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Centering for Aging Populations in the Public Health
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> SANDRO GALEA: Good afternoon, good evening, good morning. My name is Sandro Galea, and I have the privilege of serving as Dean of the Boston University School of Public Health.

On behalf of our school, welcome to today's Public Health Conversation.

These conversations are meant as spaces for the free speech, open debate, and generative exchange of ideas that shape a healthier world.

Guided by expert speakers, we aim to sharpen our thinking about what matters most for heath.

Thank you for joining us for today's conversation. In particular, thank you to the Dean's Office and the Marketing and Communications team, without whose efforts these conversations would not take place.

The world is aging and aging rapidly. The percentage of the global population aged 65 and over is projected to rise from 10% in 2022 to 16% in 2050. In the U.S., the number of Americans 65 and older is projected to rise from 58 million in 2022 to 82 million by 2050.

Today there are more people in the world over age 65 than there are under the age of 5. Supporting the health of aging populations will be core to the work of creating a healthier world in the coming decades.

Today we are going to engage with this really sentinel demographic shift and discuss how the better engagement with the health of aging populations can create a healthier world.

I'm delighted to welcome our moderator. She was a staff writer at the Washington Post for 19 years, spent the past

decade reporting for The Post on aging, generations and demography.

She is a recipient of the National Press Foundation's AARP Award for Excellence in Journalism on Aging, for stories that explored why octogenarians still work, why Americans over 50 do extreme sports, and why older trans adults come out.

Tara, thank you for joining us. Welcome and thank you to all our speakers. Over to you.

>> TARA BAHRAMPOUR: Thank you, Dean Galea, for that introduction.

It's my pleasure to be moderating today's discussion. These topics are close to my heart and stand to affect every generational cohort in America and the world. So the fact that we have four experts here to unpack it all for us is very exciting.

I would like to now introduce our speakers for this program. First we will hear from Jinkook Lee. Dr. Lee is a research professor of economics and directs the Program on Global Aging, Health, and Policy at the Dornsife Center for Economic and Social Research at the University of Southern California.

Her research expertise includes economics of aging, interdisciplinary approaches to late-life cognition and dementia, longitudinal cohort surveys, and data harmonization across low, middle, and high-income countries.

Next, we will turn to Jackie Torres, a social epidemiologist and Associate Professor in the Department of Epidemiology and Biostatistics at the University of California, San Francisco. Dr. Torres' current research focuses on the role of policies, families, and community social networks in shaping population health and health inequities, particularly in mid and late life.

Then we will hear from Rob Warren, Director of the Institute for Social Research and Data Innovation, Co-Director of the Training Program in Population Health Science, and Professor of Sociology at the University of Minnesota.

Dr. Warren is a sociologist, demographer, population health scholar, and education policy researcher with experience and expertise in the collection, production, and dissemination of large-scale data products for research on health, aging, education, and labor force outcomes.

Finally, we will hear from Rebeca Wong. Dr. Wong is the Sheridan Lorenz Distinguished Professor in Aging and Health at the University of Texas Medical Branch. She joined UTMB in 2008 to serve as the World Health Organization/Pan American Health Organization Collaborating Center on Aging and Health.

She is also Associate Dean for Research at the School of Public and Population Health, Co-Director of the Claude Pepper Older American Independence Center, and Director Ad Interim of the Sealy Center on Aging.

Dr. Wong's research agenda focuses on the economic and health consequences of population aging, in particular in Mexico and among immigrant Hispanics in the U.S.

Dr. Lee, we will start with you.

>> JINKOOK LEE: Thank you. Good afternoon. It is my great pleasure to participate in this dialogue thinking together to put aging populations at the center stage of the global public health agenda.

I am a Professor of Economics at the University of Southern California, and I study global population aging and implications for the society and individuals.

The population age structure has changed radically.

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Over the years. As you cans see, as shown in the figures, the global life expectancy soared from only 67 in 2002 to 72 years in 2022. And it is expected to continue on that long-term trajectory.

Meanwhile, between 1970 and 2020 -- for every single country in the world. These shifts a closer health -- of health, and socioeconomic challenges in the coming decade. Addressing all these challenges will require meaningful changes in lifestyle behaviors, public and private investments, institutional and policy difference, as well as technological innovations and adoption.

The potential consequences of inaction are traumatic as well. A dwindling workforce, training to support rejoining number of retirees an explosion of age-related morbidity and associated healthcare costs and a decline in quality of life among older people with human, financial and institutional resources.

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Recognizing this critical importance of population aging, the United Nations General Assembly declared 2021 to 2030 as the decade of healthy aging.

The health is central to all our experiences of older age and the opportunities that aging brings. The aging of the population impacts our health systems, but also many other aspects of society, including labor and financial markets and demands for goods and services, such as education, housing, and long-term care.

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The United Nations identified four action areas for the decade of healthy aging, which are first combating the ageism.

This calls for changing how we think and act towards age and aging.

Second, age-friendly environment, to facilitate the ability of older people to participate in and contribute to their communities and the society.

And third, the delivering integrated care and that is responsive to the needs of the individuals, and this person-centered care approach has been highlighted in recent dialogue.

And finally, the providing access to long-term care for older people who need it. And this attention to long-term care has been even more rising in recent few years.

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In such United Nations resolution mandated WHO to track progress toward these decade-long goals. This mandate recognizes that what is measured drives the action. So, action needs to be informed by the evidence and aligned with older persons' expectations and the priorities that are negotiated with various stakeholders and resourced by decisionmakers.

And the setting baseline status report and then following up how we are achieving these goals through evidence-based information driven by various data sources.

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And when we started working on tracking the goals, people have recognized the lack of data and this lack of data on healthy aging or lack of data on older population increases the individuality of older people.

Spearheaded by the United States National Institute on aging, there are increasing number of longitudinal population aging data available around the world. Currently there are 47 countries around the world collecting longitudinal data on aging population. This rich data on health and health behavior together with social economic information offers the opportunity to study healthy aging and the factors that promote and hinder healthy aging around the world.

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While this data provide important evidences, evidence basis for understanding health of the aging population and social determinants, there are still over 100 countries lacking such data. Filling this void, there are currently several new data collection initiatives.

For example, National Institute of Healthy Initiatives on Brain Aging in Africa, WHO's initiative partnership with (?) and collecting additional data on healthy aging. And recent (?) by the age and developmental banks to track aging population in low-income -- low and middle-income Asian countries.

Next slide, please.

This healthy aging is the process of developing and maintaining functional ability that enables well-being in older age. The focus on the healthy aging indeed a paradigm shift from disease-free status to optimizing functional ability. There has been rising attention to functional ability and how we can optimize those functional abilities by providing proper environment, as well as facilitating and building up the intrinsic capacities.

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The paradigm shift has been also observed moving from single disease to recognizing (?) changes in ability, as well as moving from single occupation exposure to interrelating, working like exposome, thinking not only the interpersonal relationships and social isolations, but also getting into structure of social environment, captured in ageism, sexism and other aspects of macro social environment are seriously considered.

The importance of physical environment for aging population has been also well recognized and there is an emerging literature on natural and brick environment, as well as paying attention to the air and quality and contamination associated with the air and water.

The policy influences, the determinants of health, either by directly influencing individual determinants, including policies that have access to healthy diets, tobacco consumption, exercise, injury prevention or social participation:

Policies also influence communities and national determinants, such as policies on education, transportation, employment, and retirement, urban design, pollution and healthcare.

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Healthy aging will not be possible without a healthy planet. Activities and influence have warm the atmosphere, the ocean and the land, increase the frequency, duration and magnitude of many weather and climate extremes, such as title waves, droughts and tropical cyclones.

There are increasing and consultive course for emergency actions to remit global temperature rises. Like the destruction of nature and restore biodiversity, air pollution and weather events and food insecurity are already harming us.

Without the reduced emission, climate change will become the leading global risk factors for extreme mortality and threat to human physical and mental health and well-being, including for older people.

Healthy aging and healthy longevity for most people will not be possible without the healthy planet.

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People have been neglected in studies of climate change, and climate change and rapid population aging are occurring together and their combined effects on the health and well-being of older people have to be better understood and addressed urgently. It is important to also note that older people can be agents of change in actions for the climate.

Older people are also disproportionately affected by climate change because of their high susceptibility, pre-existing health conditions, disability and social vulnerability, particularly when they live alone or in poor urban areas and are less capable of responding.

Older people must be protected from climate-related threats and calling for multisectoral policies and programs in cities and communities. This is an opportune time to increase the visibility of older people and to advocate for healthy planning. Next slide, please.

The next 10 years will be critical for the agenda of a post climate change and healthy aging. Thank you. Thank you for the opportunity.

>> TARA BAHRAMPOUR: Thank you so much, Dr. Lee. That was really interesting.

We move now to Dr. Torres.

>> JACQUELINE TORRES: Thank you so much for having me. I'm really delighted to be part of this panel with such esteemed close colleagues.

So, I'm going to switch gears. Although many of the themes that I talk about are very relevant to what Dr. Lee just presented. And talk about gaps in equitable social and long-term care policies to support older adults and their family members.

Due to the constraints of time, I will mostly be talking about the U.S. context. Although many of these themes are relevant when we think about global aging as well.

So, just to set the stage, the vast majority over 90% of older adults in the U.S. prefer to age in place in their homes and communities. But many require supports with health conditions, activities of daily living, and economic needs.

So, just for context, the vast majority of adults 65 and older are living with one or more -- one -- at least one chronic health condition, so diabetes, heart disease, et cetera. And over 60% experience what's known as multimorbidity. So, having two or more chronic health conditions, which increases the risk of adverse outcomes and economic costs as well.

Among these chronic health conditions, an estimated 10% of older adults live with dementia in the U.S., and another 22% live with mild cognitive impairment.

As a result of these health conditions and other factors, a large number of older adults require assistance with personal care needs or mobility limitations. So, these can include personal care needs such as bathing or eating, as well as routine activities such as shopping or managing medications.

There are substantial variation in the prevalence of needing help with self-care needs or mobility limitations, including by health status, but also the prevalence of needing support of activities with daily live is higher for women, for old adults of color, for lower income, older adults and can be, yes, exacerbated in the context of chronic health conditions.

For example, one national study estimated that 78% of individuals who had dementia needed or received assistance with self-care or mobility limitations.

And then finally, millions of older adults struggle to make ends meet economically. So, about 10% of older adults are estimated to live below the federal poverty line. But many more experience economic insecurity, which I will talk about a little bit more.

Unfortunately, the landscape of social and long-term care policies to support older adults and their family members in addressing these health and economic needs leave much to be desired.

There's a great deal of confusion about how long-term care is paid for in the U.S. But it is largely covered under Medicaid, which is available only to low-income adults. So, those who meet income and assets eligibility criteria.

Otherwise, costs must be covered out of pocket and/or by long-term care insurance, which is held by the minority of older adults in the U.S.

Medicaid has been rebalancing to support home and community-based services in line with the preference of older adults to age in place in their homes and communities. So focusing less on covering nursing home care and more on the kinds of supports that people need to remain in home, such as in-home support with meals, transportation, and the self-care needs that I mentioned at the beginning.

But the generosity and kind of family supportive nature of these home and community-based services vary widely by states because they are governed under state Medicaid policies.

So, for example, many states have long waiting lists to be able to even get access to these critical home and community-based services, to get access to in-home support with personal and routine care.

And there's lots of variation, and the extent to which a family member, so including spouses, may be able to be eligible

as paid caregivers under these home and community-based services policies.

In the U.S., we have no federal paid family leave policy unlike many of our peer high-income countries, which would provide opportunities for family members, so adult children or spouses, to take paid leave and have enhanced job security when they need to support older family members who are experiencing acute or chronic health conditions that require intensive care.

Social Security retirement benefits fall very short of covering true expenses of daily life, driving kind of the high prevalence of economic insecurity we saw in the first slide.

So, this point has been made very clearly by researchers at the University of Massachusetts, Boston, who published the elder index and calculate that on average Social Security retirement benefits fall about $1000 short of covering true expenses for older adults per month. Although, there's substantial variation geographically by health status and housing status, as you can imagine, the cost of living, the cost of housing varies greatly. So this gap can be much larger in many contexts.

And then eligibility for safety net programs, so food and housing assistance for older adults, is based on the federal poverty level, which in 2023 is $14,580 for a single person annually.

So, the same folks who run the elder index project at University of Massachusetts calculate that this is less than half of what a single older adult who is renting their home would need to meet their basic needs based on national averages alone, let alone imagine covering the cost of long-term care.

So, these are just some of the examples --

>> ERICA AUGUSTINE: Dr. Torres, so you know, there's a little bit of static coming through. If you don't mind moving your papers away from the microphone, it will be helpful.

>> JACQUELINE TORRES: Thanks for that. Sorry about that.

So, these are just some examples of the gaps in social and long-term care that are present for older adults and their family members.

And the implicit or explicit assumption of many of these long-term care and social policies in the U.S. as well as globally is that family members are going to fill these gaps. So, at least in some part if not entirely, family members are going to cover the personal care needs, the economic needs and so forth that are left to be filled based on what's not covered by these social and long-term care policies.

But this assumption may be unrealistic given demographic changes, economic realities and so forth.

So, in the U.S., 27% of adults 65 and older live alone. There's a slightly higher prevalence of living alone among women and with increased age.

And both in the U.S. and globally, the size of family networks are shrinking. And projected to shrink even further over the course of the 21st Century. So, this is recent work by demographers in the proceedings of national sciences projecting for each country in the world what the kind of size of family networks are expected to be and they are expected to be shrinking rapidly across the board.

But there's also expected to be changes and there are changes happening in the structure of family networks, which may also affect the ability of family members to provide care, which we might be able to talk about in the Q&A. Even when family members are present, they may face barriers to addressing care needs due to distance, economic challenges, constraints of policies related to paid leave and caregiving and their own health conditions.

So, this is work by -- from a recent study that I led with my colleagues using nationally representative data from the U.S., and we estimated that in any given year, 2.3 million adults 50 years and older were co-residing with a spouse or partner who was living with cognitive impairment or dementia.

So, dementia including its most common subtype, Alzheimer's disease, requires very intensive and intensive -- extensive and intensive care, particularly in its latter stages.

While the majority of co-residing spouses do manage to provide care to their partners with dementia, a nontrivial percentage face their own health challenges which may make providing such intensive care difficult.

For example, we estimated that about a third of women who are 80 years and older who are living with a spouse or partner with cognitive impairment or dementia themselves had difficulties with personal care needs, such as getting out of bed, bathing, eating, et cetera, which, again, may make it difficult to provide all of the intensive care left by the gaps in our existing policies.

So, the result of these gaps is that -- and they are high variation across states, is that the prevalence of unmet needs and adverse consequences related to these unmet care needs is high.

So, these are the results of a national study of Medicare beneficiaries that found that, for example, among those who needed support with managing medications, 20% reported making medication errors as the result of not receiving sufficient care with this routine activity of daily living.

Large percentages also went without groceries or personal items or without hot food. And a large percentage reported having to stay inside as the result of not getting assistance with their mobility limitations, a much smaller percentage reported having to stay in bed, while a small percentage, this is a very severe kind of adverse consequence related to unmet care needs.

And my final point is that the outcomes and experiences of older adults as they intersect with this social, economic and policy landscape are inequitable. Let's take one example. So, here's the estimated prevalence of economic insecurity among single adults in the U.S. A portion of these are experiencing economic -- who are experiencing economic insecurity are living below the federal poverty line, but there are still many more who are having trouble making ends meet because of that mismatch between the actual cost of living and what's provided under Social Security retirement benefits and other benefits.

The prevalence of economic insecurity is much higher among older adults of color as compared to their white counterparts. So, reaching above 70% for black older adults who are single and nearly as high for Latin A older adults who are single. These inequitable outcomes in late-life emerge across a backdrop of life course -- accumulated structural social economic and related inequities that have occurred across the life course that have made it such that older adults of color and women are more likely to experience poor health, to be Medicaid beneficiaries, to be relying solely on Social Security, retirement benefits and so forth so therefore more acutely impacted by the gaps and policies that I described.

So, social and long-term care policies in the U.S. and globally need to be grounded in the preference of older adults to age in place, but also the actual cost of living for older adults beyond the federal poverty limit.

To expansively consider the family unit, thinking about paid family leave and other economic policies that we might think about as pertaining to younger or middle aged adults but maybe critically important for supporting the care needs of older adults, but also acknowledge the demographic realities of changing kin network size and availability.

And finally, prioritizing equity and policy setting and outcomes.

And I very much look forward to the Q&A. Thank you.

>> TARA BAHRAMPOUR: Thank you so much, Dr. Torres. That was really interesting.

We are turning now to Dr. Warren. Thank you.

>> ROB WARREN: Bear with me as I struggle with my technology. I seem -- hold on.

There we go. You are seeing words? I'm going to assume so unless I hear otherwise.

>> TARA BAHRAMPOUR: I saw some words up -- I saw a white screen up and now it's gone. So, if you would like more time, we can -- there's a white screen up now.

>> ROB WARREN: I see.

>> TARA BAHRAMPOUR: And I see words now.

>> ROB WARREN: Okay. Sorry about that.

Thank you for this opportunity to talk today. I have learned a lot already from the first two presentations and I look forward to a discussion at the end.

By way of introduction, I'm Rob Warren. I use he and him pronouns and I am a sociologist by training, a demographer by job. I run a population center. They tell me that I am an education researcher as well. Again, I am struggling to advance screens.

Well, it appears to be working.

I am a population health scientist, as Dean Galea mentioned earlier. I run a population health training program. I consider myself a wannabe epidemiologist publishing in the top journals but having no training in epidemiology. What that leads me, again, baffled by what's going on with my screen.

Perhaps I can ask Tara to advance the screen or whoever has the power to --

>> ERICA AUGUSTINE: Dr. Warren, if you can queue when to advance the screen, we will be able to advance it for you.

>> ROB WARREN: Yeah, sure. Okay.

(Silence)

>> TARA BAHRAMPOUR: I think we may have lost -- I don't see him on screen. So, Erica, should we flip the order or should we wait a bit?

>> ERICA AUGUSTINE: We can move to Dr. Wong and then we can go back to Dr. Warren.

>> TARA BAHRAMPOUR: Okay. So, Dr. Wong, you are up.

>> REBECA WONG: Thank you. And thank you for the invitation, Erica is going to show my slides. There they are.

My highlights today are on aging in low and middle-income countries with a focus on Mexico.

Next.

The key points that I would like to make will be made with illustrations from Mexico. The first one is the speed of aging that we referred about how this happened fast. And so Illinois straight that it's much faster in low middle-income countries than what the previous high-income countries experienced. And, of course, we understand the implications of that.

The second point is that these fast gains were also present in sociodemographic conditions of older adults but they are not accompanied by gains in health among survivors.

And the third point is that the well-being of older adults in Mexico continues to persistently be linked to the United States.

Next, please.

The first point is about the speed, as I said. There's -- this is called an accelerated aging in low and middle-income countries. And this is evident as it's a very classic statistic first by the proportion of the population 65 years and older in Mexico was 6% in 2010, projected to be 15% in 2036. So, in this very short period of 26 years, they go from 6 to 15% of their population will be 65 and older.

This is compared to other countries that did it before, but the United States did, in 69 years, achieved this 15% in 2013. And France took 115 years and achieved this 15% in 1980.

So, the low and middle-income countries are achieving these levels of aging with low socioeconomic levels, and their poorly prepared to meet the challenges to provide healthcare as we have been hearing. And in particular, for example, in many countries right now, in Latin America, there's no universal health insurance or Social Security system and less than 50% of those populations 65 and over in Mexico are covered by (?)

The speed was, of course, due to the gains and how fast we heard how fast mortality and fertility dropped in these countries and the timing, the ones that are aging right now, are the ones that dropped their mortality and their fertility around that same second half of the 20th Century.

Next, please.

The second point that I said I was going to make is that there were gains in sociodemographic conditions that also were very rapid. So, for example, if we compare the cohorts that are age 50 to 59, right before they enter age 60 in Mexico, just within 17 years, so, for example, the percentage of -- that had less than five years of education went from 61% in the year 2001 to 25% in 2018. In those 17 years, that generation that -- before entered old age, the level of education rose significantly. And the mean number of children, as we said, the fertility dropped, then if it was manifested, then if you are age 50 to 59 in 2001, you had five children, whereas in 2018, in those age 50 to 59 had only three children. It is a significant gains than in education and the number of children they had.

But these gains were not parallel by gains in health behaviors. Again, among those entering -- before they interred old age at age 50 to 59, the percent of men who are very small

was 63% in 2001, and stayed about the same, just 59% in 2018. So the gain was not present.

And similarly for women, the percent, very small, was about 22% in 2001 and in 2018.

So, the more recent cohorts those who enter age 50 to 59 in 2018 show expanding disability rates. These are very concerning patterns, but among these younger, more recent cohorts we see worse health. Obviously, some is because of survival, but not all of them can be explained by low mortality rates.

Next.

And this graph only shows, the exhibit shows the rising trend of obesity that accompanied death, is what we are saying, not the parallel gains so this is the population age 53 and older across the 20 years, female in pink, males in blue. And we see a very clear tendency for a rise in obesity. And this rise in obesity was parallel with a rise in diabetes and cardiovascular diseases and other chronic conditions. So, this trend is very similar in many Latin American countries today.

Next one, please.

And the third point that I wanted to pointed out is that the aging in Mexico continues to be closely linked to the U.S. Of course, Mexico is closely linked to the U.S., period, but aging is particularly linked as well. Despite the rise and drop, the ebb and flow of migration from Mexico to U.S. over the last two decades, the proportion of males that are age 60 and older in Mexico who are former migrants to the U.S. was about 16% in 2001 and continues to be about 15% in 2018. There's no change in that pattern.

And also that means that those who are former workers in the U.S. and are out living in Mexico, they have less protection from institutional support for old age in Mexico, for example, by pensions. They conducted most of their working lives in informal labor markets.

Even when they came back from Mexico, from the U.S. to go back to Mexico, they continued to work in the informal labor market.

Also, if we look at how many of those people who are older, age 60 and older, men or women, who have at least one child living in the U.S., we see about 29% of those who are 60 and over have at least one, in 2001 and continues to be about 24% in 2018, like I said, despite all the changes, drops and rises in migration.

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And to finalize, I just wanted to point out that I think the lessons that we can learn now from these countries that are aging from the low, middle-income countries that are aging now can be useful for other LMICs aging in the future. These

lessons are critical for public health as we have understanding in listening and because other low, middle-income countries are following or may follow the same, very similar paths.

So, for example, we are learning or we need to learn more about how they recover from shocks, how they respond to policy changes, what are the long-term effects of the life course they experience, the childhood conditions turn out to be very important. So, these childhood conditions of disadvantaged, how do they manifest in old age. How can we break that chain between childhood conditions and old age, health and well-being? What are the physical consequences of occupational and environmental exposures, again, in many LMIC, low, middle-income countries, these occupational and environmental hazards are pretty high. So, we need to understand how we can, again, break that chain.

What are the benefits of the way they use their time, of the social interactions that we know it's pretty lively and active in many low-middle-income countries, the living arrangements that are very different in low and middle-income countries than in rich countries or high-income countries, and that the patterns of family caregiving are much, much different and more intense in low-middle-income countries, so what are the consequences of that, both as benefits and consequences for the caregivers?

And, finally, we have, as dean Cooke remarked on how many countries we have in these kinds of studies now, we are learning a lot from cross national differences and similarities than we see in associations. So, that for us, for example, in the study with Mexico, about 20% of the research has been produced with the Mexican data involves cross-national comparisons right now.

So, lastly, the importance of data collection on aging and LMICs I think is recognized, but we are then producing a lot of evidence on associations, but looking back, I think that more work is needed to understand the mechanisms of these relationships.

Thank you very much. And I look forward to questions.

>> TARA BAHRAMPOUR: Thank you, Dr. Wong. That's really a lot of food for thought.

And now Dr. Warren, we turn to you.

>> ROB WARREN: Thank you. Sorry for the difficulties earlier.

I was saying earlier, that I am a sociologist and demographer, education researcher, population health scholar, but in recent years I have become a wannabe epidemiologist and amateur cognitive aging scholar. So the comments that I offer today are, sort of, as a tourist to these fields. I have

learned a great many things from my colleagues and from various projects. But I am fundamentally a social scientist.

But I was asked, nonetheless, to reflect on these two questions that I think guide the webinar. I am primarily going to focus on the second, how we can better promote the health of aging populations nationally and globally from a research perspective. As someone who has spent a lot of time hanging out with folks in public health on a variety of projects.

And I, basically, want to say six things. First, and all of these points will have come up in the previous presentations, but I'm going to elaborate on several of them.

First, later life conditions have early life origins. If we are interested in promoting the health of older populations, we need to think about early life. This is very much like the street light effect. The old adage that -- or it's an old joke, I guess, that somebody was found looking under a street light and asked if they lost their keys there. The cartoon says wallet. The person says, no. I left them somewhere else, but there's more light under the street light.

I very often think that aging researchers are somewhat guilty of something similar, considering later life health by looking only at later life.

In fact, there's a great deal of evidence that any number of early life conditions, exposures, circumstances shape later life health.

For example, this is from a paper that I published with two students looking at the long-term cognitive consequences of exposure to lead in childhood. The red line are children who were exposed to lead. The horizontal axis is age, and the vertical axis is a standardized global score.

At age 60, people who were exposed to lead in childhood had about a quarter standard deviation lower global cognitive scores.

The point is if we focus only on late-life solutions and late-life additions to late-life health problems, we miss a big part of the story.

Lead, of course, is not the only early life thing that matters. A quick list might include education, not just how much, but also the quality of education that people receive, exposure to adverse childhood exposures, where people live, geography matters, environmental exposures like lead, exposures to infectious diseases and more.

All of these things shape later live health. We want to promote the health and well-being of older people we need to think about changing circumstances for children so that future older people will be better off.

A second point that I want to make is that no later-life health problems are solely biological. And, of course, this is related to the first point.

Any health, whether it's cognitive health problem or a cardiovascular health problem or a functional limitation, is purely biological and I will give you a couple of examples.

I have been doing work in recent years on dementia. There is a collective wisdom that an important predictor of who experiences Alzheimer's disease is the biology of plaques and tangles around the neurons or in the neurons of the brain.

While this may be true, the fact of the matter is, that the vast majority or at least a large majority of people who have these physical symptoms or these physical attributes nonetheless don't experience Alzheimer's disease. They live their lives often very late -- late into life, experiencing cognitive normality.

What shapes who actually experiences dementia and who doesn't, given the same or similar physical conditions, biological conditions? That's a social question. That's a question of resilience and who can -- who has enough cognitive reserve to avoid those symptoms.

So, even Alzheimer's disease, which we increasingly know a lot about the biology of, is also a social condition.

Another example, there's growing work now on the microbiome, both the gut and the oral microbiome, and its relationship to a number of diseases, and it would be easy to consider this purely a biological process, but the number one predictor of the composition and the diversity of gut microbiome are things like diet and where you live.

The number one -- or one of the number one predicters of the composition and diversity of the oral microbiome is access to dental care. These are things that are fundamentally social. These are not purely biological processes. So when we think about improving or enhancing or supporting the health and wellbeing of older people, again, we need to combine biological and social or economic perspectives.

The next point I want to make is that from a research point of view, no later life health problem can be solved or even really meaningfully addressed by any single discipline. This sort of follows from my assertion earlier that health conditions are always fundamentally both biological and social or economic.

But what this means is a challenge to the public health research establishment, also to the social science research establishment, to do more meaningfully interdisciplinary research.

If you are trying to address a health problem or a health concern among older people anywhere in the world, your research

team to really make innovative and impactful advances should meaningfully include not a token representation of people from many disciplines, but really a fundamentally interdisciplinary team and this often requires discomfort. It requires researchers to listen and learn new languages, new ways of doing research.

But that is the price to pay, I think, for really meaningfully supporting the health of older people.

The next point I want to make is about racism. Folks who study from any discipline, folks who study later live healthier, are very attentive to racial disparities and any number of health or cognitive conditions or even mortality, but they often fail to name racism as the fundamental determinant of those issues.

The same could be said of sexism or other ascribed statuses. But I'm going to focus primarily on racism.

For example, here are age-adjusted stroke mortality rates in the United States at two points in time. And probably very familiar to people who do research in the U.S. that those rates are much higher among un-Hispanic black people than among any other group.

And this is what I'm about to say is true for almost every health and cognitive condition, no fundamental biological basis for expecting higher stroke rates among people racialized as black. That is the end result of a long series of complicated interacting forces that somewhere or multiple somewheres include racism. Otherwise there is no basis for anticipating these racial differences. And I think it's important to keep that perspective in mind when we are talking about inequities by race and later-life health or cognition.

Next I want to highlight the roll of growing economic inequality. If you buy anything that I have said to this point, you would accept that social and economic conditions across the life core shape the health and well-being of older people. If that is true, then we should be alarmed by growing economic inequality particularly in the United States. This is less the case in other parts of the world. Although it is the case in many parts of the world.

In the United States, the top 1% of income earners have gone from earning about 10% of all the income to now earning about 20% of all the income since 1980.

The bottom half of the United States with respect to share of income earned as has gone from 20% to about 12%. This is just one indicator of rising economic inequality. This means not good things for large shares of the growing population of older Americans. Comparable things are occurring in other parts of the world.

Finally, I want to highlight something that's come up in various ways in the previous presenters' talks, and that is that the health and well-being of aging populations is fundamentally a political issue. We spend a lot of time talking about the nuts and bolts of particular policies that shape the health and well-being of older people and their caregivers. We need to remember that there is great power in the politics around aging.

One obvious example in the United States was the implementation of the Social Security system, which drove the poverty rate of older people from being the highest among all age groups in the United States in the 1960s and before, to being the lowest. It's now children who are particularly at risk of poverty.

That's fundamentally a political issue. This is one example of how politics can directly shape the health and well-being of older people.

So, I hope I have spoken at least to the second of these questions. And I will wrap up so that we can hear from the audience.

>> TARA BAHRAMPOUR: Thank you so much, Dr. Warren. Really compelling, and I think we have got a lot of stuff to talk about here.

And I am going to ask all our panelists to join us now for this discussion part of the event. So, if you could please turn on your cameras, I think you all have your cameras on and your minds.

And I do have some questions of my own. So I am going to start out with that before we turn to audience questions. But in the meantime, a reminder that the audience can submit questions using the Q&A feature at the bottom of your screen. And we will turn to those shortly.

But I wanted to start, again, with Dr. Lee. I was really struck by what you said about climate change, among many of the other points you brought up as being one of the really crucial factors in the next 10 years for the health and well-being of older people. And this is, you know, people talk about this as a young person's issue and it's the young people who are out there on the front lines.

But could you talk about why this is so important for older people and what would be some recommendations for you, like maybe two or three of the most important shifts that you would recommend to help older people also come to terms with climate change?

>> JINKOOK LEE: Yes. Thank you. I think climate change as I reiterated is one of the important challenges that nobody can escape from it. And what makes elderly or older generation more vulnerable is that many times the mimic the functional ability

they cannot escape from it. And especially we have been struck by bad years climate events in many parts of the world, not only in low and milled Nic countries but also high-income countries. Let's think about an example of recent flooding in California. There has been a landslide and flooding that hits the Americans at older age, and being able to get away from, you know, the flood and the landslide, you really need to have functional abilities and that declining frailty makes it a lot more vulnerable and that also is the case in earthquakes in Japan.

Even in older population in high-income countries, that is experiencing such challenges.

Another important aspect of it is as Rob has mentioned it, it is quite tied with economic conditions. So, many of the extreme heat or extreme cold weather has been increased the mortality of aging populations because many of the people, you know, in places in, like in London or places in rural India, people are exposed to such a climate, they just don't have enough heat or enough resources to buy the heat or enough resources to cool down the hot temperature.

So, those kind of issues make the older population a lot more vulnerable and also the population that is in place in rural economic status. And I think what is important to remember is as I noted earlier, the aging population can be an agent to make these changes, because it's an important voice to voice out climate change will influence their health conditions and their ability to deal with it, and being able to advocate for healthier planet would be one of the most critical issues for aging population can address.

>> TARA BAHRAMPOUR: Thank you. Before we leave this topic of climate change, I want to open it up to all of you, because several of you mentioned, you know, changes that can be made on, you know, the local but also the federal level and in some cases possibly even global level.

Is there any policy that any of you can think of that would be potentially most effective for people to be focusing on on any of these levels in terms of climate change and the older population? I can pick someone, if you want.

>> REBECA WONG: Well, first, of course, we talk about preparedness and the need to prepare the older population in the United States, nursing homes is a particularly vulnerable population with this climate change.

So, thinking about what are the targets of populations and identifying who are the most vulnerable in this climate change events would be priority 1, right? Well somebody else is taking care of how the climate change is ameliorated, it's like minimize the consequences to this population would be great.

>> JINKOOK LEE: I think another way to think about it would be like service provision, right? We have programs like (?) wells and providing what is most needed to the older population. We can think of similar ways when there is an emergency situations, we need to pay attention to reach out to aging population and take care of their need in such emergency situations.

>> JACQUELINE TORRES: I will chime in. I don't know if this is the highest priority but I think one priority that I know a number of people are advocating for is that a lot of our long-term care and social policies that are aimed at benefiting older adults have income eligibility requirements as well as assets eligibility requirements, meaning that older single person may only be able to acquire, you know, two or $3000 total worth of assets before they no longer meet eligibility to get that critical ongoing long-term care or, you know, housing or food benefits.

But if you are only able to amass that amount of assets, then you don't have the ability to manage a catastrophe event, a climate event in which you have to evacuate, in which you have to Bia a generator in order to continue to power the medical devices that you may have that require electricity. So adapting and responding to these climatic events that may require economic resources is extremely hard for people when they are also trying to, you know, have to maintain these assets, these very, very low assets in order to meet eligibility for these social programs.

>> TARA BAHRAMPOUR: That makes sense.

Dr. Torres, I will stay with you for a minute. You had mentioned several paradigms that for women and people of color were more affected than the general population.

And I am wondering if there are any specific adjustments or approaches that you have seen be effective in terms of addressing that disparity in trying to, you know, equalize things a little bit.

>> JACQUELINE TORRES: Yeah. I know -- you know, I think there are lots of different kind of varying experiments in terms of Medicare and the provision of in-home care. I think in many states -- and many states allow for this consumer directed care model where older adults can hire and fire their own in-home care providers. In some cases, that can really allow the flexibility for older adults to hire even their own family members, their adult children as in-home care providers, or, you know, to select care providers who may be culturally concordant, linguistically concordant and so forth.

So, that may allow a lot of flexibility and kind of being able to have care providers that align with the needs of older adults.

But there are also challenges with the consumer directed care model, for example, older adults who are experiencing cognitive impairment or dementia may have particular challenges, kind of with the consumer directed model.

I will also just mention, so in historically immigrants to the U.S. have not been eligible for expanded full scope Medicaid, and which covers a lot of the long-term care that I was noting. California has recently expanded their full-scope Medicaid coverage for adults 50 and older to be delivered regardless of immigration or citizenship status. So, that would be inclusive of many older adults of color who have immigrated to the U.S.

>> TARA BAHRAMPOUR: Does anybody else want to add to that question before I move on? I will let you guys jump in if you have something.

What you were saying led me back to what Dr. Wong was discussing in terms of people in Mexico who have had this very, sort of, fluid relationship with the United States over multiple generations. And I was really struck by what you said, Dr. Wong, with people who have come to the U.S. and worked here and have not accrued any Social Security kind of in either country. And then some of them also have children who are here.

And I'm wondering if you can elaborate a little bit more on that relationship. Because it seems -- you said that some of these factors are present in a lot of other low and middle-income countries, but it feels to me that there's a particular -- particularly strong relationship between Mexico and the U.S. in that sense, and how -- kind of two-prong question. A, the changes in our immigration policy in recent years, is that do you see that changing this relationship and these numbers?

And then B, I am not quite clear on how the role of the child being in the U.S., like, is that protective or not? Are people sending money back and helping, or is the fact that their kids aren't there actually hurting them?

>> REBECA WONG: Good points. Yes, indeed, the relationship between Mexico and the U.S. is special, right, very, very long and is very close and very long history of interactions. And I wanted to call attention to it, because we cannot talk about aging in the U.S. of the, say, under-represented groups of Mexicans and Mexican-Americans without thinking about what they have on the other side, Mexico.

And vice versa, we cannot talk about older Mexicans in Mexico without thinking about the many of them have an interaction with the U.S.

So, again, there are, for example, the first point that you raised about having a long-term career, say, in the United States and then you go back to Mexico and in old age you are in Mexico unprotected. And for many years, we have been talking about what they call totalization agreements, which is that the years of work in the U.S. count when you go back to Mexico and vice versa. If your children in the U.S. decides you should move with them to the U.S., the years of service in Mexico would count for old age support in Mexico.

So, anyway, so that it's a total number of years that should be counted. And that's a major policy change that -- a policy reform that is being mentioned for many years and for a while it was almost implemented. But it hasn't been. But that's a very, you know, straightforward, if we can implement it way of saying, you know, you should be counting your contribution in both countries.

From the perspective of the second one that you said, you know, the disadvantages of -- in having a child in the U.S., it could be an advantage and it could be a disadvantage, right. Obviously having a child in the U.S. is stressful to the older adult in Mexico. You know, you don't know if your child is okay, especially if they are undocumented in the U.S. and so on, it's stressful. It's also stressful to have them far away in another place that many times you cannot go visit and so on, different language. But it can also be very advantageous because if you don't have all the support, your children can, in the form of remittances send money and support to the older parents. So, that's the kind of co-dependence that we were saying for old age, it's an undeniable co-dependence between the two countries. It could be a problem, some of the research shows it could be advantageous but also this advantageous in particular for mental health. But advantageous in economic well-being and also in ability to provide for healthcare in Mexico, because you get remittances from the U.S.

>> TARA BAHRAMPOUR: In interest of time I'm going to turn to some of the questions we are getting in the Q&A. They are not in any particular order but there's a question here that I would like to start with Dr. Warren.

The question is, social isolation and loneliness among older adults is a growing concern related to health and well-being. Can you speak to this challenge and how this fits into the public health agenda for change?

>> ROB WARREN: That's an important question. I knew nothing about the research on loneliness until the last few years and I have been powerfully impressed with its relationship to any number of mental health and cognitive conditions and also to the degree which it is stratified to social position.

Loneliness feels like an individual problem, but it's, in fact, a public health issue that I think rivals many others.

A great deal of the research came out of COVID where we were all somewhat lonely, but I think it just highlights a larger problem that's been with us for a long time.

>> TARA BAHRAMPOUR: Does anyone else have anything to add on loneliness?

I'm going to power through some of these questions, then, because I'm worried we won't get to them all.

There's a question here -- I'm going to direct to Dr. Torres from Anthony -- I'm going to massacre the name -- Cangelosi.

I work with the New York State Department of Health. We are focusing on a master plan of aging developed by the entire state. In that we are developing tools to increase data utilization and provide future policy recommendations among many refinements to long-term health governance. In what ways would you suggest that departments of health, especially ones in large states, can transition from being transactional, reporting-based organizations to forward thinking, proactive research oriented organizations capable of addressing the issues mentioned by all of you today?

>> JACQUELINE TORRES: That is a big question. I'm not sure I have all of the answers. But I think one conversation that's being had in California and this is being pushed by an organization called Justice for Aging, which is a policy and advocacy group, is the focus not just on kind of quantifying expenditures on home and community-based services and in-home supportive care, which I'm guessing would be a big part of this master plan on aging, as it is in California. But really understanding the outcomes and understanding to the extent to which they are equitable.

So, really being able to quantify and survey the extent to which needs are being unmet and the consequences of those needs.

So, we actually have very little even national-level data on the kinds of unmet needs and the consequences of those unmet needs that I showed.

We do have population-level data in California and it's kind of worth, I think, investing in understanding the extent to which needs continue to go unmet both by those who are utilizing Medicaid funded long-term services and supports, but also the general older adult population, rather than just tracking expenditures and services provided.

>> TARA BAHRAMPOUR: Thank you.

Anyone else want to jump in?

All right. Next question, I am going to direct to Dr. Lee. Again, it's about climate change. It's a popular topic.

What advice do you have for local public health and other related groups to prepare and be more responsive to climate change and older adults as more adults live longer and are aging in place? I know we talked about it, sort of, on a macro level. But for local public health and other related groups, what specific advice or recommendations would you have, Dr. Lee?

>> JINKOOK LEE: I think the first priority action that we have more consider is how we can dramatically reduce the emission of the (?), especially from the local authority, I think it's very important to think about how we can reduce the consumption of the gasolines from the cars in everyday activities. We have seen many successful examples in various European countries by providing more bicycles and more public transportations to lower emissions and those are very important considerations for us to consider.

And also in terms of reducing the, helping the planet health, we have to pay attention to various waste management protocols and water protocols. There are so many things that local government can take an action upon. And the pricing as an economist is a very important consideration of how we price our water, how we price our gasoline and it would be the consumption can be much more based upon the quantity of this consumption instead of placing a flat fee on, you know, the amount -- regardless of amount of the garbages or amount of water people use, if we can penalize the quantity of water that people use or quantity of emission they produce, as impact can have a traumatic impact on reduction in those kind of harmful productions.

>> TARA BAHRAMPOUR: Is there a model out there as someplace that has done this well that we can look at?

>> JINKOOK LEE: I think that's a very good example. I can browse some -- a couple of local examples because those are done much at the municipality level. I have not seen any successful examples at the country level. But I have seen more examples at small municipality level, achieving much greater success in conserving water and reducing the core emissions.

>> TARA BAHRAMPOUR: Here's another question on countries. So, I'm going to turn to Dr. Wong. The question is, not many countries, and I imagine they mean low and middle-income countries, perhaps. Not many countries have Social Security benefits or grants for the elderly. Is there data on aging, poverty or health challenges in countries that don't have financial assistance? And I suppose if so, where will we find that?

>> REBECA WONG: Yes. It's probably, you know, the UN data that publishes documents the ability of older adults to have access to pensions and also then the poverty level.

But it's very closely related because in old age, right, the sources of income diminish, you are not working age. So the Social Security has to be either a pension or family health or if you accumulated property you can have rental income and so on.

So tends to be, in particular in low and middle-income countries, it's family income. So, it's help from the family that it comes from when there is no pension program.

>> TARA BAHRAMPOUR: Is there a place that --

(Overlapping speakers)

>> TARA BAHRAMPOUR: I'm sorry. Dr. Lee, I will -- just wanted to follow up to ask if there is a place that has actually put together data on these countries. And, Dr. Lee, maybe you were answering, too. Both of you.

>> JINKOOK LEE: Yes. There are better sources of data on the elderly poverty, like easiest way to get it for low and middle-income would be country would be (?) sources as well as OACD, some of more middle-income country data you can see.

The point that I would like to add onto that is when some of the middle-income countries that has introduced the Social Security pension type of programs, many of them are actually from the system. So, for example, a country like South Korea is very now high income. They introduce the Social Security system for their elderly population but still the elderly poverty rate is very high because this is a funding system that requires contribution during their working years. So, open currently, but when they were young and working, such program did not exist. So the future elderly will be benefited from this program, but currently elderly do not.

I think those are very important considerations to think about, whether pension system is funded system or it is not funded system.

And the other point that I like to make is, you know, as an Asian, one of the greatest myths, a lot of people believe is in Asia, children will take care of their parents. But that is really not true. Especially in this newer generations. So many of the previous family care system is collapsing, and elderly are really in the very difficult place without the societal pension system is not in place, the children move on to their own lives without taking care of their parents. So, there is a lot to think about. And we need to be cared about.

>> REBECA WONG: In particular as you were saying, because as we saw, the fertility dropped very fast. So, having fewer children means that you have fewer possible caregivers in old age.

>> TARA BAHRAMPOUR: Thank you.

There is a question directed to Dr. Torres I'm going to read it out. Thank you for your enlightening presentation. How do you believe addressing staff shortages among formal caregivers in long-term care facilities will contribute to alleviating the stress and challenges faced by informal caregivers of the elderly? Additionally, could you share your predictions for the future of long-term care facilities in the U.S.?

>> JACQUELINE TORRES: So, this is pretty far outside of my wheel house in terms of the healthcare workforce. I do know that many nursing homes are facing severe staffing shortages that have accelerated under the COVID-19 pandemic and are closing, are low capacity and, therefore, not able to provide adequate care to their residents.

I mean, I think that is just going to contribute to -- I mean the overwhelming preference that older adults already had to remain in place and age in place and put additional pressure and requirements on state and local governments to provide care in homes. So, it is, actually, much cheaper to provide care in homes. But it's not adequately provided. And if you are not covered under Medicaid or long-term care, even under those programs, there's not adequate kind of meeting of the -- all of the needs that older adults have.

But if you are in that gap of people who, you know, don't have long-term care insurance and aren't eligible for Medicaid, then you need to cover everything out of pocket. So, I mean, I think -- I'm not exactly sure, you know, what the future of long-term care facilities is going to look like. I'm sure in the U.S., they will continue to be there. They are not even really part of the conversation in most global settings.

But, you know, just want to redirect back to the kind of overwhelming preference that older adults have to remain aging in place in their communities, but struggle to do so given the patchwork of long-term care that's provided to them.

And I think -- I imagine that the staffing shortages in long-term care facilities is only going to accelerate and accentuate that preference.

>> TARA BAHRAMPOUR: I will follow up and this is for all of you. Is there a viable path politically for, you know, funding people who are informal caregivers or family caregivers or kind of helping people age in place in that way? Like, do you see kind of given our current political environment, do you see any way that that could reasonably happen?

>> JACQUELINE TORRES: I will just add. So, under the policies, again, are variable at the state level. So, in Medicaid, if you are eligible for Medicaid and you are eligible for receiving care in your home, in home supportive services,

there are provisions for family members to be paid as care providers.

Now, there are some limitations. So some states say it can be your adult child, but not your spouse, even though your spouse is, if you are co-residing likely going to be providing that care. And often the payment -- well, the payment is very low, first of all. It varies by state and county even within state. And then it doesn't cover all the hours that people are actually providing that care. So, it often provides, you know, payment for a very small percentage of that care.

So, just to lay the groundwork that there is already kind of at least under Medicaid, you know, opportunities for family members to be paid. The eligibility requirements are variable. But in terms of other models beyond the setting of Medicaid, yeah, I would love to hear what others think.

>> REBECA WONG: Yeah, I was thinking about how a caregiver program that can be expanded is an older adult worker who is still working, right, and needs to take time off because a spouse is -- needs care, that is not particularly a benefit right now that is generalized, right? It's not available.

So, that could be a possibility. There are many spouses, like you said, that are the primary caregivers or the first one that need, perhaps, some support when they are still working and family leave anyway.

>> JACQUELINE TORRES: Actually, thank you for bringing that up, Rebeca, because, yeah, I will just re-emphasize the point about paid family leave. We have no federal paid family leave policy in the United States. We have some states that have passed a paid family leave policies. They are often thought of as policies that are mostly for providing for, you know, parental care in the context of like a newborn baby and, actually, the uptick of paid family leave among older adults or their potential caregivers is pretty low. They don't provide sufficient weeks of paid family leave for addressing a chronic health condition such as Alzheimer's and dementia which is going to extend for many years, but may provide some relief, and that's, you know, for spouses and so forth to manage kind of the acute needs and maintain job security and pay and, you know, yeah, we are shamefully lacking in the federal paid family leave policy.

>> JINKOOK LEE: Another policy that is very closely tied is immigration policy, because the long-term care workers are often hired in that industry. So, we will have definitely impact on wage rates of the long-term care workers.

>> TARA BAHRAMPOUR: That is an excellent point.

I am going to address the next question to Dr. Warren. Kind of relates back to what you were talking about with social

conditions. And the question is, any thoughts on models for older populations who are chronically homeless?

>> ROB WARREN: Hmm. I think this relates to what Dr. Lee was saying about issues related to water. There are many models -- every municipality seems to be different with respect to how it please the homeless versus supports the homeless, versus provide services or vary -- in the U.S., vary local, state, but often local policies, and then I know there's tremendous heterogeneity across countries. I think this is an area where some models work better than others. So, I think there are models. This is outside of my wheelhouse. But this is an area where I think while it may be unfortunate in some ways, that localities are left to think about how to support homeless older people. It actually provides a bit of a laboratory for seeing what works and what doesn't work and what works better.

So, I think there is some hope.

>> JACQUELINE TORRES: I can add that, so in California, under, again, the same Medicaid, in-home supportive services program, before 2020, people who did not have what was previously considered a home, so people who are unhoused did not qualify for in-home supportive services on the basis of not having what met the formal definition and the policy definition of a home. And that has been changed as of 2020, such that to expand the definition of a home to be inclusive of providing care to people who are unhoused. I am not sure about kind of the implementation in other states but that's the expansive policy I think that we need.

>> TARA BAHRAMPOUR: Thank you. I see Dean Galea. Do we have time for one more question or should we wrap up?

>> SANDRO GALEA: One more question.

>> TARA BAHRAMPOUR: One more question from the listeners is related to disaster planning and again, since this is climate change related I'm going to start with Dr. Lee. The question is, any thoughts on the impact of disaster planning. And I will add, you know, kind of, again, are there places where you see this going well or any promising areas, either globally or locally?

>> JINKOOK LEE: Thank you and I feel a little bit I did an unjustice to the climate change topic as I am not quite an expert on that area.

However, I do think it's a very important topic for all of us to think about. And I think one example that I can provide is doing a great job in terms of preparation is like a country like Japan, how they prepare for earthquake and the cities and the local communities are well equipped with this unexpected disasters and being able to deal with it not only taking care of emergency actions, but also the follow-up on those disastrous

areas. I think there is a lot of lessons to be learned as the people in the U.S. Thank you.

>> TARA BAHRAMPOUR: I know we are almost out of time so I will wrap up the discussion. And I want to thank everybody for joining us today and our esteemed panelists. It was really an honor to moderate this discussion. Thank you.

>> SANDRO GALEA: I will just jump in to echo the thanks. I want to thank Tara for her masterful moderation, Drs. Wong, Warren, Torres, and Lee for really interesting comments. And I want to thank the audience. A flood of interesting questions, and I think you can see in the conversation like this, how engaging this issue is for many of us who are interested in health of populations.

And I feel about this conversation the way I feel about good conversations, which is raise more questions and, perhaps, answer and that is, perhaps, appropriate for the state we are in and thinking about this.

So, thank you to everybody who is on as part of this conversation, either on the stage or in the audience, for what you do for moving these ideas forward. Everybody, have a good afternoon, evening or good day. Take good care.

>> JINKOOK LEE: Thank you.

>> Recording stopped.

(Session was concluded at 2:29 p.m. Eastern Time)