

Informal Discussion Transcript

General Session VI: Senior Citizen in 2050

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JEAN-MARC FIX: Okay we're going to start. We've reached the end of the road, the last session on the last day. I'd like to think of this session as the cherry on top of the symposium, and I cherry-picked the panelists that we have here. This session is really different from all the other sessions. The panelists will present a short descriptive vignette of what the future could be like. Of course, we don't know what the future is really going to be like. This exercise is just to give you a lot of food for thought. The vignettes will be just oral, but we'll have them on the website at the end. So don't focus too much on the details of the vignette, but try to picture in your mind what the future could look like for a senior citizen. The big opportunity for you guys is that you can ask this pretty distinguished panel any question you want.

Try and keep your questions related to the topic on the slide, and at the end, we'll have an opportunity to ask questions on miscellaneous topics that we didn't get a chance to address. So really, the key thing here is don't be shy, because just like for desserts, if you don't eat it, you don't get it.

A picture is worth a thousand words. We don't really have any pictures here; we only have words, so get ready. I debated a long time whether I was going to present a vignette myself or not. I decided not to use the *Walking Dead* analogy, but I'm a science fiction fan, so I'll use a more *Blade Runner* type of world. So don't take this too seriously, although there are, I think, some nuggets of possibilities in there, and some elements are actually true in some parts of the world right now.

The future is what we make of it, and we play, I think, in our roles, in our role of advisers, an important part in making sure that the picture I will paint does not become the thing that happens.

Dejohn Jesus Fix takes his seat in the armored hovercraft that will bring him back from his job at the South Wall to the gated and walled enclave of Santa Los Diego Heights. The new eyes his partner got him for his 70th birthday really make him look dapper. Using a living donor was really worth the extra expense.

Unfortunately, it also allowed him to see the smoke rising from the burned-out shops, and that made the gunshots harder to ignore. That touch is in reference to Jean-Claude's comment from

yesterday or the day before.

The Under-50 no-gooders were rioting once again, using the flimsy excuse that the School Bond Proposition had been defeated for the sixth time.

So that's a gloomy vision of the future, not necessarily that I share, but it's not an impossible vision of the future, except for the hovercraft part, probably. *[Laughter]* Keep in mind that it is *our* job to take the steps now that will allow the senior citizens in 2050 not to have this kind of life, even though the person I described is one of the lucky ones.

So here *[Shows slide]* I have a couple of population pyramids to illustrate the growth of the 75-plus population. This slide is for Canada, but this similar slide is for the U.S.

Let me introduce our panelists. On my immediate left is Professor Neil Charness, who is a professor of psychology and director of the Institute for Successful Longevity at Florida State University; to his left is Professor Robert Bourbeau, who is emeritus professor of demography at the University of Montreal; and to his left is Professor Thomas Getzen, executive director of the International Health Economics Association and emeritus professor of risk, insurance and health management at Temple University. To his left is Professor Jay Olshansky, who is a research associate of the Center on Aging at the University of Chicago and the London School of Hygiene and Tropical Medicine, and finally to the far left or your far right, is Dr. Philip Smalley, who is an MD and senior VP and global chief medical officer for RGA International.

So I'll ask my first question for Robert. Here are two different pyramids, for the U.S. and Canada. The trend and the shape are kind of similar. They will be a lot less pointy in the future than now, but are there fundamental differences between Canada and the U.S. from a demographics perspective?

ROBERT BOURBEAU: Okay, thank you for this. Well, first of all, these pyramids suppose that fertility will—fertility rate will stay constant at the level of 2016, I think, 2011. So we'll see what's going on. Well, as a first remark, I don't know who constructed the pyramids, but he would fail in my course of demographic analysis. *[Laughter]* This scale is not appropriate, and we don't see the increase in population of centenarians. So—but my comments are valid for the U.S. and for Canada.

The first thing, of course, is the change in the shape of the pyramid, which is becoming like—I don't know if I can pronounce it—a sarcophagus rectangular structure, so it's not a pyramid anymore. We see that the large cohorts of baby boomers have now retired for a certain time and will be among the oldest old, 85-plus increasing the proportion of senior and contributing to the, what we can call the aging of the seniors. In 2050, 25 percent of the 65-plus will be 85-plus, and that segment of the population will be growing faster than any other segment. And 5 percent of the cohort, the 1950 cohort, will reach 100.

The problem we have—perhaps more in Canada than in the U.S., because the baby boom was higher—was concentrated in the shorter period. It's the fact that smaller cohorts will replace the larger cohorts among the workforce, and they will have to support a large proportion of people in terms of social services, in terms of health services in the years to come, and also in terms of pension plans. And it's the case for both countries. There will be more—there will still be more women than men among the oldest old. But the fundamental difference between Canada and the U.S. is really the fact that the fertility is higher in the U.S., almost two children per woman, and that will help managing the fact that the larger cohorts are going to a very old age. In Canada, the fertility rate is about 1.6 or 1.7 children per woman.

JEAN-MARC FIX: I think the presentation was made, I think Jay said that after age 50, things deteriorate, and I forgot to start the vignette. So Neil, do you want to start with your—?

NEIL CHARNESS: Sure, I'll be happy to do that. Okay, so I'm going to be looking at kind of a U.S. scenario, and one of the fastest-growing population segments, as many of you know, [is] the Latino community. So Joanna Sanchez is a 75-year-old Latina, and she's preparing to head off to work. With only two years to go to reach full pension under the March 28, 2017, new Social Security entitlement rules, because I think they're going to change, she's beginning to think about retirement transitions and the challenges of being around the house all the time with her retired 77-year-old husband.

Marc, her husband, recently had to give up watching human football. It was banned because of the toll it takes on a player's brain and particularly on late-life cognition. And he doesn't really like robot football, despite recent great strides in realism. He also seems to spend way too much

time watching their 100-inch very-high-definition 3D TV that takes up the entire wall of their living room. She is also getting a little annoyed at his bumping into the furniture during the virtual-reality games he plays when he isn't passively watching TV. And the reason he plays those games is that the health coach on his smartphone suggested those VR games as a way to get him to be a little more physically active.

At least she doesn't have to make lunch for him anymore, thanks to delivery drones, which can bring the food in within about 10 minutes of putting an order in on a smartphone, which reminds her McDonald's has still not sent out someone to collect the drone that crashed in her backyard. [*Laughter*] She even tried to call the company to speak to a real person, but was put on hold for so long, she decided to end the call rather than struggle to try to understand the strange British accent of the foreign tech support. British? Brexit resulted in a shift of phone banks from Pakistan and India to the British Isles back in the '10s. Although the translation software on her smartphone does a much better job of speech detection and translation than it did even a year ago, it's still unable to manage really strong Cockney accents.

She tells Siri 4 to bring the car around to the front door. Autonomous vehicles finally became a reality in about 2030. With two-thirds of the auto fleet now autonomous, she's having less and less of a problem with snarky teenagers cutting in front of her vehicle, testing out the collision avoidance emergency braking systems, making it a very unpleasant commute.

So she gets in her car and tells the car, "Head to work." It's smart enough to detour around the still-uncollected debris on the roads from that last super-hurricane that hit Orlando this past week. She sighs and wonders why no one took global-warming warnings to heart. Even the polite turn-taking [autonomous] vehicles are bottlenecked, turning a 15-minute commute into 30 minutes, except for those with the antique vehicles, who recklessly drive onto sidewalks to cut in front of the autonomous vehicles.

She should have been catching up on her work, but her smartphone stopped broadcasting to the screens in her car after the last software update. And she hasn't been able to reach her grandson, who probably could have walked her through a fix. Maybe she should have taken the individually adjusted reduced pension and partially retired at age 70, so she could have spent more

time doing those brain-training lessons.

That's my scenario.

JEAN-MARC FIX: Thanks, Neil. Robert?

ROBERT BOURBEAU: Okay. So Allison just turned 75 years old in 2015. She is still working to create an adequate pension fund, given that her friend—of course, an actuary—told her that her chances to live up to 100 are quite high, at least 15 percent. Until now, her health [has been] very good, thanks to healthy living and exercises, nutrition and also genetics, but the future remains uncertain. She would like to have very good financial resources to prepare for possible medical and social expenditures and perhaps leave a significant portion to her children.

Allison began to work relatively late. As many members of her generation, she traveled during her young adulthood and studied until age 35 to finally obtain her Ph.D. in engineering. She really began to work at 40, having to take care of her two babies born when she was 36 and 38 years old. She got married at age 33, but their marriage ended in a divorce 25 years later. Since her divorce, she did not engage in any formal relationship, but she has a new partner for five years in a living-apart-together relationship.

Allison is part of a multigenerational family—four generations. Her parents are still living in a nursing home with some health concerns. Her mother is 97, and her father is 99. I could put it to 100, but—. [*Laughter*] She is the mother of two children, and she is also grandmother of three. She has to take care of her parents as an informal caregiver, but also to support her children and grandchildren, thus making her the cornerstone of the family, in what we can name the multigenerational caregiving.

So you can ask, Is Allison typical of her generation, 1975, or one-of-a-kind super woman? Well, the answer is yes and no. Yes, because she represents a phenomenon that we can call the retardation of maximum life span and of the life cycle. There will be a delay in life cycle transition. An increase of maximum longevity will extend the initial stage of adulthood, as well as mature age. A longer youth and delayed menopause will allow more flexibility in birth planning. The diseases of old age will be delayed and will cover a shorter duration than today. It's a compression of morbidity. An aging population will increase the probability of being part of a multigenerational

caregiver, for woman in particular. And the answer can be no, because in fact, this generation will also live in diversified families, when it comes to types of union, same-sex couples, stepfamily, multiethnic, living apart together. And this generation will also face an important issue because general disability levels and health care costs are strongly affected by the size of the oldest old. Okay.

JEAN-MARC FIX: Thank you, Robert. Tom?

THOMAS GETZEN: I wanted to tell a story about a family, the O’Connors—three cousins, all of whom are 70 in the year 2050. These three cousins, Andy, Beth, Carlos, all go to the University of Delaware starting in 1996. Andy is the more successful one and good looking, athletic, popular. He actually plays baseball and plays extremely well, leaving college before graduating, so that he can start his professional career, but it never quite works out. In the meantime, as that career falls apart, he becomes a sportscaster for one of the local TV stations and a manager in a sporting goods store; things are going well. He buys a condo and invites all the cousins up there. It’s one of the times that they remember all being together.

But over time, a number of things happen. One of his kids develops a drug problem, and that puts stress on a marriage that was already kind of stressed out by his lifestyle as a sportscaster and athlete and good-looking guy. His marriage ends. And the daughter takes continuous care with repeat struggles with addiction. She moves into halfway houses and slowly gets better, but it’s enough that it really causes Andy’s marriage to crumble. Fortunately, one of the things that comes out of that is he meets somebody else who also has a child that struggles with addiction. The two of them get married, and now they’ve been married for 20 years, but they have this legacy behind them.

Beth, the second cousin, when she gets together with Andy, they’re all together again at the University of Delaware for their 50th college reunion, even though Andy never graduated. She is very glad that when she went to Delaware, she went straight through, got a job with the state, and has had a fairly simple career. She never really had to do much for her kids, other than just to get them through school, get them through college, help them out a little bit when they tried to buy a house. She considers herself solidly middle class. As she sits listening to Andy, she is very

grateful that she is basically middle class and not wobbling at the edges the way that Andy is.

Carlos was the quiet one—a little more reserved. A little more reliant on his skills as a mathematician but recognizing early on that he wasn't really good enough to be a real mathematician, [he] became an accountant. [Laughter] Carlos enjoyed his career. Hey! It's a good job! And since he got out of college, he joined a small local firm. A lot of his clients were small, local businesses, and it turns out that a number of those businesses have run into various problems. They depended upon him for audits and other kinds of things. He got involved in several local business interests which have worked out over time; now he considers himself "comfortable." One event that may have also affected his financial status is that his parents died relatively young, when he was about 35 or 40 years old. Both of them passed away, and he inherited what were to have been their retirement assets, which he then was able to invest in these various small business ventures that came across his desk because of his work as an accountant.

So by now, he's really doing relatively well. Carlos would like to have everybody come to visit him. He's tired of them joking about the fact that he's got one house in Maryland and a place down in Florida and also a little cottage in Ireland. So he's trying to get the entire family to come to the little cottage in Ireland. Yet he knows that he can't directly offer help to Andy, who is the one who has struggled the most, by paying his plane fare, just because Andy wouldn't feel right taking that kind of money, and it would remind Andy of what's happened to his life.

This is the little scenario that I came up with. I was asked as the economist to say what's going on in the future. Economists argue a lot about what their rate of growth will be. And generally, you get the pessimists who are down at 1/2 percent and the optimists who are up to 2 percent. And you also have some politicians who are talking about 5 percent, but you can just forget that. [Laughing]

What I think is the most critical economic factor that we have in our power to change for 2050 is the degree of inequality. These three cousins all start off pretty well and still end up far apart. The greater the longevity, the more we're going to have inequality. And we've also had other policies that have created inequality.

Jean-Marc started with his dystopian vision, and I thank you for referring to my favorite

movie, *Blade Runner*. They're bringing Deckard back, by the way. Dystopia—that movie *Dystopia* and the dystopia that we could have here in the United States, a little less likely in Canada—is based upon extreme inequality. Gated communities don't happen when people have more or less similar incomes and share certain social networks. So that's what I would like to think about most in terms of what's going to happen to a 70-year-old in 2050, is how much inequality we will have tearing at the social fabric of society.

JEAN-MARC FIX: Thank you, Tom. Jay?

JAY OLSHANSKY: Can you hear me okay? All right, so you can read my vignette online. I sent it in already. I'm not going to read the vignette now. So you knew I was going to do this, right? *[Laughing]* So we were asked to paint a picture of what the world is going to be like in 2050. And I'm going to paint two pictures for you. It's more or less in the way of a vignette when you think about it, many of us living to 2050. But here are two scenarios that I think can happen, and one of which I think is the one that we're headed toward, and the other is the one that I would like to see happen. And I think it's within our control to make it happen.

The direction that I think we're headed is one that is extraordinarily dangerous. The direction that we're headed now is based on an approach to modern diseases that we now experience with regularity, primarily diseases associated with growing to older ages, both the fatal and the nonfatal disabling diseases that influence people that make it to older ages. And we've decided to use an age-old approach to dealing with these diseases, which is the infectious-disease model. The infectious-disease model, in case you're not aware, is when you have an infectious disease, and you go to your doctor, and your doctor fixes you, pushes you back out the door until something else crops up. Then you go back to your doctor, and he or she fixes you, and they push you back out the door until something else comes up. Right? So we face all these hurdles during the course of life. Earlier in life, those hurdles are fairly far apart, but once you get to older ages, those hurdles get closer and closer and higher and higher. And we've now reached the point in long-lived populations where the hurdles are very close together. The hurdles are extremely high, and we've decided to use the same old infectious-disease model applied to chronic fatal diseases. What are the consequences? Well, look, we're going to be successful. We'll continue to go after

heart disease. We will continue to improve case fatality rates for cancer. There's no question that we're getting better and better at extending life. But we're extending life into a region of the life span where frailty and disability is extraordinarily high.

So I would bring back language that goes back to an article—I think it was 1977—by Ernest Gruenberg, called “The Failures of Success,” where he basically made the case, “Look, if we succeed in going after diseases in a particular way as we have been doing in the past, and because death is a zero-sum game, when one death goes down, something else must rise, what are we going to get in exchange for reducing the risk of death from heart disease, cancer and stroke?” The answer is Alzheimer's disease.

So one of the visions that I see for 2050 is a dramatic increase in the prevalence of Alzheimer's disease, a dramatic increase in the cost associated with Alzheimer's disease and related conditions. And while we may feel really good about reducing the risk of heart disease, cancer and stroke, I think we're doing this in sort of a blind way. The physicians are in the trenches, dealing with one disease at a time. They're not taking a look at population health from 35,000 feet, as we tend to do. That's the negative scenario. And that's the one I think we're headed toward.

The positive scenario is the one you heard for the last couple of days, from Nir Barzilai and from our keynote speaker yesterday. There is a movement afoot to change the way that we approach disease. Instead of attacking them one at a time, attack them all at once, by going after the biological process of aging. If you didn't get a sense that we're on the verge of a breakthrough, you missed the story there, because we are on the verge of a breakthrough. And I'm perhaps—believe it not, for those who have known me for a while [and] might think of me as pessimistic—I'm about as optimistic as you possibly can be, but a breakthrough is forthcoming in the world of aging science. And that we not only want to see it happen, I would argue that we need to see it happen. We need to aggressively pursue this alternative scenario, because if we don't, I fear that this first scenario is going to play itself out in a way that we currently don't understand. We're not going to like it when it happens, and I think it's within our control.

I think we have the potential to create this future of a more positive, healthy old age for individuals living out to 2050, and when you read my vignette, by the way, it's really basically a

story about two worlds, two kinds of people—the one that lives in the first world and the one that lives in the second world. I want to live in the second world. I want to live in the one where we take control over our own biology and we take control over our own health and quality of life in ways that have never been done before. And those are my vignettes, sort of condensed into this brief couple of minutes.

JEAN-MARC FIX: Thanks, Jay. Phil, you want to go ahead with yours?

PHILIP SMALLEY: Thank you. The year is 2050, 33 years from now. Mrs. Smith is a 75-year-old woman who lives at home, looking after her sick daughter, who has multiple complications from a long history of type 2 diabetes. Mrs. Smith has a past medical history of asymptomatic, preclinical Alzheimer's disease and a history of stage 4 metastatic cancer, cured two years ago with targeted drugs and immunotherapy. She is currently taking a disease-modifying anti-Alzheimer's medication, and she is on an anti-aging pill.

As part of an insurance company's post-policy-issue multifaceted wellness program, the patient has multiple sensors in her home and her car. She takes photographs of her meals. She also has biosensors embedded in her clothing. All of this data is uploaded automatically to her smartphone. The sensors detected a fever and automatically alerted the doctor's office, who called the patient to come in for a visit. The doctor's office is a large facility where half is telemedicine centers and run by nurse practitioners and a team of subspecialty doctors.

Mrs. Smith gives her health insurance information to the receptionist. After consent is obtained, 12 months of the patient's data is uploaded from her smartphone to her electronic health record. The nurse practitioner reviews the data and notices that when her temperature goes up, her heart rate goes down. This is peculiar. So the nurse practitioner calls the doctor into the room. The doctor comes into the room and turns on the natural-language-processing computer that listens and records the entire doctor-patient interaction and uploads the information to her electronic health record. The doctor asks the patient if she has eaten seafood or undercooked chicken recently. Mrs. Smith says no. But the computer interjects and asks Mrs. Smith to put on headphones. The computer tells the patient that her credit card statement showed that she did eat at a seafood restaurant a week ago. [*Laughter*] The computer then asks the patient if she consents to allow the

computer to divulge this confidential credit card information to the doctor, and she says yes.
[*Laughter*]

The doctor then takes a finger prick drop of blood that is immediately analyzed in the clinic by a small little box, and it tests negative for circulating free tumor DNA, which rules out any form of cancer as a possible cause of her fever. The blood test also confirmed the diagnosis of salmonella bacterial infection. The doctor uses precision-medicine principles, analyzing the patient's genetics that are already in her health record that were obtained as part of her insurance wellness program, post policy issue. This allows the doctor to select the right drug, at the right dose, and avoids drug side effects.

The doctor prescribes 10 days of three different antibiotics, because of the concern of antibiotic resistance. Mrs. Smith then travels home, and by the time she arrives at home, a drone has delivered the antibiotics to her home, and she takes the medications and does well. That's my vignette. Thank you very much.

JEAN-MARC FIX: Thank you, Phil. I wonder if the computer starts the lawsuits automatically, or it waits for personal action there? So we're coming now to the actual question-and-answer part of our program. I'll try to put the slide desynchronized with what we're talking about. So we'll be talking about demography for a second, for someone who has questions. For those of you who might want to think about the question you going to ask next, that will be the next topic. So anybody has any question again on the demographic structure of where the population could be? If nobody has a question, it's going to be a very, very short session. [*Laughter*] Thanks, Anna.

ANNA RAPPAPORT: We just heard about multigenerational families. At the same time, we also heard about elderly people who are alone, and we heard about families connecting. I'd like to hear about the support systems for the people who are alone and the outlook for the people being alone.

JEAN-MARC FIX: So the question is for the panel; I don't know who will take it. What is going to be different for the person that's elderly and alone in 2050 compared to today? What kind of support system will be available? Neil, do you want to give it a shot?

NEIL CHARNESS: It's hard to make a prediction to 2050. The trends, certainly in the United States, have been to try to ratchet down the amount of money that is being spent by the public

sector in that area. And so I was at a very interesting session before this one, looking at what individuals in communities can do to try and provide that type of what used to be a government responsibility, as more of a neighborhood or village type responsibility. And so I think there [are] some opportunities there for individuals in their communities to kind of step in and try to provide that support. I mean, it's a very good point. You have people like myself, baby boomers, who came—my family—I have four siblings. I have two children, and so that's kind of a good example of a typical reduction in the potential support that's available to my parents, who are now 93 and 91. And my options—well, 2050, I'd be over 100, so I don't think I'll be here. But I think that's probably one potential option. It looks like, certainly in the U.S., we're in a bit of retrenchment at this point in time from what governments are able or willing to do. And I think it's going to probably rotate more around the types of new-frontier thinking that took place when the United States was first being formed. Canada, I think, is a different story perhaps, because the government social safety nets are much stronger.

JEAN-MARC FIX: Jay? Go ahead.

JAY OLSHANSKY: I know the family structure I would like to see, and the image comes from my own childhood, where we had grandparents, parents, children, grandchildren, cousins. I mean, we actually all lived within a relatively short distance of one another. So frequently, you know, we would gather at one person's house, and then we would gather at another person's house. We had a constant mixing of generations. I know that there is a tendency now to isolate the elderly in many parts of the world, and some of the best visions of family structure that I've seen have come from these exceptionally long-lived subgroups of the population, where you get large segments of the population living out into their 90s and past 100, and what you see frequently are the children, the grandchildren, great-grandchildren gathering together and offering great respect for the grandparents and great-grandparents hovering around them, spending a lot of time around them. And it seems to be good for the kids. It's good for the grandparents, and that's the family structure I would like to see. I don't know if that is going to happen. It's certainly one that, at the individual level, we can attempt to make happen, but it's not an easy thing to do, especially in a world where we tend to push off the elderly.

JEAN-MARC FIX: And I think we're going back to the demographic structure. In my example, my daughter has three parents, and she has three grandparents that are alive, so that's one person for six here, assuming everybody lives a few more years. The shortage of children is going to be an issue in the future, because all our models depend on younger people taking care of older people.

Now, there's an issue that we did not approach at all in the symposium so far, and I think especially in the U.S., is immigration. And our population pyramid is different than everybody else's because of immigration. [Does] any one of you want to comment on immigration and possible impact or possible solutions? We've seen that with home health care. We heard from foreign countries—nurse practitioners as well, from foreign countries. So is there a way that we can alleviate that problem by attracting the skill set from countries that don't have the pyramid that we do to help with our own old-age population? Anybody wants to comment on that?

ROBERT BOURBEAU: Well, just a short comment concerning Canada. Canada is a country of immigration, so a larger proportion of the seniors will be born abroad, and it's an important part. We estimate that 36 percent of the generation reaching 65 in 2015 will be born outside Canada—namely, in Asia—and I think that this could have an impact on the care provided to dependent seniors by family members. Because some people from various ethnocultural groups can have different traditions and expectations toward their family network, once they become older, particularly if they lose their independence. So these trends can have an impact on the transition from working life to retirement, income levels at retirement, the passing of family wealth, and international cohabitation. So I think that's something that can be specific to Canada.

THOMAS GETZEN: It seems to me that it will be difficult in the future because the population demographics will be different. The family member who I most frequently run into is my niece's husband, who was born in China. We work out together, and she's actually not a blood relative. Therefore I want to talk a little bit about that immigration question raised a minute ago.

We are going to see social structures which are not strictly biological, but crafted. And as a matter of fact, if we look back at U.S. history, this 1950s Ozzie and Harriet moment was a very brief moment in time. If we look at family structures in the 1900s or 1850s, it was very common for people to blend in and have people from the neighborhood who joined in as part of the "family."

All kinds of family constructions arose. As I look at the families that I'm seeing now, they are from my social group; it's where I make those connections. It's not necessarily people who were born in my family, but who are part of my family because we create a bond. I think we're going to be much more dependent upon that kind of family, and actually, I think it's been a very negative thing to think that the 1950s was the perfect time and this nuclear family was the perfect way to do it.

And on the second point, I think when I talk to my Chinese friends, they're worried about aging. They're looking at a society that is graying. I don't think that China, with close to a billion people, is thinking that immigration is going to solve the aging problem. And I think in the future, it's going to be increasingly unrealistic in the U.S. and in Canada. We have to recognize that in 2050, the demographics of many other countries will be much more similar to what we have in the USA, and so we have to try to figure out a solution that works for all of us as society ages here at home.

JAY OLSHANSKY: I know Sam's got a question, but really, I want to address the immigration issue really quickly. So it depends on how receptive a country is to immigrants coming in. I'll tell you a quick story. I think it was about a decade ago, I was invited to a meeting in Italy with a group of economists that were concerned about the dramatic decline in the total fertility rate in Italy. And they were lamenting and going, "Oh, this is a disaster. It's going to create all kinds of problems." All these economists, by the way, were in their 20s and 30s. They had no sense of history, right? And so I said, "Look, I come from an era where we were involved in negative population growth and zero population growth." You remember that? NPG and ZPG! And I said, "Look, we succeeded. We brought down the fertility rate. It was extremely hard." And I said, "There's only a couple of options here. If you want to raise the fertility rate, you're going to have to uneducate women. [Laughter] Because educating women was one of the most powerful forces that influenced the decline in the fertility rate. So that's not going to happen. You know, you can try to stop introducing contraceptives. That's not going to work." So I said, "The only alternative would be migration. You know you could bring out migrants in Italy," and the Italians, they totally rejected the idea of bringing migrants in. And I said, "Well, then, there's only one other option. And that

is to encourage older members of the Italian population to remain in the labor force longer.” I said, “You need to encourage labor force participation among people over 60 or 65 in Italy. Make it easy for them to stay in.” So I don’t think the solution is necessarily migration. It might be contained within a society and within the older members of the society and tapping in to the value that they bring to the table.

JEAN-MARC FIX: But I do think that need creates opportunity here, and we see that in Japan. In Japan there’s a woman-to-man ratio crisis, and women do not want to get married. Japanese men want to get married, and there is a huge fertility crisis. There’s a fairly significant—even in a society that is not necessarily very open to foreigners—influx from people from Southeast Asia to Japan. Things can change, and attitudes can change.

Sam, I won’t forget your question, so if you want to sit down, I have one more comment on demography. I apologize. *[Laughter]* Or you could stay standing and exercise, and you’ll live longer.

One thing that we did not address is, I think, mobility, because one of the things that contributed to that fragmentation of the family structure is, especially in the U.S., people moving around a lot. If you don’t live next to your parents, it’s hard to help them out. Now with the possibility of telecommuting that is starting to be fairly well accepted, do you think that will allow people to age where they grew up, be happy with that situation and stay in their neighborhood they grew up in, and therefore be more likely to help their family that way? If you want to take that one, Neil?

NEIL CHARNESS: Yeah. Not a jump, because we’ve done some work looking at attitudes of managers towards telecommuting, and they don’t like it. So although the federal government has mandated it here in the United States, the federal civil service, if you want to telecommute, you can. I think that that is, until attitudes change, that’s probably not going to be the solution to keeping families together. A good example would be my own family. At one point, we lived in Canada, or lived in Canada to start with. Four out of the five kids lived within 60 miles from my parents. Today, just one, and the others are scattered across the U.S. from San Francisco, Portland [and] in my case Tallahassee, Florida, and Boston. And so I don’t think mobility—because of

mobility for jobs, because telecommuting, I think, can help with a certain set of jobs—it's not going to help in particular for jobs which aren't open to, kind of, individuals doing things on their own, of which there are a lot that's still in the labor force.

And the other problem, too, is—and this gets back to the Japan example—I want to make a quick point here: Japan, realizing they can't do much about fertility or haven't been able to [do] much about fertility, have the oldest population in the world [and] are counting on robotics as a way to try to build in a labor force to manage frail elderly individuals. Particularly, soft robotics is something that's being emphasized a lot today. Whether that's going to work is an open question. Probably not in time for, say, the baby boom generation in Japan, but that's coming. So technology may help to some extent.

Telecommuting—I have a brother who does it. My son-in-law does it. But those are fairly specialized jobs.

JEAN-MARC FIX: Thank you. Sam?

SAM GUTTERMAN: I was going to raise another issue, which you touched on briefly in your last comments, and that is technology. I look back 33 years ago, and I remember the forecasts that were made. Alvin Toffler and those other people around that time, they said, “Well, we're going to be, because of technology, we're going to have a leisurely life—two to three hours of work a week, or maybe a month, but at least a week. Everybody is going to have leisure time, so we'll get fit. We'll be healthier, and we'll overcome everything because of technology improvement.” That hasn't happened. Everyone I talk to who is employed—that is, everybody who is not sick or vulnerable—is almost the opposite. There are people, 50% of the population, [who] have no investments. They are working two and three jobs when they can get it. Which diverse paths are we going to believe? Or maybe there [are] always going to be two sets of populations, and maybe Jay's comments about two sets of people, they're going to be simultaneous, whether they like it or not. Observations?

JEAN-MARC FIX: I mean two sets of people have existed historically in a lot of places. If you go back to England, 1900 or 1880s, you can see [a] leisure class that had ownership of a lot of property and a bunch of workers in less ideal conditions. This is not the recipe, as I think Tom was

mentioning, for political stability or life stability or extension of life. This kind of environment, a difficult dystopian kind of environment, is a real issue. So it's a real problem. Any other comments?

PHILIP SMALLEY: One comment: I think a lot of the technology and points that we brought up already were centered on the elderly person, and I think all of us in the room know that looking after an older relative can be very stressful, very disabling [and] cause morbidity and mortality in the family member. So I think we've got to think a little bit bigger and not just dealing with the structure aimed at the older person, but the family as a unit, even if the family is not living with an older person. And there are programs around the U.S. and internationally that help to try to deal with the family as well as the older person.

JEAN-MARC FIX: Tom.

THOMAS GETZEN: I think this is a real problem. One of the great books on this is Robert Franks [and Philip Cook's] *The Winner-Take-All Society*. It posits a pyramid—and a lot of the people who are at the top of the pyramid are in this room—with most of the people toward the bottom. Career paths diverge because of network effects. You start off, and you build contacts, and the more contacts you have, the more business you have, and the more, and it explodes to the point where you no longer have any personal life, because there [are] so many opportunities coming to this very small group of people at the top.

We as a society are going to have to figure out a different way of doing things, and it's going to be very difficult, because the current technological environment, the increase in globalization, and social media increase those returns to being at the top 1 percent—to be the expert on something or the best singer or accountant or something like that. We have not yet figured out a way to kind of spread the wealth across the community and even spread life and work across the community, and if we don't, I'm afraid we're going to end up in a dystopian future à la *Blade Runner*. One of the things that [are] going on that we have to be paying attention to is technological change, concentrating work and power in a very small number of hands.

JEAN-MARC FIX: Thank you.

FROM THE FLOOR: So my question is around the traits that all of you said that the female

must still be caregiver, the informal caregiver—aside from Robert, who said she was still working and the husband was fumbling around the house, for lack of a better term. [*Laughter*] Why I ask about this is, aside from longevity, is there any other reason that you perceive that the woman will still be the informal caregiver? And why I ask this is we've done a small research project, attitudinal research project, for people looking for care. And we found that it was equally men and women who were actually seeking out care for their loved ones.

JEAN-MARC FIX: I mean we see an adjustment change; I can see that in my daughter. She's growing up in a world that is somewhat different, but I don't think quite as different as we would have hoped, especially as father of daughters. I think attitudes are extremely hard to change, and I'm not saying huge groundswell of change to try to change those attitudes for caregiving. If you look at nurses, it's mostly women. If you look at doctors, it's mostly men. There's really no explanation for that. [*All talking*]

FROM THE PANEL: It's changing.

JEAN-MARC FIX: It's changing, I agree. It used to be this meeting will be entirely older white men, and obviously, it's not—although, if you look around, it's not much different. So there are attitude changes, but attitude changes like this—although we have laws about equal employment and whatnot, equal opportunity—they're very hard to ingrain. But I think they do happen. It's just hard to measure the total impact, because I think the ramifications of different structures are going to overpower our prediction ability on how this family unit or this caregiving unit is going to be in the end and who is going to be the job of the care. So yeah—.

FROM THE FLOOR: And in China, better hope the guys start taking care of the families! [*Laughter*]

NEIL CHARNESS: Just make a quick point about attitudes. I do a reasonable amount of my research looking at attitudes, particularly of older adults towards technology. And it's always surprised me how quickly attitudes can suddenly change. And a good example would be here in the United States in terms of same-sex partnerships, and that change took place over an extremely short period of time. The switch was maybe five years or something from the majority of the population being against to the majority of the population being for. So I think humans are pretty

adaptive, and when circumstances call for it, they are willing to change their attitudes. And we see this particularly for older adults with respect to technology. If that technology is going to be helpful—even though, in general, they tend to lag behind their younger cohorts—if it’s helpful, they are quite willing to adopt it. So that’s, I think, a hopeful sign in terms of where technology and/or attitudes can sometimes turn quite quickly in the population.

JEAN-MARC FIX: And I think there’s also a snowballing effect as the population gets more diverse and more diverse points of view are represented. More people will be exposed to more diverse points of view, and that, I think, helps attitudes as well.

STEVE VERNON: Thank you. Steve Vernon. An excellent presentation. Thank you. I want to go back to Sam’s question and something, Thomas, what you were talking about that. I remember reading science fiction when I was a kid, and robots were going to do everything, and we’d have all this free time, and wouldn’t life be wonderful? We are actually headed that way, when you look at automation of food and other services and goods. Traditionally, the way someone gets purchasing power is they get a job that gives them money; then they can go buy stuff. And then when you retired, you were basically living off of deferred wages. What if we just don’t need humans to be working anymore? And I think we may be headed in that direction. It kind of gets to the point you were making, that increasingly the buying power is being funneled toward the top 1 percent.

The opportunity I see is that if we freed up people’s time, then humans can then take care of the older folks or educate and take care of the younger folks. So we have an opportunity where the freed-up time can address problems in society. The older folks and younger folks would benefit, but I don’t see an economic distribution system currently operating that would support that. I’m just wondering, does anybody else worry about technology this way or have ideas or thoughts on this? Because this bothers me. So I’m just wondering if anybody else has ideas on that.

NEIL CHARNESS: I’m happy to jump in, because I’ve done some work kind of in the robotics area as well. First thing to remember is anybody can make a prediction about a future technology, take that prediction and multiply by 3 for how long it’ll be before it comes in. This was driven

home to me by one of my mentors, Herbert Simon, who predicted in 1958 the world chess champion would be a computer. And he was off by 30 years. He was a brilliant individual, but he was extremely enthusiastic about then-new mainframe computers. The same is true to some extent, I think we're going to see, with autonomous vehicles.

These robots, and I should say AI generally, is very brittle. You can get it to work only in very constrained environments—assembly lines, for instance. Most successful industrial robots did AI on assembly lines, putting together cars, but not totally putting together cars. They're good for three *Ds*: dirty, dangerous and dull work. And so it's going to take—we're still a long way, not my lifetime, before we see really good smart autonomous robots that can approach the average five- or six-year-old in terms of managing in an open environment. But I think the day is coming; it won't be in my lifetime, might not be in yours, but it is coming. At which point, this issue of redistribution of work is going to be, I think, a very important question, and maybe we'll have leisure time, but only if the economic system is going to change in ways that don't encourage the top 1 percent to harvest the efforts of everybody else.

STEVE VERNON: I would tend to agree with you in terms of the ultimate eventuality where robots are doing everything. My concern right now is that we are in an in-between phase. Manufacturing jobs are increasingly being automated, so that the good jobs that used to exist for those with just a high school education, get a good line job, those are gone. And so I think we're in a transition phase, and I really wonder where are the good jobs going to come [from] for lots of folks. Are the only jobs going to be as an executive running the machines or as a barista at Starbucks? I don't know where things stand. I think we're in a transition phase, and we're going there right now, and I think that is part of the economic malaise we face.

JEAN-MARC FIX: Yes, and let's remember the transition phase [is] a very unstable phase. If we look at the industrial age, a lot of people were not very happy for quite a few decades before it sorted itself out. So if that does play out—as it has the potential, because, you know—who owns the robot becomes the question, and who gets a chance to use them. So there are a lot of questions on the stability of society, and that's why my dystopian future. There are really very distinctive, as Jay pointed out, potential paths for many reasons, not just for the life expectancy part of things.

JAY OLSHANSKY: It worked. I was just wondering if you would catch my signal.

So I'm a huge—look, I'm a huge fan of science fiction. I've actually, believe it or not, actually have written on this topic, some of the science fiction stories from the 1950s, 1960s. You go back to the old Star Trek movies and what Roddenberry did, and what many of these authors have done is that they've created a vision for the future. You know none of these technologies existed at the time, and we ended up creating many of these technologies, so I'm actually very much in favor of creating a vision for the future that we want to have and then trying to figure out how we get there. And I think that's really where you're going.

I would be cautious about some of the claims that are being made by some, like Ray Kurzweil, for example, who's made the claim that we're all going to be downloading ourselves into these artificial versions of ourself. I'd be a little cautious about that, but having said that, you know these science fiction views, I actually think, give us wonderful vision. I don't know if you're aware of this, but if you go back to the old *2001: A Space Odyssey*. Remember that? The very first iPad was shown in *2001: A Space Odyssey*. Go watch that movie when they're about to land on the moon for the first time. One of the individuals there is playing with an iPad. So the vision for many of our current technologies [was] developed by science fiction authors from decades ago, and the science fiction authors of today are envisioning a future that includes robotics, that includes various ways in which we should be thinking about health and aging and longevity. And you know, while some of them are unrealistic, I think creating the vision is quite useful.

THOMAS GETZEN: Robert Heinlein wrote 50 years ago in *The Moon Is a Harsh Mistress* or “The Roads Must Roll” about news pads—in a 1950s science fiction book. A lot of the other imagined changes did not occur, but a revolution in information technology did. Those manufacturing jobs—they're gone. And I feel a little bad about neoclassical economics. As neoclassical economists, we created a whole bunch of models and did lots of math that's very well suited to an industrial economy of 1890 and maybe all the way up until 1940, but now that doesn't work very well. We use these concepts and mathematical tools all the time, like the Cobb-Douglas production function, where if you work through all the assumptions, money goes in at one end and comes out at the other, and it pretty much gets distributed, and everybody gets the marginal

product, and it all works nicely. But now it's falling apart as we speak. That neoclassical structure got developed when the last thing, the agricultural economy, fell apart. A hundred years ago, most of us were spending all day long trying to get enough calories to survive. Now I'm trying to get enough money to pay my gym membership, so I can go work off the stuff that I ate out there. It's a different world. We've been through one transition. We have not quite gotten the next economic transition—the one where computers and robots do my job.

The guys up at MIT talk a lot about this, and people are worried. There is a good book out on the subject by Brynjolfsson and McAfee. We don't quite have the answers yet. And we certainly don't have the math. The models and math we are using in economics really fit 50 years ago, but trying to use them in 2017 is like using mortality models from 50 or 100 years ago.

JEAN-MARC FIX: Okay, I'll bring another topic here. Social environment, I think we talked a lot about; who wants to talk about health? I think Jay and Phil probably will have something to say about that. Any questions [on] what we're thinking the direction of health will be going in the next 30 to 40 years? Or any other questions you feel like asking?

SUE SAMES: This is Sue Sames. One of the things I think we do spectacularly poorly right now is end-of-life care. How can we make that better? One issue is health care directives: How does someone give direction as to what they want? It seems like we do a really bad job at that currently.

PHILIP SMALLEY: I agree. I think patient compliance—in the old model of the doctor trying to talk to the patient, tell them to take their pills or do whatever—really commonly fails. I think we will be using technology and other ways to try and encourage the older person to be compliant with medical therapy. I also think, looking at preventative medicine, looking at the risk factors, there [are] so many other things that we could try to help encourage the older people to do better.

So I think we will see that continuing squaring off of the survivor curve. I agree with Jay, and I heard him speak, we do have to think about the biology. I still think there is a lot of room to move to be able to better treat, look after the patient as a whole—not just treating disease, but looking at ways to give them quality of life and quantity of life and also help their families. I'm not sure if that gets to your point.

JEAN-MARC FIX: On medical directives and end of life.

PHILLIP SMALLEY: That's another whole topic. Certainly, we're certainly going through this in Canada right now, with a change in being able to have physician-assisted end of life and having medical directives done in advance. I think [this] has got to be something everybody should be thinking about in order to give that dignity to the end of life.

JEAN-MARC FIX: I mean, from an end-of-life perspective, I think our perspective about end of life will be changing. I think that's one of the societal adjustments that we'll be facing. Now, one thing that puzzles me is suicide rates for men have been increasing for many years, especially at the older ages. It's not the case for women. So there [are] other attitudes that come and combat that. And that's what Death with Dignity Acts that we're seeing in a lot of states—pushing for that, I think, is raising the acceptability bar of what needs to be done in certain cases. So I think that that is helping to change the attitude.

But it's bad news. It's like life insurance: People don't want to face bad news. I know that I've been trying to have a health directive for my mother, and she's really not that keen on leaving that control to me.

I couldn't see the name tag anymore. [*Laughter*]

JAY OLSHANSKY: Actually, I want to address this issue of end of life. Look, you know, most of us in this room are old enough to have gone through this experience either with our parents or our grandparents already. And I think in our modern world, we are just simply not prepared to deal with end-of-life issues as [we] probably need to be. Now, I don't actually know how exactly they need to be. I can tell you just from personal experience with my own father's death, for example. When he was approaching the end of life, my sister and I made a decision to give him the last gift we could give him, which is a good death. And it was extraordinarily difficult, and it was very difficult to communicate to the nurses and the doctors—who were also telling us, by the way, that he was going to die. So it was only a matter of time, but making that decision and how you process that and how you proceed and how you communicate with the physician on how to deal with these end-of-life issues—we were just not really very good at it.

And part of the issue that we're going to face in the future is this prediction that I have that Alzheimer's disease is going to go through the roof. That is really going to make things a whole

lot worse, because you've got people who are living a totally different life after they have Alzheimer's disease, and you can live a long time with Alzheimer's disease. So it's a very difficult scenario we've created.

TED GOLDMAN: I'm Ted Goldman with the American Academy of Actuaries. The question the last few days we've talked a lot about people not being prepared for retirement and people not saving enough for retirement—people not being educated or well equipped to figure out how to live in retirement once they have or haven't saved. I'd be really curious about your opinions 30 years from now. Are we going to solve that problem as a society, and if so, what does that look like? Do defined-benefit pension plans come back to life? Really like your thoughts.

JEAN-MARC FIX: Well, I'll start the ball rolling, because that was the topic of the previous session I was at. There are two views of retirement. The first is the one, the ideal picture that the financial planner might paint; the second is that old people will do whatever it takes to survive, just like everybody else. So, the retirement picture that we see today is you save a lot, and then you spend it. This is not working. People are not saving. If you look at any of the numbers, it's a terrible failure from that perspective. But they find other ways to generate income, and that was the topic there.

You have options in life, and the goal, especially now with technology—and maybe that's a cultural shift that needs to happen, but how many of you guys took an Uber today, or not today but have taken Uber ever? Okay. I mean, that's fairly new, and it's a significant driver of old people. and old people use Uber and drive Uber as well. There is the possibility now to realizing the financial value for a lot of your assets, or difference. And I don't think we've really explored the possibilities that can help older people in retirement.

As far as defined-benefit pension, I'm pretty sure the answer is no, it'll never happen again. And I'm not sure that it worked in the first place. This is just an anecdote, but my father-in-law, who had a defined-benefit pension plan, his company bought out his defined-benefit pension plan—paid him a lump sum, which he didn't quite understand what it was, and in the days of double-digit interest rates, was quite low. And that's what he was stuck with the rest of his life. And he managed to keep most of it for somebody else.

FROM THE FLOOR: Do you think they're going to figure this out one way or the other?

JEAN-MARC FIX: Necessity is a good teacher, yeah. And don't underestimate the potential of seniors. Seniors adapt. My mom is 80, and she has no problem adapting to the Internet. She's not as fluent as we are, but look at our kids. Our kids are also much more fluent than we are, but we still are functional, and so are old people. There are a lot of options now with the barrier for communication, as we mentioned earlier, being much lower. Anybody can be a well-published author by sticking something on the Internet, and reaching out really opens a lot of doors that used to be closed.

Any of you guys want to—? It's like a pyramid out there.

THOMAS GETZEN: We have a lot of experience, at least with some aspects of what it means to educate people about financial. It's tough, because people are so different. Frankly, all the tools and stuff that we work with—it really works well at this end of the distribution, where you have a university education, substantial assets and experience with money. And then there is the middle of the distribution, where it kind of works sometimes, and then the other end of the distribution, the people who really need help, where it does not seem to work well at all. I don't think relying on individual initiative and education is enough to solve the problems for most of the people in the middle or the bottom quartile. We have to at least supplement financial education with broader social programs. Our experience has been that when we review what happens with things like financial education, is that there is a ton of uptake by the people who are already well prepared and not so much as we go down toward the people who need help the most.

NEIL CHARNESS: Yeah, I was going to comment: If you look at financial literacy, and there are now good national surveys on that, if anything, it's headed—the last one that was done showed it was dropping, not increasing, which is a kind of a little bit scary. But I'm still very hopeful that we can make a shift. One of the problems—and sociologists have pointed this out for years—is that there is this structural lag built in—and people have been referring to it already in this session—between where we are as a society, particularly in terms of being an aging society, and what our social structures are to accommodate that. And so that lag has to be bridged somehow. Education is one way to do it. I'd love to see a change in our public education system, if it's still

going to be left, because in the United States, we're pushing more towards private education, even in the public sector. I'd like to see us educating people, not on the things they needed in the 19th century and 20th century, but what they need in the 21st. Why can't we be using retirement issues when we train basic math in our public schools? We need to kind of be pushing in a direction of change. It's very hard to do, because public institutions are very slow to change. But I think we need to be pushing in that direction—one of the important things that children should be learning today, and I think that's one of them.

JEAN-MARC FIX: That opens a whole door of financial literacy. I mean retirement is only one aspect of your financial literacy. It's the culminating part. But if you're not financially literate, you won't have to worry about assets to decumulate later.

FROM THE FLOOR: Well, I'm, now that we talked about financial literacy, under the rubric of health; I think it's probably natural for this group. But I'm going to bring us back to the question that was just asked, having to do with end of life, and what immediately popped into my mind was the No. 1 best seller on the *New York Times* book list for many, many months, and that's Atul Gawande's *Being Mortal*. *Being Mortal*—this is a physician who—he and his dad, both physicians, and his mom, a physician—and when his dad came to end of life, they realized that none of them had been trained as physicians to face this. And his book, it's a book, and it's based on a series of articles that he wrote for the *New Yorker*, so I highly recommend it.

But the other piece that I wanted to remind people of is that part of Medicare is hospice. And hospice is something that—if people have not been exposed to hospice, that's something that is built into our medical secure system. And it's slowly gaining more and more acceptance, but I'm not sure how many of you have ever heard of it. Those are my comments.

JEAN-MARC FIX: I think it's part of our personal experience. We're starting to face those issues, and we've become more aware of those services as we have to face the problems they are meant to solve.

FROM THE FLOOR: Again, I think, I mean, it's listed as a service in Medicare, because that's how you pay for it, but I think it's more us accepting it as a service, as our family members and as we need that service.

JEAN-MARC FIX: Yes, this is going to be an anecdotal evidence again, but my experience has been that people in the U.S. are trained to fight through illness until the dire end, and then [it's] only at the very, very end of the dire part that we become willing to face the fact that other choices are possible.

THOMAS GETZEN: Actually, that Atul Gawande book is very powerful, because one of the things he's pointing out is here's somebody who's, you know, at Brigham and Women's [Hospital], a surgeon, and he can't deal with what should be his kind of problem. And we've all seen that we're experts. And I assume at least some people have heard about Danny Kahneman's book *Thinking, Fast and Slow*, which talks about how there are certain patterns in our thinking, and when you give people probabilistic problems, even statisticians revert to their animal brains and figure certain things out. And we may need to accept that our mental structures are conditioned by a long evolutionary history. Certainly about death—we've been facing death for probably as long as it was history. [Laughter] At least once we realized it, right? And it may be important for us as we craft solutions in the future to think about those insights that Kahneman brings to statistics and say, "Oh, what are the patterns that we have inherent in some of our mental structures?" and not just say, "Here's rational thought; here's a formula." People should learn this. But instead, try to work with the—to uncover what our underlying mental structures are and try to work with—certainly in regard to, I think—family and death. And the thing that Jay talked about, which is really increasingly common: How do I, as a family member, help and handle your death? And I think we've got a lot of history there, and we've got a lot of future.

JEAN-MARC FIX: But we need to remember that there is also a lot of cultural variation in that approach, so to the extent that, once again, that we're exposed to more cultural variation. I think that will help in uncovering other patterns, maybe.

Okay, go ahead.

ROB BROWN: Rob Brown. Somewhat simplistically here, if you want to make the economy grow faster, it seems to me one thing you can be really sure of that would help that is to educate everybody really well. If you want to improve societal life expectancy, it seems to me, one of the things you can be sure of that would really help that is to educate everybody really well. If you

want to get rid of obesity and blah, blah, blah, make the list as long as you want. So we've got a situation where the ability of each and every person to get as much education as they are capable of handling is getting tougher. There are kids in Orlando that can't get a full education, will not get a full education. It's getting tougher in the U.S., and in fact, it's getting tougher in Canada to go and get educated as much as you may want.

Now, there's a lot of leadership people in this room, and most of it are in the top 1 percent, 2 percent, so we're at the top of the pyramid, top of the triangle, and it may not matter directly to us, although I would say if you want to live in a sociable and peaceful society, the surest thing you can do is educate everybody really well. So what can we do to turn this horrible trend around? How do we convince society or the people that make the decisions that this would all be really good?

JEAN-MARC FIX: Well, I think this is one of the major questions. All the professors here will lend their expertise in a second, but one of the difficulties is what is "good"?

JAY OLSHANSKY: Look, nobody can disagree with that. Look, there's no question education has always been one of the most powerful forces influencing health, quality and duration of life, but I wish I knew the answer to that. I mean, how do you get subgroups of the population to enhance and encourage education at higher levels? And I would add on and emphasize to your point—and this comes right out of our MacArthur Foundation Project on Aging—that it's not just educating young people, but we're also talking about lifelong education. Education shouldn't be stopping at 24 or 25 or whenever we graduate with our bachelor's degree or whatever; it should go beyond that—even people acquiring new skills at middle and older ages. So I would reinforce your point. I completely agree with it. I just don't know how to achieve it. Maybe Sam has an answer. *[Laughter]*

SAM GUTTERMAN: Let me add a theme that's been running through my mind lately – we have bimodal, distinct population segments – a part super-healthy and another with multiple ailments. The unhealthy segment is of concern — almost 40 percent of the U.S. population are obese, with 10 percent morbidly obese. For example, when I went skiing last week, I didn't see an obese person out on the ski slopes. Similarly regarding finances and retirement preparedness—there are those

who are financially illiterate and who are not adequately saving for retirement, and we've got those who are affluent, who can afford wealth management services.

Actuaries, at least in life insurance, have segmented the population into ever-more refined categories, including super preferreds and what used to call "substandard" risks. Defined benefit plans used to be provided to the employed, who are by definition healthier than the total population. But the prevalence of those plans have been decreasing steadily. Actuaries don't typically respond to the needs of the large part of the population who are unhealthy, who don't have as much prospects, and who don't have the time or resources to be able to be educated. That's obviously overstating the fact, but any observations about the other half that most financial institutions and programs don't serve particularly well?

JEAN-MARC FIX: I don't think that was a question, right? [*Laughter*] And it's one of the failures, I think, of the financial industry in general to not have addressed that need. We see that in retirement, where our work has not been entirely successful. We see that in many other aspects as well—the penetration of life insurance and all that. So we do have a central role to play, and we need to figure out how to play it better. And it's just not an easy task. I mean, a lot of people have been thinking about that. But maybe the last question?

FROM THE FLOOR: Sure, and I'll try to tie it to finances, because it was under health. A couple of you mentioned behavioral health and addiction—those types of things as well. So can you expand further on how you see behavioral health and mental health issues, which we continue to see not so much addressed, and how that will have an impact both financially and in our retirement planning, both for the individual who might be having a mental health issue or behavioral health issue themselves, as well as for their family that they're supporting?

PHILIP SMALLEY: Obviously, it's a very important social problem, and how we're going to deal with mental health disease is a large umbrella. And as people get older and—as we all know in this room—and people start getting Alzheimer's disease and other forms of dementia, the overlap with mental health problems certainly is there, and trying to have medications to treat both and social support dealing with the mental health problem as well as the medical conditions they've got. It's all got to interrelate. And I agree with you; I think we are going to see this being more of

a problem. We have already seen some evidence of this, that the population is suffering from opioid addiction, alcohol abuse and other ways that mental health is manifesting, I think that unless we deal with this problem in a multifaceted approach, I think just educating somebody about some of these factors does not work on its own. I think you've got to pull in all of the biopsychosocial components. My colleague down at the end is a psychologist [and] could possibly build on this, but I think you have to have all of this together to be able to deal with the patient.

NEIL CHARNESS: Let me make just a quick comment. With respect to aging and mental health, in general, the trends are always positive. Depression tends to drop; anxiety tends to drop. In other words, across the life span, at least cross-sectionally, and now I think now we have longitudinal data sets as well, things get better. In fact, you're happiest as you get older, for the most part.

But as was pointed out, the big, big problem is dementia. And even though there seems to be a slight decline now, just the numbers, as Jay has been pointing out, are going to be overwhelming. One of the good things about the Affordable Care Act—and I say it wistfully, because it looks like it's going away in the United States—is that for the first time, it really required providers to provide mental health services. It's going to be a pity if we backtrack on that.

JEAN-MARC FIX: Thank you very much. This is the last session, and I wanted to take this opportunity to thank our panelists for their great—. [*Applause*] Don't forget to fill out your evaluations, and I want to thank all the people that made this symposium possible, and whose names I'm going to read briefly. If you're in the room, if you don't mind standing. Of course, we have our chairperson, Tim Harris; Tom Edwalds; Sam Gutterman; Kai Kaufhold; Ward Kingkaid; Joseph Lu; Robert Pokorski; Anna Rappaport; Henk van Broekhoven; and from the Society, Ronora Stryker and Jan Schuh, who have been really instrumental in the logistics and making this symposium happen. Thank you very much. [*Applause*]

JAY OLSHANSKY: On behalf of the panelists, I want to thank Jean-Marc for putting this together. There is an awful lot of work and discussion that went into the topics and the preparation of the panel to do this. Thank you, Jean-Marc. [*Applause*]

JEAN-MARC FIX: I think you'll agree with me that it was a great meeting. I'll see you guys in three years. I think we are really in the middle of some really exciting changes here, and I've been

at all the symposium, and I've been involved in the last four. It's really a unique forum to see really what is developing with a little bit more foresight than we normally have, and a chance to interact with people from other disciplines, and I think the networking value of that symposium is really critical for its benefit to us as a profession as actuaries but also with interaction with all the other disciplines. And I encourage you to make a point for your management to send more people to the symposium, so we can have even more people next year. Thank you very much. [*Applause*]