

Global Innovations in Aging and Longevity

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By Stephen Johnston

Humans have doubled their life expectancy over the past 100 years, but increasing inequality means the benefits of longevity aren't spread evenly. Only the richest are living their additional 30 years of life to the fullest, while for too many, chronic disease and frailty impact their quality of life. Spreading the benefits of healthy long lives to everyone, not just the lucky few is a defining mission of our time.

Three megatrends are shaping innovation in aging and longevity globally that will determine the success or failure of this mission: datafication of the individual; the home as the innovation battleground; and the return of social infrastructure. This article provides context for each as well as examples from around the world based on recent work by innovation consulting company Fordcastle and the Aging2.0 corporate innovation platform, The Collective.

Datafication of the Individual

Human activity is increasingly digital, and our data trails are powering countless business models. Healthcare has been a laggard so far, but is now catching up, propelled by the pandemic, venture funding, and ambitious moves by consumer tech giants into digital health.

Longevity on your wrist. If the Fourth Industrial revolution had a marketing tagline, it couldn't do better than Apple's "The future of healthcare is on your wrist." Consumer data is shifting power and insight from the doctor to the individual. We're seeing a convergence of longevity focused life extension and more quality-of-life centered healthspan maximization. Valencia, Spain-based Hearts Radiant is building

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Clockwise from top left: Xandar Kardian radar digital signal processing devices for health monitoring; UK-based Humanity launched the world's first-ever app designed to monitor, track, and slow the aging process; and Norway's Motitech offers a virtual cycling experience.

a digital community of people receiving expert longevity guidance, drawing on the founders' experience running a longevity spa. Other longevity-focused data-driven startups such as Humanity (U.K.) and China's iCarbonX are seeking to capture all types of body data and coach users towards longer, healthier lives. Finland's Elo Health, Zoe from the U.K. and Australia's myDNA are creating personalized longevity-focused nutrition plans.

Digital diagnostics. Digital tools are increasingly complementing and, in some cases, replacing human diagnostics. U.K.-based Babylon Health uses artificial intelligence-powered chatbots to triage and diagnose common health conditions, while Binah assesses vital signs in real time mobile video. The Israeli company SOLO has developed an app that can track and improve emotional well-being (think personalized tailored videos to improve moods) and U.K.-based Cognitivity has created a quicker and more effective dementia diagnostic. Italy's TeiaCare uses artificial intelligence and sensor networks to improve efficiency in European nursing homes, while South-Korean Kardian employs radar for vital sign monitoring. Canada's Winterlight Labs is a 'digital diagnostic', using speech to monitor potential cognitive impairment.

Movement is the killer app. Mobility is one of the most important markers of longevity and lends itself to digital analysis. Singapore's ConnectedLife has partnered with Johnson & Johnson and FitBit, to improve outcomes of surgeries and track Parkinson's patients. Israel's Kemtai and Portugal's Sword use artificial intelligence computer vision to ensure home exercises or rehab are done accurately. Norway's Motitech offers an immersive virtual reality environment, allowing people to cycle on an exercise bike through the places where they've grown up, generating social, cognitive and physical benefits.

Home is the Innovation Battleground

The much-talked about shift of healthcare to the home has been accelerated by the pandemic, and more complicated procedures are now feasible at home. Sixty percent of health outcomes are driven by lifestyle activities—including diet, exercise, sleep, stress and socialization—and the home is the natural context for these. The remaining 40 percent of health outcomes are driven by 'traditional' medical services and genetics and the growth of 'hospitals without walls' programs globally is decentralizing these too.



Singapore's Kampung Admiralty is an innovative example of an age-friendly community that seamlessly integrates green space and gardens throughout its award-winning design.

Internet of Things (IoT) monitoring.

Connected devices are able to offer additional insight, particularly with respect to falls. Israel's Essence and Australia's Home Guardian among others, offer monitoring and alerts about falls or unusual activity, while Belgium's Nobi does this via a smart lamp.

Upgrading home care. The pandemic has given a boost to new hybrid care models that use in-person caregivers combined with telehealth connections to specialists. Singapore's Homage, Australia's Mable and Cera from the U.K. are catering to the growing market for helping people stay at home by building match-making marketplaces that connect families with caregivers. AXA Ventures-funded Birdie has found success building software to power home care providers.

Hospital at home. FocusCura from the Netherlands is bringing the hospital to the home, increasing the level of complexity and sophistication of medical interventions, while French company Qare allows residents abroad to access specialist doctors back in France.

The Return of Social Infrastructure

Social infrastructure can be defined as an environment that "fosters contact, mutual support,

and collaboration among friends and neighbors." As the pandemic shut down cities and travel, social interaction has become more important, and many people got to know their neighbors, and voluntarily engaged in selfless acts of support. The pandemic forced many people to reevaluate their priorities and lifestyles and many have found solace in developing more meaningful connections with each other, with other generations, and with nature.

Purposeful connections. For isolated or lonely seniors living independently, France-based Famileo (a 2020 Aging2.0 Global Innovation Search winner) allows the family members to engage and share messages and media. Israel's Uniper Care improves engagement in real time with group video calls and activities. Other exciting developments are services that provide a platform for older people to share their perspective, knowledge and skills: Labora in Brazil offers a platform for knowledge, while Diaspo allows older amateur chefs to teach their culinary skills over Zoom.

Integrated living models. There are a variety of models that are starting to reimagine the role of senior housing, in particular becoming embedded into the local community. France's Village Landais has taken the dementia-focused

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Dutch Hogeweyk model, and a similar model has opened in Tasmania, Korongee, which has a cinema, cafe, beauty salon and gardens.

Biophilic cities. There are remarkable overlaps between societies that are built to be age-friendly and ones that are environmentally-friendly: highly walkable, dense environments, strong public transport and close social ties, among others. A 2019 Nature paper found that access to nature for just two hours per week resulted in a markedly improved sense of wellbeing, while other studies have shown a reduction in blood pressure and cancer. In Singapore, the Kampung Admiralty building combines high population density living with community and municipal services, with green space and gardens embedded throughout. While Future Solund in Copenhagen has created a futuristic, open-plan senior living environment, described as a 'nature integrated care center.'

A Final Word on What's Missing

A final word on innovations that we're not seeing: ambitious public policy measures that learn from other countries and ensure our systems are ready to adapt to longer lives. As someone noted in a recent innovator roundtable we hosted focused on the United States, startups in aging "are like Christmas tree ornaments without the Christmas tree." Startups alone can't deliver the necessary infrastructure and systems change to support populations to age on their own terms. Central to this is the question of paying for longer lives. Longevity brings with it the risk of running out of money, since pensions and Social Security are underfunded, real wages for the majority have fallen, and inequality has soared. A 2019 report by the U.S. Government Accountability Office (GAO) found that 48 percent of American

households headed by someone 55 or older don't have any retirement savings. Other countries have stronger safety nets, but few countries can afford their pension commitments.

One startup focused on this topic, Dublin-based Tontine Trust, is reviving and reinventing the centuries' old concept of tontines—where a group of people put money in a shared pool paying dividends to surviving members; so those who live longest capture the most gains. Models like this that might address the question of how we will pay for longevity need to be considered in more detail.

One recent analysis¹ has found the economic value of an extra year of healthy life for everyone would deliver \$38 trillion in benefit to the global economy. The opportunity here is for innovators and public policy makers to work together on bold new international and interdisciplinary ways to adapt society, prepare for longevity, and ensure the benefits of longer lives are shared with everyone. ●

¹ <https://www.nature.com/articles/s43587-021-00080-0>



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