



UNIVERSITY  
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# Meeting California's Cancer Challenges

UC Cancer Consortium

2017

Despite steady declines in cancer rates over the past 20 years, cancer is soon expected to overtake heart disease as California's leading cause of death. This year alone, it will afflict 176,000 residents, take nearly 60,000 lives, and cost California a minimum of \$14 billion in treatment costs and days lost from work.

In a new initiative, the University of California's five academic cancer centers, home to some of the world's leading scientists and physicians, as well as some of cancer's major breakthroughs, are coming together to take on California's most pressing cancer-related problems and opportunities.

The past decade has seen unprecedented progress in cancer research and treatment. This era, with its advances and challenges in collecting and analyzing large datasets and a new ability to delve deeply inside the disease's biology, has brought the cancer community to a crossroads. Significant advances in translating laboratory science to clinical care will now depend on coordinated efforts among the best, most skilled people and institutions.

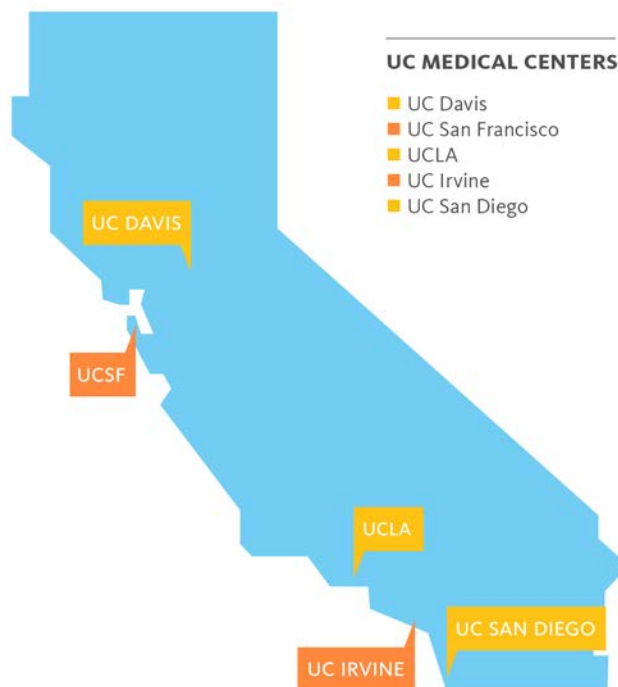
The alliance of the five UC cancer centers, all of which hold the highest designation possible from the NIH's National Cancer Institute (NCI), reflects a new model for cancer research and treatment that calls for the sharpest minds to work together, across organizations, to develop innovative solutions across the cancer care continuum.

The new UC Cancer Consortium is uniquely suited to catalyze California's efforts to improve outcomes for cancer patients and their families. Their collective expertise and capabilities will enable them to address California's most pressing issues, including cost of care, variability in reimbursement, challenges in research funding, matching developing drugs to multiple cancer subtypes and rare tumors, harnessing the profusion of data to improve patient care and safety, and disparities in outcomes and access to care.

### The University of California Cancer Consortium

Five of our nation's leading academic cancer centers are part of the University of California health system, UC Health. These centers hold the NCI's Comprehensive Cancer Center designation. Individually, they are hubs of expertise and innovation, while also partnering with industry to advance technology, protocols, and medicines that will become available to practitioners and patients around the world. Combined, the UC centers administered more than 1,600 clinical trials in the past year, connecting more than 29,000 patients to the newest, most innovative therapies available, and helping move the most promising of those therapies forward toward federal approval. Collectively, they are the nation's top recipient of research grants from the National Institutes of Health and of cancer research grants from the NCI, and the largest university holder of U.S. biomedical patents.

These five centers - UC Davis Comprehensive Cancer Center; UC Irvine Chao Family Comprehensive Cancer Center; UCLA Jonsson Comprehensive Cancer Center; UC San Diego Moores Cancer Center; and UC San Francisco Helen Diller Family Comprehensive Cancer Center – form the new University of California Cancer Consortium.

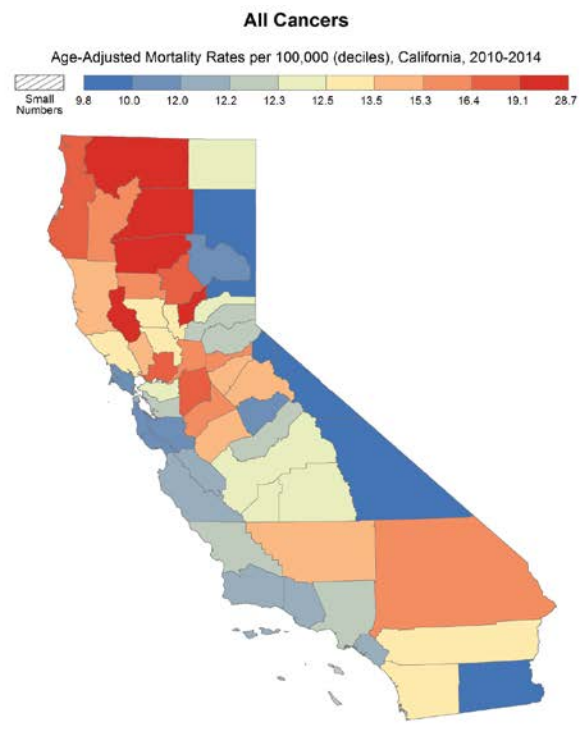
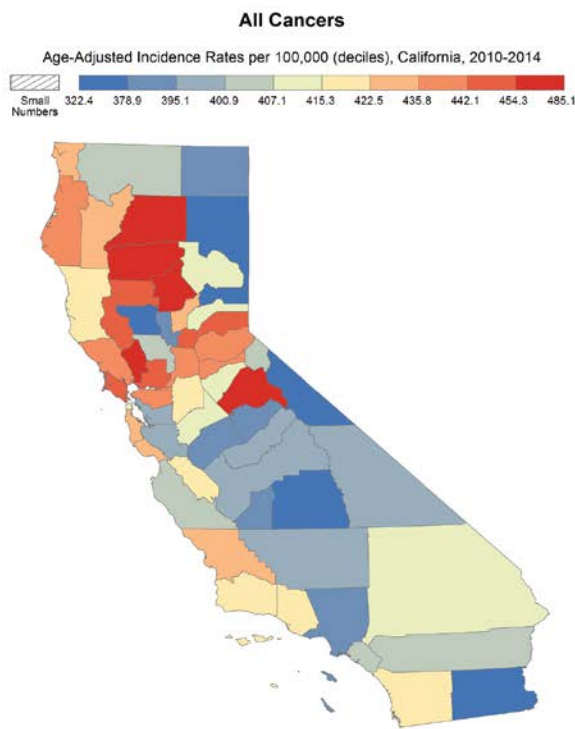


### The California Cancer Outlook

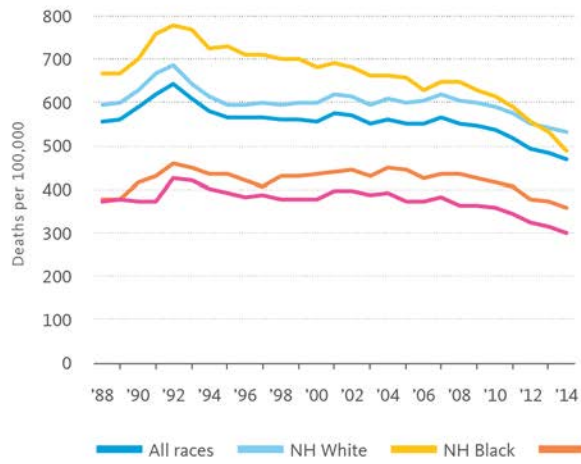
California's economy and population offer compelling motivations for the work of the UC Cancer Consortium. California has the world's fifth largest economy, with strong sectors in technology, biotechnology, and healthcare delivery. The state's population of more than 39 million people is the most ethnically diverse in the country. That diversity, combined with a high poverty rate, pose challenges the Consortium can address by studying ethnic disparities in health outcomes and access to quality care. It also serves as a tremendous benefit to the nation by creating a rich and ethnically diverse source of research that explores health differences and disparities nationwide.

Collectively, the UC cancer centers treat 16% of all cancer patients in California. Of these, 45% are patients with late stage cancers. These include patients diagnosed for the first time at a UC cancer center and patients diagnosed elsewhere and referred to a UC center. It is important to note that because of their research mission, NCI centers often see patients with rare and difficult cancers who cannot be treated in other hospitals that may lack the expertise or access to clinical trials using the latest experimental drugs.

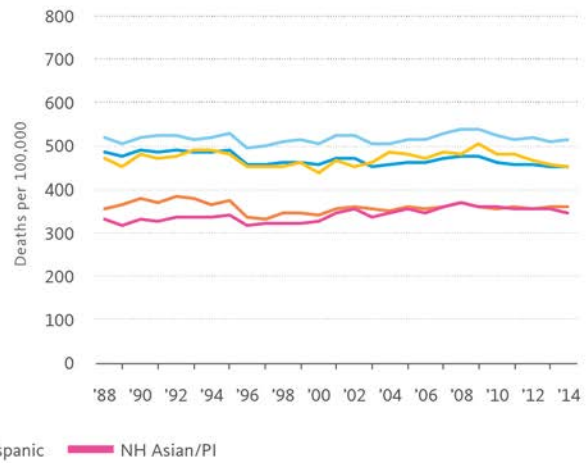
More than 1.4 million California residents are living with a history of cancer, and 60% are living five years and beyond after a diagnosis. Despite these and other promising trends, nearly one out of every two Californians will develop cancer, and an estimated one in five will die of the disease.



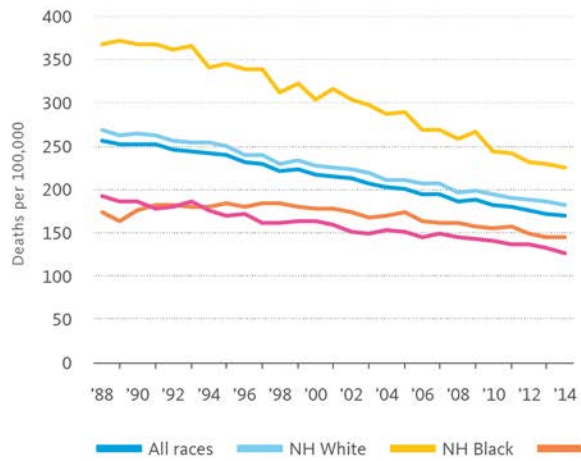
Age-adjusted Overall Cancer Incidence Trends  
among Males by Race  
1988-2014, California



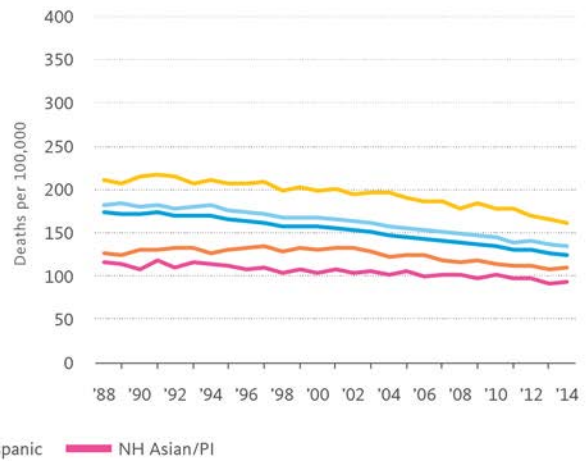
Age-adjusted Overall Cancer Incidence Trends  
among Females by Race  
1988-2014, California



Age-adjusted Overall Cancer Mortality Trends  
among Males by Race  
1988-2014, California



Age-adjusted Overall Cancer Mortality Trends  
among Females by Race  
1988-2014, California



### Initial Areas for Collaboration

Cancer research is driven by questions at different levels of biological and human organization depending on the disciplinary focus of investigators who generate new knowledge, treatments, and methods of cancer control. Basic research disciplines seek new truths that can generalize knowledge about genetic, molecular, and cellular processes and help elucidate the many mysteries of carcinogenesis. Clinical research seeks to use basic discoveries to improve the diagnosis, treatment, and care of people with cancer. Population scientists seek to understand the determinants of cancer incidence, morbidity, and mortality across the continuum and to develop and disseminate effective interventions to reduce them. (Tai & Hiatt, Epidemiologic Reviews, 2017)

The UC Cancer Consortium will begin by working on projects that best address the needs of California's patient population. These projects include:

- **Precision Medicine** - Progress in cancer genomics has ushered in a new frontier in which a patient's cancer will increasingly be characterized by mutations and other molecular abnormalities rather than the site of origin. Findings from molecular diagnostic tests are then evaluated against the ever-increasing number of therapeutics being developed in translational research and clinical practice to improve patient outcomes. Pooling of data and experience is critical in exploiting this new era of molecular medicine, which is a major driver of collaboration among the UC Cancer Centers.
- **Clinical Trials** – Clinical studies, which explore the safety and efficacy of new drugs, are the primary method through which advances in cancer treatment are made. Academic cancer centers seek to make available a wide variety of clinical trials to their patients. These include early phase trials that test the toxicity of emerging drugs in patients to late-phase trials that explore the effectiveness of promising drugs against various cancers. The aim will be to make clinical trials much more widely available across the state, giving patients more choice and increasing the pace of enrollment.
- **Population Health Science** – California is the most ethnically diverse state in the country. Increasingly, research shows that cancer's prevalence, virulence, and response to treatments can vary widely among different ethnic groups. There are significant disparities in both incidence and outcome between people of different ethnic groups, caused by genetic, environmental, cultural and socioeconomic factors. Working together we can share our experiences and implementation of new measures to reduce these disparities.
- **Big Data, Best Practices** - It has been said that the millions of gigabytes of data in the public realm hold keys to everything from repurposing approved drugs to delivering better care more safely and less expensively. Using data from the UC system and public sources present opportunities to harness immense amounts of data to revolutionize care and cost, while protecting patients' privacy. Collaboration across the five UC Cancer Centers presents an opportunity to share clinical pathways and best practices, while also allowing for a greater critical assessment of the patient experience to improve quality of care and patient outcomes and reduce costs.

- **Authoritative Advocacy for Cancer Patients in California** – The overall mission and collective expertise of the UC cancer centers make the Consortium a powerful voice to advocate on behalf of patients on matters of access, quality, cost, and public health both at the local and state level. This patient advocacy could also occur by introducing and implementing statewide initiatives, or through recommendations for legislative action. In addition, a unified group of NCI centers possesses an advantage when applying for competitive funding from public and private sources. In the past three years alone, there have been very large philanthropic investments in ambitious projects that incorporate leading experts from institutions around the US.

## ABOUT THE UC CANCER CENTERS

**UC Davis Comprehensive Cancer Center** is transforming cancer research and care by leveraging its strong scientific programs. Its unique partnership with the nation's top veterinary school is leading to new therapeutic approaches to benefit companion animals and their human counterparts. Its MUSE microscope, developed by UC Davis pathologists, in collaboration with Lawrence Livermore National Laboratory, provides surgeons with rapid analysis capabilities. And the world's first whole-body PET scanner now under construction will change the way cancers are detected and treatments delivered. The cancer center also leverages two NCI-funded programs in clinical research spanning phase 1-3 trials and offers patients throughout the region a city-wide phase I trials program. The cancer center also leads the nation in addressing unique cancer risks facing Asian-Americans, and is helping prevent cancers in high-risk, underserved communities by coordinating HBV and HPV vaccination and cancer screening efforts.

*“At UC Davis we like to say we are breaking barriers to beat cancer. We do this by leveraging our diverse partnerships across different disciplines, and we look forward to doing the same with our UC cancer center partners.”*

– Primo “Lucky” Lara, MD, Director, interim

**The Chao Family Comprehensive Cancer Center (CFCCC) at UC, Irvine (UCI)** was named a National Cancer Institute-designated cancer center in 1994 and has been a comprehensive cancer center since 1997. The CFCCC is the only NCI cancer center in Orange County, the 6<sup>th</sup> most populous county in the U.S. and home to over 3.1 million people. It serves the southern portion of Los Angeles County and the western portions of San Bernardino and Riverside counties, a total catchment area of over four million residents. UCI's academic health system, UC Irvine Health, is dedicated to the advancing medical knowledge; teaching of future healers; delivering the finest evidence-based care through its tripartite *Discover/Teach/Heal* mission; and serving the community as the largest provider of care to under- and uninsured residents.

UCI and the CFCCC bring UC-wide excellence in several areas critical to cancer science, including optics and imaging, biomedical engineering and devices, nanotechnology and nanomedicine, and structural and chemical biology. Discoveries of CFCCC members have been translated to practice-changing national clinical cancer trials, including spectroscopic imaging of breast tumors, anti-angiogenic therapy for cervical cancer, immunotherapeutic approaches to glioblastoma, and chemoprevention for colorectal cancer. The CFCCC's diverse catchment area (34% Hispanic, 20% Asian) has afforded unique opportunities to develop research-based cancer prevention and treatment initiatives in uncommon tumors in populations with barriers to effective care.

*“The UC Cancer Consortium represents the cancer research and treatment arm of UC Health, an academic health network with over 14 million patients under care. The Consortium plays a central role in alleviating the burden of cancer on the residents of California through research into the causes, prevention, and treatment of cancer, training the next generation of cancer health care providers, and providing state-of-the-art cancer care to the ethnically and socioeconomically diverse population of our state.”*

– Richard Van Etten, MD, PhD, Director



**The Jonsson Comprehensive Cancer Center (JCCC) at UCLA** includes over 500 members who conduct basic and translational cancer research. A distinguishing feature of the JCCC is its commitment to the translation of basic science discoveries to the clinic. Its members have a 20-year history of successfully doing so as exemplified by the development of the Her2/neu antibody Herceptin for the treatment of *HER2/neu* positive metastatic breast cancer. More recently, JCCC physicians have made advances in the treatment of melanoma, lung, and breast cancer. Our members are at the forefront in engineering the immune system to fight cancer, harnessing the immune response to attack tumors, and applying advances in nanotechnology for cancer drug delivery. In addition to our focus on defining the causes and of cancer and developing new treatments, members of our Patients and Survivors program have found that cancer survivors often experience acute and late effects that occur as a result of the therapies they have received, and they are developing interventions to minimize them. Finally, our researchers are keenly aware that some cancers are more prevalent in selected populations and that access to state-of-the-art cancer treatment is not equally available to everyone. Our disparities researchers are conducting research to understand why some groups of people may be more or less likely to develop cancer and how best to deliver care to these communities.

*“Mobilizing the incredible strengths of the five UC Comprehensive Cancer Centers towards common goals will accelerate research and create new opportunities for those seeking treatment for cancer.”*

– Michael Teitell, MD, PhD, Director

**UC San Diego Moores Cancer Center** aims to save lives by transforming cancer prevention, detection and care. As San Diego's only NCI-Designated Comprehensive Cancer Center and National Comprehensive Cancer Network member, Moores Cancer Center patients have access to bench-to-bedside innovations, the latest in surgical technologies and more than 300 interventional treatment trials. The new Jacobs Medical Center, a 245-bed, 10-story hospital, has dedicated space for specialized oncology, including a state-of-the-art unit with a pressurized, aseptic air-filtration system for the blood and marrow transplant program. The advanced surgery unit offers minimally invasive approaches, robotics, transplantation and other combinations of 3D visualization technologies that further advance surgical approaches to brain tumors, prostate cancer and more. With approximately 400 members, Moores Cancer Center has a history of research prominence in hematologic malignancies, cancer genomics, imaging, cancer stem cells and immune oncology, from cutting edge cell therapies to personalized vaccines (in collaboration with other elite basic science centers and biotechs) to new therapeutics for more than 200 types of cancer. Patients routinely undergo genomic sequencing with precision therapy (targeted and immune) decisions made in conjunction with a specialized Molecular Tumor Board.

*“The UC Cancer Consortium will harness the cutting edge research and patient care of the five world class cancer centers of the University of California to move the fight against cancer forward. This collaboration will allow the five centers to leverage their resources together to advance the translation of science from the laboratory to clinical care, greatly improving the quality of treatments available to patients throughout California. The residents of our state will directly benefit from this advancement through more productive use of our resources and improved cancer treatments that are more personalized at the patient level.”*

– Scott Lippman, MD, Director

**UC San Francisco Helen Diller Family Comprehensive Cancer Center (HDFCCC)** seeks to reduce cancer incidence, mortality, and morbidity in our Northern California catchment area, nationally, and globally. To do this, we apply twin principles of precision cancer medicine and precision population health, aiming to systematically and intimately link research and clinical service delivery for patient benefit. We build on the richness of the basic biological insights and the extensive and exceptional clinical research and facilities at UCSF, one of the world's leading health research universities. Moreover, our location in the Bay Area allows us to take advantage of one of the most innovative and intellectually progressive environments in the world. The Center's 400 members represent dozens of departments and institutes across UCSF, which is the only UC campus devoted exclusively to the health sciences. Members are investigators in laboratory, clinical, and population-based research who collaborate across the cancer spectrum, from basic biology to risk factors and prevention and control strategies.

*“This new UC Cancer Consortium represents a forward-looking partnership among leading academic cancer centers. Each institution has contributed significant advances to cancer research and treatment. Together, we can better serve the people of California and make even greater contributions to the field of cancer.”*

– Alan Ashworth, PhD, FRS, Director  
UC Cancer Consortium, Inaugural Chair

## References

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[http://www.ccrca.org/pdf/Reports/ACS\\_2017\\_FF.pdf](http://www.ccrca.org/pdf/Reports/ACS_2017_FF.pdf)

Maps and graphs provided by The Greater Bay Area Cancer Registry

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