



Adapting to the Age of Ageing

SHOWCASING COLLABORATION:

Highlighting university and business partnerships formed to enhance the lives of our ageing population.

Winter 2024

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Introduction

The global population is continuing to age. With the projection that, by 2040, one in seven UK citizens will be aged 75 or older, the country is witnessing a profound demographic shift.

Joe Marshall
Chief Executive, National Centre for Universities and Business

This demographic change, driven by an ageing population with increasingly complex healthcare needs, places unprecedented pressure on the NHS and the social care system. As people age, the likelihood of developing illnesses and becoming frail increases, leading to greater need for health and social care.

In 2018, the number of individuals aged 65 and above surpassed the count of children under the age of five. Looking ahead to 2050, it is anticipated that the over-65 demographic will make up a quarter of the UK's population.

To tackle the complex issue of healthy ageing, universities and businesses have joined forces. Their collective goal is to harness the power of innovation

and research to develop strategies, technologies, and interventions that will support the physical and mental well-being of older people, enabling them to lead fulfilling and independent lives.

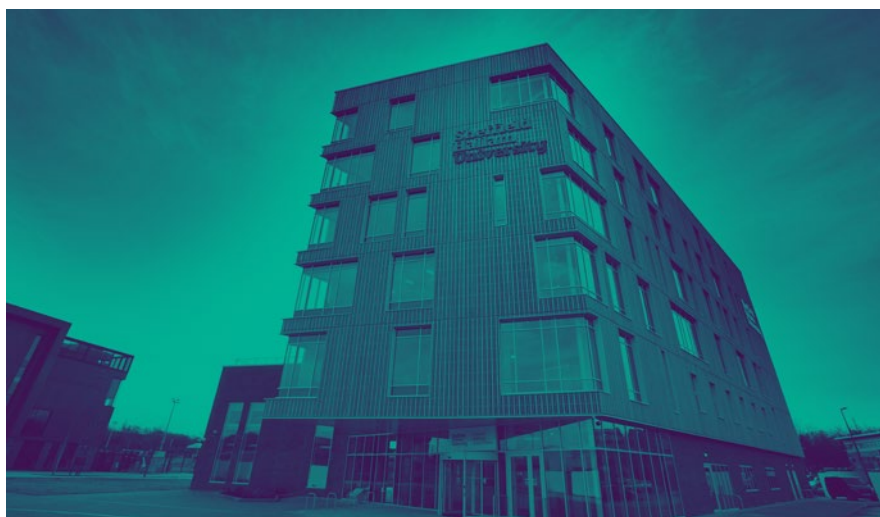
By working together, universities and businesses are rising to face this challenge. In this booklet, NCUB has collated ten collaboration case studies from across the country. These case studies just scratch the surface of the incredible collaborative work that NCUB members have been involved in to enhance the lives of our ageing population. There are hundreds of collaborative examples to support healthy ageing that could have been featured in this document.

Transforming Lives Through Innovations That Help People Move

According to the NHS, older adults should do some type of physical activity every day. It can help to improve your health and reduce the risk of heart disease and stroke. Indeed, regular physical activity is one of the most important things you can do for your health generally as we get older.

Sheffield Hallam University's Advanced Wellbeing Research Centre (AWRC) is a leading centre for physical activity research and innovation, with a mission to transform lives through innovations that help people move. The Centre utilises a novel model of co-location to create collaborations between multiple academic disciplines, industry, local communities, local authorities, charities and the health and technology sectors, all from state-of-the-art facilities in the east of Sheffield.

The Advanced Wellbeing Research Centre (AWRC) articulates its mission through five 'Global Challenges': promoting lifelong physical activity, tackling widening health inequalities, addressing climate change, closing the skills gap and reimagining rehabilitation to optimise recovery.



This allows the AWRC to prevent and treat chronic disease through co-designed research into physical activity, whilst also attracting new jobs and investment into the region.

Last year, the AWRC signed a Memorandum of Understanding with Canon Medical Systems UK to enhance the development of research and innovation products which will help people move and improve population health. The collaboration has a strong focus on physical activity, physical performance, physical health, digital healthcare, rehabilitation and tackling health inequalities.

AWRC and Canon Medical will work hand-in-hand at the newly opened Canon Medical Arena and Medical Diagnostic Centre on the Sheffield Olympic Legacy Park looking at issues ranging from performance management of elite athletes to the rehabilitation of stroke patients and the health of older people.

The four key areas of the strategic collaboration include:

- Understanding and improving clinical outcomes in patients
- Improving global human health
- Improving the clinical usefulness of medical imaging
- Understanding and improving athletic performance

Sheffield Hallam University | Advanced Wellbeing Research Centre

Canon
CANON MEDICAL

Mark Hitchman, Managing Director at Canon Medical Systems UK states, "Providing accessible healthcare and empowering innovation remain at the heart of everything we do at Canon Medical UK. That is why we are thrilled to be partnering with Sheffield Hallam University's AWRC, to facilitate vital research into sports injury and human health across Sheffield and beyond."

"By leveraging over 100 years of medical expertise, Canon Medical's full range of diagnostic medical imaging equipment including CT, X-Ray, Ultrasound and MRI will ensure the AWRC's staff and students are equipped to tackle the challenges of contemporary sports and clinical medicine. Supporting this vital work will garner the crucial data needed to improve health outcomes and save countless lives."

Dr Tom Maden-Wilkinson Senior Research Fellow at the AWRC states, "The projects will help us understand a range of issues related to muscle

strength – from strength training in older adults to help maintain their independence, to elite athletes and efficiency or injury prevention."

Jason Brannan, Deputy Director of the AWRC said: "Our relationships with industry allow us to both apply our research and also play a key role in addressing health inequalities in areas like Darnall where AWRC is based. Canon Medical UK have been a keen supporter of AWRC since our inception and are very much engaged in our mission of transforming lives through innovations that help people move. We are working in collaboration across a five-to-ten-year time horizon to exploit the remarkable potential of Canon's newly opened Medical Diagnostic Centre at the Canon Medical Arena on the Sheffield Olympic Legacy Park."

Ways the AWRC is promoting healthy ageing:

Case study: Golf as a therapeutic tool for older adults and their supporters

Researchers from AWRC have teamed up with Golf in Society (GiS) and Sport for Confidence to explore how the social connectivity of golf can improve the health and well-being of those who are frail and living with Parkinson's and dementia.

It is understood that golf can improve mental, physical and social health whilst providing respite for carers and supporters. Golf in Society data has shown that players make 27 decisions per golf shot, with 33 social interactions experienced during 90 minutes of moderate exercise. An average of 1,010 steps are taken per session.

Case study: Using extended reality to improve mental health and reduce loneliness

One in 15 people aged 50+ are often lonely, rising to one in three for those who are widowed, and one in four for those in poor health. Loneliness and social isolation have numerous health consequences including 26% increased mortality likelihood and more than doubling the risk of developing dementia. Lonely individuals are more prone to both depression and suicide.

Many older people are unable to maintain rewarding in-person connections due to restricted physical mobility or mental health issues such as anxiety or depression. The AWRC is looking into whether digital engagement via rich, multiuser extended reality games may provide opportunities for deep social engagement and significant agency.





The number of people worldwide living with dementia and cognitive impairment is increasing. Indeed, according to the Alzheimer's Society, more than 920,000 people in the UK are living with dementia – a number expected to rise to over a million by 2024. Dementia is also a global health issue, affecting millions of additional people worldwide. According to the World Health Organization, around 50 million people were living with dementia in 2020, and this number is expected to increase as the population ages.

There is no cure for most types of dementia, including Alzheimer's disease.

A collaboration between the University of Wales Trinity Saint David and a Swansea-based filmmaker, eHealth Digital Media Ltd, has given us an insight into what it's like for those suffering from the disease.

Seeing Dementia Through Their Eyes: Living with Dementia

Researchers at the University of Wales Trinity Saint David's (UWTSD) Assistive Technologies Innovation Centre (ATiC) collaborated with Swansea-based filmmakers on a project which allowed them to literally see the world through the eyes of someone living with dementia.

The innovative Seeing Dementia Through Their Eyes: Living with Dementia project involved research by the ATiC team over a period of just over a year to inform a series of 10 new films from eHealth Digital Media Ltd. The films, about the daily lives and challenges of people living with dementia, focus on delivering support, training, and education for dementia patients, their families, carers, and healthcare professionals.

ATiC is an integrated research centre which puts user-centred thinking and strategic innovation tools into practice through its cutting-edge user experience (UX) and usability evaluation research facility, located in Swansea's Innovation Quarter in SA1.

Digital communications company eHealth Digital Media produce and deliver behavioural change content such



as high-quality content information films through its established PocketMedic platform.

The project used advanced UX and human behavioural research tools, such as eye-tracking and facial expression recognition technology, in the creation and evaluation of the films.

The ATiC team worked closely with eHealth Digital Media's Creative Director, Kimberley Littlemore, whose parents received a dementia diagnosis. Cameras were set up around the parents' home to keep track of their daily lives. Additionally, the couple used wearable eye-tracking glasses while performing household activities, so the team could 'see the world through their eyes.'

This footage helped the team to detect and understand any patterns and triggers over time and to pick out key moments, which could be analysed and discussed further by clinicians and academics in the field.

The films are available on [eHealth Digital Media's PocketMedic platform](#), which delivers high-quality health information films 'prescribed' by clinicians to support their patients in managing their health. The films are also available to view free of charge in Wales thanks to funding from Cwm Taf Morgannwg University Health Board.

Tim Stokes, ATiC Innovation Fellow and project lead, said: "It all sounds highly technical but at the heart of it all, it simply involves understanding people. Understanding how they interact with each other, understanding their needs, and helping to develop the best health and well-being products, services, and systems – placing people at the heart of the research. Initially this project began life as a simple experiment that sprang from the idea of Kimberley wanting 'to see dementia through her parents' eyes' – and we were literally able to help her do that by using our eye tracking glasses. It has helped us to understand how people with dementia live and understand what types of challenges they face on a daily basis."



Kimberley Littlemore, Creative Director of eHealth Digital Media, said: "Demonstrating and sharing the lived experience of dementia, with its ups as well as its downs, has proven to be an inspirational way of delivering information and building confidence in carers and family members. Looking through the UX evaluation, it is so encouraging and rewarding to read that people feel more confident about supporting people to live well with dementia as a result of watching these films. We are very proud of our collaboration with ATiC to see dementia through the eyes of my parents. The eye tracking technology allowed us to demonstrate and share through film in a very human way what researchers had been describing in their papers about changes in visual perception in people living with dementia."

The Seeing dementia through their eyes: Living with Dementia project was supported through Accelerate, a pioneering collaboration between three of Wales's universities, Cardiff University

(Clinical Innovation Accelerator), Swansea University (Healthcare Technology Centre), UWTSU (ATiC), and Life Sciences Hub Wales.

Co-funded by the European Regional Development Fund, the Welsh European Funding Office, Welsh Government's Health and Social Services group, universities, Life Sciences Hub Wales, and the health boards, the aim of the Accelerate programme, which ended in 2022, was to create lasting economic value for Wales.

This collaboration saw the ATiC team shortlisted as finalists in the Alzheimer's Society Dementia Hero Awards 2023 and the International Green Gown Awards 2023, and they were the winners of the Benefitting Society award in the Green Gown Awards UK and Ireland 2022.

Watch the team meet Kimberley Littlemore's parents for the eye tracking experiment:

<https://www.youtube.com/watch?v=E0M2sQ0nyUA&t=1s>

Does Where We Live Influence Our Brain Health?

Some research suggests that where we live might influence our brain health. As more of us now live in towns and cities, it is important that the environment where we live (regardless of geographic location or socio-economic status) is designed to maximise our brain health.

Dementia is a broad term that refers to a group of cognitive impairments that interfere with a person's ability to think, remember, and perform daily activities. The specific changes that occur in the brain when someone has dementia can vary depending on the underlying cause of dementia.

The number of people with dementia is expected to rise to over a million by 2024. With this in mind, Queen's University Belfast, led by the Centre for Public Health, implemented the SPACE project. The project looks at whether where we live affects dementia and brain health as we get older.

Working with a range of industry partners including The Paul Hogarth Company, AECOM and Translink, as well as social enterprises, local authorities, government departments, local communities and advocacy groups, the SPACE project aims to provide evidence to inform policies and interventions that will provide supportive urban environments to promote healthy ageing, including promoting brain health. This could include using creative urban designs to support people to adopt and maintain healthier lifestyles such as being more active.

Queen's University Belfast have worked with their partners through a number of co-design projects such as the development of a systems map that illustrates the relationships between the environment and brain health, co-designing a policy agenda for the environment and health, and



developing outreach and advocacy materials such as fact sheets and videos. They have also worked in partnership with colleagues from Land and Property Services to develop an interactive geoportal which collates and makes available over 80 environmental datasets across Northern Ireland. This was launched in autumn 2023.

The project analysed data from over 8,000 older people in Northern Ireland, and linked this to information about where they live, air pollution or the toxins in soil, and to detailed molecular detail exploring the biological responses to environmental exposures. The team also intend to collect new data on a subgroup of 1,000 older people including more in-depth measures of brain health and better measures of physical activity, using GPS devices worn around the waist that monitor our locations. The



AECOM



the paul hogarth company



project will also involve workshops with local citizens to 'sense-check' our findings and promising prevention approaches.

This three-year project is due to be completed in February 2024. The team will be holding a series of events and webinars showcasing the outputs and publications from the SPACE project, including the launch of the geoportal, a policy agenda and practice-oriented outputs.

The housing industry in the UK does not respond to the challenges of growing old. It continues to build homes that are very difficult to adapt, compromising the ability of people to 'age in place' - a term used to describe a person living in the residence of their choice, for as long as they are able, as they age.

With the projection that, by 2040, one in seven UK citizens will be aged 75 or older, this needs to change.

Award winning architecture and engineering firm, Building Design Northern Ltd (BDN), is collaborating with Northumbria University to address the future needs of older people in their housing and care environments.

Another collaboration between the BRE Trust, BRE, Loughborough University, Halsall Lloyd Partnerships and Liverpool John Moores University is also looking to outline a vision for those needing dementia-friendly homes.



Building
Design
Northern



Northumbria
University
NEWCASTLE

Building Homes Suited for Our Ageing Population

The collaboration between BDN and Northumbria University was initiated to bring expertise from the university to inform a £65 million framework for Sunderland City Council, delivering nine innovative housing and care facilities.

Collaborating with a talented team of architects and engineers at BDN, the multi-disciplinary research group at Northumbria University will bring specialist knowledge, regulations and good practice into the design of the new facilities for older people.

The partnership will oversee a series of stakeholder engagement sessions, including sessions with older people, to inform and shape the evolution of buildings based on professional and lived experience. These insights will inform a Longevity Housing and Care Model that can be used in future BDN projects beyond the lifetime of the collaboration.

Helping older people return to their homes

Together, the team is working on the design of St Cuthberts' Respite Facility in Ryhope, Sunderland. The aim is to produce a sympathetic design that responds to both people and place, breathing new life into a small area at the heart of an established community.

On the site of a former derelict church, a new community of high-quality single-storey dwellings, with integrated staff hubs, will be built. The facility will enable and support residents to recover

after time in hospital or residential care, improving their health and general well-being through an uplifting, non-medicalised environment.

The facility will have 24/7 nursing and care staff, to support the building users, with the aim of them returning home. Included in the building are work environments for various activities, such as cooking and cleaning, and improving digital competences to build the users' confidence and resilience to live independently.

Creating a sense of community

The partnership will also work on a housing scheme that facilitates ageing in place and independent living at Cato Street, in the Southwick suburb of Sunderland. These ultra-low energy houses comply with the Future Homes Standards and incorporate key design considerations to improve a sense of community for the residents.

An aim of the project is to open the front of the home to better connect to the public area, providing sheltered seating as part of the front garden space to encourage interaction between residents, thus reducing loneliness - which is known to be endemic in older people in the UK.



St Cuthberts' Respite Facility
in Ryhope, Sunderland

The Living with Dementia Home

In the UK, there are currently 850,000 people living with dementia, a number comparable to Birmingham's population. Projections indicate this figure will increase to one million by 2025, with a majority aged over 65, and about two-thirds residing at home.

As part of this connection to the public area, generous entrance lobbies have been designed to facilitate comfortable entrance and exit for people with mobility aids. As mobility is an issue for some of the residents, the design of these lobbies also has integrated smart technology to allow occupants to receive deliveries, such as food and medicine. These items can be retrieved by the resident at their own leisure, promoting independence and convenience. Internally, the homes have generous well-lit spaces, constructed of reinforced walls and ceiling components to enhance durability and adaptability.

Dr Faye Sedgewick said, "Only 9% of homes currently meet the accessibility standard – a chilling figure given that by 2050, 1 in 4 people will be aged over 65. We believe it is so important to promote healthy ageing through well designed accessible homes to enhance the everyday lived experience of older people."

Prof. Paul Jones, who works on the collaboration said: "The partnership continues to be an outstanding collaboration between the very talented design team at BDN and Northumbria University. A year into the project, it is going from strength to strength. The research generated through the partnership is being directly inputted into the design of housing developments and care environments across the region that will improve the lives of older people."

Richard Marsden, Managing Director of BDN, said: "We're delighted to have formed a partnership with Northumbria University that we know will deliver incredible outcomes for our clients, drawing on the latest thinking to ensure our designs are at the absolute cutting-edge."

Find out more about this work here:
<https://bit.ly/Northumbria-NCUB>

As people age, their housing requirements shift, often necessitating support or home modifications. Prioritising a high quality of life for dementia patients benefits both the healthcare system and the elderly, reducing the strain on the NHS.

The BRE dementia-friendly home project - a collaboration between the BRE Trust, BRE, Loughborough University, Halsall Lloyd Partnerships and Liverpool John Moores University - outlines a vision for those needing dementia-friendly homes.

These homes alleviate the need for intensive care, enhancing independence, especially in the early stages of dementia. Furthermore, they serve as a research platform for ongoing studies related to dementia, building design, and technology's impact on health and well-being, fostering knowledge sharing between the healthcare and construction sectors.

The converted building's features include:

- Walkability throughout the house, including wheelchair access in all rooms with charging points located upstairs and downstairs. Space for a future lift installation has also been included. The lift would be able to carry an individual in a wheelchair plus one other person.
- Dementia-friendly bathroom facilities including a wet room downstairs and upstairs. There are also sightlines to the bathroom facilities across the house to make sure they can always be easily located.
- Stable furniture with rounded corners is used throughout the house to reduce risk of injury. In addition,

hoist provisions can be found in one bedroom upstairs and in the ground floor dayroom.

- Improved artificial lighting to improve visibility in the house.
- Views to the outdoors which demonstrably enhance well-being.
- Noise reduction features to lower the chances of stress, including an isolated washing machine.
- Simple switches and heating controls, and safety sensors in high-risks areas such as the kitchen.

To find out more about the Dementia-friendly, visit the BRE website here:
<https://bit.ly/NCUB-BRE>

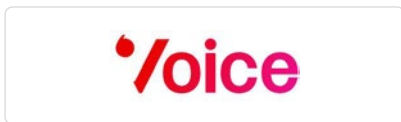


Walking is crucial for older adults and promotes physical and mental well-being. Regular walking helps maintain joint flexibility, strengthens muscles, and improves balance, reducing the risk of falls and injuries. It also enhances cardiovascular health, lowers stress levels, and fosters social engagement, which combats loneliness. It is a simple yet effective way for older individuals to maintain their independence and quality of life. A partnership between Piaggio Fast Forward and Newcastle University provides support using robots for our ageing population in lots of different ways, from carrying cargo on walks, to improving social interactions, to providing a place to rest.

A second partnership between the University of Plymouth and care homes across Cornwall has also looked into how robots can help our ageing population. The collaboration found that introducing robot pets into care home could improve the well-being of people with dementia.

Harnessing Robotics for Enhanced Well-being in Ageing Populations

As societies around the world grapple with the challenges posed by an ageing population, innovative solutions are emerging to support and enhance the quality of life for older individuals.



A collaboration between Piaggio Fast Forward and Newcastle University has shed light on the promising role of human-following robots in promoting healthy ageing and well-being among older people.

The Gita robots, developed by Piaggio Fast Forward, have been at the centre of this groundbreaking research. These robots are designed to autonomously follow human users while also having the capacity to carry cargo, making them useful and versatile companions for older adults. The robots are equipped with wheels and an internal cargo compartment capable of holding up to 18kg of items, effectively serving as a reliable walking partner for older individuals.

The partnership involved a study with participants with an average age of 75, who were shown videos of an older adult interacting with a Gita robot in real-world scenarios. The participants provided

invaluable feedback, highlighting several key benefits of these robots.

It is hoped that using the Gita robot will encourage older people to walk more, giving them more confidence to go out into their communities by acting as a responsive companion and making



them feel more connected with the outside world. The robot can also act as a convenient seat for resting during excursions, particularly useful for local shopping trips.

Beyond physical support, the study found that these robots facilitated social interactions, garnering attention and serving as conversation starters in the community.

Professor Nicola Palmarini, Director of the UK's National Innovation Centre for Ageing (NICA) based at Newcastle University said: "This exciting development could be a door to freedom for so many of our older people who need extra support but want their independence... Older people tend to travel and leave home less frequently and while there has been much focus recently on electric bikes or self-driven vehicles, we believe Gita could encourage a more practical, sustainable and healthy mode of transport – walking."

Jeffrey Schnapp, Co-Founder and Chief Visionary Officer, Piaggio Fast Forward, commented: "When we started Piaggio Fast Forward, we began with an urban point of view. We aimed to design products that move the way people move and develop technology to bring robotic mobility to sidewalks and pedestrian spaces. Our robots follow people, and they help people walk further, faster, and more frequently. Our goal is to make the world a more pedestrian friendly space with machines that walk with us rather than replace us. The Gita robot brings people together, gives them more opportunities to connect, and makes local living easier, smarter, and more fun."



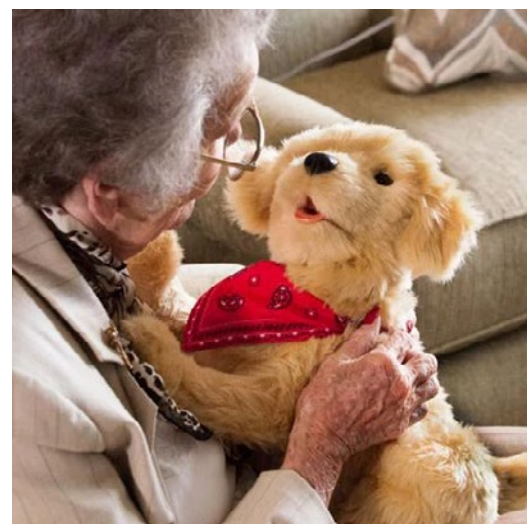
Robot Pets Help the Wellbeing of Care Home Residents

The University of Plymouth worked with care homes across Cornwall to explore how affordable robot pets could potentially improve the well-being of care home residents and people with dementia. The study, led by the University's Centre for Health Technology, was conducted before and during the COVID-19 pandemic in eight care homes across the county using ww and dog robots during this study, which cost around £100 each.

Over the course of eight months, researchers compared numerous well-being outcomes between care home residents who received robot pets and those who did not. The results demonstrated that around 85% of the residents who interacted with the robots experienced a positive impact, with decreased neuropsychiatric symptoms, such as delusions, depression, anxiety, elation, apathy and occupational disruptiveness.

It also showed that interactions with the robot pets were more common among residents with more moderate or severe dementia, and those considered to be lonely. This led the researchers to conclude that affordable robot pets hold considerable potential for improving the well-being of care home residents and people with dementia.

Dr Hannah Bradwell, a Digital Health Research Fellow in the Centre for Health Technology, said: "Our results suggest that affordable robot pets are able to produce a number of important well-being impacts for older adult care home residents. The importance of meaningful activities in care homes



cannot be overstated, and greater engagement in an activity creates an improvement in the quality of life."

Beverley Barnes, Compliance & Quality Assurance Manager at Hillcrest House Nursing Home said: "At Hillcrest, the evidence showed that the use of these two robotic pets with our residents living on the Dementia unit was invaluable. We had one particular resident who had previously had a pet Labrador before coming into the home and as a result she was drawn to the robotic dog thinking it was her pet. This had a great calming effect on her moods and behaviour and she became a different, happier person as a result."



Food plays a pivotal role in our lives, serving not only as a source of nourishment but also as a catalyst for social interactions, influencing our health and overall well-being. As our life expectancy continues to increase, the significance of healthy ageing has gained widespread recognition and nutrition plays a key role in ageing well.

Food is key for humans - from sustenance to social engagement, to its central impact on health and well-being.

Two case studies are included here: a large-scale university-business collaboration, including many NCUB members, that have joined forces to look into this issue, and also the publication of a factsheet by the University of Nottingham to help food and drink businesses develop products for older people.



Developing Food Opportunities for a Healthy, Ageing Population

One critical element of healthy ageing is the preservation of muscle mass and strength, which significantly affects an individual's quality of life. Increasing protein consumption across all life stages may prove instrumental in slowing the rate of muscle decline and the onset of related health conditions. However, there exists a notable gap in understanding the social, demographic, and psychological factors that influence food choices in relation to protein intake.

An initiative addressing this was the "Protein for Life" project, a collaborative endeavour led by Newcastle University with co-investigators from the Rowett Institute based at the University of Aberdeen, the University of Sheffield, the University of Liverpool and the University of Bristol. A range of industry partners were included in the project such as Sainsburys, Campden BRI, Nestle, Bradgate Bakery, Mondelez International, Premier Foods, and Pladis.

The project's mission was to identify and establish guidelines for protein-based products that promote healthy ageing, ensuring they are cost-effective, sustainable, and appealing to consumers. An array of approaches were employed to craft and disseminate guidelines for the food industry, facilitating the formulation of enticing, higher-protein foods. In partnership with industry collaborators, prototype products were developed, following taste trials and suitability

assessments in adults aged 40 and above.

The collaboration delved into the various aspects of protein intake at three distinct life stages, mid-life (40-54 years), younger old (55-69 years), and older old (70+ years).

Through consultations with industry partners, some key crucial findings emerged, shedding light on the development of high-protein foods for healthy ageing:





Advice for Businesses on Catering For a Growing Elderly Population

The Food Innovation Centre at the University of Nottingham published a fact sheet: 'Healthy Eating for the Elderly', to help food and drink businesses develop products for older people.

- **Cost as the Primary Constraint:** The cost factor looms large as the primary impediment to product development, largely influenced by the expenses associated with ingredients.
- **Emphasis on Protein Quantity over Quality:** Within the food industry, there is a prevailing perception that protein quantity holds greater importance than protein quality for consumers. This perspective stems from a general lack of awareness among consumers regarding the role of protein in mitigating age-related muscle loss.
- **Consumer Awareness Gap:** The current lack of consumer awareness regarding the significance of protein in healthy ageing poses a substantial barrier to the development of high-protein products tailored to the ageing population.

Funding for "Protein for Life" stemmed from the Research Councils UK's 'Priming Food Partnerships' initiative, bolstered by the support of four councils: the Biotechnology and Biological Sciences Research Council (BBSRC), the Medical Research Council (MRC), the Engineering and Physical Sciences Research Council (EPSRC), and the Economic and Social Research Council (ESRC).

The research findings were shared not only with the public but also with policymakers and the food industry, with the overarching aim of providing a comprehensive roadmap that can guide future product development efforts.

The "Protein for Life" project represents a forward-looking response to the pressing need for innovative food solutions that support healthy ageing in our society.

The fact sheet is one of a series compiled by the Centre, providing clear, concise and scientifically reliable information on key topics for small and medium-sized businesses.

Elderly people experience a range of challenges to healthy eating due to physiological changes. This could include chewing and swallowing difficulties, dry mouth and dehydration, loss of taste and smell, loss of appetite, reduced oral processing capability, muscle loss, bone strength loss, as well as digestive capability. Health conditions, such as Type-2 Diabetes, Alzheimer's, muscle failure disease sarcopenia, dysphagia, and cancer, can also impact. In addition, social-related factors such as isolation, loneliness, and bereavement can also impact on dietary intake in older adults.

"All of this can affect elderly people's ability to consume the daily required nutrients, causing them potential malnutrition (i.e. undernutrition or overnutrition). As a result, this could also further negatively affect their health conditions and/ or accelerate their physiological changes," explained research fellow Dr Wentao (Kerry) Liu, one of the team of advisors at the Food Innovation Centre, which supports food and drink businesses in Derbyshire and Nottinghamshire with expert advice and guidance."

The Healthy Eating for the Elderly fact sheet provides tips and ideas for how businesses can develop products and services to cater for this market, and at the same time, help our seniors to have a healthy diet.



The Food Innovation Centre, based at the Bioenergy and Brewing Science building at the University of Nottingham's Sutton Bonington campus, offers free support to small and medium-sized food and drink manufacturers in Derbyshire and Nottinghamshire under the Driving Research and Innovation project - a three-year project that ran until the end of December 2022.

Part-funded by the European Regional Development Fund (ERDF) via the D2N2 LEP, the project was run by the Food Innovation Centre at the University of Nottingham School of Biosciences, in conjunction with the Chemistry Innovation Laboratory in the School of Chemistry and Institute for Advanced Manufacturing and in association with the Midlands Engine. It was a unique collaboration project that provides free specialist innovation support to small and medium-sized businesses.

The Healthy Eating for the Elderly fact sheet is one of a series of fact sheets that has been published to help food and drink businesses innovate and become more sustainable. This might be through new product development, reformulation, the introduction of new packaging or a change in processing. This latest fact sheet will provide food for thought and inspiration for SMEs, and at the same time support a healthy ageing population.

Older Adults and Communication Technology

The University of Exeter's Smartline project has researched the relationship between technology and the way people live in their homes and communities. The project gathered a unique and rich set of hard data and insights from residents living in social housing in Cornwall whose demographic is proportionately older, in the South West of England, via sensors in their homes.



Age UK estimates that 1.4 million older people in the UK are often lonely. Loneliness is a major issue that is now widely recognised in society today.

Working with industry partners and volunteer organisations, the University of Exeter's Smartline projects sought to understand the different challenges people face linked to health and well-being, including the issue of loneliness. It investigated people's aspirations and barriers for using technology to help overcome these issues.

The University of Plymouth's collaboration with care homes across their region using Amazon smart speakers is a second example of how technology is used to improve the lives of older people.

The Smartline project successfully collated a wide range of data on individual health, home quality life, social interactions digital inclusion and community engagement through the partnership with Coastline Housing. The findings have been shared with European partners and the research has led to practical changes for Coastline Housing Association, Cornwall Council and in the local community.

Tackling isolation in Covid-19 lockdowns

During the Covid-19 pandemic, the University of Exeter, working with Volunteer Cornwall, a partner in the Smartline Project, produced a guide to help reduce feelings of isolation during the lockdown. The guide offered bespoke advice and practical tips to help participants learn the basics of communication technology, such as Skype and Whatsapp, to promote social interaction.

Participants interested in connecting with people also were signposted

to Volunteer Cornwall's Covid-19 Befriending Scheme, which matched participants and volunteers for weekly social calls.

About Smartline

Smartline was based at the University of Exeter and partnered with Coastline Housing, Volunteer Cornwall, Cornwall Council and South West Academic Health Science Network.

Central to their research were more than 200 social housing households owned and managed by Coastline Housing who manage over 5,000 homes and employ more than 300 people. The community shared their aspirations, constraints and challenges to help Smartline explore how digital technology can improve daily life.

Smartline's partners worked together to put their research findings into practice, while also engaging with over 280 businesses across Cornwall and the Isles of Scilly to launch new digital products, processes and services.

Amazon Smart Speakers Used to Advance Elderly Care Across Cornwall

Elderly people throughout Cornwall benefitted from new digital health assistance thanks to a project led by the University of Plymouth. The University was awarded a Technology Enabled Care (TEC) grant from Cornwall Council to buy Amazon Echo Spots for use within care environments. The aim of the study was to explore if and how the devices were being used, the barriers to their implementation, and their potential benefits.



amazon



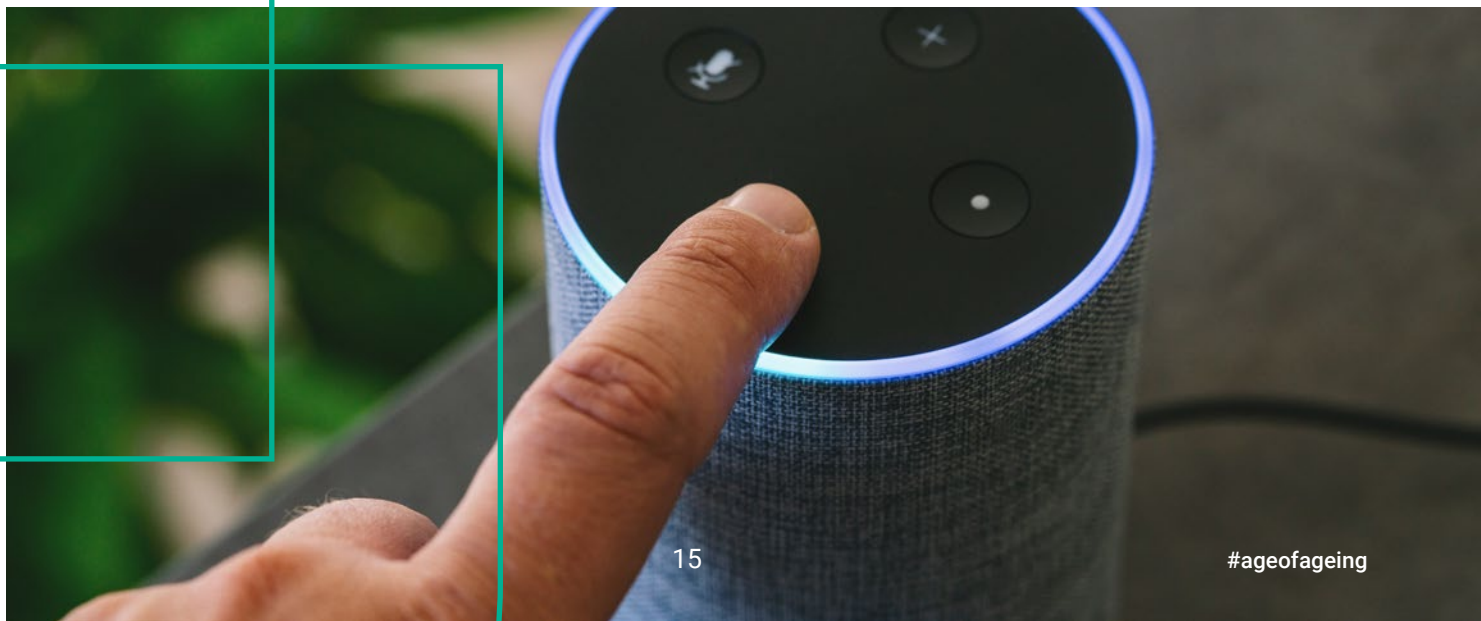
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Over the course of seven months, the University installed 156 devices in 92 care homes for older people, 50 devices for people with physical or mental health needs, and eight for others. The devices were used mainly for music but also for poetry, recipes, light controls, jokes, and video calls.

Care home managers reported there were a number of benefits for residents, including enhanced engagement with home activities, enjoyment, calming effects, and the acquisition of new skills. As a result, researchers recommended that affordable consumer devices such as smart speakers should be installed in all care homes to benefit residents.

Professor Ray Jones, Professor of Health Informatics at the University of Plymouth, is one of the UK's leading researchers in empowering more people to use digital health technology.

He said: "A lot of us take technology for granted, but there are more people than we realise who still need help to access it. We have an increasingly ageing population and considerable demand and pressure on health and social care resources. By overcoming the barriers – social, financial or practical – we can start to open up technological doors to improve people's health and wellbeing."



AI-driven Techniques Reveal New Targets for Drug Discovery

Researchers have developed a method to identify new targets for human disease, including neurodegenerative conditions such as Alzheimer's disease.

AI is getting increasingly sophisticated at doing what humans do - just more efficiently, more quickly and at a lower cost. The UK's AI industry is thriving, employing more than 50,000 people and contributing £3.7 billion to the economy in 2022.

It is predicted that this growth will increasingly assist medical professionals in diagnosing diseases and analysing medical images, potentially improving early detection and patient outcomes.

Already the team at the University of Cambridge and Insilico Medicine have utilised AI to help manage Alzheimer's disease. This is timely given that there are currently around 900,000 people with dementia in the UK, and this is projected to rise to 1.6 million people by 2040 as our population ages.



The research team, led by the University of Cambridge, presented an approach to identify therapeutic targets for human diseases associated with a phenomenon known as protein phase separation, a recently discovered phenomenon widely present in cells that drives a variety of important biological functions.

Protein phase separation at the wrong place or time could disrupt key cellular

functions or create aggregates of molecules linked to neurodegenerative diseases. It is believed that poorly formed cellular condensates could contribute to cancers and might help explain the ageing process.

The Cambridge researchers, working in collaboration with generative artificial intelligence (AI)-driven drug discovery company Insilico Medicine, developed a method for finding new targets for

drug discovery in diseases caused by dysregulation of the protein phase separation process. The team found that they could replicate disease characteristics in cells by controlling the behaviour of these targets. Their results are reported in the Proceedings of the National Academy of Sciences (PNAS).

In the study, researchers combined Insilico's proprietary target identification engine PandaOmics with the

spontaneous phase separation, aiding in the identification of proteins prone to form liquid-liquid phase-separated condensates.

Using this approach, the researchers conducted a large-scale study of human sample data, quantified the relative impact of protein phase separation in regulating various pathological processes associated with human disease. They prioritised candidates with high PandaOmics and FuzDrop

scores and generated a list of possible therapeutic targets for human diseases linked with protein phase separation.

The researchers validated the differential phase separation behaviours of three predicted Alzheimer's disease targets (MARCKS, CAMKK2 and p62) in two cell models of Alzheimer's disease, which provides experimental validation for the involvement of these predicted targets in Alzheimer's disease and support their potential as therapeutic targets. By modulating the formation and behaviour of these condensates, it may be possible to develop new interventions to mitigate the pathological processes associated with Alzheimer's disease.

Professor Michele Vendruscolo from Cambridge's Yusuf Hamied Department of Chemistry, who led the research "By working with Insilico Medicine, we have developed an approach to systematically address this problem and identify a variety of possible therapeutic targets. We have thus provided a roadmap for researchers to navigate this complex terrain."

Frank Pun, PhD, head of Insilico Medicine Hongkong, and co-author of the paper "We are pleased to reach the milestones of our collaboration with the University of Cambridge... We anticipate facilitating the translation of this preclinical research into novel therapeutic interventions soon."

Read more about this work here:
<https://bit.ly/NCUB-Cambridge>

FuzDrop method to identify disease-associated proteins prone to phase separation. PandaOmics is an AI-driven therapeutic target discovery tool that integrates multiple omics and text AI bioinformatics models to assess the potential of proteins as therapeutic targets.

FuzDrop is a tool introduced by the Cambridge team, which calculates the propensity of a protein to undergo



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Medicine**

Healthy Later Living Network Supports The Global Challenges of an Ageing Society

The overarching aim of the University of Bath's multidisciplinary Healthy Later Living Network is to lead, challenge and enable change to policy and practice which contributes to ageing well and living a healthy later life.

The number of people aged over 75 in the UK today is one in 12. By 2040, this will rise to one in 7. We are living longer and a third of children born now are expected to live to 100.

The University of Bath's Healthy Later Living Network brings together representatives from wide ranging academic disciplines, local government and industry, to help address the challenges of this demographic trend within the health sector. The network aims to help people remain independent, productive, active and socially connected for longer.



The Network's key research themes are:

Health and Digital Technology

Proliferation of digital technology offers many opportunities to improve the lives of older adults; however, older people can sometimes be excluded from this due to lack of skills, confidence, equipment and data.

The Centre for Ageing Better estimates that there are around 5 million people over the age of 55 who are not online in the UK. This can mean that people are missing out on seeking job opportunities, accessing healthcare and financial support, and connecting with organisations, friends and family. The Healthy Later Living Network aims to address these issues through collaborative research with service users and key stakeholders.

Health, Independence and Mobility

The Healthy Later Living Network aims to improve people's quality of life by helping older adults maintain their health, mobility and independence for longer.

The Network works with external partners from the health and social care, public, and third sectors to

address the challenges in this area. By engaging with these organisations and with older adults directly, the Network can better understand the needs, priorities, and challenges for maintaining independence and mobility and address these through collaborative research.

In parallel, the researchers are working with health and social care organisations, and the housing, retirement, and care sectors, to address the implications of declining independence and mobility from a policy and service-needs perspective.

Industry partners

The Healthy Later Living Network have worked with a number of partners to include joint work on research projects, consultancy and bids. Collaborations have included working with Open Bionics on prosthetics, with linkages on digital solutions to promoting physical activity in retirement living settings, and with the Welsh Government to explore the role that digital connection played in the pandemic in mitigating loneliness during this time.



Health, Community and Place

The Healthy Later Living Network recognises the importance of social connections and community for maintaining health and well-being in later life.

The Network has many research projects around this theme – working with different populations in varied locations to explore the valuable role that communities play in the lives of

older adults, and the valuable role that older adults play in their communities.

Professor Julie Barnett, Associate Pro-Vice-Chancellor (Research): “The Healthy Later Living Network helps to tackle the challenges of an ageing society in the UK and Internationally. It provides an exciting platform for us to work with external partners and brings with it opportunities new innovative research.”

For more information please visit here: <https://bit.ly/NCUBBath>

Studying the Working of the Ageing Workforce



The ONS recently revealed that in April to June 2022, the number of people aged 65 years and over in employment increased by a record 173,000 to 1.468 million, which is also a record level.

With our ageing population, it's little surprise that the workforce is also ageing: a third of all workers are now aged 50 or over.

The University of Hull and the Centre for Research into the Older Workforce are working to study the working of the ageing workforce, in the UK and beyond.

Based at the University of Hull, the Centre for Research into the Older Workforce was created in response to the growing policy interest in the ageing population, and to the wish of the Government to encourage more people to stay in paid work later in life.

Through research for the UK Government, European Commission, Trades Union Congress and CIPD, the Centre has investigated older workers' career aspirations and retirement plans; social policies which impact on career trajectories; and bespoke age management approaches of businesses across sectors and countries.

The Challenge

Research at the University of Hull has helped employers across a range of sectors and countries to support employers in managing ageing workforces, enabling older workers to pursue meaningful jobs, and creating career paths for younger ones. Recent projects include:

- The age management guide for the UK social partners: TUC and CIPD
- A good practice guide for small and medium sized businesses
- An online tool to support employers and unions to discuss workplace active ageing
- Research on the experiences of people who leave the Armed Forces after the age of 50 in finding work which makes use of their skills and experiences.

The Approach

The University of Hull have worked with employers (for example NHS, local education authorities and a range of large and small businesses), unions, the Government and stakeholder organisations in investigating innovative approaches to age and work. They have:

- Run workshops with employers and union representatives on age management
- Spoken with older workers about their career and work aspirations
- Developed good practice guides in collaboration with stakeholder organisations and government

The aims

The primary objectives of this study are to explore and pinpoint the career aspirations and retirement expectations of older employees. It is looking to discern best practices in age management within various industries and countries. The study is hoping to facilitate the harmonization of conflicting interests between workers and businesses as well as between older and younger employees, within the evolving landscape of ageing workforces.

Conclusion

NCUB's overarching aim is to promote, develop and support university-business collaboration across the UK. In this showcasing booklet, we share how universities and businesses of all sizes have worked together tackle the challenges of our ageing population.

From using robots to help older adults' mobility and decrease loneliness, to better understanding what causes dementia, to ensuring older people have access to the correct food, this booklet just scratches the surface of the many collaborative projects that UK universities and businesses have been involved in.





National Centre for Universities and Business

The National Centre for Universities and Business is the collective voice of the UK's universities and leading businesses, promoting and shaping their collaboration through research, digital insight and advocacy to secure the UK's prosperity.

HELPING THE UK PROSPER, BY WORKING FOR THE UK TOGETHER

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