

# Longevity Industry in California

LANDSCAPE OVERVIEW 2019

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# Longevity Industry in California

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# Advisors



**Sergey Young** is Innovation Board Member at XPRIZE Foundation, Development Sponsor of Longevity XPRIZE, and Founder of the \$100M Longevity Vision Fund. The mission of the fund is to accelerate longevity breakthroughs by investing in technologies, products, and services that extend human lifespans and overcome the negative effects of aging in an affordable and accessible way. Sergey Young's 20-year investment expertise includes managing a private equity fund with \$2bn in assets and co-founding Peak State Ventures, a US-based fund focused on new technologies in Real Estate, Digital Healthcare and the Future of Work.

*"Global longevity has gone from underfunded sector to a booming industry embraced by investors, scientists and the media within just a few years. I launched Longevity Vision Fund to help at least 1 billion people to live longer and healthier lives through investing into companies working at the forefront of science and technology. This open-access report, landscaping Longevity Industry efforts in California, reflects only a small portion of the enormous volume of activities aiming to extend healthy human longevity that are happening around the world."*



**Aubrey de Grey** is an English author and biomedical gerontologist. Aubrey is the Chief Science Officer of the SENS Research Foundation and VP of New Technology Discovery at AgeX Therapeutics. He is editor-in-chief of the academic journal Rejuvenation Research, author of The Mitochondrial Free Radical Theory of Aging (1999) and co-author of Ending Aging (2007). He is known for his view that medical technology may enable human beings alive today not to die from age-related causes. He is also an amateur mathematician who has contributed to the study of the Hadwiger–Nelson problem.

*"This report charts the current landscape of California geroscience, as well as a wide range of important life-extending technologies. California is one of the birthplaces of biotechnology, and, as the place where the science of biogerontology first met the technology of regenerative medicine, it can now also be styled the birthplace of rejuvenation biotechnology, and the place where the first shots in the war on aging were fired. As the war on aging goes global, California will remain an important field of battle for decades to come."*

# Advisors



**Robin Starbuck** Farmanfarmaian is a professional speaker, entrepreneur and angel investor working on companies in cutting edge tech poised to impact 100M people or more. With over 125 speaking engagements in 12 countries, she educates audiences on technology, the future of healthcare, patient empowerment, building thought leadership, and more. Her first book, "The Patient as CEO: How Technology Empowers the Healthcare Consumer", is a #1 Best Seller on Amazon. Her 2nd book published in March, 2019: "The Thought Leader Formula: Strategically Leverage Your Expertise to Drive Business & Career Goals".

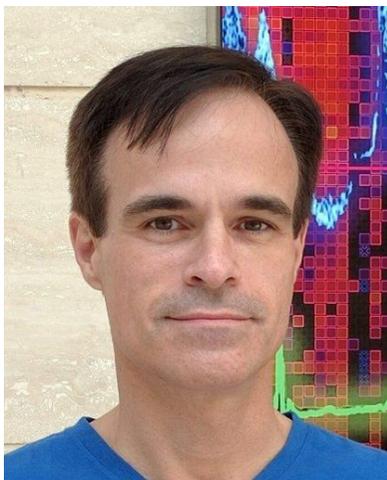
*"This report shows why California has been and will continue to be a global hub of the future of healthcare, longevity and precision medicine. Advances in healthcare and in personalized and preventive medicine are happening at breakneck speed, and individuals have never had more tools and technologies available for gaining power over their own health and longevity than they have today."*



**Zoltan Istvan** is widely recognized for helping spearhead the modern-day transhumanist movement, which advocates for using radical science to improve and evolve the human being. Zoltan's public work has received hundreds of millions of views, much of it through his political and science activism. He was the 2016 presidential candidate for the Transhumanist Party and toured the country in the Immortality Bus, which he used to deliver the original Transhumanist Bill of Rights to the US Capitol. Zoltan has spoken at the World Bank, the World Economic Forum, Microsoft, Harvard, and was the opening keynote at the Financial Times Camp Alherville. He is a graduate of Columbia University, and lives in San Francisco. Zoltan is the subject of the award-winning 2019 feature documentary: Immortality Or Bust.

*"California is the epicenter of the longevity industry. With massive financial resources, unlimited intellectual talent, and perfect weather, people are moving from all over the world to create their longevity start-ups here in California. I fully expect the first people to overcome aging to be in California using California-created tech."*

# Supporters



**Kevin Perrott** is a cancer survivor and founder and CEO of OpenCures, a health data-management platform that empowers individuals performing self-directed research. OpenCures helps individuals measure their health at an unprecedented level of resolution and focus the value of their health data on the research problems they are interested in. Using an innovative, HIPAA-compliant, collaborative data sharing platform and cutting-edge diagnostics, people can share, combine, and focus the value of their protocols and aggregate health data to create their own health solutions. Dr. Perrott is also cofounder of Oisin Biotechnologies, a biotech company focused on therapies for age-related disease by “reprogramming” cells using a non-toxic and non-immunogenic gene-delivery mechanism. He cofounded SENS Research Foundation, a non-profit focused on developing rejuvenation biotechnologies using the damage-repair paradigm of aging. He has a PhD for work done in the lab of Judith Campisi at the Buck Institute for Research on Aging focused on reducing the harmful effects of senescent cells.

*“Today millions suffer from age-related degeneration. It is a universal and complex problem facing us all, defying piecemeal solution. Never before has it been more important to systematically survey who the leading players are doing the best research and delivering real-world products able to extend healthy lifespan and California is “ground zero” for the explosion of companies focused on developing those technologies. This report is a fantastic resource for anyone needing an overview of the landscape of the Longevity Industry to serve as a starting point or reference to help them pursue their own longevity aspirations.”*



**Keith Comito** is President of the Life Extension Advocacy Foundation. Keith Comito is a computer programmer and mathematician whose work brings together a variety of disciplines to provoke thought and promote social change. He has created video games, bioinformatics programs, musical applications, and biotechnology projects featured in Forbes and NPR. In addition to developing high-profile mobile applications such as HBO Now and MLB AtBat, he explores the intersection of technology and biology at the Brooklyn community lab Genspace, where he helped to create games which allow players to direct the motion of microscopic organisms. Seeing age-related disease as one of the most profound problems facing humanity, he now works to accelerate and democratize longevity research efforts through initiatives such as Lifespan.io.

*“California, itself the world’s fifth-largest economy, is one of the few states proactively meeting the personal, societal, and economic challenges posed by an aging population. This report details its unique position to demonstrate, both to the rest of the United States as well as the world, how thoughtful policy decisions and aging-focused state-sponsored initiatives can turn these challenges into opportunities: engendering both a sustainable healthcare economy, as well as increased healthy lifespan and happiness for individuals.”*

# Editors



**Kate Batz** is Vice President of Business Development at Deep Knowledge Ventures and Aging Analytics Agency, supervising activities in the United States. She is an experienced corporate attorney licensed to practice law in California and New York, with an extensive sales and marketing background. At the beginning of her career, Kate was involved with international litigation when she worked for a former Pennsylvania state senator. As a corporate attorney, Kate worked with several Fortune 500 clients. Compelled by the paradigm-shifting advances in science and technology in the fields of aging and Longevity, Kate enthusiastically joined Deep Knowledge Ventures and Aging Analytics Agency. Kate served as a Managing Editor for Longevity Industry in California: Landscape Overview 2019 report.

*"Aging Analytics Agency has been producing landscape overviews of both the Global Longevity Industry and related regional case studies for a number of years, long before mainstream recognition of this sphere. These reports were necessary to grasp the entire scope of the Longevity industry and to gain a concrete understanding of its key players, laying the foundation for the agency's proprietary analytics and industry benchmarking. The choice of California for our next regional case study was obvious, and it is clear that the state is one of the leading catalysts of the Global Longevity Industry and a literal nuclear reactor for advancing Longevity science, driven by progress in AI, precision and preventive biomedicine and geroscience. California will undoubtedly continue to play a prominent role in this trajectory, helping the industry grow into the multi-trillion dollar giant it is destined to become."*



**Dmitry Kaminskiy** is Managing Partner of Deep Knowledge Ventures and Founder of Longevity.Capital. An innovative entrepreneur and investor active in the DeepTech and is a frequent speaker on the topics of AI and Longevity at conferences organized in London by The Economist "Aging Societies and The Business of Longevity", Financial Times "Global Pharmaceutical and Biotechnology Conference", at the "Precision Medicine World Conference" in Silicon Valley as well as several others at Oxford and Cambridge Universities. He is actively involved in the work of the All-Party Parliamentary Group (APPG) for Longevity in the UK Parliament, now serving as co-director of the APPG secretariat, overseeing the APPG's international Longevity cooperation development division and is supervising all of the APPG's activities related to the concept of establishing Centres of Artificial intelligence for Preventive Medicine and Longevity in the UK.

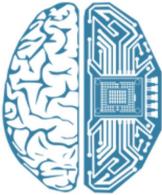
*"The future of the Longevity Industry not only has the logical potential to become the wealthiest industry in all of history, but also represents the most ethical way of doing business, and one of the greatest humanitarian efforts being done today. It is an all-encompassing sphere that touches many of the most important sectors and aspects of society today - from health and wellbeing to wealth and finance, disrupting healthcare and national economies through the convergence of advanced biomedicine, AI, geroscience and novel financial system. But countries looking to capture their fair share of the oncoming multi-trillion dollar market of 1 billion people in retirement should focus their efforts on the synergetic development of medicine, finance and national government-led Longevity development plans, not in isolation, but in accelerative convergence."*

# Institutional Partners



**AGING  
ANALYTICS  
AGENCY**

Aging Analytics Agency



**DEEP  
KNOWLEDGE  
ANALYTICS**

Deep Knowledge Analytics



**LONGEVITY  
VISION  
FUND**

Longevity Vision Fund



**Longevity.Capital**

Longevity.Capital

**sens research foundation**  
reimagine aging

SENS Research Foundation



Longevityinternational.org



# Longevity Industry in California 2019

California Longevity Companies - 220

## Precision Medicine

## AgeTech

## NeuroTech

## Regenerative Medicine



# Companies - 220

## AgeTech

### Medical Devices



### Care support



## NeuroTech

### Brain training



### Cognitive



### SleepTech



## Precision Medicine

### Personalized Diagnostics and Prognostics



### Preventive Medicine



### Personalized Medicine



### Precision Medicine



### Preventive Diagnostics and Prognostics



## Regenerative Medicine

### Tissue engineering



### Geroscience



### Regenerative medicine



### Cell therapy



# Investors - 255

## AgeTech



## Regenerative Medicine



## Precision Medicine



**California vs. Global  
Longevity Landscape 2019:  
200 Key Players**

**California Occupies  
17% of Global  
Longevity Landscape**

**Global - 165  
California - 35**

**Global**

**California**



**AGING ANALYTICS AGENCY**

**DEEP KNOWLEDGE ANALYTICS**

**LONGEVITY INTERNATIONAL**

# Top-80 Longevity Influencers in California



Adam Willoughby



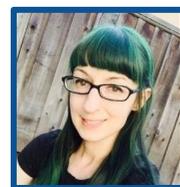
Alan Trounson



Alex Krol



Anne Brunet



Anne Corwin



Anne Wojcicki



Arielle Burstein



Arnold Whitman



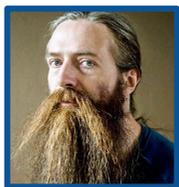
Art Levinson



Art Torres



Atul Butte



Aubrey de Grey



Bernadeane



Bill Faloon



Bill Maris



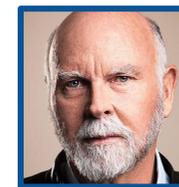
Bryan Johnson



Cameron Diaz



Christine Peterson



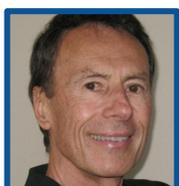
Craig Venter



Cynthia Kenyon



Danica Chen



David A. Kekich



David Botstein



David Brindley



Diana S. Dooley



Dr. David Gloss



Elizabeth Blackburn



Ellen Young



Eric Topol



Eric Verdin



Fernando Torres-Gil



Gavin Newsom



George Asimenos



Gordon Lithgow



Gregory A. Bonfiglio



Gregory Chin



Gregory M. Fahy



Gwyneth Paltrow



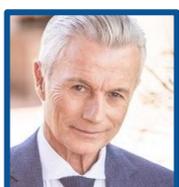
Hannah-Beth Jackson



Irina Conboy



James Edward Olmos



James Strole



James Thomson



Jessica Mega



Johnny Adams



Jonathan Cain



Joseph Rodrigues



Judith Campisi



Judith Segall



Julia Willis

# Top-80 Longevity Influencers in California



Katy Fike



Ken Dychtwald



Kevin Perrott



Lana Larocca



Larry Ellison



Laura Deming



Laura L. Carstensen



Laura Trejo



Lisa Ellerby



Lisa Fabiny Kiser



Lora Connolly



Maria Entraigues Abramson



Maria Konovalenko



Maria Shriver



Maria T. Millan



Marina Sirota



Martha Deevy



Matthew O'Connor



Max More



Michael D. West



Michael Kope



Nancy McPherson



Natasha Vita-More



Nooshen Hashemi



Patricia Olson



Paul Knopfler



Peter Diamandis



Peter Thiel



Pinchas Cohen



Ralph Merkle



Ray Kurzweil



Rebecca Hughes



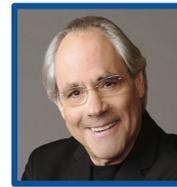
Regis Kelly



Remy Gross



Robert Freitas



Robert Klein



Robin Farmanfarmaia



Rochelle Buffenstein



Sarah Thomas



Scott Tocher



Sebastian Aguiar



Sergey Young



Sonia Arrison



Stephen Johnston



Steve Horvath



Steve Aoki



Susanne Somers



Thomas A. Rando



Thomas Okarma



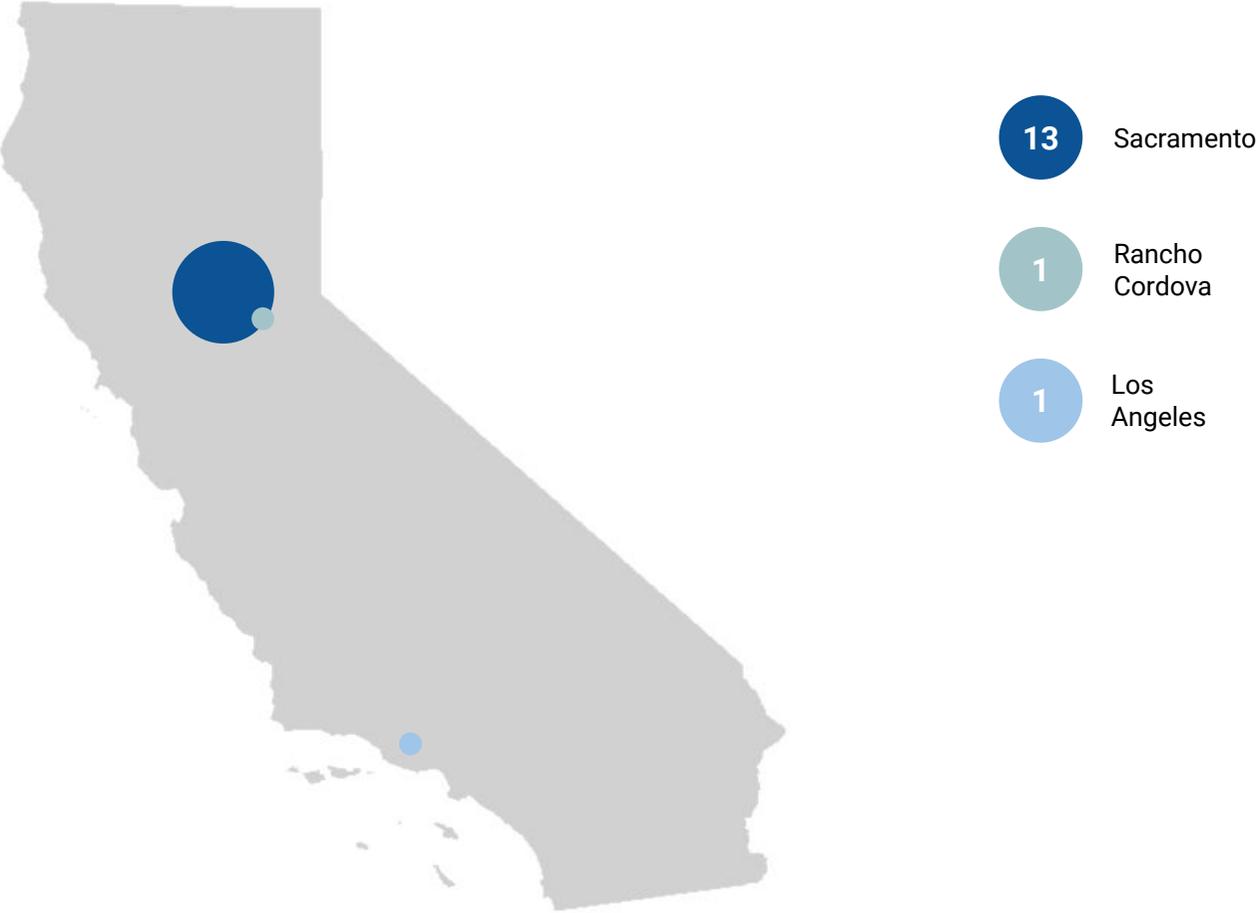
Zoltan Istvan

# Top-80 Longevity Influencers in California by City



This diagram illustrates the locations of the top Longevity influencers across California. The most influential city is San Francisco, closely followed by other cities in the same conurbation\sphere of influence, reflecting the familiar Silicon Valley clustering pattern, with neighbourhoods such as Novato providing convenient zones for biomedical facilities, while Mountain View and Santa Clara remain global biotech hot spots. Meanwhile the increased necessity of political initiative in advancing the industry means that its most influential future participants are to be found in Sacramento, while much of the money and publicity emerges from Los Angeles..

# 15 Longevity Government Organizations in California by City



This diagram illustrates the locations of the top Longevity government organizations across California.

The majority are concentrated in the capital, Sacramento where the government departments are normally based, The exceptions are the CA Office of Statewide Health Planning & Development, and the CA Emergency Medical Services Authority.

# 40 Longevity Non-Profits in California by City

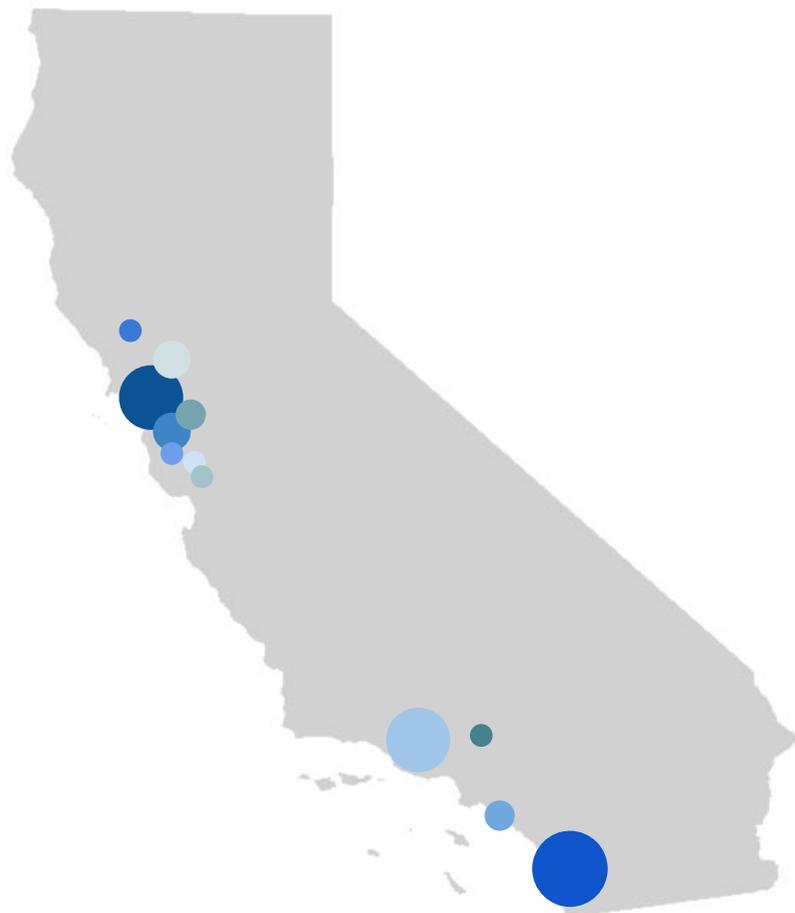


5	San Francisco	2	San Diego
3	Long Beach	1	Irvine
1	Oakland	1	Newport Beach
1	Los Angeles	1	Sherman Oaks
2	Mountain View	1	Fremont
1	Salinac	8	Sacramento
2	Palo Alto	1	San Jose
1	Santa Marcos	1	Alameda

This diagram illustrates the locations of the top Longevity non-profits across California.

Naturally a great many biotech non-profits are clustered around the San Francisco Bay area, but here too the political dimension makes itself apparent, with a growing number of advocacy groups gathering in and around Sacramento.

# 40 Longevity Research Labs in California by City



7	San Francisco	2	Palo Alto
3	Stanford	1	Sunny Vale
2	Newport Beach	3	Berkeley
7	Los Angeles	9	La Jolla
1	Mountain View	1	Novato
1	Duarte	1	Menio Park

Research labs in California are arranged in traditional biotech clusters more than any of the other sets of entities documented here, particularly South San Francisco, the self-styled “birthplace of biotechnology”. However, UCLA also plays an important role here, and the San Diego biotech cluster is also visible, with La Jolla providing a convenient zone for research facilities.

# 220 Longevity Companies in California by City



4	Alameda	1	Fountain Valley	3	Palo Alto
7	Barkeley	2	Hayward	2	Pasadena
1	Brisbane	5	Irvine	4	Pleasanton
1	Burlingame	9	La Jolla	1	Poway
1	Burlington	1	Laguna Hills	1	Rancho Dominguez
2	Camarilo	1	Larkspur	1	Rancho Santa Fe
1	Campbell	2	Los Altos	2	Redwood City
6	Carsbend	8	Los Angeles	1	Richmond
1	Chino Hills	1	Lucerne Valley	1	Roseville
1	Claremont	10	Menlo Park	2	Sacramento
1	Corona Del Mar	1	Milpitas	1	San Bruno
1	Culver City	1	Mission Viejo	1	San Carlos
1	Danville	1	Montego	1	San Clemente
3	Davis	1	Moorpark	32	San Diego
1	Dublin	6	Mountain View	42	San Francisco
1	Encino	1	Northridge	4	San Jose
2	Foster city	1	Novato	1	San Leandro
				1	San Rafael
				2	Santa Barbara
				4	Santa Clara
				1	Santa Cruz
				1	Santa Fe Springs
				3	Santa Monica
				1	Saratoga
				1	Scotts Valley
				1	Sherman Oaks
				1	Stockton
				4	Sunnyvale
				2	Thousand Oaks
				2	Tustin
				2	Woodland Hills

Companies are drawn by talent, much of which comes from the universities of UC Berkeley, University of California San Francisco and Stanford. Many of the employees at many of the biotech and life science companies hold doctorates. Because of the culture of entrepreneurship, companies create spinoffs and attract other companies, which spur additional growth around the clusters.

# Overview: Global and Regional Longevity Reports by Aging Analytics Agency

In 2018, Aging Analytics Agency systematised the Longevity Industry for the first time in a series of reports, providing a comprehensive assessment of the [global Longevity Industry](#).

Our first report, [Longevity Industry Landscape Overview 2018 Volume I: The Science of Longevity](#), standing at 760 pages, identified the emerging technologies and scientific developments which could be utilized against ageing.

The first half of that report tied together various progress trends into a coherent narrative, and described the interrelation of biomedical gerontology, regenerative medicine, precision medicine, and artificial intelligence. The second half of the report profiled 650 research hubs, non-profit organizations, leading scientists, conferences, databases, books and journals. The report utilised infographics to illustrate where research institutions stood in relation to each other. [Longevity Industry Landscape Overview 2018 Volume II: The Business of Longevity](#), standing at 650 pages, offered a more comprehensive look at the key players, companies, investors and influencers which comprise the emerging global Longevity Industry, profiled 100 Longevity companies and 100 investors, as well as the most prominent individual longevity investors and thought leaders. Further, it provided an overview of the Longevity Industry, including its rise in 2016 and rapid emergence in 2017-2018, forecast the key trends and developments in the industry in the coming years, and featured a detailed discussion on the major risks, roadblocks, and other issues which may jeopardize the credibility and success of the industry.

Since then, Aging Analytics Agency has expanded the scope of its regional reports into a number of other countries including the [UK](#), [Israel](#) and [Singapore](#), with additional regional case studies currently in production for Switzerland, Japan, Hong Kong and Taiwan.



Longevity Industry in Israel 2019



Longevity Industry in UK Q4 2018



Longevity Industry in Singapore 2019



Longevity Industry in Singapore 2018



Longevity Industry in the UK Q4 2018



Longevity Industry in Switzerland



Longevity Industry in Japan



Longevity Industry in Israel 2018



Longevity Industry in California 2019



Longevity Industry in Hong Kong



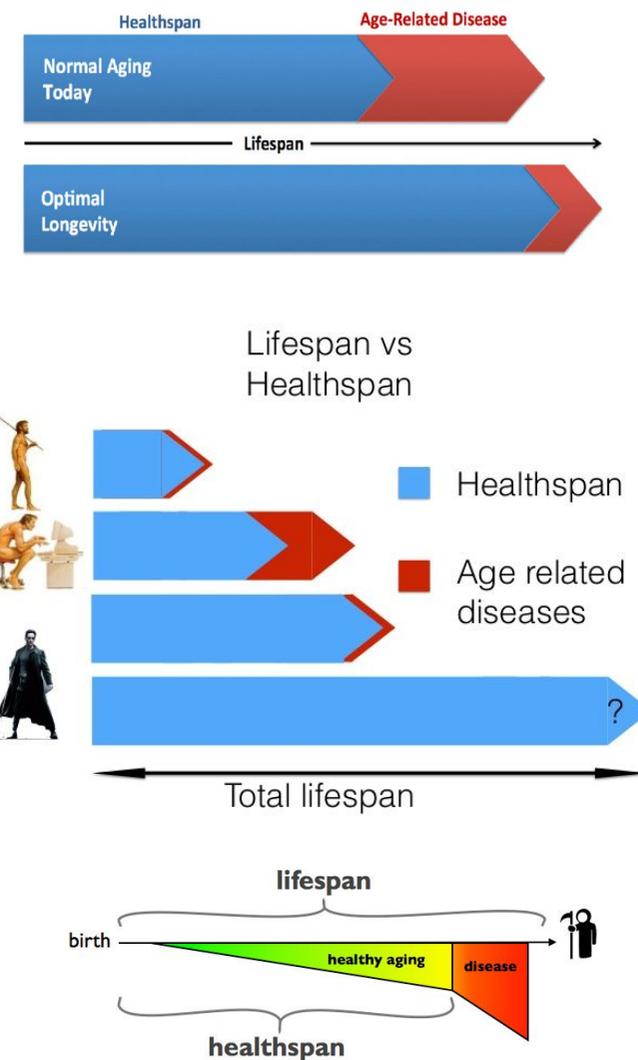
Longevity Industry in Taiwan

# Key Definitions: Longevity and Longevity Industry

For the purposes of this report, the following definitions shall apply:

**Longevity or Healthspan:** a period of human life free of age-related diseases and major age-related functional decline. The term is used in contrast with *lifespan*, the extension of which is not by itself an objective of the Longevity Industry (as defined here) unless it is a consequence of an extended Healthspan. The concept of healthspan is relatively new in geroscience research - prior to 2000, only 14 papers were indexed on PubMed with “healthspan” in the title or abstract. By mid-2018, that number has grown to more than 900. Notably, several publications use the exact terms such as “increases healthspan,” “improves healthspan,” or “extends healthspan”, implying that healthspan is a quantifiable phenotype.

**Longevity Industry:** the industry whose product is Longevity and which encompasses the following major sectors: Geroscience Research and Development, P3 Medicine, AgeTech and Novel Financial Systems. The diagram displayed on the next slide illustrates the aforementioned classification along with the breakdown of these sectors into corresponding sub-sectors. While geroscience (which focuses on the core biology of aging, and on therapeutics that prevent or treat age-related diseases by addressing the core mechanisms of biological aging itself) is distinct from P3 medicine (as defined herein), and while they are not commonly grouped together, our previous reports illustrated the logic behind considering both as equally valid sectors of the broader Longevity Industry, as P3 medicine consists of the the leading edge practical applications of geroscience and advanced biomedicine, working to apply preventive approaches to health maintenance and disease prevention, thus focusing on healthy Longevity in all but name.



## GEROSCIENCE R&D

Rejuvenation  
Biotechnology

Gene Therapy

Geroprotectors

Regenerative Medicine

Nutraceuticals

Basic Research on Biology  
of Aging

## P3 MEDICINE

Personalized Diagnostics

Personalized Biomarker  
Analysis

Personalized Prognostics

Personalized in vivo & in  
silico drug testing

Personalized QALY &  
HALE Estimation

Preventive Therapies

## AGETECH

Novel Retirement Plans

Cognitive Enhancement

FinTech for the Elderly

NextGen Mobile Apps for  
the Elderly

Continuing Education

Entertainment for the  
Elderly

## NOVEL FINANCIAL SYSTEM

Longevity Index Fund

Longevity Hedge Fund

Longevity Stock  
Exchange

AgeTech Bank

Longevity Derivatives

Longevity Trust

# Key Definitions: Longevity and Longevity Industry

**Longevity Industry Technology Readiness Level:** Technology Readiness Level (“TRL”) is a proven quantifiable framework utilized to help identify whether a given technology is ready for practical implementation in real-world products or services. TRLs use a ranking of 1-9, with 9 being the most mature technology, therefore enabling identification of the right timing and focus to ensure that each emerging technology accomplishes its specific endpoints. In the context of the Longevity Industry, a TRL ranking measures how close a Longevity therapy, diagnostic, prognostic technology or other product (collectively, a “Longevity Product”) is from reaching the hands of actual patients in the clinic

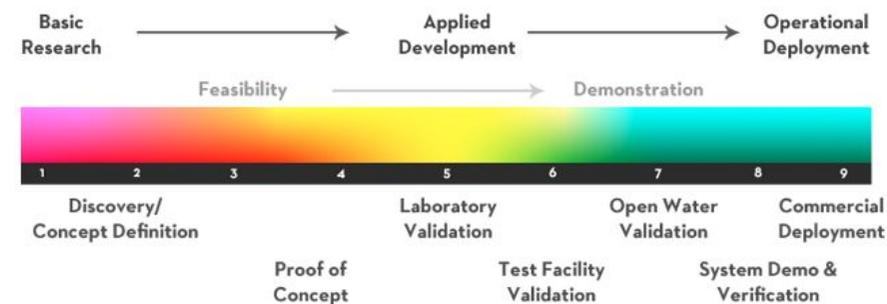
**Longevity Industry Near-Term TRL:** achievement by a Longevity product of a TRL level which would indicate that such a Longevity product will achieve market readiness within the next several years - i.e., technologies that have a TRL of 6 or higher, indicating that they have already been subject to proof-of-concept validation in actual human patients

**Longevity Industry in California - Report Scope Clarification:** as one of the global innovation centers, California is a birthplace and home to a multitude of Longevity-focused entities and Longevity products, some of which may exhibit a lower TRL level compared to the aforementioned Longevity Industry Near-Term TRL. Unlike our previous regional studies, the scope of this report will encompass entities and technologies focusing on Longevity products that are farther away from market readiness compared to what we covered previously and what other, more conservative countries and regions would have featured according to their current understanding of the Longevity Industry

## Technology Readiness Level (TRL)

9	Commercialized
8	Pre-Production
7	Filed-Production
6	Prototype
5	Bench/Lab Testing
4	Detailed Design

## TECHNOLOGY READINESS LEVELS



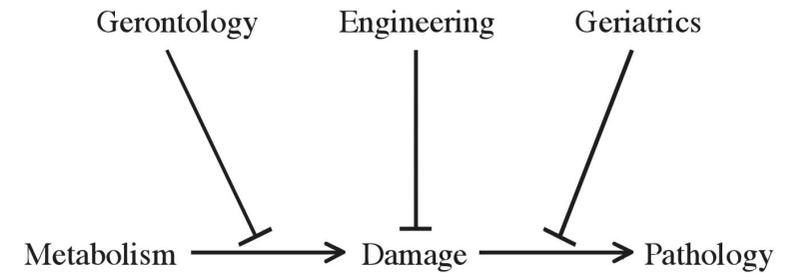
# Key Definitions: Longevity Industry Sectors

**Geroscience Research and Development:** a broad term for the interdisciplinary field that aims to understand the relationship between aging and age-related diseases by examining genetic, molecular, and cellular mechanisms that make aging a major risk factor and driver of common chronic conditions and diseases of the elderly. Geroscience R&D encompasses rejuvenation biotechnology, geroprotectors, nutraceuticals, gene therapy, regenerative medicine technologies, and basic research on the biology of aging. It is distinguished from P3 medicine by its focus on the biology of the human species in general rather than the individual

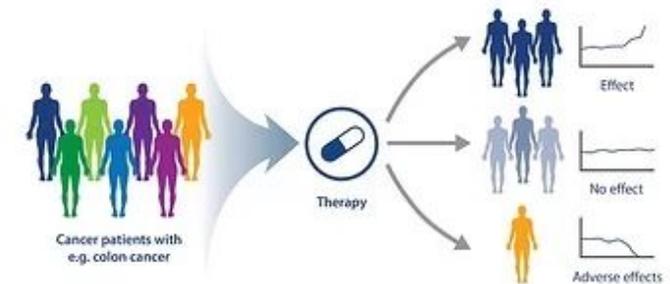
**P3 Medicine:** an emerging approach to medicine that moves away from reactive disease care and involves assessing the biology of the human individual, measuring and accounting for individual differences at the genetic, environmental and lifestyle level for each person. The term 'P3 medicine' covers three functions or "Ps": *precision*, the early detection, based on individual's advanced health data, of factors responsible for diseases, *prevention*, reducing the likelihood of diseases, and *personalization* a focus on the unique characteristics of each patient. The main core ideas of the P3 approach are to:

- Take personal traits of the patient into the consideration
- Predict diseases before they cause any substantial damage
- Prevent diseases when possible, rather than treat them later

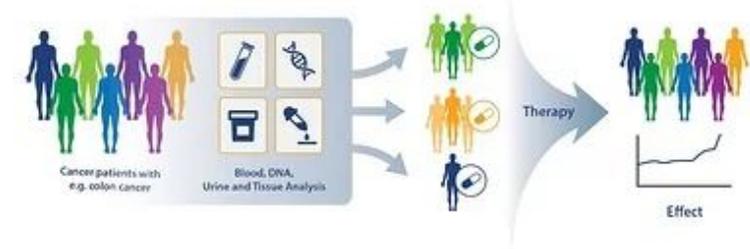
In other words, P3 medicine seeks to *learn* from an individual's genetics in order to produce individually customized therapies, in contrast with gene therapy, seeks to alter the genome directly. P3 medicine encompasses personalized diagnostics, personalized prognostics, personalized Quality Adjusted Life Year (QALY) and Health Adjusted Life Expectancy (HALE) estimation, personalized biomarker analysis, personalized in vivo and in silico drug testing, and preventive therapies



## Current Medicine One Treatment Fits All



## Future Medicine More Personalized Diagnostics



# Key Definitions: Longevity Industry Sectors

**AgeTech:** technologies and services developed specifically to support the elderly in their daily activities, taking into account individual healthcare needs as well as their life goals and objectives. AgeTech enhances senior citizens' overall quality of life, productivity and ability to re-enter the workforce undeterred by the effects of aging. This includes information technology adapted to the needs of the elderly (e.g. an iPad, NextGen mobile apps tailored for older people) as well as FinTech for the elderly as new ways of managing their wealth emerge, including via novel retirement plans. The Continuing Education and Cognitive Enhancement sub-sectors of AgeTech aim at extending the potential of an active mind and body at an older age and avoiding age-related damage to cognitive function (e.g. memory, focus) while Entertainment for the Elderly targets the attention and interest of the senior audience. AgeTech includes Novel Retirement Plans, FinTech for the Elderly, Continuing Education, Cognitive Enhancement, NextGen Mobile Apps for the Elderly and Entertainment for the Elderly

**Novel Financial Systems:** the current financial system was designed 50-100 years ago, at a time when no one could imagine that life expectancy could increase. Today, advancements made by healthcare systems and BioPharma are allowing people to live longer, but not healthier. We witness the collision of two global megatrends: the global aging population with its increased healthcare costs, and the acceleration of biomedicine as a result of its convergence with data science. This collision will necessarily result in the creation of Novel Financial System, such as the Longevity Index Fund, Longevity Stock Exchange, Longevity Derivatives, Longevity Hedge Fund, AgeTech Bank and Longevity Trust. Novel Financial System will be taking into account biomedicine parameters, such as:

- Health Adjusted Life Expectancy (HALE)
- Quality Adjusted Life Year (QALY)
- Biological age v. chronological age
- Level of innovation in P3 medicine clinics
- R&D with respect to technology readiness level (TRL)
- Practical applications TRL
- Average number of productive years when people can add to a nation's gross domestic product



## Chronological Age

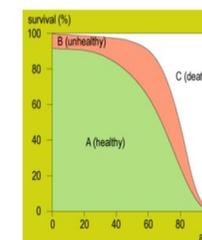
- Measures how many times you, in this body, have revolved around the sun
- Cannot be altered by mind/body approaches
- Has little relevance to how you feel and function



## Biological Age

- Measures how well your physiological systems are functioning
- Can be reversed by attending to your health
- Is the most important component of the aging process

## Health Adjusted Life Years



**Health Adjusted Life Expectancy (HALE)**  
The number of years that a person can expect to live in good health

Health gap indicator =  
**Disability-Adjusted Life-Years (DALY)**  
Number of years spent in ill health and the number of years lost due to premature mortality.

A = time lived in good health  
C = time lost due to premature mortality  
Life expectancy = A + B  
Health expectancy indicators (e.g. healthy life expectancy and HALE) = A + f(B)  
Health gaps indicators (e.g. DALYs) = C + g(B)

# Longevity Industry in California: Report Structure

The report is structured so as to introduce readers to the key developments in the California Longevity sphere. This is accomplished by highlighting principal participants in the field of Longevity, covering pertinent scientific and technological trends and advances, analyzing existing and projected governmental policies as well as by providing an overview of underlying demographic and economic data.

By utilizing a variety of infographic mind maps, the report first enables readers to quickly identify its core analytical findings and conclusions. Its chapter sequence then introduces readers to specific areas of the Longevity industry in California.

**Executive Summary** summarizes report's key findings and provides a brief overview of California's position on the global Longevity landscape by addressing state's socio-economic background, pertinent government policies, research and technological trends as well as challenges and opportunities presented by increased Longevity.

**Chapter I: California Longevity Industry - Landscape Overview** outlines California Longevity industry, highlighting the key players in the field: companies, investors, government entities, influencers, research institutions, non-profit organizations as well as pertinent conferences and top media sources. Chapter I is supported by corresponding Appendices which provide detailed information on its subject matter.

**Chapter II: History of Geroscience in California** describes the evolution of geroscience globally and then focuses on California, chronicling the state's rise to its current position among the global leaders in the field

**Chapter III: Current State of Longevity Industry in California** outlines the key aspects affecting Longevity industry in the state, such socio-economic factors, scientific and technological advances, life sciences ecosystem, venture capital scene and related issues.

**Chapter IV: California Government - Importance of Involvement in Longevity Sphere** provides an overview of underlying demographic and economic data and ensuing challenges as well as examines the state's existing and prospective strategies for addressing healthy Longevity and the needs of the elderly. It then summarizes successful approaches to managing the Age Wave by other countries and U.S. states and offers corresponding recommendations to California government regarding additional policy measures.

**Chapter V: California Longevity Economy** provides an overview of the Longevity Economy in California defined as the sum of all economic activity driven by the needs of people aged 50 and older as well as highlights key trends, developments and opportunities in this sphere.

**Chapter VI: Global Longevity Industry Overview** presents pertinent infographic mind maps and summarizes key points from our previous reports on the subject. It then illustrates the position of the California Longevity Industry in the larger context of the global Longevity industry.

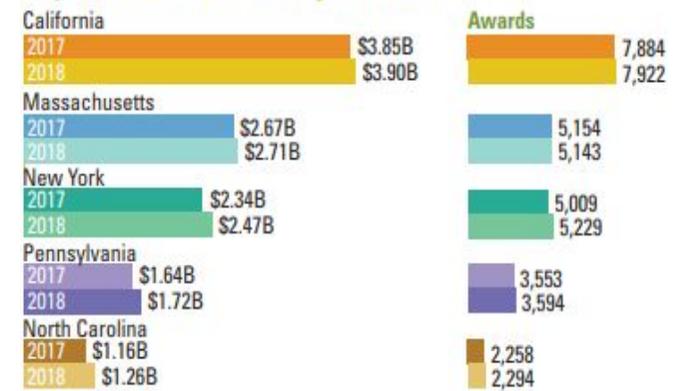
**Chapter VII: California Media and Conferences on Longevity** highlights key media sources and conferences which have given California's Longevity Industry the greatest exposure

# Introduction: Why California?

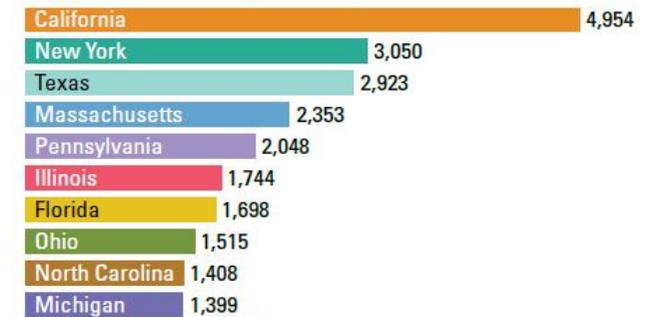
In addition to its global Longevity Industry reports, Aging Analytics Agency produced a number of regional case studies, including those focusing on [United Kingdom](#), [Singapore](#) and [Israel](#). This region-specific focus is present due to a number of factors, including the emergence of new Longevity sectors in specific countries, the rise of particularly powerful geroscience tech hubs and R&D nexuses as well as the launch of strategic national development plans proposed by progressive governments.

The choice of California as subject of our next regional report is justified for a number of reasons. It is the **world's fifth-largest economy** and, at almost 40 million people, is the **most populous U.S. state**. California is **home to a plethora of top-ranked universities and research institutions** which lead the nation (at 15.1% or \$3.9 billion) in biomedical research grants from NIH, further driving innovation. Academic excellence drives the state's **vibrant life sciences ecosystem**, which boasts four mega-clusters in San Francisco Bay Area, Los Angeles, Orange and San Diego counties. For decades, California has been implementing a **thoughtful public policy aimed at supporting the life sciences industry** through tax incentives encouraging more investment as well via state-sponsored initiatives promoting the use of advanced computing and technology to better understand and treat diseases. Due to the state's healthy business climate as well as a strong success record of its life sciences companies, California has long been a magnet for biotech investment - it consistently **leads the nation in attracting venture capital funding**.

## Top Five States Receiving NIH Grants

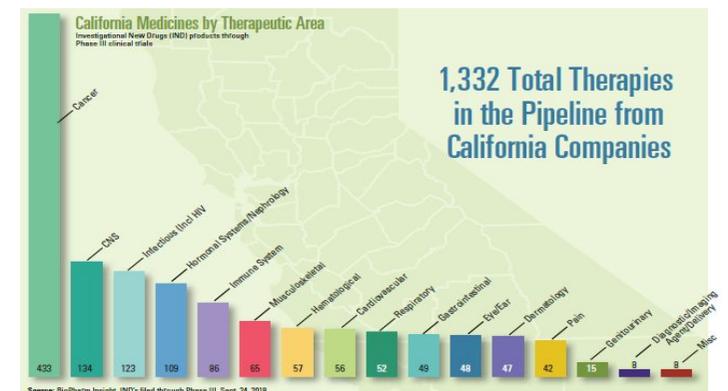
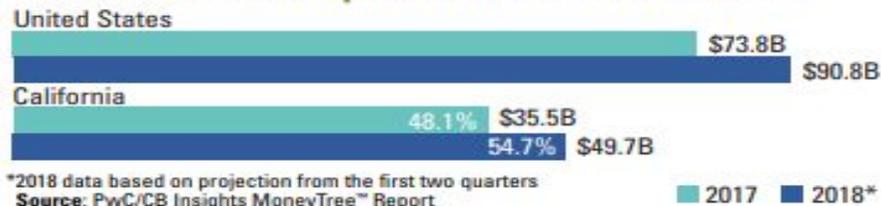


## Top 10 States with Doctoral Recipients in Sciences & Engineering



Source: NSF/NIH/USED/USDA/NEH/NASA, Survey of Earned Doctorates, 2016.

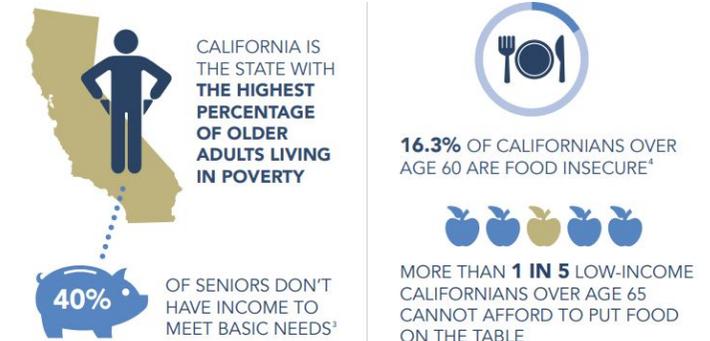
## Total US Venture Capital Investment in California



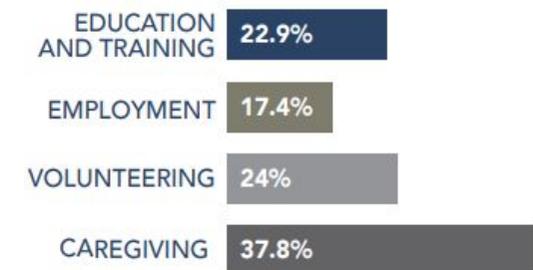
# Introduction: Why California?

Compared to the rest of United States, Californians take a progressive stance on Longevity - the state ranked **second for life expectancy at birth and third - for healthy life expectancy**. However, on a global scale, California is lagging behind other leading world regions with respect to these parameters, especially considering the amount of corresponding health expenditures. While the government of California has been among the pioneers for addressing the societal implications of aging for decades, the state is far from being immune from the associated challenges - its **elderly population is increasing rapidly**, with several factors playing key roles, such as exponential growth, particularly in the number of the oldest old; diversity; poverty and nearly doubling of the number of residents with Alzheimer's disease by 2030, which will drive up the already high costs of nursing home care. Governing a rapidly graying state means dealing with **higher overall healthcare costs**, particularly for low-income seniors, as well as facing the retirement and long-term care crises. Further, California's Silver Tsunami places an enormous strain on the state's already **fragile and fragmented aging network**. Unsurprisingly, the newly elected Governor Gavin Newsom committed to addressing the aforementioned issues by creating a comprehensive California Master Plan on Aging and Alzheimer's Task Force.

However, increased Longevity not only brings challenges but also a multitude of possibilities - people in the 50 plus age group have the largest spending power, many are willing to work past the traditional retirement age and most can infuse societies with transformative social benefits as caregivers and volunteers while themselves benefitting from such purposeful activities.



## ADULTS AGE 65+ LEAD PRODUCTIVE ROLES IN THE COMMUNITY:



The Longevity Economy is comprised of **111 MILLION AMERICANS** aged 50-plus



**RATES OF ALZHEIMER'S WILL DOUBLE FROM 2008 TO 2030<sup>1</sup>**

**80% OF OLDER ADULTS HAVE AT LEAST ONE CHRONIC CONDITION AND 50% HAVE AT LEAST TWO<sup>2</sup>**

Chronic diseases include conditions such as heart disease, cancer, and type 2 diabetes<sup>2</sup>

# California: World's Fifth Largest Economy

In 2017, California became the fifth largest global economy, surpassing the UK and India. The state's gross domestic product rose by \$127 billion from 2016 to 2017, exceeding \$2.7 trillion. The thriving technology sector of Silicon Valley, the world's entertainment capital in Hollywood and Central Valley's agricultural heartland are the key contributing factors to making local economy a global tour de force. The state's economic output is now surpassed only by the GDP of the United States, China, Japan and Germany.

Rank	Countries	(\$ billions)
1	United States	\$ 19,391
2	China	\$ 12,015
3	Japan	\$ 4,872
4	Germany	\$ 3,685
5	California	\$ 2,747
6	United Kingdom	\$ 2,625
7	India	\$ 2,611
8	France	\$ 2,584
9	Brazil	\$ 2,055
10	Italy	\$ 1,938

As further described on the next slide, California houses the largest share of the U.S. population - 12% and has contributed 16% of total job growth in the nation between 2012 and 2017. Its share of the national economy also grew from 12.8% to 14.2% during that time period.

In 2002, California has already ranked in 5th place but fell to 10th place in 2012 following the Great Recession. Since then, the largest U.S. state has added two million jobs and grown its GDP by \$700 billion. Its economic juggernaut is concentrated in coastal metropolises around San Francisco, San Jose, Los Angeles and San Diego.

## CA Median Income

Location	Median Annual Household Income
United States	\$60,336
California	\$71,805

## CA Unemployment Rate

Location	Unemployed
United States	3.7%
California	4.1%

## California Health Insurance Coverage

Location	Employer	Non-Group	Medicaid	Medicare	Other Public	Uninsured	Total
United States <sup>1</sup>	49%	7%	21%	14%	1%	9%	100%
California	47%	7%	26%	11%	1%	7%	100%

## California Poverty Rate by Age

Location	Children 0-18	Adults 19-64	65+	Total
United States <sup>1</sup>	16%	10%	8%	11%
California	15%	9%	9%	10%

# California: Home to the Largest Share of U.S. Population

Rank	State	2019 Population	2019 Growth	% of US
1	California	39,776,830	0.61%	12.13%
2	Texas	28,704,330	1.41%	8.75%
3	Florida	21,312,211	1.56%	6.50%
4	New York	19,862,512	0.07%	6.06%
5	Pennsylvania	12,823,989	0.14%	3.91%
6	Illinois	12,768,320	-0.26%	3.89%
7	Ohio	11,694,664	0.31%	3.57%
8	Georgia	10,545,138	1.11%	3.21%
9	North Carolina	10,390,149	1.14%	3.17%
10	Michigan	9,991,177	0.29%	3.05%

US States - Ranked by Population 2019

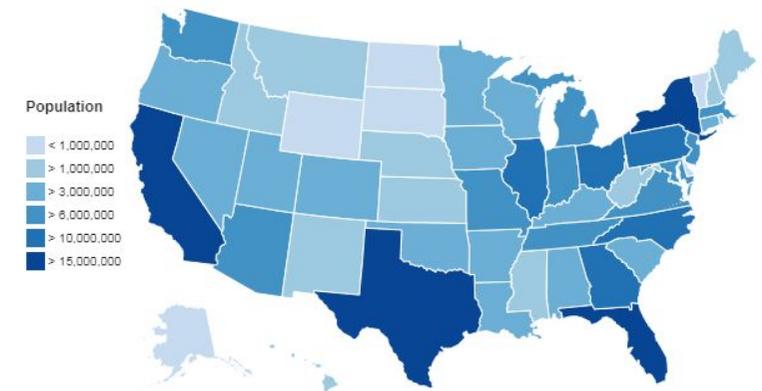


Table 4. Population by region: California, 2016-2060

	2016		2036		2060	
Total population	39,354,432	100%	45,807,050	100%	51,056,510	100%
[1] San Francisco Bay Area	7,680,709	20%	9,163,287	20%	10,468,398	21%
[2] Sacramento	2,458,135	6%	3,066,335	7%	3,714,415	7%
[3] Far North	1,055,315	3%	1,143,648	2%	1,229,677	2%
[4] Central Valley	4,208,003	11%	5,310,906	12%	6,494,076	13%
[5] Sierra Nevada	187,901	0%	198,799	0%	205,220	0%
[6] Central Coast	1,502,662	4%	1,709,588	4%	1,825,151	4%
[7] South Coast	17,565,890	45%	19,291,680	42%	19,990,023	39%
[8] Inland Empire	4,695,817	12%	5,922,807	13%	7,129,550	14%

Location	Male	Female	Total
United States	49%	51%	100%
California	49%	51%	100%

Location	Children 0-18	Adults 19-25	Adults 26-34	Adults 35-54	Adults 55-64	65+	Total
United States	24%	9%	12%	26%	13%	16%	100%
California	24%	10%	14%	27%	12%	14%	100%

Location	White	Black	Hispanic	Asian	American Indian/Alaska Native	Native Hawaiian/Other Pacific Islander	Two or More Races	Total
United States	61%	12%	18%	6%	1%	<1%	3%	100%
California	37%	5%	39%	14%	<1%	<1%	3%	100%

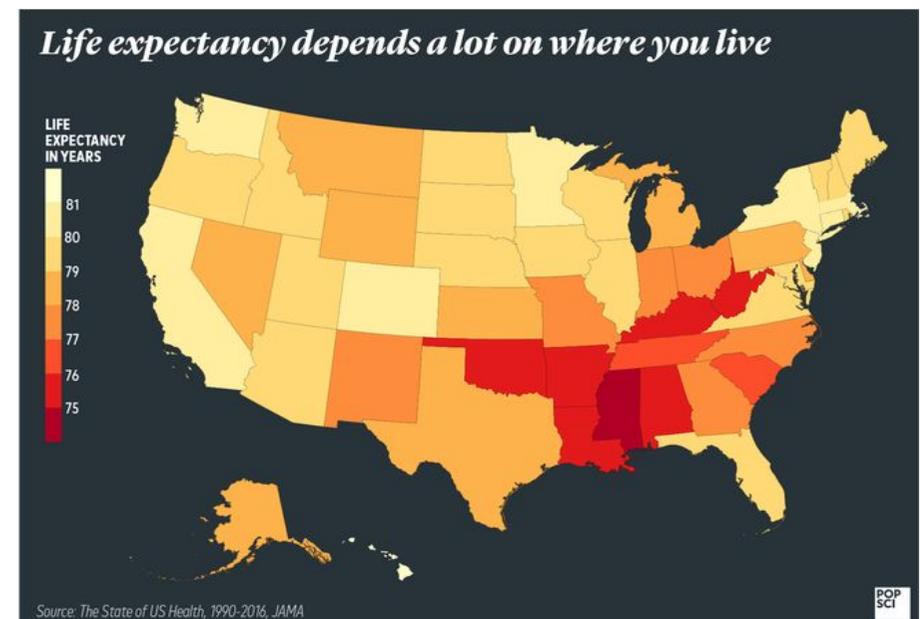
# California: the Second Highest Life Expectancy At Birth in U.S.

Life expectancy at birth is one of the most frequently used health status indicators - it is defined as how long, on average, a newborn can expect to live, if current death rates do not change. The actual age-specific death rate of any particular birth cohort cannot be known in advance - gains in life expectancy at birth can be attributed to a number of factors, including rising living standards, improved lifestyle and better education, as well as greater access to quality health services.

At 80.9 years, California residents boast the **second highest life expectancy at birth in the country**, second only to Hawaii's of 81.3 years. The underlying [study](#) by the Journal of the American Medical Association concluded that there are wide differences in the burden of disease at the state level. Specific diseases and risk factors, such as drug use disorders, high body mass index, poor diet, high fasting plasma glucose level, and alcohol use disorders are increasing and warrant increased attention.

[Since 1980](#), when the state placed 20th in the ranking, Californians improved their lifestyle which resulted in significant increase in life expectancy from 74.3 years to 80.9 years - the third largest increase among U.S. states during that time period. Today, the Golden State has the **third lowest share of obese adults, the fifth lowest share of adults who do not exercise, and the second lowest share of adults who smoke**. Further, California has the third lowest premature (adults under age 75) mortality rate in U.S.

U.S. States with Highest Life Expectancy at Birth	U.S. States with Lowest Life Expectancy at Birth
1. Hawaii, 81.3 years	50. Mississippi, 74.7 years
<b>2. California, 80.9 years</b>	49. West Virginia, 75.3 years
3. Connecticut, 80.8 years	48. Alabama, 75.4 years
4. Minnesota, 80.8 years	47. Louisiana, 75.6 years
5. New York, 80.5 years	46. Oklahoma, 75.7 years

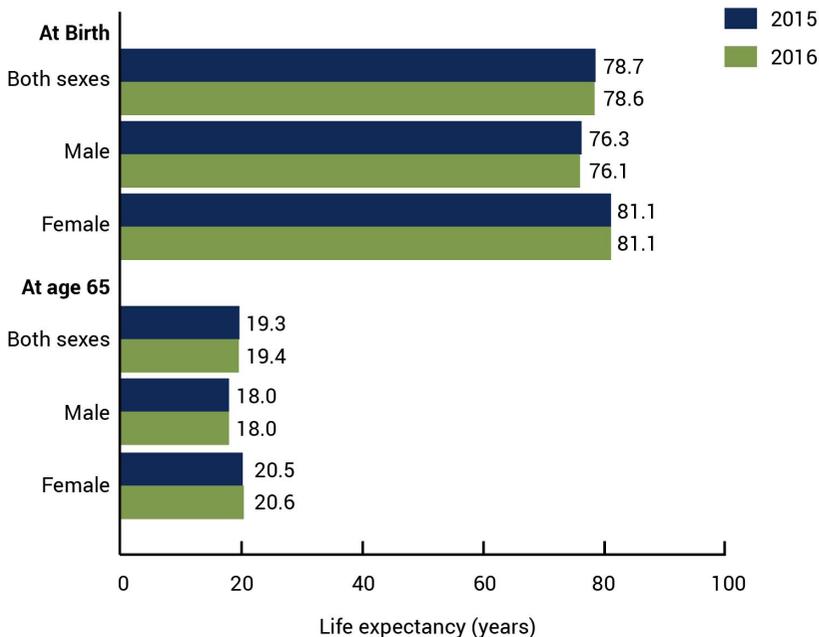


# California: Life Expectancy at Birth - U.S. and Global Comparison

While California's life expectancy at birth is currently 80.9 years, [on U.S.-wide basis](#), this parameter is equal to 78.6 years, with males' life expectancy equalling to 76.1 years and females' - to 81.1 years. [In 2016](#), life expectancy at birth was highest for Hispanic persons at 81.8 years, compared to 78.5 years for non-Hispanic white persons and 74.8 years for non-Hispanic black persons. Heart disease, cancer, unintentional injuries, chronic lower respiratory diseases, stroke, Alzheimer's disease, diabetes, influenza and pneumonia, kidney disease, and suicide were among the top 10 leading causes of death. Overall, life expectancy in the United States has been increasing - a baby born in 2016 in the U.S. can be expected to live 78.6 years on average, [more than 7 years longer than a baby born in 1980](#). However, despite this overall increase, **life expectancy at birth decreased in recent years (starting from 2014) for the first time since 1993**, largely due to increases in the unintentional drug overdose death rate as well as growing rates of Alzheimer's disease, suicide, chronic liver disease, and septicemia.

On a global level, U.S. and even its top-performing states for life expectancy are **lagging behind other world regions** with respect to this parameter.

Figure 1. Life expectancy at selected ages, by sex: United States, 2015 and 2016



Global Life Expectancy at Birth (Source: <a href="#">OECD</a> )	
1. Japan	84.1 years
2. Switzerland	83.7 years
3. Spain	83.4 years
4. Italy	83.3 years
5. Luxembourg	82.8 years
6. Australia	82.5 years
7. Israel	82.5 years
8. Norway	82.5 years
9. France	82.4 years
10. Korea	82.4 years

## Life Expectancy Across Borders

Hawaii has the highest life expectancy of all the U.S. states, at more than 81 years. Expected lifespans in 20 countries are even greater than that - Singapore, at almost 85 years, has the highest.

States that are above the U.S. value are in green while the ones that are below are in red.

Life expectancy at birth, 2017		
Hawaii	81.5	Netherlands
	81.4	Belgium, Finland, Maldives, Portugal
	81.3	Bermuda
	81.2	
	81.1	Slovenia
	81	Greece, Malta, United Kingdom
California	80.9	
New York	80.8	Denmark
Minnesota	80.7	
Connecticut	80.6	Germany
New Jersey	80.5	
	80.4	
	80.3	Peru
	80.2	Qatar
	80.1	Colombia
	80	

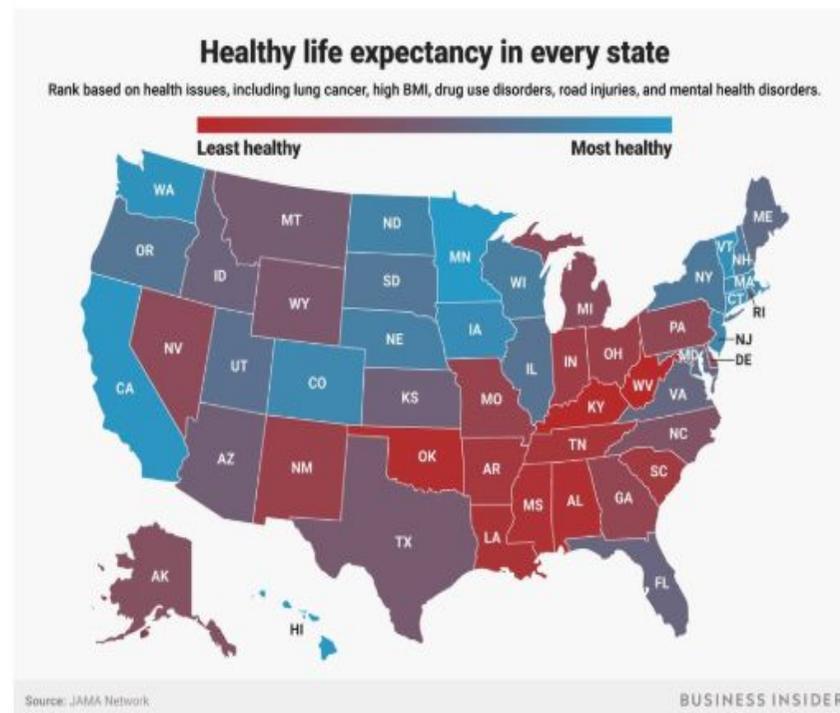
# California: *Healthy* Life Expectancy - Compared to Other U.S. States

An American born today can expect to live almost 79 years, which is approximately 4 years longer compared to 1990. However, **healthy life expectancy**, defined as **how long a person can live healthy, disability and disease-free life**, increased by just 2.4 years during the same time period. In other words, **while Americans might live longer today than they used to, they are not necessarily living much healthier lives.**

The researchers found that **the average American can expect to live just 67.7 healthy years** - growing rates of health problems like obesity and diabetes, as well as the prevalence of drug use disorders (including opioid addiction) and alcohol use are among the key contributing factors. Other health issues on the rise in the U.S. include cognitive diseases like Alzheimer's and hearing loss, which are edging out what used to be some of the most common health issues in the country, such as major depression, lower back pain, and car crash injuries.

The number of years people can expect to live healthy, illness and injury-free lives in the U.S. is over 70 years in only two states: Minnesota and Hawaii, with California lagging behind in the third place at 69.9 years.

U.S. States with Longest <i>Healthy</i> Life Expectancy	U.S. States with Shortest <i>Healthy</i> Life Expectancy
1. Minnesota - 70.3 healthy years	50. West Virginia - 63.8 healthy years
2. Hawaii - 70.1 healthy years	49. Kentucky - 64.3 healthy years
<b>3. California - 69.9 healthy years</b>	48. Oklahoma - 64.5 healthy years
4. Washington - 69.1 healthy years	47. Alabama - 64.6 healthy years
5. Vermont - 69 healthy years	46. Mississippi - 64.9 healthy years

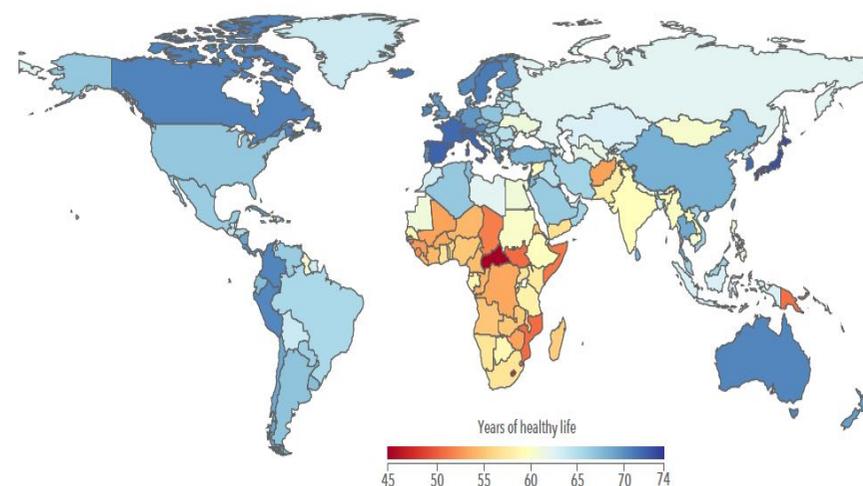


# United States and CA: *Healthy* Life Expectancy - Global Comparison

With its residents having a *healthy* life expectancy of 69.9 years, California finds itself among the [top 3 states](#) based on this criterion. However, while the Golden State is ahead of U.S.-wide average of [67.7 years](#), on a global scale, this accomplishment is rather modest, especially considering the **staggering amount of expenditures allocated to healthcare in the United States**. **Notably, in 1960, Americans boasted the highest life expectancy in the world**, 2.4 years higher than the average for OECD countries. However, [the U.S. started losing ground in the 1980s](#) - its life expectancy fell below the OECD average in 1998, plateaued in 2012, and is now 1.5 years lower than that average.

Country	Total 2016 Population	Life Expectancy at Birth (Years)	Healthy Life Expectancy at Birth (Years)	Health Expenditure per Capita (\$)	Health Expenditure as % of GDP
Singapore	5,622,000	82.9	<b>76.2</b>	\$2,280	4.3%
Japan	127,749,000	84.2	<b>74.8</b>	\$3,733	10.9%
Spain	46,348,000	83.1	<b>73.8</b>	\$2,354	9.2%
Switzerland	8,402,000	83.3	<b>73.5</b>	\$9,818	12.1%
France	64,721,000	82.9	<b>73.4</b>	\$4,026	11.1%
Cyprus	1,170,000	80.7	<b>73.3</b>	\$1,563	6.8%
Canada	36,290,000	82.8	<b>73.2</b>	\$4,508	10.4%
Italy	59,430,000	82.8	<b>73.2</b>	\$2,700	9.0%
Iceland	332,000	82.4	<b>73.0</b>	\$4,375	8.6%
Norway	5,255,000	82.5	<b>73.0</b>	\$7,464	10.0%
R. of Korea	50,792,000	82.7	<b>73.0</b>	\$2,013	7.4%
Israel	8,192,000	82.3	<b>72.9</b>	\$2,756	7.4%
<b>U.S.A.</b>	<b>322,180,000</b>	<b>78.5</b>	<b>68.5</b>	<b>\$9,536</b>	<b>16.8%</b>

Healthy life expectancy\*\* at birth, both sexes, 2017

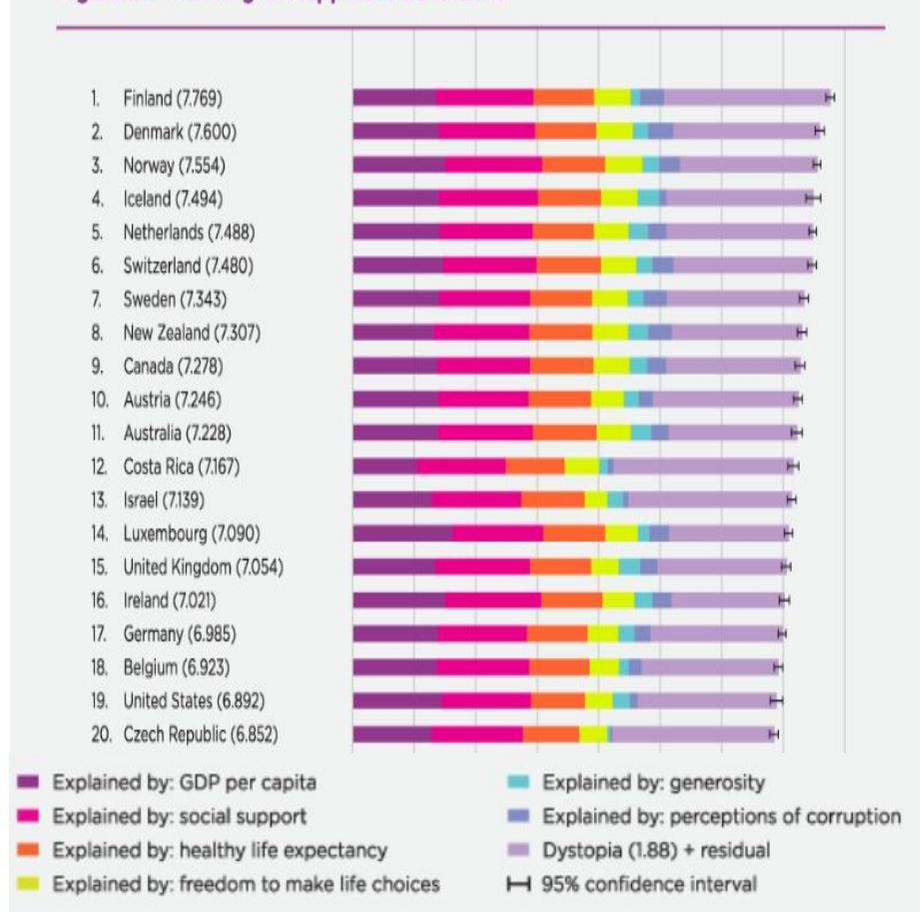


\*\*Healthy life expectancy is the number of years that a person at a given age can expect to live in full health, taking into account mortality and disability.

# United States: Global Happiness Ranking

The World Happiness Report is a survey by the United Nations Sustainable Development Solutions Network that ranks 156 countries by **how happy** their citizens **perceive themselves to be** (based on Gallup World Poll surveys). Interestingly, the surge of interest in happiness and public policy owes much to United States - Professor Easterlin famously noted in 1974 that happiness in the U.S. had remained unchanged from 1946 to 1970 despite the significant rise of GDP per person - this finding became known as the **Easterlin Paradox** and it has continued to hold true until today. The report's **happiness scores** were determined by assessing the following variables: **GDP per capita in terms of Purchasing Power Parity, social support, healthy life expectancy, freedom, generosity (donating time and/or money), and absence of corruption.**

Figure 2.7: Ranking of Happiness 2016-2018

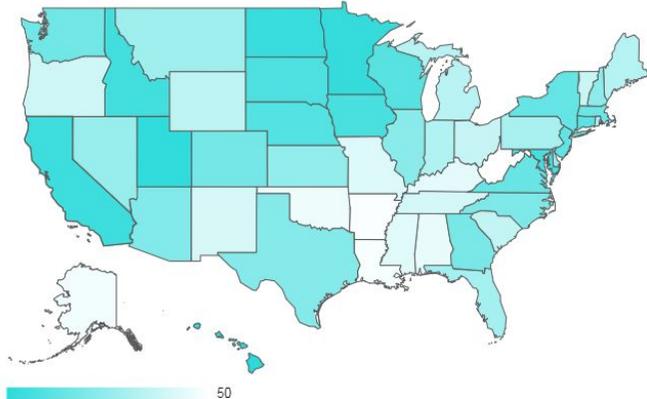


Despite falling rates of violent crime and unemployment as well as a steady rise of per capita income over the past few decades, **happiness** among Americans did not rebound to the higher levels of the 1990s, continuing a slow **decline since at least 2000**. World Happiness Report offers several explanations behind this paradox: **worsening health conditions; declining social capital and social support; decreased confidence in government; fundamental shifts in how Americans spend their leisure time as well as formation of a mass-addiction society** (substance abuse, excessive gambling, immoderate use of digital media). Mass addiction warranted a special mention in the report: it was argued that the U.S.A.'s epidemics of addictions are significantly contributing to rising rates of clinical depression and suicide, overdoses related to substance abuse, growing obesity related to eating addictions as well as dramatically rising adolescent depression (rooted in excessive use of digital media).

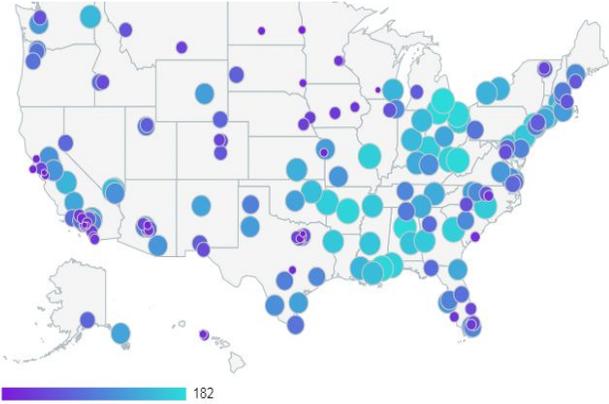
U.S. society was urged to **design a public policy built around well-being rather than corporate profits and place the rising addiction rates under intensive scrutiny** as well to take actions to reverse the epidemics by introducing **measures aimed at reducing stress levels in society (including greater job and healthcare security), lessening income inequality, promoting healthier work-life balance and greater integration of health and well-being**

# California: Happiness Ranking - Compared to Other U.S. States

**Happiness** comes from a combination of factors, including a positive mental state, healthy body, strong social connections, job satisfaction and financial well-being. One element that can have a big influence in this regard is where we choose to live. In its studies, WalletHub compared the 50 states and 182 of America’s largest cities across **three key dimensions: (1) Emotional & Physical Well-Being, (2) Work Environment and (3) Community and Environment**, collectively encompassing 31 key metrics, ranging from depression to sports participation rate to income growth. **California ranked fifth in U.S., with nearly a quarter of its cities placing among the top 100 happiest cities in the nation, including 4 in the top 10.**



Happiest States in the U.S.



Happiest Cities in the U.S.

Overall Rank (1=Happiest) ↓	State ↓	Total Score ↓	'Emotional & Physical Well-Being' Rank ↓	'Work Environment' Rank ↓	'Community & Environment' Rank ↓
1	Hawaii	68.27	1	30	4
2	Utah	67.84	18	1	2
3	Minnesota	67.26	2	6	10
4	North Dakota	65.62	6	9	6
5	California	63.14	4	24	12
6	Idaho	63.09	24	2	1
7	Maryland	61.78	7	38	5
8	Iowa	61.07	8	18	11
9	South Dakota	60.80	14	13	8
10	Nebraska	59.11	10	17	28

Overall Rank (1=Best) ↓	City ↓	Total Score ↓	'Emotional & Physical Well-Being' Rank ↓	'Income & Employment' Rank ↓	'Community & Environment' Rank ↓
1	Plano, TX	72.30	7	6	8
2	Irvine, CA	71.86	14	11	5
3	Madison, WI	71.81	3	14	7
4	Fremont, CA	71.17	10	37	1
5	Huntington Beach, CA	69.74	6	46	28
6	Fargo, ND	69.57	17	20	24
7	Grand Prairie, TX	69.30	20	35	6
8	San Jose, CA	68.90	1	18	44
9	Scottsdale, AZ	68.24	46	13	2
10	San Francisco, CA	67.53	4	2	125

Sources: [WalletHub \(States\)](#); [WalletHub \(Cities\)](#)

# U.S.A. and California: Top Causes of Death and Disability, Underlying Risk Factors - Global Comparison

Country	LE at Birth	Healthy LE at Birth	Health Expenditures per Capita	Top 10 Causes of Death	Top 10 Causes of Disability	Top 10 Risk Factors Driving Death and Disability
Singapore	82.9	76.2	\$2,280	1. IHD 2. Lower resp. infections 3. Alzheimer's 4. Stroke 5. Lung cancer 6. Colorectal cancer 7. Hypertensive heart disease 8. Chronic kidney disease 9. Liver cancer 10. Self-harm	1. Low back pain 2. Headache disorders 3. Depression 4. Falls 5. Diabetes 6. Neck pain 7. Neonatal disorders 8. Age-related hearing loss 9. Anxiety disorders 10. Other musculoskeletal	1. <b>Dietary</b> Risks 2. Tobacco 3. High blood pressure 4. High fasting plasma glucose 5. High BMI 6. High LDL 7. Occupational risks 8. Air pollution 9. Impaired kidney function 10. Malnutrition
Japan	84.2	74.8	\$3,733	1. Alzheimer's 2. IHD 3. Stroke 4. Lower resp. infections 5. Lung cancer 6. Colorectal cancer 7. Stomach cancer 8. Chronic kidney disease 9. COPD 10. Pancreatic cancer	1. Low back pain 2. Age-related hearing loss 3. Falls 4. Depression 5. Headache disorders 6. Stroke 7. Diabetes 8. Neck pain 9. Alzheimer's 10. Oral disorders	1. <b>Tobacco</b> 2. Dietary risks 3. High blood pressure 4. High fasting plasma glucose 5. High BMI 6. Occupational risks 7. High HDL 8. Impaired kidney function 9. Air pollution 10. Alcohol use
Spain	83.1	73.8	\$2,354	1. IHD 2. Alzheimer's 3. Stroke 4. COPD 5. Lung cancer 6. Colorectal cancer 7. Lower resp. infections 8. Chronic kidney disease 9. Diabetes 10. Cirrhosis	1. Low back pain 2. Headache disorders 3. Depression 4. Diabetes 5. Neck pain 6. Age-related hearing loss 7. Falls 8. Anxiety disorders 9. Other musculoskeletal 10. COPD	1. <b>Tobacco</b> 2. High fasting plasma glucose 3. High blood pressure 4. High BMI 5. Dietary risks 6. Alcohol use 7. High HDL 8. Occupational risks 9. Air pollution 10. Impaired kidney function
Switzerland	83.3	73.5	\$9,818	1. IHD 2. Alzheimer's 3. Stroke 4. Lung cancer 5. COPD 6. Falls 7. Colorectal cancer 8. Lower resp. infections 9. Chronic kidney disease 10. Hypertensive heart disease	1. Low back pain 2. Headache disorders 3. Diabetes 4. Neck pain 5. Depression 6. Falls 7. Anxiety disorders 8. Age-related hearing loss 9. COPD 10. Other musculoskeletal	1. <b>Tobacco</b> 2. High fasting plasma glucose 3. Dietary risks 4. High BMI 5. High blood pressure 6. Occupational risks 7. Alcohol use 8. High LDL 9. Air pollution 10. Impaired kidney function
France	82.9	73.4	\$4,026	1. Alzheimer's 2. IHD 3. Stroke 4. Lung cancer 5. Colorectal cancer 6. Lower resp. infections 7. COPD 8. Falls 9. Breast cancer 10. Pancreatic cancer	1. Low back pain 2. Headache disorders 3. Depression 4. Falls 5. Anxiety disorders 6. Age-related hearing loss 7. Neck pain 8. Diabetes 9. Other musculoskeletal 10. Oral disorders	1. <b>Tobacco</b> 2. Dietary risks 3. Alcohol use 4. High blood pressure 5. High fasting plasma glucose 6. High BMI 7. Occupational risks 8. High LDL 9. Air pollution 10. Impaired kidney function
California	80.9	69.9	\$7,549	1. IHD 2. Alzheimer's 3. Stroke 4. Lung cancer 5. COPD 6. Lower resp. infections 7. Chronic kidney disease 8. Colorectal cancer 9. Cirrhosis 10. Diabetes	1. Low back pain 2. Headache disorders 3. Depression 4. Drug use 5. Diabetes 6. Anxiety disorders 7. Age-related hearing loss 8. Other musculoskeletal 9. Neck pain 10. COPD	1. <b>High BMI</b> 2. Tobacco 3. Dietary risks 4. High fasting plasma glucose 5. High blood pressure 6. Drug use 7. Alcohol use 8. High LDL 9. Impaired kidney function 10. Occupational risks
U.S.A.	78.5	68.5	\$9,536	1. IHD 2. Alzheimer's 3. Lung cancer 4. Stroke 5. COPD 6. Lower resp. infections 7. Chronic kidney disease 8. Colorectal cancer 9. Diabetes 10. Drug use disorders	1. Low back pain 2. Headache disorders 3. Diabetes 4. Drug use 5. Depression 6. COPD 7. Anxiety disorders 8. Neck pain 9. Other musculoskeletal 10. Age-related hearing loss	1. <b>High BMI</b> 2. Tobacco 3. Dietary risks 4. High fasting plasma glucose 5. High blood pressure 6. Drug use 7. Alcohol use 8. High LDL 9. Impaired kidney function 10. Occupational risks

# Projections: U.S. Healthcare Costs to Rise, Life Expectancy to Plummet

Today, healthcare spending in the United States is [greater than in any other country in the world](#) - however, this fact does not make the USA a leader in life expectancy - in 2014, U.S. ranked just [43rd in the world](#) based on this parameter. According to [Peterson-Kaiser Health System Tracker](#), the **U.S. has plummeted to the bottom of the list of countries with a similar GDP and high average income**. In 1980, average life expectancy at birth was within one year in the U.S. and in comparable countries and while the U.S. gained 5 years of life expectancy in the subsequent decades, the average comparable country has gained 7 years.

2040 Rank	2040 Projected LE	2016 Rank & LE
1. Spain	85.8	82.9 (4th)
2. Japan	85.7	83.7 (1st)
3. Singapore	85.4	83.3 (3rd)
4. Switzerland	85.2	83.3 (2nd)
5. Portugal	84.5	81 (23rd)
6. Italy	84.5	82.3 (7th)
7. Israel	84.4	82.1 (13th)
8. France	84.3	82.3 (8th)
9. Luxembourg	84.1	82.2 (10th)
10. Australia	84.1	82.5 (5th)
39. China	81.9	76.3 (68th)
64. U.S.A.	79.8	78.7 (43rd)

**U.S. health expenditures are projected to grow at an average annual rate of 5.5%** during 2018–27 and **represent 19.4% of gross domestic product in 2027**. During that period, prices for health care are projected to grow 2.5% per annum - faster than during the last decade. Among the major payers, annual spending growth in Medicare (7.4%) is expected to exceed that in Medicaid (5.5%) and private health insurance (4.8%).

Although expected life span will rise globally in 2040, the **United States, despite the projected increase in its health care spending, is expected to further plunge in life expectancy rankings in 2040 - from 43rd place to 64th - the largest decrease for a country defined as “high income”**. With a projected lifespan of 79.8 years (just 1.1 years increase), the U.S. will sit behind countries including the United Kingdom, Colombia, Japan, Costa Rica, Saudi Arabia and Turkey. Spain will have a lifespan of 85.8 in 2040, the best in the world. Japan, Singapore, Switzerland, Portugal, Italy, Israel, France, Luxembourg and Australia also ranked in the top 10. **China's global ranking is projected to rise from 68th to 39th place**.

The underlying study projected a significant increase in deaths from noncommunicable diseases, including diabetes, chronic obstructive pulmonary disease, chronic kidney disease, lung cancer as well as worsening health outcomes linked to obesity. **The top 5 health drivers that explain most of the future trajectory for premature mortality are high blood pressure, high body mass index, high blood sugar, tobacco and alcohol use, and air pollution**. However, [the future is not predetermined](#) and adequately addressing health drivers by health systems will be key to progress or stagnation.

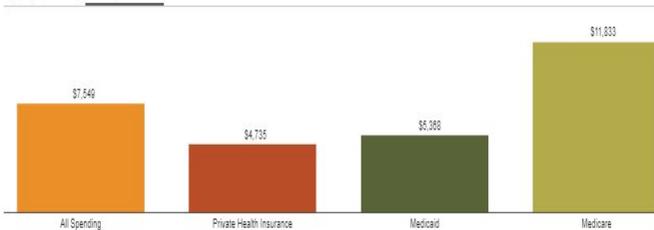
# California: Health Care Expenditures - U.S. Comparison

In general, **health care spending per capita in California (\$7,549) is lower than the U.S. average (\$8,045)**, and **ranked 15th** among all states in 2014. However, California's **Medicare** spending, which among other groups **covers people aged 65 and older** was **8% higher** compared to the **United States**. Further, from 2009 to 2014, **California's health care spending growth** averaged 4.9% per year in total and 4.0% per capita - this was **faster than average U.S. spending growth** (3.9% total health spending, 3.1% per capita). Overall, **hospital care accounts for the largest share of health care spending both in U.S. and California**. Notably, in U.S., **people aged 55 and older** comprise 29% of population but **accounted for 56% of all health spending in 2016** - in contrast, people under age 35 made up 46% of the population but accounted for less than a quarter of health spending. The below charts illustrate how California's health care spending compares to the United States as a whole as well as to other states which top the life expectancy and/or healthy life expectancy rankings:

1. Health spending\* in California totaled \$292 billion, or \$7,549 per person.

California, 2014

Aggregate (in billions) Per Capita/Enrollee



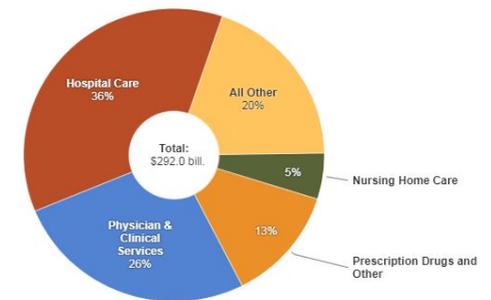
\* Personal health care, which excludes public health activities, administration, and investment.  
Source: CMS, Health Spending by State of Residence, 1991-2014 • Created with Datawrapper

Personal Health Care Spending, 2014	CA	US
Total Spending (in billions)	\$292	\$2,563
As Share of GDP	12.6%	14.8%
Per Capita	\$7,549	\$8,045

### Per Enrollee Spending, 2014

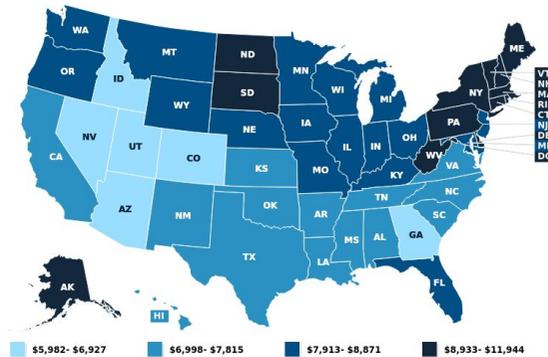
Medicare	\$11,833	\$10,986
Medi-Cal	\$5,368	\$6,815
Private Health Insurance	\$4,735	\$4,551

All Spending Medicaid Medicare



\* Personal health care, which excludes public health activities, administration, and investment.  
Source: CMS, Health Spending by State of Residence, 1991-2014 • Created with Datawrapper

Health Care Expenditures per Capita by State of Residence: Health Spending per Capita, 2014



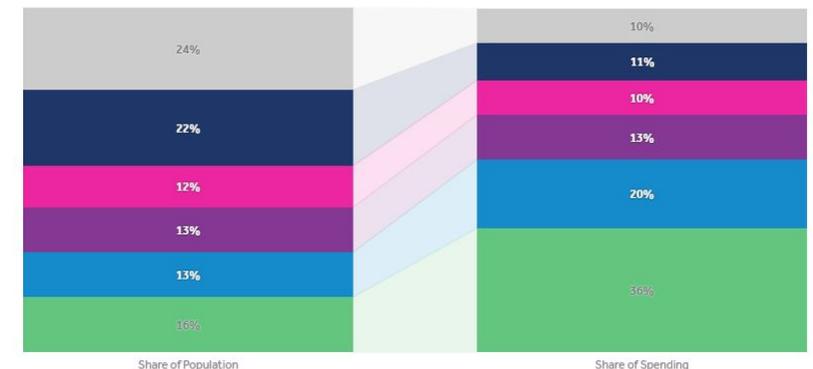
SOURCE: Kaiser Family Foundation's State Health Facts.

Location	Health Spending per Capita
United States	\$8,045
California	\$7,549
Connecticut	\$9,859
Hawaii	\$7,299
Minnesota	\$8,871
New York	\$9,778
Vermont	\$10,190
Washington	\$7,913

## People age 55 and over account for over half of total health spending

Share of total health spending by age group, 2016

65 and over 55 to 64 45 to 54 35 to 44 19 to 34 Under 19

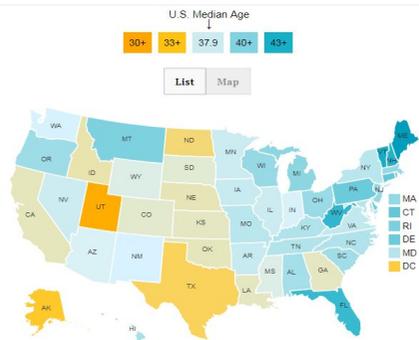


Source: Kaiser Family Foundation analysis of Medical Expenditure Panel Survey • Get the data • PNG

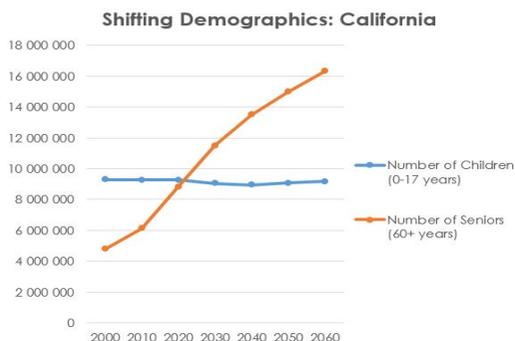
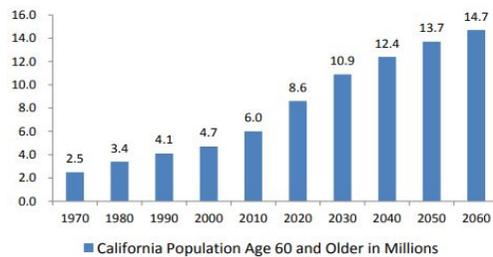
Peterson • Kaiser

# California: Facing an Epic Age Wave - 2016-2060 Projections

Currently, California's median age is 36.2 years, which, compared to 37.8 years for the entire country, makes it the [7th-youngest state in U.S.](#) (Utah tops the list at 30.7 years). However, the state is yet to embrace an unprecedented demographic shift - the so-called "**Silver Tsunami**" or the "**Age Wave**" - while its large Baby Boom cohort (born in 1946-1964) had kept California younger than U.S. average for decades, that same group now contributes to the **rapid aging of the population**, a trend that started in 2011 when Baby Boomers started going into retirement.



Source: American Community Survey, 2016  
**Figure 2**  
**California Population Age 60+ Growth Trends<sup>2</sup>**  
 (in millions, rounded)



By 2036, the state's median age is projected to increase to 41 years, and to [45 years in 2060](#). According to California Department of Finance, the share of **Californians aged 65 and older will increase from 14% to 23% during 2016-2036** time period and [to 26% - by 2060](#), making it the **fastest growing population cohort**. It is projected that by 2030 people aged 65 and older will constitute a [larger share of the population than children](#). California's population cohort aged 60 and older is undergoing a transformation - between 1970 and 2016, the number of its seniors grew from 2.5 million to 7.8 million, [an increase of 212%](#). This trend is estimated to continue as the cohort **aged 60 years and older** is estimated to grow to 14.7 million **by 2060, an increase of 88% from 2016**.

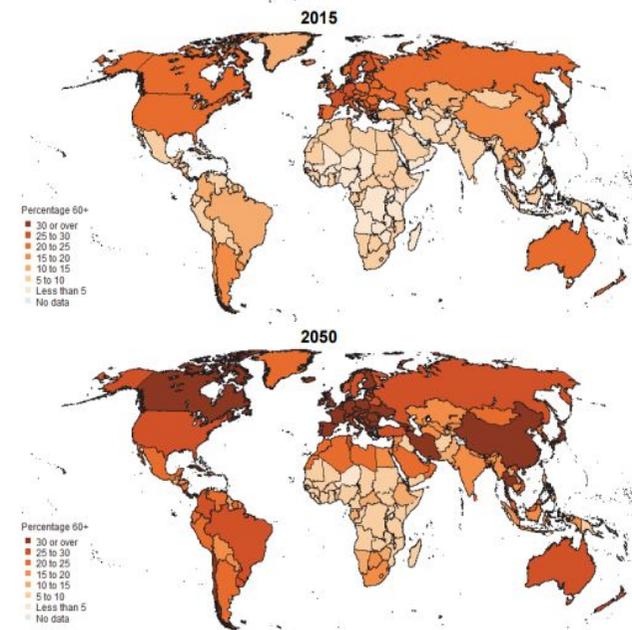
While the overall population aged 60 years and older is growing rapidly, changes within specific segments of this age group are occurring at different rates. The fastest growth will take place during the next 30 years as the Baby Boomers reach age 60. **Between 2010 and 2030**, California's population **cohort aged 85 years and older** is estimated to **increase by more than 70%**. While 604,139 Californians were aged **85 years and older** in 2010, **by 2050**, an estimated 2.26 million individuals will be in this age group, a dramatic [274% increase](#).

There are other factors contributing to the aging of California population, namely, **lower fertility rates and greater longevity**. The total fertility rate has fallen from 2.1 children per woman in 2000 to 1.8 in 2015, and is projected to decrease to [1.6 children by 2060](#). Life expectancy at birth has increased from 78 years in 2000 to 81 years in 2015, and is projected to increase to [86 years by 2060](#). [In 2051](#), California is projected to join the ranks with Japan and several European countries that have more deaths than births, however, migration is expected to keep the state's population growth rate positive.

# California: Silver Tsunami Projections - Global Comparison

Virtually every country in the world is experiencing growth in the number and proportion of older persons in their population - this is poised to become one of the most significant social transformations of this century, with implications for nearly all sectors of society, including labor and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and intergenerational ties. Globally, **between 2015 and 2030, the number of people aged 60 years or over is projected to grow by 56%**, from 901 million to 1.4 billion, and by 2050, this cohort is projected to more than double its size in 2015, reaching nearly 2.1 billion. In 2015, 1 in 8 people worldwide was aged 60 years or over - **by 2030, older persons are projected to account for 1 in 6 people globally, and by the middle of the century, 1 in every 5 people will be aged 60 years or over.** The ageing process is most advanced in high-income countries. Japan is home to largest share of the world's elderly - 33% Japanese were aged 60 years or over in 2015, followed by Germany (28%), Italy (28%) and Finland (27%).

Across the world, the number of **people aged 80 years or over**, the “oldest-old” persons, is **growing even faster than the number of older persons overall.** Projections indicate that in 2050 the oldest-old will amount to 434 million, having more than tripled since 2015. The share of this population cohort **is projected to rise from 14% in 2015 to more than 20% in 2050.**



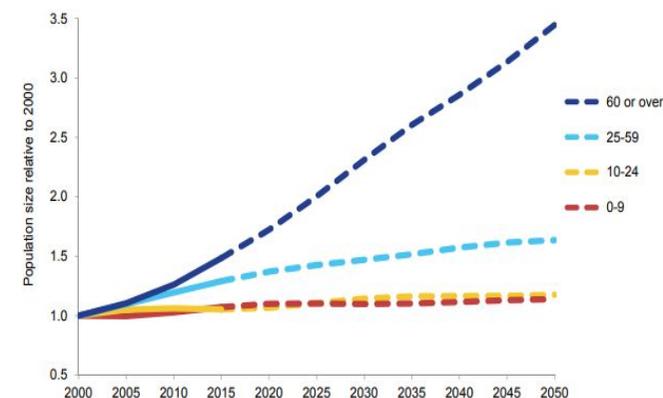
Data source: United Nations (2015). *World Population Prospects: The 2015 Revision.*

TABLE II.3. TEN COUNTRIES OR AREAS WITH THE MOST AGED POPULATIONS, 2000, 2015 AND 2030\*  
 (SEE ANNEX TABLE A.III.4 FOR FULL LIST OF COUNTRIES OR AREAS RANKED ACCORDING TO THE PERCENTAGE AGED 60 OR OVER)

Rank	2000		2015		2030	
	Country or area	Percentage aged 60 years or over	Country or area	Percentage aged 60 years or over	Country or area	Percentage aged 60 years or over
1	Italy	24.1	Japan	33.1	Martinique	38.5
2	Japan	23.3	Italy	28.6	Japan	37.3
3	Germany	23.1	Germany	27.6	Italy	36.6
4	Greece	22.8	Finland	27.2	Germany	36.1
5	Sweden	22.2	Portugal	27.1	Portugal	34.7
6	Bulgaria	22.2	Greece	27.0	China, Hong Kong SAR	33.6
7	Belgium	22.0	Bulgaria	26.9	Spain	33.5
8	Croatia	21.8	Martinique	26.2	Greece	33.2
9	Portugal	21.7	Croatia	25.9	Slovenia	32.7
10	Spain	21.4	Latvia	25.7	Austria	32.4

Data source: United Nations (2015). *World Population Prospects: The 2015 Revision.*  
 \* Of 201 countries or areas with at least 90,000 inhabitants in 2015.

Figure II.12.  
 Increase in world population relative to 2000, by broad age group, 2000-2050

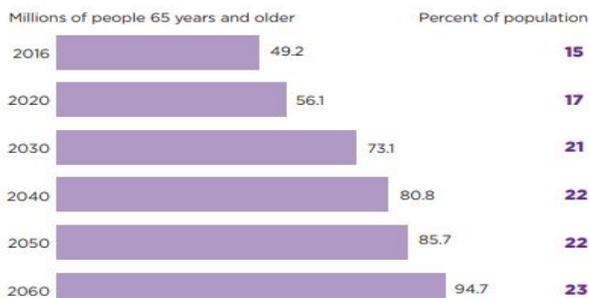


Data source: United Nations (2015). *World Population Prospects: The 2015 Revision.*

# California: Silver Tsunami Projections - U.S. Comparison

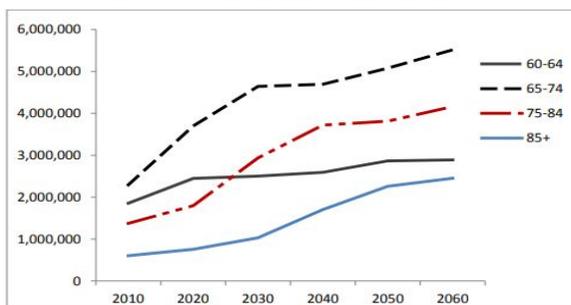
In the centuries since the country's founding, U.S. life expectancy at birth has [more than doubled](#). Today, the **U.S. population is aging rapidly** - the number of [people age 65 and older has increased by 33% between 2006 and 2016](#). Currently, of all the states, Florida has the [highest percentage of persons aged 65 years and older](#) (19%), however, as far as the absolute statistics are concerned, [California holds the record as having the largest actual number of elderly persons](#). According to U.S. Census Bureau's [2017 Population Projections](#), the year 2030, when all Baby Boomers will be older than age 65, marks an important demographic turning point, when **older population will outnumber children for the first time in history and 1 in 5 residents will be retirement age**. The 2030s are projected to be a [transformative decade](#) - U.S. population is expected to grow at a slower pace, age considerably and become more racially and ethnically diverse. **Net international migration is projected to overtake natural increase** in 2030 as the primary driver of population growth in the United States. As the population ages, the **ratio of older adults to working-age adults** ("old-age dependency ratio"), is **projected to rise** - by 2020, there will be about 3 ½ working-age adults for every retirement-age person and by 2060, that ratio will fall to just 2 ½ working-age adults for every retirement-age person.

Figure 1.  
**Projections of the Older Adult Population: 2020 to 2060**  
By 2060, nearly one in four Americans is projected to be an older adult.



Source: U.S. Census Bureau, 2017 National Population Projections.

Figure 3  
**Age 60+ Population Growth Projections<sup>3</sup>**



**United States**

**California**

Table 1.  
**Population by Age Group: Projections 2020 to 2060**

The population is projected to reach 404 million by 2060.  
(In millions)

Characteristic	Population						Change from 2016 to 2060	
	2016	2020	2030	2040	2050	2060	Number	Percent
<b>Total population</b> . . . . .	<b>323.1</b>	<b>332.6</b>	<b>354.8</b>	<b>373.1</b>	<b>388.3</b>	<b>403.7</b>	<b>80.6</b>	<b>24.9</b>
Under 18 years . . . . .	73.6	73.9	75.4	76.8	77.9	79.8	6.2	8.4
18 to 44 years . . . . .	116.0	119.2	125.0	126.3	129.3	132.3	16.3	14.1
45 to 64 years . . . . .	84.3	83.4	81.3	89.1	95.4	97.0	12.8	15.1
65 years and over . . . . .	49.2	56.1	73.1	80.8	85.7	94.7	45.5	92.3
85 years and over . . . . .	6.4	6.7	9.1	14.4	18.6	19.0	12.6	197.8
100 years and over . . . . .	0.1	0.1	0.1	0.2	0.4	0.6	0.5	618.3

Note: The official population estimates for the United States are shown for 2016; the projections use the vintage 2016 population estimate for July 1, 2016, as the base population for projecting from 2017 to 2060.

Source: U.S. Census Bureau, 2017 National Population Projections.

Table 1. Population by age category: California, 2016-2060

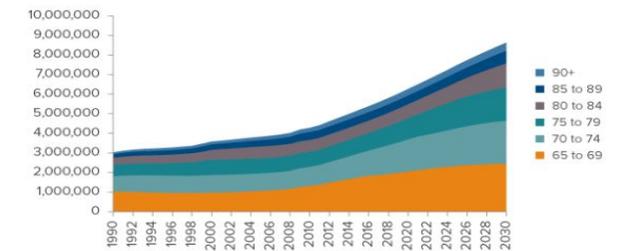
	2016		2036		2060	
Total population	39,354,432	100%	45,807,050	100%	51,056,510	100%
Age <18	9,257,380	24%	8,946,985	20%	9,166,821	18%
Age 18-24	4,223,279	11%	4,401,571	10%	4,401,877	9%
Age 25-64	20,413,692	52%	22,087,332	48%	23,999,011	47%
Age 65+	5,460,081	14%	10,371,162	23%	13,488,801	26%
Age 16+	31,171,308	79%	37,951,306	83%	42,995,258	84%

# California Seniors: Demographic Profile

California's senior population will [nearly double by 2030](#), when the youngest Baby Boomers hit the retirement age. While by that time most seniors will be relatively young, between age 65 and 75, **beginning in 2020 the fastest growth will occur among seniors age 75 and older**. By 2030, the over-85 population will increase 61% from 2012. In addition, the **senior population in 2030 will have more single and/or childless adults** than it does today, suggesting an **increased number of people living alone**.

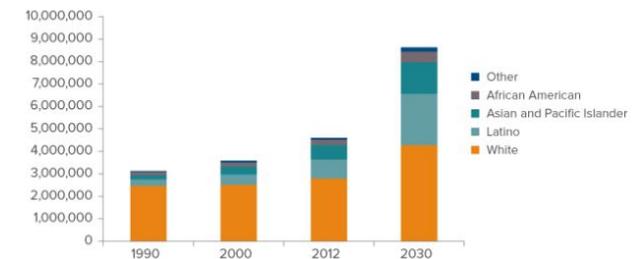
On a more granular level, the [fastest projected rates of growth](#) will be among the **divorced/separated and never married groups** - by 2030, nearly [20% of seniors will be childless](#) (v. 12% in 2012) and thus likely in **greater need of non-family sources of care**. As people age, they tend to require more medical care and are more likely to have trouble living alone, warranting the **need for home- or community-based health services, assisted living, and nursing homes**. It is [projected](#) that the number of **seniors who will have self-care limitations will increase by 88% in 2030 v. 2012 population levels**, however, the vast majority of these seniors will not be living in a nursing home. A **decline in reliance upon nursing homes is projected**, assuming that the general preference for living at home and reliance on support services will continue to increase. In light of these shifts, California policymakers should be considering the kinds of resources that will best address the needs of this changing population cohort.

Figure 1. California's senior population will nearly double by 2030



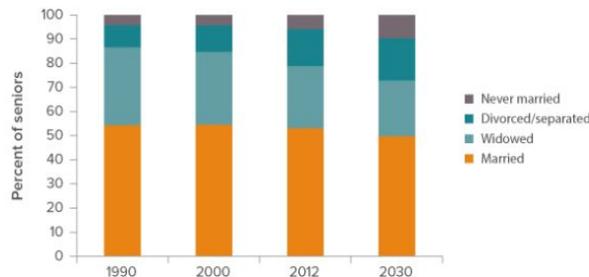
SOURCE: State of California, Department of Finance, State and County Population Projections by Race/Ethnicity, Sex, and Age 2010-2060, Sacramento, California, December 2014.  
NOTE: See [Technical Appendix A](#) for detailed tables and [Technical Appendix B](#) for data and methods used to generate the projections.

Figure 2. California will see strong growth for seniors in every ethnic group



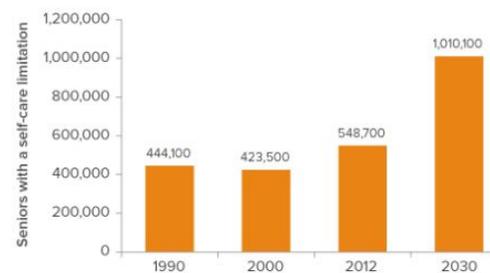
SOURCE: California Department of Finance.  
NOTE: See [Technical Appendix A](#) for detailed tables.

Figure 3. More seniors will be divorced/separated or have never married



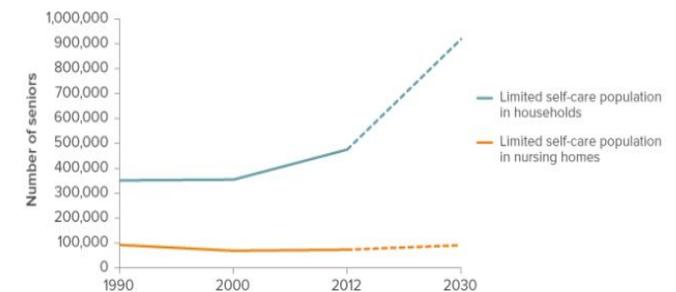
SOURCE: Author calculations based on the American Community Survey and Decennial Census.  
NOTE: See [Technical Appendix A](#) for detailed tables and [Technical Appendix B](#) for data and methods used to generate the projections.

Figure 4. The number of seniors facing difficulties with self care will almost double



SOURCE: ACS and Decennial Census and author calculations.  
NOTE: See [Technical Appendix A](#) for detailed tables and [Technical Appendix B](#) for data and methods used to generate the projections.

Figure 5. Most seniors with self-care difficulties will be living at home



SOURCE: ACS and Decennial Census and author calculations.  
NOTE: See [Technical Appendix A](#) for detailed tables and [Technical Appendix B](#) for data and methods used to generate the projections.

# California Seniors: Health Profile

America's Health Rankings® Senior Report by United Healthcare Foundation ("UHF") is built around the following definition by World Health Organization: **"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"** and provides a comprehensive analysis of senior population across 35 measures of health. UHF model reflects that determinants of health (Behaviors, Community & Environment, Policy, and Clinical Care) directly influence health outcomes, with determinants accounting for 3/4 and outcomes - for 1/4 of each state's overall score and ranking.

**Massachusetts tops the list** of healthiest states for seniors, with **California lagging behind at 28th place** - while the **state's strengths are low prevalence of obesity, low hip fracture rate and high prescription drug coverage**, such factors as **low Supplemental Nutrition Assistance Program ("SNAP") enrollment, high prevalence of frequent mental distress and high percentage of hospital deaths** bring down the overall score.

## 2016 Ranking

2016 Rank (1-50)	State	Score
1	Massachusetts	.627
2	Vermont	.618
3	New Hampshire	.602
4	Minnesota	.599
5	Hawaii	.596
28	California	.016
46	West Virginia	-.631
47	Arkansas	-.648
48	Mississippi	-.648
49	Oklahoma	-.682
50	Louisiana	-.761

	Value	2016 Rank	No 1 State
<b>Policy</b>			
Low-Care Nursing Home Residents (% of residents)	10.7	20	4.1
SNAP Reach (% of adults aged 60+ in poverty)	23.3	49	124.4
Prescription Drug Coverage (% of adults aged 65+)	87.0	8	88.0
Geriatrician Shortfall (% of needed geriatricians)	66.3	24	25.8
<b>Policy Total</b>	<b>-0.039</b>	<b>31</b>	
<b>Clinical Care</b>			
Dedicated Health Care Provider (% of adults aged 65+)	94.2	30	96.9
Flu Vaccine (% of adults aged 65+)	58.2	34	70.7
Health Screenings (% of adults aged 65 to 74)	87.9	16	92.3
Recommended Hospital Care (% of hospitalized patients aged 65+)	97.3	32	98.7
Diabetes Management (% of Medicare beneficiaries aged 65 to 75)	79.3	30	86.2
Home Health Care (number of workers per 1,000 adults aged 75+)	72.4	42	278.8
Preventable Hospitalizations (discharges per 1,000 Medicare beneficiaries)	40.7	9	24.4
Hospital Readmissions (% of hospitalized patients aged 65+)	14.9	28	12.4
Hospice Care (% of decedents aged 65+)	45.6	39	65.5
Hospital Deaths (% of decedents aged 65+)	25.4	47	15.3
<b>Clinical Care Total</b>	<b>-0.027</b>	<b>38</b>	
<b>All Determinants</b>	<b>-0.028</b>	<b>30</b>	
<b>Outcomes</b>			
ICU Use (% of decedents aged 65+)	18.3	48	4.4
Falls (% of adults aged 65+)	30.7	37	20.6
Hip Fractures (hospitalizations per 1,000 Medicare beneficiaries)	5.0	3	3.1
Health Status, Excellent or Very Good (% of adults aged 65+)	44.0	19	50.7
Able-bodied (% of adults aged 65+)	64.3	26	69.6
Premature Death (deaths per 100,000 adults aged 65 to 74)	1,456	2	1,394
Teeth Extractions (% of adults aged 65+)	8.7	2	6.4
Frequent Mental Distress (% of adults aged 65+)	8.9	47	4.7
<b>All Outcomes</b>	<b>0.044</b>	<b>28</b>	
<b>Overall</b>	<b>0.016</b>	<b>28</b>	

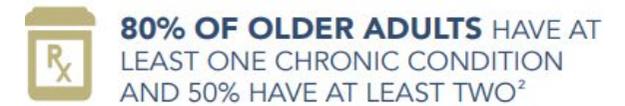
	Value	2016 Rank	No 1 State
<b>Behaviors</b>			
Smoking (% of adults aged 65+)	8.0	14	4.5
Excessive Drinking (% of adults aged 65+)	8.5	42	2.9
Obesity (% of adults aged 65+)	24.1	6	14.1
Underweight (% of adults aged 65+ in fair or better health)	1.6	32	0.7
Physical Inactivity (% of adults aged 65+ in fair or better health)	26.2	7	22.7
Dental Visit (% of adults aged 65+)	71.3	9	78.1
Pain Management (% of adults aged 65+ with joint pain)	45.3	27	53.2
<b>Behaviors Total</b>	<b>0.081</b>	<b>9</b>	
<b>Community &amp; Environment</b>			
Poverty (% of adults aged 65+)	10.6	41	4.3
Volunteerism (% of adults aged 65+)	21.9	36	46.3
Nursing Home Quality (% of 4- & 5-star beds)	50.1	10	62.9
<b>Community &amp; Environment—Macro Total</b>	<b>-0.011</b>	<b>32</b>	
Home-Delivered Meals (% of adults aged 65+ in poverty)	11.0	46	101.3
Food Insecurity (% of adults aged 60+)	16.3	38	8.3
Community Support (dollars per adult aged 65+ in poverty)	\$419	42	\$6,701
<b>Community &amp; Environment—Micro Total</b>	<b>-0.032</b>	<b>43</b>	
<b>Community &amp; Environment Total</b>	<b>-0.043</b>	<b>36</b>	

# California Government and Age Wave Challenges: Overview

California's aging population is increasing rapidly and undergoing a significant demographic change, with [three key factors](#) contributing to this transformation (1) **exponential growth** of the older adult population, **particularly** in the number of the **oldest old**, (2) **diversity** and (3) **poverty**. Governing a rapidly graying state means dealing with **higher healthcare costs, particularly for low-income seniors who are eligible for Medi-Cal**. Most importantly, California's Silver Tsunami will place an **enormous strain** on the state's [already fragile](#) network of **long-term services and supports**, including in-home aides and skilled nursing facilities. Further, this population cohort will become [more racially and ethnically diverse](#), warranting a need for culturally competent care that respects the beliefs and responds to the linguistic needs of seniors from diverse backgrounds.

According to the U.S. Census Bureau's Supplemental Poverty Measure, **poverty among seniors in California** is estimated to be **21%, the highest in U.S.** Unsurprisingly, the [fastest-growing population of homeless](#) people is among older adults. Moreover, [more than three-quarters of a million of older Californians](#) are among the "hidden poor" – **seniors with incomes above the federal poverty line (FPL) but below a minimally decent standard of living** as determined by the Elder Economic Security Standard™ Index. As many public assistance programs are aligned with the FPL, a large number of economically insecure older Californians are denied aid. The [highest rates of the hidden poor](#) among seniors are found among **renters, Latinos, women, those who are raising grandchildren, and people in the oldest age groups**.

The situation is made worse by the fact that **no single government entity has complete ownership of the issue of aging**. Navigating government-sponsored resources available to California's seniors can be [confusing](#): *"Medi-Cal is governed by the Department of Health Care Services, while the In-Home Supportive Services program, which pays for home care for the low-income elderly, is overseen by the Department of Social Services and is administered by each county. The Department of Aging contracts with local agencies to provide caregiver resources, while the Department of Veterans Affairs operates homes for aging vets"*.



Chronic diseases include conditions such as heart disease, cancer, and type 2 diabetes<sup>2</sup>

## A "Patchwork" of Government Entities and Resources Available to California Seniors:

### Medicare:

the federal healthcare program for seniors, does not cover long-term care ("LTC")

### Medicaid:

the federal program which provides health coverage to low-income seniors

### Medi-Cal:

California's Medicaid program, covers LTC

### In-Home Supportive Services ("IHSS"):

pays for home care for Medi-Cal eligible seniors

### California Department of Aging:

provides resources to caregivers and seniors

### California Department of Veterans Affairs:

operates homes for aging vets

# California Government and Age Wave: Retirement Crisis Challenge

The U.S. retirement income system comprises of Social Security, workplace retirement savings plans, Individual Retirement Accounts and personal savings. The **average California senior has modest income** - most elderly **depend heavily on Social Security**, do not have income from retirement accounts, and relatively **few of them work, especially after age 70**. California's seniors are already struggling to meet basic needs and **the state ranks among the worst performing** when it comes to the **financial security of seniors**. Across the state, the **demand for adequate housing, healthcare and supportive services** for seniors is expected to **increase dramatically** which requires an evaluation of the adequacy of public and private resources, services and income for the economic security of current and future California seniors. With no policy action to improve old-age financial security for today's workers and sustain quality of life for the aging population, **California's impoverished elderly poor will grow rapidly in number** over the next two decades.

The [Financial Security Scorecard](#), designed to inform policymakers regarding the financial security outlook for future retirees, ranks each state in three sources of potential economic pressures for *future retirees*: (1) potential retirement income; (2) major retiree costs (housing, health care); (3) labor market conditions for older workers. Using this criteria, California was among the [3 states with lowest scores](#) in 2012, exhibiting lower future retirement income and some of the highest retiree costs.

## California Seniors: [Key Findings](#)

- The fastest growing groups of seniors are:** age 80+, Latinos and Asians, with women continuing to make up a majority of seniors - these are **the very populations that tend to have fewer resources in retirement**
- Three out of ten seniors:** do not have enough income to cover their basic needs
- Older seniors, seniors of color, older women, unmarried seniors, and renters:** more likely to be poor and to struggle to meet their basic needs
- Certain regions face greater challenges with their aging population, but no region is exempt from the retirement crisis:** L.A. region and the Central Valley have the largest senior population growth; Sacramento has the fastest growth rate for seniors age 80 +, most in need of supportive services

Figure 2.1 | Total Annual Personal Income, Seniors Age 60 and Older



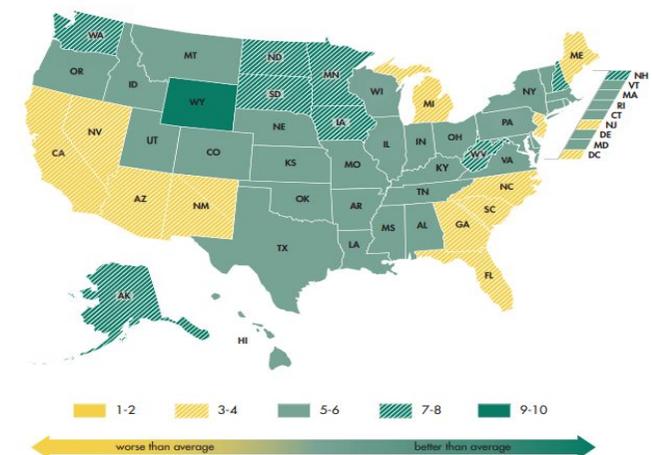
Source: Author's analysis of US Census Bureau, American Community Survey (ACS) Microdata, 2009-2013

Table 2.6 | Senior Employment by Age

	All Seniors (60+)	Age 60-69	Age 70+
<b>California</b>	26%	42%	9%
<b>Regions</b>			
Northern California	22%	35%	8%
Sacramento	23%	37%	7%
Central Valley	23%	36%	8%
Bay Area	29%	46%	10%
Central Coast	28%	45%	10%
Los Angeles	26%	42%	9%
San Diego	26%	42%	8%

Source: Author's analysis of US Census Bureau, American Community Survey Microdata, 2009-2013

Figure 1. **FINANCIAL SECURITY FOR FUTURE RETIREES IN THE STATES, 2012**  
Overall financial security scores based on potential economic pressures facing future retirees

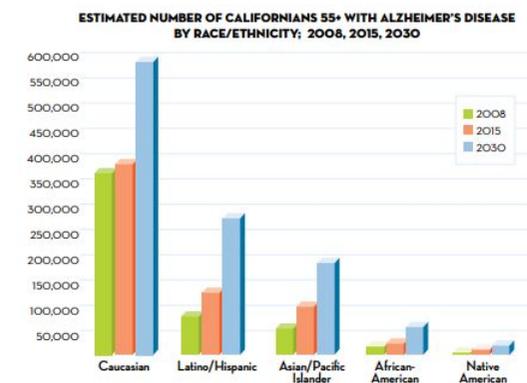
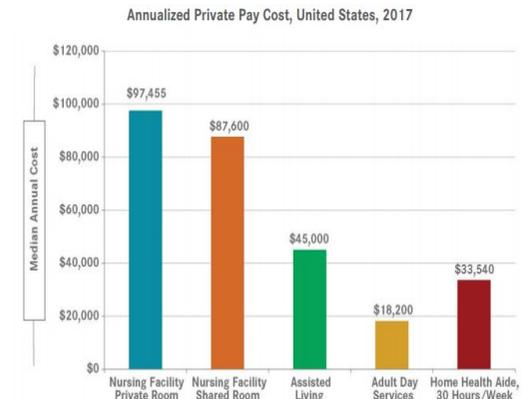


# California Government and Age Wave: Long-Term Care Challenge

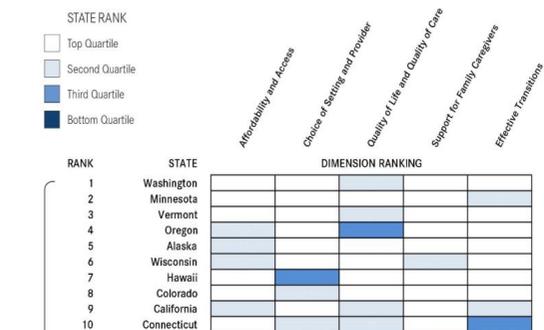
Long-term care (“LTC”) involves assistance with activities of daily living and can be provided in nursing homes, assisted living facilities or seniors’ own homes, depending on level of disability. California’s **senior population is growing rapidly**, becoming more racially and ethnically diverse, with an **increasing share of single and/or childless adults without family members to care for them**. Further, within 2011-2030 time period, the **number of residents with Alzheimer’s disease is anticipated to nearly double**, bringing with it significant implications - the cost to **Medicare** for Alzheimer’s patients is estimated to be **3 times the cost** of enrollees without dementia and the cost to **MediCal** - **2.5 times higher**, with **much of the cost driven by nursing home expenditures**, the most expensive care option.

Traditionally, LTC responsibility has fallen on unpaid family caregivers - a [2015 AARP study](#) found that the **4.5 million of the California’s family caregivers provided \$57 billion worth of unpaid care, roughly the equivalent of the Costa Rica’s GDP**, equating to an hourly wage of \$13.94. However, when paid services are needed, the **cost of LTC is out of reach for most families**, causing people to first exhaust their savings into poverty and then rely on [multiple, uncoordinated public resources with unique requirements](#), with Medicaid (Medi-Cal) being the main source of payment for LTC. Despite the obvious need, **the vast majority (95%) of adults ages 40+ do not have LTC insurance**. Without viable alternatives to financing LTC, federal and state governments will face increased Medicaid (MediCal) expenditures.

As detailed in a [2015 report](#) by CA Senate Committee on Aging and LTC, the state has an insufficient LTC system for seniors. **California ranks 9th in the nation** according to [AARP’s LTSS Scorecard](#) which measures **LTC system performance** across 5 dimensions: Affordability and Access, Choice of Setting and Provider, Quality of Life and Quality of Care, Support for Family Caregivers and Effective Transition - CA has several areas in **need of improvement, particularly with respect to providing caregiver support and decreasing the burden of care transitions**. [It is projected](#) that by 2030 **more seniors will require support to stay at home, and that the number requiring nursing home care will grow as well**. Policymakers shall anticipate a demand for increased spending on Medi-Cal and In-Home Supportive Services and need to plan accordingly, taking into account where seniors will live and what type of workers they will need for help. Developing a corresponding workforce, with an emphasis on providing home- and community-based services, will play a crucial role.



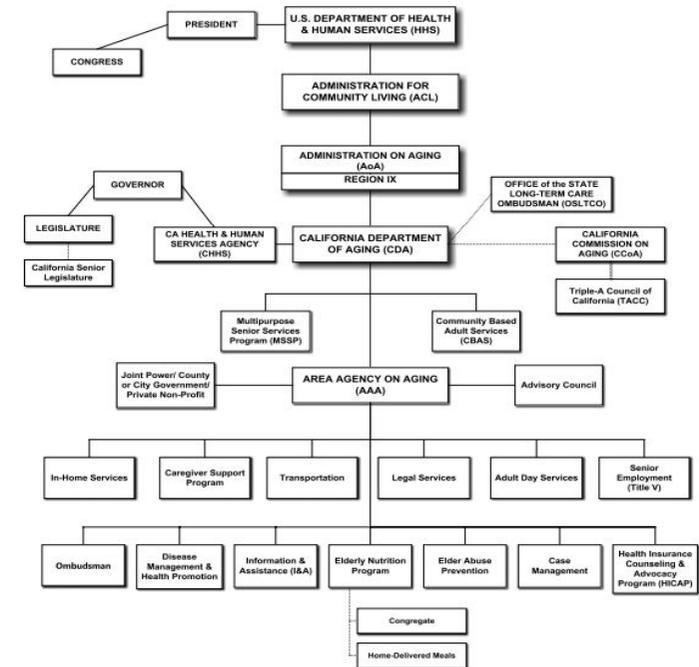
## 2017 State Scorecard Summary of LTSS System Performance Across Dimensions



# California Government and Seniors: Aging Network Overview

California first explored the societal implications of aging as early as **1948** - during Governor Warren's administration, an **Interdepartmental Coordinating Committee on Aging** served in an advisory capacity to the governor and Legislature. In **1955**, after the first Governor's Conference on Aging, a **Citizens' Advisory Committee on Aging** ("CACAA") was founded. The enactment of the **federal Older Americans Act in 1965** established an **Administration on Aging** and called for the creation of **State Units on Aging** - CACA changed its name to **California Commission on Aging** ("CCoA") and became the state's administrative agency for the federal grants within the Health and Welfare Agency ("HWA"), tasked with advising the governor and coordinating efforts between local governments and agencies, senior organizations, as well as business, industry, and labor. In **1973**, the **Burton Act** established the **Office on Aging** ("OoA") as a department within HWA, with CCoA continuing in its advisory capacity and OoA taking **operational responsibility for the state's programs by dividing the state into 33 Planning and Service Areas** ("PSAs") to be administered by **Area Agencies on Aging** ("AAAs"). In **1976**, OoA became the **California Department of Aging** ("CDA") - its duties were further extended by the **Older Californians Act of 1980** which also designated the **Area Agencies on Aging** as "**principal advocates**" at the local governmental level.

Today, **CDA** administers funds allocated under the federal Older Americans Act, the Older Californians Act, and the Medi-Cal program, with an **annual budget of more than \$200 million**. Mandated **services are delivered through the 33 local AAAs** with which CDA contracts and which are run independently or as a part of county or city agencies **under CDA's supervision and guidelines**. The services are administered by AAAs in the 33 designated PSAs, consisting of one or more counties (and the city of Los Angeles) within the state. AAAs may provide services directly or by contract with an outside entity, with an **objective of helping seniors find employment, supporting older and disabled individuals to live as independently as possible in the community, promoting healthy aging and community involvement as well as assisting family members in their caregiving role**.



## CA Department of Aging: Programs and Services

- [Aging and Disability Resource Connection](#)
- [Adult Day Health Care](#)
- [Disease Prevention and Health Promotion](#)
- [Family Caregiver Support Program](#)
- [Health Insurance Counseling and Advocacy](#)
- [Legal Assistance](#)
- [Long-Term Care Ombudsman Program](#)
- [Multipurpose Senior Services Program](#)
- [Nutrition](#)
- [Senior Community Services Program](#)
- [Senior Information and Assistance Program](#)
- [Supplemental Nutrition Assistance Supportive Services Program](#)

# California Government: Critical Policy Areas for Seniors and Disabled

**Health Care:** access to culturally competent health care is essential for reducing mortality, disability and quality of life

**Long-Term Care (“LTC”):** the increasing longevity and disability will amplify the need for culturally competent LTC

**LTC Financing:** LTC is funded through a mix of sources, with individuals and their families relying first on personal resources and then on multiple, uncoordinated public sources. Without viable financing alternatives, the state and federal government budgets will face ongoing pressure with increased Medicaid (Medi-Cal) expenditures, the main payment source for LTC

**Unpaid Family Caregivers:** while a number of support programs exist, most caregivers are unaware of or unable to access them

**Transitional Care:** inadequate planning and lack of access to services in the home setting following Hospital to Home Transitions lead to repeat hospitalizations and a higher likelihood of placement in a nursing home; Nursing Home to Home Transitions is hampered by limited availability of affordable and accessible housing and transportation

**Wellness and Mental Health:** health promotion activities such as exercise, nutritional guidance and preventive services, including access to mental health services and social and intellectual engagement are vital to maintaining health and containing costs

**Alzheimer’s Disease and Related Dementia:** rapid growth of the number of residents suffering from these diseases brings with it a substantial increase in caregiving and service needs

**Housing:** there is an inadequate supply of affordable supportive housing for people who need more services and support than can be provided in their homes or who wish to transition out of an institution into the community

**Transportation and Mobility:** in addition to public transportation, low-cost mobility options to access health services, socialize, volunteer, participate in physical or intellectual activities, are needed

**Employment and Retirement:** employment can be essential to remain integrated and engaged in society - both state and employer policies should enable seniors to remain gainfully employed as long as they need or want to work



# California Government and Seniors: State Plan on Aging, Master Plan

"Let's talk about something we too often overlook. The Golden State is getting grayer. We need to get ready for a major demographic challenge headed our way ... **It is time for a new Master Plan on Aging.** It must address person-centered care, the patchwork of public services, social isolation, bed-locked seniors in need of transportation, the nursing shortage and demand for In-Home Supportive Services that far outpaces its capacity."

**Governor Gavin Newsom, 2019 State of the State Address**



## California State Plan on Aging: 2017-2021

California Department of Aging submits a State Plan to the federal Administration on Aging at least every 4 years. **Current Plan has the following key goals and strategies for seniors and their caregivers:**

### **Goal I: Easy access to information needed to make informed decisions:**

provide information regarding health and supportive services to promote independence and wellness; offer counseling to seniors; make information and training on person-centered counseling available to public

### **Goal II: Enable seniors and their caregivers to be active and supported in their homes and communities:**

integrate long-term services and supports into Cal MediConnect; implement Medi-Cal State Transition Plan; expand opportunities for community involvement and volunteerism

### **Goal III: Provide information and tools to support health and wellbeing:**

promote healthier living through programs targeted to adults with chronic conditions; increase access to nutritious foods and help establish healthy eating habits

### **Goal IV: Protect the consumer rights of older Californians and assist them to obtain needed benefits:**

evaluate implementation of California's Legal Services Provider Standards and identify best/promising practices; improve abuse investigation skills for Adult Protective Services workers

## California Master Plan on Aging: Preliminary Goals

In February 2019, Senator Jackson introduced legislation to develop a Master Plan on Aging. [Senate Bill 228](#) sets out the following **preliminary goals**:

- Expand access to coordinated, integrated systems of care
- Strengthen access to long-term services and supports
- Prepare families to plan and pay for long-term services and supports
- Support California's family caregivers
- Increase access to oral healthcare
- Develop affordable housing options
- Enhance access to transportation
- Develop a culturally-competent paraprofessional and professional workforce
- Prevent exploitation and abuse (financial or physical) of older adults
- Streamline state administrative structures to improve service delivery

# California Government: Key Longevity-Related Measures and Initiatives

In addition to having an extensive Aging Network, California implements a number of longevity-related measures and initiatives. Its globally renowned life sciences ecosystem is supported by the forward-thinking public policy as well as by top-tier research institutions and vibrant venture capital scene. Golden State has been on the forefront of sponsoring pioneering fields such as stem cell research and precision medicine and is exploring the ways of harnessing the power of Artificial Intelligence. Further, the state has a number of programs aimed at improving health and well-being of its residents.

**Tax Incentives to Life Sciences Companies:** the California Competes Tax Credit is an income tax credit available to businesses that want to come and grow in the state. Local governments also offer a number of incentives, such as San Francisco's biotech payroll exemption and support of Mission Bay biotech expansion.

**California Institute for Regenerative Medicine ("CIRM"):** in 2004, voters approved Proposition 71: the California Stem Cell Research and Cures Initiative which created CIRM to fund and promote all areas of stem cell research that show promise in accelerating treatments to patients in need.

**California Initiative to Advance Precision Medicine ("CIAPM"):** launched in 2015, CIAPM is a partnership between the state, University of California and other public and private entities, aimed at supporting precision medicine. As a centralized information base, it stimulates collaborations among scientists, clinicians, entrepreneurs and patients, enabling them to turn large data sets and innovation into better health outcomes based on each person's unique characteristics and circumstances. CIAPM's goals are: (1) assembling an inventory of precision medicine assets in California and (2) support projects that have the potential for tangible benefits to patients within a short timeframe. The state allocated [\\$30 million](#) for CIAPM in its 2018-2019 budget.

**Artificial Intelligence ("AI") - a Roadmap for California:** prepared by the state's Little Hoover Commission in 2018, this report provides the new Governor and Legislature with an AI policymaking agenda that revolves around public engagement, building a human infrastructure, attacking pressing social needs, and protecting core values. It specifically highlights AI application to the healthcare needs of Californians with a special emphasis on the needs of its senior population



# California Government: Key Longevity-Related Plans and Initiatives

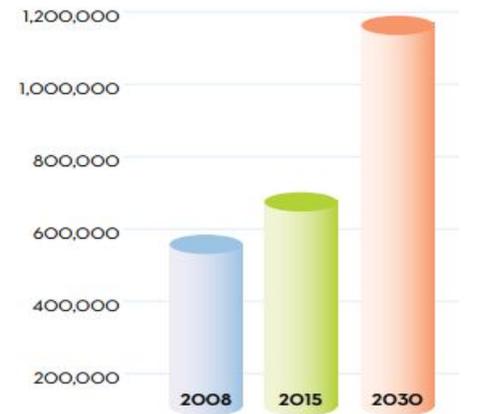
**California's State Plan for Alzheimer's Disease for 2011-2021:** key goals and recommendations: (1) eliminate stigma associated with Alzheimer's disease; (2) ensure access to high quality, coordinated care in the setting of choice; (3) establish a comprehensive approach to support family caregivers; (4) develop an Alzheimer's proficient, culturally competent workforce; (5) sustain and expand existing Alzheimer's research efforts (6) create a coordinated state infrastructure that enhances the delivery of care.

**Let's Get Healthy California Task Force ("LGHCTF"):** LGHCTF was established in 2012 to develop a 10-year plan for improving the health of Californians, controlling health care costs, promoting personal responsibility for individual health and advancing health equity. It identified specific issues to be considered (including diabetes, obesity, hypertension, hospital readmissions) and developed a framework organized under two strategic directions: Health Across the Lifespan (Healthy Beginnings, Living Well, End of Life) and Pathways to Health (Redesigning the Health System, Creating Healthy Communities, Lowering the Cost of Care).

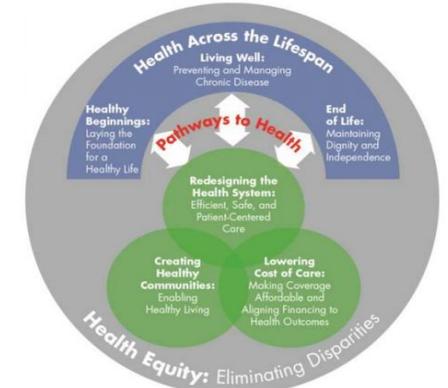
**California Wellness Plan ("CWP"):** in 2014, CWP was published as the result of a statewide process led by the CA Department of Public Health in alignment with LGHCTF - its overarching goal is equity in health and wellbeing, with an emphasis on the elimination of preventable chronic disease and injury. To attain this, the following goals were identified: (1) Healthy Communities (2) Optimal Health Systems Linked with Community Prevention (3) Accessible and Usable Health Information, and (4) Prevention Sustainability and Capacity.

**Coordinated Care Initiative ("CCI"):** passed in 2012, this initiative encompasses 8 counties and transforms California's Medi-Cal (Medicaid) care delivery system to better serve local low income seniors and disabled. CCI produces greater value for the Medicare and Medi-Cal programs by improving health outcomes and containing costs via an integrated offering of medical, behavioral, and long-term care services and shifting service delivery into the home and community, away from expensive institutional settings. Key components of CCI are: (1) Cal MediConnect and (2) Managed Medi-Cal Long-Term Supports and Services.

ESTIMATED NUMBER OF PEOPLE 55+ WITH ALZHEIMER'S DISEASE; 2008, 2015, 2030



**Let's Get Healthy California Task Force Framework**  
The Triple Aim:  
Better Health • Better Care • Lower Costs



# California Government: General Recommendations on Aging Strategy



UNITED NATIONS

## UN: 2015 World Population Ageing Report

Governments need to design innovative, multisectoral policies and services for the elderly, including housing, employment, health care, infrastructure and social protection. This ensures the well-being and socio-economic integration of seniors while maintaining the fiscal solvency of pension and health care systems. **Recommendations:**

**Expand and ensure solvency of pension systems** to guarantee basic income security in old age for all

**Health care systems must adapt to the needs of seniors**, adequately diagnosing and treating age-related conditions

**Enact policies that promote lifelong health** and emphasize preventive care to prevent or postpone age-related disability

**Prepare for a growing need for long-term care**, both home-based and facility-based

**Eliminate age-related employment discrimination**, promote the recruitment of and flexible employment opportunities for the elderly

**Facilitate access to microcredit, provide subsidies** and other incentives for senior self-employment

**Include seniors in public policy** processes

**Improve seniors' access to public services** in urban and rural areas

**Help to bridge the digital divide** of seniors through technology training programs and learning hubs tailored to their needs



## WHO: Global Strategy on Ageing and Health

**Strategic Objective 1: Commitment to Action on Healthy Ageing:** establish national frameworks for action on Healthy Ageing; strengthen national capacities to formulate evidence-based policy; combat ageism and transform understanding of ageing and health.

**Strategic Objective 2: Developing Age-Friendly Environments:** foster seniors' autonomy and enable their societal engagement; promote multisectoral action.

**Strategic Objective 3: Aligning Health Systems to the Needs of the Elderly:** orient health systems around intrinsic capacity and functional ability; develop and ensure affordable access to quality senior-centered care and integrated clinical care; ensure a sustainable and appropriately trained, deployed and managed health workforce.

**Strategic Objective 4: Developing Sustainable and Equitable Systems for Long-Term Care:** establish and continually improve a sustainable and equitable long-term care system; build workforce capacity and support caregivers; ensure the quality of person-centered and integral long-term care.

**Strategic Objective 5: Improving Measurement, Monitoring and Research on Healthy Ageing:** agree on ways to measure, analyze, describe and monitor Healthy Ageing; strengthen research capacities and incentives for innovation; research and synthesize evidence on Healthy Ageing

# California Government and Seniors: Long-Term Care Recommendations

*"Long-term care is the No. 1 issue ... It's not enough to have service delivery ... you need to have a coordinated system, and you need to have the means for middle-income Californians to get the support they need"* Nancy McPherson, the California state director for AARP



**Develop a Managed Care Expansion:** Coordinated Care Initiative offers long-term care ("LTC") in certain locations only - a strategy for system integration regardless of where one resides, is needed

**Family Caregivers:** establish a sustainable system of support, including reconsidering employment-related policies, such as increasing the length of protected leave and expanding the California Family Rights Act to include care for grandparents, siblings, and in-laws

**Person-Centered Planning:** develop standards for person-centered service planning in an integrated system to ensure that individuals and families have the opportunity to engage in health and LTC service planning

**Comprehensive LTC Workforce Strategy:** develop a strategy to analyze and align LTC workforce needs, training and education requirements; address the mental health workforce needs for seniors

**Reducing Nursing Home Placements:** specify the minimum levels of functional limitations to receive MediCal reimbursement

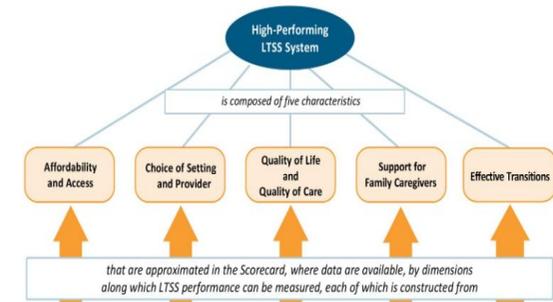
**Planning for LTC Needs:** create a strategy to raise Californians' awareness of, and engagement in, LTC planning. Most people are in denial about aging and future LTC needs which can be a serious detriment to individuals who are not prepared to address and finance their LTC needs

**Elder Justice/Elder Abuse Prevention:** include guidance on enhancing decision-making capacity for impaired individuals, as well as options for supported and surrogate decision-making that are appropriate for various levels of impairment and risk

**End-of-Life Planning:** address end-of-life planning issues, improve end-of-life care

**Building on Regional Innovations:** expand innovations addressing the challenges of LTC service delivery

## High-Performing LTC System



## California's LTC Scorecard

Dimension	Rank	Number of Indicators with Trend*	Number of Indicators Showing:**		
			Substantial Improvement	Little or No Change	Substantial Decline
OVERALL	9	23	6	16	1
Affordability & Access	19	5	1	4	0
Choice of Setting & Provider	3	5	1	3	1
Quality of Life & Quality of Care	21	3	1	2	0
Support for Family Caregivers	8	4	2	2	0
Effective Transitions	22	6	1	5	0

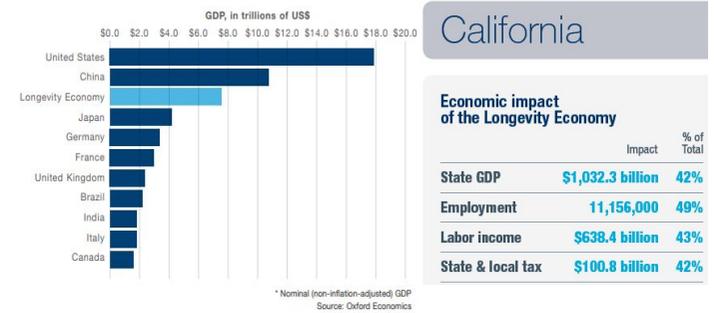
# CA Age Wave: from Challenges to Opportunities - Longevity Economy

As of 2015, there were more than **1.6 billion people globally in the 50-plus age cohort** - by 2050, this number is projected to grow to nearly 3.2 billion. The contributions of this age group are collectively known as the **Longevity Economy: the sum of all economic activity driven by the needs of people aged 50 and older** - this includes the products and services they purchase directly, as well as the further economic activity this spending generates. Increased longevity represents [the biggest business opportunity of the 21st century](#) - companies have an opportunity to steer a cultural shift, highlighting aging not as a time of decline, but as a purposeful life stage.

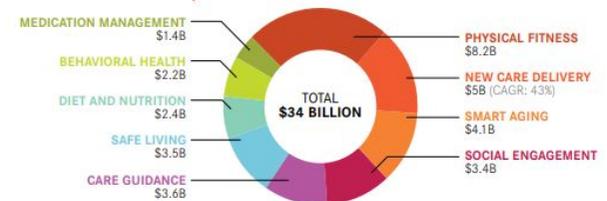
Currently, **35% or 111 million of U.S. population are aged 50-plus**, representing a powerful force for the U.S. economy - **in 2015, the Longevity Economy fostered \$7.6 trillion in economic activity**. This cohort is staying employed for longer, spending more money, generating tax revenue, and producing economic value long past what used to be a traditional retirement age. Older workers are doing this in ways that complement rather than compete with their younger counterparts - they are active in industries that are more knowledge-intensive and less physically demanding and tend to be more highly educated and [productive](#). A [UK study](#) found that **real GDP would increase by 3.25% per year if older workers remained active in the workforce for an extra 3 years**. [Research](#) suggested that **working past age 65 may lead to a longer life**. Further, this age group is **helping to form and transform markets for goods and services**. This population cohort is also crucial in **driving entrepreneurship and investment**, and as enthusiastic **consumers of leisure activities**. **83% of US household wealth is held by people over 50**, allowing them to spend more on goods, services and investments.

In **California**, people over 50 contribute to the economy in a positive, outside proportion to their share of populace. **Despite being 32% of the state's population in 2015** (expected to be 31% in 2040), their total economic contribution to the Longevity Economy accounted for **42% of California's GDP, driven by consumer spending in such sectors as health care (62%), entertainment (53%), and trade margins and personal transport services (52%)**. This age group also supported 49% of local jobs, 43% of labor income, and 42% of state and local taxes.

Fig. 9. The Longevity Economy on a global scale, 2015\*



BIGGEST MARKET OPPORTUNITIES: CUMULATIVE REVENUES, 2015-2020



# CA Age Wave: from Challenges to Opportunities - Societal Benefits

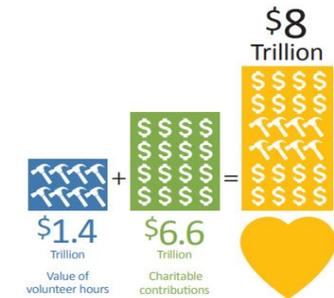
Beyond the economic contributions, the 50-plus age group also accounts for the majority of volunteering, philanthropy, and donation activities in the United States - a spill-over value that is often overlooked. Per [study](#) by Merrill Lynch, as the **Boomer generation retires, they will help create an \$8 trillion surge in giving** - considered the “**Longevity Bonus**” this value comprises of **\$6.6 trillion in monetary contributions and \$1.4 trillion in value of time** during 2015-2035 time period. Our culture, however, offers a scant recognition of older individuals’ potential - existing stereotypes shroud aging and celebrate all things young while overlooking scientific evidence about the strengths of seniors.

Research suggests that **aging with purpose offers solutions not just to problems inherent in aging itself, but to an array of other societal challenges**. Seniors can infuse societies with transformative social and economic benefits: through their insight and ability to mentor, they **help the young learn and develop**; as caregivers and volunteers, they **help one another age with dignity** and provide invaluable support; in work settings, they **bring experience and emotional stability**. Older adults **themselves gain mentally and physically through purposeful activity**: [studies](#) associate volunteerism with lower rates of mortality and depression, increased strength and energy, and delayed physical disability.

## Longevity Economy: Key Implications

- Acknowledging the spending patterns of the 50-plus cohort as the group with the **largest spending power**
- Maximizing the productivity of older workers, accommodating the need for **longer working lives**
- Staying informed of trends in **health care that increase the quality of life for seniors** and accommodate their preference for aging in place
- Innovating and adopting new **technologies that improve the lives of people aged 50-plus**
- Understanding how **longevity is good for society** in terms of charitable giving and taxes

America's Longevity Bonus (2016-2035)



Source: Calculations based on data from the Center for Wealth and Philanthropy at Boston College, the U.S. Census, the U.S. Corporation for National Community Service, and Giving in Retirement: America's Longevity Bonus survey.

## The 50-plus tend to be more PHILANTHROPIC & CHARITABLE



### OLDER ADULTS PROVIDE:

- KNOWLEDGE
- EXPERIENCE
- STABILITY
- COMMUNITY ENGAGEMENT
- CULTURE

### HOW CAN WE BETTER INCLUDE OLDER ADULTS?



- BE AN EMPLOYER
- BE A FRIEND
- BE A MENTEE OR MENTOR

# CA: Epicenter of Academic Excellence, Life Sciences and Innovation

California boasts **10 institutions in the Shanghai's Index of the world's 100 top universities**. In 2016, the state graduated more than 4,900 science and engineering PhDs, by far the most in United States. Academic excellence drives the California's **vibrant life sciences ecosystem**, which offers many advantages, such as:

- Four life sciences **mega-clusters**: the Bay Area, Los Angeles, Orange and San Diego counties
- State's research institutions receiving the **most (15.1%) NIH funds in the nation**, further driving innovation
- California's **world-class research** generates new companies, health technologies and improved care

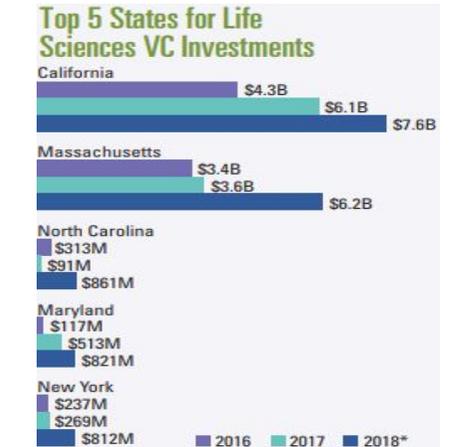
The state supports life sciences industry through various tax incentives encouraging more investment as well as through initiatives aimed at promoting the use of advanced computing and technology to better understand and treat diseases. Such **thoughtful public policy plays a critical role**, supporting a healthy business climate as well as improved access to diagnostic and therapeutic technologies. The Golden State is home to 3,418 life sciences companies which have an enormous impact on human health - as of September 2018, local companies had **1,322 medicines in the pipeline** to treat cancer, central nervous system conditions and infectious diseases.

The life sciences industry is also an **economic engine** - in 2017, the sector's revenue exceeded \$178 billion, generated \$18.8 billion in federal and local taxes and is second only to computer technologies in employment among high-tech industries. As California companies have a strong record of translating science into products that help patients, the state has long been a magnet for investment - in 2018, local life sciences companies attracted more than **\$7.6 billion in venture capital funding**, leading the nation once again. At **\$3.9 billion**, California also **attracted the most VC funding in U.S. in the digital health sector**.



**California Life Sciences Industry** 2017 (estimated)

Total Estimated Revenue	\$177.7B
Total Estimated Employment	311,226
Total Estimated Wages	\$37.1B
Average Annual Biomedical Industry Wage	\$19,070
Total NIH Grants Awarded, FY2018	\$3.9 B
Total Estimated Venture Capital Investments, 2018	\$7.6B
Total Biomedical Exports	\$25.2B
Direct Federal Taxes	\$12.5B
Direct State and Local Taxes	\$6.3B
Number of Life Sciences Companies	3,418



# Executive Summary: Conclusions

California plays an important role on the global Longevity scene - its sheer economic power; world-renowned academic and research institutions producing top talent and fostering innovation; thoughtful public policy supporting the state's vibrant life sciences ecosystem as well as dynamic venture capital scene help secure such a position. The state views healthy Longevity as a priority, as evidenced by a multitude of government-sponsored initiatives aimed at understanding disease and improving health of its residents as well as by a network of agencies tasked with addressing the needs of the elderly.

While Californians boast second-highest life expectancy at birth in U.S., the *healthy* life expectancy of 69.9 years pales in comparison to other leading world regions, especially considering the amount of the state's health expenditures. Further, the Golden State is following the global ageing trend and is becoming the Graying State - its vast Baby Boomer cohort started entering retirement in 2011 and, for the first time in history, older Californians are projected to outnumber children by 2030. This so-called Silver Tsunami brings about a number of challenges such as higher healthcare (especially long-term care) costs, retirement crisis and poverty of the elderly, among other issues. However, increased Longevity also presents a number of opportunities, both societal and economic.

This report examines California's Longevity industry by itself as well as offers a global perspective on the subject. This is accomplished by highlighting the key players in California Longevity sphere, analyzing pertinent socio-economic data and government policy, identifying leading research and technological trends as well as by exploring the opportunities associated with the Silver Tsunami and providing policy recommendations based on successful global practices. The report's appendices offer detailed information regarding companies, investors, influencers, research institutions, government entities, non-profit organizations and other principal participants in California's Longevity field.





## AGING ANALYTICS AGENCY

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**Aging Analytics Agency** is the world's premier provider of industry analytics on the topics of Longevity, Precision Preventive Medicine and Economics of Ageing, and the convergence of technologies such as AI, Blockchain, Digital Health and their impact on the healthcare industry. The company provides strategic consulting services in fields relating to Longevity, and currently serves as the primary source of analytics and data for the UK All-Party Parliamentary Group for Longevity.



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**Longevity Vision Fund** is a \$100M life extension-focused investment fund dedicated to making longevity affordable and accessible to all. The fund accelerates breakthroughs in longevity by investing in startups and companies that develop technologies, products, and services that extend human lifespans and overcome the negative effects of aging. Founded by Sergey Young, XRPIZE Innovation Board Member and Longevity XPRIZE Development Sponsor.



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**Longevity.Capital** is a specialised Longevity Industry Index Hedge Fund with enhanced liquidity that uses hybrid investment technologies to combine the profitability of venture funds with the liquidity of hedge funds, thus significantly de-risking the interests of LPs and providing the best and most promising Longevity companies with adequate amounts of investment.



[www.sens.org](http://www.sens.org) | [foundation@sens.org](mailto:foundation@sens.org)

**SENS Research Foundation** works to develop, promote, and ensure widespread access to therapies that cure and prevent the diseases and disabilities of aging by comprehensively repairing the damage that builds up in our bodies over time. They are redefining the way the world researches and treats age-related ill health, while inspiring the next generation of biomedical scientists.



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**Longevity International UK** is the Secretariat for the UK All-Party Parliamentary Group for Longevity, structured as a social enterprise bringing together start-ups, industry, academic and governmental stakeholders under one umbrella to provide a unified voice and coordinating vehicle for positive discourse and change to ensure the 'longevity dividend' is accessible to everyone.



# AGING ANALYTICS AGENCY

**Link to the Report: <https://www.aginganalytics.com/longevity-in-california>**

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