Longevity Trends 2020

How longevity is disrupting the world across health, science, business, technology and financial services

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Longevity will be the defining trend of the next decade.

Every sector stands to be disrupted by longevity, whether by changing customer demographics and opportunities, an ageing workforce, new ways to prevent and treat disease, the intersection with rising in wellness and sustainability trends or change across the pensions market.

This report captures Longevity Leaders' extensive research into this space, including the most important longevity trends of 2020 that businesses, policy makers, scientists and the general population need to be aware of.

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Section 1: Ageing Science

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Eric Verdin, Chief Executive Officer, Buck Institute for Research on Ageing

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1.1 Interview: How far have we come, and where are we going?

Eric Verdin, Chief Executive Officer, Buck Institute for Research on Ageing

Interviewed by Angela Tyrrell, SVP, Longevity Leaders

ANGELA: Tell me a little bit about The Buck Institute and your mission in ageing science.

ERIC: The Buck Institute was started in 1999 on the heel of some key discoveries showing that ageing could be studied biologically using the modern tools of genetics. Our mission today is to take what we have learned about ageing during the last 20 years and to start translating these discoveries for improving human healthspan and lifespan.

ANGELA: What were those key discoveries?

ERIC: The initial discoveries by several groups between 1985 and 1995 suggested that there are genes that can mitigate the ageing process. If these genes are mutated to either gain or lose function, one can dramatically impact healthspan and lifespan. These observations were made in a number of models like C.Elegans (or worms), Dresophlla fruit flies and eventually mice. The goal of the Institute for the past twenty years has been to build on these initial discoveries and try to provide a fuller understanding of what ageing is.

We've learned a number of key lessons. Firstly, we've learned that there are genetic pathways that interact together and appear to control ageing. Secondly, these pathways seem to be conserved across different species. So, we find the same pathways in yeast, in worms and in humans. Thirdly, we can speak to these pathways via small molecule drugs to have the same effect as mutating the gene, and subsequently impacting the ageing process. Finally, these genes that control ageing don't just control lifespan, they also control healthspan. The animal models we studied did not only live longer, but they appeared to be healthier for longer.

When you start to look at humans a whole new level of complexity arises, but I think we really need to start examining the relevance of this research in humans. This is something that we are determined and poised to do. **ANGELA:** That leads us to the development of a therapeutic field based on this science. When do therapeutics start to come into the picture, and how do you see that field progressing?

ERIC: We are very much in the middle of this and it's not without its ups and downs. The Buck Institute was associated with launching one of the first ageing therapeutics companies along with the Mayo Clinic, a company called Unity. They have been targeting senescence, trying to eliminate senescent cells. Now it is a public company with a market capitalization of close to a half a billion dollars. It's considered one of the early successes of the ageing field. There were others before, but they almost uniformly ended in failure.

ANGELA: Are there any technologies or pathways that you see emerging beyond cell senescence that you think could prove to be particularly interesting or significant?

ERIC: I tend to look separately at how to target an identified pathway, and at the types of intervention. A lot of people are focussed on developing drugs that control ageing, and this is fine. But I don't think it is where the most important work lies today, because these drugs are going to take years to develop and many are going to fail.

We need to focus on what we have today. Some of the key areas that we really have to address to increase our longevity are things like nutrition, exercise, sleep and stress. Unfortunately, a lot of the knowledge in these fields is fragmented. For example, how exactly does exercise impact longevity? We know it does, but we don't know what forms of exercise are effective – endurance vs high intensity interval training? 10,000 steps vs 4,000 steps? We need a molecular-level data to increase our knowledge.

ANGELA: That leads perfectly to my next question: where do you see major gaps in our

knowledge and in which areas would you like to see **ANGELA:** That is a very admirable mission, and I more research emerging?

"Our understanding of ageing is still as a process caused by multiple factors. I remain convinced that there has to be a unifying theory"

ERIC: At a basic biology level we have identified what are commonly called The Hallmarks of Ageing. years? This is a series of problems that we see emerging during ageing and include things like mitochondrial dysfunction, stem cell dysfunction and so on. We have eight or nine of those. The problem is that we don't really understand how they are related. As a result, our understanding of ageing is still as a process caused by multiple factors. I remain convinced that there has to be a unifying theory, and this is something we're interested in at the Buck.

One of the oldest questions in ageing science is why do different species have different life expectancies? Why do we live to eighty years while a mouse only three? There's an inherent diversity across species. If we understood why certain other species live so long, we might be able to replicate this in humans.

We can also go back to the question of exercise we know that exercise increases lifespan, but we don't really understand how it works. The same goes for nutrition. There's a clear link between over-eating and a shortened lifespan, or decreased nutrition (such as calorie restriction) and increased lifespan. But we don't fully understand the best recommendations to make to people. There's a lot of work right now on fasting which seems to have a beneficial effect, but we don't know how, and we don't know what forms of fasting. We don't really know what we should be eating - carbohydrates or proteins or fats - or in what proportion. We can raise the same sort of questions for sleep or stress.

There is a lot of conflicting information in the public domain right now. Some studies generate a high degree of publicity that they potentially should not receive. Other very strong studies may not receive any attention from press. Part of the mission of the Buck is to publicise validated and curated information to help people make the best lifestyle decisions to maximise their healthspan.

How do you see this field evolving in the next five

ERIC: In the next five years there's a critical need to be able to measure the validity of interventions without waiting for our whole lifespan. Right now, if we make an intervention that we think will increase lifespan we need to study it for twenty or thirty or forty years for an answer. We cannot run clinical trials this way.

One solution is to develop biomarkers of ageing. That is, we need to be able to assess whether a given person is ageing well or ageing poorly at a biological level.

A comparative field would be statins, a class of medicines to lower cholesterol levels. We know that by measuring cholesterol we can predict a person's risk of a heart attack. So the pharmaceutical industry developed medicines that lowers cholesterol as a preventative measure. We measure the effectiveness of statins by measuring cholesterol. We need a similar paradigm for ageing.

There is a lot of interest in the field to identify markers that predict a person's rate of ageing, because we know all of us are ageing at a different quality, a different rate. Some of us are going to live to 90 or 100. And some of us are going to live to 70. The question is, can you look at a 40-year-old and predict their trajectory? Imagine the potential if we can deploy anti-ageing intervention to those at risk of early death or declining health. So, for me, the priority for the next five years is the development of biomarkers of ageing.

We are also in the early stage of testing some anti-ageing interventions, which I think will progress over the next five years. There are clinical trials ongoing for senolytics, for metformin and for rapamycin. I hope that in the next five to ten years we will see the first ageing drugs available.

"For me, the priority for the next five years is the development of biomarkers of ageing"

ANGELA: Do you see a change in how industry - and I'm thinking particularly of Big Pharma - are approaching or starting to approach this field?

ERIC: They have been sideline players to date. Ageing interventions are intensely disruptive to Big Pharma's business model, which is traditionally organised into therapeutic areas around things like heart disease or infectious disease. It's the way that medicine as a whole tends to be organised. If you have a heart problem, you see a cardiologist. If you have a lung problem, you see a pulmonologist.

Ageing biology presents a different way of organising medicine and of treating disease. Ageing affects every single organ, so if your intervention targets an ageing pathway, you will affect the development of diseases in different organs. That doesn't fit in the traditional field of medicine. So, one of the biggest challenges we face – not just with industry, but with physicians and funding agencies as well – is convincing people that we should be studying disease in the context of pathways that are universal across different organs. We need to change the way that we practice medicine to aim for a preventative approach. I think a lot of people will be reluctant to accept the new model, but this is ultimately what we should be working towards.

ANGELA: Agreed! And to finish off Eric, what would you do with five extra years of healthy life for yourself?

ERIC: I love life! I would keep doing exactly what I what I'm doing now, working to try and change the world. In the old days when labour was physically intensive, the whole idea of retiring, of drawing a pension, was the norm. I envision a future where people remain physically and mentally healthy for longer. So, for me, I have no intention of retiring because this is what I love to do.

"We need to change the way that we practice medicine to aim for a preventative approach"



1.2 Roundtable: Tackling clinical development challenges within ageing science

Joan Mannick, Chief Medical Officer, resTORbio, Inc Steven Braithwaite, Chief Scientific Officer, Alkahest

Moderator: James Peyer, Founder & Managing Partner, Cambrian Bio

JAMES: Let's start with a quick introduction to give readers some context about the type of work you're each doing in this space.

STEVEN: Alkahest is built on the science from the lab of Tony Wyss-Coray at Stanford, who identified that there are circulating factors in plasma that can rejuvenate or restore function in the ageing brain. This is a systematic anti-ageing concept meaning that we can develop anti-ageing therapies based on the plasma proteome, using plasma fractions as therapeutics not just in the brain, but driving antiageing biology throughout the body. Within the plasma there are also critical hub proteins that can be therapeutic targets in their own right.

We're building clinical programmes based on plasma factions in areas like Alzheimer's disease, Parkinson's disease and broader inflammatory ageing disorders. We're also finding individual protein targets in indications such as age-related macular degeneration and neurodegenerative disorders for more traditional therapeutic routes.

JOAN: resTORbio is a spin-out out of a program that started at Novartis targeting the biology of ageing as a new way to prevent or treat ageingrelated diseases. The first pathway we're focusing on is the activity of a protein complex called TORC1. In every preclinical species studied to date, inhibition of TORC1 activity extended both lifespan and healthspan. The function of some (but not all) ageing organ systems is also improved in older animals given TORC1 inhibitors. At resTORbio we're tackling this one organ system at a time to see what translates to humans and what doesn't.

In our first program we investigated whether TORC1 inhibitors improved immune function in older people. In previous Phase 2 trials we showed that TORC1 inhibitors enhance influenza vaccine response and decrease T lymphocyte exhaustion in older people. TORC1 inhibitors were also associated with a decreased incidence of respiratory tract infections in two Phase 2 trials, but not in our recent Phase 3 trial. We have to do a deep dive in

the data to figure out the difference between the results in the Phase 2 and Phase 3 trials.

In the meantime, we have another program targeting neurodegeneration. TORC1 inhibitors have shown clinical benefit in preclinical models of Parkinson's disease, Alzheimer's disease and Huntington's disease, all of which have protein aggregation as an underlying pathology. TORC1 inhibitors have been observed to induce autophagy, which is a process by which cells clear protein aggregates. Therefore, TORC1 inhibitors may have clinical benefit in neurodegenerative diseases by inducing autophagy and clearing toxic protein aggregates. So at resTORbio, we're moving ahead just one organ system at a time, doing rigorous science to figure out where the findings from the preclinical species will translate and have benefit in humans.

JAMES: Excellent, thanks to you both. Now as we dive into some of the questions, please don't be afraid to give some detail about how this emerging ageing biology space that we're all a part of is unique from traditional biotech development, and what makes ageing biology a different beast to tackle.

Let's talk about overall development pathways. What are the special considerations that you have to take into account when developing a therapy based on the biology of ageing compared to developing a traditional therapy?

JOAN: One of the really tricky parts about clinical development in this space is that ageing occurs over a very long period of time. You have to pick ageing-related clinical endpoints that can be assessed in a shorter period of time. Figuring out those endpoints is critical because we have to have smaller proof-of-concept trials where we can get a go/no-go decision in a short period of time without a huge clinical trial that will de-risk later stage development. It has to be thoughtfully considered when moving the preclinical science to the clinic.

approach with a plasma fraction.

We'll be presenting our top line data in

"Defining what population you want to target is a challenge because ageing is a risk factor for almost every disease"

The expanse of potential indications is enormous. Pinning down which indication will have the highest probability of success requires a lot of thought.

STEVEN: I think that's a major issue, that ageing per say is not an indication area. There is no regulatory path for anti-ageing therapies. Our long-term goal is that we will develop therapeutics that modulate the biology of ageing and will have impact across multiple disorders. But practically, we have to go through a more traditional indication space at the moment and as Joan said, pretty much every indication except some genetic disorders. Therefore picking the right indication to target is key.

It's also very hard to translate preclinical findings from a two or three-year old mouse to a human with a lifespan of eighty plus years. How is the biology different? We have to build translational tools to actually understand how we improve going from preclinical to clinical studies.

JAMES: I couldn't agree more with many of those challenges raised. Tell me about some of the ongoing trials that you're watching in this space right now?

STEVEN: I think we're all watching the individual mechanisms that have been connected to the biology of ageing. The trials that Unity have been doing around cell senescence are very interesting. We're all going to learn a lot from the deeper analysis of those studies. Even if the primary endpoints don't hit, we're going to learn a lot from secondary end points and a lot from the secondary biology.

I'm personally very excited to learn more from resTORbio's studies. Again, even if they haven't hit the primary endpoint, there is going to be a wealth of data generated that will help us learn the right utility of modulating mTOR pathway.

We have our own studies at Alkahest that are reading out now, taking a more multi-modal

Alzheimer's disease soon, but the deeper analysis of biomarkers is what will be key to progressing field-wide understanding.

Clearly, one of the key studies in the ageing field is Nir Barzilai's TAME study testing metformin in ageing. Key here will be looking at novel endpoints, at developments of co-morbidities and how we shift the onset of multiple disorders, as a model for how to take a long-term anti-ageing therapy forwards.

The other studies that I'm interested in are the broader studies looking at exercise or diets, for example. We're going to learn a lot from these longer, broader studies which are nonpharmacological, particularly looking at how endpoints are changing there.

JOAN: I think Steven is spot-on. We hope the information gleaned from our Phase 3 trial will move the field ahead because we'll learn more about how to improve trial designs and identify appropriate patient populations. We have to continue moving this preclinical science into humans with more rigorous, placebo-controlled trials. We need to learn what's going to translate and what isn't, and in which populations. Even though it's, of course, very disappointing to have a negative trial, there can be a lot of very important and valuable information to be gleaned that will help future studies succeed.

JAMES: Absolutely. That's the nature of biotech R&D broadly, right? We all have to recognize that not every trial is going to be a breakthrough. It is a risky business. I really applaud your willingness to say "this one didn't work out exactly as we had hoped it would, but now we're going to figure out what we can learn and how to adjust." There are lots of nuggets of really interesting truth in this biology.

JOAN: Exactly. It's really interesting. It can be hard to take the hits when you're breaking new ground and the data doesn't come out the way

"One thing I've really enjoyed about being in the ageing field is that we are forming a very collaborative community. In some ways we need to be pre-competitive at this stage" you expected. But we will all learn a lot from analysing what happens as we move this science into humans.

STEVEN: One thing I've really enjoyed about being in the ageing field is that we are forming a very collaborative community. In some ways we need to be pre-competitive at this stage. That's something that this field has taken to heart and it has been very open about the studies going on. We just have so much to learn from each other.

JAMES: We've talked about existing trials within the current biotech development framework. Looking forward, would you describe what the ideal clinical trial looks like for ageing-related therapeutics? What patient population do you want to be able to treat? What kind of biomarkers or endpoints are you looking for?

JOAN: In the future we may be able to personalise ageing-related therapeutics. For instance it would be useful to develop biomarkers of ageing-related biochemical pathways and then use therapeutics targeting specific biochemical pathways in the specific patients who have dysregulation of the pathways of underlying ageing-related diseases.

STEVEN: I think there will be a sequence of what we need to learn from trials. In the short term we have to go through trials which have relatively rapid and a very mechanism-based, target-based readout. We can't be doing trials that are five years long. We then need to be able to pick up exploratory endpoints in these trials which will help us learn more about long term efficacy. These short-term trials are going to be very targeted. We have to modulate factors which actually are problems for patients. We need to have functional outcomes with a therapeutic utility, while learning more about long term effects.

Decades into the future we'll be talking much more about preventative therapies - prophylactic products we can take years before onset of symptoms. We can't develop in that way right now. But the more we can learn from today's trials about how we're modulating longer term biology, the longer-term outlook is that we'll have prophylactic therapies too.

JAMES: Is there a model, perhaps one that has been used in the past, that might lay the groundwork for future clinical development applicable to the ageing space? **STEVEN:** It's similar to looking at a biomarker like cholesterol. We're going to learn that some of these biomarkers of ageing eventually translate to something, and that we can modulate a signal in the short term for longer term efficacy.

JAMES: So in order to get there, we might need to produce an equivalent to the Framingham Heart Study that laid the groundwork for the FDA approving cholesterol modulation as both an end point and as primary prevention. That was an exceptionally long-term study. Do you think we need to take lessons from existing short-term trials and initiate a long-term trial similar to the Framingham Heart Study? Or is there another way?

JOAN: A different way of thinking about this can be drawing on a field like oncology, where ageing is a result of signal pathway biochemical or biologic perturbations. Different perturbations are going to play more or less of a role in how each individual ages. We can then identify the pathway perturbations in different populations and target them more specifically with a personalised medicine approach.

JAMES: So you could take something like autophagy - cellular recycling mechanisms where we know that the rate of autophagy in cells tends to be higher when we are younger and decrease as we age - and look for a biomarker for broad rates of autophagy or autophagy under a fasted state or something equivalent to that. Then using that biomarker, we can justify an intervention like an`mTOR inhibitor targeted specifically to increase rates of autophagy.

JOAN: Right. For instance in neurodegenerative diseases, different patient populations may benefit from interventions targeting different parts of the autophagy pathway.

STEVEN: You make a very good point that we see increased heterogeneity as patients get older. We certainly see this a lot in preclinical studies, specifically increased heterogeneity in animals when we work with older populations. In every setting this makes running clinical trials even harder. The more that we can do to narrow patient heterogeneity through personalisation, the better the probability of a successful trial to actually develop these drugs.

"Do you think that ageing biology is big and impactful enough to become its own branch of the biopharma ecosystem?" **JAMES:** Do you think that ageing biology is big and impactful enough to become its own branch of the biopharma ecosystem, or will it represent a family of mechanisms that sit within existing umbrellas?

STEVEN: Five years ago nobody was talking about modulating ageing as a therapeutic approach. The biopharmaceutical sector was so indication-only based it was heretical to talk about modulating ageing. That has changed, and now it is more widely accepted that modulating the biology of ageing has a fundamental influence across multiple disorders. The FDA and other agencies are keen to address how to build therapeutics for the growing ageing population. So, I think there's been a very rapid maturation of the field and an acceptance that ageing should be thought about as a primacy. We have to navigate through the hurdles of how to develop these therapeutics. But I really believe that it is going to become a fundamental target in its own right.

pharma. It won't just be a little niche.

JAMES: That's very exciting! The last piece that I want to address in this discussion relates to something that I think we're all pretty sensitive about, which is what's real versus what's hype in the ageing biology space? How much of the value is preventing disease, like modulating ageing has the potential to do, versus treating existing indications like today's short-term trials are aiming to do?

STEVEN: We need to prove that we're actually making an impact and that cannot be by conducting long term trials at the moment. We need to be having near-term impacts and we need to be learning about the potential for the long term through biomarkers. But right now, the value drive has to be on short term efficacy readouts that are really impacting individual disorders.

"We are targeting a risk factor that has never been targeted before and that people didn't realize could be modified"

JOAN: People have to realise that if ageing is the biggest risk factor for most diseases and it's modifiable, that becomes a whole new area of medicine and drug development that we haven't previously targeted. My prediction is that it will develop into its own area in both biotech and **JOAN:** Often times it is easier to demonstrate that a therapeutic can treat rather than prevent a disease in a clinical trial. However, targeting the biology of ageing either to prevent or treat diseases is exciting scientifically, because it is a previously unexplored area of medicine.



1.3 Interview: The investment landscape for ageing therapeutics

Sergey Young, Founder, Longevity Vision Fund

Interviewed by: Terry O'Dwyer, Chief Executive Officer, Longevity Leaders

TERRY: Tell us about your views on investing into ageing science? How do you keep up with the longevity investment landscape?

SERGEY: With all the fast, technological progress taking place in the longevity space and the advent of technologies such as AI transforming the longevity landscape, I use the "3 Horizons of Longevity" framework to map the longevity & ageing investment landscape. Horizon One represents today - technology currently available that has the potential to expand our lifespans to 100 years, such as DIY diagnostics, wearables, digital healthcare delivery, medical software & apps. Horizon Two represents tomorrow, the emerging technology with the potential to expand our lifespans to 150 years, such as genome therapy and editing, stem cell therapy, nanorobots, Albased diagnostics or drug discovery and smart hospital. Horizon Three represents the future, things like age reversal, brain-computer integration, have already found it! However, taking some base avatars and Internet of the Body.

TERRY: What major changes or breakthroughs have you observed in this field? What do you think is changing the game?

SERGEY: We invest across all three horizons at Longevity Vision Fund, but mainly focus on the first two, which offer the most immediate breakthroughs. Freenome is an example of one of our portfolio companies that is changing the game. They are an AI-based blood (liquid biopsy) testing for early detection and proactive intervention of cancer without the need of unnecessary, more invasive biopsies. Early diagnosis of certain cancers means a recovery rates exceeding ninety three percent.

Another is LyGenesis, an organ regeneration company that uses lymph nodes to regrow functioning organs within the patient's own body. This has the potential to completely eradicate the problem of organ rejection in transplantation patients and solve the unmet demand for organ supply.

Finally, there is Insilico Medicine, a next-generation

Al drug discovery and development company. The company's core competence is the identification and validation of novel disease targets. Insilico's latest key achievement is the demonstration of Insilico's capability to design, synthesize and validate novel drug-like molecules in just 46 days, compared to the 2-3 years typically required by big pharma companies without this technology

TERRY: What should everyone know about longevity and living to 100? How do you attain this goal?

SERGEY: People don't always believe that living to 100 is attainable or realistic, that being a centenarian is becoming the new norm.

In terms of attaining longevity, there is no magic potion - if there was only one solution, we would steps will ensure that you live long and well. For example, something as simple as getting regular annual check-ups. Getting diagnosed early can extend your life by 10 years or more. Even the most serious and fatal diseases are treatable if diagnosed early.

Quit smoking now. Everyone already knows the health dangers of smoking, so I won't go into it here, but keep in mind that life expectancy for smokers is 5-10 years shorter than for nonsmokers. Quitting smoking before turning 40 reduces the risk of dying from smoking related disease by 90%.

Finally, decrease your calories. Intermittent fasting and a heavily plant-based diet cutting out added sugars and processed foods has been shown to positively impact life expectancy. Apart from that, habits like taking at least 10,000 steps a day, engaging in quality sleep and practicing meditation will take you even closer to living to a happy and healthy 100.

TERRY: You are the author of Longevity @ Work program. Can you tell us more about it?

SERGEY: Longevity @ Work is the first corporate longevity program in the world, the aim of which is to create healthy longevity-friendly environments. It is delivered as part of my mission to extend healthy lifespans of 1 billion people. I have already launched the first pilot program at a large international financial organization of 300,000 employees, which has delivered amazing results such as 8M years collectively added to employees' lifespans, +100M GBP additional revenue due to the reduction of employees' sick days by 1 day and +15% increase in the happiness index of employees.

I now aim to launch this program in the UK and the USA with startups and SMEs, as most people in the UK work at these rather than large corporations. This has the potential to improve health and longevity on a national level. Participation focusses on the most impactful steps to maximizing longevity including fighting deadly monsters with annual health checkups, quitting smoking, driving responsibly, cutting calories by 25%, eating organic and unprocessed food, ensuring you walk 10,000 steps daily and enhancing your mind with regular

meditation, tech-enhanced sleep and acts of kindness

TERRY: You're speaking at next year's Longevity Leaders World Congress on the topic of the morality of immortality. Can you offer some insight about what this implies and why you think it is important?

SERGEY: People who know me, know that I plan to live to 200. This made me think carefully on the subject of immortality and its implications. If you had a choice of how long to live – what would you choose? Would you want to live forever if you could? This raises many deep questions and deserves a whole encyclopaedia on this topic altogether! In my talk I will address whether extending our lifespans is ethical and sustainable, if it would divide society and how we could bridge the gap between the rich and the poor. I will also paint a picture of what the world might look like once we all live to 200 – and hopefully, that's a picture yourself or your kids will live to see!

"This has the potential to improve health and longevity on a national level"



Section 2: Age Tech and Business

2.1 White paper: 8 sectors to be disrupted by longevity

Angela Tyrrell, Senior Vice President, Longevity Leaders

- What is the Longevity Dividend and why is it important?
- How longevity might be saving sectors in crisis
- Which sectors are already realising the benefit of the longevity market?

2.2 Roundtable: Investment in Age Tech

Jonathan Synett, Chief Investment Officer, NCL Technology Ventures Dominic Endicott, Managing Partner, 4GEN Ventures Keren Etkin, The Gerontechnologist

- Why Age Tech is emerging as an important asset class
- Which products and services are likely to see early success?
- Age Tech investment landscape in the next five years

2.3 White paper: Striving for Blue Zone Equality – the dysfunctional truth about longevity

Yvonne Sonsino, Partner & Innovation Leader, Mercer

- Who is funding our increasing longevity?
- How are firms changing at an organisational level?
- Who is already capturing the Longevity Dividend successfully?

2.4 White paper: How longevity and the Future of Work will transform all sectors

Dr Jean Accius, Senior Vice President for Thought Leadership & International Affairs, AARP

- Implications of longevity for workplaces
- Business opportunity and imperative
- Addressing inequality and disparity

2.1 White paper: 8 sectors to be disrupted by Longevity

Angela Tyrrell, SVP, Longevity Leaders

Longevity is one of the most important and disruptive trends of 2020. We are living longer than ever, but how we age is changing dramatically. Baby Boomers are actively aware of the later life challenges experienced by their own parents, and of the challenges that they themselves experience as their primary carers. They are making the lifestyle changes needed to ensure that their finances, health and wellbeing are optimised in later life, and that their children's lives are better for it.

As a result, our ageing populations are becoming healthier, more active, more socially connected and more financially secure. It has been estimated that Americans over 50 control 76% of disposable income and drive 50% of all spending. Over the next twenty years the spending power of this group is expected to exceed \$4 trillion. Looking beyond the numbers, Baby Boomers are demanding more from later life, and the products and services on offer for them. This offers both a tremendous opportunity for businesses willing to recognise and seize it, and a threat for those that ignore it.

A good example is the tech industry. Although traditionally associated with youth markets, big tech companies have quietly identified and been providing for a newly active, engaged and wealthy ageing customer. Apple's Apple Watch Series 5 now contains a number of functions to assist ageing consumers, including fall detection, an EKG monitor, international emergency calling and a Noise App that helps users to understand ambient sound levels in environments that could negatively affect hearing. But those tools are useful for everyone, I hear you cry! Well yes, that's the point. As the Ford Focus proved years ago with larger, brighter dashboards and comfortable ergonomic seats, what's good for an ageing customer is good for all consumers.

Apple aren't the only tech company making subtle changes to provide for an ageing consumer. In 2018 Amazon's health team were reported to be in talks with AARP – the not-for-profit organisation set up to "empower people to choose how they live as they age" – about making products for older people. Television adverts for Apple's Siri, Amazon's Echo and Alexa or Google Home make clear that an ageing demographic forms a core target market for smart virtual assistants. Samsung are working with software start-up Zone-V to provide an age-friendly user experience on their smartphones. Over-55s in the UK now spend more time on Facebook than 18-24s. And let's not forget that the World Wide Web was invented by a Baby Boomer in the first place.

This quiet change in the tech landscape begs the question: which other sectors are likely to be disrupted – or even saved - by longevity?

1. Retail

Retail is a sector in crisis. The bricks and mortar business model is under serious threat of extinction, and most high street retailers are still struggling to commercialise digital distribution to a satisfactory level. Meanwhile younger generations are demanding ethical and sustainable (and more expensive) manufacturing practices and materials, and increasingly choosing to spend on recycled fashion or with ethical independent brands over traditional retailers.

Meanwhile, recent work by the International Longevity Centre suggests that spending on fashion and beauty by people over 50 in the UK will increase by £11bn (or 60%) between 2019 and 2040, making them the retail sector's key consumer base in that time. Older consumers also tend to exhibit more consistent brand lovalty to retailers who have served them well over the years, and place greater value on the physical space and sense of community that well-loved brands can provide. But it's not all about bricks and mortar for older consumers. Recent numbers from BI Intelligence suggest that they are also spending more time online, and spending a larger proportion of that time online shopping compared with their younger counterparts.

Rather than disrupting retail, I would argue that older consumers have the ability to save retail. But retailers still need to adapt if they are to benefit. single customer segment, but a richly diverse collection of different types of travellers. At the very least, there is a huge difference between the

"Retailers need to get beyond "over 50s" as a target market and segment that group with the same attention to detail as "under 50s" when devising offerings"

Firstly, a shift in mindset about what an "ageing customer" wants to buy is needed. Contrary to popular belief, that is not (unsurprisingly) a preference for frumpy clothing or unattractive mobility tools marketed with a slightly patronising tone. Secondly, retailers need to get beyond "over 50s" as a target market and segment that group with the same attention to detail as "under 50s" when devising offerings. Thirdly, retailers should look not at where these groups spend their money, but at how they prefer to spend their time. Whether it is a preference for the sense of community that a store can deliver or the peace of shopping online from home, the physical shopping experience needs to be better tailored towards an ageing demographic.

2. Travel and tourism

Since retiring four years ago, my parents have been to Belize, Jamaica, Mexico, Russia, Egypt, China and South Africa, in addition to the more traditional destinations in Europe and the United States. Currently they are planning their 2020 trips to Sri Lanka and Cuba. My 88-year-old grandmother just returned from an adventure in Indonesia and Borneo. My mother-in-law and her disabled partner spent last April traipsing through India. None of them are naturally intrepid people, and having expendable income for the first time in their lives have spent it ensuring that they feel safe and comfortable during those trips. Although my mother books most of it herself online she still pays a travel agent to make sure that she has someone she can contact in emergencies. The whole sample size (admittedly of just five people) agree that there is no travel option less appealing to them than a cruise.

I can safely say that the older generation of my family contribute vastly more to the global travel and tourism economy than the younger ones, who are restricted by time, money and young families. No business class or month-long holidays for us, we go for a week, and on a tight budget. And yet travel marketing to anybody older than parents of youngish children seems to fall exclusively towards cruises, golf retreats or package deals. Travel and tourism are missing a massive opportunity.

As with retail, travel and tourism providers need to appreciate that "over 50s" or "retirees" are not a

travel needs and desires of an active 65-year-old and their 90-year-old parent. It would also do to remember that in many cases the offering doesn't need to change, just who it's being offered to and how.

3. Insurance

Converse from many of the other sectors in this list, I would describe the insurance sector as "engaged" in the longevity opportunity. It makes sense, this is a field that has always been interested in how people age and how long they live, whether providing life, health or pensions insurance. But insurers can't realise the longevity dividend on their own, they need others engaged to really maximise their own opportunity in this space.

For example, they need corporate employers to understand the reality of an ageing workforce, and the responsibility that they have to help their employees age well physically, mentally and financially. Once accepted employers can look to insurers to help them, whether that's providing more comprehensive health services to employees helping to improve general wellbeing and reinforce healthy behaviours or insuring large portions of their longevity risk to ensure that pension members are guaranteed a financially stable future.

There is a lot of talk in insurance circles about what sorts of new products might better support an ageing society. An interesting area ripe for disruption is financial advice. Planning for retirement is a complex affair incorporating multiple pensions, asset management, housing, future health and care provisions and legacy planning. Few of us have been asked to look at our assets with this degree of detail while we're earning and lack the experience to make informed decisions. Professional advice is expensive. There is an opportunity for financial institutions such as insurers to fill this gap, barring complex regulatory considerations. The emergence of increasingly sophisticated algorithmic tools might provide a way to bring costs down while providing better advice to customers. Generally, this is an exciting field and one I look forward to seeing develop. providing better advice to customers.

4. Retail banking

Retail banks are a funny one because they tend to think they have longevity covered. In fact, my research suggests that they are still missing the mark. Customers of a certain age are accounted for by the bank's Vulnerable Customers programme. There's a problem here on two fronts. Firstly, this is falling into the old stereotype that old age equals vulnerability. As the insurance sector understands, being older and closer to or in retirement actually drives far better understanding of one's personal finances and associated risks and opportunities. A great many older banking customers won't consider themselves as vulnerable. Rather, many think of themselves as informed and proactively financially responsible. They also tend to hold vast amounts of wealth relative to their younger relations. By classing these engaged, wealthy older customers as "vulnerable" banks are missing out on developing targeted products and services to suit their specific needs.

There's no getting away from the fact however, that many older people do fall within the Vulnerable Customer remit. But herein lies the second problem: the practices in place to protect these customers don't seem to be working. Crime figures analysed by AgeUK suggest that an older person becomes a victim of financial fraud every forty seconds. Gone are the days when our bank manager knows our name and the details of our life and lifestyle and would be in a position to personally detect and intervene any suspicious behaviour.

Banks have a couple of options here, and they don't necessarily need to be mutually exclusive. Banking itself has already seen massive disruption in the past ten years with the rise of fintech. Within this field lie some interesting fraud detection and management tools specifically designed for the longevity market. Applications like Kalgera allow family members to safely detect and action unusual activity on older relatives' bank accounts. Banks have an opportunity to develop or partner with fintech tools offering more personalised fraud detection.

The other option is developing a new version of the old model of actual in-person personalisation.

Remember that bank teller who used to know everyone's name? As with retailers, banks have a unique opportunity to provide a physical touchpoint with customers. Tweaking that user experience could pave the way for better customer service, better brand loyalty and ultimately more customers, not just among older consumers but among all consumers.

5. Advertising and media

There is growing awareness that traditional representations of older adults in advertising is off. The assumption has typically been that older consumers don't switch brands or change habits, so marketing to them is a waste of time and resources. When older adults are portrayed in advertising it tends to be either sat in front of the television sad, helpless and lonely, or walking hand in hand along a beach ironclad in linen, or perhaps taking a swing on the golf course. One of the identified problems with advertising is that it tends to be staffed by youngsters who lean towards these stereotypes having no experience of it themselves.

There has been a change in attitude in the advertising sector, mainly as executive staff begin to hit that "over 50s" milestone and realise that they don't see themselves represented in their own work. But advertising agencies are still at the behest of their clients. Clients who typically want to build their profile among younger consumers. As with insurance, advertising can't seize the longevity opportunity without bringing others along for the ride.

Disruption does seem just around the corner, however. In 2019 the BBC reported on the rise of Instagram "granfluencers" living and posting with attitude. Also, in 2019 Getty Images published the Disrupt Ageing Collection, a series of stock photos presenting the diversity and holistic nature of growing older. Helen Mirren, Emma Thompson and Jane Fonda were among the actors portraying imperfect, complex and interesting older characters on the big screen. The prevalence and representation of ageing in the media is changing, and with it will come major disruption to the worlds of branding and advertising.

"Tweaking that user experience could pave the way for better customer service, better brand loyalty and ultimately more customers, not just among older consumers but among all consumers"

6. Beauty

The longevity market is already driving disruption in the beauty sector. Beauty is an industry highly connected to its customers and foresaw the shift away from "ageing" and towards "longevity" a few years back. Now instead of anti-ageing products, consumers can obtain products that "restore glow" or "improve firmness and elasticity." Beauty brands are confidently displaying older models (although still predominantly female) and have tapped into the positivity of ageing. This is one sector that has embraced the value that an older consumer base can bring.

Perhaps the next wave of disruption for the beauty sector in the context of longevity will be more closely aligned to the field of ageing science. Traditionally beauty companies have shied away from claims that may see their products regulated as therapeutic or pharmaceuticals. However most big brands run extensive Research & Development laboratories for whom emerging insights into ageing pathways is interesting. The development of therapeutic products based on biological ageing pathways could be a game-changer for beauty.

7. Wellness

Wellness is another sector that is starting to change with the emergence of a longevity economy. Evidence from the ageing science community continues to stress the importance of things like exercise, diet and nutrition, mental health, sleep and even certain supplements like metformin on longevity and healthspan. The more evidence published the better educated consumers become on the role that they have to play in their own longevity. This is driving a booming wellness market, as people embrace lifelong healthy practices to help them "age better."

That said wellness is still seen as the domain of the young and the sexy. When applied to an ageing population the language tends to change, prioritising disease prevention and healthy life extension, not bad concepts but not exactly inspirational. For older people, wellness is still seen as a government rather than commercial remit. A major opportunity lies at the intersection of wellness and longevity that will only be fully realised when an ageing consumer is embraced. Wellness could learn a lot from the beauty sector in this regard.

8. Medicine and healthcare

Yes, medicine and healthcare. The most obvious. And the most challenging. Without good health and access to good healthcare, none of the above happens. This is the sector that, regardless of geographical region, will be under the most pressure to adapt to an ageing population.

There are some promising signs. Governments around the world have recognised the importance of basic health education to retain health in later life. Businesses are starting to recognise their obligation to keep employees happy and healthy and are offering services accordingly. Digital health platforms and telemedicine are providing access to cost-effective healthcare to those who might previously have missed out. Tracking and testing tools are helping to drive proactive health management at an individual level. Preventative health is an important component of the ageing story, and one that seems to be moving.

But prevention doesn't address the major problems in areas like long term care or chronic disease management. These desperately need to be tackled to support an ageing population for whom preventative measures have failed, or never reached. The ageing science community will say that this is what they are working towards, that they envision a world where we have therapeutic interventions available to stop chronic disease or the need for long term care. A cynic might question the availability of these therapies to the general population, or at least their expected timeline for delivery (at best five to ten years).

For me, this is the sector that is most likely to be disrupted because it is in the most critical need for disruption. The field of ageing science and upstream intervention offers the most legitimate path forward. But it will require a huge shift in mindset from healthcare providers, from drug companies, from policy makers and from the general public, as well as responsible and "nonhyped" development and communication from the scientists themselves, to be fully realised and accepted.

"A major opportunity lies at the intersection of wellness and longevity that will only be fully realised when an ageing consumer is embraced"

2.2 Roundtable: Investment in Age Tech

Jonathan Synett, CIO, NCL Technology Ventures Dominic Endicott, Managing Partner, 4GEN Ventures Keren Etkin, The Gerontechnologist

Moderator: Terry O'Dwyer, Chief Executive Officer, Longevity Leaders

TERRY: Let's start with definitions. How would you define age tech? What are the sorts of platforms or technologies that you think might come under that banner?

DOMINIC: To me, Age Tech is the digital-enabled market opportunity from consumers over fifty (an arbitrary cut off I know). Today I would estimate that there is a 20 trillion dollar spend in this older demographic segment, and roughly 5 percent of that is digital. So, that gives us about a trillion dollar market opportunity in Age Tech.

A core theory within Age Tech is that digital will make itself accessible to people that today don't access it. For example, Apple's facial recognition technology opens up an experience for older people who might be less dexterous. It doesn't have to be about ageing per se, it's can be about how technology can make products and services accessible for everybody in society, in particular for older people.

JONATHAN: There are two ways of looking at it. A very simple definition would be it is technology which is targeting an elderly segment of the population. Within that, you could break it down into repurposed applications of existing technology to serve the elderly market; and new businesses which are specifically focused on elderly people. Some examples of the former might include voice recognition technology applications in small homes or assisted living accommodations. Examples of the latter might be sensors for cognitive decline or devices for improving hearing.

KEREN: I would broadly agree. It is also important that the technology has been designed with older adults in mind and that they have been included in that design process.

TERRY: Why are we talking about Age Tech now? Why do we see this as an important emerging asset class and why do we think people are starting to get a lot more interested in a lot more excited about it?

DOMINIC: There's an emerging awareness of how much older people contribute to the economy as a group. Roughly three quarters of the wealth in the world is owned by people over 50, and the hold somewhere in the order of 40 to 50 percent of all disposable income. They are an interesting consumer class that has to date been somewhat ignored. If you look at most venture backed companies targeting consumers, fewer than 1 percent of VC dollars are going into this class and yet the opportunity is staggering.

We are also starting to see some big exits which have raised awareness and interest in the segment. Pill Pack, for example. Babylon Health is another. The exists are bringing awareness about the segment's potential and people are starting to think that maybe this could be the next big thing.

JONATHAN: I agree it's becoming increasingly important. Although, I would argue it is not quite mainstream yet.

Everyone knows that this is a wealthy segment, and a growing segment. It's also a segment which is becoming much more comfortable with technology. Everyone likes to say how their grandma is on Facebook now, for example.

On a societal level, elderly populations are having a massive impact on the healthcare system and on the cost of healthcare. I think it's very important for technology to come in and try and solve some of these problems, to try to improve quality of life and to reduce the burden on the healthcare system.

It is also not just about health and well-being, but also things like education and financial wellness. There are lot of people approaching their 50s and 60s who are going to live longer than they thought. It's important from a societal point of view that the poorer demographic of this ageing population is properly prepared. Otherwise, it has the potential to make certain aspects of a society unsustainable. **TERRY:** What do we think will be the successful emerging technologies in this category? Have you come across any particularly exciting products or services?

have really cracked a business model that feels scalable. There are other underdeveloped areas that offer massive opportunities such as work, learning, training and skills development.

"Five or ten years ago, there was a perception that older people only need health services. That is now evolving to encompass areas like housing, social, communication and finance."

KEREN: I see entrepreneurs starting to develop a more holistic view of the ageing population. Five or ten years ago, there was a perception that older people only need health services. That is now evolving to encompass areas like housing, social, communication and finance. As entrepreneurs start to become caregivers to their own parents, you start to see initiatives for family caregivers who are overburdened and overstressed. Once they start to look for tech solutions for themselves or for their parents, they see that there is a huge gap – and therefore opportunity

TERRY: What are the disruptors on the care tech side of the equation?

DOMINIC: You have the care recipients, you have the care givers and then the care employees, all under a huge amount of stress. For example, care employees often having to go from job to job. Commuting may be an issue and they're often not able to spend sufficient time with their care recipients. Scheduling software and computer models that are rethinking at a fundamental level how to optimise deployment of care employees can have a real impact here.

It's important to point out that even though we talk about tech, I would argue that the human side is just as, if not, more critical. In practice that means, how do you enable people to be more efficient by making use of the available technology?

JONATHAN: One area I could highlight, and where we've seen a lot of companies emerge in the last few years, is home monitoring. These are technologies or tools that offer support to both the patient and the caregiver by creating an environment of reduced stress. It's a growing market and a tremendous amount of innovation is emerging.

TERRY: Care tech is of course only one vertical in Age Tech. Which do you think is the most exciting or most fruitful area for innovation right now?

DOMINIC: We've looked at the U.K. market and identified roughly five hundred companies in Age Tech. Roughly half of them are in health or care. So clearly, right now, that's where you see the most activity. But it's not clear that many of them

KEREN: There's a huge opportunity for work. People don't necessarily want to keep working full time. They don't necessarily want to keep working in the same workplace. Some of them want to start their own business in their 60s or 70s. Workplaces will need to adapt to an ageing demographic as well.

Learning is going to have a huge part to play in this. New places where older adults can acquire education, retrain or reskill will emerge. New types of employment will become increasingly important. For example, we have the gig economy, which usually is targeted toward younger people. In fact, this type of work could elicit a lot of older adults who want to work on their own terms for some extra income.

DOMINIC: Another field would be food and nutrition. A really interesting start-up ecosystem that has emerged here, including cloud kitchens and farm-to-table delivery. These are currently catering for the Gen X's but could pivot into an ageing demographic as a next-generation version of Meals on Wheels.

KEREN: I also think that the built environment will come into focus. The whole topic of age friendly cities is exciting and important. Age Tech will play a huge role in the ability of more people to age well in society and in the community, especially in Europe. We need to make public spaces safer for people who walk slowly, for example. Cities and urban environments will also need to create spaces that encourage social interactions, because we know that as people grow older, unfortunately they have fewer options to be social with other people in their day-to-day life.

DOMINIC: We see the built environment as a monster opportunity, especially in the context of the home. We see a massive opportunity associated with "elegant downsizing" and rethinking the home, the house, the block, the neighbourhood and ultimately the city. This gets even more interesting when we associate it with the carbon neutral movement. The optimal city will be good for 80-year olds and 8 year olds. Trillions of dollars that should largely go into funding these age friendly cities. It will take a little while to get going, but it will it will actually

outweigh everything else.

TERRY: What is standing in the way of developing these obviously very important and necessary innovations?

TERRY: Let's do some crystal ball gazing. Tell me, what do you think we can expect to see in the world of Age Tech investment in the next five years?

DOMINIC: We estimate that today Age Tech is

"Ageism is prevalent, particularly in the tech world. We need a fundamental shift in how we think and develop new models in the context of longevity."

DOMINIC: Mindset at a macro level. Ageism is prevalent, particularly in the tech world. We need a fundamental shift in how we think and develop new models in the context of longevity.

JONATHAN: I don't think there are enough entrepreneurs, business owners and investors who cater to an ageing demographic. The tech industry is young, and they develop businesses for young people. And that is a a big problem. An attitudinal shift is required.

The other major obstacle holding Age Tech back is the question of business models. Specifically, within health and social care where the business models are broken in many ways. The payer model in healthcare makes it challenging to roll out technologies.

TERRY: When do you expect to see Age Tech really come into its own?

JONATHAN: I don't think the penny is going to drop in the next twelve months or so unfortunately. There are huge societal issues that need to be sorted out before Age Tech really takes off. But we're certainly not far away.

KEREN: My sense from entrepreneurs in this space is that fund raising is extremely difficult because, as you know, most VCs don't really have domain expertise on this. However, I think that the penny is going to drop with the investor community quite soon, perhaps in the next twenty-four to thirty-six months. worth roughly ten billion a year globally.

We think that's going to grow to one hundred billion between now and roughly 2025. Where that's going to happen is a really interesting question. I would argue that actually Europe has a huge opportunity, I think it's a natural home for Age Tech. But I think the U.S. and China, when they wake up, will move a lot faster.

JONATHAN: I think Age Tech will become mainstream within the next few years. You'll have funds that are specifically focused on aged tech and aged care. I think we'll see more and more dedicated programmes and accelerators emerge in the next few years.

KEREN: I think we're going to see more of what we've seen in the past two years, which is at Amazon and Apple and sometimes Google dipping into this market and not only with investments, but also with acquisitions. I think we're also going to see a lot of big corporates trying to win back Baby Boomers as primary customers. We're going to see a lot more corporate venture arms trying to dip into this market.

Companies that sell products and services that are respectful of older adults, include them in the design process and make them feel like their opinions and needs matter will emerge successful. And the companies with the smartest marketing strategies that think deeply about the elder demographic market will win big.

"We estimate that today Age Tech is worth roughly ten billion a year globally. We think that's going to grow to one hundred billion between now and roughly 2025."

2.3 Striving for Blue Zone Equality – the dysfunctional truth about longevity

Yvonne Sonsino, Partner, Multinational Client Group; Global Co-Leader of Next Stage, Mercer

How do we tackle an emerging dysfunctional truth about longevity? There is already a shocking problem of health inequality across the UK population, with as much as a twenty-year difference in the healthy life expectancy (HLE) of people who live in the east and west side of Glasgow. Hardly a fair comparison with the socalled 'Blue Zones', geographic regions where super ageing populations thrive and there are higher proportions of centenarians than any other regions in the world. Simple lifestyles with regular downtime, a mostly plant-based diet, physical outdoor activity, no smoking, social engagement - these are some of the common factors that span the Blue Zones such as in Italy, Japan and Greece. Scientists are also studying high-altitude Blue Zone areas such as Nepal, Tibet and China, where native flora can effectively counteract the ageing process.

There is an emerging and increasingly serious field of drug development counteracting the ageing process. Some prominent scientists proclaim we are just 10 or 20 years away from widely available inexpensive drugs that will extend HLE to 150. Many have been taking Metformin for years, and extol the human life extending qualities of this drug, more usually used in the treatment of Type 2 Diabetes.

But even if the science enables living to 150, the social sciences are not yet ready with the answers as to how this extra HLE will be funded. The drugs may be cheap but living costs will not simply disappear.

In my view, the Longevity Dividend needs to be measured by a unit that is achievable, sustainable and more equitable for all. This is where the scientists should investigate the social science implications of what it will really be like living to 150. People in highly developed countries with strong and stable pensions and savings systems *already run out money* somewhere between 8 and 20 years before they die*. If we really are looking at a 150-year life, then given current savings habits, people will run out of money some 80 years or more before they die. This emerging dysfunctional truth about longevity is clearly neither achievable nor sustainable.



Figure 12: Expected proportion of retirement income by source

*2019, World Economic Forum, Investing in and for our future, pg. 21, fig 12.

"The Longevity Dividend needs to be measured by a unit that is achievable, sustainable and more equitable for all"

How we can maximise the 'Longevity Dividend'?

Let's explore the options, and maybe take a closer look at some of the Blue Zone success factors.

Working longer is the immediate reaction when you hear the facts about longevity, and if extra life expectancy is healthy, as the scientists espouse, then that should be a perfectly feasible option. But currently, the experience of working longer for many is that they encounter ageism, prejudice, pay and promotion stagnation, lack of training and find it an almost impossible task to get hired after age 50. In the tech environment, they can experience all of these things at an even earlier age, and some have taken drastic measures to disguise their age. In a recent survey 89% of employees in the tech sector agreed that ageism is rife, with a quarter of these saying it starts as young as age 36.

However, the real Longevity Dividend could be enjoyed right now by organisations if they looked more carefully at their number one asset - their people. Mercer's Next Stage research shows that age and experience add value to business performance. Companies who use data analytics and business impact modelling to examine their own organisational demographic data discover the real drivers of business performance. This is the type of dividend that pays back to companies and economies alike. And it pays back to individuals, as fulfilling work gives them a sense of purpose, a sense of belonging and there is much scientific evidence to support that these feelings lead to actual physical good health and wellbeing. Preventative health interventions that adopt the blue zone winning tactics on diet and recreation will also pay dividends. So, we need to take a balanced approach to understanding and crystallising the longevity dividend.

What are firms doing to capture 'Longevity Dividend'?

Some companies are using analytics and business impact modelling to examine their own organisational data to discover what drives business performance. In fact, our research found that age diverse teams outperform:

• Experienced workers lower costs because they are less likely to leave and, interestingly, so are the people they supervise. Turnover and onboarding can cost businesses between 25% and 300% of annual pay per person. A 5% reduction in t/o saved one of our clients \$66m in cost per unit and \$31m improvement in operating margin

- Experienced workers increase productivity

 one study with a US bank showed that specific branch performance had increased revenue of \$40m per year for each year of extra service / age of its sales team
- Yet 20% of job leavers in the UK aged 50-64 are being made redundant. That makes no sense – employers need to analyse their own data to isolate performance drivers and optimise them. Optimisation could be through constructing and maintaining age diverse teams, so redundancy for this potentially outperforming segment of the population could be counterproductive.

Organisations are also exploring the intersection of retirement plan design and flexible working. Across eight of the top developed countries, there is already more than \$70 trillion pensions gap between what people have saved and what they will need for retirement and as stated, many will run out of money long before they die. Retirement affordability is already a serious issue; people will have to continue to work to earn.

But pension plan design can put handcuffs on employers and employees, by prohibiting phased retirement and congruent flexible working. There should be mandatory enabling mechanisms to allow employees to transition from work to non-work over a longer period of time to suit changing physical and financial needs. The decision is binary in many countries - you either work or retire, there is no middle ground. In recent focus groups with the over 50s in the UK. we found that four out of five employees wanted to 'work differently' in future. Half wanted more flexibility, and less working hours. The other half were hungry for a new challenge. It's time to investigate flexible working, later-life career reinvention opportunities and retirement programmes in a holistic way to ensure they enable the new multistage life approach and capture a longevity dividend.

Not only do organisations need to enable phased retirement and flexible working, employers need to make the workplace a great place to be for older workers. Addressing ageist practices is key to this, and by undertaking pay, promotion, bonus award, performance grade and hiring equity checks, employers can get to see the full extent of potential ageist outcomes. According to our research, less than 3 in 10 companies do any of "Across eight of the top developed countries, there is already more than \$70 trillion pensions gap between what people have saved and what they will need for retirement"

these checks; of those that do, more than two thirds find these checks to be an effective way to become more 'age friendly'. Even more shocking is that less than 1 in 10 companies have examined the age distribution of training spend – if they do, they will find is heavily skewed towards younger workers. It's simply unacceptable to discriminate on grounds of age – it's illegal and immoral.

Finally, companies are starting to realise the importance of taking a lifelong learning approach. People have an appetite for learning – in the US, as many as 57% of workers in some states have 'skills anxiety' and believe they need more training to stay relevant for jobs of the future. In focus groups in Europe this year, we found as many as 62% of the over 50s prioritised lifelong learning opportunities as part of their future development plans, and 55% had undertaken new skills training in the last three years.

What is changing for organisations?

Firms are facing real labour and skills shortages impacting their businesses. By 2022 in the UK, there will be 700k fewer school leavers and 3.7m more workers over 50. Fuelling economic growth in some geographies, the only growing labour pool to tap into is older and experienced workers. Organisations are also telling us that they have now 'done' gender, they are ready to tackle the last bastion of D and I – ageism. There's a movement brewing. It's not just Greta Thunberg that has found her voice. I'm interviewing an 84-year old blogger next month and I can tell you she has found hers too! She assures me that being 84 is absolutely fabulous.

A final note of caution – age discrimination is the highest growing litigation in the US right now. In the UK, in order to be legally compliant with the law on age discrimination, there needs to be an organisational strategy designed for older workers, implemented throughout the company and proactively managed.

Science and social science have a chasm to bridge over the dysfunctional truth about longevity, and to identify new ways of living and working. Embracing generation after generation is what the longevity dividend is really about, whether you live in a blue zone or not.



Are you age-ready?



Our population is ageing to the extent never experienced before in history. To continue strong economic growth, it is vital to support people to live healthier lives and stay in the workforce for longer.

Mercer's Next Stage platform explores futurefit approaches to longevity. In our new point of view, we show how smart employers can optimise their workforce performance by capturing the value of age and experience in a changing world of work.

Discover the steps you can take today to build an ageready organisation.

To learn more and download our point of view, visit: www.mercer.com/mercernextstage



2.4 How longevity and the Future of Work will transform all sectors

Dr Jean Accius, Senior Vice President for Thought Leadership & International Affairs, AARP

The big economic story of late has been all about technology. Rapid advances in artificial intelligence and big data, all part of a <u>"Fourth Industrial Revolution"</u>, dominate headlines, and understandably so. After all, the shifts are unprecedented and revolutionizing, with implications that span the range of society.

But the same can be said of another huge trend, for it promises to produce change that is in some ways equally profound. That trend is longevity and the ageing of the population. From a workplace and business perspective, the longevity trend affects employers and employees. It affects organization's products and services as well as the consumers of those products and services. It affects infrastructure, and it affects workers' families. In other words, as with the latest technology revolution, it affects everything and everyone.

The Implications of Longevity

People are living longer, and the population is ageing. According to leading researchers, the average 10-year old child who lives in a nation with one of the longest average life spans can expect to live to at least 100. That means up to six decades of work. Today in the U.S., 10,000 people turn 65 every day, and in just 11 years, millennials, who already represent the <u>largest</u> <u>generation</u> in the labor force, will start to turn 50.

Not surprisingly, more people want or need to work in their later years. Today many people no longer see their career's end goal to be full retirement and a life of leisure; instead, the vision for later life may be a new career, partial employment or simply the continued gratification of continued work. Perhaps most importantly, more years of life mean the need for more financial resources. Working later in life both pays the bills during those extra years of work and also means more years of saving for whenever one chooses to, or must, stopping working.

Business Opportunity and Imperative

Fortunately, the era of older workers is good news for all stakeholders, particularly employers.

Research shows that productivity is highest when generations work side-by-side, that diverse teams drive better financial returns, and that mixed-age teams outperform others. Employers benefit from the retention of intellectual capital, a more stable, productive and engaged workforce, and closer alignment to market needs.

Yet this vision is not merely an exciting opportunity; it's a must. With an ever-increasing proportion of all workers being what was once considered "older," failing to tap later-career talent could mean worker-shortage challenges. Further, any organization providing a product or service—that is, all organizations including those in the private-, government- and nonprofit sectors—must understand their inevitably ageing customers. Age diversity, therefore, becomes a business imperative in that respect as well. AARP's recently released Longevity Economy Outlook finds that economic activity driven by people ages 50-plus totals \$8.3 trillion, accounting for 56 cents of every dollar spent in the U.S., and those numbers will only rise. Understanding that market is a necessity.

Finally, there is the importance of corporate responsibility. Today, customers and investors expect companies to maintain high environmental, social, and governance (ESG) standards; age must be a part of an organization's diversity and inclusion efforts to drive good governance and ensure sustainability. Age diversity, therefore, is not only good for society, it's good business.

Action Required

Yet as with anything, tapping the opportunities of an age-diverse workforce requires planning and investment. To harness the power of this trend rather than get blindsided by it, all sectors must come together to design and plan with intention. Executives need to think creatively about talent – how to value it, where to find it, how to unleash it and how to keep it. Fostering a climate of respect and fairness for all – including opportunities for meaningful work and skills development – is crucial. "The vision for later life may be a new career, partial ` employment or simply the continued gratification of continued work"

Policies affecting recruitment, assessment, retention, compensation, life-long learning, health and wellness and retirement all need to be ageand stage-inclusive. To build a thriving ageinclusive workforce, employers must reimagine benefit packages and recruitment and retention practices. They should reimagine training and development, ensuring everyone gets opportunities to contribute, no matter their stage or age. One example: "Returnship" programs that broaden the options for people starting a new life chapter, such as after parenting, or for former retirees who wish to resume working, help an organization attain and retain critical skills.

As with the technology revolution touching all aspects of our lives, government has an equally important role to play. Policy addressing paid time off for family caregiving is one example, while strong policy can also help enable workers to be retrained or pursue more education.

AARP is helping to accelerate the pace of change by, among other efforts, teaming up with the World Economic Forum and OECD in an effort called <u>"Living, Learning and Earning Longer."</u> The initiative, which engages some of the most prominent global companies and organizations, will further build the business case for age diversity and highlight best practices from around the world.

Reality Check: Ageing's Disparity

It's time for a reality check. Despite the opportunity, challenges are already here, for the benefits of longevity are not reaching everyone, with differences in income and <u>inequity driving</u> <u>disparities in life-expectancy</u>. Moreover, not everyone can work longer. Health concerns or caring for a loved one full time can end workers' paid employment, to name just two factors. In addition, some jobs are not suited for older works. Employers and policy makers must address and factor in these issues.

Further, another matter arises concerning age, health and work. Traditionally, science and medicine (and even the public) have focused on extending lifespan, but we now understand the importance of health span—that is, that healthy longevity is necessary to both work and quality of life. We also now understand that work has health benefits (and social benefits, also related to health), making all these pieces inextricably linked.

Identifying strategies and priorities to enable healthy longevity is key. Toward that, AARP is sponsoring the <u>National Academy of Medicine's</u> (NAM) Global Roadmap for Healthy Longevity. As part of those efforts, AARP is taking a leadership role to ensure that issues of equity are a core focus.

Our Choice

We can't alter demographic trends, yet today we nevertheless stand at a crossroads. We can either ignore these trends and wait to see what happens, or we can embrace them, plan and create. We can design how we want our changing world to look and tap its great opportunity.

The choice is ours.

"Traditionally, science and medicine (and even the public) have focused on extending lifespan,but we now understand the importance of health span"

THE FUTURE IS LIVING, LEARNING, AND EARNING LONGER.

As people live longer, healthier lives, many will want or need to work longer. Longevity thus presents an opportunity and responsibility for governments, employers, and people of all ages to reimagine what it means to earn and learn over a lifetime. The future is Living, Learning, and Earning Longer.

Learn more about this initiative: www.aarpinternational.org/llel



Section 3: Longevity Risk

3.1 Roundtable: The impact of scientific, medical and socioeconomic trends on life expectancy

S. Jay Olshansky, Chief Scientific Officer, Lapatus Solutions Aubrey de Grey, Co-Founder & Chief Scientific Officer, SENS Research Foundation Stuart McDonald, Head of Demographic Assumptions & Methodology, Scottish Widows

Moderator: Paul Kitson, Partner & Pension & Savings Disruption Lead, PwC

- Predicting changes to life expectancy
- Life expectancy metrics and how to use them
- Examining equality of access to scientific and medical advances

3.2 Roundtable: The rise of the superfund

Adam Saron, Chief Executive Officer, CLARA Pensions Antony Barker, Managing Director, Asset & Liability Management & Solutions, The Pension Superfund Jay Shah, Chief Origination Officer, Pension Insurance Corporation

Moderator: Angela Tyrrell, Senior Vice President, Longevity Leaders

- What is longevity risk and how has it been managed traditionally?
- Unpicking the superfund model
- Regulatory framework for consolidators vs insurers

3.3 How the pension de-risking market can overcome obstacles to further growth

Victoria Sander, Partner, Latham & Watkins

- Conversion of longevity swaps to buy-ins and buy-outs
- Examining insurer flexibility
- Will private equity heighten consolidator engagement?

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PAUL To start us off, give us a brief overview of your thoughts on human life expectancy and in particular, what's likely to change?

AUBREY: My personal view is that both in the U.K. and in the wider developed world we are likely to continue to see an increasing levelling off of life expectancy in the short term. We may even see a slight decline in life expectancy by the traditional measure and early period life expectancy in some countries. The USA leading the charge in that race to the bottom.

But in ten to twenty years-time things may be beginning to look very different. We may be starting to see the signs of the next revolution in medicine, a revolution that will see a change in the trajectory of life expectancy. It could be even more dramatic than what we saw one hundred and fifty years ago, when the ability to contain and avoid early death from infections became increasingly widespread.

This will occur as a result of what I call rejuvenation medicine. In other words, medicine that actually turns back biological age rather than just slowing down biological age advancement. Of course, we don't know for sure that this technology will come along twenty years from now. But the present challenge is worth waiting for.

JAY: As we all know, life expectancy rose by about fifty years in the last century or so. It's decelerated in recent years in spite of people claiming that it will continue to increase as it has in the past. This recent deceleration in the rise in life expectancy and even decline should not be news to most people. It's been predicted by many for almost thirty years now.

Exactly why it's happening also should not be a surprise. That, too, has been discussed extensively in the scientific literature. The logic behind

these life expectancy models is based on the use of blinders, looking only to the past and extrapolating into the future. This is a really bad idea as we know that the future cannot be like the past, and we can no longer achieve the gains in life expectancy that were associated with reductions in infant child and maternal mortality. Ageing is what gets in the way, and we can't modify ageing - yet.

I agree with Aubrey that we don't know when it's going to be, but I'm very optimistic that we are going to find a way to break through this longevity ceiling.

Now, whether or not we can achieve gains in life expectancy in the future that are on par with what we saw in the past, unlike Aubrey, I'm sceptical that that is going to happen. Keep in mind that you when you save children from dying, you add seven, eight, nine decades of life. The increases in life expectancy are dramatic. You would have to add the same seven, eight, nine decades of life to a 70-, 80- or 90-year-old today to achieve the same result. I haven't seen any evidence presented to suggest that that is even remotely possible.

I believe that as long as we live now is about as long as we're going to live, based on current technology, on what we're capable of doing today. I've referred to this as peak longevity. That shouldn't be interpreted to mean that there is a biological limit specifically for the purpose of keeping us from living longer. It's a limit imposed by body design.

STUART: I agree with much of what Aubrey and Jay have said, and sit between their two viewpoints on where life expectancy is headed over the next couple of decades. Despite the deceleration in life expectancy gains that's been called out, life expectancy in the U.K. today is the

"The vision for later life may be a new career, partial employment or simply the continued gratification of continued work"

highest it's ever been. It's rising and has been for more than a century.

I think comments so far have focused on total life expectancy from birth. I'm an actuary looking at insurance and pensions risks. That means I'm most interested in life expectancy for members of pension schemes. I need to make allowance for expected changes to death rates during the remaining lifetime of those pensioners.

Life expectancy for a 65-year-old retiree today is about twenty-two years for males and about twenty-four years for females. That's higher than many people realise – it's a real concern that people systemically underestimate how long they are likely to live when making financial plans.

I'm expecting life expectancy to change relatively slowly over the next five to ten years, but then potentially more rapidly after that. I'd anticipate about a one-year increase in the life expectancy of retirees over the next decade and then maybe another one to two years increase on top of that in the 2030s. Personally, I'm much more confident in the first prediction than the second one. The level of uncertainty increases pretty rapidly as we look further ahead.

PAUL: Aubrey, could you explain some of the big developments, or perhaps barriers that need to be overcome, in order to unlock the potential of transformative regenerative medicine?

AUBREY: Rejuvenation is damage repair. It is restoration of the molecular and cellular structure and composition of our tissues and organs to something like how they were at an earlier age in early adulthood. It's a divide and conquer approach.

Some stem cell therapies are going really well right now. There are clinical trials in indications like Parkinson's disease attempting to demonstrate repair of damage from ageing. There are also clinical trials in removal of senescent cells, or zombie cells that are hanging out, not necessarily dividing, but not dying when they should and creating difficulties for their environment.

The most difficult areas are mitochondrial mutation accumulation and also the loss of elasticity of

various tissues, especially the artery walls. I'm delighted to say that in the past couple of years we have had enormous breakthroughs in these areas. At this point, we can be a lot more optimistic about how soon we may actually reach a decisive level of comprehensiveness in our ability to repair damage and thereby cause people to remain youthful. Of course, that will have a consequence on mortality rates, irrespective of how long ago they were born.

PAUL: Jay, the question I want to put to you is around life expectancy metrics. How we use them and what should our focus be, or not be?

JAY: First of all, the metric of life expectancy itself is not a good one, it's an insensitive one. The higher it gets, the more difficult it becomes to move it further. I'm not a big fan of using life expectancy for just about anything, truth be told, and certainly not forecasting. It's just not going to move that fast.

Really, our focus should not be trying to make us live longer. We should be focused on extending the period of healthy life. A longer life extension without health extension could very well be harmful. Now, chances are we're going to live longer as a result of ageing science's impact on health span. How much? I don't know, but I don't actually care all that much about how much longer we might live. I'm far more interested in how much more we can extend the period of healthy life and compress the period of frailty and disability at the end of life.

I agree with Aubrey that there are really exciting lines of research now going on in the study of senescent "zombie" cells as well as the clinical trials on metformin that are beginning.

But it's not going to be easy to determine the effect on lifespan, because it takes too long to study. Anybody claiming that these interventions will make people live ten, twenty, fifty years longer is making it up out of thin air. There's no way to possibly know what the effect will be on a population. The point I'm making is that you have to be careful about the absence of legitimate scientific methods for assessing longevity, and the effects of any intervention that we're looking at.

"Anybody claiming that these interventions will make people live ten, twenty, fifty years longer is making it up out of thin air" By contrast, healthspan can be measured quickly and easily. Scientific tools allow us to understand the effects of interventions on healthspan far more efficiently and more effectively, and within a short time period. So that's the reason why I'm suggesting that we focus on healthspan rather than lifespan.

AUBREY: Let me just add to this. I am characterized often in the media as taking a view that rather strongly departs from what Jay just said. People call me the Prophet of Immortality and so on. This is very frustrating. Pretty much all of what Jay says is absolutely identical to my own view. I've been getting more and more aggressive over the years onstage and on camera making this point: lifespan is a side effect of health.

With regard to testing, though, I think we can do better than what Jay had just said. We have seen in model organisms that some interventions don't just reduce mortality rates in the near term, but also throughout the remaining lifespan. Then it's a reasonably justified extrapolation to determine what this probably means for lifespan extension even from a short-term study.

Some of the interventions we're talking about may or may not be as effective in extreme old age as they might be if they begin earlier in life. But I think this just points to the difficulty in generating research designed to test a hypothesis within ageing. It's not untestable, it's just the difficult one to do.

PAUL: Stuart, you're the actuary who thinks about life expectancy risk in the context of pensions. This discussion really demonstrates the sort of challenges an actuary might have in managing risk. What are your thoughts on this debate?

STUART: I take some comfort from the fact that I am not having to forecast for younger people. As you can tell, there are a wide range of views even among well-informed experts. There is a significantly narrower range of possible futures when considering only older lives. Actuaries shouldn't get too much confidence from their ability to forecast life expectancy for retirees and extend that down to younger age groups without allowing for the additional uncertainty.

The first thing that actuaries need to do is to get

their starting point right. We've talked a lot about how things will change in the future. Actually, the difference between the life expectancy of richer and poorer groups today is bigger than the uncertainty around how the population death rates will change in the next couple of decades. It's really crucial to allow for these socioeconomic differences, both in assessing current mortality rates and also the rate of future change. We've seen a slowdown in the pace of mortality improvements over the past decade within the general population, but it didn't affect everybody equally. So, we need to allow for the possibility that more affluent groups may well continue to outperform the average level of mortality improvement.

Actuaries increasingly need to cast a very wide net when forming their views on life expectancy. Relevant developments are coming from many different fields, including some of those discussed already today. We need to rely on the expertise of others, but also appreciate the limits of those expert opinions. For example, a cardiovascular expert asked thirty years ago about improvements in preventing and treating heart attacks and strokes might have missed the impact that technology like mobile phones would have, through reducing response times.

Finally, we need to be realistic about our ability to make these forecasts. We need to ensure that the institutions we are advising will be solvent in cases where life expectancy increases more rapidly or indeed more slowly than our best estimate view. A key part of our role is communicating uncertainty rather than producing a single deterministic projection.

PAUL: The question of inequality is one that is paramount in longevity. Do you have a view on the potential for the benefits of this research; will it become the preserve of the rich and affluent? Will it be available for everyone or will it exacerbate the socio-economic divide?

AUBREY: The question of whether and when this medicine comes along is, of course, a very open question. It's pioneering research. However, the question of what happens when it comes along is not an open question at all. It's completely clear to me. These therapies will reach everyone and anyone who is old enough – irrespective of ability

"The difference between the life expectancy of richer and poorer groups today is bigger than the uncertainty around how the population death rates will change in the next couple of decades"

to pay.

This is because it would be economically suicidal for governments not to make sure that they frontload the investment that's required to build the infrastructure and train the medical personnel and so on. The overwhelming majority of medical expenditure across the entire industrialized world is directed at the health problems of later life. Governments and society stand to gain an insane amount of money by a focus on prevention and preventative healthcare. Jay was a prominent participant in an important initiative more than a decade ago called the Longevity Dividend Initiative, in which this was pointed out. Things haven't changed since then.

JAY: That said, there isn't anything of value in the world of medicine and public health that is equitably distributed. Nothing. Clean water. Fresh food. Access to health care, income, education. All of these factors influence longevity. The forces that they exert on survival prospects are dramatic. They are not small. They are not equitably distributed.

Let me first emphasize something I consider of great importance. This is the next big breakthrough in public health, on par with what we saw in the middle of the 20th century with the introduction of antibiotics, the advent of vaccines and the emergence of basic public health services. We are talking about a huge sea change. I share Aubrey's optimism that this is going to happen. Not only is it going to happen, we need to be aggressively pursuing it for all of the obvious reasons.

However, I don't anticipate it will make its way equitably to the population to begin with. Some of these compounds or potential genetic interventions are likely to be costly and anything that is costly is not going to be equitably distributed. Now something like metformin, for example, could be different. It is an inexpensive drug that could make its way to the population very much like aspirin.

PAUL: Stuart, what is your sense of longevity and the gaps between different socio-economic groups? Will we see the them converge? Do you have any view on what's caused the difference over the last few years?

STUART: Whether the life expectancy of different groups will continue to diverge, or will converge

probably depends on the timeframe you measure. I do expect some further divergence in the near term, with perhaps some convergence to follow thereafter. As a rule of thumb, when life expectancy is increasing slowly as it has in recent years, it tends to mean that the gap between rich and poor is getting larger. That's a simple function of the fact that you get the most "bang for your buck" in increasing life expectancy when you focus on those at the more deprived end of the spectrum. It's mathematically similar to Jay's earlier point that you increase average life expectancy much more when you save a child than an older person.

A few things that I think could make a real difference in years ahead, and which could have a different impact on different socio-economic groups, would be public education, particularly around things like diet and exercise; nudges, like the recent sugar tax; moving towards a total smoking ban; and any changes to access to medical and social care. These are absolutely crucial to life expectancy.

There's a big dependency on the extent to which governments are prepared to direct increased funding towards those areas to meet the demands of an ageing and growing population. How governments invest in these public health issues will be very relevant to the level of life expectancy increase that we see, and how equitably that's shared across the population. If you could bring everybody up to the level of the least deprived ten percent that would make a much larger difference over the next twenty years than any of the sexy new science.

JAY: My colleagues and I published an article several years ago entitled Two Americas at the Dawn of the 21st Century, where we were arguing the same thing – that there is a vast difference among population subgroups and it's going to grow larger. There was also a paper that came out in the Journal of the American Medical Association that documented in great detail the disparities that exist in life expectancy in the United States and the cause of the decline that's actually been occurring since about 2010. Part of the takeaway message from this latest research is that the issue, at least in the United States, is a systemic problem of disparities. It's not one that is getting better, but one that is getting worse. As

"This is the next big breakthrough in public health, on par with what we saw in the middle of the 20th century with the introduction of antibiotics, the advent of vaccines and the emergence of basic public health services" *"It's not currently possible to measure anyone's biological age, period. We can't say you're chronologically 60 and biologically 55 with any degree of confidence"*

a systemic issue, it means that the problem is going to echo across future generations.

AUBREY: Let me clarify my position on this particular point of inequality, as I fear I may have given the wrong impression. It is not that I think that there's going to be absolute egalitarian access to this. Of course, there is a great deal of disparity in terms of access and ability to pay to some public goods, like education, for example. But if we look at basic education for young kids it is actually pretty much free at the point of delivery, irrespective of ability to pay, even in the USA. I think that we will see universal access to the basics and that that will have a pretty rapid impact on life expectancy, whether period life expectancy or anything else.

PAUL: Let's change tack a bit. One of the things I've seen commentators talk about in the field is the ability for one to find out one's biological age. We've already seen one case in Germany where a man went to court to be recognised by biological age rather than chronological age. What are your views on the science of biological age, or the role that biological age may play in helping people understand ageing?

AUBREY: It's an extremely big area right now, and it's big scientifically, medically and socially. Scientifically, measuring biological age is getting better.

However, on the medical side, we are still a long way away because we need to identify a measure of biological age which not only predicts the onset of a disease, but also correlates when you introduce a new intervention. That, of course, was not involved in the development of the biological age measure because the intervention is new. It's going to take a long time to identify measures of biological age that are robustly correlated in the context of new interventions of a variety of different types.

On the sociological side, it is also really important. A lot of people just don't want to know when they're sick. They don't want to know that they have a cancer diagnosis. It's similar with biological age, when the ability to actually do anything with this newfound knowledge is very limited or is perceived to be very limited. A lot of people just don't want to know. I think a huge amount of public education is needed to encourage people to understand their biological age. It's becoming something that people can actually act on. **JAY:** I would disagree. Let me address the claims that we can actually measure somebody's biological age. It's not currently possible to measure anyone's biological age, period. We can't say you're chronologically 60 and biologically 55 with any degree of confidence. Let me be clear about that.

Now, that doesn't mean that there aren't tests being developed to give us clues about the rate of biological ageing. Or that we may not necessarily be able to place you quantitatively into a given score or age. We may be able to say that somebody is ageing more rapidly or more slowly than the average person in the population. There's a lot of information that can be used by, for example, the life insurance or health insurance industries that can place people more reliably in certain risk pools.

Methylation age is one of the metrics developed relatively recently that has a lot of promise. My colleagues and I have developed a metric based on face age, which illustrates the documented relationship between how young or old you look relative to your chronological age. It's not a statement that you're this many years younger or older, but it seems to be a reasonable biomarker giving you a clue that you might be ageing more slowly or more rapidly.

There is a whole suite of metrics being developed to get us towards a biological age metric of some kind. I think it's just being sold to the public too soon. What's out there today is more gamesmanship than anything. You cannot calculate anybody's biological age based on anything that we can do today. However, there are tools that we can use to place people more reliably in particular risk pools.

STUART: I find the concept of biological age fascinating. Physicians can make a relatively accurate estimation of frailty and potentially life years remaining from visual assessments. It's really compelling to think about when those assessments are more technology enabled and where that might take us.

Looking at life years remaining might be a way of helping people, particularly when they're thinking about retirement planning and their financial futures. Talking about life years remaining is perhaps more meaningful to people than the concept of chronological age. People intuitively and quite wrongly compare their own chronological age with the chronological age of previous generations. It would be very cool if people looked at their biological age rather than chronological age and could in theory then come up with a highly personalized life expectancy forecast.

Of course, even a personalized life expectancy forecast doesn't help much with predicting our individual lifespans. There's a lot of natural variation in lifespan, and more than half of us will exceed our life expectancy, often by several years.

PAUL: Thank you all, gentlemen, for your contribution. I think this discussion goes to show that this is going to continue to be a very lively area over the coming years.



3.2 Roundtable: The rise of the superfund

Adam Saron, Chief Executive Officer, CLARA Pensions Antony Barker, Managing Director, The Pension Superfund Jay Shah, Chief Origination Officer, Pension Insurance Corporation

Moderator: Angela Tyrrell, Senior Vice President, Longevity Leaders

ANGELA: What is longevity risk and how has it traditionally been managed?

ANTONY: All of us are dealing with the settlement of pension promises. Life expectancy has seen an upward trend over the last twenty or thirty years, albeit that the rate of pace of increase has slowed down recently. These changes have been driven in part by people making better lifestyle choices, but also by medical advances such as major organ replacements or improving cancer survival rates. The question is "how do you fund this extended lifespan?" This is a major challenge for pension sponsors and insurance companies as well as governments and regulators.

Many defined benefit (DB) pension schemes were largely set up in the 1960s and 1970s, almost as a way of deferring salaries for their workforces. For a few decades it was a fairly easy ride for these companies driven by few guarantees, high equity status, rising stock markets and dividend-based actuarial valuations. Since the 1990s the investment strategies of these schemes have focussed instead on fixed income investments which mirror the change in value, if not the size, of those original pension promises. But that doesn't get away from the dual problems of longevity risk or inflation risk that drive how long for and how much you have to pay.

There are some well-established ways of hedging and de-risking inflation, either through using government securities or other assets delivering inflation-linked income. The challenge for us all is how to de-risk longevity, both at a trend level and as a step-change. There aren't that many natural hedges in the market, and historically corporate sponsors have looked to transfer that risk to an insurance company like the Pension Insurance Corporation (PIC).

JAY: The longevity risk hedging market is increasing year on year. Our estimate for 2019 was around forty billion pounds worth of transactions taking place, a significant increase on previous years. While transaction numbers are growing, they are still a small slice in the context of the entire DB universe, even just in the UK.

PIC offers bulk annuity products to the UK market in the form of buy-ins and buy-outs. It's a relatively straightforward proposition and structure offering a highly secure product to provide pension benefits for members of defined benefit pension schemes within the insurance regulatory system. There are various safeguards in place providing a hundred percent guarantee for all benefits even in the very unlikely event that an insurer fails.

ANGELA: So, what is the superfund model, and how does it differ from traditional insurance?

ANTONY: At the request of government, Superfunds are offering an alternative to move that legacy risk from one closed occupational pension scheme to another ongoing occupational pension scheme. That is largely what our structure is at The Pension Superfund, a taxapproved Pension Protection Fund eligible occupational pension scheme trust. Instead of being supported by an operating company covenant it is supported by a financial covenant in the form of a partnership holding material financial commitments from the former sponsor and new external capital providers, that should ensure members get at least 99% certainty of receiving their promised benefits in full. Consolidation is a common practice in many industries to get economies of scale and better governance and we are using existing trust structure to bring those benefits to the pension industry.

Within that model we will also be hedging longevity, which we see as a very high risk particularly from a step-change perspective. While we periodically might use insurance-type solutions, our business model is not (unlike CLARA's) explicitly to move liabilities on to insurance companies. We'll probably look to go directly to reinsurance through a captive model when it makes sense to do so.

ADAM: The outcome that CLARA will achieve, from the perspective of the sponsor, is the same as what The Pension Superfund propose. We allow the sponsor to fulfil their pension obligations by removing that obligation to us and CLARA as a consolidator takes on the risks. Longevity risk is a big part of that. But where our approach differs markedly from the Pension Super Fund is the other group of stakeholders not yet mentioned, the member. Our model is designed to be memberfirst.

The way we achieve that is, like The Pension Superfund, we provide new external capital. We do expect the transferring sponsors to pay their share of historic obligations, but crucially the capital that we provide travels the full journey with members. When a scheme comes into CLARA it becomes a section of the CLARA Pension Trust. The capital that we provide is dedicated to that section, and neither the capital nor the return on that capital comes out until every member has their full benefits secured in the insured market.

The way that we like to describe the model is that CLARA is a bridge to buy-out. I guess that's the other big difference between us and The Pensions Superfund – we're explicitly not a run-off model. We are very conscious that as a bridge to buy-out, when we come to buy that insurance contract, we are effectively buying longevity protections within it. We are very aware that at some point in our lifecycle we will need to be buyers of longevity protection. Like any risk it needs to be managed, at the right time and at the right price.

ANGELA: Why are these new models needed?

ADAM: When you look at the UK market for private DB pension schemes, the vast majority are closed to new members and increasingly closed to future accruals. There are currently two big consolidators in that market. At one extreme you have the insurers consolidating pension liabilities and assets out of pension schemes into insurers very successfully for thirteen or fourteen years. I think since the insured market has existed the total value of bulk annuity insurance is about 150 billion against probably 2.2 trillion of remaining liabilities. Insurance is making a difference but too slowly.

At the other extreme where you have sponsor failure, the Pension Protection Fund is the

consolidator. But in between these two extremes there are no other solutions. The market is crying out for alternative ways to manage longevity risk.

ANTONY: The size of that hinterland is enormous. Perhaps one to two percent of funds manage an insurance buy-out in a year. Another one to two percent end up, unfortunately, entering into the Pension Protection Fund (PPF) following the insolvency of their sponsor. Despite the significant value of insurance transactions this year and last, it is not keeping pace with the growth in pension liabilities due to their annual inflation and statutory revaluation increases. Hence the total problem is still getting bigger.

There are about five and a half thousand defined benefit pension schemes still in existence in the UK. Their sponsoring companies have a legacy financial problem – there is rarely an HR benefit still associated with running the final salary scheme, and a lot of them closed ten or fifteen years ago – using up a lot of management time and a lot of corporate capital. If they have the money to do so they can offload the problem to an insurance company. If not, they need an interim measure.

All three options – insurers, the Pension Protection Fund and superfunds - are trying to deal with the same problem but at different ranges on a spectrum. There are more complementary areas than there are areas of difference.

JAY: I'm in agreement with Antony and Adam about the issue itself. There are a large number of smaller pension schemes in the UK suffering from, among other things, poor funding levels, poor governance as a result of their size and lack of buying power leverage for asset management or administration providers. But I don't think that the superfund is necessarily the right solution to the problem.

The concern I have with the superfunds – and I'm talking generically rather than with regard to Antony or Adam's specific models – is that they don't address this issue. Various superfunds coming to market are trying to position themselves as being very different from insurance companies, which I don't think is true. An insurance company is guaranteeing that they will pay the right pension to the right person at the right time with no cutbacks. They are able to do that because they source capital from

"I don't think there's anything wrong with saying that we're making pensions safer, but maybe not quite as safe as insurance" private investors looking to make a return on the risk. Insurance companies and superfunds seem to be doing the same thing and making the same promise. I think it's quite dangerous to expect DB pension members to make a legal distinction between one that is technically a pension fund and one that is technically an insurance company, when they are doing essentially the same thing.

Like ourselves, superfunds will be run as commercial organisations looking to make a profit for their shareholders who are putting in the capital. For that to work commercially, the price that a superfund would charge to a pension scheme for essentially the same product that an insurer offers can't really diverge far from the existing insurance model.

What superfunds are really offering is the same guarantee and product as bulk annuity insurers, but with a lower level of security. In itself I don't have an issue with that as long as it is made explicit. If it is to be made explicit it should be governed by exactly the same regulations as insurance companies, with an explicit deduction from capital that superfunds have to hold. A customer can then see that if a superfund holds less capital it comes with a higher level of risk. We shouldn't fool ourselves into thinking that somehow you can provide a cheaper proposition with the same level of security. If the price is cheaper, it's because it's a riskier proposition. Customers ought to be able to fully understand that.

ADAM: From our perspective most people are able to understand quite clearly that while consolidation is about making pension schemes safer, it's not providing the same level of security as insurance. In CLARA's case we are offering a bridge to that the purchase of an insurance product. Employers and trustees understand that the cost for the additional security is that it's not quite as secure as insurance. Both we and The Pensions Superfund are incredibly clear about that. I don't think there's anything wrong with saying that we're making pensions safer, but maybe not quite as safe as insurance.

I think every trustee, if they could wave a magic wand, would love the option to buy-out for their members. Insurance is like the Rolls Royce to get you through your pension – it's big, its comfortable, its safe. But if you can't afford a Rolls Royce, does that mean that your only other option is to walk? Do you know what, a Volvo is a pretty decent car and it's probably going to get you where you need to be.

ANGELA: What about the regulatory framework, how does that differ for superfunds vs for insurers?

JAY: The regulatory framework for insurers is

stringent – painfully stringent at times. But it works and its properly understood. Currently for superfunds there is a question mark as to whether they should be regulated by the Department for Work and Pensions (DWP) or the Prudential Regulatory Authority (PRA). If they are to be regulated by the DWP it is generally accepted that the Department would need to scale up volume and skills base of people to do so. It begs the question would we really build a second regulator to do essentially the same job? So that suggests that superfunds ought to be regulated by the PRA.

ANTONY: It's important to get the clarity between government departments and government agencies. They're all staffed by the same individuals who often rotate across government. So, I struggle to see how the Pensions Regulator would have a hiring challenge. I set up the Pension Protection Fund and it was very easy to get people to transfer across from industry or from the public sector to join that lifeboat fund. I don't see the staffing side being a challenge.

JAY: I agree in that it's entirely possible for them to get the resources to do that. But what would be the point? Why create two very sophisticated regulators essentially to do the same job? Why not have the PRA regulating two superfunds if by and large, the oversight required should be either identical or at least very similar to insurance companies?

The superfund model has been described as a good option for some schemes given where they are right now, while not necessarily providing the same gold standard that insurance companies represent. But we have to acknowledge that pension schemes as they stand in the UK are significantly underfunded, a situation that has been allowed to evolve under the current pension regulatory regime. So how is it right to create a new model under that same regulatory regime and ignore the insurance regulatory system which has done pretty well over the last several decades?

ADAM: I absolutely agree that insurance is the gold standard outcome for members of closed DB pension schemes. As a member-first solution that's exactly why our solution is built as a bridge to the buy-out market. But the reality is that consolidators are pension schemes, and pension schemes are already regulated not by the DWP but by the Pensions Regulator. They are a speciality regulator in the private market to the tune of about two trillion pounds worth of pension liabilities and have been doing so fairly successfully. The bulk annuity market is much smaller. In that sense, insurance is the exception,

"We have to acknowledge that pension schemes as they stand in the UK are significantly underfunded, a situation that has been allowed to evolve under the current pension regulatory regime"

albeit a growing exception and a valuable one.

There is also a crucial difference between being a pension scheme and an insurance company. It's a subtle one, but important. A pension scheme is comprised of two balance sheets – the scheme itself which is governed by an independent board of trustees, and the financial interest controlled by the pension sponsor. In an insurance company, there is a single balance sheet. There is one board of directors who, unlike the trustees who owe their fiduciary obligation to members, owe their fiduciary obligation to shareholders. That said the combination of the Financial Services Compensation Scheme and the PRA provide a very valuable protection.

ANTONY: I'm pleased that Adam mentioned the Financial Services Compensation Scheme because we should acknowledge that insurance companies can fail. Individually, insurance companies can't guarantee the promises that they make. However as an industry they can, through the backstop of the Financial Services Compensation Scheme. The pensions industry now has similar backstop in the Pension Protection Fund. I think we can agree that if companies never failed there would be no need for a lifeboat fund of this kind. There'd be no need for bulk insurers, or for consolidators either. But companies do fail, and there needs to be an exit route for trustees to secure an outcome for members.

Trustees are looking to pay people's pensions with higher degrees of certainty and a lesser degree of risk. There is no "no risk" solution. That's why the Financial Services Compensation Scheme exists. Yes, insurance is the gold standard, but there need to be alternatives.

I'm sure Adam is in the same position as us of being approached by a lot of smaller pension schemes. They might have flaws in their data, they might be too small, they might have too many deferred pensions. It doesn't really matter whether they've got the money to do a deal or not, they're getting roundly refused by insurance companies who aren't interested in taking them on as a liability. It's a real challenge, particularly for those coming out of PPF assessment whose only source of ongoing funding is the existing assets of the scheme. The longer the situation perpetuates, the worse the deal is for the members in the arrangement.

ANGELA: There's no doubt that the longevity risk market is gathering steam. 2019 was a record year for bulk annuities. To wrap up, I'd like to know what each of you see 2020 bringing?

JAY: We can look at the pattern of the last few years. In 2017 the bulk annuity market was twelve billion. In 2018 it was around twenty-four or twenty-five billion. Last year it was upwards of forty billion. I don't know whether volumes in 2020 will be equivalent to 2019 but it certainly wouldn't surprise me if they are similar. It's certainly going to be a significant market.

ADAM: We would expect similar volumes to 2019. We do expect there to be more competition amongst the bulk annuity providers and potentially new entrants in that market, which for us as the ultimate buyers of that product is very exciting. But closer to home we are hoping to get to a point of being approved by the pensions regulator and moving on to our first transactions.

We've given Jay a hard time today, but he makes a number of fair points. We are a commercial operation and we're very much looking forward to transacting. The pensions regulator has been incredibly diligent in its dealings with us. Jay will be happy to hear that they have been giving us a suitably hard time too, as is only fair. That process will take as long as it takes, and we'll cooperate to get over the standard that they set. Hopefully we look forward to taking on our first members next year!

ANTONY: I forecast it being the first of a number of record years of schemes transferring into commercial consolidators, if only on the basis they couldn't have done it before. It also will continue to be another strong year for insurance companies as the market expands and risk transfer in its varying forms becomes increasingly affordable.

At the end of the day we're all trying to deal with the same problem in slightly different ways. I do have discussions with other insurance companies about the opportunities for insurers and consolidators to come together. Perhaps the analogy is, we're operating in two very large fields on the same farm, but occasionally it will make sense to work together across the hedge. Ultimately, we want to ensure that the risk of

"Since the insured market has existed the total value of bulk annuity insurance is about 150 billion against probably 2.2 trillion of remaining liabilities. Insurance is making a difference but too slowly."

providing pensions is not stranded with companies and individuals who are not either skilled, resourced or funded to be able to deal with it. That future and lead to a superfund industry that is not opportunity is probably best transferred to

organizations like those that the three of us offer. No doubt others will come into the market in the iust members first, but **members better.**



3.3 How the pension de-risking market can overcome obstacles to further growth

Victoria Sander, Partner, Latham & Watkins

Many of the obstacles preventing the further growth of the pension de-risking market stem from trustees' desire to future-proof and ensure the flexibility of the terms of the arrangements that they enter into. Although most trustees are on a "de-risking journey", their individual circumstances may present difficult decisions over whether to take actions sooner that would help them, but which might hinder them down the line; or simply wait with certain of their risks unhedged. However, the industry has been evolving and seeking solutions for these challenges.

Conversions of Longevity Swaps to Buy-Ins/Outs

In relation to the longevity de-risking market, a key obstacle for some schemes has been the lack of straightforward mechanics for converting longevity swaps to buy-in/out transactions. While this challenge remains a topic of concern, given the difficulty of "hard-wiring" any legally binding conversion mechanics and an increasing desire to transact without undue complexity, trustees may gain confidence from the increasing number of schemes with swaps successfully achieving a conversion.

Several insurers active in the buy-in market have devoted considerable time and effort to agreeing a set of framework terms for hedging their longevity risk with a panel of preferred reinsurers. Framework terms allow for additional tranches of risk to be reinsured on a largely agreed set of terms, with the specifics being captured in a confirmation for that particular transaction. The approach emerged in the buy-in market in recent years and has since been adopted for broader use by the insurance industry. This development affords insurers greater flexibility to take on a pension scheme longevity swap when the scheme wishes to move to a buy-in/out, as they can potentially accept the economic position (and price that into the buy-in/ out transaction) and more easily migrate the terms of the pension scheme swap onto their existing reinsurance framework arrangements.

Consequently, the legal barriers for entry into longevity swaps for a more limited period may to

some extent break down for pension schemes for which a buy-in/out does not make sense but hedging longevity risk would deliver benefits. Inevitably, trustees and insurers will still need to agree to some bespoke provisions at the time of conversion; for example, in relation to collateral provisions and other commercial matters. However, the recent success of several schemes in navigating this route suggests that market participants widely acknowledge that they must develop pragmatic solutions to this issue. New longevity swaps may also be able to better anticipate some of these conversion issues as the body of experience develops.

Flexibility for Insurers

Trustees clearly have a legitimate concern regarding solutions that can adapt to their needs over time. However, insurers have also been adjusting to uncertain times and a high degree of regulatory change and focus that shows no signs of abating. The challenges of Brexit and its impact upon cross-border licensing has been an issue requiring consideration for most insurers active in the de-risking space.

In the buy-in/out market, contractual terms have undergone adjustment in recent years as the volume of de-risking transactions has grown and new entrants have joined the market. A high-water mark may have occurred in this respect in favour of pension schemes in late 2017 amid strong market competition. But during subsequent high-volume periods, the pendulum has clearly swung back to offer mild correction in favour of insurers in some areas where they have a legitimate need for future flexibility. For instance, insurers are solidifying their views around their own commercial needs to grow and develop their business models, including in the areas of index replacement and Part VII transfers. In addition, wider acknowledgement and understanding of the robustness of the UK insurance regulatory regime has assisted in bridging some of the historical expectation gaps between trustees and insurers regarding matters such as collateral and termination rights.

"Insurers have also been adjusting to uncertain times and a high degree of regulatory change and focus that shows no signs of abating"

Will Private Equity Heighten Engagement in Pension Fund Consolidation?

Pension consolidation through "superfunds" has drawn widespread attention as a further strategy to help address the needs of corporates and pension schemes on their de-risking journey. However, several obstacles have loomed large over potential consolidators — including the fact that they have been stuck in a holding pattern until the conclusion of the UK government consultation process on superfunds, arguably another victim of the ongoing political turmoil in the UK. However, the announcement of the first deals has been long expected, which would clearly result in this part of the market turning the corner and becoming a more realistic option for pension schemes.

On the investment front, the private equity sector's involvement in this emerging segment of the de-risking market suggests that it may be poised to overcome the hurdles facing it. Private equity investment in leading UK bulk annuity providers, such as the Blackstone and GIC backing of Rothesay Life's successful and rapid development, has been a feature of the de-risking market for some years. These heavyweight investors, including TPG and Disruptive Capital Finance, have now become involved in backing the so-called "superfunds", and other strategic investments in this area seem likely to follow.

Notably, these early investments transpired despite the continued regulatory uncertainty (including around the potential future regime that may apply to superfunds, and their governance and control structures). Initial deal sizes may be relatively modest whilst proof of concept is firmly established; however, if we see deals starting to come through in early 2020, this limitation will only be temporary. In particular, those interested in the de-risking sector eagerly anticipate resolving the thorny issue of how to achieve the appropriate level of regulation to protect from regulatory arbitrage between insurance and pension consolidation models.

As a "bridge to buy-out", these structures may fill a perceived gap in the current market. They are also sometimes seen as a potential option for smaller schemes that perhaps lack the scale to feel successfully able to negotiate the buy-in market at an appropriate pricing point. However, the traditional insurance and investment management providers have created their own solutions for those schemes that are not yet at the stage of seeking a buy-in/buy-out, but which aim to access an investment strategy that helps them move closer to their goals. In a demonstrably innovative industry that has fuelled the rapid development of the buy-in/buy-out market, it may be a close race as to which of these alternative strategies gains real traction first.

Implications

The development of the pension consolidators may present some challenges to the insurance industry depending upon the final regulatory regime. Insurance regulators have emphasised the potential for arbitrage - a point wellobserved by the industry itself as it grapples with its own exacting regulatory standards and the widespread use of longevity reinsurance to manage its bulk annuity business appropriately. However, at the level of activity seen in 2019, there clearly seems to be a gap for smaller schemes that may face difficulties gaining the attention of the insurers who are able to focus their efforts on larger deals as they build scale. Pension consolidators may offer an opportunity for these schemes to find a solution, as well as for those who have not yet reached funding levels that support an insurance solution.

Section 4: Wellness for Prevention

4.1 Whitepaper: 10 consumer trends driving the preventative wellness market

Angela Tyrrell, Senior Vice President, Longevity Leaders

- Intersection of the longevity and wellness markets
- Impact of consumer trends on wholesale longevity
- Examining detractors

4.2 Interview: Wellbeing in later life

Jackie Marshall Cyrus, Ageing Innovation Strategist

- What does wellbeing in later life encompass?
- Exploring sexual wellbeing for older adults
- Problems with long term care as it currently exists

4.1 10 consumer trends driving the preventative wellness market

Angela Tyrrell, SVP, Longevity Leaders

It has become evident that the lifestyle choices we make throughout our lifespan impacts our health and wellbeing in later life. As Eric Verdin, CEO of the Buck Institute for Research on Ageing points out, the key areas to be addressed if we are to increase our longevity are things like nutrition, exercise, sleep and stress. If we are to look at equality in how we age - a key remit of the UK Government's Ageing Society Grand Challenge these are things that can be improved regardless of an individual's socioeconomic position. Information-distribution today is not without its major flaws, but it does have the advantage of being far-reaching and (should we be inclined to distribute in this way) reach across socioeconomic or cultural divides.

Ironically it is the voices and actions of today's young people that are driving much of the cultural change needed to improve health and wellbeing in later life. I think of this movement as the preventative wellness or "wellgevity" market. That is, how our personal health and wellness management throughout our lives impacts our life expectancy and healthspan in later life. Here are ten consumer trends that are driving that movement:

1. Digital tracking tools

Whether it's counting steps, logging calories, tracking ovulation or recording sleep patterns, we have never been more plugged in to what is happening in our bodies. The tiny supercomputers that we carry in our pockets or on our wrists have given us the ability to record, interpret and intercept patterns of behaviour that influence our health, hopefully for the better. While not without their problems – for example, they can open the door to unhealthy obsessive behaviours - digital tracking tools make basic health education and management available to a wider pool of people than those who can afford expensive private services.

2. Consumer biological testing

The big one is personalised DNA testing by the likes of Ancestory.com or 23andme. But other services are emerging to help consumers get a deeper understanding of their bodies at a biological level, like Chronomics' epigenetics testing and uBiome's (admittedly failed) microbiome testing. As with digital tracking tools, consumer testing services offer the promise of more effective health management throughout our lives. They are however, more expensive and hence prohibitive to some socioeconomic groups. The business model for effective, informed intervention is also still to be cracked.

3. Personalisation

In the face of readily accessible tracking and testing, a demand for personalised solutions is to be expected. We are living in the age of "Me Me Me" where "my truth" can be readily exchanged for "the" truth and anybody can star in their own music video, their own digital story or even their own printed picture book. It makes sense that we're also demanding personalisation of our health management tools. While the cynic in me wants to roll my eyes, the pragmatist acknowledges that anything driving consumers to take more ownership of their own lifelong health management is a good thing. Personalised nutrition is one of the most interesting trends disrupting the food industry and has the potential to completely change how we manage our health at an individual level. Likewise personalisation of skincare could have an important role to play in mitigating skin ageing.

"While the cynic in me wants to roll my eyes, the pragmatist acknowledges that anything driving consumers to take more ownership of their own lifelong health management is a good thing"

4. Responding to climate change

Arguably the most iconic trend of our time will be the acknowledgement of climate change and the demand for action. At the level of individual health, this could have rather a positive impact. Consumers are becoming more mindful of how they travel (think of Greta Thunburg's highly publicized sailboat hitchhike across the Atlantic last year). At a more local level this means driving less and turning to alternative means like walking, cycling or public transport, all resulting in higher activity levels or incidental exercise. Having climate change at the forefront of public consciousness is also influencing our dietary habits, making "plant-based" cool again and steering both consumers and food vendors to be more adventurous with fruit and vegetable intake.

5. Meat Alternatives

Red meat consumption has become synonymous with carbon emissions. This is driving a booming industry in alternative meat products made from plants, insects or even grown in laboratories. I would argue that the field is too young to claim (and validate with robust clinical studies) that these products have a positive impact on health but what is interesting is the impact they can have on changing consumer behaviour. As with the increasingly prevalence of plant-based diets, simply having the access to alternative meat products is encouraging consumers to examine their dietary habits more closely. As a result they will hopefully make sensible nutritional choices that have a positive impact on their long-term health.

6. Alcohol alternatives

This one is more clear-cut. The detrimental effects that high levels of alcohol consumption have on our long-term health prospects have been thoroughly validated. The trend towards alcoholfree alternative beverages enables us not only to consume less alcohol, but to re-examine our relationships with alcohol. Actively cutting back on alcohol consumption will have a proven effect on our long-term health and longevity.

7. Natural products

Another prominent consumer trend is the demand for reducing unnatural chemicals in everyday products. When we're looking at health, food is the field that springs straight to mind. "Natural" can be a helpful marketing ploy but the research does back up the idea that reducing added preservatives or flavours like highly processed sugars and salt is beneficial to our long-term health. Another field being driven to change by this consumer trend is personal care and beauty. I'm less familiar with the research in this space but common sense suggests that the fewer petroleum products we put on our faces the better.

8. Mental health awareness

One of the most positive consumer trends to emerge in the past few years is a growing awareness of mental health. The accompanying destigmatisation is paving the way for diagnosis and proactive treatment of a range of diseases. Research is emerging to suggest that depression and other mental health conditions may result in an increased risk of dementia in later life. We don't yet have the longitudinal data needed to determine whether increasing awareness and treatment of mental health conditions will result in reducing cognitive decline in later life. But one hopes...

9. Meditation and mindfulness

Meditation and mindfulness programmes – especially via digital channels such as apps or podcasts – have really gained momentum in recent years. There are a wealth of outcomes to choose from, whether you're looking to reduce stress, improve sleep quality or breathing or accompany a physical activity such as yoga. What may once have been brushed aside as New Age or "hippy-dippy" is now mainstream and even encouraged, and beneficially so. Stress has a known negative effect on longevity and healthspan, and these mental practices offer an effective toolkit to counter stress.

"The trend towards alcohol-free alternative beverages" enables us not only to consume less alcohol, but to re-examine our relationships with alcohol" "What may once have been brushed aside as New Age or "hippy-dippy" is now mainstream and even encouraged, and beneficially so"

10. Ethical leadership

In 2020 corporate and social responsibility at a business level has gone beyond a "nice-to-have" or fluffy PR exercise. It's become a business-critical priority from board-level and throughout. In order to retain customers and to avoid being called out and publicly, catastrophically shamed, consumer businesses need to demonstrate ethical leadership and a strong CSR policy. This change could have long-term benefits for the health of their employees. Ethical leadership gives employees a sense of purpose. It should also ensure that staff wellbeing is front of mind: reducing stress-inducing practices, facilitating healthy lifestyle behaviour and minimising financial worries. Workplaces are absolutely key to preventative wellness practices, and finally the growing demand from consumers seems to be steering things in the right direction.

So, there we are, my top ten consumer trends that are driving the preventative wellness market. Of course, nature abhors a vacuum, so other consumer trends are emerging with the potential to undo all of that good work. For example, there is evidence to suggest that our increasing reliance on digital social tools is negatively impacting our ability to form personal relationships. These tools can also lead to increased levels of anxiety, negative thoughts and obsessive behaviours, all damaging to our long-term health and longevity.

At Longevity Leaders we'll be exploring the world of consumer trends, preventative wellness and their impact on longevity in more detail this year. Stay tuned for more to come!



4.2 Interview: Wellbeing in later life

Jackie Marshall Cyrus, Ageing Innovation Strategist

Interviewed by Angela Tyrrell, SVP, Longevity Leaders

ANGELA: Tell me a little bit about your background and how you came to be such a prominent figure in the ageing space? sexuality of adults past a completely subjective age range. In some cases, the findings showed an actively negative response, a sense of disgus

JACKIE: I'm a registered general nurse. I completed my nurse training in the Republic of Trinidad and Tobago, and then September 1999 emigrated to the UK. I found myself working in a small nurse-led community hospital which provided intermediate care and rehabilitation for older adults. In 2003, I took up the role of Clinical Board Manager at the Willesden Centre for Health and Care in Brent, which was another intermediate care and rehabilitation setting for adults. So those two roles began my initial experience working with older adults.

The pivotal point came during my time at Willesden Centre for Health and Care. There was a gentleman in the presence of the consultant, the registrar and his family who all felt that the safest place him would be to go into a care home. In a group meeting he turned to me and he said, "Sister, please don't let them put me in a nursing home. They are sentencing me to a life of celibacy." That struck at the very core of my being. I had never perceived how long-term care might have such an impact on this adult.

ANGELA: You're quite well known for talking openly about the need to destigmatize sexual wellbeing in later life. Have you seen any change to how this conversation has evolved?

JACKIE: When I joined the Technology Strategy Board, as it was called then, about ten years ago, I tried to highlight this aspect of ageing and the need to maintain sexual wellbeing as a component of people's lives. Back then it was seen as quite funny – "Oh Jackie, she's crazy."

I started to look at attitudes held by healthcare professionals and observed a neutering of the

sexuality of adults past a completely subjective age range. In some cases, the findings showed an actively negative response, a sense of disgust. A man who expressed his desires was seen as a dirty old man. A woman might be branded a Cougar. There would be jokes about it.

Thankfully, people are talking about it now. I've observed numerous situations in clinical practice, social circles, mainstream media, social media and in everyday conversations. People within ageing are now openly addressing and confronting the issue.

There still needs to be a bigger shift in society's attitude so that older adults feel that they have social permission to express their sexuality. I believe this is key to happiness, contentment and satisfaction. We cannot extricate sexuality from wellbeing in later life, it's a core part of human nature. The benefits of sex for younger men and women are well understood, but there is still a failure to extrapolate this for older adults, particularly in the face of disability, degenerative conditions or chronic disease. Once you fall into one of those groups, or reach an arbitrary chronological age, sexuality is no longer supposed to be a part of your natural human desires. We need to amplify this discussion.

ANGELA: Speaking more broadly, what does the concept of wellbeing in later life mean to you?

JACKIE: Often it's seen simply as the absence of physical or mental degeneration. For me, it's about contentment, satisfaction, selfdetermination, self-esteem, social acceptance and a sense of security. It's not necessarily the absence of disease. The fact is that despite our best prevention and health promotion efforts, some of us will contract conditions both acute and chronic. Some of us will develop impairments.

"Sister, please don't let them put me in a nursing home. They are sentencing me to a life of celibacy" "We also all need to recognise that we are next in line to be elderly. For that reason, if no other, we should be looking to catalyse a shift in social attitudes to ageing"

Whatever our health status, we still need to feel that we have a purpose in life. We need to feel that we have the wherewithal to achieve our desires and goals. We need to feel loved. We need to feel good about ourselves. We need to feel socially accepted. We need either social or familial circles around us.

Some of the conversations I have acknowledge these important elements of wellbeing, but we are not yet vigorously addressing them. As a result, they continue to prove a hindrance to older people achieving contentment, social acceptance and a sense of security.

Then we have the added problem of ageism. Ageism is the entrenched, largely unchallenged, pervasive discrimination of adults based on their chronological age. It needs to be at the forefront of every debate – when we talk about longevity, when we talk about digital technologies for older adults, when we talk about wellbeing, when we talk about workplaces. Until we are able to highlight and address ageism, and to break down some of these barriers legislatively, socially and economically. We won't progress as quickly as we should.

We also all need to recognise that we are next in line to be elderly. For that reason, if no other, we should be looking to catalyse a shift in social attitudes to ageing.

ANGELA: Which other elements of well-being in later life would you like to see further up both policy and social agendas?

JACKIE: I would like to highlight institutional long-term care. There is a lot of attention on the age-related agenda now, especially around the opportunities bought by an ageing population. A major focus is keeping people independent in their own homes for longer. This implies that at some point you won't be in your own home - that we'll keep you there for as long as possible, but we anticipate that at some point you will have to move somewhere else. That somewhere else is what we're not addressing.

The fact of the matter is that there are over fourteen thousand centenarians in the UK at the moment. That figure is expected to rise to about twenty-three thousand in the next decade. A significant segment of that population will require long term care. That's where the problems start to manifest no matter how happy and fulfilled you are in later life. I work in long term care, and I feel overwhelmed by it. It is so huge and unpleasant it's frightening. Every now and then a scandal makes the headlines and the general public assumes it is an isolated incident. In my experience it is not. The regulator, despite their best efforts, do not have a handle on the situation. A lot of people put store in the ratings that these facilities receive, but a new light needs to be shone on ratings. These rating reflect policy adherence. They don't accurately reflect the quality of life, the quality of care, the competence of carers or the rights and privileges of individuals in the facilities. We need to take a more innovative approach to improving long term care.

Technology and innovation are not generally commonplace in care, and yet they have an important role to play. Innovation – social, technological and business-related – needs to form a key component of ratings and standards.

ANGELA: What sort of technologies or innovations are you thinking of?

JACKIE: One of the fundamental problems we have is monitoring people. A simple innovation I've seen is a glass panel that can become transparent or opaque at the touch of a button. It offers both privacy and an interior view as the situation demands. For example, every night we are required to check people for breathing or general wellbeing. Currently you have to open a door to do so. That door is usually alarmed and people – often with cognitive impairment – are shocked into wakefulness. This glass panel offers the ability to make the checks without interfering.

Another example would be to tackle issues around medication errors. Currently we use the most archaic form of identification when administering medicine, a photograph. There are so many technologies that we could repurpose from other sectors to improve identification and reduce errors.

ANGELA: What tangible changes would you like to see happen within the field in the next twelve months?

JACKIE: I'd like to see two changes. Firstly, I would like to see the diversity and inclusiveness of our society reflected in the leadership of the field. Ageing encompasses all ethnic backgrounds, and we need to be able to connect with more "We also all need to recognise that we are next in line to be elderly. For that reason, if no other, we should be looking to catalyse a shift in social attitudes to ageing"

segments of the population to deliver longevity and wellbeing for all citizens in the UK. I think diversity in leadership – in both policy and business - would go a long way to reduce inequalities in healthcare.

The second change I would like to see is a dynamic change from talking to action. I would like to see more groups coming together to highlight the

challenges for which innovation is required. I would like to see greater engagement with industry to find solutions that mitigate risks faced by ageing populations. We need to create a vibrant, competitive marketplace where ageing individuals are consumers of products and services specifically designed to support their lifestyles.



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