

A strategy for collaborative ageing research in the UK

Developed under the auspices of the Lifelong Health
and Wellbeing Programme



Foreword

Life expectancy in the UK has increased by around 30 years over the past century. This dramatic rise is not limited to the developed world: developing countries are also now experiencing a demographic shift to an increasingly older population. Along with energy and climate change, ageing is one of the major global challenges for the 21st century.

Researchers, decision makers, practitioners and carers who work in the ageing field are well aware of the issues involved. UK research continues to make a major contribution to extending and improving the length and quality of people's lives around the world. Major advances have been achieved by individuals pursuing scientific challenges within their specific field and it will be important to support such excellent research in the future.

However, we recognise that key challenges in ageing – such as reducing morbidity, maintaining independence and wellbeing and providing cost effective care – cannot be solved in research silos but require a pluralistic approach. We must also encourage enterprising world-class researchers who seek to combine their expertise with others to tackle the cross-cutting challenges and exploit the new opportunities associated with an ageing population.

Individual initiatives, partnerships between research funders, previous research councils schemes such as EQUAL and New Dynamics of Ageing (NDA) and the current Lifelong Health and Wellbeing (LLHW) cross-council programme create and sustain environments that support multidisciplinary and cross-sector working in ageing research. By bringing together experts from different disciplines with stakeholders and users of research it is possible to focus on where the UK is best placed to make the greatest impact.

The Strategy for Collaborative Ageing Research, developed under the auspices of the LLHW programme, builds on these successes. The opportunities it outlines not only provide direction for future research partnerships, but should also serve as a catalyst for creating new collaborations with government, industry and the third sector, which will result in tangible benefits to health, wellbeing and independence in later life.

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Executive Summary

Context

Improvements in healthcare, diet, sanitation and housing have resulted in an increase in life expectancy in the UK of around 30 years over the past century. In common with other developed countries, the rise in longevity in the UK has been accompanied by an overall decrease in fertility rate, leading to a growing proportion of the population over retirement age. A key goal is to understand the contribution and interaction of the determinants that shape ageing across the life course and develop strategies and interventions to improve and extend cognitive and physical function and quality of life in old age.

The research councils and health departments have a long standing commitment to funding ageing relevant research. The purpose of developing the strategy for ageing research in the UK is to focus on shared issues where there are opportunities to add value through strong cross-sector approaches. The strategy will inform the future direction of collaborative ageing research supported by the research councils and health departments and guide coordination between funders and partnerships with other Government departments, the private and third sectors. It is envisaged that the strategy will also provide a vehicle to promote transition of knowledge into policy, services, products and practice.

Research Challenges

Three overarching research challenges have been identified where there is scope for enhanced research collaboration by building on existing multi-sector approaches or combining UK strengths across research and stakeholder communities.

- **Promoting mental health and mental wellbeing**
- **Life course influences on healthy life expectancy**
- **Impact of ageing on health and independence**

Opportunities for Impact through Joint Working

Specific areas within the research challenges are highlighted where there are opportunities for greater impact on complex ageing-related issues by joining forces across different disciplines and sectors.

- **Achieving good cognitive function and mental wellbeing in later life**
- **Promoting physical health in older age**
- **Extending healthy working lives**
- **Enhancing mobility and independence in an ageing population**

To exploit existing resources, build on research strengths and realise the opportunities for enhanced collaborative working identified in the strategy, the following cross-cutting research issues will need to be addressed:

- **Capacity building**
- **Integrating markers of healthy ageing**
- **Synthesis and analysis of existing evidence**
- **Knowledge exchange and cross-sector collaboration**

The research challenges and opportunities presented in the strategy are UK-wide and cover the remits of a range of disciplines, funding bodies and private, public and third sector organisations. Successful implementation of the shared aims of this strategy will therefore require a coordinated approach from public and charity funders working in partnership with Government, industry and the public, with the aim of maximising the UK's ageing research endeavour for ultimate societal benefit.

1. Introduction and Rationale

1.1 Overview of the challenge

Improvements in healthcare, diet, sanitation and housing have resulted in an increase in life expectancy in the UK of around 30 years over the past century. More people who survive into old age today in most developed countries are living for longer than previous generations¹. In common with other developed countries, the rise in longevity in the UK has been accompanied by an overall decrease in fertility rate, leading to a growing proportion of the population over retirement age. Around one in six people in the UK is currently over 65 and this figure is projected to rise to almost one in four by 2033. The fastest growth is amongst the over 85s, the oldest old, who are expected to reach 4.6% of the population in 30 years time². A large proportion of the population attaining old age is an achievement to be celebrated, with positive social and economic implications and opportunities for society³. However, old age can be associated with dependence and ill health, resulting in increased public expenditure on health and social care and pensions^{4,5}. To fully prepare for the opportunities and challenges of the UK's changing demographics, we must put measures in place to create an equitable, affordable and sustainable ageing society for the future.

Although ageing is inevitable, it does not follow a uniform pattern. The older population is diverse, spanning a wide range of ages and socioeconomic and ethnic groupings. Life expectancy in different regions of the UK varies by as much 14 years⁶. Health, wellbeing and lifespan are influenced by a complex mix of biological, environmental, socioeconomic and cultural factors throughout life. A key goal is to understand the contribution and interaction of the determinants that shape ageing across the life course and develop strategies and interventions to improve and extend cognitive and physical functioning and quality of life in old age.



1 Vaupel JW Biodemography of Human Ageing 2010 *Nature* 464; 536 - 542

2 ONS (2008) National Population Projections

3 <http://www.bis.gov.uk/assets/biscore/corporate/docs/ageing-population/10-828-opportunities-and-challenges-of-ageing-population-analytical-paper.pdf>

4 HMT (2002) Securing Our Future Health: Taking A Long-Term View - The Wanless Review

5 The King's Fund (2006) Securing Good Health for Older People

6 ONS (2009) Life expectancy by local areas in the United Kingdom

Research has played a central role in increasing the length and quality of peoples' lives. Good progress is being made addressing many of the challenges facing an ageing society, but some areas would benefit from novel multi-disciplinary research approaches. It will be essential that researchers work closely with stakeholders from private, public and third sectors to ensure that the outputs of research are translated to inform policy and improve services, products and practice in the future.



1.2 Purpose of the strategy

A range of public, private and third sector organisations in the UK support a spectrum of research activities aimed at improving health and wellbeing in old age. The research councils and health departments have a long standing commitment to funding ageing relevant research including many recent individual and joint major initiatives in the field [Table 1].

The purpose of developing a strategy for ageing research in the UK is to focus on shared issues where there are opportunities to complement funders' individual strategic plans and add value to existing initiatives through strong cross-sector approaches. The strategy seeks to build on achievements and ongoing activities by capitalising on UK strengths and identifying areas of untapped potential that would benefit from greater collaborative working across different research and stakeholder communities.

The strategy will inform the future direction of collaborative ageing research supported by the research councils and health departments, especially the coordination between funders, and partnerships with other Government departments and the private and third sectors. It is envisaged that the strategy will also be used by a variety of stakeholders to inform strategic decisions, facilitate new collaborations and provide a vehicle to promote translation of knowledge into policy and practice.

2. Development of the Strategy

The strategy has been developed with input from:

- The Lifelong Health and Wellbeing Advisory Panel, comprising academic experts from different disciplines and representatives from industry, policy, charities and the public [Annex 1], which met with the LLHW funding partners to identify major UK strengths, opportunities and tractable cross-cutting challenges in ageing research.
- A scoping exercise which surveyed the age-related investments of the research councils, health departments and major charities.
- A review of recent reports, reviews and literature in the area.
- Key stakeholders in the ageing research field.

Based on the above evidence, three overarching research challenges have been identified with an emphasis on prevention and promotion of health, wellbeing and independence in later life, where there is scope for greater multi-sector coordination. Strong research collaborations in these areas can be achieved by enhancing existing cross-sector approaches or combining UK expertise across different research and stakeholder communities (Section 3). Within these cross-cutting challenges, specific opportunities for greater impact through joint working across disciplines and sectors are highlighted, with the aim of maximising the UK's ageing research endeavour for ultimate societal benefit (Section 4).



3. Research Challenges

3.1 Promoting mental health and mental wellbeing

The socioeconomic importance of maintaining good mental health and mental wellbeing throughout life and into old age has been described in the recent Foresight Mental Capital and Wellbeing report⁷. Old age can present many mental health challenges including age-related cognitive decline, coping with loss and social exclusion, which can frequently be compounded by physical ill health, disability or dementia. Although it is acknowledged that the foundations of good mental health are laid down at an early age, a variety of factors throughout life shape mental health, cognitive function and wellbeing. A key challenge will be to develop strategies to promote mental health and wellbeing across the life course and retain cognitive reserve in old age.

3.1.1 Preserving cognitive function

Cognitive decline is a feature of the ageing process. Valuable insights into the variability of cognitive resilience and prevalence of age-related cognitive decline have been gained through analysis of the UK's unique set of cohorts. Underpinning the UK's significant investment in foci specialising in age-related cognitive function is a strong neuroscience community focusing on cognition, memory, neural circuitry and plasticity and brain ageing, coupled with the development of brain imaging tools and technologies. Greater collaboration between these recognised UK research strengths will lead to increased understanding of the genetic and environmental determinants of cognitive function and their interplay over the lifespan.

The recent review of mental health research conducted by the MRC⁸ highlighted the importance of developing interventions to enhance mental health and preserve cognitive function in old age. Currently there is limited understanding of the mechanism, efficacy and generalisability of these interventions. Development of robust strategies to retain cognitive reserve will require a combination of expertise from neuroscience, psychology and population sciences. There is potential to explore the use of existing resources such as establishing nested case control studies within the UK's well phenotyped ageing cohorts to facilitate these developments.



7 Foresight for Government Office for Science (2008) Mental Capital and Well-being: Making the Most of Ourselves in the 21st Century www.foresight.gov.uk

8 MRC Review of Mental Health Research: Report of the Strategic Review Group (2010) <http://www.mrc.ac.uk/mentalhealthresearch>

3.1.2 Promoting mental wellbeing in later life

There is evidence that mental wellbeing in older age is associated with higher cognitive functioning, good physical health, increased capacity to cope with stress, better interpersonal relationships and longer life expectancy. The loss of meaning and purpose, independence and mobility, social isolation, the physical environment and poor quality of life in old age may both reflect and impact on an individual's sense of wellbeing. This suggests that beneficial effects on wellbeing may be achieved through directly targeted approaches or as an indirect outcome of interventions aimed at other aspects of health, environmental, sociopsychological and economic gain.

Evidence indicates that interventions such as continued learning, physical activity, work, cultural participation and social networking can improve wellbeing in older people. Schemes have been introduced by Government and local community initiatives to promote social engagement by elderly residents through civic participation, volunteering and social and cultural activities. The UK has a large investment in digital inclusion research which is aimed at increasing older people's use and uptake of information and communication technologies, enabling them to participate in online services, learning, cultural and social networking activities. This growing digital research base is complemented by a small portfolio of projects involving older people's physical participation in community and cultural activities such as literature, art, theatre, dance and music.

We need robust evaluation of policy and research-led initiatives using well characterised methods to ascertain whether these interventions can successfully promote sustained wellbeing, are cost effective and can be translated across different settings. In concert with these studies, we need new multi-disciplinary approaches to further explore the development of novel interventions designed to improve wellbeing and quality of life in old age.

3.2 Life course influences on healthy life expectancy

The advantages of long life expectancy can only be fully realised if the years gained are accompanied by good health. A key societal challenge is to compress morbidity in old age by reducing the time spent with disability and in poor health. We need to understand how socioeconomic, environmental, technological, behavioural, cultural and biological influences throughout our lives affect the health, wellbeing and life expectancy of a heterogeneous older population. To successfully plan for the future we must assess the impact of changing demographics and longer working lives and understand how we can modify behaviour and environmental factors to improve and extend productivity, health and wellbeing in later life.

3.2.1 Demographic change and society

- **Changing population dynamics**

Meeting the needs of an ageing population requires an understanding of future population trends and potential demand for and cost of public services, especially in welfare, health and social care. There is substantial UK research investment addressing these issues ranging from macro and micro economic modelling of wealth and income after retirement, pensions and workforce dynamics to changing patterns of public policy, migration, fertility and household dynamics. Rich data sets such as surveys and longitudinal cohort studies provide valuable resources underpinning these studies. Increased data linkage and secondary use of research data and routinely collected data sets will be needed to strengthen knowledge in this area in order to inform future social and economic structures of an ageing society.

- **Extended working lives**

Demographic changes and economic policies are resulting in more people in employment at an older age. While there is an economic imperative to work later in life, the consequences of these policies for health and wellbeing need to be understood. The recent review by Dame Carol Black⁹ highlighted the importance of maintaining health and wellbeing across the working age population and providing support to return to work following ill health or injury.

⁹ Working for a Healthier Tomorrow (2008) Department for Work and Pensions and Department of Health

There is evidence that working at older ages can confer health and wellbeing benefits such as a sense of purpose, social engagement and maintaining physical and mental activity. However the generalisability of these effects will need to be explored in the context of the changing capabilities of a diverse ageing workforce, employment and retirement decisions, the effects of workplace environments on older workers, attitudes to ageing workers and health risks of employment at an older age.

3.2.2 Ageing well in the physical environment

The physical environment plays a central role in determining older people's mobility and wellbeing. There is increasing awareness of the need to design environments for the widest possible range of users including older and disabled people, many of whom face challenges in negotiating home and external environments as a result of impaired mobility, vision, hearing or dexterity.

Accessible housing and reliable transport to access shops, friends and family, leisure facilities and health and care services are essential to enable people to live productive, healthy and independent lives. In addition to understanding the physical requirements of an older population, it is important to determine how issues such as perception of community safety, susceptibility to mistreatment or abuse and proximity to informal support and family and social networks impact on independence and wellbeing.

There is a growing research base in the UK investigating the requirements of healthy sustainable ageing communities, such as inclusive design of products, services and physical environments aimed at safeguarding the needs of vulnerable older adults and extending active independent living of people with differing physical abilities. Greater attention should be given to combining the skills of engineers, architects, designers, social scientists, epidemiologists and psychologists with users, service providers, town planners and policy makers to create environments that promote independence, health and social engagement in an increasingly older population.

3.2.3 Determinants of health and longevity

- **Gene environment interactions**

The rate of the natural ageing process is heterogeneous with variation between people and in different organs and tissues of the body. Findings from twin studies have indicated that approximately 25% of variation in longevity can be attributed to intrinsic genetic factors, with the remaining 75% determined by extrinsic environmental influences¹⁰. Investigation of early life influences such as maternal diet has shown that environmental factors play an early role in determining health and susceptibility to disease in later life. Further work is needed to understand the interplay between genetic variations and environmental factors and how these gene environment interactions influence lifespan.

- **Maintaining healthy lifestyles**

Health behaviours and lifestyle choices are major determinants of life expectancy, health and wellbeing in old age. Physical activity, for example, is important for maintaining bone density and muscle mass, and confers positive effects on mental health and wellbeing. Quality



10 Kaare Christensen, Thomas E Johnson and James W Vaupel (2006) The Quest for Genetic Determinants of Human Longevity: Challenges and Insights *Nat. Rev. Genet.* 7 (6) 436 - 448

and quantity of diet are essential factors underpinning health yet changes that occur in nutritional requirements and dietary behaviours across the life course are not well understood. Research findings from the UK have demonstrated that obesity and smoking shorten length of life by up to 10 years¹¹, whereas evidence suggests that moderate amounts of alcohol may be beneficial for health. Key societal challenges are to understand the drivers and effects of health behaviours and identify effective interventions to extend healthy life expectancy across diverse social, cultural and economic groupings within the population.

Major research goals are to widen the range of interventions developed and evaluated. Stronger evidence is needed on their generalisability and sustainability of benefits in different settings and sub-populations, cost effectiveness, ethical implications and their wider impact on inequalities and social isolation. An important component in the development of interventions for behavioural change will be to determine the optimum diet and level and type of physical activity required to maintain health and to protect against disease at different ages.

The UK's unique sets of cohorts, longitudinal studies, biobanks and surveys provide a rich source of data on UK populations. This information, together with the UK's strengths in genetics and genomics, can be used to gain a better understanding of how socioeconomic, environmental, cultural, psychological and genetic factors influence health and drive health behaviours. Combining the UK's strong research base in epidemiology, population health and nutrition with physiologists, engineers, technologists, social scientists and health and social care professionals offers the potential to advance this area by exploring novel approaches to robust interventions able to motivate and sustain healthy lifestyles across the life course into old age.

3.3 Impact of ageing on health and independence



Ageing is a major risk factor for development of degenerative conditions and diseases such as dementia, osteoporosis, sensory decline and cardiovascular disease, which can lead to chronic ill health and dependence. Pressure on health and social care services is set to escalate with more people living for longer in old age. Greater understanding of the relationship between the ageing process and onset of age-related conditions will be needed to inform strategies to prevent, delay, ameliorate or manage the effects of age-related illness and disability. Development of innovative diagnostics and novel treatments, coupled with the provision of cost effective health and social care, will enable an ageing population to better manage their health, sustain independence and benefit from extended functional ability in later life.

3.3.1 The ageing process and age-related conditions

The recent report from the Academy of Medical Sciences¹² provides a comprehensive overview of the current status of understanding of the normal physiology of ageing. The UK's research community is engaged in a wide range of

11 Kay-Tee Khaw, Nicholas Wareham, Sheila Bingham, Ailsa Welch, Robert Luben, Nicholas Day (2008) Combined Impact of Health Behaviours and Mortality in Men and Women: The EPIC-Norfolk Prospective Population Study *PLoS Medicine*: 5 (1) e12

12 Academy of Medical Sciences Rejuvenating Ageing Research (2009) www.acmedsci.ac.uk/publications



biological studies from biogerontology and systems biology to fundamental molecular and cellular studies that are relevant to biological ageing. There is also a large UK investment in tissue and biobanks and ageing cohort populations which can be used to both inform and translate these underpinning studies.

It is well recognised that the immune system declines with age, contributing to increased infection rates and poor vaccination responses in older adults. Research into ageing of individual immune cells is a recognised UK strength, however comparatively little is known of the relative significance of changes in immunity and how other age-related physiological changes impact upon the immune response. Improved understanding of how the immune response as a whole alters over the life course is central to development of interventions and policy to maintaining a healthy immune system in old age.

A reduction in bone density, impaired joint function and loss of muscle strength are consequences of the ageing process. These changes are the main causes of osteoporosis, sarcopenia and frailty, which are associated with increased risk of falls and fractures, hospitalisation and long-term care requirement. Sensory decline which results in conditions such as incontinence, blindness and deafness is also a common feature of ageing. Greater knowledge of how age-related changes alter the normal physiological processes and how system changes contribute to the pathophysiology of these conditions is required to develop strategies to protect against their debilitating effects.

The increasing proportion of elderly people in the population has seen a growth in the number affected by neurodegenerative diseases including dementias. Progress in development of effective treatments has been hampered by a lack of understanding of the basic molecular and cellular origins and mechanisms of these diseases. The processes associated with intrinsic brain ageing have not been well elucidated, adding to the complexity of identifying candidate genes and pathways involved in the development of diseases. In recent years there has been substantial investment in the UK targeting brain ageing and neurodegeneration. Outcomes from these investments will accelerate understanding of normal brain ageing, the pathogenesis of neurodegenerative diseases and the relationship between the two processes.

The normal ageing process is known to share common mechanisms such as genome instability, telomere damage and mitochondrial dysfunction with cancer and neurodegenerative diseases. A key goal will be to integrate our understanding of the biology of ageing with the pathogenesis and risk of developing age-

related conditions, in particular the immune system, sensory organs, brain and musculoskeletal system, to ensure effective translation of knowledge into prevention, diagnostics and treatments.

Multi-disciplinary research teams will be needed to determine how biological, psychological, social, cultural and economic markers of ageing can be integrated to predict healthy ageing phenotypes, longevity and susceptibility to disease in a diverse older population, with the ultimate aim of informing interventions to promote longer healthy lives.

3.3.2 New models of health and social care

As the proportion of older people in the population grows, there will be increasing pressure on health and social care services. The projected rise in costs indicates that current models of care provision will be unsustainable.

Assistive technologies and services such as telecare, which triggers alarms and sensors in response to changes in the environment, and telehealth, which enables an individual to monitor their own health status, provide a new way of delivering care outside hospital or residential care services. Receiving support at home or in a GP or community setting enables older people to live independently for longer, which improves wellbeing, results in fewer acute hospital admissions and reduces pressure on long term residential care.

The UK is at the forefront of innovation in the design and development of assistive tools and technologies to promote independent living and self management at home. Key to the success of these emerging technologies as a viable care solution will be their adoption and use by older people and the development of sustainable service delivery models. It will be essential to involve service users and other stakeholders in their development to ensure technology and service designs are fit for purpose, scalable and genuinely enable people to live independently while maintaining a high quality of life.

Modelling of the impact of an ageing population on health and social care to determine the likely future demand for existing services is a current UK research strength. There is a need to develop and evaluate, both in terms of effectiveness and cost effectiveness, alternative forms and innovative ways of delivering social and long-term care. Better intelligence is also required on the impact of the shifting interface between social care and other forms of welfare, such as health care, income maintenance and housing on the ageing population, particularly those in low income groups. Factors enhancing the seamless provision of services and the control of service users over the services or care they receive are also key research issues, especially in the context of the changing roles and responsibilities of individuals and the public, private and third sectors. These challenges will need contributions from a broad number of disciplines and sectors ranging from health and welfare economics to management and social policy.

3.3.3 Improving diagnosis and management of age-related conditions

In recent years there have been major UK investments dedicated to developing innovative diagnostic markers, tools and technologies and a range of therapeutic drugs, devices and interventions aimed at improving the detection, treatment and management of age-related conditions such as cardiovascular diseases, musculoskeletal conditions, dementias, and sensory and cognitive decline. To exploit these research advances we need to ensure knowledge is effectively translated to benefit and inform patients and service users.

New partnerships across academia, the NHS and social care, the third sector, Government and industry are being forged to ensure the outputs of research are used better to inform policy, practice and delivery of health and social care. It is essential we continue to support the development of novel diagnostics, treatments, rehabilitation and management interventions aimed at reducing morbidity associated with age-related disability and conditions. Encouraging the formation of further multi-disciplinary and cross-sector alliances will accelerate the translation of these research outcomes to improve the health and wellbeing of an increasingly older population.

4. Addressing the Research Challenges

The UK is well placed to respond to the major research challenges facing an ageing population in the 21st century. There is significant investment supporting valuable resources and world leading expertise focused on key ageing-related issues. It will be important to continue to exploit existing resources, build on research strengths to advance our current knowledge base and include international collaboration and international comparative research where appropriate.

Opportunities have been highlighted in this document where we have the potential to make a significant impact by joining forces across disciplines and sectors to bring innovative approaches to tackling complex ageing-related research challenges. The strategy outlines the following areas where we can build on existing UK strengths and increase capacity by working collaboratively to address the research challenges and opportunities identified.



4.1 Opportunities for impact through joint working

Achieving good cognitive function and mental wellbeing in later life

- Developing and robustly evaluating a wide range of interventions with the potential to enhance wellbeing in older age, drawing on expertise from biological, social and population sciences, engineering, arts and humanities, economic and health sectors.
- Identifying environmental, socioeconomic and genetic influences throughout the life course that shape cognitive function in old age, in particular utilising the UK's collection of ageing cohorts.
- Exploring strategies to maintain cognitive reserve by combining UK strengths in psychology, neuroscience and population based studies.

Promoting physical health in older age

- Identifying the drivers and effects of health behaviours, in particular examining how these complex factors interplay in different social and cultural groups within the ageing population. Harnessing UK expertise in epidemiology and social sciences.
- Encouraging healthy behaviours throughout life to improve health in old age by identifying and evaluating interventions leading to sustained healthy lifestyles. Determining optimum levels of physical activity, diet and nutrition to maintain health and wellbeing in older age. Exploring the potential of using alternative approaches to support behavioural change through new cross-sector partnerships.
- Defining the relationship between the physiology of natural ageing and the pathogenesis of age-related conditions, in particular neurodegeneration, sensory loss and musculoskeletal conditions. Encouraging greater collaborations between basic and clinical scientists, with the aim of informing strategies to prevent, delay or treat age-related conditions.
- Unraveling the complex interaction between genetic and environmental determinants of healthy life expectancy through greater collaboration between basic, clinical and social scientists.

Extending healthy working lives

- Creating environments to support health and wellbeing in the workplace, in particular addressing the needs of a diverse older workforce. Establishing cross-sector collaborations with academics, employers, policy makers and older workers.
- Understanding the socioeconomic, health and quality of life implications of working at an older age. Maximising the use of longitudinal studies and survey data and forming new collaborations across disciplines and stakeholder groups.

Enhancing mobility and independence in an ageing population

- Designing physical environments including housing and transportation and inclusive design of products and services which facilitate mobility and social participation. Building on existing strengths and encouraging more cross-sector collaboration between academics, local and central Government, the public and service providers.
- Developing effective interventions including assistive technologies and new models for care services to support independent living by fostering collaborations between academics, users, policy makers and wider stakeholders to ensure cost effectiveness, adoption and sustainability.

4.2 Tackling cross-cutting research issues

To exploit existing resources, build on research strengths and realise the opportunities for enhanced collaborative working identified in the strategy, the following cross-cutting research issues will need to be addressed:

Capacity building

Increase and sustain the research base in ageing-related research by encouraging young investigators into the area, supporting career development at all stages, attracting expertise from outside the ageing field and building new alliances between academics from across different disciplines and wider stakeholder communities.

Integrating markers of healthy ageing

Development and validation of methods to integrate biological, psychological, physical, social and economic markers to better understand or predict resilience, ageing phenotypes and determinants of health and wellbeing in later life.

Synthesis and analysis of existing evidence

Increase impact of existing evidence and data through synthesis of state-of-the-art knowledge on healthy ageing, including systematic reviews, secondary use of research data and use of routinely collected datasets. Maximise the use of the UK's large and valuable collection of birth cohorts, longitudinal studies, surveys and biobanks and the research potential of electronic patient and health care records to better understand life course influences on health, wellbeing and the cause and risk of developing disease and disability in later life.

Knowledge exchange and cross-sector collaboration

Effective translation of exploratory science and research outcomes into interventions, products, services or knowledge that can impact positively on practice and policy, by fostering new or building stronger collaborations between academia and stakeholders from public and private sectors and the public. Stimulate research that aligns with policy and practice needs through the development of closer alliances between academics, policy makers, users and practitioners.

5. Next Steps

The research challenges and opportunities presented in the strategy are UK-wide and cover the remits of a range of disciplines, funding bodies and private, public and third sector organisations. Many of the challenges highlighted in the strategy align with recommendations from related reviews and reports in the area including the MRC Mental Health Review; Academy of Medical Sciences Rejuvenating Ageing report; the cross-Government report Building a Society for All Ages¹³ and devolved nations policy documents on ageing and the consultation on public attitudes to ageing research¹⁴. Successful implementation of the shared aims of this strategy will therefore require a coordinated approach from public and charity funders working in partnership with Government, industry and the public.

Ageing-related research is supported through individual and joint strategically directed initiatives, partnerships between UK, European and international funders and investigator-led schemes of individual organisations. Current opportunities to address the research challenges identified in the strategy are via existing routes offered by individual funders or through targeted schemes including the cross-council Lifelong Health and Wellbeing programme, the joint ESRC Technology Strategy Board call in Assisted Living: Economic and Business Models and Social and Behavioural Studies, the National Prevention Research Initiative, AHRC co-ordinated Connected Communities Programme and the European Joint Programme in Neurodegeneration. The framework presented in this document is intended as a high level strategy to inform the future direction of collaborative ageing-related initiatives and partnerships activities that will shape the UK ageing research agenda going forward.



13 Building a Society for All Ages (2009) HM Government

14 Public Consultation on Ageing: Research into Public Attitudes Towards BBSRC- and MRC-Funded Research on Ageing (2006) <http://www.ipsos-mori.com/researchpublications/researcharchive/poll.aspx?oItemId=372>

Table 1

Current Research Councils' and Health Departments' Major Strategic Investments in Ageing Research

Initiative	Date [#]	Amount Committed*	Funders [†]
Large Multi-Partner Initiatives			
Lifelong Health and Wellbeing	2008-2011	£16m to date	AHRC, BBSRC, EPSRC, ESRC, MRC, CSO, DH/NIHR, HSC and NISCHR
New Dynamics of Ageing	2006-2009	£20m	AHRC, BBSRC, EPSRC, ESRC and MRC
Collaborative Initiatives			
Medical Engineering Centres	2009	£22m	EPSRC and Wellcome Trust
Neurodegenerative diseases initiative	2009	£17m	MRC and Wellcome Trust
Collaborative Research on the Biology of Ageing	2009	£4m	BBSRC and National Institute of Aging (US)
Ageing Bladder and Bowel	2009	£1.4m	BBSRC and Age UK
Understanding Society	2008	£15.5m	ESRC, CSO, DH/NIHR, HSC, NISCHR, DCMS, DoE, Defra, DWP, DfT, FSA and DCLG
Centre for Ageing Research and Development in Ireland	2007-2011	£2.4m	The Atlantic Philanthropies, HSC and Department of Health and Children (Ireland)
Centre for Integrated Biology of Ageing and Nutrition (CISBAN)	2005	£6.5m	BBSRC and EPSRC
Individual Funder initiatives			
NIHR Dementias and Neurodegenerative Diseases Research Network Coordinating Centre (DeNDRoN)	2010	£5.6m	NIHR
Cambridge Centre for Ageing and Neuroscience (CamCAN)	2010	£5m	BBSRC
Older People and Ageing Research Network (OPAN)	2010	£1.3m	NISCHR
The Wales Dementias and Neurodegenerative Diseases Research Network (NEURODEM)	2010	£734k	NISCHR
MRC Life Course Epidemiology Unit	2010	£14.6m	MRC
EQUAL Consortium including KT EQUAL	2008-2009	£6.8m	EPSRC
MRC Unit for Lifelong Health and Ageing	2008	£4.7m	MRC
Scottish Dementia Research Network	2008	£1.1m	CSO
Newcastle NIHR Biomedical Research Centre in Ageing	2007	£7.6m	NIHR

Date of funding allocated or period of open competition for funds

*Total funding commitment by partners

† AHRC Arts and Humanities Research Council; BBSRC Biotechnology and Biological Sciences Research Council; CSO Chief Scientist Office Scotland; DH Department of Health England; EPSRC Engineering and Physical Sciences Research Council; ESRC Economic and Social Research Council; HSC Health and Social Care Research and Development Office Northern Ireland; MRC Medical Research Council, NIHR National Institute of Health Research; NISCHR National Institute of Social Care and Health Research Wales, DCMS Department for Community, Media and Sport; DfE Department for Education; Defra Department for Environment, Food and Rural Affairs; DWP Department for Work and Pensions; DfT Department for Transport; FSA Food Standards Agency and DCLG Department of Communities and Local Government.

Annex 1

Lifelong Health and Wellbeing Research Advisory Panel members who contributed to the development of the strategy

Professor David Armstrong (Chairman), King's College London

Dr David Britt, LLHW Public Perspective Group

Professor Chris Carey, University College London

Professor Cyrus Cooper, University of Southampton

Professor James Goodwin, Age UK

Professor Kay-Tee Khaw, University of Cambridge

Professor David Kipling, Cardiff University

Professor Peter Lansley, University of Reading

Professor Janet Lord, University of Birmingham

Ms Jackie Marshall-Cyrus, Technology Strategy Board

Professor John Mathers, Newcastle University

Professor Brendan McCormack, University of Ulster

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You can download a copy of the ageing strategy from: www.mrc.ac.uk/LLHW/ageingstrategy

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