The First KP CHEN Memorial Lecture

The Future of Aging: A Public Health Perspective

Michelle A. Williams

Conference in Memory of the 100th Birth Anniversary of Professor KP Chen:
Population Aging and Global Public Health
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The world is on the cusp of an unprecedented demographic transition. Lifespans are longer than ever before. Fertility rates are falling. Soon, people over age 65 will outnumber children for the first time in human history.

How we navigate this terrain has vast implications, not only for aging people themselves but also for the larger world. How can we assure that lives are not just longer but also healthier? That lives remain productive and fulfilling for as long as possible?

In this talk, Harvard T.H. Chan School of Public Health Dean Michelle A. Williams will reflect on these questions through a public health lens. To this end, she will highlight the social determinants of healthy aging, including health care coverage, environmental factors, and policies that make it easier or harder to develop good health habits, with particular focus on Taiwan and the United States.

Against this backdrop, Dean Williams will discuss some of the far-reaching work now under way at the Harvard Chan School, where she has made aging and longevity a top research priority. These range from research into the health benefits of strong social connections to efforts aimed at identifying cellular mechanisms to slow the physical aging process. What do we already know—and where is more research needed?

Finally, Dean Williams will reflect on the need for a cross-disciplinary approach to healthy aging. Only through engaging both laboratory research and population scientists can we move to make healthy aging a global reality.
Michelle A. Williams, SM ’88, ScD ’91, is Dean of the Faculty, Harvard T.H. Chan School of Public Health. She is an internationally renowned epidemiologist and public health scientist, an award-winning educator, and a widely recognized academic leader. Prior to becoming Dean, she was Professor and Chair of the Department of Epidemiology at the Harvard Chan School and Program Leader of the Population Health and Health Disparities Research Programs at Harvard’s Clinical and Translational Sciences Center. Dean Williams previously had a distinguished career at the University of Washington School of Public Health. Her scientific work focuses on integrating genomic sciences and epidemiological research methods to identify risk factors, diagnostic markers, treatments, and prevention targets for disorders that contribute to maternal and infant mortality.

Dean Williams has published over 450 scientific articles and has received numerous research and teaching awards, including the American Public Health Association’s Abraham Lilienfeld Award. In 2011, President Barack Obama presented her with the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. Dean Williams was elected to the National Academy of Medicine in 2016. She holds an undergraduate degree in biology and genetics from Princeton University, a master’s in civil engineering from Tufts University, and master’s and doctoral degrees in epidemiology from the Harvard Chan School.
MC Dr. Wan-Chen Lee:

Thank you everyone. Today's conference is composed of four sessions with invited speakers and discussants from six different countries in the US and in Asia. Each session will be moderated by esteemed faculty members from the College of Public Health with professional and practical experiences in the relevant fields. I would like to introduce the moderator for the first lecture, Professor Chen Wei-Jane. Professor Chen Wei-Jane received his Doctor of Medicine degree at National Taiwan University and a graduate degree for Doctor of Science in Epidemiology from Harvard School of Public Health. He is also the former dean of the college for six years until 2017. During his stewardship, the college has become the first in Asia that has been accredited by Council on Education for Public Health. So let's give a warm welcome to Professor Chen to host the session: The Future of Aging: A Public Health Perspective.
Moderator: Professor Wei J. Chen:

Good morning! Since the VP has left, so we can relax a little bit. Because, you know, the best way to celebrate our mentor's 100th birth anniversary is to be networking and work together. I think that's very important. So you can realize that we arranged the whole conference very differently from traditional academia conference. We like to do a lot of dialogue so that all the speakers will not deliver long speeches, just short ones. Then we have some discussants and we also will be open to the audience. So everybody can raise your points after the delivery of the speech.

So now let me introduce Michelle Williams a little bit before she delivers the first KP Chen Memorial Lecture. To many people, Michelle is also a legendary figure herself. The reasons, Michelle migrated from Jamaica to the United States when she was a child. Okay, so she was not born in the US. But then she grabbed the opportunity to strive for excellence in education. And I had the honor to be involved in the doctoral program in epidemiology, you know, at the same year with Michelle. So we shared the same doctoral students’ office. But Michelle was smarter than me, and she graduated one year earlier than me.

After she graduated, she moved to the west coast. Eventually she served as the Head of the Epidemiology at the University of Washington. Then probably six years ago, she was recruited back to Harvard School of Public Health and become the Chair of the Department of Epidemiology. So when I visited Michelle in 2013, that is, we met together after more than 20 years ago. She introduced me to her Director's Office. The first thing she did was, she pulled out my doctoral dissertation. So, remember, students, don't write anything rough for your dissertation, because the institutions are going to keep the dissertation as record. She opened my dissertation, “See, for our school, those doctoral students graduated with Doctor of Science are our “Jewel of the Crown,” she told me this. So, as you can see, she emphasized the importance of a good education, a good research, as good basis for public health projects.

Today we are very honored to have Michelle to deliver the first KP Chen Memorial Lecture. As Dean Chuan-Chang already said, Michelle was appointed as Dean in last July by the first female Harvard President to serve as the first African-American dean at Harvard University. Now let’s welcome Michelle Williams!
Professor Michelle A. Williams:

Thank you. Good morning, everyone.

I'm deeply honored by Professor Wei Chen's invitation to deliver the first KP Chen Memorial Lecture. I would also like to extend my thanks to the Chen family and the foundation who made today's gathering possible. I'm delighted and grateful to Dean Chan and everyone at the memorial at the National Taiwan University for organizing today's conference and for your warm welcome here in Taipei. It's truly humbling, deeply humbling to me, to be asked to speak before so many of my eminent colleagues from across the region.

Professor Chen is one of many distinguished Harvard Chan School alumni with us here today. He and I also share other bonds as you heard. We were Harvard students at the same time, both studying epidemiology, and both went on to become deans of great schools of public health. Although I have to say, even though I graduated a year before you, Wei, you were far ahead of me on becoming the dean, congratulations! As you know, my dear friend Wei, and my competitive partner, stepped down as Dean of NTU College of Public Health just last July after serving two consecutive three-year terms—but not before accomplishing a remarkable achievement. Under his leadership, NTU became the first school of public health outside of North America to become accredited by the Council on Education for Public Health, that's CEPH. I want to offer my personal congratulations on this milestone, congratulations!

Today, we celebrate the anniversary of Professor KP Chen's 100th birthday. The Harvard School, the Harvard Chan School of Public Health, is just a few years older. Our centennial year was just four years ago. And you might say that Professor Chen and the School came of age together.

Their stories also overlap. In 1960, as you heard, Professor Chen came to Harvard as a young scholar. Ten years later, just ten years later, he returned to deliver the Cutter Lecture on Preventive Medicine. I was curious about what he'd said and so I asked a number of my colleagues and our librarians to see what they could find and if they could find a copy of his remarks. (Moving the podium. Thank you, thank you, perfect, thank you) So, as I was saying, I was curious about Professor
KP Chen’s remarks made in 1970 at our Cutter Lecture. I couldn’t, however, come up with his lecture. They could not locate the document, but they were able to identify the dinner menu in celebration. So, I thought, I would share that. So, those of you who haven’t attended Harvard Chan events know that we try to practice what our nutrition department teaches at our dinner table. We don’t go as far as some would like. I know, Walter Willett would like us to go much farther. But I think along the lines we push to remove salt, for example, in the school’s cafeteria, and the resulting protests ensued. But we still do make an effort.

Okay, so what we were serving in 1970 at KP Chen's Cutter Lecture: the dinner menu for that lecture featured Filet Mignon with Bernaise Sauce, a stuffed potato (baked potato), Bisque Tortoni with Grande Marnier Sauce, and, for libations, they served martinis, Scotch, bourbon, sherry, and wine. Reading this list, I can't help but hope that dinner came along after the lecture and not before.

But back to what brings us here today: During his remarkable career, Professor KP Chen explored issues ranging from cancer epidemiology to the genetics of twins, to health problems of the elderly. He was a renowned expert, as you heard and saw on the film, on Blackfoot Disease, a terribly debilitating and often fatal disease endemic in an area of Taiwan's southwestern coast where artesian well water had high concentrations of the heavy-metal arsenic.

But of all his accomplishments, none are more far-reaching than his contributions to public health education in Taiwan. The fact that the Harvard Chan School has more alumni in Taiwan than any other Harvard graduate school, that's more than 250 alumni, is no doubt one reflection of Professor KP Chen’s lasting legacy. Many have taken their own place in public health education, carrying on this legacy forward. Wei Chen is one of the most notable, but there are many others. And I shall say, they include:

- Dr. Huey-Jen (Jenny) Su, the first female President of National Cheng Kung University in Tainan in its 83-year history and honored last October with the Harvard Chan School’s Leadership in Public Health Practice Award.

- There's also Dr. Wei-Shone Chen, Dean of the School of Medicine at National Yang-Ming University, here in Taipei.
• There is also Chang-Chuan who succeeded Wei Chen as Dean of this school, College of Public Health at NTU, and now holds the position.

• There's also Dr. Chii-Ruey Tzeng who served as Dean of Taipei Medical (University’s Medical) College from 2004 to 2013.

Beyond the academic environment, Harvard Chan alumni have assumed more leadership roles on a greater and larger public stage.

• In September, William Lai, an MPH graduate from 2002, was named Taiwan's premier after seven years as Mayor of Tainan.

• Professor Ching-Chuan Yeh, now President of KP Chen Preventive Medicine Foundation, is a former Minister of Health for Taiwan. Dr. Yeh is a sponsor of this conference, for which I am deeply grateful.

I should also make clear that this isn't just a one-way street. Far from it, indeed. The Harvard Chan School has benefited immeasurably from its close ties to Taiwan.

One singular example that comes to mind is the K.T. Li Professorship, a generous gift to the School of Public Health from the Harvard Club of the Republic of China. This is truly a gift that keeps on giving.

The chair was first held by none other than Professor William Hsiao. As you probably Know, Professor Hsiao is one of the world's leading experts on designing health care systems and he played a key role in establishing Taiwan's National Health Insurance system in 1995.

The K.T. Li chair is now held by Professor Ashish Jha, a health care systems expert who heads Harvard's university-wide Global Health Institute. The Institute was launched in 2011, and it works to leverage the vast expertise across Harvard to promote advances in global health research and education. In this way, we can say that Taiwan is at the epicenter of the entire university’s efforts to tackle the world's most critical health challenges.
Now I want to switch gear and talk a little bit more about the theme of this conference today. The theme is Population Aging and Global Health. I was so excited when I learned of this. Since becoming dean in just over a year ago, I honed in on four key research priorities—areas of urgent need where the Harvard Chan School is positioned to have outsized impact. Aging and longevity is just one of these four priority areas.

It's fitting that we're addressing this issue as we celebrate what would have been Professor KP Chen's 100th birthday. Once almost unheard of, 100th birthdays are something we are seeing more and more. Indeed, centenarians are the fastest growing segment of the world's population, with an estimated 450,000 among us today. In Taiwan, the number is increasing faster than the global average, that is, more than 44% increase between 2010 and 2015. Today, Taiwan's population is aging at more than twice the rate of European countries and the United States. But if centenarians remain rare, they point to a new and pervasive reality.

The world is on the cusp of an unprecedented demographic transition. Lifespans are longer than ever before. Fertility rates are falling. Soon, people over the age of 65 will outnumber children for the first time in human history. Age distributions in many countries once formed a pyramid—with billions of young people at the bottom of that pyramid and far fewer older survivors at the top. That distribution is shifting, and it's shifting rapidly. The pyramid has now become a square. And this is not simply a momentary blip. It's widely predicted to become our new normal.

This demographic transition is happening more quickly in Taiwan than in most other places. You probably already know that. In recent years, Taiwan's fertility rate has been among the lowest in the world, while lifespans are at or near record highs. By 2050, its predicted that almost 40% [36.9%] of Taiwan's population will be age 65 and over. Contrast that with just 7% in 1993.

That said, while Taiwan is on the fast track, it is certainly not alone. All aging societies—and that includes the US, by the way—share certain fundamental questions. The questions are: What does it mean to age successfully? How can we assure that lives are not just longer but also healthier? Can a sense of purpose and fulfillment in life help us preserve health into old age?
These are important questions. These are questions our public health scholars have to pivot towards answering, and answering rigorously and quickly. As we grapple with these questions, there is much talk of what comes to be called “healthy aging.” The topic is debated at global conferences and explored in a seemingly endless stream of media reports. But what do we mean by that term? What does healthy aging look like?

Well, I want to start with the World Health Organization's definition of Health, and then we can go from there. The World Health Organization's definition has been the same since 1948. The definition of health is as follows: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” In that definition, there is no reference of age. No suggestion that this definition pertains only up to the age of 60 or 70 or even 80. To the contrary, that definition of health is universal—and unequivocal.

We see this, too, in the criteria for successful aging proferred by the MacArthur Foundation's Research Network on an Aging Society. Along with avoidance of disease and disability, the MacArthur Foundation's Research Network on an Aging Society include in their definition maintenance of mental acuity, physical activity, and social interaction. This is a vision of life well-lived, regardless of age.

So, how do we move toward this definition?

It's helpful here to reflect on the concept of the demographic dividend. This term demographic dividend was coined by Harvard Chan School’s David Bloom back in 2011. The Time magazine dubbed David Bloom’s term “demographic dividend” as one of the ten ideas that would change the world.

Simply put, the “demographic dividend” speaks to the economic boost that often follows when countries shift from high rates of fertility and mortality—for example, where women having lots of children, many of whom died young—towards a different demographic trend that is characterized by low birth rates and longer life expectancies. This is what we’ve been seeing in the developed world, which in the course of 30 years, has resulted in adding 30 years of human life expectancy.
At the start of the demographic transition, we see a youth bulge in the working-age population. That's because women are still having lots of children, and those are surviving longer. With the right policies in place, this can lead to a surge in economic productivity. This is the first demographic dividend—and it is what happened in most and much of East Asia, starting in the 1980s.

With economic development comes improved health care and public health campaigns. These, in turn, lead to longer lives, and this new longevity tends to give rise to a second demographic transition or demographic dividend. This comes in the form of increased savings rates, as people come to see that they need to plan for old-age.

Now we are fast moving towards yet another great transition. Much focus is on the potential downsides of aging populations: slowing economic growth, growing strain on existing pension and health care systems, a greater burden on younger generations.

All of these are indeed legitimate concerns. However, at the same time, we must not let challenges blind us to important opportunities. My colleague Linda Fried, who is Dean of Columbia’s Mailman School of Public Health in New York, has gone so far as to suggest that we might be able to find a third demographic dividend in the world's aging population. In her view, older people represent a vast resource—what she calls “a trust fund that all generations can draw upon to their mutual benefit.” In support of this view, Dr. Fried cites evidence that older adults in the U.S. contribute the equivalent of $162 billion dollars a year through volunteering and informal care-giving.

Whether you find Dr. Fried's arguments convincing or not, one thing is crystal clear: Healthy aging starts with healthy living and good lifelong health care to support that health. Both are critical to keeping older people healthy and active for as long as possible. The goal is what we in public health call “compression of morbidity,” that is, where fewer unhealthy years are lived near the end of life.

Taiwan, always progressive in this space of public health, took huge strides in this direction with creation of the National Health Insurance.
As I mentioned earlier, our own Harvard Chan School’s Bill Hsiao played a key role here, leading a task force that designed the System. What an achievement. One important achievement.

Today, virtually all citizens have comprehensive health care. I just learned that the percentage is 99.8% coverage. That’s universal. We won’t quibble about the point two percent. There’s always a little bit of error there. That’s really remarkable, amazing accomplishment, compared to just some 57% before the implementation of the system. I can only hope that the United States will someday follow in your footsteps. We owe that to the people of the United States as well.

Of course, critically important though it is, health care coverage is just one part of the equation. Another crucial factor is lifestyle—our habits and the environment in which we live, work and play.

The foods we eat, the air we breathe, the water we drink, whether we smoke, whether we exercise. Such factors can reduce or increase our risks for a myriad of chronic diseases including cancer, heart disease, diabetes, and—increasingly—Alzheimer’s. Such chronic conditions have supplanted infectious diseases as the biggest global killers. This represents a shift often refer to as the epidemiological transition. It is not that epidemics have gone away—indeed, due to rapid air travel, diseases such as SARS and bird flu have the potential to go global more quickly than ever before. But infectious diseases in general no longer pose the same threats that they once did a century ago.

The importance of habits and the environment point to the profoundly interdisciplinary nature of public health today. As I said earlier, aging and longevity is just one of four areas we’ve identified as research priorities at the Harvard Chan School of Public Health. The others are: climate change and sustainability, healthy weight and wellness, and trauma and resilience—and each of these has a direct bearing on aging and longevity. To cite just a few examples, let me share the following:

- Extreme weather events—such as this year’s devastating floods in South Asia and the Hurricanes that ravaged Puerto Rico—take a particular toll on vulnerable populations, particularly the elderly.
• Healthy weight is tied to good nutrition, one of the critical building blocks for a healthy aging.

• Resilience is fostered through strong social bonds, also key to healthy aging.

Against this backdrop, I want to turn now to work under way at the Harvard Chan School, just to share with you some of the work our scholars are engaged in.

One of the many things that distinguishes our School is excellence in both laboratory research and in the population sciences. As we like to say, our work extends from the genes to the globe—and this is fully evident in our work on aging and longevity.

Physical decline is often seen as an inevitable part of aging. Like a car gradually rusting as it grows older, bodily deterioration is seen as the unavoidable result of numerous tiny hits to the system: genetic, cellular, metabolic, environmental, stress-induced hits to the system. But recent research by our own Professor James Mitchell, Will Mair, and others at the Harvard Chan School suggests that this traditional view of aging may not be correct.

The new thinking is that the disorders we associate with aging may be linked to the biological mechanisms of aging itself. This new way of thinking opens up new avenues for exploration. Key questions in this new paradigm of thinking about the biology of aging include: Why are we more likely to get diseases when we're old than when we're young? How can we shift the risk of frailty? And what can we learn from centenarians, who tend to die from different causes than those who die younger? People who make it past the age of 100 usually decline swiftly at the end—to a broken hip or a bout of pneumonia—but not from cardiovascular diseases or malignancies or neurodegeneration. These are important questions and observations that we have to explore going forward.

Along with such work, we are moving to combat Alzheimer's disease, an increasingly common cause of death worldwide. Globally, Alzheimer's is estimated that 46.8 million people have dementia. That's approaching twice the population of Taiwan.
One of the leaders in this area is Albert Hofman, my successor as Chair of the Department of Epidemiology. Professor Hofman's work aims to better understand the biologic processes through which Alzheimer's progresses—and through which it can perhaps be altered. On a positive note, emerging research suggests that the rates of new Alzheimer's cases are on the decline, at least in the U.S. and in Europe. Professor Hofman suspects that this may be tied to the fact that we are also seeing better heart health, a condition linked to healthy habits such as exercise, good diet, and reduced or no smoking. Yet another reminder that healthy aging is part of a larger fabric of public health.

The link between aging and diet merits special note. Professor Frank Hu, who chairs our Department of Nutrition, believes that healthy plant-based foods can improve vascular health in both the heart and the brain in ways that, among other things, reduce the risk of Alzheimer's disease. In a 2014 study, Professor Hu found a correlation between what is known as the Mediterranean diet, that is a diet that emphasizes vegetables, fruits, and fish. And what he did was he found a correlation between that Mediterranean diet and telomere length, a key biological marker of aging. Exciting evidence that diet may have the potential to turn back the body's aging clock. Very exciting. Ideally, healthy foods, healthy habits are established early. But even old people can reduce their risk of chronic disease and death by changing what they eat.

Of course, life cannot be extended forever. But even if its end is inevitable, we do have wide latitude to shape the experience of death and dying. Traditionally, medical practice has acted on the view that prolonging life is the single most important goal. But should we be giving patients greater scope to make their own decisions in this space? When we do, we have found that their choices often make their last days fewer, but they also make them better. These issues around end-of-life are at the heart of a best-selling book by Harvard Chan's Atul Gawande. The book is entitled Being Mortal: Medicine and What Matters in the End, and it makes a powerful case for patient autonomy. Atul Gawande pioneered the life-saving Safe Surgery Checklist, you may have heard of this. This has been currently used now by a majority of surgeons providing care around the world. But as he tackles the issues of aging and longevity, Atul has been making similar efforts to think and help us reshape how doctors, patients, and families think about the end-of-life and care in this period.
That said, old age is not simply a prelude to death. Quite to the contrary. Many and more, old age is being recognized as a distinct developmental stage—one that has both unique challenges and unique gifts.

Once viewed as primarily an individual matter—the realm of physicians, not social policy—old age is now squarely in the realm of public health discourse. These are uncharted demographic waters, for sure. What health care policies will best serve us in the long run, given the new—and permanent—reality of an aging world? It's an important question. What should retirement look like? How do we meet the needs of an aging population without overwhelming available resources? Harvard Chan's Professor Lisa Berkman and Professor David Bloom are among those tackling these population-level and policy questions.

We know that a key to healthy aging is strong relationships. This is an area of research explored by Harvard's Ichiro Kawachi, and he goes as far as saying that these are important. The social connections are important for healthy aging as his diet and exercise. Professor Kawachi has research evidence to support this claim. In one study conducted in Japan, he looked at the effect of membership of so-called “sports clubs” on people 65 years and older. These sport clubs are organizations that blend socializing with physical activities such as walking, lawn tennis, and croquet. What Professor Kawachi found was truly fascinating: he found that those who belonged to sports clubs and didn't exercise fared better health-wise than those who exercised alone. Interesting. His conclusions: A sense of belonging was a better health protector than physical exercise alone. That said, do keep in mind that the healthiest of people were all of those who both exercised and socialized. So keep that in mind.

All of this work is yet another reminder that aging is not simply something that happens to us—it's a social experience that we can shape and are shaping. It is up to us to shape aging for the better. In old age, as throughout life, we must focus on enhancing the good, not simply preventing the bad. Focus on enhancing the good, not simply on preventing the bad. Which is why I am so deeply thrilled about our new Lee Kum Sheung Center for Health and Happiness. This Center is headed by Harvard Chan faculty Vish Viswanath and Laura Kubzansky, and the Center supports research to identify the psychological, social, and emotional strengths and assets, an emphasis on the positive assets that may protect people against disease and enable them to live longer, healthier, happy lives.
Which is, after all, the whole point. In aging—as throughout public health—it is why we do what we do every day as public health scholars, practitioners, and students.

Before I close, I just want to say I am so deeply honored to be here with you today to give this lecture. As I sat through the opening morning greetings, and as I watched the film of Professor KP Chen's trajectory of his work over his life, I could not help but remember my favorite author Maya Angelou's very simple words, and these words are:

“When you learn, teach. When you get, give.”

As I reflect on Professor KP Chen's life, he is the embodiment of the beneficiary of a great education that he then gave to his students, and his students’ students, and far more. And he has given global health equity to all in his life work.

And for that, I thank you for your listening. I thank you for sharing and allowing me to share in the celebration of KP Chen's lasting legacy.

Thank you.
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