says. A few nuclear accidents like the one at Chernobyl would immediately shut down the nuclear industry, he says, but policies aimed at reducing air pollution are slow to emerge, and often ineffective.

MAYUR VASWANI (LEFT), WITH THE INCLEN TRUST INTERNATIONAL, AND PROFESSOR KIRK SMITH DEMONSTRATE AN INDUCTION STOVE TO A FAMILY IN HARYANA, INDIA

"You could have a Chernobyl accident every month, and it still wouldn't produce one-tenth of the harm we find from air pollution."

That pivot—from nuclear reactors to air pollution—exemplifies one of the guiding mantras that Smith teaches his students: Follow the risk, not the money. Zhang says he still selects research projects with Smith's principle in mind.

Smith is nothing if not dogged. Starting in the 1980s and 1990s, he produced some of the earliest evidence of the harm from smoke from wood-fired cook stoves in low-income countries. But his voice wasn't heard, recalls Zhang. "I remember when I presented some work I did with Kirk, and we often found only two or three people in the room," he says. "The rest of the people didn't hear us, they weren't interested, the problem was too far away from their lives."

Immediately after his first studies in the 1980s, Smith began designing trials and applying for funding. "Given this pollution," he thought at the time, "what kind of health work should we do?" His applications for a randomized trial were initially denied. Seventeen years later, his persistence paid off with a randomized trial in Guatemala of how attention to stove design could reduce the risk of childhood pneumonia.

Now, at least 10 randomized trials are in progress worldwide, all aimed at reducing the harms caused by wood-fired cook stoves. Household air pollution is recognized as a major threat that causes millions of premature deaths every year, with the largest risks among pregnant mothers and young children.

Smith has studied pollution inside and outside homes; he's showed the extent to which they're connected, and argued that policies aimed at reducing widespread ambient pollution must first address the influence of household fuels. With his students and collaborators, he has led studies of the problem in 20 countries in Asia and Latin America; their work has resulted in hundreds of articles in journals and books on topics ranging from air pollution to climate change. He's also spearheaded the design and implementation of small, smart, fast, and cheap air

AJAY PILLARISETTI PHD '16 (RIGHT) WITH KIRK SMITH AND A FAMILY IN HARYANA, INDIA

sensors for people in low-income countries. His awards are legion: He helped produce the third, fourth, and fifth reports of the Intergovernmental Panel on Climate Change, which in 2007 shared the Nobel Peace Prize for its work disseminating knowledge about anthropogenic climate change—and devising strategies to slow it down. His research set the stage for a generation of investigators who are not only probing the science behind the problem but also designing new stoves, testing new fuels, and working with policymakers to improve global health through legislation.

Beth Altshuler, a former student, says that Smith's teaching and guidance helped influence how she approaches some of her own work at Raimi + Associates, an urban design research firm in Berkeley that focuses on health, sustainable, and equitable communities. "Through Kirk, I have the fluency to make big climate science concepts really relatable to everyday things that people care about in their neighborhoods."

Ajay Pillarisetti, a postdoctoral researcher in Smith's lab, currently works on a project led by Smith in Maharashtra, India, to provide clean fuel to pregnant women and find ways to encourage them to use it. Pillarisetti uses the phrase "intellectually nimble" to describe Smith's approach to research and mentoring. "He's open to new thinking, and he pushes back appropriately when we're off base," he says. "The group is focused on working on problems where there's substantial risk, and thinking about how the science can be applied to protect public health."

That idea—using the science to protect the population—has become even more important in Smith's current work. His pioneering efforts have inspired decades of research into the harm and extent of air pollution. They've also led to attempts by other researchers to look for solutions, like designing better stoves and finding ways to encourage cleaner fuel use among the poor. But they're not always successful.

"There are graveyards full of these interventions," Smith says. "I went to a house once in China that had seven different so-called improved stoves, left in the house after various programs had gone through. They were used for storage; they held sacks of grain." Since 2014, when he completed a sabbatical in China and India, he's switched his focus away from trying to measure the extent of the health effects and toward affecting real change. "There's no reason I should be doing the same thing now I was doing 30 years ago," he says. "The big issue now is how do we fix it?"

To that end, he's publishing more papers on policy and fewer on science; he's meeting with foreign leaders and helping draft legislation that will protect the world's most vulnerable populations. This has been most successful so far in India, where a program is underway to introduce clean fuels to 100 million poor families, the largest intervention of its kind to date.

His field and policy work continue in India, China, and Mongolia, as well as through the work of the dozens of advisees and hundreds of students who remind themselves, and their own advisees: Follow the risk. That's where the change has to happen.

LEE RILEY'S INTERDISCIPLINARY TOOLBOX

Professor of Epidemiology and Infectious Diseases Lee Riley's research spans decades, continents, and even disciplines. His resume is weighted with honors that speak to the reach of his work: He's a fellow of the American Association for the Advancement of Science, the Infectious Disease Society of America, and the American Academy of Microbiology. His hundreds of published papers, his co-authored 2016 book *Slum Health*, and his dozens of global public health advisees working around the world all orbit the same urgent questions:

How can epidemiologists identify infectious diseases with global importance, and how can that research improve human health?

Those questions first took root in his mind when, in the early 1980s, he landed in the slums of Sao Paolo, Brazil, to work on a project with the CDC's Epidemic Intelligence Service, or EIS. He was fresh out of a residency at Columbia University, and one of his first assignments took him to join a microbiologist studying diarrhea in children, most of whom lived in the city's shantytowns.

The diseases of slums would shape his work for decades, but those two years in the EIS exposed him to something else: the burgeoning field of molecular epidemiology. Part of his responsibilities involved analyzing the genotypes of bacterial isolates. Those studies, in turn, led him to become fascinated with another field—microbiology pathogenesis, or the cell-level understanding of how germs cause disease.

By the time Riley was recruited to Berkeley, in 1996, he'd become known for his work combining epidemiology with pathogenesis research. His research questions—now, as then—arise from epidemiological work and studies of infectious disease.

"My inspirations are drawn from real-world public health issues," he says. "Unanswered questions in public health ultimately end up having to be addressed by bench research."

He'd also become known for analyzing the health risks of slums from the perspective of a microbiologist. Riley returned to Brazil again and again, establishing new projects designed to probe the molecular underpinnings of diarrhea, tuberculosis, and leptospirosis.

"I thought, there's something about slums that engenders these diseases," he recalls. "We need to look more closely at the slum factors that contribute." Much of his research on understanding and eradicating biases in slums is highlighted in the 2016 book, *Slum Health: From the Cell to the Street*, which he co-authored with fellow Berkeley Professor Jason Corburn. The book unites Riley's biological research of the molecular roots of infectious diseases with Corburn's focus on urban design.

Epidemiologist Brendan Flannery, now with the CDC's Global Immunizations Division, was one of Riley's first advisees at Berkeley, in the late 1990s. Flannery now evaluates flu vaccines, but during his time at Berkeley, he visited Brazil multiple times for Riley's projects, including identifying potential targets for a leptospirosis test. They discovered that cases of leptospirosis surged after rains in people who lived in slums that were subject to flood, in part because of contact with rat urine.

Riley recruited more Brazilian scientists to the effort over time, and Flannery says the research flourished. "The ability to exchange research ideas with people from all over the world that Lee brought together in his laboratory, working on different questions, was a really rich experience," says Flannery. (He credits Riley with influencing his life in other ways, too: He married a woman he met in Brazil, and they and their kids often return.)

Epidemiologist Sara Tartof, a former student now studying vaccine efficacy at Kaiser Permanente, says Riley approaches science with an unending and infectious curiosity. "He's very, very creative," she says. "A lot of people get stuck thinking, 'this is the way we've understood something for a long time.' I think Lee has a lot of fun blowing that stuff up. I try to keep that level of creativity and open-mindedness in my own work."

At Riley's urging, Tartof joined the EIS after her education at Berkeley. "That was the coolest thing in epidemiology," she says. "It totally changed my life."

Many of Riley's students, inspired by his creativity, have gone on to make their own mark in the world. In 2001, says Riley, no one really knew the origins of the *E. coli* pathogens that caused urinary tract infections in women. Amee Manges, then a Berkeley student, came to Riley and said she wanted to find out. With Riley advising, Manges looked for the pathogenic fingerprints in the urine of women with UTIs—first at Berkeley, then at other schools.

What they found was a shock: Biologists have identified tens of thousands of different types of *E. coli*, but half the women with UTIs were infected with the same few strains, which were resistant to the antibiotics used for treatment at the time. More recent work has revealed that these strains may be present in meat—especially chicken—which suggests that women could acquire UTIs as a food borne disease.

That project revealed important new research questions for scientists around the world. "Why are these particular five strains all over the world?" he asks. An answer to

"My inspirations are drawn from real-world public health issues. Unanswered questions in public health ultimately end up having to be addressed by bench research."

TOP: PROFESSOR LEE RILEY AND A TEAM RESEARCHING THE BURDEN OF ZIKA IN NITERÓI, A MUNICIPALITY OF RIO DE JANEIRO, BRAZIL IN 2017
BOTTOM: RILEY WALKS AND TALKS WITH PROFESSOR EMERITUS BOB SPEAR

that question, from a microbiology standpoint, could point to new ways of preventing UTIs and other diseases.

This case shows the power of Riley's combination of pathogenesis and epidemiology: The study begins with a public health observation, leads to a microbiological investigation, and ultimately produces new treatment strategies.

That project also relates to what Riley says is a crisis waiting to explode: antimicrobial resistance. Rising use of antibiotics and other drugs that suppress the immune system has resulted in a growing number of "superbugs"—bacteria and other pathogens that don't respond to available treatments.

"Something that a lot of people haven't realized yet is that we're running out of new antibiotics," he says. "This is going to be a huge issue in the future."

Riley says his job is to look to the future, devising solutions for big problems on the horizon. The uptick in homelessness in the Bay Area, for example, looks eerily similar to what he's seen in the slums in other countries. "Of course, it hasn't reached the proportions we've seen in Brazil and India, but I wouldn't be too surprised if this problem were to continue to increase, and we see the same things here that we see in Brazil, in terms of infectious diseases."

The reason for the problem is the same in both places, he says: "There's a huge disparity between the wealthy segment of society and the poor segment of society," he says. That divide, according to Riley, is what drives the homeless problem, and what drives the rampant spread of infectious diseases in poor areas.

"Those problems are going to be a lot more urgent soon," says Riley.

ART REINGOLD TRAINS PUBLIC HEALTH DETECTIVES

When Art Reingold's phone rings or an email appears in his inbox, it's likely as not to be a former student. Maybe it's Jordan Tappero checking in, who until last December was the director of the Division of Global Health Protection at the CDC. After more than 25 years in Atlanta, Tappero now studies neglected tropical diseases at the Gates Foundation. Or maybe it's epidemiologist Aubree Gordon at the University of Michigan School of Public Health, calling at dawn on a Saturday to get career advice.

Or any one of dozens, if not hundreds, of students-turned-friends looking for his trusted perspective. Tappero hasn't been in Reingold's class as a student since the mid-1990s, and Gordon finished her PhD at Berkeley years ago.

"He's a mentor, a friend, and a colleague. He's special," says Tappero. "You don't feel like the class is over when you get your grade and you walk away. I know I'm not the only one who picks up the phone and says, 'Hey Art, what do you think of this?'"

Reingold acknowledges that he teaches and mentors a lot of students. "I have a reputation for teaching too much," he says. "I get quite involved in teaching students how to think epidemiologically."

Reingold sees teaching as a critical part of his contribution to global public health. It's not the only part, of course. He's studied the relationship between HIV and tuberculosis in the developing world, as well as opportunistic infections in AIDS patients. Reingold was part of a group of researchers at the CDC who, in the early 1980s, investigated a disease that made healthy women sick and was associated with the use of tampons, now known as Toxic Shock Syndrome. He also worked on understanding Legionnaires' disease and meningococcal meningitis, as well as other infections.

His work has helped shape policy and recommendations at the CDC and beyond. He advised the World Health Organization on issues related to vaccine-preventable illnesses, one of the foci of his research, and in 2003 was elected to the Institute of Medicine of the National Academy of Sciences. More recently, he's helped develop strategies around immunizations and, in a climate of increased distrust of vaccine safety, how to convince people to protect themselves and their children.

"We have to collect the evidence and make it available, as opposed to dismissing people's concerns," he says. "We have to find interventions that are both effective and safe."

Like many epidemiologists, Reingold participated in the CDC's two-year Epidemic Intelligence Service; he still wears a small earring that depicts the program's logo, which is a shoe with a hole in its sole. It's a nod to shoe-leather epidemiology, or using the tools of public health to solve problems. "We called it medical detective work," he says. "It changed my career plans and changed me as a person. It was like the Hollywood version of epidemiology. Can you answer the question that solves the problem?"

That notion—of putting methodological tools to use in real-world settings—guides his work. "I work very closely with people

"We have to collect the evidence and make it available, as opposed to dismissing people's concerns. We have to find interventions that are both effective and safe."

PROFESSOR ART REINGOLD AT A CHRISTMAS PARTY IN MYSORE, INDIA, WITH THEN PHD STUDENT PURNIMA MADHIVANAN (LEFT OF REINGOLD)

in the real world of public health," he says. That includes county and state health officials in California and beyond. He's worked with health offices on issues ranging from vaccine policy to training all over the world—in Brazil; in Uganda, Zimbabwe, and other African countries; in India.

Those personal networks enliven his classes, too. If students are studying disease outbreaks and an outbreak occurs in a nearby county, says Tappero, it's not unusual for Reingold to haul his students out to conduct research firsthand, in the field. "He has a real focus on getting you into the field," says Tappero. "He made it fun. He made it feel like I'm going to take what I'm learning and go use it right away."

Reingold has also helped shape the careers of students around the world through Berkeley's Fogarty AIDS International Training Program, which funds talented scholars from India, Uganda, Thailand, Zimbabwe, and other countries to study epidemiology at the School of Public Health.

"This is an incredible global footprint and contribution," says Madhukar Pai of the program. He and his wife, Nitika Pai, received fellowships in 2000. "This opportunity was the single biggest break we have had in our career, and it changed our lives," he says. "Art played a key role in our training, with his mentorship, teaching, and inspiring leadership." Pai is now a tenured professor at McGill University and director of Global Health and the TB Centre at the university; his wife is a professor who continues to study HIV/AIDS there.

For Reingold, public health work boils down to asking the right questions, which is what he trains his students to do. "The challenge is to identify questions that haven't been answered already, where somebody would care about the results, and they could influence policy or decision-making," he says. "Identifying a good question and then deciding the best approach to answering that question is the single greatest challenge to making an impact in our field."

In many cases, he says, the question presents itself. A disease erupts in an outbreak, or a lot of people get sick for some unknown reason. In his classes, Reingold goes to great lengths to teach his students how to recognize the core issue that they want to study. What he doesn't do, however, is hand them question to investigate.

"My approach is a little unusual, in that I tend to ask students what questions they think are important," he says. "Then I can help them refine those questions or think about ways to answer them."

Kunchok Dorjee, a former advisee and now a postdoctoral researcher at Johns Hopkins, is working on a tuberculosis elimination campaign among Tibetan refugees in northern India. He credits Reingold with showing him how to find the resources he needed to push his own research forward.

"He gives you the independence to pursue your ideas and build on them," says Dorjee. "He would at the same time chime in time and time again to give you direction." Dorjee says he also felt supported personally by Reingold. Dorjee moved his family to California from India to pursure his PhD in Epidemiology at Berkeley, and his first son was born while he was in school. "Things were challenging, but Art really made me feel supported. His advice was invaluable."

Gordon, at Michigan, says she often encounters Reingold's networks. "I'm constantly interacting with people at meetings and his name will come up," she says. "It's just amazing how many lives he has influenced and what an amazing mentor he's been to these people, both formally and informally."

▲ JOSE CORTEZ
ZESEMAYAT MEKONNEN ▶

FIELD NOTES FROM JOINT MEDICAL STUDENTS

Between classes and clinicals, students give a glimpse into the life of a JMPer

BY JOSE CORTEZ AND ZESEMAYAT MEKONNEN

In 1978, the first cohort arrived in Berkeley to begin the UC Berkeley-UCSF Joint Experimental Program in Medical Education. The five-year program included three post-baccalaureate pre-clerkship years in health sciences and medical education at Berkeley, followed by two clinical years at UCSF. The program intended to expand the definition of health from a physician's perspective beyond the boundaries of medical care.

Fifteen years later, this program came under the auspices of the UC Berkeley School of Public Health and became known as the UC Berkeley-UCSF Joint Medical Program, or JMP.

The JMP attracts medical students who are passionate about scholarly inquiry to improve the world's health. While working toward an MS degree in Health and Medical Sciences, these students learn the foundations of being a doctor through a student-led, faculty-supported Problem Based Learning (PBL) curriculum.

The JMP puts students through the ropes—they juggle a master's thesis with PBL and clerkships—and affords them opportunities to gain real experience both in the hospital and in health scholarship. Current JMP students Jose Cortez and Zesemayat Mekonnen give a glimpse into a typical week of the (caffeinated and fast-paced, yet rewarding and expansive) JMP curriculum.

MONDAY

ZESEMAYAT "ZESEE" MEKONNEN: It's Monday at 9:10 a.m., and we're back in the classroom. I wonder who is snack keeper this week and what kind of snacks we'll get: homemade treats or store-bought granola and fruit. Strawberries, nuts, and a lemon tart!

The bell snaps me out my thoughts. Our Problem-Based Learning (PBL) case begins with a chief complaint. 66-year-old Mr. X presents in the ER with shortness of breath and fever. The classroom comes alive with a differential, making use of the mnemonics that have streamlined our various ideas into a structured hypothesis. One person at the board writes our top three diagnoses and work-up plan as we continue with the case. Past history of smoking and diabetes. Temperature of 102. Normal heart rate.

We come up with questions as we flip each page, hoping they will be answered later. But we're also keenly aware that some of our questions never get answered. Real patients aren't like textbooks—something we keep reminding ourselves when we get stuck and can't explain a patient's renal function or high potassium level. I end PBL with coffee on my mind.

JOSE CORTEZ: Each time I arrive at the clinic I feel anxious. The elevator ride up to the 3rd floor always seems to be just a few seconds shorter than I want it to be. As I walk past the clinic doors and am greeted by the nurses at the front desk, I remind myself to "turn on extrovert Jose," a task that is far more difficult for me than probably should be.

I never know what to expect when I'm in clinic. Some days go by smoothly as we see patients for straightforward, easy to manage presentations. However, likely because I am still a student, most days are filled with complexity, which end up being incredible opportunities to learn and grow as a provider. Today, I had my first experience working with an interpreter, and it was awkward. As I was stumbling through the first bit of the patient interview, I took a moment of pause and communicated to the patient it was my first time. The patient was understanding and very graciously agreed to slow down so that we could get through the interview together and ensure I collected all the necessary information. As I left the patient's room I felt tense. However, when I relayed the patient information back to my supervising provider I got a "great job, Jose!" and felt relief.

As a medical student, I am constantly trying to balance the feelings of imposter syndrome and anxiety with my hunger to learn. Therefore, I feel incredibly lucky to be at a program that has exposed me to patient care and the clinical environment from day one. When I reflect on my ability to see patients, I recognize I've had tremendous growth over the past two years. I understand why medicine is often referred to as a practice; it is through constant practice that providers become master clinicians. The JMP recognizes the importance of early clinical exposure, and although it was initially really tough, each clinic day has become a little easier. The slight anxiety I feel when I arrive at clinic has never gone away, and probably never will, but I've gotten better at managing it as I grow more confident in my clinical skills.

TUESDAY

ZESEE: Masters. Masters. Masters. I awake to the looming deadlines of my master's thesis and inevitable realization that although the move to SF over the summer saved me from the stress of searching and moving right before clerkship, it also meant I would now have a daily commute back to the East Bay.

I walk into the suite and head straight for the M&M dispenser. My daily treat, refilled by staff and student donations. Then I head into my thesis meeting with my adviser to go over my data analysis and currently, nonexistent figures. I'll need to spend the rest of the day working on R and drafting my methods section. Meeting one is over. Meeting two is clinical skills practice with my classmate. We head into our clinical skills room and take turns conducting the neuro exam. Essentials only, for now. Mini Mental Status, Cranial Nerves, Motor, Sensory, Reflex, etc...maybe we'll actually get a reflex done right before clerkships start. Or maybe, we'll continue practicing, hoping we'll finally get the right flick of the wrist and angle to elicit the right action. As we review the differences between Delirium and Dementia and Altered Mental Status, we see pieces of PBL reveal themselves as we work through the differential. "Remember that case with the elderly woman who had pernicious anemia? Let's add B12 to the workup." We continue through the case and then head out to study and review Learning Objectives before tomorrow's PBL.

WEDNESDAY

JOSE: When I'm in PBL, I feel like a detective. I'm working to gather information to help care for a patient, information that spans physiology, pathophysiology, pharmacology, and so on. I have the independence to guide my learning through the foundational sciences, which is an experience I never knew I could have.

"When I'm in PBL, I feel like a detective. I'm working to gather information to help care for a patient."

I remember our first day of our PBL case, when we were presented with a patient who had suffered extensive burns to several layers of skin. Before med school I had worked at a large level 1 trauma center in southern California, where I occasionally saw burn patients. I would quietly observe as providers in the emergency department scuttled around at high alert. During PBL, I finally learned more myself about the pathophysiology of burns.

My colleagues and I quickly assembled a differential including burns of different causes and drug reactions that may mimic burn lesions. We collected information on the management of burns, including the need to assess the lungs, watch for infections, and maintain adequate fluid balance. I'm thankful for the past two years of collaborative work experience. Teamwork is central to patient care, and the JMP has uniquely prepared us to provide the best care we can.

"I'll admit, balancing two degrees has been really tough. Would I do it again though? Absolutely."

THURSDAY

ZESEE: I walk into Berkeley Way West and immediately set up my PowerPoint to the projector. We will be reviewing my figures today in preparation for Master's Symposium. I take a sip of my coffee, a prerequisite for the 8 a.m. start, and ready myself for the student feedback on the best way to present my data. But first, we go around a circle checking in about the current state of our projects and troubleshooting any hiccups students have had in the past few weeks. I present my initial findings and diligently jot down the suggestions I receive and make a mental note to make changes before our next class meeting.

I finish my working lunch as I prep for clinical skills and walk into the classroom. Today's lesson plan is focused on liver failure. Our professor, an infectious disease doctor focused on HIV, has a number of cases we will review today to improve our clinical reasoning skills. We begin similarly to PBL, with differential diagnoses, but this time we are pushed to state what physical exam and lab findings will help us rule in and rule out one diagnosis from another. After we finish working through the cases, a visiting emergency physician shows up with an ultrasound machine and orients us to the basics of knobology.

We pair off into groups to practice using the ultrasound machine and to review the physical exam tests we do when we suspect liver failure.

I always find it funny how we practice the physical exam on each other, attempting to elicit a fluid wave shift on each other. Each attempt is a game of make-believe as we yearn to become as proficient as the professors teaching us. Hopefully, one day we will.

FRIDAY

ZESEE: I snag the last open seat in the back of the Multivariate Statistics classroom and pull out my computer to listen to the professor discuss the theory behind linear regressions. He deftly explains words and concepts that before seemed foreign to me: constant variance, dummy variables, and multiple correlation coefficient.

I sit through the three-hour lecture, constantly glancing at my programming software and his lecture slides as I try to maximize my efficiency. Once class ends, I head back onto BART for the long ride back home and pray I find an open seat to sit and study in during the commute.

JOSE: People often ask me how I'm able to concurrently work on a master's degree and the preclinical foundational sciences. The answer is coffee, more coffee, and I suppose the occasional time management.

I started working on my master's thesis during my first year and spent a significant amount of time finishing up the project design and data collection during the summer. My winter break was spent cleaning up my data and running a large part of the data analysis. I've spent the remainder of my time finishing up analysis and writing. I've also interspersed additional (additional?!) courses to support my understanding of research methods and statistics, to facilitate my ability to execute my project. That brings us to today. I have designated a half morning each week to working on my thesis, but the work isn't that neatly contained. Long commutes from San Francisco to Berkeley end up being the perfect opportunity to finish up a figure. Small chunks of time between meetings and classes are excellent opportunities to write up pieces of the analysis. Weekends too are great opportunities to look over reviewer's edits, though definitely over brunch and a mimosa.

I'll admit, balancing two degrees has been really tough. Would I do it again though? Absolutely. In many ways, I feel like learning how to balance medicine and research is a skill that most physicians end up having to learn at some point in their careers. The MS at the JMP has provided me with so much more than just a degree. I've learned about grant writing, research design, researcher collaboration, research interpretation, research dissemination, and yes, time management. These are useful skills for me in my pursuit of a career in academic medicine, though useful also for all physicians, regardless of whether they are involved in research. What's next? In the following weeks I will be filing my thesis to the graduate division, submitting a manuscript for publication, and preparing for the wards at UCSF in January!

To Think Like a Mosquito

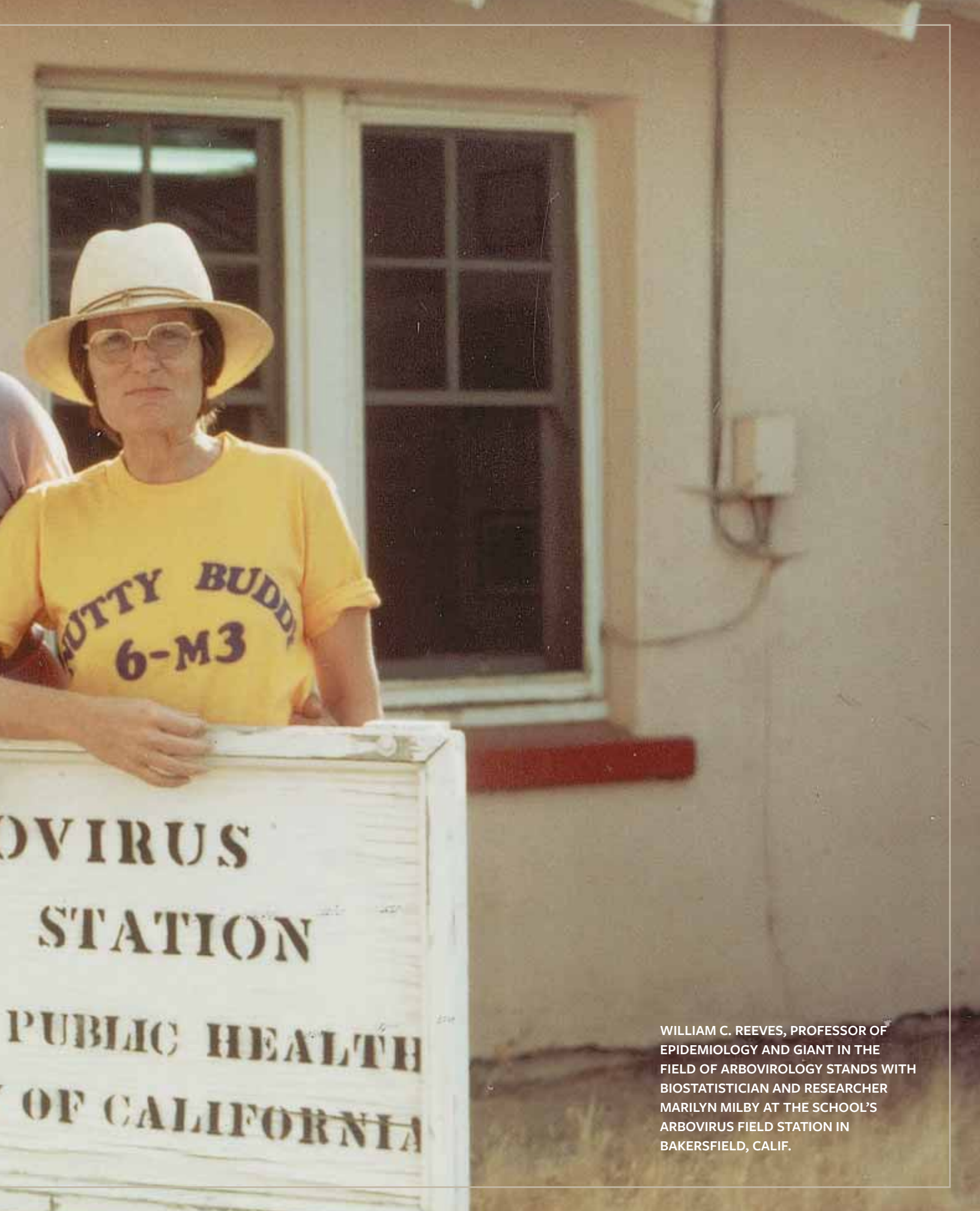
Berkeley researchers battle diseases from malaria to Zika

BY AUSTIN PRICE

The deadliest animal in the world is a miniscule flying insect that carries disease.

Mosquitoes, which to many of us in the United States aren't much more than a backyard nuisance, transmit viruses like yellow fever, dengue, Zika, and chikungunya. These viruses can lead to symptoms like rash, vomiting, headaches, and even birth defects like microcephaly. Too often, they result in death. The World Health Organization estimates that mosquitoes account for the premature death of 720,000 people around the world each year.

The field of arthropod-borne virology, or arbovirology, aims to tackle this global problem. "By definition of vector-borne diseases, you have to look at much beyond just the biology," says Eva Harris, molecular biologist and professor at the School of Public Health. "You have your human aspect, and you have your viral aspect, but you also have your mosquito aspect."



WILLIAM C. REEVES, PROFESSOR OF EPIDEMIOLOGY AND GIANT IN THE FIELD OF ARBOVIROLOGY STANDS WITH BIOSTATISTICIAN AND RESEARCHER MARILYN MILBY AT THE SCHOOL'S ARBOVIRUS FIELD STATION IN BAKERSFIELD, CALIF.

Entomologists must think like epidemiologists, statisticians like ecologists, biologists like sociologists, and so on. This transdisciplinary approach defined the career of the late William C. Reeves, the UC Berkeley professor of epidemiology often credited for coining the term "arbovirus." A trained entomologist, Reeves established a legacy in the field of public health of groundbreaking research and work in the field to combat mosquito-borne illness.

From Harris, who looks at the pathology of viruses and the populations they affect, to John Marshall, a biostatistician at the frontlines of mosquito genetics research, today's School of Public Health faculty members continue that legacy established by Reeves, who would often tell his students and colleagues that to survey and control a mosquito, you must think like one.

ARBOVIROLOGY IN THE MAKING

Yellow fever and dengue had already caused widespread sickness and death for centuries before scientists identified arthropods as the vehicle for transmission. In 1881, a Cuban physician named Carlos Finlay presented his mosquito-as-vector theory to the International Sanitation Conference. Yellow fever periodically ravaged Havana, and Finlay aimed to find out why. He pointed to *Aedes aegypti*—the species of mosquito that would come to be known as the "yellow fever mosquito," though this species would later prove capable of transmitting dengue, chikungunya, and Zika as well.

Fifty-five years later, a tall, broad-shouldered 20-year-old from rural Southern California walked onto the UC Berkeley campus as a student for the first time.

Bill Reeves wasn't particularly studious then. At the end of his career, he would tell science historian Sally Smith Hughes that he delegated much of his growing-up years playing basketball or catching insects. "I wasn't a student," he said. "I was too interested in chasing bugs in my spare time."

Reeves came to Berkeley to study entomology and the School of Public Health had not yet been established. But either way the field of public health hadn't yet crossed Reeves's mind. He bounced from courses and field work in forest entomology to agricultural and economic entomology, all while bumping elbows on the intramural basketball court with other aspiring bug scientists.

Fate intervened. A serious knee injury ended his basketball days and confined him to his textbooks. He leaned heavily into his academic interests until he had taken every entomology course offered on campus, plus courses in microbiology and parasitology. When he transitioned into the entomology graduate program, a professor named W.B. Herms, who had done research on tick-borne diseases in California, offered Reeves a job.

Reeves recalled that this job paid $45 a month, "enough to live on," though he "never had a pay raise." He accepted and became a full-time teaching assistant in medical entomology—a position that further steeped him in the biology of both mosquitoes and the potential diseases they carry.

At that time, thousands of horses across the western United States had died from a virus known as western equine encephalitis. There was no known cause of transmission, though UC Berkeley pathologist Karl F. Meyer had hypothesized that mosquitoes had something to do with it. For his dissertation, Reeves transmitted an isolated strand of the virus to guinea pigs through mosquitoes, proving Meyer's theory. The discovery enabled public health officials to effectively target a key source of disease transmission, leading to the ability to better control the widespread outbreaks encompassing western North America in the 1940s.

WILLIAM C. REEVES AND AUSTRALIAN RESEARCHER MALCOLM SIMPSON COLLECT MOSQUITOES FROM POOLS OF STANDING WATER IN MURRAY VALLEY, AUSTRALIA, 1952.

When Reeves earned his PhD, there was still much to be learned about viruses. UC Berkeley offered no course strictly on virology. But Reeves knew one truth about a virus that would set him up to become a pioneer in an emerging field: "It was some little thing that you couldn't see, you couldn't smell," he said. "But it was there, and it was infectious."

FROM BENCH SCIENCE TO PUBLIC HEALTH

As an entomologist with a PhD, Reeves set a precedent for applying science to the emerging field of public health. In 1943—the same year Reeves graduated—Governor of California Earl Warren signed legislation establishing the School of Public Health. Also in 1943, an epidemic broke out on American soil, in the territory of Hawaii on the edge of World War II. *Aedes aegypti* delivered dengue to Pearl Harbor.

Reeves got the call to serve, not as a military man but as an epidemiologist. The army had a vested interest in hiring entomologists to

"I wasn't a student. I was too interested in chasing bugs in my spare time."

control insect-borne diseases among troops. Reeves knew mosquitoes, as well as how to survey and control the diseases they spread. He spent the remainder of the war as a civilian advisor to the military, eventually joining the Armed Forces Epidemiological Board. He returned to Berkeley in 1949 to teach, but not as an entomologist. He joined the new School of Public Health as a professor of epidemiology, a position he held for over 40 years. He also served, albeit reluctantly, for a few years as the School's fourth dean.

Throughout his career, Reeves's work at the intersection of entomology and epidemiology provided a cornerstone for applied science in the field of public health. He officially retired in 1987, although he continued to come to the School three or four days a week until the early 2000s—passing along his infectious spirit and drive to others at the School, particularly fellow arbovirologists.

"I always had this drive that I wanted to use science in the real world," says Eva Harris, thinking back on her time as a Harvard biochemistry student in the 1980s. In those days, she recalls, physicians were the ones who traveled to the communities affected by arthropod-borne and infectious diseases. Bench scientists typically stayed in the lab. It wasn't yet clear to Harris how to bridge that gap.

Today, Harris is a professor of Infectious Diseases and Vaccinology and director of the Center for Global Public Health. She first made the jump from bench science to public health in Nicaragua, where as a graduate student she was exposed to dengue, literally and figuratively. "I didn't know what it was," she says. "I didn't how how to spell it. I didn't know it was a virus. But I knew it was a big public health problem."

Harris has spent much of her 20-year career at Berkeley finding out everything there is to know about dengue. At any given moment, she has multiple active research projects concerning the various aspects of dengue, from its microbiology to the social implications of its spread in certain populations. She calls this a "renaissance approach" to disease surveillance. The science of each virus is a spectrum, she says. Her lab constitutes researchers from various academic backgrounds, from molecular virologists with a knack for primers and assays to epidemiologists with a lens on the sociopolitical aspects of arboviruses.

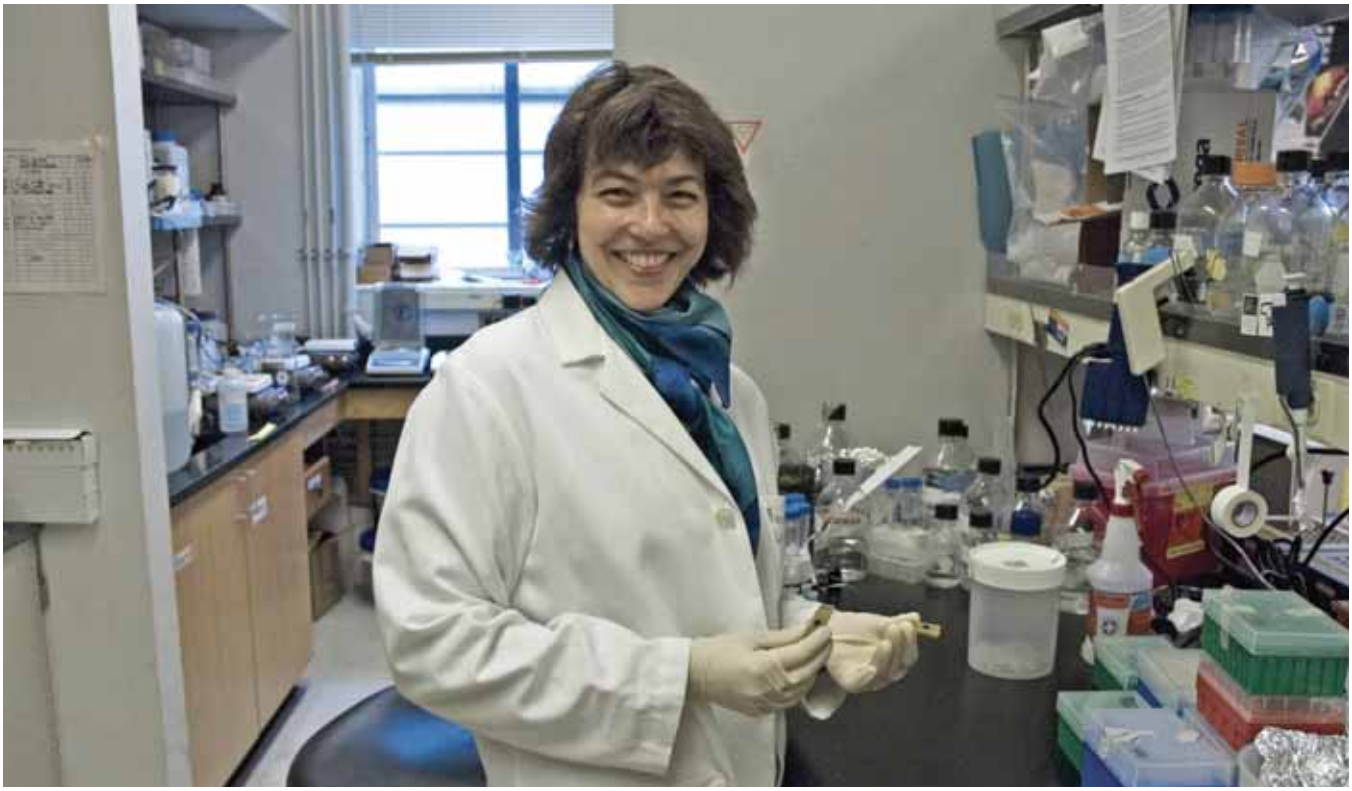
In 2015, Harris's transdisciplinary lab pivoted from dengue to Zika following the outbreak and epidemic that originated in Brazil.

"When Zika came along, there wasn't just one question," says Harris. "There was what I like to call the zillion Zika questions."

Within a few months, she had projects on the ground that would go on to explain multiple aspects of the virus, such as how it affects a developing fetus and just how many people in Nicaragua were eventually infected.

As Harris continues to find out new things about arboviruses, she works within communities in Nicaragua and elsewhere. Solutions to health problems, she explains, don't come only from the mind of a microbiologist. Testing for antibody-dependent enhancement in dengue is one thing. Developing a plan to reuse old tires, where standing water collects and mosquitoes breed, is another.

"If you do all this work across the whole transdisciplinary approach," she says, "then you can really see the whole disease."



EVA HARRIS AS AN ASSOCIATE PROFESSOR IN HER LAB ON THE UC BERKELEY CAMPUS IN THE EARLY 2000s.

TECHNOLOGY ON THE VIROLOGY TOOL BELT

John Marshall, like Harris and Reeves, comes from a hard-science background. As an undergraduate in New Zealand, he studied laser physics and molecular biology. He eventually earned a PhD in mathematics from UCLA. "When you do applied mathematics, you can apply it to high-energy physics, or hedge funds if you want to, or climate change," he says. "Or to any number of diseases and epidemics."

An assistant professor of Biostatistics, Marshall applies his expertise in mathematics and biostatistics to the latter problem. More specifically, he works to control mosquito-borne diseases by targeting the mosquitoes themselves—by modifying their genetics.

Many people have become more familiar with the CRISPR-Cas9 method. Developed over the last decade by Jennifer Doudna, a biochemist at UC Berkeley, CRISPR marks a significant—some say, revolutionary—step in genome editing technology. Marshall says that CRISPR turns "a haphazard, random process" into "a precise, almost digital process." Across campus from Doudna, he researches the application of this and other gene-editing technologies to mosquitoes, in order to control the diseases they spread. Specifically, Marshall models strategies for the safe use of genetically modified mosquitoes such that they can be released, shown to be effective, and removed from a population at the end of a trial.

As a graduate student at UCLA, Marshall worked with ecologist Charles Taylor, who introduced him to the idea that gene editing in mosquitoes could provide a solution to widescale disease transmission. This research can take a number of approaches. One method involves releasing genetically modified, sterile mosquitoes into a population of disease-carrying mosquitoes. This reduces the number of offspring they have, thereby suppressing the population and disease transmission. Another method involves driving genes into the mosquito population that disrupt their ability to transmit disease—a process made much easier by technology like CRISPR.

Marshall spent a year in Mali talking with people, gauging interest in the use of genetically modified mosquitoes to limit disease and co-organizing biosafety workshops to lead the way to a regulatory framework for releasing these mosquitoes in a responsible way. In that time, Marshall recognized that many Malians were receptive to this technological approach, if it meant saving lives.

"At the time I was doing my PhD, two children were dying every minute in sub-Saharan Africa from malaria," says Marshall. "Now it's one child every minute, as a result of bed nets and antimalarial drugs."

With nearly a billion people in sub-Saharan Africa, the distribution of mosquito nets and medicine goes only so far, says Marshall. Gene editing technology like CRISPR has the potential to finish the job in combination with these other tools.

ASSISTANT PROFESSOR JOHN MARSHALL IN HIS LAB IN BERKELEY WAY WEST IN 2018.

"At the time I was doing my PhD, two children were dying every minute in sub-Saharan Africa from malaria."

Gene editing technology comes at the end of a long line of technical advancement in the field of arbovirology. Reeves himself developed techniques to survey mosquitoes, including using carbon dioxide and light to trap them and marking them with a fluorescent dust to track them.

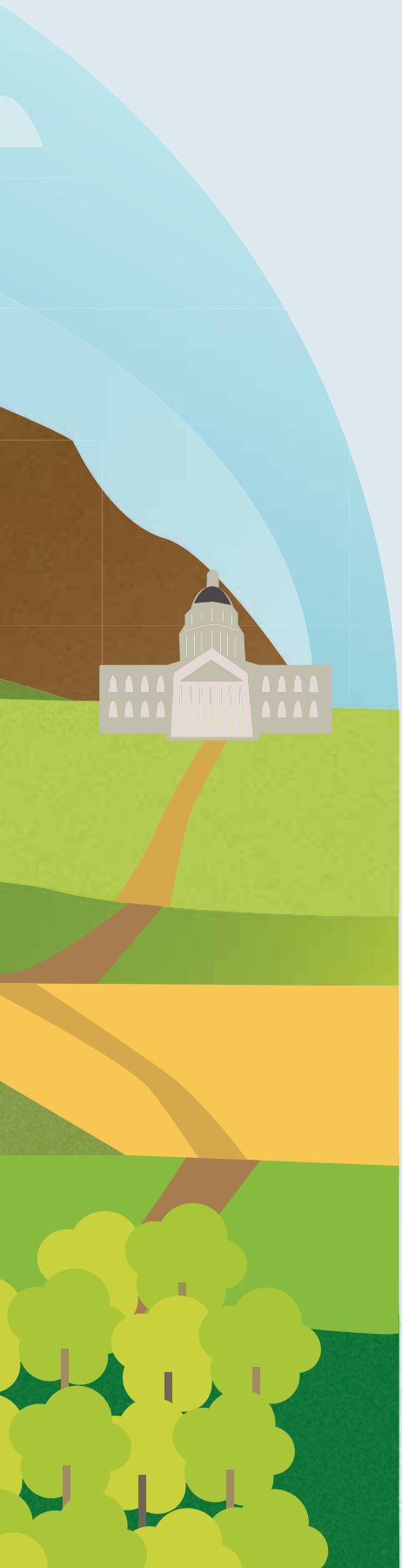
Throughout Harris's career, she has dealt with much of the lab technology that makes studying arboviruses possible. As a graduate student, she began organizing workshops in Nicaragua to introduce scientists to polymerase chain reaction—a technique of amplifying and replicating DNA, often referred to as "molecular photocopying." At that time, notes Harris, Nicaragua had little running water and intermittent electricity, but that didn't stop the advent of technology that has since become ubiquitous in diagnostics and identifying arboviruses. "Polymerase chain reaction is actually quite simple in concept," says Harris. "And very powerful."

In 2004, after six decades at the forefront of arbovirology, Reeves passed away at the age of 87. His background "chasing bugs" had led him to become a "giant in his field," as then Dean Stephen Shortell observed at the time of Reeves's passing. His methodology for colonizing, controlling, and surveying mosquitoes remained integral throughout the rest of the twentieth century. In fact, just a few years before he died, a dead crow in New York City signaled the start of the West Nile Virus epidemic in the United States. The Centers for Disease Control and Prevention gave a retired Reeves a call to help control the outbreak. Dr. Roy Campbell, chief of the surveillance and epidemiology activity of the Arboviral Diseases Branch at the CDC had said that Reeves's encephalitis research from a half-century earlier still provided "a roadmap for understanding West Nile virus."

But with time comes new outbreaks—and an increasing need to deeply and widely understand the world of arthropods and the diseases they carry. The work of Reeves, Harris, and Marshall shows that this understanding lies on a spectrum—from the ecology of the mosquito and where they spawn, to the deep science of what they transmit, to the communities these viruses affect. One researcher can't do this work on his or her own. But the faculty at UC Berkeley show that one researcher can certainly do plenty.

At the end of his career, Hughes asked Reeves, "Do you look upon yourself as an entomologist, an epidemiologist, or something else?"

To which he answered with a laugh. "Yes."



Community Health Service from Salinas to Sacramento

Research centers engage communities and policymakers to move the needle on better health

BY STEPHEN ORNES

For nearly two decades, researchers toiling in a small brown building in Salinas have been probing the effects of pesticides on the health of some of the most vulnerable members of society: kids who live, play, and attend school near agricultural fields. Salinas, about 100 miles south of the Bay Area, lies at the heart of America's "Salad Bowl"—a long, narrow valley near the coast, nestled between two rows of mountains. Most of the lettuce consumed in the United States grows in its agriculturally prolific fields.

But the chemicals sprayed on those fields can take a toll, particularly on children. The study based in the little brown building has made this case time and again. Children exposed to sulfur, for example, are more likely to have asthma and other breathing problems. More than 150 peer-reviewed publications have emerged from this Center for Environmental Research and Children's Health (CERCH) project called CHAMACOS.

Other studies connect a mother's exposure to organophosphates—common insecticides used in homes and fields—with developmental disorders and hyperactivity in children. One investigation found that at seven years old, children born to mothers who live within a kilometer of fields treated with organophosphate pesticides have lower-than-expected IQs, a two IQ-point loss for every 522 pounds of applied pesticides.

The researchers share their findings and information with people who can improve public health and effect change. Those stakeholders include the farmworker families in the Salinas areas, as well as lawmakers and policymakers at the local, state, and national levels. Turning research into action is the ultimate goal of CERCH, housed at the School and the academic home of CHAMACOS and other studies.

It's a goal shared by other University of California initiatives at Berkeley, including the California Program on Access to Care, or CPAC. Established more than 20 years ago and administered by UC Berkeley since 2008, CPAC connects University of California researchers with lawmakers in Sacramento in order to help the state develop evidence-based policy.

These centers first understand and then address the major public health problems facing some of the state's most vulnerable, and often hidden, communities—the working poor, immigrants, and farm workers and their families.

The Valley and Beyond

In Mexican Spanish, chamacos is an endearing term for children. The Center for the Health Assessment of Mothers and Children of Salinas, or CHAMACOS, is the brainchild of Professor Brenda Eskenazi, who divides her time between the Bay Area and the Salad Bowl. "I don't know what ever got me to think I could do a study like this," she says.

By the late 1990s, she'd spent decades studying reproductive epidemiology and the effects of chemicals on children's health. At some point she recognized that, given her location in California, she was surrounded by a vital but overlooked source of exposure—the effects of which hadn't been analyzed.

"I knew it had to be about agriculture," says Eskenazi, who also directs CERCH. "We're the agriculture state. At the time, there wasn't much research being done."

The longitudinal CHAMACOS study focuses on the effects of pesticides and other environmental exposures during pregnancy and early childhood, and the study's young participants—most of whom enrolled before they were born—are now on the cusp of adulthood.

From the beginning, Eskenazi knew she had to involve the families she wanted to study, not only as participants but as partners. Over the years, she and her collaborators have built meaningful and productive relationships with the farmworker families.

"It's important to us to know what the community concerns are, so they can help us with what direction we should be going in our research," says Kim Harley, associate professor of Maternal and Child Health and associate director of CERCH. Those connections make it possible to connect exposures to health risks, and to communicate those findings to the at-risk population.

Community members work with CERCH researchers and are trained to collect data and biological samples. It's an example of community-based participatory research, which means scientists and subjects work as equal partners.

"We really have been able to build a connection with the farmworker community and with the community in general," says Harley. "What we're learning about early life environmental exposures has applications to all of us."

Giving back to the community is an important part of CHAMACOS. The program has educated more than 50,000 people in the community about pesticides and how to protect themselves against unnecessary exposure—even through small changes. "We learned in the study that if people keep their shoes outside and wipe their feet before they enter, there are lower levels of pesticide inside," says Eskenazi.

Giving back also includes contributing to the education of the children themselves. More than 500 have participated in the study since birth, and an additional 300 have been enrolled since they were nine years old. Now, those children are on the cusp of adulthood. Some have children of their own; others are writing college essays. Some have even become co-researchers.

"We work with them to develop neat research studies that they design and do the data collection for," says Harley. In a study called HERMOSA, for example, teenage researchers analyzed the effects of exposure to endocrine disruptors often used in cosmetics and designed interventions to reduce exposure. (Hermosa means beautiful in Spanish.) In another offshoot study, teenage researchers have been studying pesticide exposure among their peers in the community not currently enrolled in CHAMACOS.

The study's leaders also want to affect change in policy and put safeguards in place to protect the people of Salinas. In March 2017, for example, Berkeley environmental health scientist Asa Bradman presented findings from a CHAMACOS paper to the California State Senate. In January 2018, the state implemented regulations requiring schools near fields be notified in advance of the application of pesticides, and prohibiting the use of some pesticides near schools at certain times.

Harley and other CERCH researchers have also studied exposures to chemicals like Bisphenol-A (BPA) and those found in flame retardants. "Our flame retardants research played a role in changing the flammability standards of the state of California with respect to the chemicals in foam," she says.

CLOCKWISE FROM TOP: BRENDA ESKENAZI AS AN ASSISTANT PROFESSOR, AGRICULTURAL FIELDS IN THE SALINAS VALLEY, THE CERCH TEAM

"Our flame retardants research played a role in changing the flammability standards of the state of California with respect to the chemicals in foam."

The hundreds of papers and additional studies using CHAMACOS data show its potential to help inform research in a variety of areas, including air pollution exposure, genetics, and even dentistry.

"If I have to credit myself with anything, it's that I love the interdisciplinary nature of this thing," says Eskenazi, who originally trained as a neuropsychologist. "The study is very transdisciplinary."

The success of the CERCH has caught the attention of epidemiologists and other researchers worldwide. "We have shared our study protocols widely with people across the world," says Eskenazi. On one day, for example, she hosted collaborators from Chile, Brazil, and France. She also advises on birth cohort studies that look at environmental exposures around the world. "I think we've helped move the field forward," she says. "We have a model of what can be done."

The end, she says, is not in sight. Eskenazi has put practices in place so that CHAMACOS can continue its usefulness long into the future. For example, the study has produced a biorepository of about 350,000 samples, she says. "People can use these data and biological samples for years to come."

She's also thinking about future study populations. "I feel like in some ways that I have 600 children," Eskenazi says. "I would love if we could follow up on the children's children, the study's grandchildren."

Spreading the Word

Peer-reviewed publications are often seen as a benchmark of academic success, but making research useful means making it available beyond the boundaries of academia. That can be a high hurdle, as researches have incentives to publish but not to share, says Professor Will Dow, a health economist and interim dean of the School of Public Health.

"We need to provide them with extra resources in order to be able to disseminate, because that's a substantial extra step beyond writing journal articles," he says. "Encouragement sometimes means paying for more of their own time to engage with legislative stakeholders."

> "Faculty are often incentivized to produce knowledge, but not to use evidence to help the legislature."

In 2006, when health reform was a pressing topic in the Schwarzenegger administration, Dow had been conducting research on risk adjustment that could help bring perspective to the conversation. He applied for assistance from the California Program on Access to Care, which provided him with a grant that funded his travel and time to join the statewide conversation by briefing lawmakers on his research. In 2009, he received another CPAC grant to fund dissertation research by graduate student Carrie Colla, who was looking at the effects on employers of mandated health benefits in San Francisco. That project resulted in multiple publications, and Dow and Colla, now an associate professor at Dartmouth College, shared their results with policymakers in San Francisco, Sacramento, and Washington D.C.

Dow says that the CPAC grant was critical to helping Colla complete her research. "While funding is available for many types of healthcare research," says Dow, "it is not readily available for this type of timely, policy-relevant research."

CPAC was established with projects like Dow's in mind; its goal was to "bring academic expertise to bear on helping the state develop evidence-based policy," says Gilbert Ojeda, the founding director of CPAC.

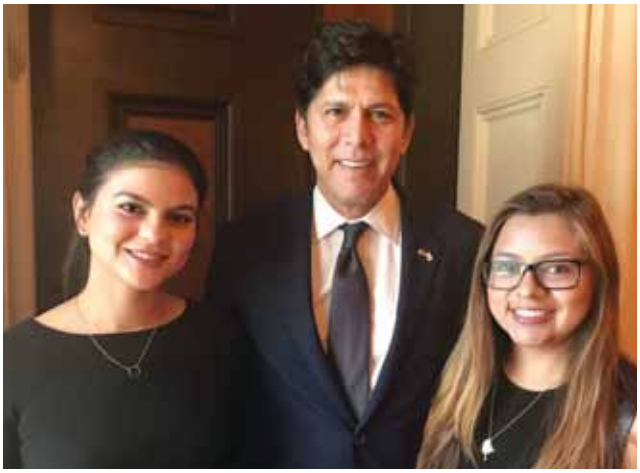
The center began in 1997, when the California legislature reached out to the University of California system to pilot a program to bring faculty expertise to state legislators, with the goal of using evidence to shape around issues related to the working poor, immigrants, and farmworkers. "It followed the logic that state colleges and universities ought to give a direct value to the decisions that the state makes," says Ojeda.

The program had three primary components, according to Ojeda. First, it funded original research in relevant areas. Second, it offered technical assistance for researchers to connect with policymakers, such as presenting evidence to a relevant government committee. Third, it helped develop new initiatives to reach vulnerable populations.

For example, Ojeda says, the CPAC served as a sort of incubator for the Health Initiative of the Americas, an international program established at the School of Public Health in 2001 to reduce health disparities in California's Latino population, and the California Medicaid Research Institute, which united experts throughout the University of California system to work on the largest Medicaid program in the country.

The CPAC has awarded more than 150 grants to state university researchers. Hector Rodriguez, professor of Health Policy and Management, is now the faculty director of the center. Under his guidance, the center is emphasizing moving UC investigator generate evidence into policy changes aimed at improving health equity.

"Faculty are often incentivized to produce knowledge, but not to use evidence to help the legislature," he says. "There is a market failure in our system." That's where CPAC



CLOCKWISE FROM LEFT: CPAC AT THE CALIFORNIA STATE SENATE FLOOR; ALEIN HARO AND ANDREA JIMENEZ, CPAC FELLOWS, WITH SEN. KEVIN DE LEON DURING A SENATE HEARING; CPAC FOUNDER GILBERT OJEDA

comes in. "We try to remedy that failure by funding and providing technical assistance to faculty who have evidence to share with the legislative stakeholders who can use that evidence to develop and implement public policy."

To have a more focused impact on policy and community change, CPAC is now focused exclusively on disseminate existing evidence—rather than funding original research—to decision-makers who need to see it. For example, CPAC has funded six projects to develop tools like videos, briefs, roundtables, or curricula that will help disseminate evidence to key audiences. These are aimed at influencing policy in areas including helping undocumented Californians, attending to the needs of older adults in the inland empire, and making it illegal for ICE to deport patients from hospitals.

Rodriguez hopes these funding opportunities will provide incentives to academics to share their work in order to improve health equity. "Focusing on end users will change the way we do research over time," he says, "and encourage funders of research to see the value in supporting the dissemination and use of evidence."

CPAC also offers small grants to faculty members so they can respond to requests from legislative committees, caucuses, and offices. "CPAC's best asset to the legislature is our faculty and researchers," Rodriguez says, "We bring expertise rom across the UC system."

By connecting researchers with policymakers, CPAC helps shape the conversation and prioritization of health policy issues at many levels. CPAC's legacy is secure, even if its financial future is less certain.

As the center works to raise the influence of research in and around state issues, both Ojeda and Rodriguez see a major opportunity on the horizon. California's leaders will continue to wrestle with the questions surrounding universal coverage and lowering the cost of care, and they'll continue to benefit from the input of experts at Berkeley and beyond who have studied health markets here and around the world. As will all Californians.

The Stethoscope of the Future

MACHINE LEARNING AT THE POINT OF CARE

BY AUSTIN PRICE

Two hundred years ago, a French physician invented the stethoscope.

Inspired by a hearing aid known as the ear trumpet, René Laennec fashioned a small funnel to the end of a wooden tube to direct soundwaves from inside his patients' bodies to his ear. Before that, doctors used percussive methods, or placed their ear directly on patients' bodies, to observe internal sounds. Laennec wasn't alone in recognizing the limits of such practices, so he developed a way to help. Today, doctors seldom practice without the symbolic tool around their necks.

"There are all these precedents for fundamental changes in this field brought about by new technology," says Ziad Obermeyer, an associate professor of Health Policy and Management at the School of Public Health. After the stethoscope came microscopy, then radiography and x-rays. Health professionals quickly adopted these tools into common medical practice, which tells us one thing: as healthcare has become increasingly complicated; man left to his own sensory devices can't keep up. We've developed tools because we require them.

Obermeyer joined the faculty at the School in the summer of 2018 after years of research into machine learning as a way to better understand patients' histories, environments, and levels of health risks. Like the stethoscope, machine learning can improve diagnoses and limit physician error.

In other words, the next fundamental tool in healthcare, he says, is the algorithm. "Big data will transform medicine," he wrote definitively in the *New England Journal of Medicine*.

Machine learning—the process of running data through automated algorithms to produce a result or prediction—has become more and more commonplace in our everyday, twenty-first-century lives. Netflix recommends movies based on our preferences. Amazon shows us advertisements based on our purchase history. A self-driving car can approach a crosswalk and—after computing the world around it through light detection and ranging (LIDAR)—stop for a pedestrian.

"It's just algorithms layered on algorithms," says Obermeyer. "And each of those algorithms parse out this super complex task into what is fundamentally a prediction."

As an emergency physician in Boston, Obermeyer recognized that machine learning could also be applied to the increasingly complicated field of medicine. "Doctors are faced with difficult decisions, under a lot of uncertainty," he says. "They can become acutely aware of how errors in judgement can lead to really bad outcomes that affect people's lives."

After his residency, Obermeyer joined the faculty at Harvard Medical School and began working with computer scientists and economists like Sendhil Mullainathan at the University of Chicago and Jon Kolstad and Ben Handel at UC Berkeley to develop algorithms and data sets that could make certain predictions about patient health risks. He has focused particularly on the unfortunate number of patients who die after being discharged from the emergency room, despite no risk of life-limiting illness reported in the patients' claims. Many of those patients, he has found, die of heart disease. In the meantime, doctors are often accused of doing way too many tests in the ER, says Obermeyer, while their diagnoses can still overlook life-saving information.

Machine learning, his research has shown, can mitigate trial and error from the emergency

"Big data will transform medicine."

room, helping doctors make predictions on risks of abnormal heart rhythms, even for patients without clear risk factors.

The use of machine learning in healthcare doesn't have to be limited to the hospital setting. As researchers find ways to collect data in developing countries, machine learning could better inform global health policy. Obermeyer gives the example of maternal health. "There's a lot of complex decision-making around childbirth," he says. "Some women are high-risk, others are not."

"Doctors are faced with difficult decisions, under a lot of uncertainty. They can become acutely aware of how errors in judgement can lead to really bad outcomes that affect people's lives."

The first step would be to matriculate data, which, even in developing countries that may lack electronic health records, Obermeyer says, is getting more and more feasible. He points to Joshua Blumenstock at the UC Berkeley School of Information, who uses cell-phone and satellite data to map poverty in Rwanda. This type of data could help healthcare professionals sort through the complexities that burden them so they can better deliver appropriate care to the people that need it the most.

No matter the healthcare issue, Obermeyer sums up machine learning's role: "Complex data in, important decision out."

Obermeyer and his team haven't yet implemented machine learning in an emergency room setting. Medicine, he reminds us, is of course different from other uses of algorithms like Netflix or Amazon. The stakes are higher. Randomized trials take careful planning.

There are statistical problems that Obermeyer and his colleagues are currently addressing. A 2016 ProPublica investigation showed one algorithm, for example, that had a racial bias when computing judicial decisions. "These are the things you need to be careful about when designing algorithms, well before you deploy them," says Obermeyer.

Recently relocated to the Bay Area, Obermeyer and his team are looking for partners to begin putting his research into practice. "We're now at the point where we are sufficiently confident that the work we're doing is ready to test," he says. "We're actively starting to try to find partners to do that."

Our computer screens won't replace doctors, Obermeyer clarifies. Although airline pilots use machine learning on commercial flights more and more, "I don't think that even today anyone believes that we're going to replace pilots with algorithms," says Obermeyer.

But the use of algorithms has already fundamentally guided much of our twenty-first-century technology. Machine learning has already become ubiquitous in other sciences. Astronomers no longer depend on the naked eye to chart the night sky for example. The future of medicine, Obermeyer believes, is no different.

Much of Obermeyer's talk of the future builds on his perspective of the past. Before medical school, he earned a MPhil in science history from Cambridge.

Think of the printing press, Obermeyer says. In the 15th century, Johannes Gutenberg invented a way to use movable type to mass produce printed text. The most obvious port of this technology was the first printed Bible—followed by a complete fundamental change in the spread of information and a subsequent revolution of thought. "Of course, no one saw the fundamental transformation that the printing press was going to produce in society," says Obermeyer. "It's like that with any transformative new technology. We just can't imagine what may happen."

MOVING BEYOND MEDICINE

AND INTO OUR NEIGHBORHOODS

Berkeley faculty build on the Berkeley legacy of researching the social determinants of health

BY AUSTIN PRICE

Before Jennifer Ahern studied social epidemiology under S. Leonard Syme, before she joined the UC Berkeley faculty as a social epidemiologist herself, she grew up in Baltimore.

"Baltimore had a lot of social problems, very high in violence and crime, antagonistic race relations, complicated history," says Ahern. "None of which I really understood at the time."

Not unlike many cities across the country, Baltimore has long been emblematic of how social determinants affect health. This is the city where Anthony Iton—alumnus and now senior vice president for health communities at the California Endowment—came up with the trope that aptly describes the social determinants of health: When it comes to health, our zip code counts more than our genetic code. Neighborhood factors like a lack of adequate housing, transportation, education, and safe public green space—compounded by environmental hazards like air pollution and toxic water—result in health disparities between those at the center of society and their neighbors at the margin. The life expectancy of some Baltimore neighborhoods can be 20 years lower than in others. What's more, these social determinants are often representative of structural and systematic racial and economic disenfranchisement.

At Brown University, Ahern took a class with social epidemiologist Sally Zierler, who introduced her to the concept of looking beyond the medical system to evaluate these social factors that affect health outcomes. "Taking that class with Sally was eye opening," Ahern says, to the point that she sought further education—and eventually joined the faculty—at UC Berkeley, where the social determinants of health have been woven into the research DNA of the School of Public Health over the last 50 years.

"Medical care is important when we need it," says Stephen Shortell, Dean Emeritus and a professor of the graduate school in Health

Above: Associate Professor of Epidemiology Jennifer Ahern
Previous Page: Professor Emerita Meredith Minkler, Alumnus Sir Michael Marmot, Professor Emeritus Len Syme

Dean Emeritus and Professor of the Graduate School Stephen Shortell with Health Policy PhD students Leeann Comfort and Jessica Poon

Policy and Management, "but it's not really the major determinant of our health."

The School abides by the value that health is a human right. But one step further, the faculty believe that a human's right to health is also a right to a safe and healthy place to live, work, and play, as well as to a healthy and clean environment. "To really address health equity, we need to talk first and foremost about equity more broadly," says Professor Emerita Meredith Minkler, "You can't have health equity without racial and social equity."

UC BERKELEY'S PIONEERING LEGACY

"It goes back in many ways to Len Syme," says Shortell. "He's one of the fathers of social epidemiology."

In 1955 a 23-year-old Syme attended a medical sociology program at Yale University. He and three other fellows were given a choice between two concentrations: sociology *of* medicine—which examined the institution of medicine and patient attitudes—or sociology *in* medicine. Syme understood the latter to mean the study of how social factors impact health. He was the only fellow to choose this option.

According to the Yale faculty at the time, sociology in medicine actually evaluated the link between social class and mental illness. But Syme had little interest in mental illness. "I wanted to know if social factors were related to diseases that were not so obviously connected to the social world," he wrote in an article for *Epidemiologic Perspectives & Innovation*. "Diseases such as heart disease, cancer and arthritis." In retrospect, he called this a "naive view" and a "reckless decision," because "there was virtually no literature on these topics at the time and no one was sure there ever would be." Naivete or sociological intuition—either way, his decision to look at the social causes of diseases, not just the diseases themselves, was a turning point in efforts to bring sociological methods to epidemiology. He later became the first sociologist to hold a position in an epidemiology department, when he joined the School's faculty in 1968.

"You can't have health equity without racial and social equity."

Syme often points to a study he conducted on San Francisco bus drivers to explain his social epidemiological approach. The research focused on the high rates of hypertension among bus drivers compared to other employees in other industries and profession—but the research team soon noticed that these bus drivers also had higher rates of lower-back pain, respiratory problems, and alcohol-related diseases.

"What's going on here?" Syme recounts asking himself. "Is this a study of these diseases, or should we be studying the job of the driver that's leading to all of these diseases?"

That distinction, says Syme, is the difference between a social epidemiological, public health approach and a traditional, clinical medical approach. Going beyond the medically-minded mold of epidemiology, which looks primarily at diseases, Syme began to look at community forces—in the case of this study, the job as a bus driver—to determine the social causes for those diseases.

Syme's career at Berkeley saw him apply this approach to various social contexts, alongside many students and postdoctoral scholars who would go on to become giants in the field of social health determinants by their own right. He conducted early research on how social factors and acculturation among Japanese immigrants to California influenced their cardiovascular mortality. One student on this project, Lisa Berkman, branched off this study to explain how supportive social ties—or the lack thereof, or loneliness—can influence chronic disease susceptibility.

Syme also advised a doctoral student named Nancy Krieger, who has since become a prominent Harvard epidemiologist examining the impact of racism on health outcomes. In a recent editorial for the British medical weekly *THE BMJ*, she asked, "Are hate crimes a public health issue?"

Another student of Syme's, Sir Michael Marmot, went on to conduct the renowned Whitehall study of British Civil Servants, which showed that health risk directly correlates with social class. The higher you are on the hierarchy, the better your health. Over the course of his career, Marmot has brought the social determinants of health into the global spotlight. In 2000 he was knighted by Queen Elizabeth II for his work in this field. He chaired the Commission on Social Determinants of Health set up by the World Health Organization in 2005, and later conducted a review of health inequalities in both his native England and continental Europe. He currently teaches at University College London.

"Race was associated with every health outcome, but I wanted to know why. Why were African Americans more likely to live sicker and die younger?"

Syme's five decades at the School saw the social determinants permeate the research of many other alumni as well. George Kaplan, a former postdoc, founded the Center for Social Epidemiology & Population Health at the University of Michigan. Maternal and Child Health alumnus Michael Lu worked to explain racial disparities in birth outcomes. And alumna Kate Pickett co-authored a well-circulated book on health inequality called *The Spirit Level* with her partner and fellow epidemiologist Richard Wilkinson.

However, as Syme and his colleagues provided more and more evidence for the social causes of certain health outcomes, they became increasingly concerned about how best to approach solving these endemic problems.

"It's estimated that only about one percent of research results ever end up benefiting society," says Linda Neuhauser, who co-leads (with Syme) a research center called Health Research for Action. "The accepted idea that researchers make discoveries and then community practitioners and policymakers are expected to apply them doesn't usually work."

Meredith Minkler, another longtime faculty member at the School and an alumna herself, has spent her 40 years at UC Berkeley developing a research approach known as community-based participatory research, or CBPR. Minkler defines CBPR as "research that is community-based, rather than merely community placed." Community-based research, she says, "helps to turn the traditional 'outside expert' research paradigm on its head, so that we work *with* rather than *on* communities and really focus on issues that matter to the people." This means that local residents participate in defining the research agenda and the data collection process in their own communities, and afterwards give input to help refine and translate the findings into action.

Minkler herself has employed CBPR in many areas of community health, particularly involving criminal justice reform, food security, and public policy. About a decade ago, she worked on a project known as the San Francisco Chinatown Restaurant Worker Health and Safety Study, in which she worked with members of the Chinatown community to refine research questions, improve data measurements, and interpret findings. It turned out that many restaurant workers were not getting the wages and benefits to which they were entitled. A few years later, Minkler's research influenced legislation. In 2011, San Francisco became only the second city in the country to pass a wage theft law.

THE SOCIAL DETERMINANTS OF HEALTH INEQUALITY

"Health equity means attaining the highest level of health for all," says Mahasin Mujahid, a social epidemiologist and associate professor at the School of Public Health. "For me that does not mean equitable input. It means equitable output."

In other words, that means investing more time and public resources in vulnerable populations—groups that "start ten feet under," as Mujahid says—where the need is greatest.

Through the legacy of Syme, Minkler, and others, the School of Public Health has long been fertile ground for advanced research into the impacts of systems theory, environmental causation of health problems, and upstream social factors and social justice. This legacy has paved the way for today's continued pursuit of health equity, particularly for those marginalized communities facing an ongoing struggle brought on by a history of exclusion and racism.

Associate Professor of Epidemiology Mahasin S. Mujahid

The "health equity team" of faculty at the School uses a multi-pronged approach to addressing these complex problems. Rachel Morello-Frosch and Jason Corburn, both with joint appointments in other departments on campus, focus on the environmental injustices that plague low-income and minority communities. Mujahid and Amani Allen (formerly Nuru-Jeter) research how racial discrimination and neighborhood stressors such as racial residential segregation and gentrification increase the risk of chronic disease among African Americans and other racial minority groups. Denise Herd examines the interplay of culture and behavior on racial health disparities and serves as the associate director of the Haas Institute for a Fair and Inclusive Society. And Shortell, along with colleagues Hector Rodriguez and Amanda Brewster, looks at the functionality of the healthcare system and how providers are incentivized to integrate social determinants into clinical patient care.

"Berkeley is known for doing work that's strong methodologically," says Ahern—and this is true across the range of approaches used under the umbrella of social epidemiology. Ahern herself researches the social implications of violence. She also teaches the graduate seminar on social epidemiology methods, through which she directly imparts Syme's methodological legacy to the next generation of students. The students then chart new territory, come up with new combinations of theoretical and statistical approaches, and ask new questions to move beyond the status quo.

NEIGHBORHOODS DO MATTER FOR HEALTH

Mujahid became a social epidemiologist by asking why.

When she was a graduate biostatistics student at the University of Michigan, a professor explained to her that all biostatistical models need to account for certain variables, including race, gender, and age. Statisticians understood that health disparities often fall along racial and ethnic divides, but Mujahid wanted to investigate the causes for these variables. "Race was associated with every health outcome, but I wanted to know why," she says. "Why were African Americans more likely to live sicker and die younger?"

The answer, she would discover, lies in social and physical contexts. Mujahid's research has connected higher rates of heart disease—the leading cause of death in the United States today—with neighborhood

characteristics like food insecurity, crime, inadequate housing, and poorly funded education. These social determinants "get under the skin" of the residents in these neighborhoods, affecting the physiology of their bodies.

"Neighborhoods do matter for health," she says.

"In the United States and Europe, youth drinking has gone down. However, those rates have not dropped as much for vulnerable populations like African American kids."

Professor of Environmental Health Sciences Rachel Morello-Frosch

Morello-Frosch has employed other methods to come to a similar conclusion. In one 4-year CBPR project called the Household Exposure Study, she trained low-income residents in Richmond, California, to monitor air quality and collect dust samples along the fence line of the Chevron petroleum refinery that towers over their neighborhood. These residents had long been concerned that elevated cancer and asthma rates were due to living in close proximity to the refinery. Their samples were then compared to similar samples collected in Bolinas, where there is essentially no industry. Unsurprisingly, there was a significant difference in dangerous exposure levels.

This study quantifies the health impact of living in proximity to environmental hazards, which is a common characteristic of many low-income communities across the country from Flint, Michigan to Houston's Manchester neighborhood and parts of Brooklyn and the Bronx.

Even before he studied urban environmental planning as a graduate student at MIT, Corburn recognized these urban disparities as clear signs of environmental injustice. A native New Yorker, he grew up noticing that low-income communities across the five boroughs contained bus depots, refineries, and other sources of asthma-inducing air pollution.

"This doesn't happen by accident," says Corburn, who has since become a far-reaching researcher on environmental justice issues around the world. "It turns out there are reasons behind why there are toxins in certain neighborhoods, why there's air pollution, waste, terrible infrastructure, or lack of infrastructure like water and sanitation and safe toilets in places like Nairobi—the root cause of all that is discrimination and racism."

In other words, today's systemic racial discrimination is tomorrow's higher rates of cardiovascular disease, asthma, HIV, and other chronic illnesses in minority communities.

THE INTERSECTION OF RACE AND PLACE

Just as neighborhood contexts matter for health, according to Mujahid, these social and physical factors can also serve as "the root causes of racial and ethnic disparities in cardiovascular disease" and other health outcomes. These factors aren't limited to the environmental injustices that minority communities often face (Richmond, along the fenceline with the Chevron refinery, is a historically black and hispanic neighborhood). As School faculty research reveals, there are health effects of racial disenfranchisement even more invisible than toxic particulate matter in the air.

For instance, there's allostatic load, defined as the physiological wear and tear on our bodies due to repeated adaptation to stress.

Professor of Community Health Sciences Denise Herd

"Allostatic load is an indicator of multi-system physiological dysregulation," says Amani Allen, "It's a composite measure of a variety of biological markers indicative of how well different systems in the body are functioning. It's an early marker of disease risk."

When Allen was a postdoc in the Robert Wood Johnson Health and Society Scholars program, and trying to make sense of some of her prior research on income inequality and racial segregation, she began talking to colleagues in health psychology about stress. "I wanted to know how neighborhood factors turned into preterm birth or cardiovascular disease."

One study was particularly influential—a 2006 study by University of Michigan's Arline Geronimus, which found that middle-aged, black females measured significantly higher levels of allostatic load compared to white men and women and black men. Allen wanted to know why, so she designed the African American Women's Heart & Health Study to examine whether social stressors like racial discrimination are connected to these physiological outcomes.

Allen surveyed 208 middle-aged African American women in the Bay Area about their experiences of racial discrimination in different contexts—at work or school, finding housing or employment, applying for a bank loan, and so on—over their life course. The research team then gave these women a physical exam and drew blood samples to determine their allostatic load. The results, recently published in the journal *Psychoneuroendocrinology*, show that less-educated African American women who reported higher levels of racial discrimination had higher levels of allostatic load and faced a higher risk of developing chronic diseases.

Allen's research explores one way in which racial discrimination can lead to poorer health outcomes. But there are other mechanisms. Take Herd's long-term studies of racial disparities in alcohol-related diseases for example. A medical anthropologist and behavioral sciences professor, Herd evaluates culture for the social determinants of health.

"In the United States and Europe, youth drinking has gone down," says Herd. "However, those rates have not dropped as much for vulnerable populations like African American kids."

Higher alcohol consumption in turn translates to higher rates of alcohol-related diseases, like liver cirrhosis. And the problem may be worse than what her research shows. She depends on school and household surveys, which omits even the most vulnerable—those who have dropped out of school or may be homeless. Herd's research attempts to connect these higher rates of liver cirrhosis and other outcomes to the promotion of alcohol through hip-hop artists and other youth icons, as well as to the inferior alcohol prevention education low-income students receive in the public school system.

"This changes the conversation from 'intervention focused on behavior' to 'intervention focused on society itself.'"

"A vulnerable population doesn't get the services it needs," says Herd. "There's a great disparity in almost every single kind of condition, with almost every health outcome you can think of."

"We keep looking at things like behavior—people need to eat better, they need to exercise, go to the doctor more. Even if people do all of those things, I would argue that we would still see health disparities," says Allen. "We now know that the experience of social stress is associated with so many poor health outcomes. I think that this changes the conversation from 'intervention focused on behavior' to 'intervention focused on society itself.'"

RESEARCH TO ACTION IN THE HEALTHCARE SYSTEM

Social epidemiology, environmental injustice, and racial health disparities bring us outside the medical system to ask questions about what truly causes health outcomes. "But public health is not only about identifying risks," says Allen. "Ultimately it's about improving population health and reducing health disparities."

The next step for many researchers is intervention. For Steve Shortell, that means linking the healthcare system to community organizations that address the underlying social determinants of health.

In his 45-year career as a professor and health services and policy researcher—including 11 years as dean of the School of Public Health—Shortell has seen the conversation surrounding the social determinants of health evolve, particularly as it pertains to how the healthcare system itself should respond to the growing body of health disparity scholarship. "It's only now becoming top of mind to medical providers that these [social determinants] are important," he says.

Much of Shortell's research focuses on reforming the organizational healthcare delivery system to better include the social determinants of health. In 1993 he coined the phrase "holographic organization" to describe an integrated healthcare system. "In parts," he says, "you embed the whole."

Alongside colleague Hector Rodriguez, Shortell started the Center for Healthcare Organizational and Innovation Research, or CHOIR, in part to evaluate the interface between healthcare organizations and the social determinants that affect their communities. The CHOIR team has worked to integrate factors like transportation, housing, and access to healthy food into patient screening, engagement, and care.

"It's a huge undertaking," says Shortell, not least because disparate data exchange and uneven budget distribution across health and social service organizations present obstacles to his "holographic organization." The CHOIR center works to integrate a system that up to this point has been structurally siloed.

Mujahid has also begun to pivot her social epidemiological research into intervention into health systems and clinical care. In 2014, the

Professor of Public Health and City and Regional Planning Jason Corburn

National Academy of Sciences, Medicine and Engineering released a report calling for the inclusion of more behavioral and social factors in electronic health records systems. In response, Mujahid and colleagues from UCSF recently completed a project geocoding 5.9 million electronic health records in the UCSF medical system. These health records will now include indicators of neighborhood environments, and therefore social determinants of health, to help care providers accurately screen patients and better understand "how social context really shapes patient outcomes."

CITIZEN SCIENCE CAN HELP

Beyond hospital management, place-based interventions—or "intervention focused on society itself"—present a new set of possibilities, though not without problems. "It's costly and complex," says Herd, explaining why "research on the cause of the problem is much more developed than the research on the solution to the problem."

According to Mujahid, interventions in certain communities might not be reaching the people who need it the most because of gentrification, in which the most vulnerable people in these communities are at risk of displacement. Mujahid studies the effects of gentrification on health outcomes and has found strong links between living in a gentrifying neighborhood and poor health status among African Americans. "If we want to address health disparities," she says, "we have to be sure that we can create certain policies, like rent-control policies, that both protect the rights of residents as well as address structural racism."

"We keep looking at things like behavior—people need to eat better, they need to exercise, go to the doctor more. Even if people do all of those things, I would argue that we would still see health disparities."

"Better health and a better society," says Herd, "takes a lot of social and political motivation." In many ways, this motivation for change comes from the bottom up.

"An anchor part of my research in health equity is definitely community engagement, community participation," says Corburn. Like Rachel Morello-Frosch, Linda Neuhauser, Meredith Minkler, and others, Corburn has found CBPR to be a bedrock for research that instigates policy change. He primarily focuses on citizen science, saying that whether in Kenya's slums, Brazil's favelas, or the streets of Richmond or Brooklyn, "citizen science moves into action. It encourages an action-oriented approach to health equity."

Community-based participatory research also puts data collection in the hands of people exposed to social and physical inequalities, he explains, which in turn extends the reach of data collection beyond where the academic can go. "And importantly," he says, "it explicitly includes residents in translating that data into action."

His first book, *Street Science*, documented the use of citizen science to measure environmental injustices in Brooklyn: residents learn to use air monitors and water samplers to quantify environmental injustices like subsistence fishing in a dirty East River, childhood lead poisoning, and asthma-inducing air quality.

"Citizen science isn't just getting folks to use professional technology," he says. "They're part of the analysis and the meaning-making. Finding out what these data mean for us and our community, and what needs to be done."

A NEW RESEARCH STANDARD

In 2002, Syme and a postdoc named Katherine Frohlich co-wrote an article for the journal *Epidemiology* observing that in the prior decade, 10 new books focused on the social determinants of diseases had been published. "We suggested that this explosion of work marked the coming of age of the field of social epidemiology," Syme wrote in a subsequent article a few years later. By 2005, Syme had seen a dozen more social epidemiology books published, along with at least a dozen National Research Council reports and hundreds of journal articles on social and behavioral approaches to health inequalities.

Today, the social determinants of health have become ubiquitous in public health scholarship. "It's almost unusual if there is no acknowledgement of social determinants in someone's research," says Ahern.

In the same way, CBPR raised the bar to a new base level of ethical research in community public health. Research *with*, rather than *on*, a community is a new standard for researchers who don't want to be, as Minkler characterizes them, "mosquitoes that suck your blood, then leave."

As Syme, Minkler, and others have pioneered approaches to bring epidemiology beyond the medical mold, the social determinants of health have shaped the educational mission of the School. In the last few decades, students have come to the School to take courses in topics such as cultural diversity in health, social epidemiology theory, stress biology, and research advances in health disparities, healthy cities, and structural competency.

Beyond documenting problems and organizing solutions, the next step for these faculty researchers is education—training their successors to continue addressing the social side of health outcomes, to help create a more equitable society for all.

THE KAISER PERMANENTE SCHOLARS DECADE CLUB

A public-private partnership approaches 200 students trained to give back

BY DAVID TULLER

In the spring of 2017, Juan Carlos Piña accepted an offer from the School of Public Health's Health and Social Behavior program to join the next cohort of MPH students. But he soon found himself reconsidering his decision due to the anticipated expenses.

Then, in July, he learned he'd been named one of 23 Kaiser Permanente Public Health Scholars for that year. He would receive a $15,000 stipend for each of his two years in the program—almost enough to cover his tuition.

"I was blindsided by the opportunity," says Piña. "I had no idea that the program existed. It was like a miracle."

The UC Berkeley–Kaiser Permanente Public Health Scholars Program was designed to support students like Piña. As an undergraduate at UC Davis, Piña had sought out opportunities to help others from disadvantaged backgrounds—translating for an immigrant law clinic, for example, and mentoring low-income high school students.

After graduation, Piña worked as a junior specialist with the University's Center for Health and the Environment, conducting a study on heat illness prevention among fieldworkers. From an early age he became familiar with the many challenges facing farmworkers and their families—his parents had emigrated from Mexico to work in California's agricultural fields—and he sought to give back to this community.

"Because of the skills, knowledge, and insights I gained through my work experience, education and cultural upbringing," he says, "I was more than ready to join the team of public health researchers."

Funded by a $5 million grant from Kaiser Permanente in 2008, the program aims to expand California's public health workforce in underserved communities. Master's degree recipients receive $15,000 for each of their two years. DrPH students receive $20,000.

In addition to the tuition coverage, Kaiser Permanente scholars also receive specialized mentoring from alumni and healthcare leaders in the field, paid summer internships at Kaiser facilities and community-based safety net organizations, and skills-building workshops and academic support.

In the last decade, the program has awarded 182 scholarships to students pursuing MPH and DrPH degrees at Berkeley. Almost all are underrepresented minorities. Graduates of the program have now spread across California to improve the health of vulnerable populations. Of program alumni, 43 percent work for a health provider, 15 percent work for a city, county, state or federal health agency; and 14 percent are engaged in research to reduce health disparities.

When Piña started his career at Berkeley as a Kaiser Permanente scholar, he joined a growing "club" of public health professionals and researchers working to advance population health.

Others in this group include Nancy Pham, who earned her MPH in 2012 to complement a career in direct patient care.

Some of the 2013 Kaiser Permanente Scholars at a reception at the Durant Hotel in Berkeley, which was hosted by Kaiser Permanente and the East Bay Community Foundation.

Raised in Boise, Idaho, by parents who had escaped Vietnam, Pham had spent many years volunteering for community-based projects—counseling women on a cancer helpline, helping to seek donors for an Asian-American bone marrow registry, and tutoring high school kids.

As a Scholar, Pham had the financial freedom to pursue a volunteer opportunity with the California Department of Public Health, where she worked on a gonorrhea survey. That experience, in turn, led to a summer epidemiology internship with the department. After graduation, Pham decided to add clinical skills to her repertoire and received training as a nurse practitioner at Yale University.

Pham recently returned to the Bay Area for a postgraduate nursing fellowship at Asian Health Services in Oakland. "I love community health clinics," she says. "I grew up going to them when I was a kid, so for me it's very familiar. I wanted to be able to contribute back to the community in this way."

Since Pham's cohort, the number of scholars admitted each year continues to grow. In 2009, 13 students received the scholarship. 2018 saw 24 new Scholars and, by 2020, the annual cohort of scholars will grow to 30.

"The fact that Berkeley has such a scholarship tells me that the School is practicing what it preaches," says Maribel Diaz MPH '11, who was in the first cohort of Kaiser Permanente Public Health Scholars. "It's not just that they're teaching students about health disparities, they're actually funding students who are interested in this area."

Members of the 2009 cohort of Kaiser Permanente Scholars stand with Winston Wong MD, MS '81 (left), medical director for community benefit at Kaiser Permanente, and Raymond Baxter (second from left), then senior vice president for community benefit, research, and health policy at Kaiser Permanente.

For program alumni and current students, the Kaiser Permanente Scholars Program is emblematic of something beyond the funds it provides. "I was excited that there was some resonance at Berkeley for the kind of work I had been doing," says Jennifer Martinez MPH '13. "Before I came to Berkeley, I had a sense that work with vulnerable populations was valued. But if there's money attached to that, it's more meaningful. It shows a commitment from the School and its partners."

Fresh Perspectives on Health Policy

"Our Health Policy and Management faculty are 10 years ahead of the nation on health policy issues," says Hector Rodriguez, the Henry J. Kaiser Endowed Chair in Organized Health Systems. The School of Public Health's Division of Health Policy and Management has always taken a cutting-edge, holistic approach to improving healthcare delivery, as measured by access, quality, and cost. Here, our new and veteran faculty share their expert opinions on a few current topics in health policy.

1. **CONNECTING SERVICES FOR PEOPLE WITH COMPLEX MEDICAL AND SOCIAL NEEDS**
2. **IMPACT OF CONSOLIDATION ON THE CALIFORNIA HEALTHCARE SYSTEM**
3. **REFERENCE-BASED PAYMENT AS A PURCHASER STRATEGY TO COUNTER HIGH HEALTHCARE PRICES**

1

Connecting services for people with complex medical and social needs

BY AMANDA BREWSTER PHD, MSC
Assistant Professor of Health Policy and Management

We have long known that social circumstances play a major role in determining health. Social determinants—such as low income, unstable housing, or food insecurity—increase a person's risk of poor health, and make it harder to recover when someone does experience illness or injury. Addressing social determinants of health has historically remained outside the purview of the healthcare system, however. Healthcare organizations have focused on providing medical care, while separate social service organizations (often underresourced) have specialized in helping people attain basic resources like stable housing, food, and income.

The clear division between health care and social services may be starting to change, with the emergence of innovative programs to coordinate medical and social supports for patients with complex needs. Among the broadest is the Accountable Health Communities Model, run by the Centers for Medicaid and Medicare Services, which is starting to test a new process for healthcare providers to screen patients for social needs and refer them to community-based social services.

In about 30 pilot sites, spread over more than 20 states, patients enrolled in Medicaid or Medicare are asked questions about non-medical problems they might be experiencing—issues like unstable or unsafe housing, lack of food, transportation or utilities, and risk of interpersonal violence. If patients report concerns, they are linked with social service providers in the community for help. California is also testing new models of coordinating health care and social services for vulnerable groups of Medi-Cal beneficiaries—through the Whole Person Care pilot programs.

Signs of broader-scale change are also on the horizon. Healthcare payment models designed to encourage prevention—such as capitated, risk-based, and bundled payments—are accelerating the creative process. In recent years, calls for the healthcare system to address patients' social determinants of health have emanated from a range of influential organizations—including the American College of Physicians, the American Hospital Association, and the National Quality Forum. In a recent national survey, 80 percent of hospitals reported that their leaders were committed to establishing processes to systematically address social needs as part of clinical care. And research by our team at Berkeley shows that it is now fairly common for medical practices to screen for social determinants of health.

Managing care that spans multiple organizations and multiple sectors poses a daunting organizational challenge. What we still do not know is how healthcare providers and social service agencies can work together to most effectively improve the health of their communities. Our current research in the School of Public Health seeks to learn from examples where organizations have established productive working relationships.

2

Impact of consolidation on the California healthcare system

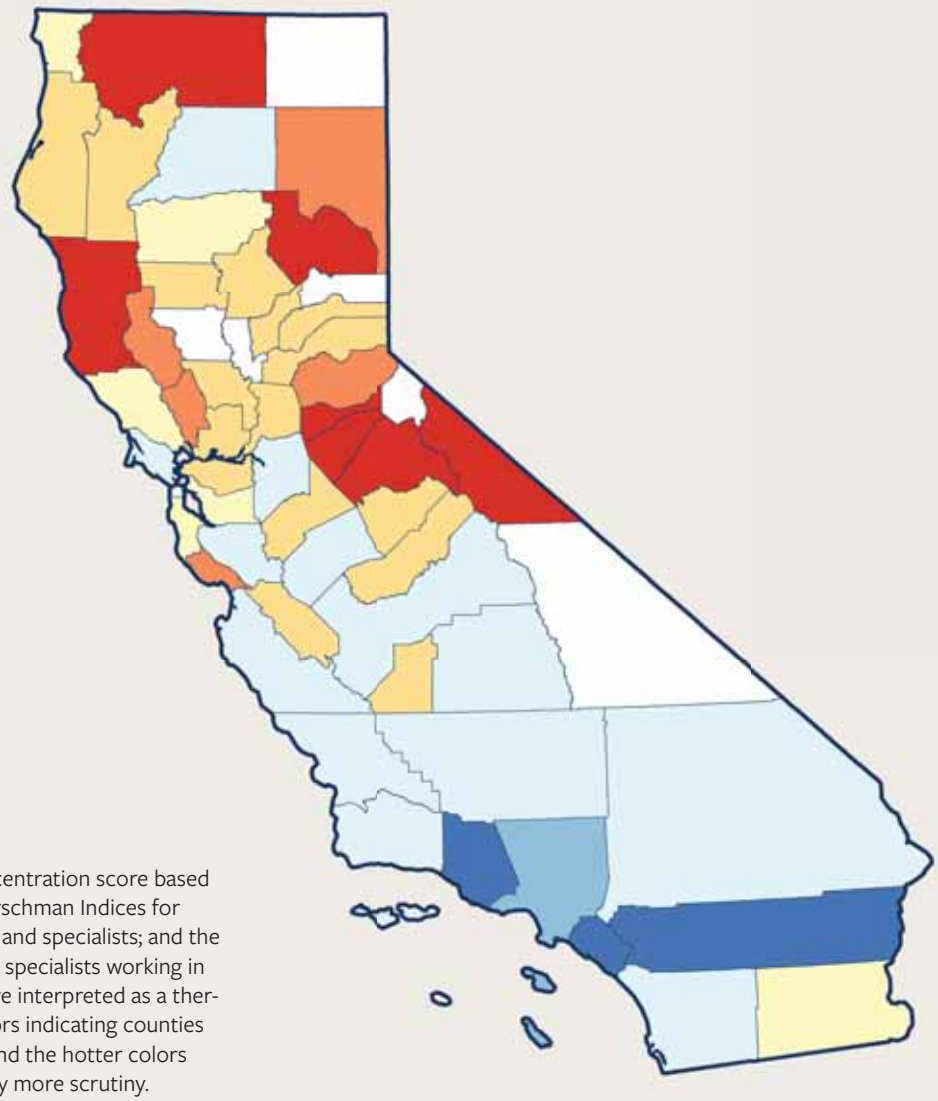
BY RICHARD M. SCHEFFLER PHD
Professor of the Graduate School and Director, Nicholas C. Petris Center

California is experiencing unprecedented consolidation and concentration in its healthcare markets. This is highlighted in my just released study with coauthors Daniel Arnold and Christopher Whaley, where we constructed a 'hotspot' map, which presents market concentration scores by county. The map shows that seven counties are concentrated on all measures of market concentration as of 2016, including physician, insurer, and hospital concentration as well as ownership of physician practices by hospitals. Similarly, five counties are concentrated on five measures and 16 are concentrated on four measures. These counties should receive intense regulatory scrutiny.

The percentage of physician practices owned by hospitals has increased from 25 percent to 40 percent from 2010 to 2016 in California. This type of vertical integration was associated with a 12 percent increase in ACA premiums, a 9 percent increase in the prices of specialist outpatient services, and a 5 percent increase in the prices of primary care services. Most of this consolidation happens with small groups of physicians being bought out by large hospital systems.

Why are hospitals doing this? They are interested in capturing the referrals that these physicians make to hospitals. They are seeking increased market power over the prices of physician services. The regulatory decisions on these mega mergers will fundamentally change the healthcare system in the United States. No longer will it be clear to consumers from whom they are purchasing care and what are their incentives. When your doctor refers you to a hospital, are they more likely to refer you to the hospital system they are part of, or the one that best meets your medical needs? Although physicians are under no legal or financial obligation to refer patients to the owning hospital, hospitals can influence these decisions in subtle ways, including by marketing their services to captive physician audiences. A recent study found that hospital ownership of an admitting physician's practice dramatically increased the probability that the physician's patients will choose the owning hospital. There are also anti-competitive concerns. Will the hospital use its influence on doctors to make it more difficult for rival hospitals to enter or stay in the market?

Three major vertical mergers have recently been approved by the Department of Justice or are being scrutinized in California by the Federal Trade Commission. Cigna's merger with Express Scripts for $52 billion was approved in September 2018—an example of an insurer acquiring a pharmacy benefits manager. In a reverse case of a pharmacy benefits manager acquiring an insurer, CVS's purchase of Aetna for $69 billion was approved in October 2018. Finally, UnitedHealth's OptumCare unit agreed to buy DaVita's medical group for $5 billion in December 2017. The total value of these acquisitions amounts to $126 billion. The Optum-DaVita deal added 17,000 physicians and other care providers from Davita Medical Group to OptumCare's 30,000 employed and affiliated physicians. The CVS–Aetna merger added 20 million enrollees in Aetna's various health plans to the merged entity consisting of CVS's 9,700 retail pharmacies and more than 1,100 MinuteClinics. Similarly, the Cigna-Express Scripts deal merged the second-largest pharmacy benefit manager in the United States with the fifth-largest insurer in the country.



"HOTSPOT" MAP OF MARKET CONSOLIDATION IN CALIFORNIA

Each county in California has a market concentration score based on six measures: the average Herfindahl-Hirschman Indices for hospitals, insurers, primary care physicians, and specialists; and the percentages of primary care physicians and specialists working in practices owned by hospitals. The scores are interpreted as a thermal gradient on the map, with the cool colors indicating counties that warrant lower concern by regulators and the hotter colors indicating counties that warrant increasingly more scrutiny.

SOURCE: Authors' analysis of data for health insurers from the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy), for hospitals from the American Hospital Association Annual Survey Database, and for physicians from the SK&A Office Based Physicians Database provided by QuintilesIMS.

These developments put further pressure on State regulators to carefully scrutinize vertical consolidation, not only from an economic perspective but also for their potential impact on patients and delivery of care. In September 2018, the Governor approved AB-595, which provides for review and approval of mergers based on their effect on competition, healthcare costs, access or quality of care by the Department of Managed Health Care in California. Additionally, SB-538, which proposes new rules on contracts between hospital systems and health plans, has been recently introduced in the state legislature. Redoubling our efforts to carefully scrutinize consolidation has never been more important for California's consumers of health care.

3

Reference-based payment as a purchaser strategy to counter high healthcare prices

BY JAMES C. ROBINSON PHD, MPH
Leonard D. Schaeffer Endowed Chair in Health Economics and Policy Director, Berkeley Center for Health Technology

The U.S. healthcare system exhibits high and widely variable prices charged for similar products and services, with no consistent link between price and quality. This unjustified variation reflects weak cost-consciousness on the part of purchasers and consumers, plus weak competition between producers and providers. Over the past five years, our faculty and graduate students have engaged in a series of studies of purchaser efforts to counter this price variation, collaborating with the California Public Employees Retirement System, a variety of smaller employers and labor unions, Anthem Blue Cross, and other entities. This work is done under the organizational umbrella of the School's Berkeley Center for Health Technology (BCHT).

The principal research focus has been reference pricing, or reference-based payment, in which the insurer or employer establishes a maximum amount of a product's price that it will contribute towards covering. This insurance benefit design is used in the context of wide variation in prices for therapeutically similar drugs, diagnostics, or procedures—and where insurers are increasingly unable to negotiate uniform prices for similar products with various producers. A reference-based payment limit is set at the minimum, median, or other point on the range of negotiated prices within a market of therapeutic class. Patients who use a product whose price falls at or below this limit pay only a modest copayment, while those using more expensive options pay the full difference between the reference limit and the price of their chosen product.

Reference pricing has been piloted in the United States for surgical and diagnostic procedures, including joint replacement, colonoscopy, and advanced imaging. Reference pricing now is being extended to drugs in the United States by selected employers and labor unions.

For example, the RETA Trust, a national association of 55 Catholic organizations that purchases health insurance for its members' employees, found itself paying dramatically different prices for drugs within the same therapeutic class, due to aggressive price increases by both branded and generic manufacturers. In 2013, RETA implemented reference pricing for outpatient drugs as a part of an effort to sensitize enrollees to the cost of the care they use. Following implementation of reference pricing, the average price paid by RETA decreased by 14 percent, generating $1.3 million in savings for the employers. This decrease in spending by RETA was associated, however, with a 5.2 percent increase in consumer cost sharing for enrollees.

The RETA study suggests that reference pricing potentially offers meaningful savings for purchasers in the United States. This cost-savings, however, comes with the potential to shift more of the cost to patients in the form of higher cost-sharing. Reference pricing has several key limitations, and is no panacea for all the challenges of drug or medical purchasing.

As emphasized in our BCHT publications and presentations, reference pricing needs to be accompanied by up-to-date information on the prices charged at different distribution sites (e.g., retail pharmacies, supermarkets, mail order channels) and for different

drugs within each therapeutic class. Ideally, drug price information should be available to physicians through their electronic information systems at the time of prescribing, so they can select the low-priced alternative or request an exemption from reference pricing if they feel it is clinically indicated. When applied to heterogeneous procedures or classes of drugs, reference pricing needs to be accompanied by information on quality as well as on price.

To date, reference pricing has been applied only to non-specialty drugs, the well-established treatments for common medical conditions. Specialty medications that treat severe but less common conditions such as cancer, immunological and neurological disorders, and rare 'orphan' illnesses are much more expensive than traditional drugs. Competing specialty drugs may have different mechanisms of action, modes of administration, or other features that make it difficult for physicians and patients to switch amongst them based on price. BCHT research currently addresses specialty drugs, including both prices and incentives for continued investments in innovation. To be applied to specialty drugs, reference pricing needs to incorporate evidence from comparative effectiveness research on the incremental benefits and risks of each new drug. These clinical differences then need to be translated into differences in the payment offered by the employer or insurer.

Consumers should be required to pay more for an especially expensive drug only to the extent the higher price is not justified by commensurately higher clinical benefit. Patients should have low-cost access to low-priced products within each therapeutic class. They also should have low-cost access to high-priced products to the extent the higher prices are justified by higher clinical performance. If the patient's preference for a more expensive drug is not based on clinical performance or a special need; however, the patient should pay the difference in price. Thus patient retains the right to choose, but this right is tempered by responsibility.

35 Years of Health & Wellness, Berkeley-Vetted

The story of The UC Berkeley Wellness Letter and the people who made it possible

BY AUSTIN PRICE

The founding editorial board for The Wellness Letter in University Hall in the early 1990s. Managing editor Dale Ogar, publisher Rodney Friedman, professor and editorial board chair Sheldon Margen, and Dean Emerita Joyce Lashof

In October 1984, the first edition of The UC Berkeley Wellness Letter gave its readers a guide to picking out a pair of running shoes, the science of Nicorette gum, advice on storing tofu, and other health and lifestyle tips—all packaged in an eight-page printed newsletter. Two years of thought and planning went into the newsletter's inauguration. And despite the lengthy process, some members of the faculty were worried they'd run out of content after a few monthly issues.

"It turned out, we just never ran out of things to say," says Dale Ogar, a School of Public Health staff member who has served as managing editor of The Wellness Letter for the entirety of its nearly 35-year run.

If anything, in the ensuing three decades, the writers and editors behind The Wellness Letter had even more myths to debunk and misinformation to address. "If you tend to get your health information from the headlines, you're

very likely to be misled," says Ogar. Today, a surplus of unvetted material of varying quality and veracity is just a Google search away.

Since that 1984 inagural issue, The Wellness Letter has brought information to the public focused on the preventative side of health, emphasizing areas of our well-being not limited to medical treatment. The latest science informs these articles, which are vetted by an editorial board comprised of faculty from the School of Public Health, plus UCSF health professionals and the Bay Area medical community.

Oftentimes, that vetted information goes against the grain of popular belief of the time. For example, issues of The Wellness Letter have reported that coffee might actually be good for our health. And that vitamin C pills don't prevent colds or cancer.

But debunking health myths and informing the public is only half of the story.

"We completely exceeded the expectations that anybody had for this."

In its more than three decades, The Wellness Letter has earned millions of dollars in subscription revenues that have helped the School of Public Health support students. "It's a win-win," says Dr. John Swartzberg, chair of the editorial board. "It has helped us train more public health professionals while at the same time getting good information out to the public about their health."

The Wellness Letter started with a phone call between Sheldon Margen and Rodney Friedman in 1982.

One of the more widely circulated health newsletters at the time came from Harvard Medical School. But Friedman, a New York City publisher, thought there were gaps. He wanted to provide a perspective on health care that wasn't strictly medical—one that would complement the advice we receive from doctors. So he looked to the field of public health. And, turning the largely East-Coast-based health newsletter market on its head, he looked to the west.

He called Margen, professor and head of the nutrition program at the UC Berkeley School of Public Health.

By that time, Margen was established as an expert on the long-term effects of diet on human health. Starting in 1962 as a professor in the Department of Nutritional Sciences, he carried out a series of landmark studies that significantly informed

University of California, Berkeley
Wellness Letter

Running for your life

When Jim Fixx, the celebrated author of *The Complete Book of Running*, died this past summer while he was out jogging, runners everywhere were given pause. Fixx had inspired so many others with the thought that they would develop cardiovascular endurance by running, and yet he himself died of a heart attack at the age of 52. What could be the benefits—or perhaps dangers—of exercise after all?

The answer to that question appeared at just the time Fixx was stricken, in reports from scientists at Stanford and Harvard. According to Dr. Ralph Paffenbarger, a study of the health and habits of 17,000 Harvard graduates between the ages of 35 and 84 showed a "direct relationship between the level of physical activity and length of life."

Specifically the report showed that cardiovascular disease was "reduced substantially" among men who burned 2,000 calories or more per week in exercise. (Jogging for an hour three or four times per week would burn about 2,000 calories; a brisk walk burns about 270 calories an hour.)

The most sedentary group of men in the study were twice as likely to suffer from fatal heart disease as those in the most active group. Or, to put it positively, those who would change from a sedentary to an active style of life (running, swimming, or brisk walking three or four times per week, or even more vigorous exercise) would reduce their risk of coronary heart disease by 33%. To be effective, the exercise needs to be kept up regularly, but it does not need to be strenuous. Even daily walking (at least a mile) seems to reduce risk of heart disease.

The Paffenbarger study is particularly impressive because of the large size of the group studied—17,000 men in a wide age range.

College athletes, it was found, carried over no benefits from college unless they continued to exercise. True enough, ex-varsity athletes who continued to be active had less than half the coronary heart disease of their least active classmates. But college athletes who had stopped exercising had as high a risk as any other sedentary graduates.

Other studies have shown that exercise may decrease the risk of heart disease because it increases blood flow and brings more oxygen to the heart, raises the level of HDL-cholesterol (the good cholesterol), and lowers heart rate at rest. Epidemiological studies comparing the number of heart attacks in active and inactive men also indicate the protective value of exercise. But this was the first study with convincing proof that physical activity definitely lowers incidence of coronary heart disease.

Previous studies have shown links between heart disease and smoking, obesity, hypertension, and a parental history of heart trouble; the Paffenbarger study assigns specific risk values to each factor. If a man stops smoking, he may reduce his chances of heart disease by 25%; if he reduces his weight, the risk is lowered by 24%; if he changes from high to normal blood pressure, he reduces his chances by 17%; if he has no family history of heart disease, his chances are reduced by 22%. The percentages are not cumulative, but if all four factors can be brought under control, and an exercise program is added, a man reduces his chances of heart disease by two thirds.

Jim Fixx overcame many of these risk factors, but his family history was against him: his father died of a heart attack at the age of 42. And Fixx may have made the most basic miscalculation of all: according to his wife, he was "really negligent" about seeing doctors and, despite his family history, apparently never had the sort of stress test that might have turned up warning signs ■

Exercise stress tests

Could a complete physical examination have uncovered Jim Fixx's heart condition and thus saved his life? "It's impossible to say definitively," according to Dr. Ronald Crohn, president of the Life Extension Institute, a New York health examination center that administers complete physicals. "But it is quite likely that the extensive atherosclerosis found in Jim Fixx at his autopsy would have shown obvious abnormalities in a stress test." Given Fixx's age and otherwise excellent physical condition, such test results might well have led a doctor to treat him with medications that decrease the chance of heart attack in just such cases—or with bypass surgery to restore blood flow to his heart.

While Fixx had not had a physical exam in many years, conventional tests would probably not have uncovered his heart condition. For instance an electrocardiogram (ECG) performed while the person is at rest will show signs only of *previously* damaged heart muscle. Since it won't indicate blocked or narrowed coronary arteries or poor overall

(continued on page 3)

Fascinating facts

- Infant Dental Education Association president Dr. Keith Roberts says that raisins can cause more cavities than chocolate.
- American women have six times the rate of breast cancer that Japanese women have—a fact thought to be due to the high-fat diet of women in the U.S.

The front page of The Wellness Letter's first issue, published in October 1984

the U.S. dietary recommendations on food labels. Before that, he served in World War II as a doctor, treating soldiers and helping establish feeding regimens for returning prisoners of war. He was known to have a photographic memory and a close relationship with the library stacks.

"On top of all that, he cared so deeply about people," says Ogar, who worked closely with Margen for more than 30 years. Ogar believes that Margen's compassion and intelligence gave The Wellness Letter much of its life in those early years.

If Margen brought the mind and heart to The Wellness Letter, then Friedman brought its charisma. Friedman showed up to his first in-person meeting with Ogar, Margen, and then-dean Joyce Lashof wearing shorts, rollerblades, and a backpack slung over one shoulder. Ogar recalls that his enthusiasm was contagious. He came up with the idea to use the word 'wellness,' which had seldom been used in a mainstream healthcare context before.

At that meeting, the idea of The UC Berkeley Wellness Letter was born.

It took time and many faculty meetings for Margen, Ogar, and Lashof to convince the faculty that a private-public partnership would not compromise the integrity of the School.

Lashof assured the faculty that the information would be evidence-based, personally vetted by her and the editorial board, and free from the editorial influences of advertisers and donors. And, most importantly, the royalties would directly benefit public health students.

From the publication of the first newsletter, The Wellness Letter moved at full steam. By 1988, it had the most subscribers of any newsletter in the country, and a few years later circulation had exceeded one million. Ogar estimated that each issue at that time was read by at least two million individuals. They also published 11 books, including several cookbooks, home health encyclopedias, and other hardcover volumes related to health.

"We completely exceeded the expectations that anybody had for this," says Ogar.

Time and technology have brought change to The Wellness Letter, even as its mission has remained constant. The heyday of printed subscription-based newsletters yielded to the era of the world wide web, where people expect to consume content free of charge. In response, Remedy Health Media, led by CEO Mike Cunnion, worked with Swartzberg and Ogar to create BerkeleyWellness.com, an online outlet for the information published each month by The Wellness Letter.

"Over a period of 35 years, there's been so much change in the ways that people consume information and in the way that people behave in relation to health," says Cunnion. "One of the biggest challenges is how do you stay relevant? How do you evolve as consumer behavior and media change?"

Today, the School publishes 16 issues of The Wellness Letter each year, along with 16 issues of Health After 50—a newsletter that has a greater focus on medical conditions and treatment—and a catalogue of annual white papers and reports. Altogether this content is called Health & Wellness Publications. Recently, a new partnership with ConnectWell makes the content available via the digital platforms of employers and health providers.

Teh-wei Hu, professor emeritus at the School of Public Health and member of the editorial board, vets Mandarin translations of certain articles published in a Taipei periodical, as well as in The World Journal, the largest U.S. Chinese-language newspaper. And in partnership with the Transamerica Center for Health Studies, the Health & Wellness editorial board is now producing selected articles in Spanish and English in an ongoing bilingual publication.

Through both the digital manifestation and language translations of the Health & Wellness content, readers can expect the reach of The Wellness Letter to expand, without compromising its integrity.

As Ogar sees it, if the Health & Wellness Publications continue to build on the legacy of the two men—Margen and Friedman—who laid out its foundation, then the mission of The Wellness Letter will live on to support students and deliver evidence-based information to the public.

"That is, after all, also the mission of our School," says Ogar.

Community Care Comes Calling

Luisa Buada founds and defends safety-net clinics for Californians in need

BY LINDA ANDERBERG

Luisa Buada RN, MPH '90, recalls her mother always had missionary magazines strewn about their Bay View house. The message she received from these pages was that you were supposed to use your God-given talents and get an education in order to help others.

Her mother was a registered nurse who worked at a UCSF hospital. Yet, as a teen, Buada says she didn't want to go into health care. "Particularly, I had planned to be a teacher," she says. "Pretty much for women at that time, it was teaching or nursing. Those were the sort of things I really saw around me."

However, Buada's path would soon lead her back to health care and nursing. Currently CEO of Ravenswood Family Health Center in San Mateo County, she has founded four community health clinics in California and been instrumental in the operations of many more. Although she never became a teacher, she now enjoys mentoring the next generation of community care professionals.

As an 18-year-old college graduate from UC Santa Cruz, Buada went to work for the United Farm Workers (UFW) union in Coachella. It was the summer of 1973, and she was helping people in need to get food stamps. While there, a nurse recruited her to help as an interpreter at the UFW clinic for farmworkers in Salinas Valley.

This job exposed her to the inequalities and injustices in health care.

Before the Emergency Medical Treatment and Active Labor Act (EMTALA) was passed in 1981, emergency rooms could turn away people without insurance or a way to pay.

"Women who were pregnant and in labor were turned away and told to come back when they were farther along," Buada remembers. "They were not given fetal monitoring and nobody was checking on any of that stuff, so people lost babies. A woman also could be sterilized without her consent until a law was passed in 1978. All kinds of really bad things were happening to farmworkers and women."

Buada became interested in single-payer, healthcare for all, and building a diverse workforce of health care providers. She adopted the motto of a pin she wore that read "health care for people not profit," and decided to go into nursing after all. She enrolled at UCSF in 1975.

Buada knew she wanted to go back into primary or outpatient care as a nurse, but the United Farmworkers Union had closed their clinics while she was in school. She applied to work at the Monterey County Public Health Department because they had outpatient services.

"My experience of public health as a child was getting immunizations," recalls Buada.

"I said 'well, two years,' but we couldn't find anyone that could do everything and start a clinic from scratch. And I ended up staying."

"My mom used to take us to the Public Health Department for smallpox and polio vaccines. So I was familiar with the Public Health Department as a patient."

Initially she worked with a pediatrician in a mobile clinic conducting screenings and immunizations for farmworkers' children. They would often see 30 to 40 4 and 5-year-old children in a labor camp in a single day.

At age 25 Buada became a home-visiting public health nurse doing TB follow-ups, prenatal and newborn visits, and child abuse and neglect checks from Salinas to San Ardo in the Salinas Valley. Then a unique opportunity arose to found a new clinic for farmworkers, Clinica Popular del Valle de Salinas.

"I started working on the Salinas clinic with a group of nurses from the UFW clinic, which had closed, but by the time the new clinic got funded and we were ready to open, everybody else had moved on," says Buada. The consultant suggested she apply for the executive director position, but Buada hesitated, as she had never run anything before. "He said, 'All you need to know is how to ask the right questions and know when you're getting the right answers. Everything else comes with experience. You just do it."

Buada ran the clinic for three years. What followed was many years of consulting for beleaguered clinics and clinics doing strategic planning throughout the country. "I started getting all these requests from local clinics," she says. "How to improve their operations; how to help them plan a renovation; writing policies, procedures and grants; doing compensation surveys and strategic plans."

Buada met Professor Henrik Blum while working on a strategic plan for the Over 60 Health Center in Berkeley. "He said to me, 'You know, you're good. You have really good ideas and good thinking. But you need to go and get a Master's degree in public health. Because one day the fact that you're a nurse and you did this work isn't going to be enough.'"

Convinced, Buada applied and was accepted to the UC Berkeley School of Public Health a week before the application deadline closed. She received a full scholarship through a program that paid tuition for ethnic minority nurses getting their Master's degrees. "Half the class were people like me, who came out of the field of public or community health," she says. "We had a great class and I still communicate with many of these people."

After earning her MPH, Buada dove back into community clinic work. She founded a clinic at Herrick Hospital in Berkeley—the Berkeley Primary Care Access Clinic—in order to provide access to primary care for Flatlands residents and MediCal patients.

In 1996, Buada helped merge the Berkeley clinic with two other small clinics to form LifeLong Medical Care. She recalls that, at the time, their midwifery clinic was delivering about 450 newborns a year. The midwives had a 13 percent C-section rate compared to 28 percent for the rest of the OBGYN private physicians delivering at Alta Bates Hospital. "We were seeing women who were V backs, breeches, twins, on heroin or cocaine or meth, it didn't matter," she says. "If they didn't have a medical condition that would require them to go to high-risk OB, the midwives could deliver them. It was pretty amazing."

In 2002, Buada was asked to come down to a San Mateo clinic for three months to teach them everything she knew. "I was only going to be here for a little while and then I said 'well, two years,' but we couldn't find anyone that could do everything and start a clinic from scratch," she says. "And I ended up staying."

This was the Ravenswood Family Health Center in East Palo Alto, where Buada has now served as CEO for more than 15 years and which she describes as "my 'opus magnum.'" Under Buada's leadership, what began as a small modular building with 13 employees has grown to a custom-built 38,300 square foot facility with more than 200 employees. The center provides critically needed health care services to predominantly low-income, uninsured, and undocumented residents in San Mateo County. For her work there, Buada has been hailed as an "East Palo Alto hero" and was inducted into the San Mateo County Women's Hall of Fame.

Despite her entrepreneurial spirit, there are plenty of challenges at the more established Ravenswood to keep Buada motivated to stay. "We added health care for the homeless via mobile services," she says. "We added a satellite site. We built a dental clinic. We have a pharmacy. Every one of those are like little startups."

At age 65, Buada is looking to pass on a legacy of experience to her successor before she retires at 70. She also has a vision of leaving the next generation of clinic defenders on more solid footing to do their work. "I don't want them to have the same struggles around raising money," she says. "I want them to have the space and the circumstances to be focusing on the services and not on fundraising."

Reflecting on her career, Buada feels best about being able to offer jobs in health care to diverse people in her community, giving them opportunities that other places may not provide.

"We've been able to give jobs to many people in the community over the years, especially to women and single moms, and see them grow and develop and come into themselves," she says. "And that's been a great joy for me."

Building Roads to Rural Health Care

Lynn Barr leads the healthcare caravan across rural America

BY AUSTIN PRICE

Lynn Barr MPH '10 was born in Queens, New York—as urban as you can get in the United States. But throughout her life, personal and professional experiences led her away from the city and toward a passion for meeting healthcare needs in rural areas.

One such experience came when she was an intern at California Health and Human Services as an MPH student at the School of Public Health. As part of that internship, she convened healthcare stakeholders across the state—hospitals, academic medical centers, FQHCs, and so on—to collect data for the strategic plan for Health Information Technology and Exchange. "My dream was to build a really robust database of information," she says. "To see what really happens to patients when they get health care."

But throughout this process, most providers were reticent to share their data, except for rural providers. Barr saw an opportunity. With 60 million people living in rural areas across the country, she believed that data from rural health systems—the "anchors of their communities," as she calls them—could shed light on how to best care for this slice of the American population, at less cost. "That was the birth of Caravan Health," says Barr.

Today Barr leads a company called Caravan Health, which works to aggregate patient data, improve health care while cutting costs, and advocate for public health training in rural areas across the country.

Barr first moved to California in 1986, when she joined the army as an emancipated minor at the age of 17. She worked as an army lab technician while earning her degree, eventually moving on to lab supply sales and then marketing, before finding her professional home in medical device and pharmaceutical development. She spent the next decade leading multiple start-ups and steering 13 products through the FDA approval process to worldwide markets.

But while testing that 13th product, a two-millimeter microsyringe, she began to question if she was working in an area of health care that actually helped populations. "Nobody uses these products as they're designed in a clinical trial," she says. "I just wanted to help people, but I wasn't really sure if I was helping them or causing them harm."

In 2004, her husband Steve was diagnosed with an aggressive cancer. While some doctors said that nothing could be done, others said that more treatment—and more medical fees—could save his life. "But they couldn't," says Barr. Her husband passed away six months later. "We spent that six months in the hospital, instead of being with his family."

Barr's distrust of fee-for-service healthcare grew. "We all die eventually," she realized. "But how we die in the United States is a tragedy." She took a break from her job as a product developer to think about her career in health care. "That was when I decided I wanted to create this data warehouse," she says. She then applied to the UC Berkeley School of Public Health.

After graduation, Barr took a job as the Chief Information Officer at a hospital near Lake Tahoe ("Tough duty," she jokes. "But it's rural!"). In this position, she networked among other rural providers across the country and officially started Caravan Health to assemble these providers into Accountable Care Organizations (ACOs), in order to consolidate their data, receive more data from the government, and use that data to improve health care in rural areas.

The company started with a single ACO, including providers from four states covering 50,000 patients. That number has since grown significantly. Caravan Health now spans 20 percent of the nation's rural hospitals and health systems, in 33 states and Guam; covers more than a million patient lives; and saves an average of 2 million dollars of healthcare costs per ACO.

"With all that data you can really understand what's happening with the community," says Barr, "with the patients, where patients were going for care, what works and what doesn't."

And what works, according to Barr, is public health training and immunizations to coincide with case-by-case medical treatment. Caravan Health uses its database to enact interventions, such as training workshops for nurses in public health and preventative care.

"Our belief is every doctor needs a nurse that will work on the wellness, prevention, and chronic care management of his or her patients," says Barr. "My whole career I always thought it was going to be some invention that would save the world. Now I realize it's public health."

These Are My Passions

James Tayali adds tech and business to his public health toolbelt

BY AUSTIN PRICE, AMY MOSTAFA

After crossing the graduation stage in 2017, James Tayali '17 was on his way to Austin, Texas, to begin a job with Blue Goji, a fitness video game company founded by Cal alum Coleman Fung. It was the next step in an already eventful journey toward a career in health innovation to benefit communities.

Tayali hit the ground running as a freshman. When he first arrived on the UC Berkeley campus, he already had a passion for public health—one that stemmed from his own childhood experiences in Malawi, Africa.

When he was five years old, Tayali lost his father to meningitis. Only a few years later, his mother died of malaria. He then lived with extended family members. Later, an older Tayali started to have questions about the health system in his home country. "Maybe my parents just didn't have better services to provide better care, so they didn't survive," he reflects.

Tayali was the first Malawian undergraduate student ever to attend UC Berkeley. He knew on arrival that he wanted to study public health. His dedication to his family translated into a commitment to improving his own country.

"My goal was to make an impact in my community," he says. "That way, when I come back to Africa, I can create programs or some healthcare initiatives that can provide access to care to many people that need it."

UC Berkeley opened Tayali to a world full of all sorts of people taking different approaches to research and action for better public health. "It could be NGOs, it could be international clinicians, it could be just a professor with some interesting research," says Tayali. "It's what drives your passions when you see what other people are able to do when they are going beyond the limits to make something work."

As a sophomore, Tayali interned with the Kenya Medical Research Institute, where he worked on a mapping project in Kenya's Kisumu slums to mitigate gender-based violence—using technology and geo-referencing to promote community health.

He then applied and was accepted to the Fung Fellowship for Wellness and Technology Innovations—a two-year fellowship program founded by Coleman Fung to train undergrads to develop to develop technology solutions to address the real-world public health challenges facing at-risk populations.

"I really learned a lot from that program because it walks you through from design to ideation to prototype production and execution of the project," says Tayali, "so they taught us a lot about how to design for the community."

During his time at Berkeley, Tayali also developed a Malawi-based startup called Keki-Mawe, which improves nutrition and maternal health by distributing locally produced, iron-rich powder and cookie products. This experience taught Tayali the value of collaboration.

"I realized that the things on the ground are a little bit different; You need to have stakeholders," he says. "These are the community leaders, the government, and also the universities around who can help me to design the product I want, and also to see how I can reach the communities I serve.

Following his contract role at Blue Goji, Tayali returned to Africa to continue to leverage technology and business for public health from within his community.

"One thing I learned in public health is that we are not always the problem solvers," he says. "Sometimes you have to solve with the community."

In November 2018 Tayali returned to Malawi and, in January, he will proceed to South Africa. He was recently awarded a Mandela Rhodes Scholarship to pursue a Master's degree in Health Innovation at the University of Cape Town. From there, he imagines earning a PhD before returning to Malawi to teach human-centered design or technology projects.

"I think it's really important when you come into communities, that you're not just coming in as a savior from abroad, but you've been living with them and you actually design with the communities," says Tayali.

"These are my passions," he continues. "Empowering communities with knowledge, expertise, and maybe even resources as we continue to fight against some of the diseases that we're seeing in Africa."

Kicking China's Smoking Habit

Professor Emeritus Teh-wei Hu wages a researcher's war on tobacco

BY AUSTIN PRICE

"Policy change takes time," says Professor Emeritus Teh-wei Hu, massively understating how true that can be.

In 2014, Hu noticed a change in attitude among Chinese government officials toward introducing a tax on a pack of cigarettes. For nearly 25 years prior, he had researched the economic and health effects of such a tax. He conducted surveys, plugged numbers into simulations, published his findings, and wrote, edited, and helped translate a book on the economic policy of tobacco taxation in China.

He led workshops near Beijing and spoke with policymakers and the press. He argued that introducing a tax on tobacco in China would be a necessary step to saving millions of lives, cutting medical care costs, increasing government revenue, and creating a healthier environment overall.

For over two decades, nothing changed. Then, after one of his 2013 workshops, Hu's research team received a request from the office of President Xi Jinping for a policy briefing on tobacco taxation. He had never received such a request, and he took it as a good sign. In May the following year, China introduced a tax on cigarettes.

The tax is not enough, says Hu. But it's progress all the same. An example that a combination of research and action—with plenty of time and perseverance—spurs progress.

Hu has had a 30-year-long career as UC Berkeley School of Public Health faculty member—and an even longer career as an economist. In the 1960s, he came to the United States from Taiwan to work at the World Bank. After a year crunching numbers for basic statistical analysis, he decided to pursue a PhD in econometrics at the University of Wisconsin, where he focused on the economic system of the Wisconsin dairy industry.

It wasn't the industry but the research model that defined his dissertation, which refined the model of econometrics.

"You have a lot of data," Hu explains, "and you find out how to make sense of it, to come to conclusions, findings. It's a tool."

He went on to teach econometrics as a professor of economics at Pennsylvania State University, where his expertise brought him into public health. The Pennsylvania governor commissioned him to determine the cost-effectiveness of the state's welfare system in regard to child health. "I looked at hospital costs and the health of the children," says Hu. "And I became interested in the healthcare sector."

Throughout the 1970s and 80s, Hu would continue to apply econometrics to public health. He studied the economic system of mental health as an advisor to the National Institute of Mental Health. He published reports on the financial impacts of senile

"The government focused more on money than on health."

dementia in the United States, and he thoroughly studied the health and economic repercussions of the Three Mile Island disaster, a 1979 nuclear power plant accident that set off a chain reaction of health, real estate, and industrial changes.

In 1974, Hu served as a visiting professor at the Fogarty International Center at the NIH in Washington D.C. There, he befriended Richard Scheffler, at that time a health economist at UNC Chapel Hill who would later join the faculty of the UC Berkeley School of Public Health.

Hu gives Scheffler credit for bringing him to Berkeley in 1986. Hu never thought he would become a professor in a public health school. For over two decades he worked in an economics department. "He convinced me to come here," says Hu with a laugh. "This is a great place. Good weather, good Chinese food. And closer to China."

In 1989, the state of California put a 25-cent tax on a pack of cigarettes. The electorate voted and passed Proposition 99, the Tobacco Tax and Health Protection Act, which instituted the tax and allocated the resulting revenue to smoking-related education and prevention. Fifteen years later, Prop. 99 had cut medical care costs in California by an estimated $86 million.

Hu's new employment at UC Berkeley put him in direct contact with policymakers in California, and he advised the state on Prop. 99. To an economist like Hu, tobacco taxation was a matter of figuring out the price elasticity of demand, i.e. how much tax would need to be raised to reduce consumption. California showed that raising a tax on cigarettes results in decreased consumption, which equates to fewer incidence of cancer and other ill effects from smoking and second-hand smoke, leading to reduced medical care costs. The tax is also a source of revenue that the government can allocate to medical care and other services.

With funding from NIH, Hu then brought his research on tobacco taxation to China, where he had previously advised the government on health care reform. "We can learn something from California," Hu told staffers at the Chinese Ministry of Health. "This is a win-win-win situation. A triple win."

But there are barriers to tobacco taxation in China that don't exist in California. Namely, China is the largest consumer and producer of cigarettes worldwide. There are 350 million smokers in China—nearly a fourth of the country's population. One study concluded that nearly half of the male physicians at a teaching hospital in Shandong province were regular smokers.

When Hu first approached Chinese policymakers about introducing a tobacco tax, he was met with hesitation, or downright rejection. (Three-hundred-and-fifty million smokers represented that many voters, after all.) What's more, the Chinese National Tobacco Corporation enjoys a monopoly in China, and it's owned by the Chinese government itself. The Chinese government would be putting a tax on its own product.

"For them, to reduce cigarette consumption was a conflict of interest," says Hu. "The government focused more on money than on health."

This interplay between health and economics occurs everywhere, says Hu. Even within the United States, we can see how health measures are still weighed against economic development from state to state. Today, the tax on a pack of cigarettes in California (which has the second lowest incidence of smoking, behind Utah) is $2.87. In North Carolina, Virginia, and Kentucky—the leading tobacco producers in the United States—the tax per pack is $0.45, $0.30, and $1.10 respectively. In Kentucky, a quarter of the population smokes cigarettes.

"The money talks, right?" Hu says.

In 2015, when China finally introduced a tax on tobacco, Hu felt that his 25 years of work had begun to pay off. But the work is far from over. Cigarettes are more affordable now than before, Hu argues, given the relative increase in China's average income. The new tax was a step in the right direction, but not enough. There are still questions to ask: how to raise the tax further, what to do with the resulting revenue, how the tax affected both health and industry, and so on.

"After they raised the tax," says Hu, "I thought, 'I need to write and edit another book.'" A year later, he published his second book on tobacco policy in China.

Hu retired from teaching in 2004 but he continues to work with former students, even those from his days at Penn State, who have brought his econometrics model to other countries where the health of the population is adversely affected by the business of producing and selling cigarettes. In this way, Hu has extended his research to Indonesia—which the World Health Organization ranks third in the world for total number of smokers—and Tanzania, where the focus shifts away from the consumers of cigarettes and toward the poor working conditions of tobacco farmers.

"We want to make a difference in the world," he says, "and save lives."

Hu lists the foundational elements for any researchers aiming for long-term policy change. "You have to identify a very important topic, where you can make a difference," he says. "You have to do research, collect data. You have to show that your findings are credible, with quantitative information. And you have to be persistent."

SPECIAL SECTION

Berkeley Public Health Celebrates 75

Since 1943, the UC Berkeley School of Public Health has been home to unconventional, curious, and bold minds who have collectively led change in California and around the world. In 2018, we celebrate our community of past, present, and future public health pioneers who have been defending health as a human right in our local and global communities for 75 years and counting. We're looking forward to taking on the next 75 years of public health challenges, together.

For more of our stories, a historical timeline, and to share your Berkeley moments and memories, please visit publichealth75.berkeley.edu.

IN THIS SECTION

A Will and a Way

California comes together (eventually!) to create a school of public health for the West

BY LINDA ANDERBERG

1940s postcard of Sather Gate (mailed in 1951) *Courtesy Steve Finacom*

In 1942, the Committee on School of Public Health made the case for establishing a public health school in California, concluding:

"California has long been a leader of public health progress among the Western States. It supports one of the greatest state universities in the nation. This State and this University are the logical place for a public health school which will become the alma mater for future Western health leaders. The State owes it to its own citizens to provide them with the best trained public health officials in the world. It is a necessary public service not only to California but to the entire West."

The analysis, which was reviewed and approved by the Northern California Public Health Association, was attached to Assembly Bill 515, introduced to the California Assembly by Assemblymen Carlson and Carey in January of 1943. The bill passed to the California Senate on April 12 and the Senate passed it and sent it to then Governor Earl Warren at 2 p.m. on May 5. On May 13, then UC President Gordon Sproul sent the governor a letter urging his signature on the bill. On June 8, 1943, Governor Warren approved the bill providing for the establishment of a school of public health in the University of California and making an appropriation of $87,000 to the UC Regents. (This would be about $1.2 million in today's dollars.)

Like so many successes, this one was delivered by the inability of a few visionaries to accept failure.

Looking at the establishment of the UC Berkeley School of Public Health within 1943, nothing could seem more straightforward. California government, health experts, and academia agreed upon a need and came together in order to serve the greater good and train future health leaders to the benefit of the California, the West, and—eventually—the world. And indeed that did happen. But it's not the full story. Like so many successes, this one was delivered by the inability of a few visionaries to accept failure. One of these visionaries: Dr. K.F. Meyer.

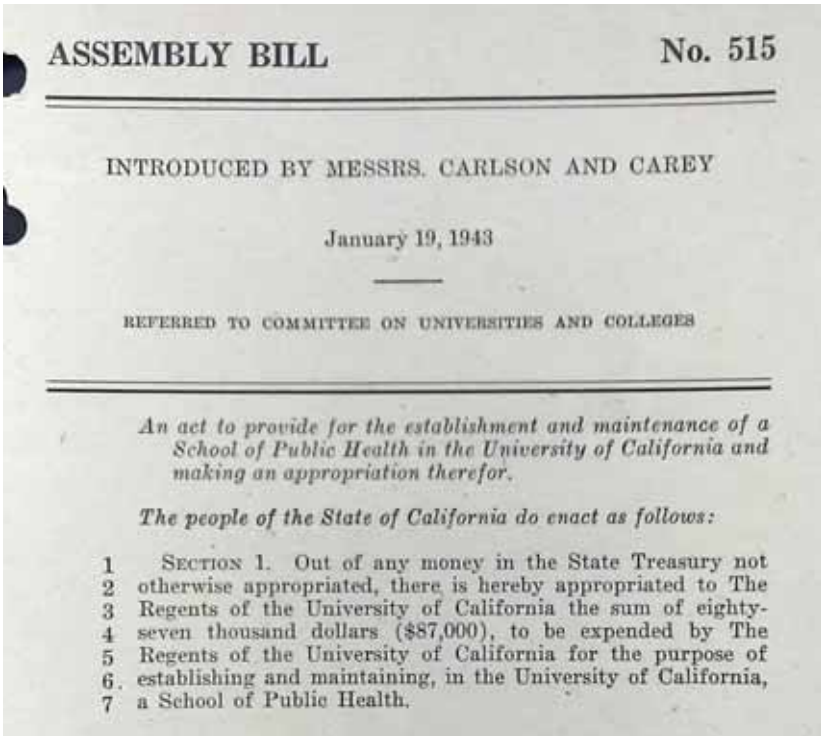
FROM BASEL TO BERKELEY

Karl Meyer was born in Basel, Switzerland, in 1884 and grew up in a three-story stone house near the Rhine where he mastered many of the "gentlemanly" arts—fencing, horseback riding, mountaineering. He first attended the University of Basel in 1902, but transferred to the University of Zurich in order to better apply himself to his studies. He received the equivalent of a BA from there in under 3 years, and earned a doctorate in veterinary medicine—then a field concerning the etiology of animal diseases like rabies, bovine tuberculosis, and foot-and-mouth disease.

Meyers then took a three-year contract in South Africa as a pathologist at the Veterinary Bacteriological Institute, particularly to develop rabies vaccine in case of outbreaks, but he also did autopsies on all the lab animals. When he returned to Switzerland in 1910, he found he no longer fit in there, in part because he dressed like a colonial and "walked around in tropical clothes with a big double-rim sombrero hat."

The British ambassador to the United States, whom he had befriended in South Africa, suggested Meyer should see the United States and connected him with a teaching position in pathology and bacteriology in the School of Veterinary Medicine at the University of Pennsylvania. After a year, he was promoted to full professor and was in charge of a lab. However, Meyer felt like an outsider in Pennsylvania as well, and he also clashed with the faculty in regard to the preparedness of the students.

Assembly Bill No. 515 provided for the establishment and maintenance of a School of Public Health in the University of California with the sum of $87,000 from the California State Treasury.



ASSEMBLY BILL No. 515

INTRODUCED BY MESSRS. CARLSON AND CAREY

January 19, 1943

REFERRED TO COMMITTEE ON UNIVERSITIES AND COLLEGES

An act to provide for the establishment and maintenance of a School of Public Health in the University of California and making an appropriation therefor.

The people of the State of California do enact as follows:

1 SECTION 1. Out of any money in the State Treasury not
2 otherwise appropriated, there is hereby appropriated to The
3 Regents of the University of California the sum of eighty-
4 seven thousand dollars ($87,000), to be expended by The
5 Regents of the University of California for the purpose of
6 establishing and maintaining, in the University of California,
7 a School of Public Health.

"When it came to clinical laboratory demonstration I had the keenest disappointment," he recalled. "The students didn't know any histology; they couldn't recognize a kidney from a spleen." So when a close colleague suggested a move to California, Meyer was open to the idea, despite being skeptical that they wanted to "park K.F. out on the Pacific." Meyer took a professorship of bacteriology and protozoology at UC Berkeley in 1913, with the understanding that he would only teach one semester and the other would be devoted to research. When he got there, he found out that a recent rule passed by the Academic Senate meant he would have to teach two semesters. He recalled, "I slapped my fist on the desk and I said, 'If I stay here more than a year, my name is John.'"

He ended up staying at UC Berkeley and UCSF for more than 40 years, where he became one of the world's most prodigious investigators in animal diseases and public health. Although initially angry with the course load, he found the "relationship with the students was perfectly marvelous, the echo from them was unbelievable; it was perfect."

He "slid into" the field of epidemiology when he joined the faculty at the Hooper Foundation for Medical Research at Parnassus, UCSF, in 1915. There was a famous outbreak of typhoid epidemic, where over 120 cases of typhoid developed from from a spaghetti pie served at a single church dinner. As one of his first assignments, Meyer was called to work on the problem. He found that the woman who cooked the pie was a carrier of typhoid and had given many people the disease in the preceding six years. The experience convinced him of the importance of epidemiology in public health.

"I was public health conscious from the beginning, due to the fact that whenever I was following up an infection I could very clearly see that from a preventive point of view nothing had been done or no effort was being made," he said.

THE PUBLIC HEALTH PASS AROUND

In 1919, UC Berkeley established a Department of Hygiene, where students were trained to become state-licensed sanitarians and laboratory technicians. The department cooperated closely with the State Health Department—state researchers and department faculty shared laboratory facilities in the Life Sciences Building on campus and often conducted joint research. State health officers could often be found taking classes at the Department of Hygiene.

And Meyer became a consultant to the State Health Department in 1919, a relationship which continued for decades.

"Whenever they wanted some technical advice they came upstairs or they asked me to come downstairs and I usually stopped by and saw what they were doing," he recalled. "If I was interested, well, I stuck my hands in it and took the problem and walked off with it."

This close relationship raised awareness of the need for formal public health training on the west coast. But it wasn't until 1935 that a real opportunity for funding arose when the Social Security Act was passed by the United States legislature. Beyond establishing social security, the Act included several additional provisions. One was Title VI, which appropriated about $10 million in funds for public health services and training to the states. The federal government wanted some of that money to go toward establishing a school of public health in the western states. This request was made of the State Board of Public Health, which then directed it to the University of California. Dr. Wilton Halverson, then director of the California Department of Public Health wrote:

"The need is particularly acute...It is also our conviction that, providing standards of training were equal, personnel trained in California would be better qualified to do effective work in this state than if they were trained in the East."

Or as Meyer put it: "This was proposed to the State Board of Health, who promptly hollered 'No, can't the University do this?'"

Meyer took the idea to then UC President Robert Gordon Sproul, who took it to the Regents. But the Regents were concerned about the funding it would take and ended up suggesting to Meyer that he set up a curriculum of public health within the Department of Hygiene, using, essentially, a budget of zero from the University itself. And Meyer set out to do it.

Top: The Department of Hygiene's first class in laboratory technology (1919-20). The Department of Hygiene, established in 1919 to train state-licensed sanitarians and laboratory technicians, would later be expanded into the School of Public Health.

Left: Karl F. Meyer in his office. *Courtesy UCSF Library*

A UNIQUE SORT OF PROGRAM

First, Meyer made a deal with then Surgeon General Hugh S. Cummings to be able to charge $250 per student for the curriculum, which would result in a Certificate in Public Health. He also convinced the U.S. Public Health Service to ask the 15 western states to contribute to the funding of the program, which many of them did. He ended up raising about $40k to run the program (which would be about $700k today), and developed and launched the curriculum without having yet collected any of the money.

Professors and lecturers taught the coursework to the first 17 students on only the promise of later payment from Meyer: "I paid only $5 per lecture to which everybody objected and raised Holy Cain. Justly so, but I didn't have any more."

Dr. Sanford S. Elberg, who later went on to become the dean of the Graduate Division at UC Berkeley, was a freshly minted graduate with a Bacteriology degree from UC Berkeley when Meyer asked him to assist in the lecture work for the public health curriculum. Meyer offered to get Elberg a stipend from the National Youth Agency, which was an organization headed by Eleanor Roosevelt that gave money to students for employment in colleges.

"I paid only $5 per lecture to which everybody objected and raised Holy Cain. Justly so, but I didn't have any more."

"The Curriculum in Public Health was enormous, in the sense that he used faculty from all the adjacent institutions of the Bay Area—Stanford, UC Med, Berkeley, Davis, the State Department of Health, and so on, from all his professional contacts," recalled Elberg.

Dr. E.S. Rogers, who would become the School's second dean, described the curriculum as "a very unique sort of program, intensive and highly personalized. [Meyer] is a dynamic personality; class would start at one o'clock and end at eleven p.m."

At the same time the Department of Hygiene began offering short courses for sanitarians

and sanitary inspectors and a course for health officers who weren't qualified for the four-year program. The department trained more students than ever before and, in May 1937, graduated 17 students with a Certificate in Public Health: 14 health officers, one public health engineer, one public health laboratory technician, and one statistical technician. The program was a success and Dr. Meyer and fellow bacteriologist Charles Lipman submitted a report to UC President Sproul, once more expressing the need for a school of public health in California.

"It is our firm conviction that, whether or not financial assistance is rendered, the University of California through such grants as we are now obtaining from the United States Public Health Service or from foundations or other sources, it is our duty as a state university to offer adequate training for those persons who are preparing to assist in the far-flung public health program of the country which is now shaping itself. This is our conviction because we believe that the people of any state look to the state university to take the initiative in matter which are so vital to the public weal as the conservation of the health of the community." However, this report was also rejected by the Regents. So no school was established and then money ran out for the fledgling public health curriculum. In desperation, Meyer asked President Sproul for just $5,000 a year to run the program, but was rebuffed again and shut it all down in 1939.

CALIFORNIA COMES TOGETHER

Yet pressure was building to upgrade public health services in California through a school of public health housed in the University of California. The Department of Hygiene faculty were for it, members of the State Department of Public Health were for it, Meyer was obviously for it.

It was at this time that Meyer assembled a team to help, including representatives from the American Social Hygiene Association, the California Tuberculosis Association, the San Francisco Board of Health, the American Red Cross, the U.S. Public Health Service, and Stanford's Medical School. Bill Shepard, VP at the Metropolitan Life Insurance Company served as the head lobbyist to Sacramento.

"[Meyer] was such a clever politician that he knew he shouldn't be the principal spokesman in Sacramento," said Bill Reeves, fourth dean of the School of Public Health, in an oral history.

In 1942, the Northern California Public Health Association together with the California Medical Association formed a committee to present the need for a California school of public health to the state legislature. Their review emphasized the differences in the health problems faced by the East and the West:

"Western health problems are different from those in other parts of the country. In California we deal with the diseases particular to the alkali desert and the dangers presented by ports open to the Orient. There is a difference in Western culture which public health officers and their assistants must recognize.... It is even said that Western politics are different and, if so, the Western health officer should know it."

The lobbying group was very successful in presenting their case, in part because Governor Earl Warren had just been elected and he held public health research to be of great importance—one of his campaign promises was to reorganize the Department of Public Health. Assembly Bill 515, which was, as quoted, "an act to provide for the establishment and maintenance of a School of Public Health in the University of California and making an appropriation therefore," was passed in Governor Warren's first legislative session.

Dr. E.S. Rogers would later reflect on the process, "This was a most unusual way to have a department of the University come into being. Normally the state legislature doesn't set up an academic program. ... The Warren administration of course was exemplified by a very close supportive relationship between the university and state government."

On March 23, 1944, The Daily Californian ran an article titled "First Western Public Health School Begun," signifying a turning point for public health as a consolidated discipline in the Western States. And the rest, as they say, is history. ★

Students attend one of the early laboratory classes at the UC Berkeley School of Public Health.

EVENTS IN PHOTOS

75th Anniversary Party

The School of Public Health celebrated its 75th Anniversary in 2018 with a party in the new home of the School—Berkeley Way West. Alumni, faculty, donors, staff, students, and friends gathered on April 21, 2018, to mingle, mark the milestone, go on building tours, hear about the School's distinguished legacy, and view student research posters. We also honored our 75 Most Influential Alumni of the past 75 years.

Three of our alumni honorees—Deborah Dean, Laura Stachel, and Julie Gerberding—celebrate 75 in our party photo booth.

Policy Advisory Council member Loel Solomon and wife, Anna Martin, enjoy the evening's signature cocktail, "The 75th." Laurene Wu McClain enjoys the wine generously donated by Mount Beautiful.

Dean Emeritus Stephen Shortell with Chair of the Policy Advisory Council Richard Levy

Event sponsors from Sutter Health Jeff Gerard, Julie Petrini, Stephen Lockhart, and Karen Bals with Alumni Honoree Jane Garcia, CEO of La Clinica de la Raza (middle)

Policy Advisory Council member Jerry Cacciotti and his husband, Wai Poc (right), with Builders of Berkeley Lilian Qian (left) and Samantha Chien

Alumni Honoree L. Martin Griffin with his wife, Joyce Griffin

First building tour of the night! Front row, left to right: Bob Campbell, Alumni Honoree Lynn Barr, Victor Vega and Terry Bayer, Janis Burger, and Alumni Honoree Kathy Kwan

Janet Liang, president of Kaiser Permanente's Northern California region with Anne Bakar, president of Telecare Corp., an event sponsor

Alumni Honoree Robert Hiatt with Associate Professor Mahasin Mujahid

Alumni Honorees Bessanderson McNeil and Carl Lester

Alumni Honoree Michael Bird with family: Petrolena Smith, Alice Bird, Jeanette Bird, Evelyn Bird

The crowd listens to Amani Allen (formerly Nuru-Jeter), associate professor and then faculty chair, deliver the keynote speech

Alumni Honoree Lynn Barr with her husband, Bob Campbell, inside the forum of the new building

Alumni Honoree and Policy Advisory Council member Anthony Iton with Alumni Honoree Jeff Oxendine, former associate dean for public health practice

Hilary Imai, Christina Murphy, and Donald Hoang, former student leaders of the Haas Healthcare Association

Professor Katharine Hammond with one of her former students, Alumni Honoree Gan Quan


GO BEARS!

75th Anniversary All Alumni Brunch

Alumni, faculty, and staff came for brunch on April 22, 2018, and heard from our living deans during our Dean's Roundtable.

Public Health Alumni Association board members Sarah Ismail, Marta Cieslak, and May Funabiki (right) with Zahwa Amad (second from right)

Alumni Honoree Kathy Kwan with Associate Professor Amani Allen

Professor Emeritus Teh-wei Hu, then Dean Stefano Bertozzi, and Alumni Honoree Michael Lu

Young alums at the brunch: Beth Keolanui, Whitney Jemison, Andy Chau, Emily Mou, Margae Knox

Dean Emerita Joyce Lashof with Professor Emerita and Alumni Honoree Meredith Minkler. Lashof served as dean of the School of Public Health from 1982 to 1992.

Alumni Honorees Bessanderson McNeil and Mary Pittman

Dean's Roundtable panelists (Dean Emeritus Ed Penhoet, Dean Emerita Joyce Lashof, Dean Emeritus Stephen Shortell, then Dean Stefano Bertozzi) with moderator (and Alumni Honoree) Nap Hosang

Clinical Professor Karen Sokal-Gutierrez and Clinical Professor and Alumni Honoree Linda Neuhauser

Alumni Honorees Martha Ryan and Claire Brindis

75th Anniversary Research Showcase

On Cal Day, the School hosted a 75th Anniversary Research Showcase where faculty and students presented the School's latest research on Zika, targeted machine learning, and everything in between.

Associate Professor of Epidemiology Mahasin Mujahid gives welcome remarks.

Brenda Eskenazi, Brian and Jennifer Maxwell Endowed Chair in Public Health, watches her colleagues' presentations. Earlier, Professor Eskenazi presented "Protecting the next generation of children from environmental exposures"

Many thanks to the UC Berkeley School of Public Health faculty members and students who participated in our 75th Anniversary Research Showcase!

75 Years of Berkeley Moments

As part of our 75th Anniversary celebration, we asked our community to share their "Berkeley Moments" from their time at the School of Public Health. Here are some of our favorite responses.

If you would like to share a memory or well wishes in honor of our 75th Anniversary, please visit publichealth75.berkeley.edu/share or use the hashtags **#Berkeley150** and **#PublicHealth75** on social media.

"Every subject was interesting. I had to adjust to American English, the practice of multiple choice questions, and impromptu mid-terms in Statistics. I was amazed that we were permitted to have packed lunch if we had a class during the lunch hour!"

Josephine Mary Namboze Kiggundu MPH '62

"My greatest memory is the diversity of the classmates and the richness of their professional experiences, which they brought to our class."

Marion Johnson Chabot MPH '67

"When students and selected faculty reorganized the focus of the school to anti-war activities on the occasion of the U.S. invasion of Cambodia during the Vietnam War."

Robert A. Miller MPH '66, DrPH '72

"My Berkeley moment was the ability to work closely with a social researcher, Professor William Bruvold, who offered valuable insights about designing a study of attitudes."

Katharine Frohardt-Lane MPH '75

"My Berkeley moment was having the head of the Psychology Department help me in the analysis of my dissertation on participation of pregnant women in Ghana villages in community health activities."

Bill Ward DrPH '79

"As a student I had many thought-provoking and inspiring discussions. As a professor now, I try to create an environment for my students to experience the same."

Karen B. Sokal-Gutierrez MPH '88

"Studying with colleagues on the lawn outside Warren Hall on a beautiful day."

Michael Fischman MPH '82

"My Berkeley moment was when a professor in the School asked if health care is a right. The vast majority of hands went up saying yes it is, but I was hesitant. My thinking was, how *much* health care is a right? I think that started an intellectual journey that I believe I could only find in a place like Berkeley."

Will Wright MPH '09

"Discovering like-minded fellow students from a diverse range of professional backgrounds in my post-doctoral cohort."

Sheryl Burt Ruzek MPH '81

"My greatest memory might be my internship at the San Francisco Department of Public Health. The Affordable Care Act had just been passed, along with many provisions for Medicaid expansion. The Department needed help thinking through how it would be prepared to handle a huge inflow of newly covered members looking for primary care. I was tasked with a few research projects to help them evaluate new programs and solutions, and I remember thinking how these were truly big questions with big unknowns, and I was directly a part of really steering the Department in new areas."

Angela Chu MPH '12

"When I went complaining to Henrik Blum that my project ideas had been defeated because of politics, he said, and I quote: 'I'm tired of hearing this BS from you. Public Health is seventy-five percent politics and twenty-five percent science and if you can't take the heat, get out of the kitchen.' I'll never forget that moment. It changed my life."

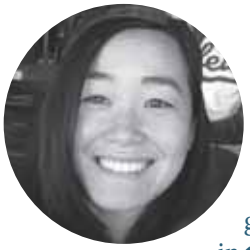
Myrna Cozen MPH '89

"The whole group of health education students rallying to support a professor of color who was being denied tenure."

David Nakanishi MPH '91

"I truly appreciated the background, insights and projections about epidemiology that faculty passed on, above and beyond the techniques learned."

Grayson W. Marshall Jr. MPH '92



"My greatest memories at the School of Public Health have been meeting my peers and colleagues, both in my cohort and in the larger School community. The graduate students that I have met in this program are strong-willed and motivated to do public good as a career choice and have admirable goals of providing a lifetime of social service to their community or to the world at large. It has been an inspiring and self-motivating experience to be a part of this collective."

Ina Zhang MPH '17

"I was invited to watch my first football game by my advisor Professor Kirk Smith, go Bears!"

Jiawen Liao MS '14

"My Berkeley moment came during my internship where I had the opportunity to work in Western Samoa at the Ministry of Health and World Health Organization revising various health policies, spearheading speeches for the Minister of Health, creating promotional health material around tobacco and personal hygiene, and working with the U.S. Navy on disbursing new equipment/revised handouts to the national hospital."

Sheila Baxter MPH '10

"My Berkeley moment was knowing I had found a welcoming academic home with genuinely committed students and a very supportive faculty."

Paul B. Hofmann BS '63, MPH '65, DrPH '94

"When I got admitted, and received a fellowship—as an immigrant, with so many struggles making it here was quite remarkable, and I felt accepted."

Pratik Chhetri MPH '18

"Meeting Len Syme during my master's work at another school and being inspired to pursue Berkeley as a home for work on social determinants of health."

Rachel Berkowitz, current DrPH student

"The first time I realized that, unvaryingly, every new friend and acquaintance I make being a student here is driven, has already accomplished much in life and career, and is exceptionally open to understanding the world from new angles. It is exhilarating to be around this much intellectual and righteous stimulation."

Carrie Whitaker MPH '18

"I planned to go on an Experiment in International Living journey after graduation. The teaching assistants at the School 'passed the hat around' and gave me money for this life-transforming experience. I never have forgotten their generous spirit and support."

Anonymous

"I have a very vivid memory of conducting our research on diabetes in Rio de Janeiro, Brazil, producing all of this written educational material for the elderly diabetic population, and realizing shortly thereafter (due to my Berkeley training in critical analysis + cultural awareness, and epidemiology, etc.) that all of that written material didn't work in this slum population where the elderly diabetic population was illiterate (~60%), and then (calling upon that same creativity cultivated by the University) developing a music video with the residents there. The reception by the School and support I received at the University thereafter was the most Berkeley moment I experienced."

Robert Snyder PhD '16, MPH '12

"Dropping all my note cards for my epidemiology class final and, after the initial paralysis, I went on to give the best presentation I had ever done."

Anonymous

"Mine was when my advisor Ray Catalano told me of the study in NYC that showed that adding up the value of all of the case workers, providers, vouchers, and other assistance, you could translate that into about $75,000 in cash for each person and that if you just give them the cash, they'd have better outcomes. That is why I've never been interested in traditional public health safety net services and I'm always working on policy and structural elements."

Anonymous

"It happened during my first campus visit when I got to know my classmates and saw that despite coming from different backgrounds (personal and professional) we all wanted to work towards a common good. The sense of community among all of us was a sentiment that has prevailed ever since. This environment invites you to learn, thrive and blossom!"

Montserrat Ayala-Ramirez MPH '18

Together, Berkeley Grads Change the World

Honoring our 75 Most Influential Alumni

In celebration of the School's 75th Anniversary and in recognition of their significant contributions to the field of public health, the School community selected 75 living alumni to honor as among the most influential of the past 75 years.

Collectively, they are:

The disease eradicators like Sue Desmond-Hellmann, an oncologist, scientist, and philanthropist, who spent 14 years at biotech firm Genentech developing a number of breakthrough medicines—including two of the first gene-targeted therapies for cancer—and who now serves as CEO of the Bill & Melinda Gates Foundation. And Moses Kamya, Marcos Espinal, and Madhukar Pai, each doctors with doctoral degrees who use their considerable skills and expertise to combat communicable diseases like malaria, HIV/AIDS, Zika, Ebola, and tuberculosis in Africa, India, and Latin America.

Alumni honorees celebrate at our 75th Anniversary Party on April 21. Left to right: Curtis Chan, Claire Brindis, Jane Garcia, Kate Lorig, Bessanderson McNeil, Mary Pittman

The champions for California like Tony Iton and Sandra Witt, both employed by The California Endowment, who work to bring health to the state's most vulnerable communities with a commitment to health equity. And Richard Jackson, a pediatrician and former director of the CDC's National Center for Environmental Health, who took to state and federal political action to protect farmworkers and their children from the risk of pesticides.

The guardians of the health of the next generation like Michael Lu, a public health professor at George Washington University and recent Director of the Maternal and Child Health Bureau for the U.S. Department of Health and Human Services, where he launched major initiatives to reduce maternal, infant, and child mortality across the country. At George Washington, he works alongside fellow honoree Dean Lynn Goldman, who formerly worked for the Environmental Protection Agency as assistant administrator for toxic substances—a role she used to promote child health through global chemical safety.

The action-oriented academics like Marion Nestle, who believes that food matters for our public health and has spent a career as a nutrition policy advisor for the federal government, professor of nutrition at New York University, and author of six award-winning books on food policy and politics. And David Ragland, an adjunct professor emeritus of epidemiology at the School, where he founded the UC Berkeley Safe Transportation Research and Education Center.

The protectors of the environment like Marty Griffin, who played a major role in preserving the environmental health of much of Marin and Sonoma coast from planned freeway and nuclear power plant construction by establishing wildlife sanctuaries and other protected areas. And Linda Rudolph, director of the Center for Climate Change and Health at the Public Health Institute, who promotes health and sustainability among vulnerable communities in our changing world.

Mavens moving beyond medicine like Martha Ryan, a health activist who took to the streets of San Francisco to provide prenatal care to homeless mothers. And Kate Lorig, emerita research professor at Stanford who specialises in the development and dissemination of community-based self-management programs for people with chronic disease. And Rajiv Bhatia, a practicing primary care physician and health systems innovator who pioneered the use of open data to gear public policy towards the economic and environmental roots of health outcomes.

Of course, they are not alone. Every day, more than 15,000 of our graduates are out there making a difference. Hundreds more students join them every year. But we are inspired in particular by the tireless work of these 75 visionaries on behalf of our local and global communities. We thank them, and our entire community, for making the world a better place. ★

You can read more about our 75 Most Influential Alumni at publichealth75.berkeley.edu/honorees.

Alumni honorees Deborah Dean and Rajiv Bhatia

Our 75 Most Influential Alumni

Our alumni honorees list first includes our living Alumni of the Year since the award was established in 1978. The remaining awardees were nominated by School community members and then voted on by our faculty.

Jerome Adams
M. Adhyatma
Jennifer Ahern
Lynn Barr
Michael N. Bates
Lisa Berkman
Rajiv Bhatia
Michael E. Bird
Claire D. Brindis
Garrett D. Brown
Julie M. Brown
Curtis Chan
Patricia Crawford
Deborah Dean
Susan Desmond-Hellmann
Carol N. D'Onofrio
Lori Dorfman
Bonnie Duran
Paul Brian English
Marcos Espinal
Susan Foerster
Gan Quon
Jane Garcia
Julie Louise Gerberding
Lynn R. Goldman
Maria S. Gomez
Lawrence W. Green
L. Martin Griffin, Jr.
Judith Heumann
Robert A. Hiatt
Judith H. Hibbard
Nap Hosang
Anthony Iton
Richard J. Jackson
Margaret H. Jordan
Moses R. Kamya
Alex H. Kral
Sarah Krevans
Nancy Krieger
Kathy Kwan
Margaret Lapiz
Carl N. Lester
Kate Lorig
Luiz Loures
Michael C. Lu
Sir Michael Marmot
Willi McFarland
Bessanderson McNeil
Meredith Minkler
Marion Nestle
Linda Neuhauser
Jeff Oxendine
Madhukar Pai
Rena J. Pasick
Diana Petitti
Cheri Pies
Mary Alison Pittman
Katherine S. Pollard
David R. Ragland
Reimert Thorolf Ravenholt
Henry F. Raymond
Linda Rudolph
Martha Ryan
Steve Selvin
Kirk R. Smith
David S. Sobel
Shoshanna Sofaer
Laura Stachel
Barbara Staggers
Melanie Marie Tervalon
Lawrence Wallack
Nina B. Wallerstein
A. Eugene Washington
Marilyn Ann Winkleby
Sandra M. Witt

75th Anniversary Campaign Update

Thank you for being a part of our milestone year

Dear Alumni and Friends,

Thanks to you, 2018 has been a historic year for the School of Public Health. We've had a lot of fun bringing the community together to celebrate the School's 75th anniversary and commemorate the move into our gorgeous new "Healthy Futures" building. Our new home is ideal for events of all kinds, so if you have yet to come, we encourage you to visit us soon!

This year has been marked by breakthroughs in philanthropy and greater engagement of the entire School community. During our 75th anniversary year, the School received 10 of the 30 largest gifts ever made by individual donors. And many more donors made milestone gifts, which we are proud to recognize by naming rooms in our new building in honor of these generous supporters and their loved ones.

To mark our 75th anniversary, we set an ambitious goal of raising $7.5 million in core support for the school. Core support is crucial to the School's mission of improving health locally and globally, especially for society's most vulnerable populations. Gifts to the School of Public Health Fund go directly to support our amazing:

- Students, in the form of undergraduate scholarships, graduate student fellowships, and internship stipends
- Professors, who train and mentor them
- Staff members, who run our excellent academic programs and support the student experience
- Center for Public Health Practice and Leadership, which has been held up as a national model of excellence for career advising, internship placement, and leadership development services
- D.R.E.A.M. (Diversity, Respect, Equity, Action, and Multiculturalism) Office, which provides truly effective outreach, one-on-one advising, academic support and community-building for students from under-represented and economically-disadvantaged backgrounds

Thanks to so many of our generous alumni and closest friends, we are now over 90 percent of the way toward our goal of raising $7.5 million in core support.

This fall, we welcomed nearly 500 new students to our public health community. More than 30 percent of our 1,100 undergraduate and graduate students now come from underrepresented communities, moving us toward our goal of fostering a student and faculty body that closely mirrors the diversity of the state of California (where more than half of graduating high school seniors are now Latinx). And 40 percent of these diverse future public health leaders received student aid, thanks to the support of our alumni and community members, as well as the invaluable partnership of Kaiser Permanente and the UC Berkeley Kaiser Permanente Public Health Scholars Program (read more about the impact of this important program on page 38).

In a time of declining state-funding for faculty positions, your support also allowed us to recruit five new world-class faculty by providing them competitive start-up offers and research support.

As we look ahead to the next 75 years of advancing health for all in California, the nation, and around the world, there is no better time to invest in our work. We invite you to continue to engage with us and support the School as we build our collective legacy. Thanks to your partnership, our faculty and students will continue to defend health as a human right for the next 75 years and beyond. We're so grateful to each of you for marking this milestone with us.

Warmly,

Priya Mehta

Priya Mehta,
Assistant Dean of Strategy & External Relations

No Cure but Care

New fellowship addresses the growing need for geriatricians

BY LINDA ANDERBERG

Charles McClain, Joint Medical Program student Bessie Young, Laurene Wu McClain, and Joint Medical Program Director John Balmes

Wanted: More doctors specializing in aging.

So reads a 2016 perspective by the former national medical director for Aetna Medicare. It makes intuitive sense—as our population is both aging and living longer, we need healthcare professionals who understand the unique health circumstances that come with our later decades of life.

Laurene Wu McClain and Charles McClain saw this clearly as they provided ever increasing assistance to Laurene's mother with her medical needs as she aged. They also recognized a gap in resources and interest in this area.

"One of my mom's doctors at UCSF said to me: 'My students are really afraid of older people, and they don't seem to want them as patients,'" recalls Laurene, a dual Berkeley alum and lawyer. "And I said, 'You know, we gotta get real here, because probably most of their patients will be older people, and it will be necessary for more doctors to be trained to work with older patients.'"

The American Geriatrics Society estimates that only about 7,300 geriatricians practice nationwide, despite a need for about 20,000. That need will grow to 30,000 by 2030, in order to adequately provide health care for the elderly. Not only that, but health systems will have to transform to become more collaborative, as more than half of older patients are managing two or more chronic conditions.

The McClains are philanthropists and have supported both UCSF and UC Berkeley students through fellowships and scholarships before. When they sold Laurene's parents' San Francisco home, Laurene felt strongly that they should use the proceeds to advance education in geriatric medicine in some way, and Charles agreed.

They both recalled a house calls program at UCSF, which Charles described as "just a godsend."

"My mom's doctor came every few months, all the tests were done at home, and I thought, 'wonderful program!'" says Laurene. "Really fantastic program, but we didn't have it here at Berkeley, or actually, anywhere else in the Bay Area."

"Medicine can be so focused on cures, but old age is more about care."

The McClains inquired at UC Berkeley, but learned that there wasn't a geriatric program on campus. Fortunately, they also learned more about the School of Public Health and were introduced to the UC Berkeley-UCSF Joint Medical Program.

Charles McClain has been a lecturer in residence with the UC Berkeley School of Law since 1977. "I spent many years on the Berkeley campus and I've had absolutely no idea this program existed," he says, referring to the JMP.

They were able to visit Berkeley to learn more about the program, and viewed a Problem-Based Learning session through a one-way window. "We saw the way that the educational method worked at the School of Public Health, and we were extremely impressed with problem-based education," says Laurene.

They also valued the international scope of research at the School.

"Research is being done, not just on Americans, but also on people from various other countries and cultures," says Laurene. "I think that the donation that we give will be reaching out beyond just the scope of the United States. The impact is going to be greater than just in our own immediate area, which is something we didn't expect initially."

But what really confirmed the choice for them was meeting JMP student Bessie Young.

Young wasn't originally a pre-med student—she has a bachelor's in psychology and art history and a master's in photography. She first became interested in medicine while working on a photography project documenting quality of life in elder care and memory care facilities. She was drawn to a joint degree program in order to continue work on projects like this one while earning her MD.

"I want to situate my medical knowledge within an understanding of personhood and people," Young says. "Our case-based learning that focuses on individuals, hypothetical patients, enables us to consider things like aging or other characteristics of a patient that might go overlooked. And the space to pursue research also allows for this." In addition to traditional medical training, clinical experience, and problem-based learning, JMP students produce a master's thesis on a subject of their choice. Young is producing an ethnographic film about the experience of dementia. She hopes to bring filmmaking related to elder care and medicine into her career down the road.

"Sensory ethnography attempts to capture the sensory experience of someone's world," says Young. "It's a useful methodology for examining aspects of the personal experience that are affected by illness, particularly the ones that affect our ability to communicate via the typical ways."

The topic of dementia and the patient identity resonated with the McClains.

"I can't think of anything more important than that," said Laurene. "Because we know the older people are, the greater the chance of suffering from some sort of dementia. And personalities do change."

She recalled how her father and mother did change—not because of dementia, but as they aged. "When I was growing up, my mom never hugged me, never touched me. In a Chinese family, you just generally didn't do that," she says. "But I noticed that in her older age, whenever I visited her, she would tell me how much she loved me and she would hug me."

She adds, "I think Bessie's working on facets of getting older that are like that. What is this person's identity now? And is it necessarily a negative?"

The McClains were convinced that the Joint Medical Program was a way they could directly further geriatric medicine education in Berkeley. Using half of the money from the home sale, they established a $500,000 endowed fund at UC Berkeley to create the the Laurene Wu McClain and Charles J. McClain Fellowship in Geriatric Medicine. The fund provides the financial support needed to enroll future generations of highly qualified applicants into the JMP, specifically those who have a commitment to serving the basic health needs of older adults in California. Thanks to the fellowship, the JMP will be able to expand specific research and practical gerontology experience opportunities for students within the program in perpetuity.

"The JMP is opening up vistas for medical students that they wouldn't normally get in traditional medical education," said Charles, "and now with the added dimension of the geriatric education, even more so."

Fittingly, Bessie Young was named the first recipient of the new fellowship. She describes the support as "such a blessing," and says that it will allow her to dedicate more time to her research. She is determined to honor the intent of the gift and make a difference in the lives of elderly patients.

"Medicine can be so focused on cures," Young says, "but old age is more about care. So there is a different orientation that's needed. It's important to have medical students who are comfortable with patients' suffering and realize that they can't alleviate all suffering but they can make a huge difference in people's lives regardless."

Thanks to the McClains' generosity, the JMP will be able to help more students gain this same understanding.

Dean's Circle

The School of Public Health Dean's Circle is a community of committed benefactors who support the School's future by making annual leadership gifts of at least $1,000.

The following list reflects gifts received for our 75th Anniversary Campaign between November 1, 2017 and November 1, 2018.

$500,000 and Above

Lynn Barr & Bob Campbell
L. Martin & Joyce Griffin
Susan Neely
Estate of Robert Porter

$250,000 to $499,999

Terry Bayer & Victor Vega
Charles & Melissa Froland
Kathy Kwan & Alan Eustace
Leonard & Pamela Schaeffer
Stephen & Susan Shortell
Eric Vittinghoff

$100,000 to $249,999

Gertrude Case Buehring
Susan Desmond-Hellmann & Nicholas Hellmann
Theresa Look & Watt Chin
Janet Martin
Charles & Laurene Wu McClain
Anita Morris
Anjali Morris
Kirk Smith & Joan Diamond
Kathleen Wesner

$50,000 to $99,999

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Coleman Fung
Estate of Mary Joaquina Martins
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Laura Flores & Ori Skloot
Marjorie Follette
Julie Gerberding & David Rose
Lois & Fred Goldberg
Julia Habiby
Barry & Micheline Handon
Daniela & Alexandru Hanganu
Kim Harley & Chris Fry
Christine Ho
Paul & Lois Hofmann
Stephen Isaacs & Kathryn MacBride
David & June Jeppson
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Bouhinan Kalou-Badirou
Kristine & Steven Klein
Delphine & Albert Ko
Scott Lee
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John Metcalfe
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Erica Verrillo II
Eileen & James Vohs
Harvey & Rhona Weinstein

$2,500 to $4,999

Colette Auerswald & Matthew Kramer
Stacey Baba & James Vokac
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$1,000 to $2,499

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Linda & Randal Avey
Deborah L. Bain & Jason Brickley
Michael Bates
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Lou Corsius
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Janet Dafoe
Sandra Dixon
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Kunchok Dorjee
Matthew Dorsey
Carey Eberle
Wetona Eidson-Ton & Hendry Ton
Catherine Erickson
Brenda Eskenazi & Eric Lipsitt
Robert Frangenberg & Ingrid Lamirault
Deborah Freund & Thomas Kneisner
Robert & Carol Friis
John & Virginia Gaston
Judy & Jerome Gilbert

GIFT SPOTLIGHT

Providing critical support for undocumented students

Sarah Krevans MBA, MPH '84 & William Brieger

Amount: $20,000

Impact: In late 2017, shortly after President Trump announced his decision to rescind the Deferred Action for Childhood Arrivals (DACA) program, alumna and Sutter Health CEO Sarah Krevans and her husband, William Brieger, decided they wanted to support the School's undocumented students. Because undocumented students are no longer eligible for federal financial aid grants or loans, philanthropy has been critical for ensuring that they can continue their studies. Partnering with UC Berkeley's Undocumented Student Program, the School was able to provide fellowship awards to two former DACA students pursuing their master's degrees in public health.

Robert Gillespie
Lynn Goldman & Douglas Hayward
Aubree Gordon
Deborah & Thomas Grieb
Joseph Gross & Carol Brosgart
Alice & Howard Gruber
Kelly Guntrum
James & Patricia Harrison
Thomas Hazlet
Katherine Cooper Herzog
Irene Hilton
David & Katharine Hopkins
Patricia Hosel
Nancy & Sidney Ganis
Jeffrey Hunter
Dena Jacinto
Ashley Judd
Susan Kandarian
Margaret Kellogg
Rosalia Kersch
Andrea Kim
Joan King-Angell & Jeffrey Angell
Julia Klees
Jane Koehler
Laurence Kolonel
Lawrence Koplin
Michelle Kothe
Pam Laird & Mark Jacobsen
Andrew Leavitt
Marlin Ledbetter
Suzanne Lee
Lawrence Leong
Sanaz & Sean Leoni
Carl Lester
Yvette Leung & Liwen Mah
Edward Low
Steven Lubet & Linda Lipton
Purnima Madhivanan & Karl Krupp
Anthony Marfin & Amy Bode
Karen Barnard Martz
Christina Maslach & Philip Zimbardo
Sara Mathew
Wende & Gaetan Micco
Dzovag Minassian
Michelle Minikel
Kenneth Moritsugu & Lisa Kory
Laurie & Richard Morrison
Bhavadharini & Krishna Narayanan
Linda Neuhauser & Craig Buxton
Thomas & Johannah Newman
Nora Norback & Darrel Hess
Roberta O'Grady
Michael Ong
Nanette & John Orman
Dennis & Sharon Osmond
Lisa & Roger Ota
Leland & Kristine Peterson
Christina Phares & Colin Garrett
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Roger Pies
Mary Jo Potter
Erin & Andrew Richardson
Richard & Dana Sankary
Lewis Scarpace & Michele Cohen
Dana Seeley-Hayse & Tom Hayse
Steve & Nancy Selvin
Caroline & Steve Shiboski
Yasuko & Sei Shohara
Shannon & John Siegfried
Curtis & Barbara Smith
Shoshanna Sofaer & Lawrence Bergner
Maida Taylor & Edward Kelly
Kenneth Taymor & Beth Parker
Corinna & William Tempelis
Barbara & Alfredo Terrazas
Bung-Fung & Hwa-Chung Torng
Judith Tuller
Sylvia Turner & Sam Vega
Gustavo Valbuena
Samantha Vega
Maria Veras
Karlene Ware & John Garcia
Deborah Waroff
John & Elizabeth Anne Wikle
John Williams
Stephen & Kimberly Wold
Katherine Woodruff
Blanca Zapata
Alfred Zerfas

GIFT SPOTLIGHT

William Satariano

Honoring a beloved professor's legacy by supporting students studying health and the built environment

Enid Satariano

Amount: $100,000

Impact: William Satariano, professor of Epidemiology and Community Health Sciences and director of undergraduate health programs, died at the age of 70 on May 28, 2017. A faculty member at the School for more than 20 years, Satariano was a beloved colleague, teacher, and friend. His widow, Enid Satariano, donated to create an endowed student support fund in honor of his tremendous legacy at the School. The funds will support students enrolled in the joint degree program between public health and city and regional planning.

Donor Honor Roll

The School of Public Health gratefully acknowledges the following individuals and organizations for their generous contributions from November 1, 2017 to November 1, 2018.

For space reasons, we have included individual gifts of $100 and above and organizational gifts of $1,000 and above. We thank all our donors for being part of our 75th Anniversary campaign.

INDIVIDUALS

$500 to $999

Jennifer Ahern & Yohance Edwards
Harrison J. Alter
Larry Ballonoff
Marilyn Barkin
Marina Baroff
Tonia & Lee Bates Jr.
Steven Bellan
John Bennett
Chhaganbhai & Sarojben Bhakta
Claudia Cappio
Benjamin Chaffee
Charlotte Chang & James Lastoskie
Doris Chang
Po-Shen Chang & Julie Craig-Chang
Barry Cik
Kathy Clifford
Rose Anne Clifford
Ron Conte
Alan Cooper
Bernard Cordes
Jacqueline Scott Corley & Douglas Corley
Patricia Crawford & Roger Crawford Jr.
Abla Abu-Zayyad Creasey
Hana & Meir Dan-Cohen
Dale Danley
Robert Davidson
Luke Davis
Patricia Davis
Mary Dimmock
Alexander & Kimberly Ding
Beate Eiklid
Joseph Eisenberg
Greg Field
William Flynn
Susan Bolger Foerster & James Foerster
Nene Fofana
Sara Frank
Paul Friedlander
Scott Fujimoto
Martha Galvan & Jonathan Corren
Kimberly Gibson Garfinkel & Jonathan Garfinkel
Carol Giblin
Robin Gillies
Bethany Goldberg
Eric Goldman & Laurie Weisberg
Laurel Littman Gothelf & Michael Gothelf
Reuben Granich
Lawrence Green & Judith Ottoson
Joseph Guydish
Matthew Hahn
Doris Hawks Torbeck & John Torbeck
Eric Herfindal & Patt Herfindal
Judy Heymann Kazan & Steven Kazan
Kimberly Hicks
Mark Horton & Mary Ann Miller
Andrew Hugh
Robert Hultquist
Brennan James & Fitzgerald James
Bethelen Johnson & Edmund Powers
Veronica Jones
Marsha Kabakov
Nancy Hood Karp
Walter Keller
Yunkyung Kim
Denise Koo
Nora & Andrew Lau
C. Suzanne Lea
Lauren LeRoy & Jaime Biderman
Bau-Gwei & Jeffrey Lee
Carrie Graham Lee & John Lee
Adam Levine
Ququan Liu & Joey Zhou
Leslie Louie & David M. Bowen
Catherine Lyons
Barbara Mahon
JoAnn Manson & Christopher Ames
David Matson
Brigid McCaw & William Finzer
Anne & Richard Melbye
Margaret & Thomas Merzbacher
Frode Michalsen
Meredith Minkler & Jerry Peters
J. C. Montgomery Jr. & Lark Montgomery
Matthew Moore
Rachel Morello-Frosch & David Eifler Jr.
Mary Tamaki Murakami & Raymond Murakami
Masako & Richard Murakami
Joelle Nadle
Jeffrey Newman
Karen & Elliott Ng
Mary & Craig Noke
Janis Olson
Amy Oppenheimer
Olav Osland
Edward & Camille Penhoet
Alissa Perrucci
Maya Petersen
Pamela Petersen-Crair & Michael Crair
Myrto-Xeni & Andrew Petreas
Jerry Pier & Susan Bennett
Donna & Darwin Poulos
Alexis Pozen
Denise & Michael Prince
Patti Prostebby
Brian & Tacy Quinn
Liping Ran & Dongbiao Ye
Sujit Rathod
Nooshin Razani & Saam Morshed
Claudia Reay
Justin Remais & Elena Conis
Beth Roemer
Maria Roberts
Camille Rosati Pennix & Brian Pennix
Nancy Rosenthal & Jason Rosenthal
Nicholas Ross
Matthew Sandblom
Cheryl & Raymond Schreck
Takeo Shirasawa

GIFT SPOTLIGHT

Advocating for the health of society's most vulnerable

Henry (Hank) Abrons

Amount: $80,000

Impact: Thanks to a gift from Hank Abrons and the Louis & Anne Abrons Foundation, the School recently launched the Advocacy Initiative for Health Policy Change, a comprehensive training effort designed to produce a cadre of diverse leaders equipped with the practical skills they need to make systemic improvements in public health outcomes for society's most vulnerable populations. The initiative connects graduate students with policy campaigns aimed at improving lives, from housing the homeless to ensuring that low-income people have access to affordable, quality health care.

GIFT SPOTLIGHT

Strengthening our ability to train diverse leaders in public health

Carl N. Lester MPH '65

Amount: $4,000

Impact: When the Public Health Alumni Association board of directors launched a crowdfunding campaign in 2016 to provide support for diverse public health students, Carl Lester was one of the first of our alumni to step up with a lead gift of $2,000 in support of the campaign. A champion of diversity in his career, volunteering, and philanthropy, he donated again for the 2017 campaign. Thanks to the combined generosity of Lester and other alumni and friends, both crowdfunding campaigns exceeded their fundraising goals and were able to provide 11 fellowships for diverse graduate students over two years.

Esther Siebert
Amanda Singer
Jonathan Singer
Andrea Shields
Renita Sinn
Christopher & Ashley Stephens
Judith Stewart
Elizabeth Stone
Sean Sullivan
Laurence & Ann Sykes
Davida Talcove
Caroline Tanner
Patricia Taylor
Melissa Tiarks
Tien Tran
Robert Tufel & Michael Sasso
J.H.H.M. Van De Wijgert
Tida Violante & Electron Kebebew
Leslie Wallace
Lesley & Carl Walter
Thomas White & Tina Arnold
Thomas Williams & Marla Schlom
Patricia Wakimoto
Teresa Chung Wong & Otis Wong
Nita Wu
Junhua Zhang & Baogen Wu
Lingling Zhang & Shyh-jen Shih

$250 to $499

Simone Adams
Lois Addy
Ellen & Paul Alkon
Ramona Anderson
Richard Anderson & Carlene Anderson
Richard Bailey
Arthur Bakal
Keith & Gail Bandel
Sarah Barber
Gail Bateson & David Rempel
Sheila Baxter
Lucinda & Ronald Bazile
P. Robert Beatty
James Behrmann
Lisa Behrmann
Justin Benjamin
Michelle Berlin & Robert Lowe
Linda Bilyea
Thomas Blair & Keramet Reiter
Serena Blanchflower
Jane Borg
Marissa & Michael Brandon
Elizabeth & Per Brashers
Jeanette Broering
Garrett Brown & Myrna Santiago
Julie Brown
Sally Burch
Arnold Byrne
Evelyn Caceres-Chu & Albert Chu
Marcus Caporicci
Shane Carlson
Elisa & Peter Chiu
Barbara Choppin de Janvry
Ann Chou
Marta Cieslak
Carol & Ronald Clazie
Janet Coffman
Nancy & Andrew Colb
Garen Corbett
Oliver Cornes
Katrin Cox
Nan & Michael Criqui
Robert & Merle Davis
Philip Darney & Uta Landy
David Dassey
Deborah Dauber
Eleanor Davin
Marloes De Boer
David DeClercq
Louise Detwiler
Andy Devereux-Cooke
Hellan & Bradley Dowden
Theresa Dowell
John Downey & Bradford Hise
Jane Dulay
Susan & Michael Eckhardt
Roberta Edge
Miriam Eisenhardt & Edward Murphy Jr.
Douglas & Barbara Engmann
Richard Ensor
Marsha Epstein
Frederick & Jean Erdtmann
Tamar & Joe Fendel
Mary Field
Robin & Mark Fine
Johnna Flood
May Funabiki
Gordon Gao & Carrie Peng
Daniel Gentry
Lucia Giudice & John Leonard
Elizabeth Glowacki
Christian Godbout
Amy Goldberg-Day & Mark Day
Betty Ivie Goldblatt
Maria Gomez
Sylvia & Simon Guendelman
Karen & Richard Gunderson
Robert Gunier & Andrea Saveri
Victoria & Nelden Hagbom
Judith Hahn
Mary & Paul Hamer
Carol Head
Mary Henderson
Glenn & Jan Hildebrand
Richard Hirsh & Cathy Neto
Nina Holland
Susan & Mark Holm
Joseph Houska & Christine Paige
Linda & Joseph Hummel
Fran & Stuart Jaffe
Deborah Jan
Andrew Joseph

Joyce and L. Martin Griffin stand in front of what will become a native plant garden and event space on the roof of the School's new building, thanks to their $750,000 philanthropic commitment. Says Marty: "Joyce and I are proud to support the creation of the Martin and Joyce Griffin Terrace Garden to provide an outdoor event space and enriching learning environment with native landscaping and gorgeous views of Berkeley."

Ellen Kallevik
Irene Kan
Lalith Karunanayake
Susan & Harvey Kayman
Justin Keller
Matthew & Linda Kidd
Maria Kim
William Kirkpatrick
Edward Klinenberg
Arlene & David Klonoff
Rebecca Knittle
Elena & Ronald Krause
Meg & Charles Landefeld
Fernanda Lessa & Ronaldo Pinto
Walter Lin
David Lindquist
Raphaela Lipinsky Degette
Sheri Lippman & Victor Perez-Zubeldia
Joakim Loktu
Geoffrey Lomax
Robert Longworth
Ying Lu & Weizhao Zhou
James Lubben & Maureen Lubben
Christiana & Charles Macfarlane
Carter & Margaret Mack
Sheryl Magzamen
Kim Malcolm
Kimberly Marsh
Steven & Kathryn Marzolf
Michael & Michele McCulloch
Kevin McGirr
Hallie Morrow
Nancy & Robert Mueller

At Commencement 2018, **Sara Ortega BA '18 and Melissa Hermerding MPH '18** present a check to Dean Stefano M. Bertozzi that represents funds the graduating class hopes to raise for the 2018 Class Gift Campaign. The 2018 Class Gift Campaign is in support of stipends for graduate student internships and undergraduate scholarships.

Linda & Lawrence Mura
Katherine Nammacher & Dean Diongson
Beata & Harlen Ng
Mary O'Connor & Emil Brown III
Kara O'Keefe & Massimiliano Poletto
Susan O'Keeffe
Chao-Yang Pan
Monique Parrish
Rob Parsons
Padmini Parthasarathy
Michelle Pearl & Brett Mendel
David Pepper & Sarah Feldman
Marjorie & Fred Pitts
Paul Poling & Veronica Jordan
Vincent Racaniello
Valerie Randolph & Donald Fenbert
Kyndaron Reinier & David Henehan
Barbara Reiss & James Snyder
Kathleen Ries & Stephen McCurdy
Rachel Riggs
Jonathan Robbins
Corinne Rocca
Jackie Rosenson
Michael Runnels
Ann & Lars Sandven
David Satcher
Frances Saunders
Sharon Shaw
Jessica Siegel & Stephen Tsoneff
Brooke Simmons
Robert Simon
Alexander Smith & Cindy Hsu
Debbie Smith
Loel Solomon & Anna Martin
Jennifer Spotila
Alan & Sala Steinbach
Ahna Suleiman
Sharon & Raymond Sugiyama
Timothy Taylor
Melanie Thomas
Peter Trewhitt
Feng Tsai
Gayle Tyerman
Paula Uribe-Echevarria & Michael Delacruz
Craig & Patricia van Roekens
Todd & Lisa Wagner
Caroline Walker
Shuo Wang
Michael Weiss
Rosana & Jeffrey Weldon
Geraldine West
Patricia & Phillip West
Kevin Whitehouse
Patricia Williams
Barbara Wismer
Channing Wong & Vivian Rafael-Wong
Adrienne Wooding
Helen Xu
Stella & Ken Yang
Zheng Yin
Max Zarate
Martha & Sheldon Zedeck
Luoping Zhang

$100 to $249

George & Susan Abbott
Miriam Abeshouse
Karen Abrahams
T. Elaine Adamson & Edward Gould
Susanna Agardy
Taejoon Ahn & Jeannie Lee
Sohail Alibhai
Abbey Alkon & Jonathan S. Leonard
Lyle Allan
Geoff Allen
Adele Amodeo
Janet Anders
Karen Anderson
Hilary Anema
John & Kaaren Antoun
Karina Arambula & Andy Capdarest
Akila & Balan Aravind
Veronica Arias
Katherine Armstrong
Benjamin Arnold
Daniel Arnold
John & Lauree Asarian
Anne Ashe & Larry Orman
Ann-Marie Askew
Shaunt Attarian
Bobbi Ausubel
Harshith Avula & Vidya Pai

GIFT SPOTLIGHT

Giving back to global health in honor of Art Reingold

Susan Desmond-Hellmann MD, MPH '88; Madhukar Pai MD, PhD '04; many others

Amount: $250,000

Impact: Madhukar Pai and his wife, Nitika, wanted to give back to the School in honor of a teacher and mentor who had given them so much, Professor and head of Epidemiology Arthur Reingold. Leveraging a $100,000 challenge match from Susan D. Desmond-Hellmann and Nicholas S. Hellmann, the Pais gave $5,000 and helped the School raise almost $250,000 to create the Arthur L. Reingold Global Health Fund in support of the next generation of global health professionals.

At the 2018 Scholarship Tea four recipients of the **Dr. Julia Quint** Work Environment Fellowship join donor **Richard Quint** MD, MPH '78 (middle). Students from left to right are: **Sylvia Sanchez, Rosemarie de la Rosa, Jessica Trowbridge, and Jose Franco.**

Montserrat Ayala-Ramirez
Amin Azzam & June Tester
Inge Baader
Lela Bachrach & Slobodan Simic
Dean Baker
John Barker & Fan Cheng
Cheryl Barth & Tom McCurdie
Carollynn Bartosh
Sanjiv Baxi & Courtney Gonzales
Robert & Gity Baxter
Wendy Bazari
Lucie Bedard
Rasika Behl
Jade Benjamin-Chung
Christapher Benson
Gale Berkowitz
Barbara Rust Berring
Nancy Beskin
Kathleen & Brad Bettman
Lianne Beyerl
Harvey & Bonnie Bichkoff
Gill Bigglestone
Michael Bird
Glenn & Jeri Bissell
Hope Biswas
Maureen Bivard
Marsha Blachman
Elizabeth Blackadder
Tim Blackman
Cecelia Blair
Bea Blakely
Gladys & Clifford Block
Andrea Bloom & Mitchell Levinson
Jacqueline & Daniel Boggan
Helen Bond
Michelle Bourgault
Roger Bourlet
Lynn Bousquet
Jill & Thomas Boyce
Sophie Braccini
Lynda Bradford
Monica Braughton
Russell & Kara Braun
Joseph Brazie
Donald Brecker & Ann Darling
Ronald Bremond
Claire & Ralph Brindis
Linda Bringedal
Eileen Brodigan
Claude Brown
Marcia Brown-Machen & Terry Machen
Luisa Buada
Katarzyna Buchacz
Monique Buffler
Merrill Buice
Sally & Graham Bullock
Alexandre Bureau & Sylvie Marceau
Lisanne Burkholder & Glenn Eldridge
Kimberly Buss
Iselin Byggstøyl
Joan Byrne
Esther Byun
Lisa Calandro
Maria & Armando Camargo Vegas
Rose Camp
Catherine Carpenter
Ann Pinson Cassin
Sally Caunce
Curtis Chan
Raymond & Grace Chan
Ryan Chan
Neha Chande
Jo Chapman
Patricia & Scott Charles
Brian & Julie Charter
Helen Chase
Eric Chen
Juliann & Shyr Chen
Kevin Chen
Jill Chin
Evelyn Chorush
Eric Chow
Noel & Judith Chrisman
Hilde Christensen
Oliver Chu & Joice Huang
Michael & Jan Clar
Dolores & Samuel Clement
Francine Coeytaux
Seymour Cohen
Stephanie Cohen
Simon & Janet Cohn
Paul Colarusso
Trent Colarusso
Carrie Colla
Barbara Collier
Donald Collins
Peggy & James Colman
Dorothy & Ralph Conway
Dorothea Copecknolan
Patrick Corcoran
Deborah Costigan
Laura Cotter
Eve Cowen & Edward Heindl
Marguerite Cowtun & Henry Terrell
Lawrence & Constance Cowper
Rosie Cox
Jason Cranston
Chm Creusen
John Crichton
Nicola Crouch
Juliette Cubanski
Carol & James Cunradi
Stephen Curry
Marilyn Davey
Rena David & Walter Meyers
Helena Daly & James Daly
Darla Erhard Danford
Caroline Davidson
Laurel & Stuart Davis
Lilia De Jesus
Tanimu De Leon-Nwaha
Stacy Deane & Christopher Carman
Marlene Dehn
Denice Dennis
Katherine Detwiler
Mamadou Diallo & Ouda Kamagate
Ronald Dieckmann & Patricia Gates
Alice & Robert Diefenbach
Deborah Dobin & Scott Robinson
Maddy Dobson
Denny & Martha Donnell
Helen Donovan
William & Chika Dow
Jacquolyn Duerr & Alberto Balingit
Gordon Dugan
Sandra Duma
Danielle Duong & Van Nguyen
Sall Duron
Abigail Eaton
Evelyn & Leslie Edens
William Edwards
Jose Eguia
Alicia Butcher Ehrhardt
Tamesin Eldredge
James Ellsworth
Denise Emery
Wayne & Rocio Enanoria
Cathrine Engsig
Sarah Epstein
Ayse Ercumen
Magdalena Eriksson
Michael Evans & Lisa Jo Silva
Peter & Connie Ewald
Jennifer Falbe & Alberto Ortega-Hinojosa
Nancy Falk
Krista Farey & Vishwanath Lingappa
Laura Farmelo
Sarah Farzinkhou
David Faulkner
George Faulkner
Sue Fensome
Sammy Feuerlicht & Susanne Simpson
Jared & Janet Fine
Daria & Bruce Fireman
Michael & Sandra Fischman
Lois Fisher & James Anderson
Robin Flagg & Jon Braslaw
Brendan & Luciana Flannery
Carol & James Floyd
Janet Fogel & Robert Schlegel
Lillian & Stewart Fong
Eimear Forde
Diana Foster
Paul Fox
Laarni Francia
Darlene Francis
Elizabeth & Ralph Frankowski
Kimberly Freed
Oron Frenkel
Katharine & Daniel Frohardt-Lane
Abe Froman
Gavin Funabiki
Betty & Fred Furuta
Brad & Pauline Garber
Erika Garcia
John Garcia Jr.
Carole & Carl Garner
Terhilda Garrido
Theresa & Michael Gasman
Jack & Karen Geissert
Michaela George

Marianne Gerson
Susan Gibbons
Virginia Gidi
Nancy Gilien
Aaron & Krista Giovara
Annette Goggio
Marshall Goldberg
John Goldenring
Marilyn & Amos Goldhaber
Lauren & Allen Goldstein
Sandra Goldstein & Kenneth Wilkinson
Belma Gonzalez
Holly Gooding
Simon Goodwin
Jackie Goold
J.J. Gough
Ilana Graetz
Benjamin Graham Jr.
Hubert & Jean Green
Linda Greenberg & Hiroshi Motomura
Stewart Gregg
Egbert Grinage
William & Lynda Gross
Nina Grove & Kenneth Johnson
Erica Grubb
Malkeet Gupta
Janet Gusukuma-Hamilton & Neil Hamilton III
Abigail Gutmann-Gonzalez
Armond & Josephine Habiby
Jill Hacker-Chavez & Raymond Chavez
Tycho Haemers
Thomas Hall & Sarah Vernlund
Jodi Halpern & Robert Devries
Rita Hamad
Jeffrey Hanson
Janice Hargreaves
Marianne Harlow
Alan & Harriet Hollett
Eva Harris & Pablo Rodriguez
Jamal Harris
Paul Harterink
Diana Harvey
Lars Hassel
Erika Heaton & Carlo Woods
Aine Hefferon
Emil Heiling
Susan Helmrich & Richard Levine
Morry Hermon & Sandhya Rao Hermon
Susan Hester
Warren & Miriam Hill
Ashley Hinds
Rosemary Hoban
Corwin Hull
Dorothy Hung
Vanessa Hurley
Carlessia Hussein
Marian Haley
Teresa & Scott Hamstra
Claudia Heath
Erica Heiman
John & Leta Hillman
Donald Hoang
Carolyn Hoke-Van Orden & Frank Van Orden
Sarah Holcombe
Hallie & Gilbert Holtzman
Barbara & Cornelius Hopper
Nap Hosang & Joyce Yap
Lori Houston

Winston Wong MD, MS '81 (front, third from left), Medical Director, Community Benefit, Kaiser Permanente, with a group of this year's Kaiser Permanente Public Health Scholars at the 2018 Scholarship Tea.

Anjali Morris MD, MPH '86 at the 75th Anniversary Party on April 21, 2018. Thanks to the support of Dr. Morris, the School has established the Morris Fellowship for the Advancement of Public Health in India, which enables four junior faculty from universities in India to conduct independent research alongside the School's global public health faculty to address some of the toughest population health challenges in the country's poorest states.

Patricia Hoyt
Teh-wei & Tien-Hwa Hu
Estie & Mark Hudes
Chen-yi Hung & Fan Zhang
Sarah & Stephen Hung
Robina Ingram-Rich & Timothy Rich
Miranda Ip
Sarah Ismail
Steve Jackson
Loisann Jacovitz
Lisa Jarvinen
Mark Jensen
Kathony & Franklin Jerauld
Debrina Johnson
Isaac Johnson
Janice Johnson
Sarah Johnson
Marilyn & Lawrence Jossens
Vinita & Shirish Joshi
Emma Joy
Simmeon Juchau
Kathryn Jung & Clifford Wong
Douglas Jutte
Alma & Ian Kagimoto
Alison Kajiwara
Gerald Kajiwara
Ming-Jer Kang & Bei-Wei Chang
Unhei Kang
Mark Kaplan
Barbara & Snehendu Kar
Leanne & Richard Kaslow
Irene & Kiyoshi Katsumoto
Elaine & Joshua Kaufman
Sukhvir Kaur
Anne Katten & Glenn Harris
Deborah Kavounas
Hollie Kay
Erin Keitel
Joan Kennelly
Charlotte Kent
Sean Kirby
Diane Kirk
Carl-Johan August Kisling
Torkil Kjernli
Kim Klein & Stephanie Roth
Alison Klurfeld
Jean Kohn
Veronica & Kenneth Kornberg
Donna Korones
Heather Kuiper & Loren Rauch
Michael Kupkowski
Marilyn Kwan
Young Do Kwon
Joan La Rosa
Julia Lai & Andy Ho
Ling Lai & Hongbo Yang
Shui Lam & Koon Chan
Ian Lamb
Andrew Lan
Heidi Lancaster
Mary Lance
Frank Landerville
Sandra Lane
Kay Lang
Olivia Lang & Michael Ward
Carol Langhauser
Matthew Lazell-Fairman
Kelvin & Brenda Lee
Eric Larsen
Jingsong Li
Hilde Lin Larsen
Phyllis Vincent Larsen
Christine Laszcz-Davis
Leisha Leclair
Ai-Chu & Winston Lee
Mimie Lee
Sheryl Lee
David Lein
Felicia Lester
Susan Liebeskind
Adrienne & Van Horn Lieu
Jennifer Lin
Zihua Lin & Shengping Yang
Elena Lingas
Lauren Lipsay
Patricia Loehrer
Michelle Loya-Talamantes
Roger Luckmann & Erica Foldy
Anne & Charles Ludvik
Ellen Luecke
Jessica Lum
Robert & Sharlene Lund
Kara MacLeod
Michael Mader
Katherine Magwene
Tanya Majumder
Christina Malin & Stephen Texeira
Tanya Mamantov & Cornelius Jansen III
Debra & Paul Manca
Anne & David Manchester
Amy Mandel
Harry & Claire Manji
Martin Marciniak II
Jennifer Marra
Grayson & Sally Marshall
Michael & Jeanee Martin
Rani Marx & James Kahn
John Mateczun & Elizabeth Holmes
Gabriel Matson
Ellicott Matthay
Karen Matthews & John Oldson
Mark Maus
Marlon Maus
Sandra Mayor
Timothy & Mika McAfee
Jeanette McCarthy
Marjorie & Robert McCarthy
Robert & Darlene McCarthy
Sean McClellan
Marilyn & Michael McConnell
Jo & Richard McCulty
Susannah Mckay
Marta McKenzie & Lawrence Chapter
Norma McKinzie
Lou McLaren & Randall Gates
Susan McLellan
Barbara Mcmullen
Bessanderson McNeil
Nicole Mcniff
Vicky Mcniff
Joan Mcparland
Jenny Meagher
Rosa Medina
Nita Mehta & Anil Thayamballi
Priya Mehta & Jason Asuncion
Linda Mehrtens
Diane Melendez
Mark Mendell
Roger Meredith
Emily Merideth
Andrea Merlin
Jane Meyer
Keara Meyercord
Andrew Miller
Faith & Robert Miller
Peter Miller
Julie Milton
Elizabeth Minkler
Kunal Mishra
Kristina Mody
Leone Mohney
Bettine Molenberg
Joel Moncada
Billie & Jim Moore
Dan Moore II
Maureen Morgan
Stephanie Morimoto
Clara Morton
Emily Mou
Kathleen Mulhern & Kedar Prasad
Marian Mulkey & John Powers
John Munday
Sally Murray
Michael Musante
Frank Mycroft & Sue Tsang
Mariam Naficy
Ruth Nagano
Bradley & Susan Neal
Claudia & Robert Nettle
Christina Ng & Francis Pao
Keith Ng & Patricia Hui-Ng
James Nicholson
Janiece & Robert Nolan
Audrey & James Nora
Barbara Norrish
Charlotte Noyes & Clark Watkins
Amani Nuru-Jeter
Chidinma & George Nwakudu
Michelle Odden
Marcellina Ogbu
Diane Ogilvy
Margaret O'Halloran & Christopher Lutz
Luna Okada & Wynn Sheade
Nobuko Okano
Catherine O'Keeffe
Joanna Omi
David & Mary O'Neill
Melissa Ongpin

Alan Oppenheim & Alice Salvatore
Karen Pak Oppenheimer
Peter Origenes
Anne Osborne
Chris Ounsley
Simon Ounsley
Emily Ozer & Antony Fields
Vineet Pandey
Jane Pannell
Susan Pante
Matthew Pantell
Luz & David Pardini
Valentine Paredes
Seema Patel
Patricia Patterson & Scott Willis
Eileen & Mark Pearl
Rachel Pedowitz
Jenna Perez-Feinberg & Steven Feinberg
Mary & Arthur Perkins
Katrina Pethers
Audrey Pettifor & Mark Schoeman
Nancy Pham
Robin Phipps & Thomas Hahn
David Pies
Natasha Pinto
Sharon Pipkin & Richard Pipkin
Jessica Pippen
Mary Pittman & David Lindeman
Katherine Pollard
William Pomart
Elisabeth Powelson
Kristen Pratt
David & Verna Pryor
Dennis Pryor
Susan Purdin
Kelvin Quan & Karen Lam
Renee Rabache
Rosemary Rainwater
Jayant Rajan
Meena & Kumar Ramaiyer
Hallie Randel-Schreiber
Thomas Rankin & Jocelyn Real
Judith & John Ratcliffe
Stephen Rauch
Justin Rausa & Colleen Klus
Leighton & Carol Read
Leslie Reiber & David Witt
Kenneth Renwick & Trish Rowe
Megan Resch
Joseph & Nancy Restuccia
Anna Kathrina Reyes
Patricia & Pedro Reyes
John & Mary Reynolds
Melissa & Norbert Riezler
Jean & Francis Riley
Helge Sverre Risan
Stephan Ritter
Annette & Wilfrid Roberge
Helen & Fred Roberts
Jennifer Roberts
Sarah Roberts
Mary & Carl Rodrick
Prudence Rollo
Austin & Annette Ross
Cath Ross
Nancy Rotecki
Gretchen Rothrock
Tami Rowen
Elisabeth Røyseth
Keren Rumbold
Dewey Ravenscroft
Lisa Sadleir-Hart & Thomas Hart
Lisa Safaeinili
Nadia Safaeinili
Debra Safer & Adam Arkin
Alexander Sajnani
Linnea Sallack
Sally Saltzstein
Jones Samuel
Kelly Behrens Sandin
Baljeet Sangha
Andrea & Gopal Sankaran
Elizabeth Sanseau
Blaine Sayre
Judith Sayre
Jennie Schacht
Susan Scheer
Janet Schilling
Alexander Schrobenhauser-Clonan
Emily Schwarz
Shaila Serpas
Shira Shafir & Ted Kroeber
Mark Shaw
Lila Sheira
Gordon Shen
Cindy Shepler
Carol & Alan Sherman
Kim Shetter
Dion Shimatsu-Ong & Gregory Ong
Karen Shore
Jing Shui
Elizabeth Sigman
Alissa Singer
Joan & David Skurnick
Lester & Pauline Smith
Marcela Smid
Kristie Snider
Gina Solomon
Constance & Jason Som
Laurie Soman
Marcia Somers & Robert Somers
Lina Somsouk Sy
Jeanette Spangle & Alan Walfield
Merry Speece
Sandra Spence
Kara Spencer
Usha & Bharat Srinivasan
Frank Staggers
Kathryn Stambaugh & Thomas Mazzotta
Karen Starko
Sura Steinberg
Valerie Steinmetz
Kristin Stempf De Vargas
Eileen Stephens
Halbert Sterling
Ian Stirling
Laura Stock
Marilyn & William Stocker
Einar Storlien
Elva Strandberg Rust
Janice Strassheim
Anna Summer
Richard Sun
Andrea Sundström
Dee Sunyata
Somjit Supannatas
Patricia & Frank Tallerico
Janet Tam & Christopher Ratcliff
May Tan
Hui Tang
Sara Tartof
Dawn Taylor
Marna & Peter Taylor
Ying Tcheou & John Cunningham
Irene & Marsh Tekawa
Ned Therien
Maria Thilander
Lidia Thompson
Pamela Thompson
Courtney Tierney
Claudine Torfs
Cara Torruellas
Bruce Train
John Troidl
Alex Trope
Lee Trope
Roky Truong
Lue-Yen & Jeffre Tucker
Mary & Kenneth Tuckwell
Joanne Tuller
Michael & Barbara Turell
Yukiko Umemoto & Richard Younge
Walter Unger
Deryk & Karen Van Brunt
Mark & Martine Van Der Laan
Anil Van Der Zee
Michele & Robert van Eyken
Loetta Vann
Tanya Himathongkam Vannapruegs
Juan Velasquez
Ellen Velie
Christopher Vercammen-Grandjean
Eilen Vollan
Devi Vyas & Girish Vyas
Georgianna Wade
Barry & Susan Wainscott
Miranda Walker
Maggie Wallace
Julia Walsh & Stephen Dell
John Walsh-Heron
Marcella & James Warner
Helen Watkinson
Christina Watson
F. Watton
Li Webb
Rachel Weinrib
Karen Fletcher Weisman
Alan Welsh
Margaret Wenig
Paul Wesson
Joan Wheelwright
Justin White
Cynthia Whitney
Annette Whittemore
Emilia Wilkins
Geoffrey Williams
Michael Williams
Rhid Williams

The Cohn family stands in front of Professor Arthur Reingold's office, which they named in memory of Leonard Cohn, Class of 1957 with a gift of $75,000. The Cohn family represents three generations of Cal graduates. Pictured here are **Robbie Cohn, Barry Cohn, Wendy Feldman, Janna Feldman, Kyla Feldman, Justin Feldman, and Professor Art Reingold,** in front of Art's office, which bears the plaque honoring Leonard. Not pictured: **Denise Cohn and Mark Cohn.**

Robin Williams
Carl Wilmsen
Nancy Wiltsek
Nicole Wine
Helen Leabah Winter
Terry & Antonia Winter
Melissa Woods Nelson
Liane & Mitchell Wong
Paula Worby
Annie Worth
Miranda Worthen
Donna & Philip Wright
Kara Wright & James Lawrence
Frances Wu
Stephanie Wu
Jane Yang & Adam Crawley
Wei Yang
Susan Yeazel & Richard Seegers
Elaine Yeh
Jessica Young
Sandra Young
Virginia Young-Cureton & Glen Cureton
Tamiko Younge
Victoria & Steven Zatkin
Martha Zaragoza-Diaz
Mary Zernicke & Peter Honigsberg
Elin Zetterstrand
Chi Zhang
Danielle Zhou
Cynthia & Bennett Zier
Lucas Zier
Jane & Stacey Zones
Ann Zukoski & Mark Bartlett

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$500,000 and Above

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The Commonwealth Fund
East Bay Community Foundation
Gilead Sciences Inc
Kaiser Foundation Health Plan, Inc.

$250,000 to $499,999

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Shire
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Global Good Fund
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PSC Partners Seeking A Cure
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Universidad Nacional Autonoma de Mexico

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UC Chinese Alumni Foundation
Wells Fargo Bank NA

Newest Campus Building a Home for the School of Public Health and a Hub for 'Healthy Futures'

Chancellor Carol Christ gives remarks at the ceremonial ribbon cutting for the new "healthy futures" building.

Chancellor Christ and campus leaders cut the ceremonial ribbon to welcome our collective communities to the new building.

With a snap of the traditional big scissors, Chancellor Carol Christ and other campus leaders formally opened Berkeley Way West, UC Berkeley's newest academic building and the School of Public Health's new home.

The eight-story, 230,000-square-foot building houses classrooms, offices, open workstations, and collaborative space designed to serve the 900 students, staff, and faculty connected to the Graduate School of Education, the Department of Psychology, and the School of Public Health.

"This building was conceived of as a home for 'healthy futures,'" Chancellor Carol Christ said at the ceremonial ribbon cutting on October 12, 2018. "The students, staff, and professors in each of these disciplines are committed to a future in which health and wellness are more accessible to all, in which there is greater educational opportunity and in which we possess a deeper understanding of ourselves and our humanity."

The audience enjoys some celebratory confetti following the ribbon cutting.

Berkeley Public Health

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