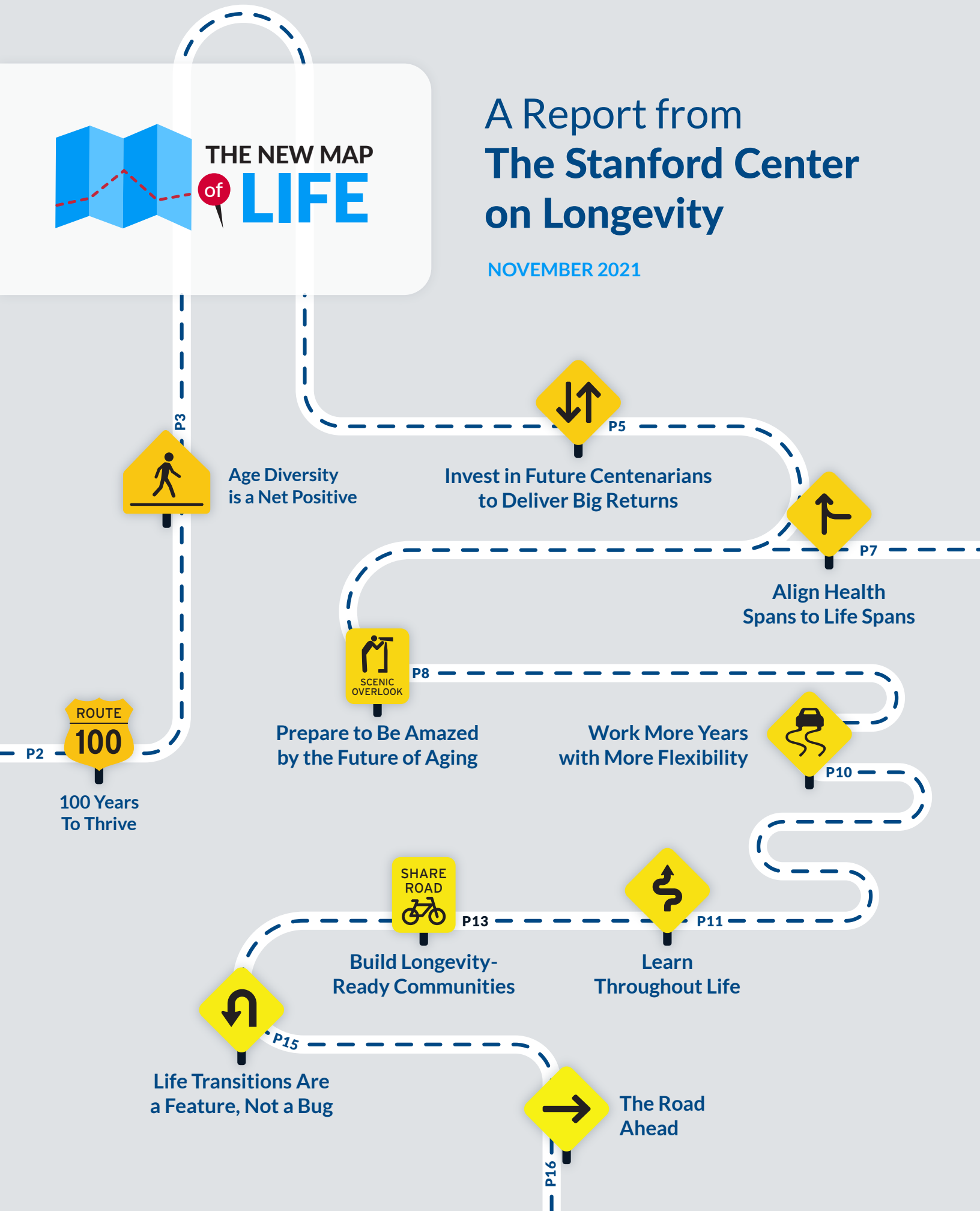


THE NEW MAP
of **LIFE**

A Report from The Stanford Center on Longevity

NOVEMBER 2021



100 Years To Thrive

In the United States, demographers predict that as many as half of today's 5-year-olds can expect to live to the age of 100.

By the middle of this century, this once unattainable milestone may become the norm for newborns, continuing a remarkable trend that saw human life expectancies double between 1900 and 2000, and still rising in this century, despite the grievous toll of the Covid-19 pandemic. Longevity is one of the greatest achievements in human history, brought about by reductions in infant mortality, advances in sanitation and medicine, public education, and rising standards of living. Yet the change came about so quickly that the social institutions, economic policies, and social norms that evolved when people lived for half as long are no longer up to the task.^{i,ii}

We see a huge opportunity. In 2018, the Stanford Center on Longevity launched an initiative called The New Map of Life, believing that one of the most profound transformations of the human experience calls for equally momentous and creative changes in the ways we lead these longer lives. We make a clear distinction between aging, the biological process, and longevity, the measure of long life. The Center's goal is not to advocate for longer life—a phenomenon that is well underway—rather, it is to identify ways to enhance the quality of those century-long lives, so that people experience a sense of belonging, purpose, and worth at all ages and stages.

The advent of 100-year lives coincides with declining birth rates, and these two defining demographic trends are often conflated into a crisis narrative about an aging society about to be engulfed by a “gray tsunami.” In this scenario, older adults are presumed to be a burden to society, and the presumed antidote to old people is more babies—who, by historical standards, are becoming scarce. This crisis mindset assumes that people will age in the future as they did in the past, that financing 100-year lives is a challenge made insurmountable by the projected insolvency of the Social Security trust fund, and that additional mechanisms for saving, investing, and supplementing income are beyond reach. This static view of what it means to age distorts our perspectives about longevity in the future, and overlooks the opportunity to change the trajectory of aging and associated costs, by starting now to redesign institutions, practices, and norms so that they align with today's reality, rather than last century's.ⁱⁱⁱ



The New Map of Life calls on us to shift from a deficit mindset that laments the losses now associated with aging—

whether to health, mobility, financial security, independence, or social engagement—and to identify the gains that now go unmeasured and overlooked.

In place of the outdated assumption that older adults drag down productivity and drain societal resources, we take a forward-facing perspective on the economic potential of a more age-diverse population in which older adults contribute in increasingly significant and measurable ways to the social good and to GDP, so that opportunities for healthy longevity are shared across races, geographical regions, and socioeconomic status.^{iv}

With these guiding principles, we set out to design The New Map of Life to offer new, more flexible options for learning, earning, and saving, while also improving health and social engagement. To plot new options for the life course and its many

variables, we created a postdoctoral training program and appointed an interdisciplinary team of talented fellows, each paired with a faculty mentor with expertise in nine domains that are core to longevity: early childhood, education, work, financial security, built environment, climate, health and technology, lifestyle and fitness, and intergenerational relationships.

We challenged the fellows to question the conventions and assumptions that are so baked into our age-defined culture we may not even recognize them—or the ways in which they have limited our imaginations. We find powerful evidence that longevity holds even greater opportunities for growth than we thought possible when we launched our initiative. And we believe that the very real and substantial challenges that longevity creates for our economic and social order can be met— if we act now.

Guided by the following principles, we can start laying the groundwork for a society that is healthier, more equitable, and longevity-ready.

1 Age Diversity is a Net Positive

Never before in human history have so many generations been alive at the same time, creating opportunities for intergenerational connection that have until now been impossible.

With life expectancy hovering around 30 years as recently as the 1800s, for much of human existence people had just enough time to pass on

their genes and provide basic sustenance during their children's early years. Even by 1900, when life expectancy reached 47 years, only 6 percent

of American children had four living grandparents; by 2000, that figure had risen to 40 percent. Today there are comparable numbers of people in every age group, from birth through their 70s, with increasing numbers in their 80s and 90s.

This era of unprecedented age diversity means society benefits from a complementarity of skills and abilities that people develop over their lives. The speed, strength, and zest for discovery common in younger people, combined with the emotional intelligence and experience prevalent among older people, create possibilities for families, communities, and workplaces that haven't existed before. Having more older people means that children can receive more attention from grandparents or other caring adults. Multigenerational families can share financial and social resources, including housing and caregiving, deepening social responsibility and engagement across generations.

A 2021 survey by the nonprofit organization Generations United found that one in four Americans were living in a household with three or more generations, and that multigenerational living has nearly quadrupled in the past decade. Much of that surge can be attributed to the economic pressures of the pandemic: Nearly six in ten of those surveyed say they doubled or tripled up with family members due to a change in financial circumstances caused by the pandemic. Perhaps most interesting though, 72 percent of respondents say they plan to continue living in multigenerational households for the long term, citing benefits that include enhanced family bonds, greater ease of meeting the care needs of family members, improved mental and/or physical health, and improved finances or more time to continue school or job training.

To reap these as-yet unrealized benefits, we


must bridge generations and reduce the age segregation that took hold in American society over the past century, as young people left family farms in search of higher-paying jobs and the population became concentrated in cities and suburbs designed for nuclear families. Modernity and economic progress succeeded in delivering longer lives, but along the way, many Americans lost chances to share wisdom, joy, and everyday moments with extended family. Meanwhile, working parents struggle with stress-inducing gaps in caregiving, emotional support, and financial security. A key challenge ahead is to foster meaningful connections among different generations to take full advantage of social capital that humans have never before had available.

Age diversity brings profound implications for the workforce as well. Workers over the age of 55 are the fastest-growing cohort, now comprising 25 percent of the U.S. workforce. While stereotypes portray older workers as less healthy, productive, and tech-savvy than their younger counterparts, the evidence suggests that older workers in knowledge jobs are superior in judgment, reliability, and mentoring skills and are indeed capable of mastering the technology requirements of their jobs.^v Along with an increased sense of competence, older workers become motivated to use their vast repertoire of skills to help others. All of these factors serve to improve workplace climate and reduce turnover among workers of all ages, thus lowering costs for employers.^{vi, vii}

While there are great variations in abilities and needs among people 65 and older, older people today are in better functional health than past generations. Nonetheless, the 65+ demographic—all 52 million of them—are often lumped by marketers, media, and policymakers into a monolith assumed to represent a drain on society, rather than an

enormous, untapped source of human capital.

Changing the narrative to value age diversity along with other forms of diversity is more than an exercise in semantics; it is essential if we are to make use of the immense reserves of knowledge, experience, and skills in older adults who want to remain productive through paid work, volunteering, or mentoring, so that we can deploy them across the country at a time of tremendous need. Misguided assumptions drive misguided employment policies, practices, and ageism.

 Rather than dwelling so anxiously on the costs incurred by an “aging” society, we should reframe the conversation around measuring and reaping the remarkable dividends of a society that is, in fact, age-diverse.

2 Invest in Future Centenarians to Deliver Big Returns

“Aging society” narratives portray the later decades of life as a period marked by vulnerability and dependence.

A longevity perspective instead views the 30 extra years of life as a dividend that can be strategically distributed across all stages of life. Milestones, expectations, and social norms will shift as a result. Must young people graduate from high school by 18 and hurtle across the educational finish line, diploma in hand by their early or mid 20s, to achieve success over a 100-year life? Why not have learning be a lifelong pursuit that is just as likely to take place outside a real or virtual classroom as inside one? At a time of labor shortages, why do we expect 65-year-old knowledge workers to leave the workforce, just as many

achieve peak performance? Is a chronological number even the best way to define “age” when science offers so many new tools to measure vitality and health?

Investing in future centenarians starts with access to high-quality childcare and early childhood education, delivering double benefits to families. Children develop foundational skills for future success and well-being, while parents can pursue adult education, employment, and higher incomes.^{viii} Increasing social mobility for families helps decrease children’s exposure to

adverse experiences (e.g., violence, neglect, and family dysfunction). High-quality childcare has also been found to improve math and reading ability, increase the likelihood of graduating from college, and decrease the likelihood of receiving public assistance and coming into contact with the justice system.^{ix} Despite these benefits, fewer than half of children in the U.S. age 3 or younger are currently enrolled in childcare.^x While caring for children at home will continue to be the choice for many, providing childcare options increases the odds of success for those who need it.

Fully developing each child's potential is greatly enhanced by preschool geared toward the natural strengths of the youngest children, whose brains are primed to discover their worlds through play, creativity, and physical activity. Adequate time for these activities in early childhood enhances later academic skills. There is no need to sacrifice one for the other, and evidence is mounting that replacing playtime with academic tasks so that 5-year-olds can read is counterproductive.

Early childhood is a critical time for establishing healthy behaviors that contribute to disease prevention and are foundational for lifelong engagement in physical activities.^{xi} Current guidelines recommend that young children engage in at least 60 minutes of moderate to vigorous physical activity every day,^{xii} yet nearly half of children do not meet these guidelines.^{xiii} Physical activity starts to decline when children enter school^{xiv} and are required to spend more time sitting in a classroom. Physical education has slipped as a priority—the median physical education budget for elementary schools is only \$460 per school year.^{xv}



The pivotal years between birth and kindergarten are also the optimal time for children to acquire many of the cognitive, emotional, and social skills needed for a healthy, happy, and long life.

Creating opportunities for that process to unfold, rather than pressuring the youngest children into becoming small facsimiles of older learners, not only makes childhood better, it lays the foundation for learning, collaboration, and productivity over a long life. Economic models suggest that comprehensive, high-quality early education and childcare programs are excellent public investments, delivering a lifetime return on investment of 13 percent each year.^{xvi}

These investments yield other meaningful returns over 100-year lives. As people live longer and the roles and social norms associated with age become more fluid and self-defined, less uniform and regimented, qualities such as resilience, self-efficacy (a belief in one's own abilities to shape outcomes), and curiosity (rather than dread) when confronted with change will become the emotional tool kit for longevity. People who learn these traits in early childhood have more time to practice and hone them during adolescence and early adulthood, and they are then better equipped to navigate the challenging passages that can be brought on by illness, disability, job loss, career change, divorce, or financial setbacks later in life.

3 Align Health Spans to Life Spans

While median life spans have increased dramatically over the past century, our health spans – defined as the years in which people are healthy, mobile, mentally sharp, and free of pain – have not kept pace.

Health span should be the metric for determining how, when, and where longevity efforts are most effective. We can use health span as a public health objective that gives healthcare providers and policymakers a more detailed and relevant picture of the conditions, needs, and disparities that contribute directly to longevity differences among populations.



A key principle of The New Map of Life is that healthy longevity requires investments in health at every life stage, and the process begins in childhood,

when access to healthcare services such as newborn screenings and childhood vaccinations, and programs to provide adequate nutrition, are essential to ensure that children are set early in life on the trajectory for longevity.

Simple interventions like providing more time for recess and creating opportunities for children to safely walk or ride their bikes to school can influence lifestyle habits from a young age. Research shows that lack of regular access to green space can slow a child’s cognitive development by up to 12 months.^{xvii} Access to green spaces

also corresponds with beneficial behaviors such as exercise routines and social interaction, while lack of access corresponds to adverse health outcomes, including cardiovascular and respiratory diseases, impaired brain and nerve functioning, obesity, stress, and higher body-mass index.^{xviii, xix, xx} Many low-income communities are “food deserts,” lacking supermarkets, gardens, or other sources of healthy food; improving access to affordable, fresh, and nutritious food for all is essential to improving health.

While it is common to attribute healthier outcomes to lifestyle choices and virtues such as willpower and self-discipline, the physical environments and institutional constraints that impoverished children and adults contend with limit choices in ways that more affluent communities do not. Addressing health disparities means addressing the systems that produce them—investing not only in better access to healthcare, but in the health of communities, especially those affected by poverty, discrimination, and environmental damage.

A major challenge is making high quality healthcare available to all. The full promise of longevity can only be realized if advances in individualized therapies are complemented by a much-expanded investment in population-level delivery of care. Otherwise, medical innovations will widen the already profound health disparities in the U.S., by excluding those who cannot pay for, or lack access

to, even basic healthcare.

Expanding access to healthcare through telemedicine is vital for older adults and people in low-income and rural communities, which in turn makes access to universal high-speed internet a healthcare essential.^{xxi}

These services, which saw a sweeping uptake during the Covid-19 pandemic, include virtual visits, specialty care and specialist interpretation, and health dashboards. Aided by data from wearable smart devices, the delivery of precision, personalized medicine can alert the wearer to abnormal metabolic variations that signal illness, as well as exposure to infection, allowing for earlier

and less costly intervention.

As essential as it is to expand public health investments, people will get sick and most will require substantial care at the very end of life. A clearer focus on health span can also contribute to a cultural shift around dying, giving people more control over the end-of-life care they receive. When their health span can no longer be reasonably extended, many older or terminally ill people may choose palliative care over spending their final days or weeks in a hospital intensive care unit, without the suffering and expense that are so often incurred. A longevity-ready society also offers scenarios for dignified and comfortable death.

4 Prepare to Be Amazed by the Future of Aging

Today's 5-year-olds will benefit from an astonishing array of medical advances and emerging technologies that will make their experience of aging far different from that of today's older adults.

As they age, these future centenarians might deploy technology functioning as "smart skin" to monitor heart, brain, and muscle function for abnormal activity or disease. These bio-integrated electronic devices, thinner than a human hair and as supple as skin, could supplant today's wearable technologies (smart watches, Fitbits, and the like) and be capable of preventing an epilepsy attack, resetting an irregular heartbeat, or sending

biometric data to be analyzed by a doctor for early intervention. Heart attacks and strokes could be diagnosed remotely in their earliest moments, possibly reducing severe organ damage and death.

In the future, older adults will be able to remain mobile longer than they can now, with the help of thin, wearable exoskeletons that let them walk and run with enhanced strength, much as e-bike riders

power uphill without huffing and puffing. Unlike wheelchairs, these devices can be tuned to provide enough support to maintain normal activities while still allowing muscles to exercise to their capacity, preserving muscle mass. Some exoskeletons will be capable of sending electronic impulses to help injured muscles heal, and in the case of paralysis, reversing some of the effects.

As they reach middle age and beyond, today's kindergarteners will find products to ease their journey that go well beyond multivitamins and hearing aids. 3D-printed braces and pads, customized to the individual, will help prevent injury. Sleep may be enhanced by unobtrusive monitors that sense disturbances and adjust temperature and light. Later in life, remedies for age-related issues will be built into clothing, cars, and homes, much as driver-assist technologies are already making cars safer with blind spot indicators and automatic braking.

These are just some of the technologies already in development or in the marketplace today. While we cannot know what breakthroughs will come next—



We can count on the pace of innovation to accelerate, as an ever-larger segment of the population seeks products and treatments to improve health and functioning as they age.

While there is no way to stop the process of aging, there is strong evidence that the biology of aging is malleable. The emerging field of geroscience has the potential to transform how we age, by seeking to identify—and “reprogram”—the genetic, molecular, and cellular mechanisms that make age the dominant risk factor for certain diseases and degenerative conditions. Rather than treating individual diseases or conditions related to age as medicine does now, as they emerge, geroscience offers advanced interventions at the cellular or genetic level that can slow, stop, or even reverse processes that drive multiple age-related diseases.

Whether longer health spans are realized through investments in early childhood healthcare, public health, telemedicine, geroscience, or precision and personalized medicine—or all of the above—these advances promise to alter the future of aging. They can delay or prevent the onset of age-related diseases and conditions, improve early detection of health risks, and help to reduce the cost of delivering healthcare as people age. Combined, these opportunities have the potential to redefine old age from a period associated with illness, frailty, and dependence into yet another life stage with potential for vitality, independence, and continued contributions to society.

5 Work More Years with More Flexibility

Over the course of 100-year lives, we can expect to work 60 years or more.

But we won't work as we do now, cramming 40-hour weeks and 50 work weeks a year (for those who can afford vacation) into lives impossibly packed from morning until night with parenting, family, caregiving, schooling, and other obligations. Rather than muddling through these all-too-familiar time constraints, imagine more flexible, less sequential routes through all the roles, opportunities, and obligations that life brings.

The Covid-19 pandemic raised uncomfortable questions about what it means to be an “essential worker,” the deep economic and racial inequities that often demand the greatest risks be carried by those least able to afford their costs, and the disproportionate childcare burdens on women in the workplace. It also made clear the desperate need for greater workplace flexibility to accommodate the needs of working parents in a society with no paid parental leave and piecemeal childcare options that convey choices and benefits to the most advantaged.

Collectively, the shifts wrought by the pandemic signal an opportune time to develop broad solutions for how employers and policymakers might respond for the benefit of all employees and their families, in the interest of a post-pandemic society that is also longevity-ready.^{xxii}



We can start by replacing the traditional one-way street

from education to work to retirement with more flexible routes in and out of the workplace, including paid and unpaid intervals for caregiving, health needs, lifelong learning, and social transitions to be expected over century-long lives.

Because The New Map of Life envisions on-ramps and off-ramps allowing workers to extend their working lives over many decades, older workers will continue to grow as a portion of the workforce. And this means taking on ageist stereotypes and policies. Older people who work spend more money and pay more taxes; whether they remain engaged through paid or volunteer work, they are also healthier and have greater mental agility than those who do not work.^{xxiii}

Rather than plunging over a retirement “cliff” at a time predetermined by age, workers can choose a “glide path” to retirement over the course of several years, allowing them to gradually reduce working hours while remaining in the workforce. Some companies are also experimenting with “returnships” that incentivize retired workers to come back to the workplace to share their expertise and alleviate skilled labor shortages. Studies show that older

workers are more likely to opt for a flexible schedule over promotions or pay increases, drawing many to consulting or gig work, and creating incentives for employers to offer part-time jobs and work-from-home options. These options allow workers to continue earning, building financial security, and paying taxes, creating benefits at the individual, workplace, and societal level for more years.

For younger workers, an “open loop” can relieve pressure at other life stages—for example, at the outset of parenthood, when the demands of peak career-building years collide with the time demands of starting families, especially for women. For new parents, who show the lowest levels of job satisfaction, the key to retention and higher future productivity is childcare. Making high-quality childcare universally available indeed accrues a double benefit to families.

Allowing—and encouraging—workers to move in and out of the workplace will require cultural change, as well as changes to employment and tax policies that now drive older adults seeking a respite from paid work into early or forced retirement when they face illness or caregiving responsibilities.

Unplanned or unwanted retirements deprive individuals of income, employers of productivity, and governments of income and payroll taxes. Changes to Social Security policy would allow retirees who want to resume paid work to do so, without being penalized by reductions in benefits. Allowing Medicare to cover the full employee health costs of workers over the age of 65 would remove a key barrier for employers concerned that retaining or hiring an older worker would increase their healthcare costs.

Financing longer lives also requires changes in institutional and government policies, along with new financial products that protect income streams through life transitions, illness, or disability. This may well require government guarantees or risk pooling. With appropriate employer and tax incentives, more workers can take a glide path and avoid the negative financial and health consequences that often come from going over the retirement cliff.

These changes will give workers of all ages and life stages a more sustainable and financially secure approach to their 100-year lives.

6 Learn Throughout Life

Given the strong links among education, health, and longevity—

The New Map of Life calls for innovation and more flexible options in our education system so that more people can develop their potential, becoming—and just as crucially, remaining—productive

and engaged over longer lives.

A useful place to start is with the distinction between learning, the process of acquiring

knowledge or modifying existing knowledge and skills, and education, providing systematic instruction. Learning and education are often conflated, with education assumed to entail a cognitive task of limited duration, within the confines of a formal institution, which children enter at kindergarten and emerge from after high school or college, presumably prepared to enter the workforce.

If children are to be truly educated for the challenges and opportunities that their longer lives will bring, we must tackle two simultaneous challenges. First, we must close the pervasive opportunity gaps in the current educational system that prevent so many children from fulfilling their potential due to racial or socioeconomic barriers, such as living in unsafe, unhealthy neighborhoods, attending poorly resourced schools, or being the first in their families to try to attend college. Second, we must create new pathways for learning that are less tethered to formal institutions, along with credentials for the resulting skills that are recognized by employers and society more broadly.

Rather than front-loading formal education into the first two decades of life—



We envision new options for learning outside the confines of formal education, with people of all ages able to acquire the knowledge they need at each stage of their lives, and to access it in ways that fit their needs, interests, abilities, schedules, and budgets.

Lifelong learning provides not only economic opportunities but also measurable health benefits, especially for older adults. Maintaining stimulating activities improves cognitive and physical health.^{xxiv} The state of Georgia, for example, has made tuition free at all state universities and colleges for residents 62 and older, whether senior scholars are enrolling for credit toward a degree or auditing.

Two-thirds of Americans do not obtain a four-year degree, and even for those who can afford it, college need not be the only path to the middle class or the sole credential for employability. Workers of all ages and educational levels need ways to qualify for jobs that pay a living wage. These options include trade apprenticeships and other employer-based training and certifications, online education micro-degrees, and retraining and upskilling through community colleges.

For those Americans who do attend college, institutions must also adapt to the realities of students' lives. More than 60 percent of undergraduates are now classified as “post-traditional learners,” meaning they are over the age of 25, working full-time, meeting family responsibilities, or enrolled in the military.^{xxv} These students need to access education online or in a hybrid format that lets them move at their own pace and integrate learning into their other daily responsibilities. The same holds true for hybrid learning at the K-12 level. Rather than teaching all children the same curriculum at the same time, AI-driven programs can identify a student's strengths, challenges, and interests, and customize lessons to meet them.

7 Build Longevity-Ready Communities

As a nation, we must start now to design and build neighborhoods that are longevity-ready.

As Americans debate whether to invest trillions of dollars in an expansive view of infrastructure that includes closing the digital divide, as well as investments to advance human potential through universal preschool and publicly funded community college—



It is important to assess potential value through the lens of longevity: Which investments will produce the highest returns for the greatest number of people over the course of a century?

By this standard alone, closing the digital divide will deliver returns for lifelong learners of all ages, increased labor productivity, access to healthcare, and greater equity for low-income and rural communities. More broadly, we see the opportunity for an “infrastructure triple play” to meet three overlapping sets of needs:

NEED 1: Making investments to advance human potential, especially for Americans who have been held back by racism or poverty, creating conditions for a healthier, more productive, and economically competitive population.

NEED 2: Reengineering U.S. infrastructure in preparation for longer human lives, with built

environments that are more walkable and provide access to mass transit, healthcare, and opportunities for lifelong learning, and that foster intergenerational connections.

NEED 3: Investing to help communities adapt and protect their residents from the increasingly severe effects of climate change.

Governments at all levels can rank proposals and award infrastructure contracts based on the bidding company’s ability to deliver simultaneously on resistance to climate change, economic equity, and the needs of a longevity-ready society.^{xxvi} The physical environment in the places children grow up and adults grow old sets us on trajectories that determine the quality and length of our lives. Whether air and water are clean or toxic, whether housing has lead in pipes or paint, whether fresh, nutritious food is available, or there are safe places to play and exercise outdoors, whether a neighborhood offers quality schools, economic opportunities, access to healthcare, and other needed social supports—these are critical factors underlying longevity.

The impacts of the physical environment begin before birth, with advantages and disadvantages accumulating over the entire course of life. This is especially true for Americans living in poverty, who experience significant disparities in life expectancy that can be traced directly to the conditions where they live.^{xxvii} The effects of the environment are evidenced in a study conducted in 2010, where

researchers measured and compared the gene expression of a large sample of Americans across the country. Fifty percent of the differentially expressed genes were attributed to living in urban versus rural areas, while only 5 percent were attributed to ancestry and gender.^{xxviii}

Safe and flexible housing for an age-diverse population is one area of unmet need—and tremendous opportunity. Over the next 20 years, according to the Joint Center for Housing Studies at Harvard, households led by people in their 80s will be the fastest-growing segment by age group. In 2011, the most recent year for which data is available, fewer than 4 percent of U.S. households had basic disability access features. The shortage of age-friendly and multigenerational housing will require concerted action by policymakers and homebuilders in both the public and private sectors.

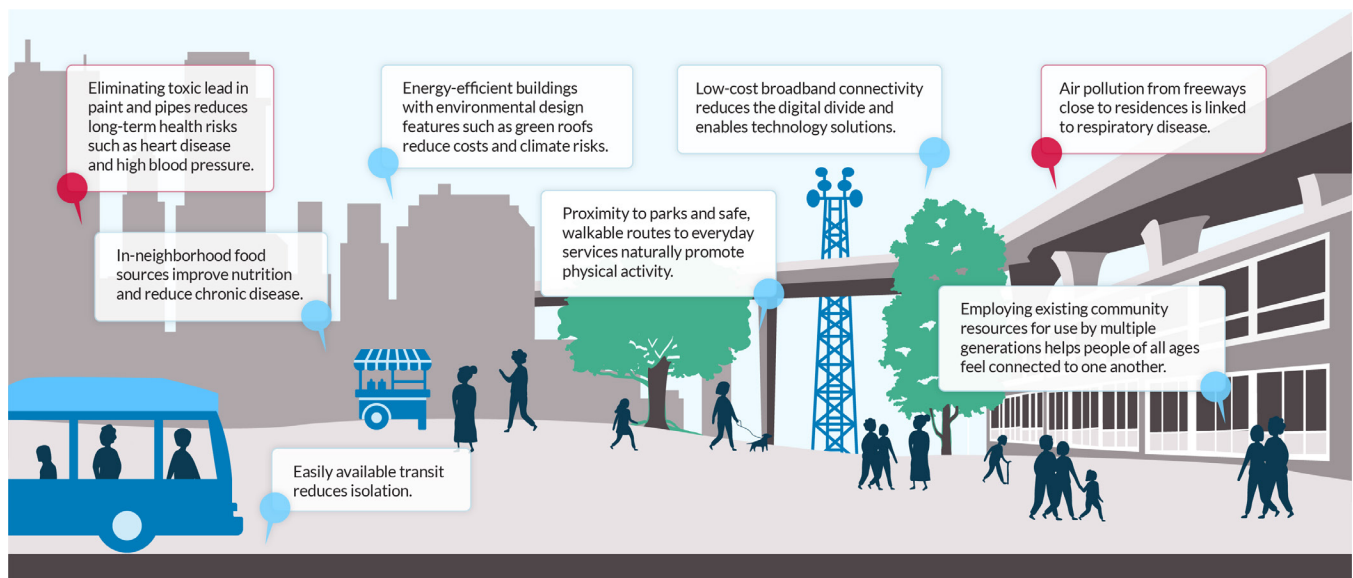
The U.S. will require a wide range of solutions on a national scale that are feasible not only in cities, but also in suburbs and rural areas. It may be most cost-effective in cities to change zoning policies to

encourage more multigenerational housing as well as places for on-site caregivers to live. But in rural areas, the greater need might be access to telemedicine via better broadband, or transportation options for adults no longer able to drive. We must develop and apply the right solutions in the right places.

The homes and neighborhoods where we live shape our lives in myriad ways, and the impacts cannot be overstated. Built environments encompass risk factors and potential benefits starting in childhood, including how likely an individual is to be physically active, whether they are isolated or socially engaged, how likely they are to develop respiratory, cardiovascular, or neurodegenerative disease. The graphic below illustrates the breadth of impact that built-environment choices can have on life at all ages.

While zoning and planning decisions are up to local governments, state and federal policies can incentivize the development of climate-resistant, livable, walkable communities that promote the well-being and safety of people of all ages.

Built-environment choices can improve long lives



8 Life Transitions Are a Feature, Not a Bug

While the conventional life course is a one-way road through pre-scripted stages, our new map features roads with forks, which take us in many directions through the roles, opportunities, and obligations that 100-year lives will bring.

There are intersections, cloverleaves, curves, on-ramps, and off-ramps to and from the decades of life dedicated to paid work, providing more opportunities for informal learning and lifelong learning, and for intergenerational partnerships that improve the flow of knowledge, support, and care in all directions. There are also ample opportunities to change course when the inevitable bumps, curves, and roadblocks knock us off our stride—or when we see new opportunities.

The New Map of Life promotes fluidity in the timing of life's milestones so that there is more time to savor the benefits of childhood, to establish stable personal and professional pillars during early adulthood, to have flexibility for parenting and caregiving as those responsibilities arise, and to reset the course as needed or desired during middle age through upskilling, reskilling, and career changes. These options for thriving throughout the early stages of life contribute cumulatively to the likelihood of feeling engaged and valued, healthy and financially secure, in later adulthood.

This whole-of-life approach is about optimizing each stage of life, so that benefits can compound for decades, while at the same time allowing for more time to recover from setbacks.



Flexibility is the mantra, and course corrections are the norm.

Rather than fixed chapters that span 70 years and focus consecutively on education, work, and retirement, we envision several shorter, flexible intervals dedicated to learning, working, caregiving, and leisure that are woven as needed into the course of 100-year lives, with working intervals likely to include more than one primary career.

Those who must veer at one point or make a U-turn at another deserve respect for their resilience in the aftermath of a mistake, miscalculation, or misfortune. Adversity may be inevitable in life, but a central design feature in The New Map of Life is that it need not become indelible. And sometimes transitions feel like adversities because they are experienced in isolation and lack the social rituals that otherwise ease major life changes. Rather than associating the second half of life principally with menopause, retirement, and death, we can create social observances around meaningful milestones such as volunteering and mentoring, returning to work, launching an encore career or a new business, downsizing a home, or getting back

into the game after illness or injury with physical limitations. Understanding that transitions are the norm and worthy of social acceptance, even

celebration, will make us stronger as individuals and as a society.

The Road Ahead

Meeting the challenges of longevity is not the sole responsibility of government, employers, healthcare providers, or insurance companies; it is an all-hands, all-sector undertaking, requiring the best ideas from the private sector, government, medicine, academia, and philanthropy.

For us, it is not enough to reimagine or rethink society to become longevity-ready; we must build it, and fast. Our collective challenge is to develop social innovations that will help people remain healthy and productive over the course of longer

lives. The policies and investments we undertake today will determine how the current young become the future old—and whether we make the most of the 30 extra years of life that have been handed to us.

Acknowledgements

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We owe special thanks to the present and past leadership of the Advisory Council. Russ Hill, Chairman of the Stanford Center on Longevity Advisory Council sparked ideas, provided foundational support, and offered critical guidance at every stage of the project. Advisory Council Vice-Chair, Linda Tarplin, contributed policy expertise and a critical eye that informed and balanced the effort. John (Jack) Rowe, inaugural chairman of the Council and luminary in the field of aging advised the project from its inception. Of course, we will never forget the support, inspiration, and good sense that former Advisory Council Chair, James Johnson, contributed to this work. We hope that this report would have pleased him.

The New Map of Life got its start in 2018 with a workshop co-led by Mark Cullen, then Director of the Stanford Center of Population Health Sciences, and Mark Duggan, Director, of the Stanford Institute for Economic Policy Research, in which a diverse group of experts came together to envision what high quality century-long lives could be and to identify ways to achieve them. At the 2018 meeting and throughout the effort, we benefitted from the expertise from several academic contributors outside of Stanford who became key partners in charting new maps of life.

The initiative was made possible by the generosity and vision of our sponsors, who saw the potential represented in the initiative, and contributed both financial support and a wealth of expertise and encouragement. Sponsors included Wallis Annenberg and the Annenberg Foundation, Bank of America/Merrill Lynch, Tushara Canekeratne, The Eisner Foundation, The Hewlett Foundation, Honda Motor Company, Inc., The Packard Foundation, and the Rainwater Charitable Foundation. We are especially grateful to Canny Kennard, Surya Kolluri, Carol Larson, Jane Nakagawa, Andrew Sieg, Jeremy Smith, and Trent Stamp for their guidance throughout the effort.

At its core, the New Map of Life report reflects the work of ten Stanford fellows who worked tirelessly for two years to analyze and envision critical domains of life that must change to support century long lives. Each fellow was guided by a Stanford faculty advisor, who provided input to fellows and contributed directly to the project. Thomas Rando, Deputy Director of the Stanford Center on Longevity shared unparalleled knowledge of geroscience. A highlight of the initiative was a weekly seminar for the fellows, in which they heard from internationally acclaimed experts spanning academic disciplines, businesses, and industries and generated lively discussions and insights as they came to know each other in a richly multidisciplinary

environment. We thank all of our speakers for these invariably instructive sessions. The resulting domain reports - focused on built environments, climate, early childhood, education, financial security, healthcare, intergenerational relationships, lifestyles, and work - provided the basis for the present integrated report skillfully interwoven by Karen Breslau. During the latter phases of the project, we received strong support from our communications partners at Palisades Media and RALLY.

This report would not exist without the tireless efforts of a talented and dedicated staff at the Stanford Center on Longevity. They operate much like a family, supporting one another when needed and going above and beyond when challenges arise, even a global pandemic. It is my great privilege to work with these remarkable colleagues.

A handwritten signature in black ink, reading "Laura L. Carstensen". The signature is written in a cursive style and is positioned to the left of a vertical line.

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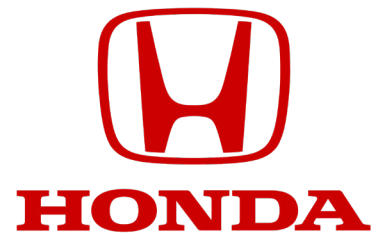
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