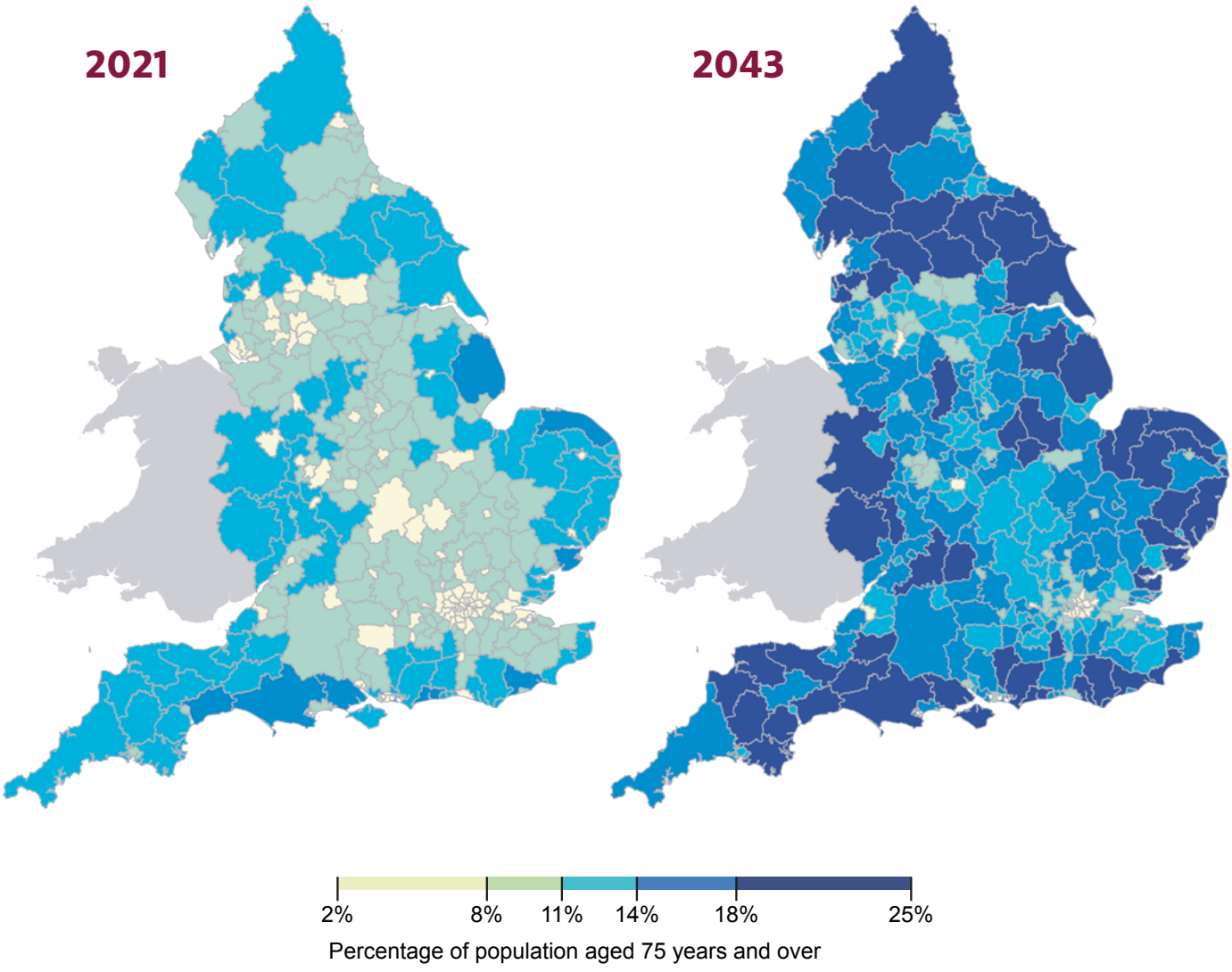
# Chief Medical Officer's Annual Report 2023

# Health in an Ageing Society



Front cover images: Maps of England showing the percentage of the population aged 75 years and over in 2021 and the projected population aged 75 years and over in 2043

Image source: Office for National Statistics

# Foreword

One of the triumphs of modern medicine is that the great majority of people live into older age. For many, this is a period of great happiness; freedom to do what they want, the joys of being a grandparent, a respected place in families and in society. At the other extreme, for some older age is a time of great difficulty, with dignity impaired, independence curtailed, and encroaching frailty, discomfort and loneliness. The difference between these two is largely determined by health, physical and mental. Those who enter older age in good health and maintain it to the end have a very different experience to those who rapidly accumulate multiple debilitating or degenerative conditions, living with them for many years.

Older people have essential roles in society, including significant caring responsibilities for younger generations and their peers, and skills and knowledge accumulated over a lifetime. Those living in older age have however always, on average, depended more on family and wider society than they did as young adults and in middle age. Improving and maintaining the health of older adults is a strong social responsibility. The principal reason to support the health of the oldest members of society is for those people themselves. There are, however, additional benefits to partners, family members, health services and wider society if we can minimise the period of ill health and dependence in older age. Even with optimal improvements in health in older age, society needs to provide greater support through health and social care and we need to plan for this as the population ages.

The aim of this report is to concentrate on issues which are about improving the quality of life in an adult's later years, rather than the quantity. Some of the things we can do to allow people to have healthier lives in older age may, as a fortunate by-product, also extend their lifespan, but this report is not concentrating on these areas in particular.

Improving the quality of life can broadly be divided into 1) things which reduce disability and ill health, and 2) things which can be done to adapt the environment to allow an individual with a set amount of disability in older age to live as independent and enjoyable a life as possible. In general, helping people maintain health is the role of public health and medicine. Improving the environment for older adults includes issues around urban planning, building design, social care and aids to independent living. There is of course a lot of overlap; for example, an urban environment which allows older adults to use active transport, especially walking, safely will both improve their current independence and their future health.

The executive summary which follows identifies many of the key issues raised by the report. I would however like to highlight one paragraph each for the general public, policymakers and the medical profession.

For the **general public**, I wish to highlight that most people enter older age, and many remain, in good health. A great many more go through older age in health which is sufficient to have independence and a high quality of life. Most people do not have Alzheimer's or other dementias, or major debilitating conditions, before they die. Older age is often portrayed relentlessly negatively when actually the experience for many in older age is positive. One of the

most satisfying things that doctors experience is caring for women and men of a grand old age facing the end with great serenity and saying 'I've had a good innings' or equivalent. Some of this is due to good luck, but the chances of delaying disease and disability are substantially increased by straightforward measures individuals can take to prevent or significantly delay disease and maintain physical, mental and social activity.

For **policymakers**, the biggest concern I have is that government and professional bodies have not recognised the degree to which the population living in older age is concentrating geographically in the United Kingdom in general, and England specifically. People move out of cities and large towns before older age, concentrating geographically in coastal, semi-rural or peripheral areas, often with relatively sparse services and transport links. Manchester, Birmingham and London will age very slowly but areas such as Scarborough, North Norfolk or the south coast are going to age rapidly and predictably. Providing services and environments suitable for older adults in these areas is an absolute priority if we wish to maximise the period all older citizens have in independence. The provision of health and social care also needs to be concentrated in these areas.

For the **medical profession**, wider healthcare professionals and medical scientists I would like to highlight the importance of multiple long-term conditions in older age, often called multimorbidity. This is increasing and will continue to increase in the future. Medical specialisation, specialised NHS provision, NICE guidelines, and medical research are all optimised for single diseases but that is not the lived reality for the great majority of older adults who often transfer very rapidly from having no significant disease states, to several simultaneously. The increasing specialisation of the medical profession runs counter to optimising treatment for this group of largely older citizens and patients. We must address this seriously as a profession.

Overall, this is an optimistic report. The history of the last few decades has been of longer life in a diverse ageing population, but also longer periods of life living with disease and disability. However, this expansion of the period in ill health is not inevitable; compression of morbidity so that people spend less time living with ill health is entirely realistic. If we can push disease out to the right in terms of time so that people develop conditions later, and preferably not at all before they reach their natural end, we can significantly improve the quality of life for older citizens whilst reducing the pressure on health and social care systems. This should be a major aim of policy and medical practice.

In writing this report I benefited greatly from advice from many individuals, specialists and groups around the country, some of whom have kindly authored chapters and others are noted in the acknowledgements section. I would however particularly like to thank Dr Ben Holden who was the editor of this report.

Almost everyone reading this report will know older adults and will grow old themselves. Maximising the health, and therefore the life chances, of older adults should be seen as a major national priority, and one where we can make very significant progress often with relatively straightforward interventions.

Prof. Chris Whitty
Chief Medical Officer for England, 2023

# Executive summary

## Health in an ageing society

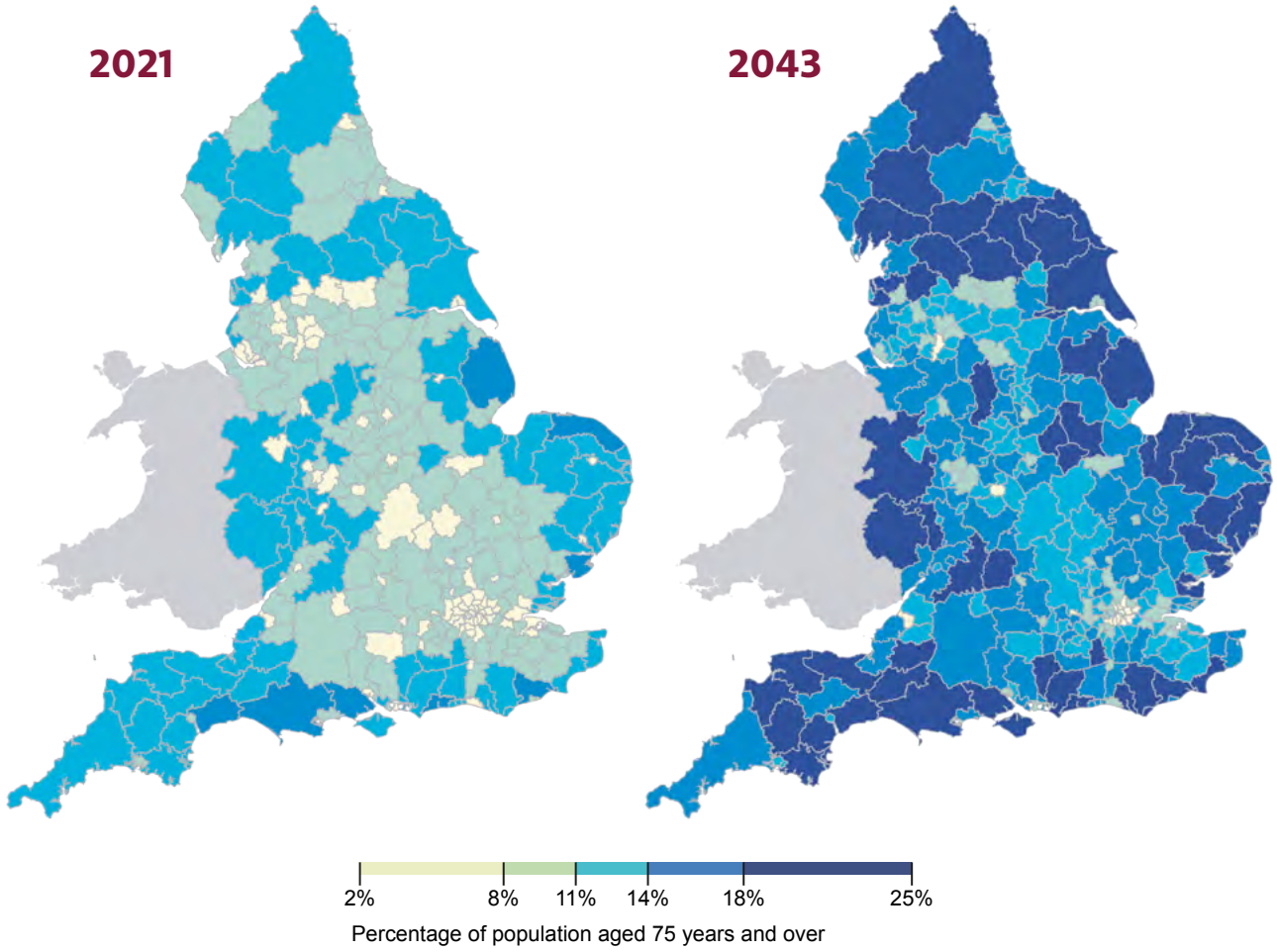
1. **This report is about improving quality of life rather than longevity**
   The fact that people are living longer compared to a century ago is a triumph of medicine and public health. It is something to celebrate, but alongside this we have a responsibility in medicine, government and wider society to plan to ensure that older age is as healthy, independent and enjoyable as possible into the future. This report does not aim to advise on how to extend life further, although this may be a positive side-effect of some of the interventions discussed if undertaken systematically. Rather, the focus is on how to maximise the independence, and minimise the time in ill health, between people in England reaching older age and the end of their life.

2. **Ill health and disability in older age is not inevitable**
   Whilst diseases, long term conditions, and disabilities become more common and accumulate as we become older, they are far from inevitable, even in later years. For example, dementia prevalence in the UK is only around 3% for those aged 70 to 74 years and 11% at 80 to 84 years (in other words, around nine out of ten 80 to 84 year olds do not have dementia); in those aged 90 to 94 years, around seven out of ten will not have dementia.[1] There is often an assumption that people in older age will need a significant amount of care and support, and for many, especially those with frailty, that is true, resulting in a significant loss of independence and often practical and financial strains on families. However, UK census data from 2021 show that around eight in ten people aged over 90 years were not living in care homes and less than 4% of those aged 80 to 84 were in care homes.[2] There are many straightforward actions that individuals, the NHS and the government can take to reduce risks of dementia, degenerative disease and frailty for future generations still further.

3. **Urban areas are not where the growth in older people is occurring; more peripheral areas are where the increase in need will be seen**
   In planning health and social care services, as well as infrastructure, this report makes clear that the geography of older age in the UK is already highly skewed away from large urban areas, and will become more so. A large proportion of people migrate away from cities before they reach older age. The result is that metropolitan areas largely maintain their current demographic, ageing only slowly, while some areas, particularly rural, semi-rural and coastal areas in the periphery, age much faster (Figure 1). The proportion of older adults in some parts of the country will be substantial. At the same time, the proportion of working-age people able to provide care is often reducing in these areas (this is represented by a rising old-age support ratio). Many of these areas are often beautiful and welcoming, but underserved in health care, with less accessible transport links and insufficient infrastructure designed for older adults, including housing. People who have moved to these new areas in later life often do not have the social support networks those born and

bred locally may have. The report gives examples of how local teams from around the country are supporting older adults in some of these areas.

**Figure 1: Map of England showing the projected rise in the percentage of the population aged 75 years and over**



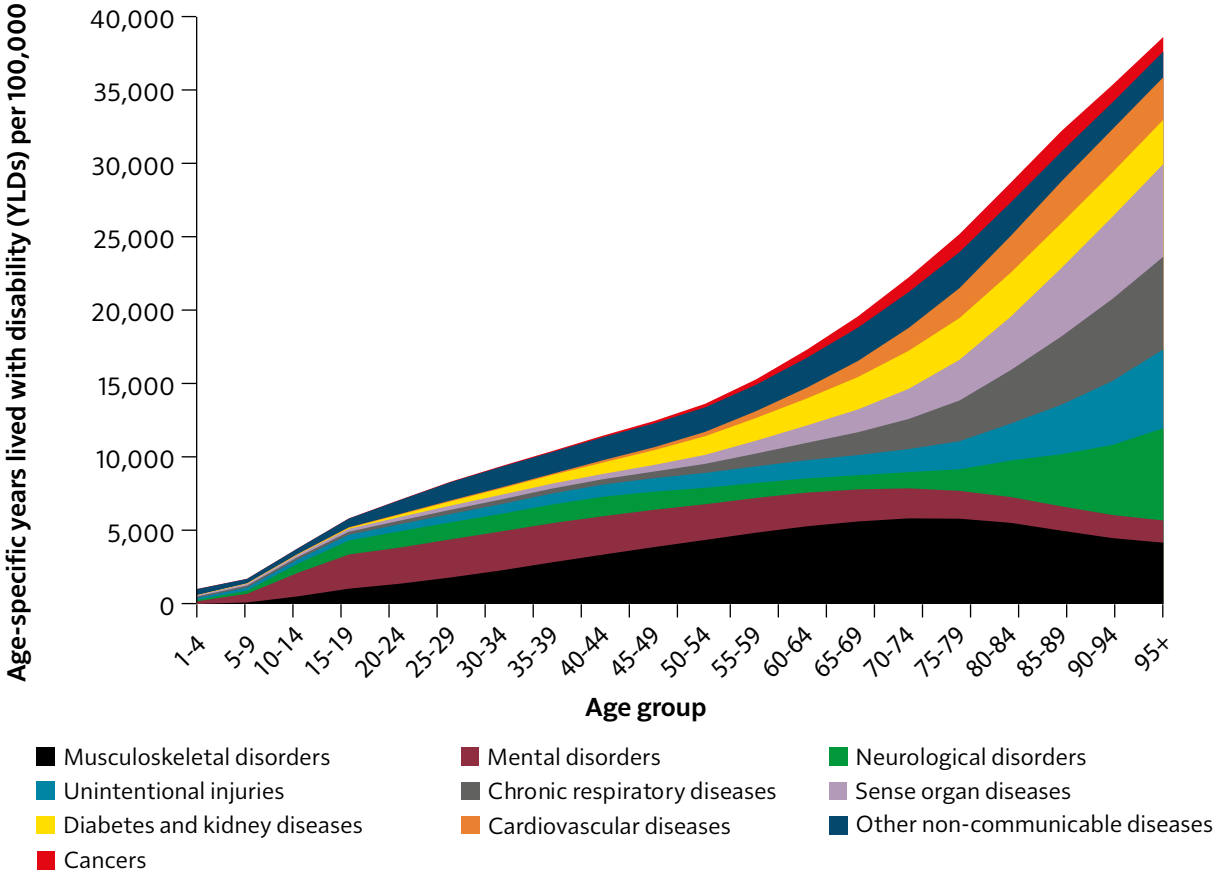

Source data: Office for National Statistics (ONS), 2021 mid-year estimates by local authority,[3] and 2018-based subnational population projections for 2043[4]

4. **Maintaining independence both by reducing disease and adapting the environment**
   We can maintain people's independence via two broad approaches, which are complementary. The first is to reduce disease, including degenerative disease, to prevent, delay or minimise disability and frailty. A healthier person will maintain their independence longer in any given environment. It is likely they will also have greater enjoyment of life. The second approach is to change the environment so that, for a given level of disability, all people can maintain their independence longer. We must do both.

5. **Delaying disease onset enables adults to live for a much shorter proportion of life with significant disability**
   People experience more ill health (morbidity) and disability in later life (Figure 2). The principal aim of prevention and treatment for those in older age should be to compress the period spent living with ill health by delaying disease onset. Contrary to the assumption by many that as the population grows older the length of time spent in ill health must

inevitably rise, it is possible to compress the period of ill health if we are systematic about delaying disease. If we delay the point at which people get life-limiting disease for as long as possible, disease may occur only shortly before their eventual death, or not at all. Systematically shifting disease out to the right in time can increase people's independence in older age and decrease their period of dependence on others. If someone who dies at 87 years of age would have developed heart failure at age 80, but onset is delayed until age 85, they will live with it restricting their life for 2 years rather than 7; if we can delay disease onset to age 88 it will never be a life-limitation at all.

**Figure 2: Causes of years lived with disability across age groups in England, 2019**




Morbidity rate by age and top 10 broad causes, age-specific years lived with disability (YLDs), persons, England, 2019

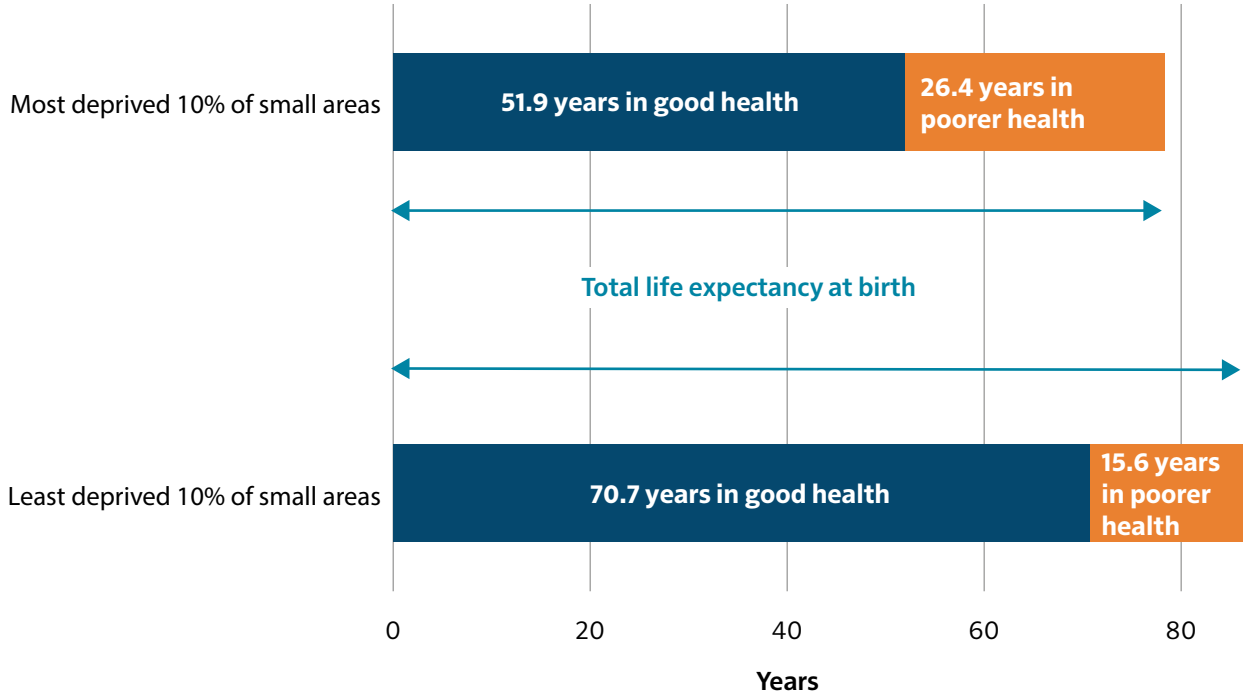
Source data: Global Burden of Disease Study 2019 (GBD 2019), Institute for Health Metrics and Evaluation (2020)[5] – Used with permission. All rights reserved.

## 6. The importance of primary prevention by government and secondary prevention by the NHS

Public health measures include both primary prevention by central and local government to reduce risk factors for disease, and secondary prevention by the NHS to slow down early disease. Both can delay, and therefore shorten, the period of life in ill health. The fewer diseases that an individual has, and the shorter the amount of time they have them for, the better their quality of life is likely to be. We all age identically chronologically and eventually die, but biologically some people age substantially faster than others. This inequality in the rate of biological ageing is largely preventable and is affected by the social and economic environments that people live and work in. This can be seen by the significant gap in

effective biological age experienced by those living in poverty and deprivation who experience multiple risk factors across the life course such as exposure to smoking, air pollution and access to green space, compared to those living in the least deprived areas (Figure 3).

**Figure 3: Inequality in life expectancy and healthy life expectancy at birth for females in the most and least deprived areas in England, 2018 to 2020**

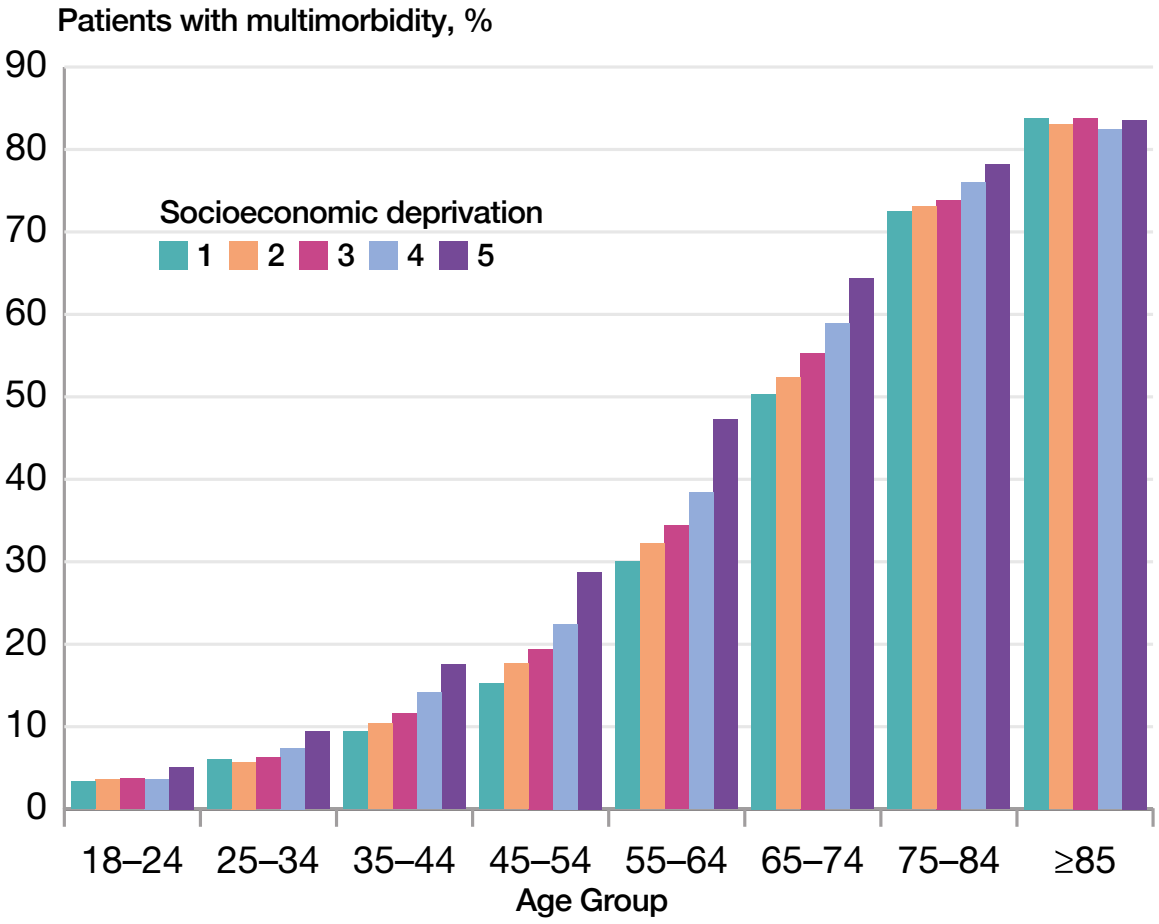



Source data: Office for National Statistics (ONS), Health state life expectancies by national deprivation deciles, England: 2018 to 2020[6]

## 7. Multimorbidity is increasing; medical science and the medical profession must respond

With older age comes an increasing probability of an accumulation of chronic diseases, sometimes called multimorbidity (Figure 4). These diseases can interact, meaning that an older adult who could have maintained independence and quality of life with one of these diseases struggles to do so with the combination. Much of the medical profession is organised around single diseases or single organ systems in a way that is ill-suited to a future of increasing multimorbidity. People can spend their time going to multiple unrelated specialist clinics, be on several care pathways and are prescribed multiple medications (polypharmacy). Medical science is not yet tackling multimorbidity as effectively as it has single diseases or organ systems. The medical profession and the NHS need to respond to the rise of multimorbidity; further sub-specialising training and clinical care is obviously not the correct response on its own. It is essential that doctors maintain generalist skills alongside their specialist ones.

**Figure 4: Prevalence of multimorbidity (2 or more conditions) by age and deprivation**




(Index of Multiple Deprivation quintiles: 1 = least deprived, 5 = most deprived)

Source data: Cassell A and others (2018). The epidemiology of multimorbidity in primary care: a retrospective cohort study. British Journal of General Practice[7]

Image source: Chief Medical Officer's Annual Report 2020, Health trends and variation in England

8. **Frailty overlaps with, but is not the same as, multimorbidity**
   Frailty is used to describe a state of health experienced by some generally older adults. It describes how some individuals lose their in-built reserves and become increasingly vulnerable to sudden changes in their health, which may be triggered by events such as an infection or change in medication or environment. Clinically, frailty is used to identify the group of older people who have the highest risk of adverse outcomes such as disability, falls, hospital admission, and the need for long-term care. Early identification of frailty can slow its progression and delay loss of independence. Frailty is not the same as multimorbidity, but there is often overlap. It is estimated that around 70% of adults living with frailty have multimorbidity, but less than a fifth of older adults with multimorbidity are living with frailty.[8] There are inequalities in frailty prevalence, with higher rates and earlier onset in areas of deprivation.

9. **Environmental adaptation allows older adults to maintain independence and quality of life**
   If as a society we wish people with typical disabilities of older age to maintain their independence and quality of life, not heavily dependent on other people or the State, we

need to ensure the environment, and in particular the built environment, is adapted and optimised for them. Since the geographical concentration of older adults is so clearly and predictably going to be in certain parts of the country, we need to improve the infrastructure for older adults and others with disability rapidly in those areas. This includes transport, access to places of leisure and exercise, and housing. Much of the housing stock is designed for younger families rather than older adults, who sometimes live alone. It will be considerably easier to plan and build for this future of a predictable heavy concentration of older adults in particular geographical areas if we do it now, rather than trying to retrofit at scale later. For example, this is far more urgent in parts of Suffolk than it is in central Manchester.

10. **Mental health needs in later life are rising**
    Alongside the projected rise in the number of age-related health conditions such as arthritis, cardiovascular disease, sensory loss, lung disease, and dementia, there is growing concern regarding the rise of mental health conditions in older age. Older adults can have mental health problems such as depression and anxiety, although these often manifest differently in older age. Renewed focus on mental health improvement interventions and services for older adults is key to improving overall quality of life in people's later years.

11. **Improving quality of life in older age sometimes means less medicine, not more**
    It is essential that all patients, but especially those in later old age, are able to have realistic discussions with their doctors about whether more treatment will improve quality of remaining life. Some treatments may extend life but at the expense of reducing its remaining quality and independence; the decision about how to balance these should be the patient's. This needs full and realistic information from their medical advisors. Examples might be major operations, or chemotherapy, or continuing drugs which have side effects and whose principal aim is to extend life, or repeated admissions to hospital. In medicine it is often easier to do more things, even when it is far from clear that quality of life will increase as a result. Over-treatment is as inappropriate as under-treatment in all patients, including older patients. Greater use of advance care plans can help avoid over-treatment especially when out-of-hours doctors and carers may be less familiar with someone's wishes.

12. **Research often excludes older adults; they should be the main focus of much of our research**
    Research often systematically excludes older adults, despite the fact that the great majority of ill health is concentrated in this population. It should not be acceptable, for scientific reasons if no other, to have trials and studies where age or multimorbidity are contraindications to enrolment. There is extremely exciting research into the processes of ageing and how these can be delayed. Although there are significant research programmes on improving the health of older adults, there is a relative dearth of research activity in the older age group. Some areas, such as social care and frailty in older age, and ageing in ethnic minority populations are significantly under researched. There are several research gaps, including into the much greater risk of infections in older adults, outlined in this report.

13. **Focus where the need is greatest**
    If we can achieve shorter periods in ill health and an easier environment for those with disabilities, concentrating on areas of the country where the need is clearly going to be greatest, we can significantly improve the outlook for those in older age. The aim to maintain independence for the longest possible time is achievable if we are systematic in our approach. Conversely, if we choose, ostrich-like, to ignore the growing concentration of older adults and their inevitable healthcare needs in these geographical areas, we are not undertaking proper responsible planning and will have a far harder landing as the population in those areas inexorably age.

# Recommendations

A) Older age is becoming increasingly geographically concentrated in England, and services to prevent disease, treat disease and provide infrastructure need to plan on that basis. This should be seen as a national problem and resources should be directed towards areas of greatest need, which include peripheral, rural and coastal regions of the country. The **NHS, social care, central and local government** must start planning more systematically on the basis of where the population will age in the future, rather than where demand was 10 years ago. This includes building or adapting housing and transport to be appropriate for an older population.

B) **Central and local government** (the State) have the principal responsibility for environmental factors which can delay or prevent the probability of early ageing (**primary prevention**). Making it easy and attractive for people to exercise throughout their lives is one of the most effective ways of maintaining independence into older age. Reducing smoking, air pollution and exposure to environments that promote obesity are other examples where the State has a major role to play in delaying or preventing ill health and disability over a lifetime and into older age.

C) Delaying disease to the greatest possible extent, to delay the period of disability in older age, should be the aim of public health and medicine. Science is continuously developing new tools to help do this, but we are often extremely poor at maximising the use of the tools we have. The longer people live with risk factors such as hypertension or high cholesterol the earlier the start of their disabilities will be. **Secondary prevention** is predominantly the responsibility of the **NHS** but is currently under-prioritised. **Screening programmes** help to delay or stop the onset of serious disease and therefore prevent ill health in later life. It is essential that we prioritise secondary prevention and screening services, and to do more to extend these services to groups with reduced access and historically low uptake.

D) The **medical profession** needs to respond to the inexorable rise of **multimorbidity**. The single most important way to achieve this is to recommit to maintaining generalist skills as doctors specialise. **NHS** organisations also need to minimise the probability that the same person has to attend multiple clinics for a predictable cluster of diseases.

E) The health and care needs of older adults are often not recognised because the relevant data are not systematically collected or aggregated in one place. For example, epidemiological data on health conditions contributing to disability such as hearing loss and mental health is not routinely available for older adults. To plan appropriately, organisations including the **NHS, Office for National Statistics (ONS), and central and local government** need systematically to collect and share data on the health and care needs of older adults, including by ethnicity, sex and other protected characteristics.

F) I have put a number of recommendations around research into the chapter on **research for scientists and research funders**. Three in particular are worth highlighting. The first is that it should be unacceptable to have exclusion criteria based on older age or common comorbidities. The second is that research into multimorbidity, frailty and mental health needs to be accelerated. Thirdly, social care research needs to be a core component of health research programmes. The lack of inclusion of social care in health research is a significant gap.

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## 1 Introduction

## 2 Understanding health in an ageing society

## 3 Local authority context

**3.1 Hampshire County Council**
Simon Bryant, Sarah Wallace, Marie Claire Lobo and Jenny Bowers

**3.2 Isle of Wight Council**
Simon Bryant, Sarah Wallace, Marie Claire Lobo and Jenny Bowers

**3.3 Gloucestershire County Council**
Siobhan Farmer, Zoe Clifford, Claire Procter, Rachel Howard and Cheryl Hampson

**3.4 Cumberland Council**
Colin Cox and Clare Paling

**3.5 North Yorkshire Council**
Louise Wallace, Victoria Turner, Carly Walker, Rebecca Dukes, Liz Meade and Chris Watson

**3.6 Derbyshire County Council**
Ellie Houlston, Thom Dunn, Lorraine Stokes, Catie Peach, Shirley Devine and Caroline Mackie

**3.7 Norfolk County Council**
Stuart Lines, Alison Gurney, Joshua Robotham and Nicola Coburn

## 4 Enabling older adults to live free from disease for longer

**4.1 Introduction**

**4.2 Promoting and improving health in later life**
Jeanelle de Gruchy, Amy Bleakley and Beth Smout

**4.3 Secondary prevention and early diagnosis**
Beth Smout and Emily Whamond

**4.4 Reducing the risk of falls**

**4.5 Maintaining cognitive and mental health in older age**

**4.6 Preventing infections in older adults**
Thomas Waite and Harriet Drake

## 5 Supporting older adults to live well with disease

**5.1 A health care system for those with multimorbidity and multiple long-term conditions**

**5.2 Identifying and responding to frailty**

**5.3 Multidisciplinary team working**

**5.4 Social care**

**5.5 Access to care in more peripheral areas**

**5.6 Realistic medicine**

**5.7 Palliative care**

## 6 Physical environments that enable independence

**6.1 Health, housing and the built environment**

**6.2 Equipment and adaptations**

**6.3 Transport and mobility**

## 7 Research to improve health in an ageing society

**7.1 Research priorities for older adults**

**7.2 Can we prevent ageing-related multimorbidity and frailty? The new geroscience approach**
Linda Partridge, Janet Lord, Lorna Harries, Sarah Giles and Luke X Reynolds

# Contents

# 1 Introduction

## Health in an ageing society

The fact that people are living longer compared to a century ago is a triumph of medicine and public health. It is something to celebrate, but alongside this we have a responsibility in medicine, government and wider society to plan to ensure that older age is as healthy, independent and enjoyable as possible into the future.

This report does not aim to advise on how to extend life further, although this may be a positive side-effect of some of the interventions discussed if undertaken systematically. Rather, the focus is on how to maximise the independence, and minimise the time in ill health, between people in England reaching older age and the end of their life.

The report firstly describes the health needs of the current population of older adults at a national and then a local level. It then goes on to outline future opportunities and challenges for society, given that we have an ageing population. The report focuses on the need for a societal response, and recommendations are therefore for the NHS, departments of central and local government, and research organisations.

We have not used a strict chronological cut-off for older age. People age biologically at different rates, and a lifetime lived in deprivation, individuals' health behaviours as well as medical and government intervention can significantly affect this. Our default is to use data starting at 75 years old and above, but some important data sources only have data classified at 65 years and above.

The themes of the report have an overarching message. It is entirely possible to reduce, probably significantly, the period of older age spent living with illness and disability, and in parallel to ensure the environment is suitable for an older population. In turn this maintains independence and quality of life.

## Biological versus chronological ageing

Ageing is a gradual, continuous process of natural change that begins in early adulthood. However, the term 'ageing' can be used in two quite different ways.

- Chronological ageing refers to our age in years.
- Biological ageing refers to the biological changes that take place throughout our lives in our bodies associated with older age. These can occur at different rates in different people.

We cannot change how we age chronologically. However, biological age can be influenced by many factors, both within and outside of our control, to change how, and how fast, our bodies age.

# Topics discussed in this report

The topic of health in an ageing society is extensive. Rather than publish an exhaustive report covering all aspects of ageing, we wish to acknowledge the valuable work undertaken by countless others to improve the current and future health of older adults. In this report, we seek to highlight key areas for societal intervention, rather than explore every possible topic relevant to health in an ageing society.

# 2 Understanding health in an ageing society

## 2.1 Introduction

Chapter 2 of this report provides an overview of the current and projected trends in population ageing for England. This is intended to provide context to the issues discussed throughout the report.

The changing age structure of our population around the country is primarily driven by two factors. Firstly, improvements in life expectancy mean that people are living longer and reaching older ages. Alongside this, people are having fewer children than previous generations.

Secondly, internal migration within England already causes major variation in the proportion of older people in different geographical regions, and this is going to become even more pronounced. The anticipated rise in the number of people with health and care needs due to multimorbidity and disability in later life will largely be in more geographically peripheral parts of the country rather than the conurbations.

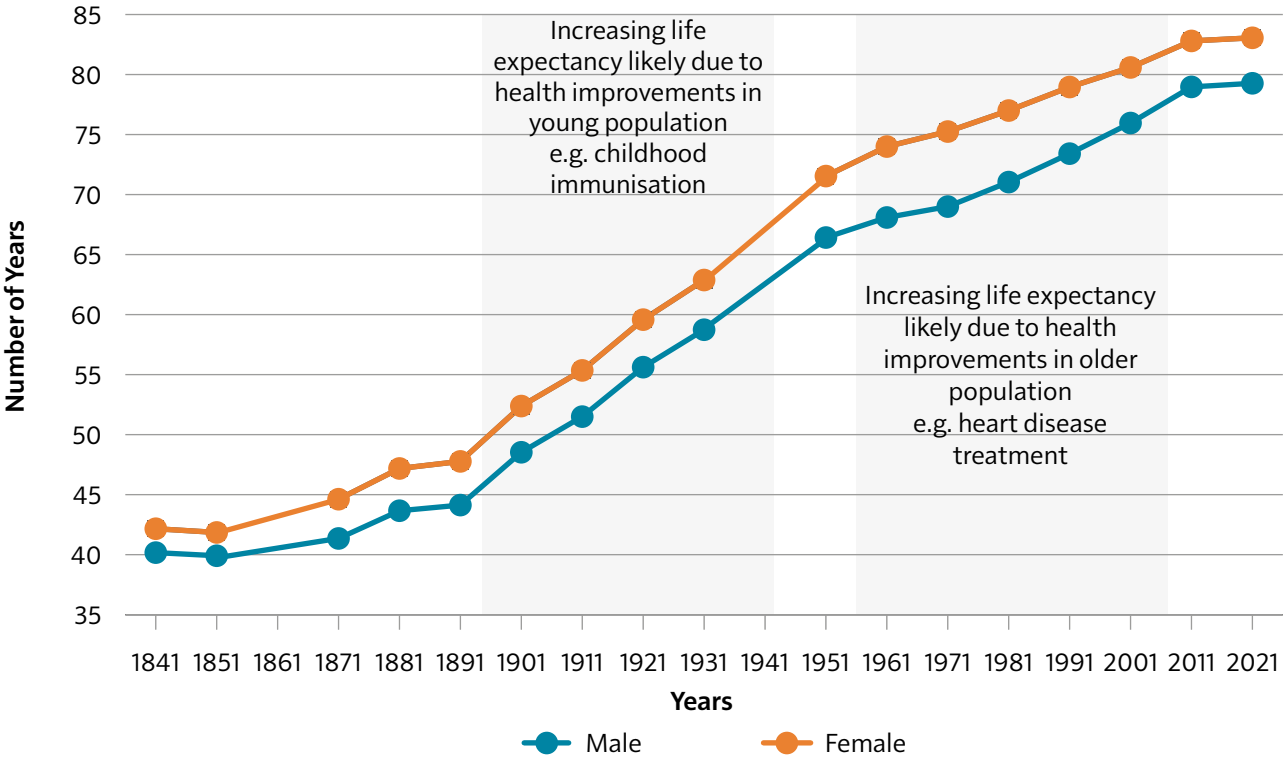
# 2.2 Demographic trends

## People are living longer lives

Life expectancy has increased substantially over the last 180 years (Figure 2.1). Life expectancy for males and females has almost doubled between 1841 and 2021 due to public health and medical advances. Improved living and working conditions, reduced smoking rates, and improved healthcare have all contributed to increasing life expectancy from generation to generation.

However in recent years the improvements in life expectancy have stalled. This trend started prior to the COVID-19 pandemic, which has exacerbated it.

**Figure 2.1: Life expectancy at birth, England and Wales, from 1841 to 2021**

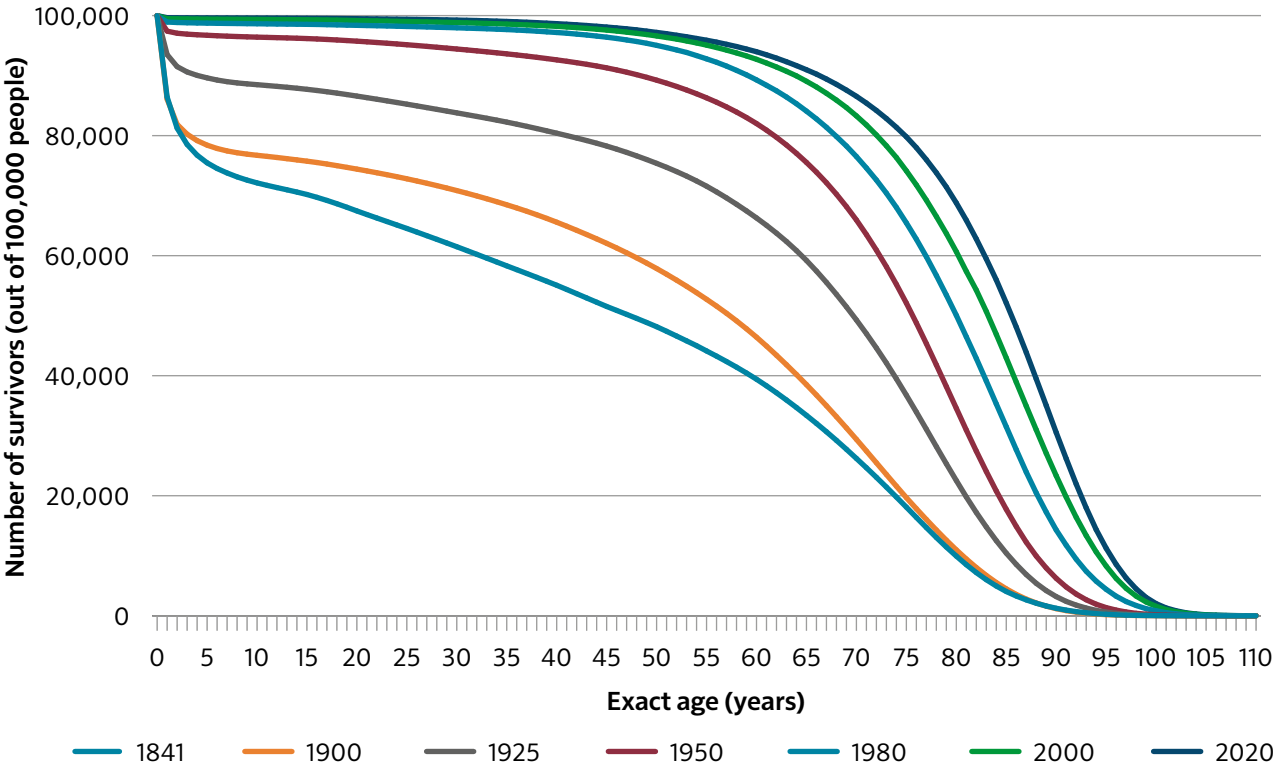



Source data: Office for National Statistics, Mortality in England and Wales[1]

Another approach to measuring overall lifespan is to look at the chances of survival. The Office for National Statistics (ONS) calculated survival curves from a life table to show the number of people surviving to a given age out of a hypothetical cohort of 100,000 people, based on mortality rates by age for a given year. Figure 2.2 shows female survival curves for England and Wales, for selected years from 1841 to 2020.

**Figure 2.2: The female survival curve from 1841 to 2020**

This shows the number of survivors out of 100,000 people by exact age for England and Wales




Source data: Office for National Statistics, Mortality in England and Wales[2]

In 1870, 14.5% of female deaths were in those aged under 1 year and people died in significant numbers all the way through the life course. By 2020, 0.3% of all female deaths were infant deaths, and deaths between infancy and older age had become rare. As the majority of deaths concentrate in later life, the curve gradually resembles a rectangular shape, rather than a rounded curve. There is an increasingly concentrated age range at which life comes to a natural end.

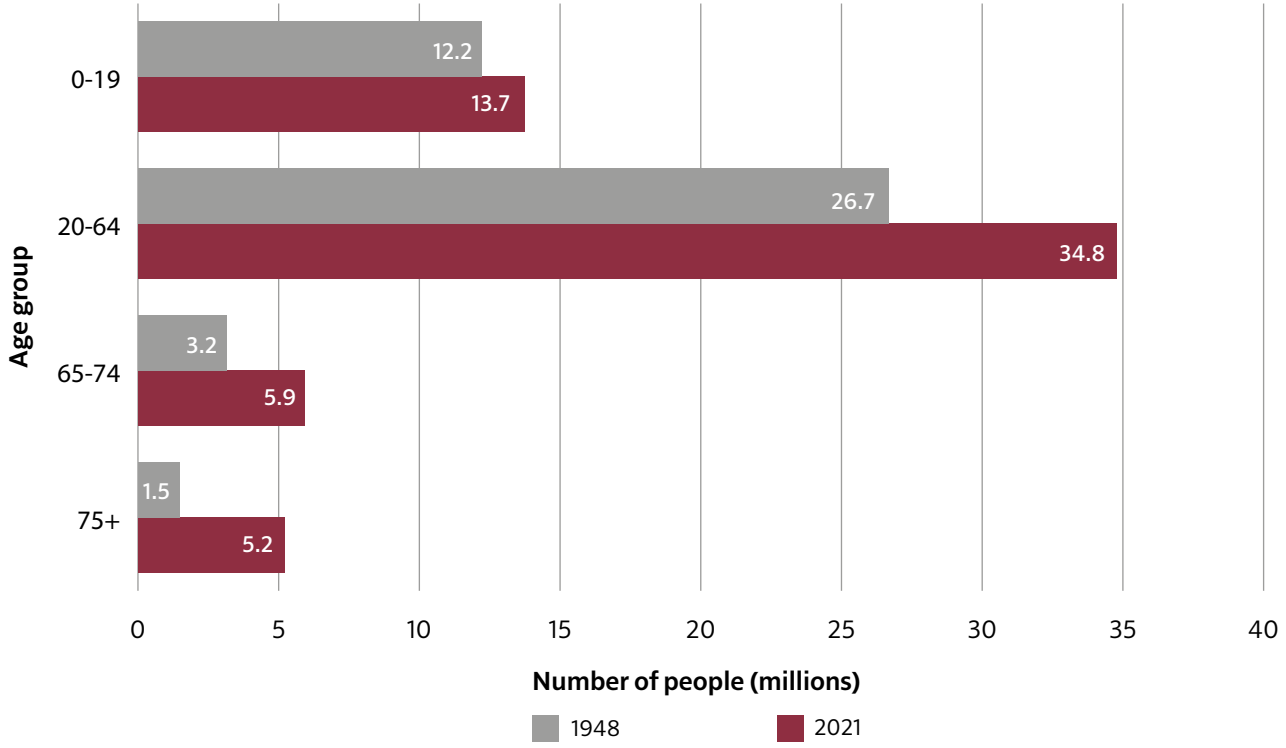
According to the most recent life expectancy estimates from the ONS, a female born today has a 1 in 4 (25% chance) of living 99 years.[3]

# There are many more older adults now than when the NHS was established

In 1948, when the National Health Service Act came into effect, there were 1.5 million people aged 75 years and over in England and Wales (3% of the population).

75 years later at the most recent Census (2021), this number has more than tripled to 5.2 million people aged 75 years and over. Older adults aged 75 years and above currently make up 9% of the population in England and Wales. Figure 2.3 demonstrates the changing number of people by age group between 1948 and 2021. The number of people of working age has also increased, but at a much slower rate.

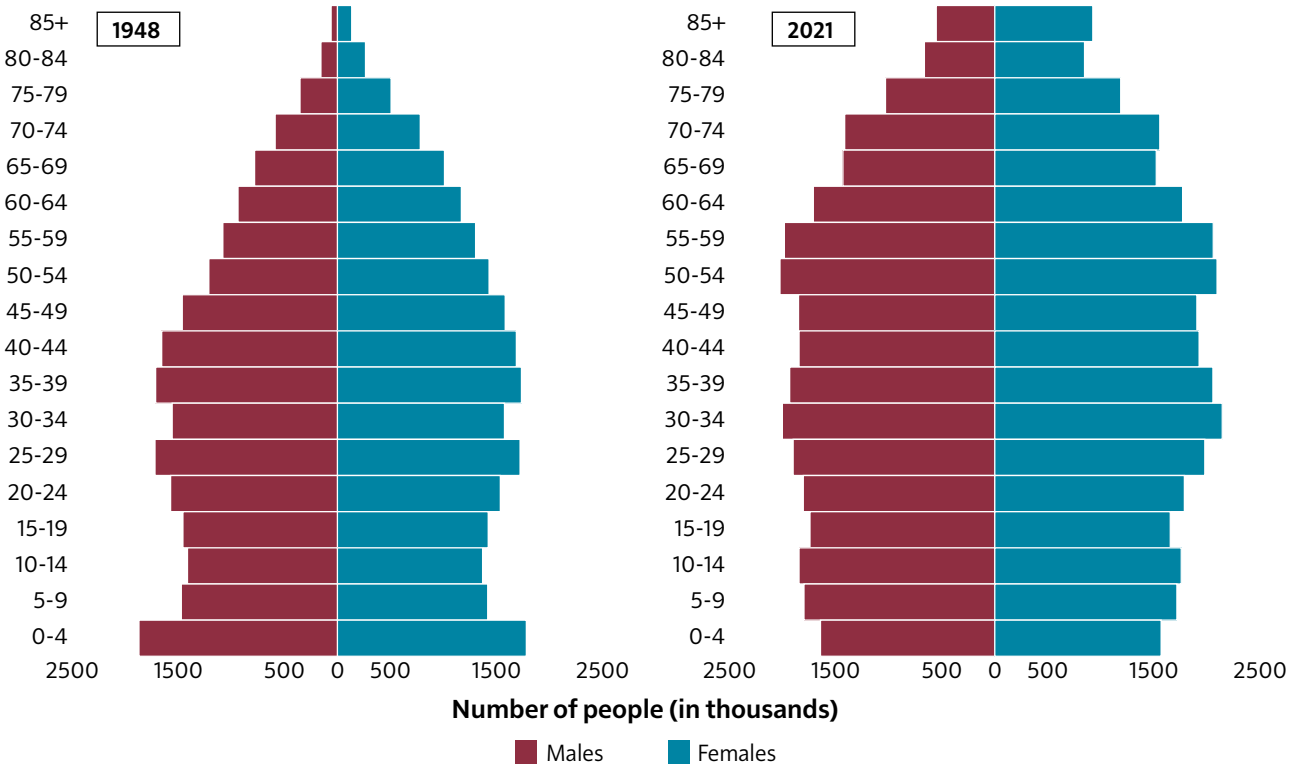
**Figure 2.3: Number of people living in England and Wales by age group, 1948 and 2021**




Source data: Office for National Statistics, Population estimates – England and Wales[4]

This is also seen in the changing shape of the 'population pyramid' for England and Wales between 1948 and 2021 in Figure 2.4.

**Figure 2.4: Population pyramid showing the distribution of the age and sex of the population for England and Wales, 1948 and 2021**




Source data: Office for National Statistics, Population estimates – England and Wales[5]

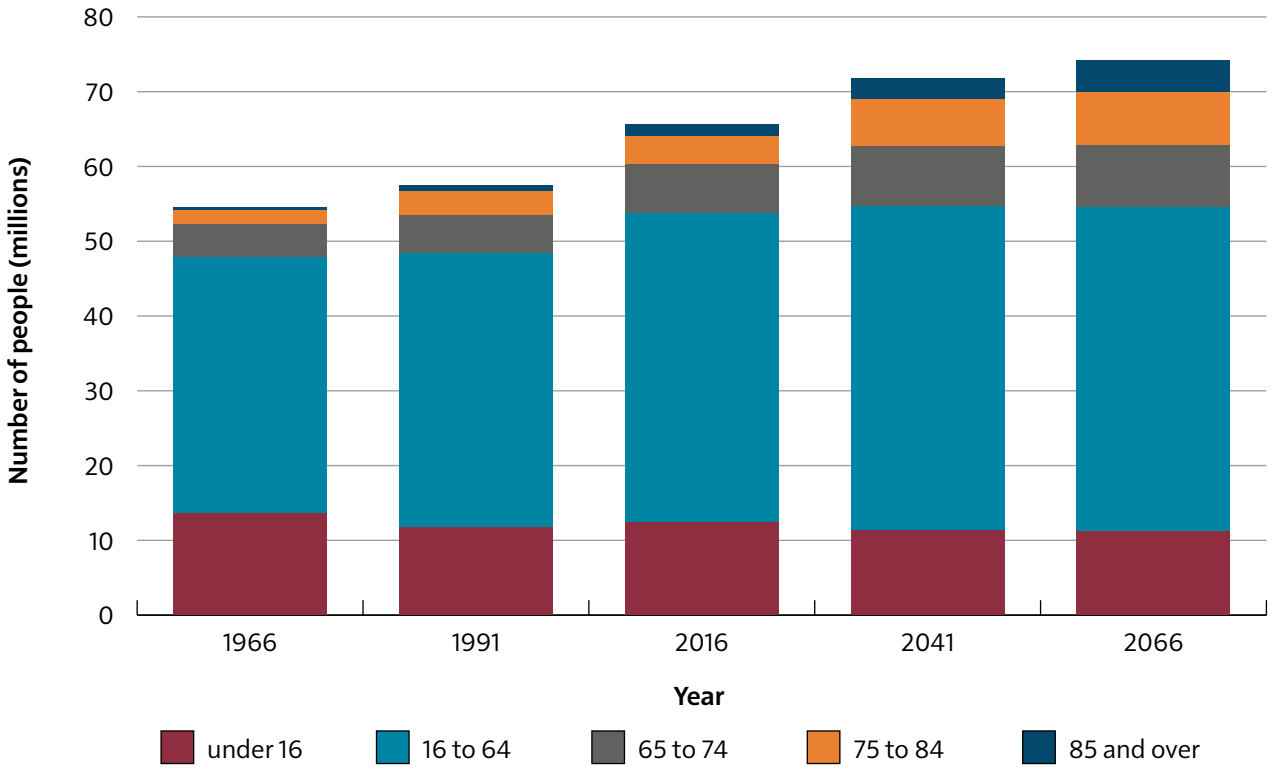
# The trend in population ageing is projected to continue

Over the last 75 years, the UK population has been steadily getting older and this trend is projected to continue in the future.

The fastest increase will be seen in the 85 years and over age group. In mid-2016, there were 1.6 million people aged 85 years and over (2% of the total population); by mid-2041 this is projected to double to 3.2 million (4% of the population) and by 2066 to treble. By 2066 there are projected to be 5.1 million people aged 85 years and over, making up 7% of the total UK population.

In contrast, the population aged 16 to 64 years is projected to increase by only 2% over the next 25 years and by 5% by 2066 (Figure 2.5).

**Figure 2.5: Historical and projected population of the UK by age group, 1966, 1991, 2016, 2041 and 2066**

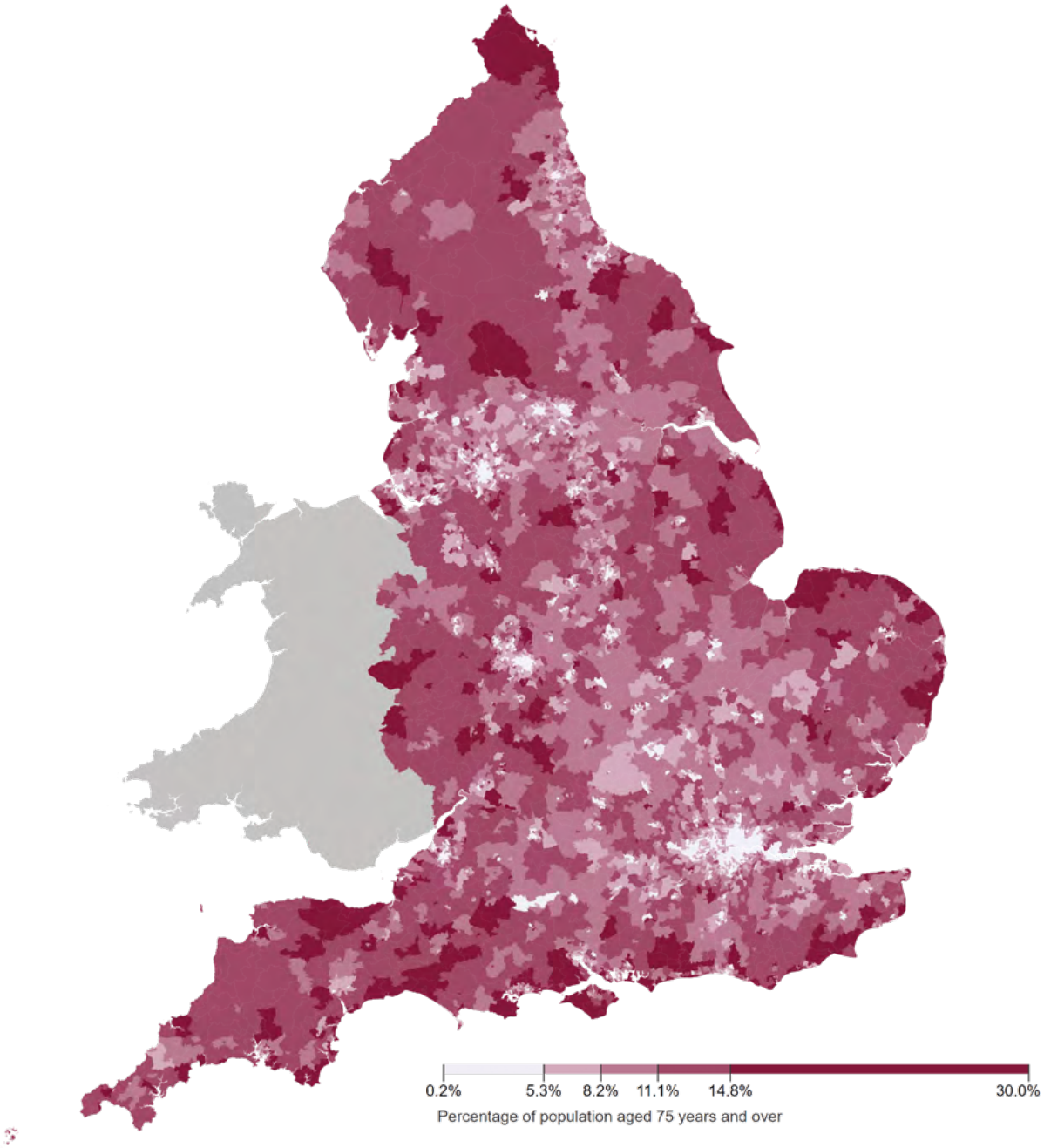



Source data: Office for National Statistics, Population estimates[6] and 2020-based principal population projections[7]

# The geography of older age in England is already skewed away from large urban areas

Figure 2.6 shows that populations with a higher percentage of older adults are seen in more peripheral areas, such as rural, coastal, and remote areas. These are the darker areas on the maps. The lighter areas are urban areas.

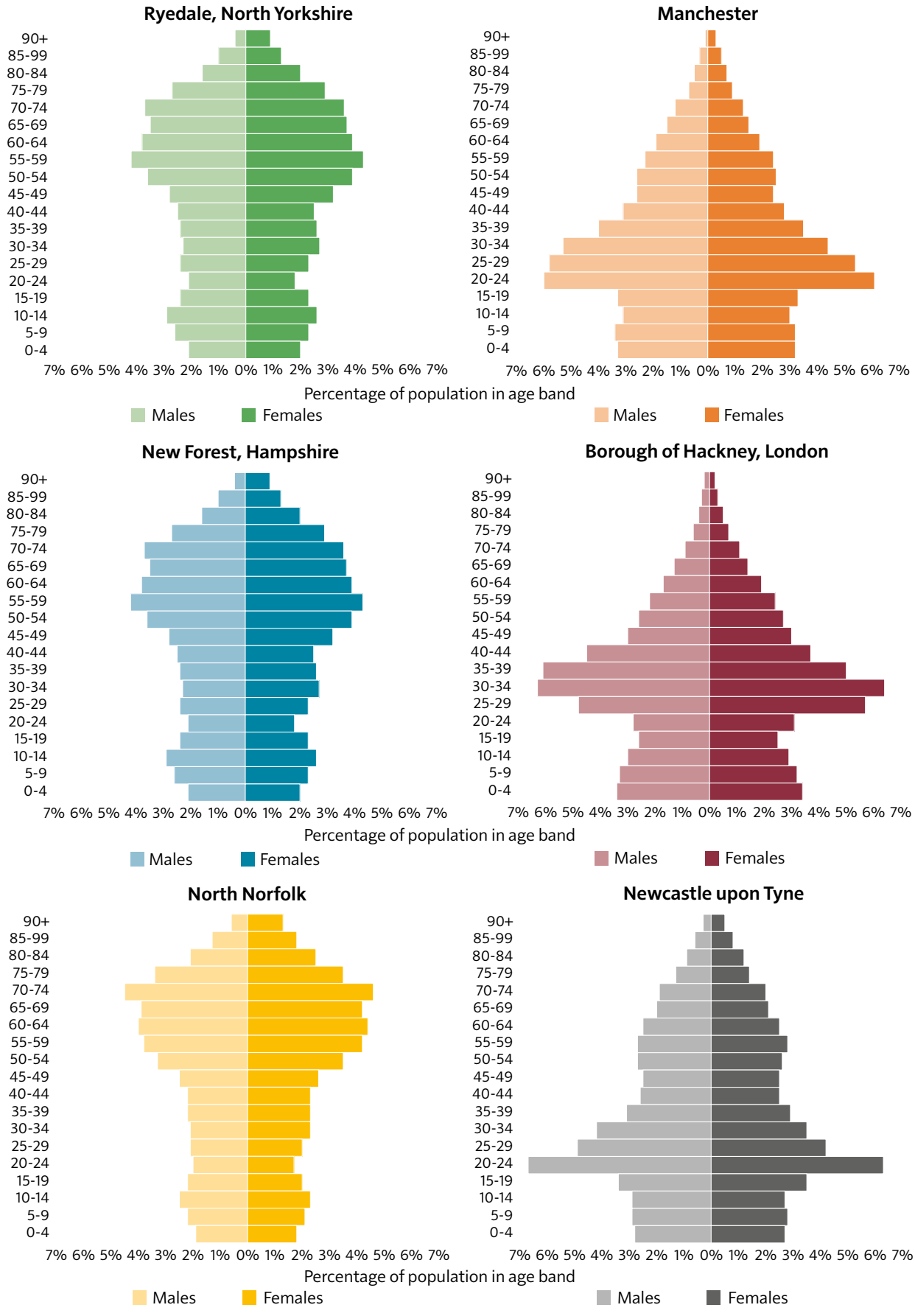
**Figure 2.6: Map showing the proportion of the population aged 75 years and over, within small geographical areas (Middle Layer Super Output Areas) of England, in 2021**




Source data: Office for National Statistics, Population estimates – Census 2021, England[8]

Figure 2.7 shows the population pyramids for six example local authority districts to demonstrate the different age structures of different parts of the UK.

## Figure 2.7: Population pyramids for six districts in England, in 2021

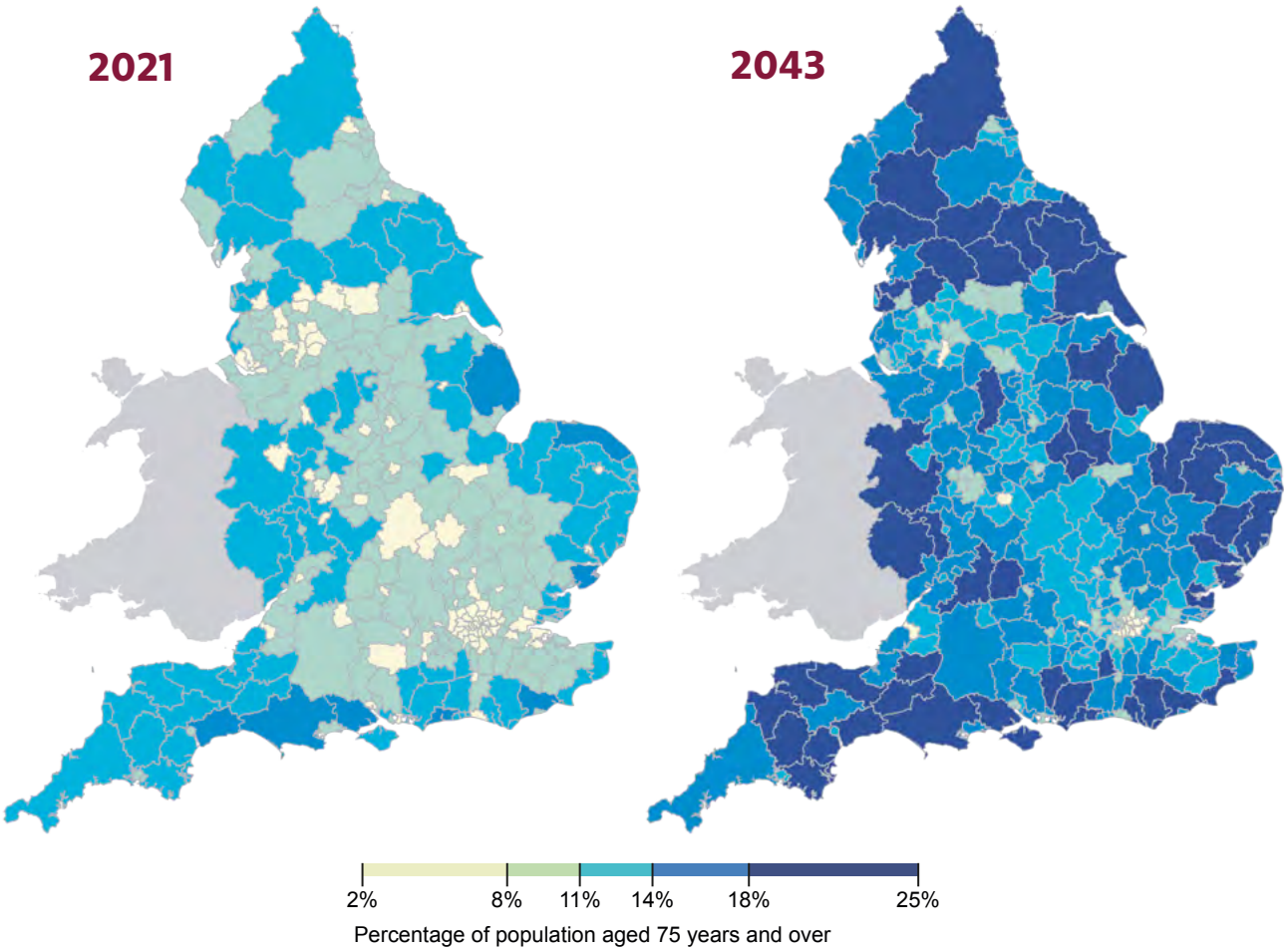



Source data: Office for National Statistics, Population estimates, England[9]

# Rural and coastal areas are ageing at a faster rate than urban areas

Figure 2.8 shows the local authorities that will see the greatest rise in the percentage of the population aged 75 years and over.

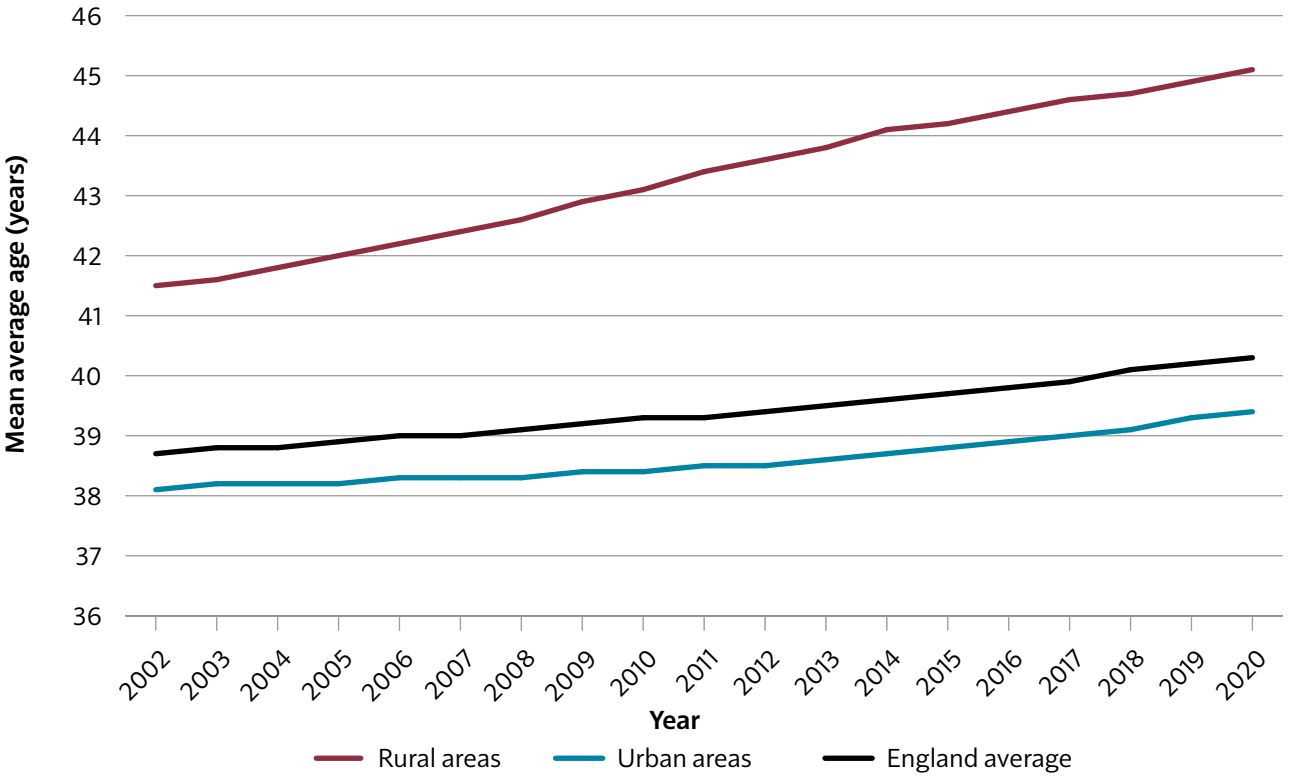
**Figure 2.8: Map of England showing the projected rise in the percentage of the population aged 75 years and over, by local authority area, between 2021 and 2043**




Source data: Office for National Statistics 2021 mid-year estimates by local authority,[10] and 2018-based subnational population projections for 2043[11]

Figure 2.9 shows that the average age of the population in rural areas has been consistently higher than in urban areas since 2002, and over time the gap has widened. In 2020, the average age across all rural areas was 45.1 years compared to 39.4 in urban areas. The gap in average ages between rural and urban areas widened from 3.4 years in 2002 to 5.7 in 2020. Table [2.1] shows the breakdown by different types of rural and urban settlements.

**Figure 2.9: Mean average age of the population between 2002 and 2020, by rural or urban classification**




Source data: Department for Environment, Food & Rural Affairs, Population Age Profile[12]

**Table 2.1: Population aged 65 and over as a percentage of total 2020 mid-year population, broken down by settlement type***

| | Population aged 65 years and over | Proportion aged 65 and over (%) |
|---|---|---|
| **Rural total** | **2,454,800** | **25.4** |
| Rural Town and Fringe | 1,238,200 | 24.6 |
| Rural Town and Fringe in a sparse setting | 57,900 | 29.3 |
| Rural Village and Dispersed | 1,065,200 | 25.7 |
| Rural Village and Dispersed in a sparse setting | 93,500 | 30.7 |

* Settlement types (such as Rural Town and Fringe) are defined in Appendix B.

| | Population aged 65 years and over | Proportion aged 65 and over (%) |
|---|---|---|
| **Urban total** | **8,009,200** | **17.1** |
| Urban Major Conurbation | 2,958,900 | 14.6 |
| Urban Minor Conurbation | 346,800 | 17.1 |
| Urban City and Town | 4,676,400 | 19.1 |
| Urban City and Town in a sparse setting | 27,200 | 29.7 |
| **England** | **10,464,000** | **18.5** |

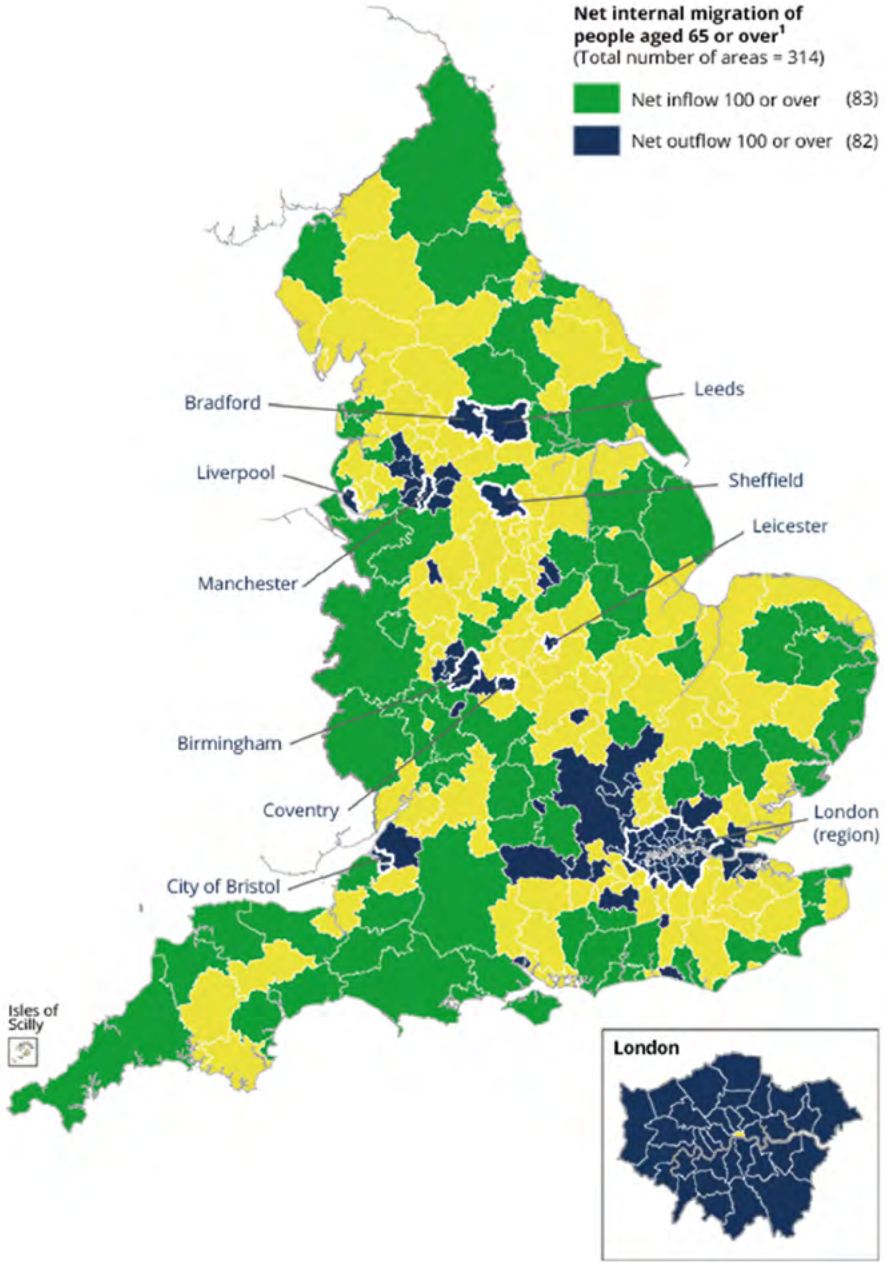
Source data: Department for Environment, Food & Rural Affairs, Population Age Profile[13]

## Internal migration contributes to the rising age in rural and coastal areas

The rise in the proportion of older adults in some areas within England is driven by movement away from major cities to rural and coastal areas as people age. After a move into cities for study or work the outward migration often starts after people start families and continues into older age. ONS used data from 2019 to summarise the movement of people over 65 in the map below (Figure 2.10).

Figure 2.10 shows areas in which at least 100 people aged 65 years and over migrated into or out of the local authority in the mid-year ending June 2019. Blue areas show net outflows and generally align with major cities and commuter areas. Green areas show inflows and are typically more rural, often by the coast, and are less connected to major cities.

**Figure 2.10: Map of England showing the local authorities in which net internal migration of those aged 65 years and over was at least 100 people, in 2019**



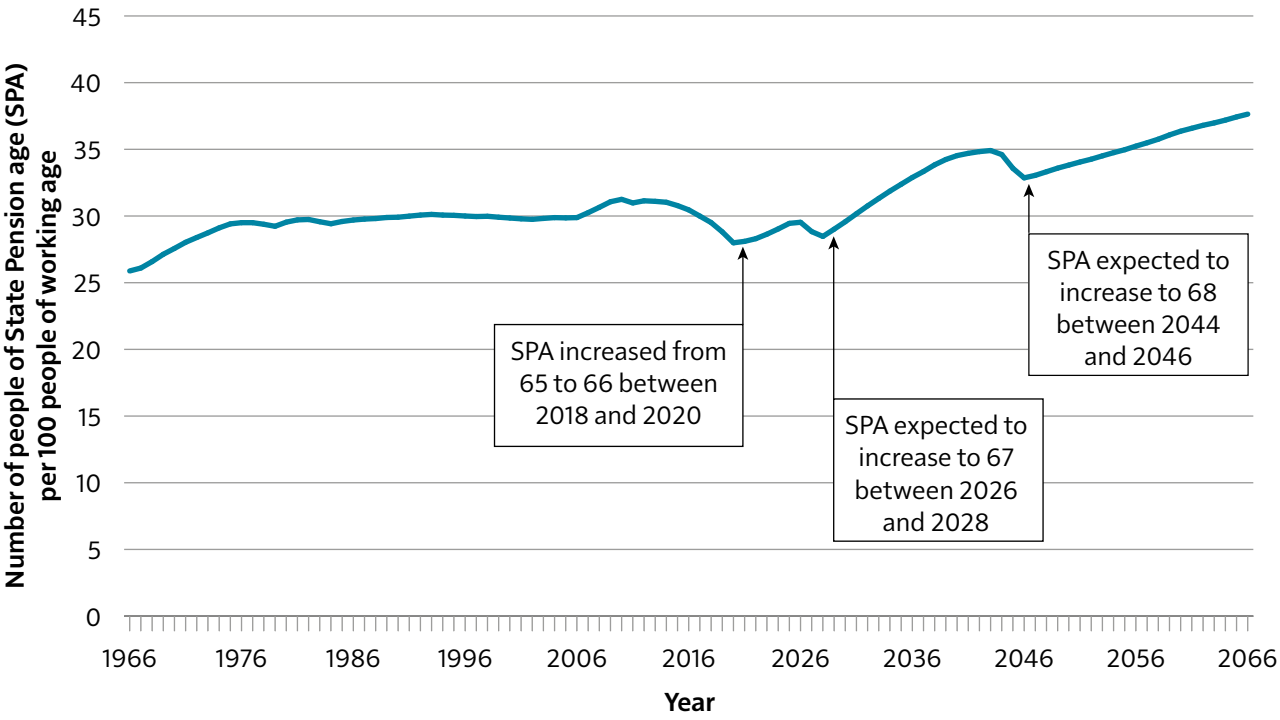

Source data: Office for National Statistics, 2019 mid-year population estimates[14]
Image source: Office for National Statistics

# The ratio of older adults to working-age adults will increase

Old age support ratios (also known as age dependency ratios) are a measure of the number of people of pensionable age and over, per 100 people aged 16 years to State Pension age (SPA).† The historical and projected change in the old age support ratio between 1966 and 2066 is summarised in the graph below (Figure 2.11). In practical terms, this should prompt the question of who will care for this gradually ageing population.

The number of people of State Pension age per 100 people of working age has remained relatively steady over the last 50 years, excluding the drop in the old age support ratio caused by the increase in State Pension age in 2020. However, this is projected to change as the population ages.

**Figure 2.11: Historical and principal projection of the old age support ratio for the UK, from 1966 to 2066**




Source data: Office for National Statistics, Population estimates, State Pension Age Factors, 2020-based principal population projections[15]

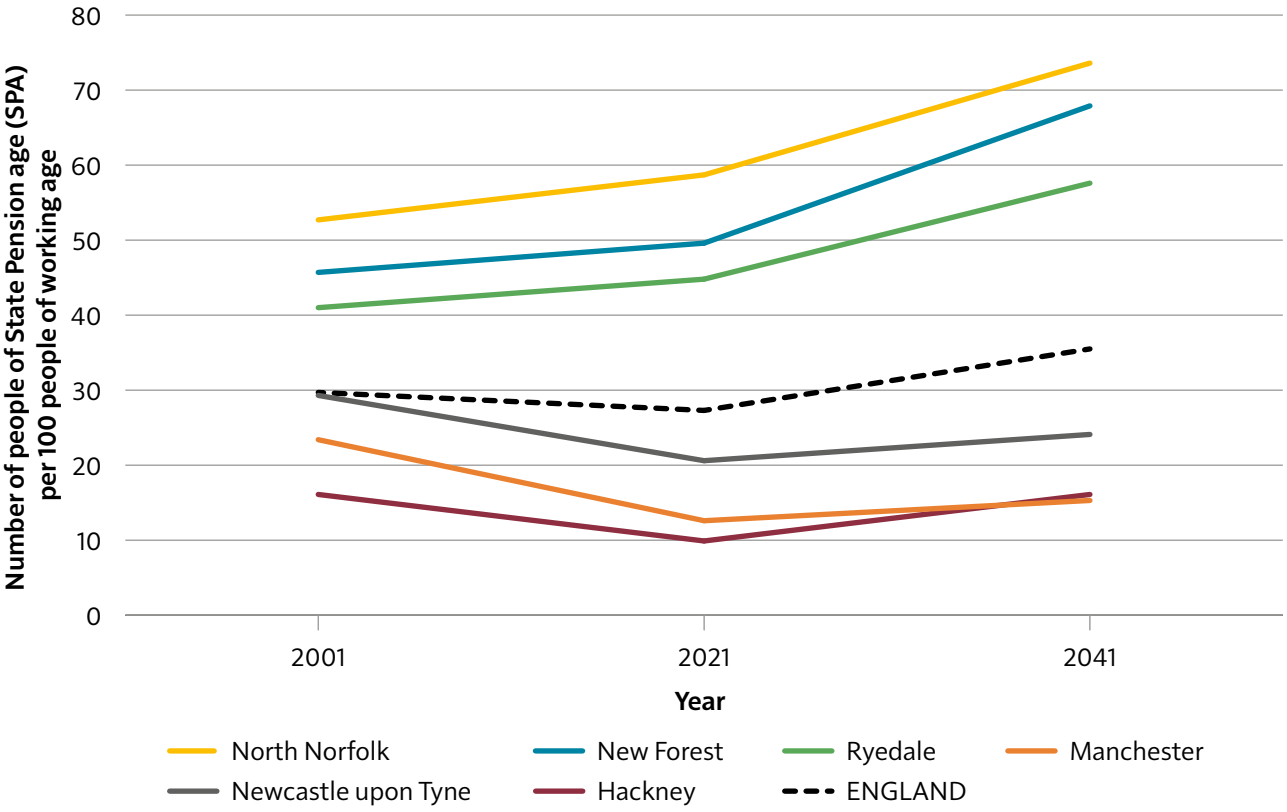
There is no sign that the old age support ratio is going to be rebalanced towards younger adults by increases in younger people born in England. The number of births in England is trending down, and this is not expected to increase in the immediate future.

Figure 2.11 shows the average for England, and masks widespread variation across the country.

Figure 2.12 summarises the old age support ratios for six example local authority districts to demonstrate this geographical variation.

† State Pension Age is defined in Appendix B.

**Figure 2.12: Historical and projected old age dependency ratios for six local authority districts, compared to the England average, 2001, 2021 and 2041**



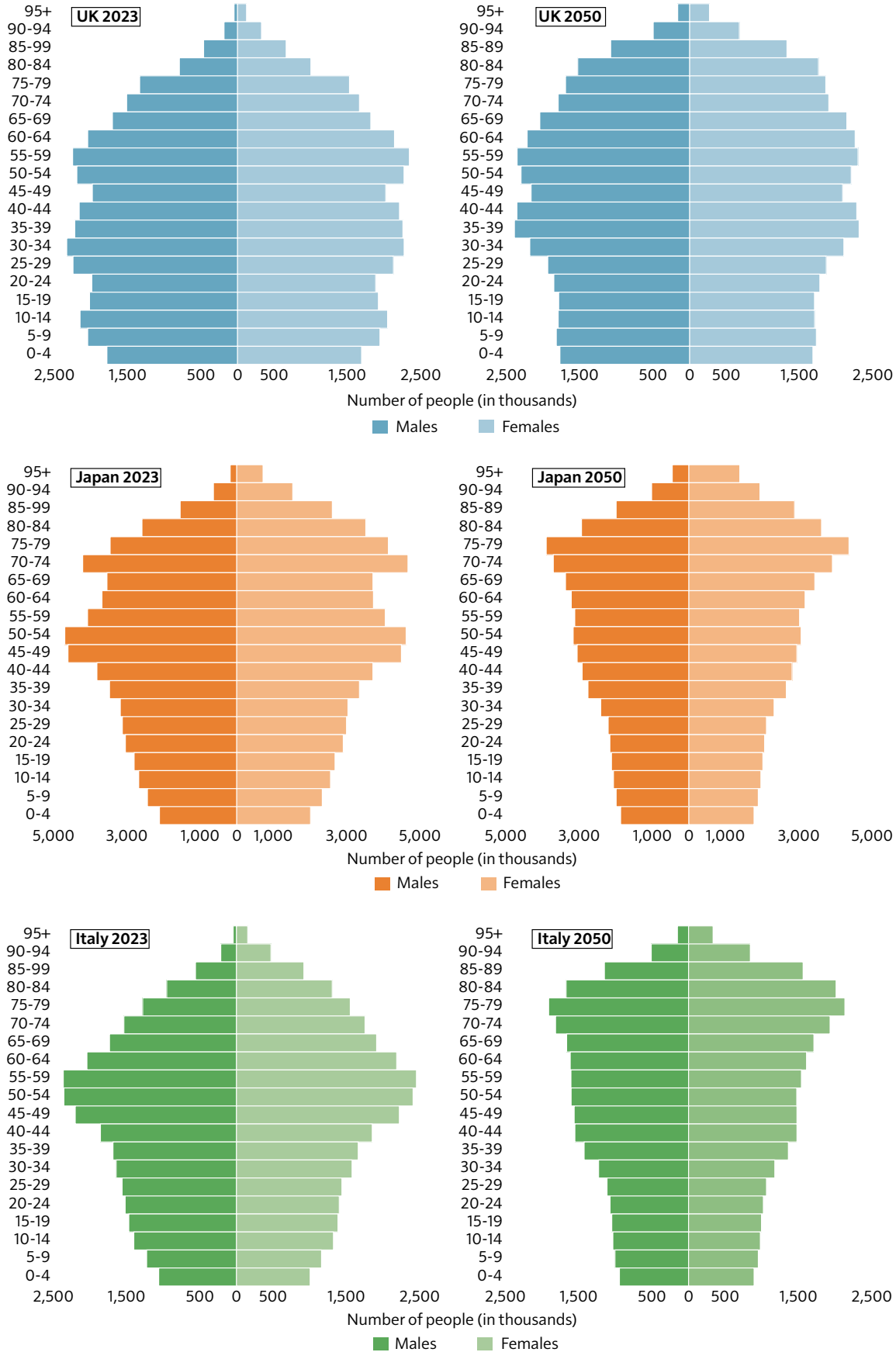

Source data: Office for National Statistics, mid-year estimates by local authority,[16] and 2018-based subnational population projections[17]

# International comparisons

Although a rise in the proportion of older adults is expected in England and the wider UK, the rate of increase in the average age of the population is slower than other countries.

Japan is widely recognised as one of the world's fastest-ageing countries, and Italy is an example of a European country likely to see a rapid rise in the age of the population over the coming decades. Figure 2.13 shows the projected change in the age structure of Japan and Italy compared to the UK.[18]

## Figure 2.13: Population projections for the UK, Japan and Italy, for 2023 and 2050




Source data: United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2022 Revision. (Medium variant)[19]

# The older population is becoming increasingly diverse

The older population has more ethnic diversity than two decades ago. This diversity varies across the country with small pockets of older ethnic minority groups in some areas of the country.

The age profiles for most ethnic groups tend to be younger than for those that identify as White British. However, the median age for the majority of these groups increased between 2011 and 2021.[20]

Data on gender identity and sexual orientation in England and Wales was collected in the 2021 Census for the first time. One in eight people who identify as lesbian, gay, bisexual or other minority sexual orientations (LGB+) are aged 55 or over.[21] These proportions are expected to rise over time, as the number of people aged 45 to 54 that identify as LGB+ is higher than for the 55 to 64 age group.

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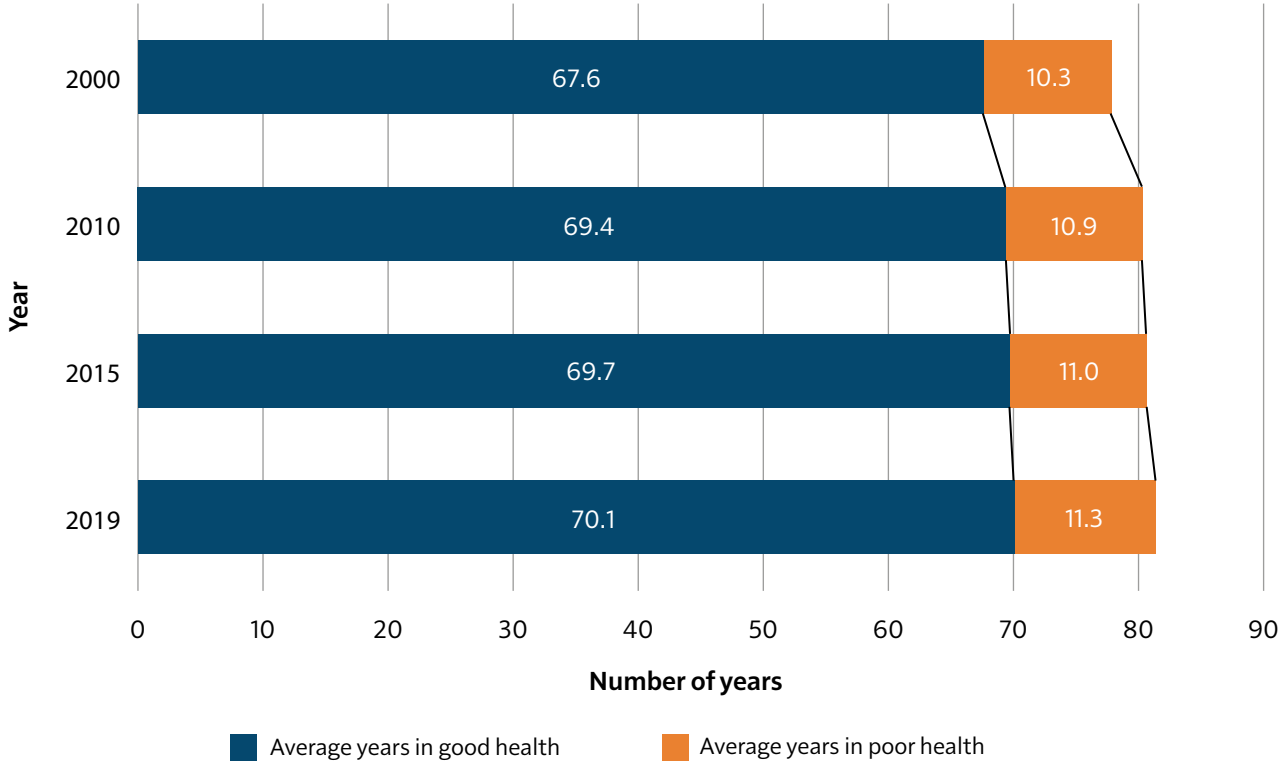
# 2.3 Health status

## Despite improvements in longevity, the proportion of life spent in poorer health has changed little, but the absolute period in poorer health has increased

Figure 2.14 uses World Health Organization (WHO) global health observatory data to compare the number of years lived in good health, compared to the average number of years in poorer health for the UK population.

These estimates show that as life expectancy has increased over the last 20 years, so has the number of years lived in poor health. The proportions of life in poorer health have remained relatively stable, but the number of years spent in ill health has increased over time.

**Figure 2.14: Estimated number of years spent in good health and poorer health* in the UK, 2000 to 2019**




Source data: World Health Organization, The Global Health Observatory - Life expectancy and Healthy life expectancy[1]

Using the data presented in Figure 2.14, it is estimated that the average proportion of life spent in poorer health has gradually increased over time from 13.2% to 13.8% (see Table 2.2).

* An explanation of 'good health' and 'poorer health' is provided in Appendix B.

**Table 2.2: Proportion of life spent in poorer health (%), in the UK, 2000 to 2019**[†]

| Year | Healthy life expectancy at birth (years) | Life expectancy at birth (years) | Estimated number of years lived in poorer health | Proportion of life spent in poorer health (%) |
|---|---|---|---|---|
| 2000 | 67.6 | 77.9 | 10.3 | **13.2%** |
| 2010 | 69.4 | 80.3 | 10.9 | **13.5%** |
| 2015 | 69.7 | 80.7 | 11.0 | **13.6%** |
| 2019 | 70.1 | 81.4 | 11.3 | **13.8%** |

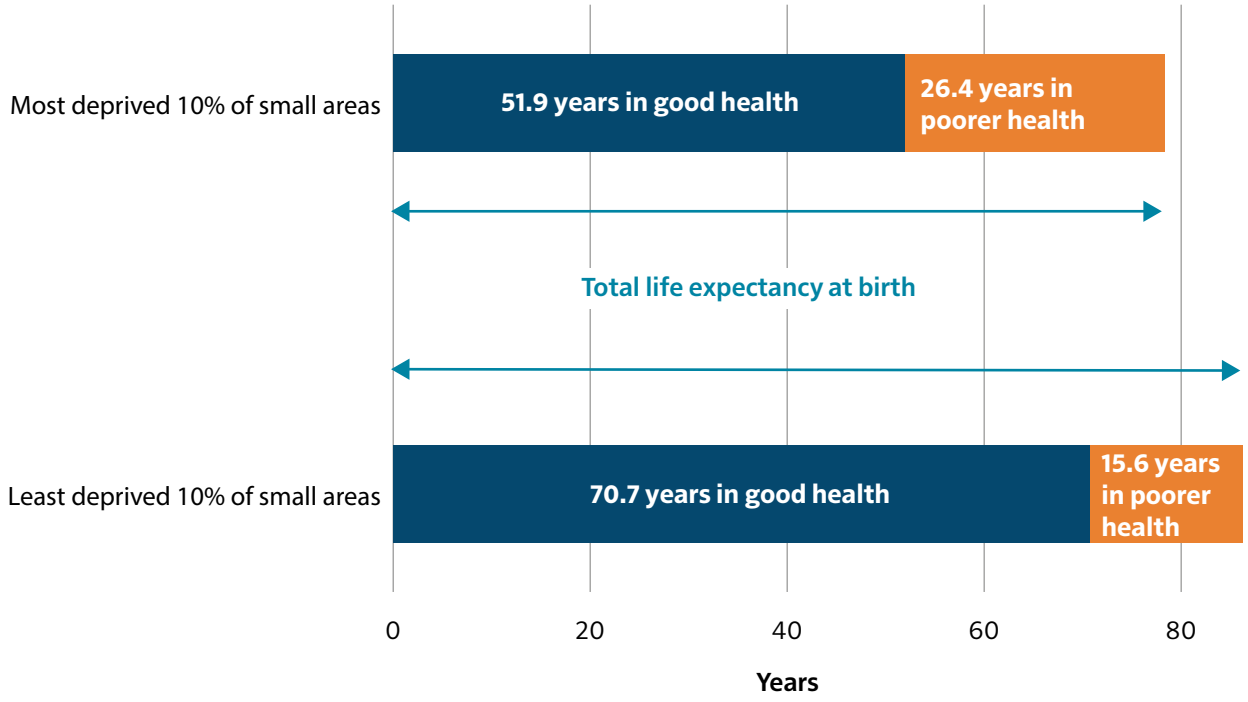
Source data: World Health Organization, The Global Health Observatory - Life expectancy and Healthy life expectancy[2]

† These global estimates are used to indicate an overall trend since 2000. They are not directly comparable to UK data provided by the Office for National Statistics. Further information is provided in Appendix B.

# There are inequalities in the number of years lived in good health versus poorer health

Life expectancy and healthy life expectancy[‡] vary starkly between different areas of England and there is a strong link between deprivation and both the proportion, and the absolute, periods spent living in poorer health. Figure 2.15 uses English data to show that females living in the 10% most deprived areas of England have a shorter life expectancy and spend around a third of their life in poorer health. Females in the most affluent areas of the country live longer lives and spend less than a fifth of their life living in poorer health.

**Figure 2.15: Inequality in life expectancy and healthy life expectancy at birth for females in the most and least deprived areas in England, 2018 to 2020**




Source data: Office for National Statistics, Health state life expectancies by national deprivation deciles 2018-2020, England[3]

These data highlight the extent to which our rate of biological ageing is far from fixed compared to our chronological age (as discussed in the introduction in Section 1) and demonstrates that improvements in quality of life are possible.

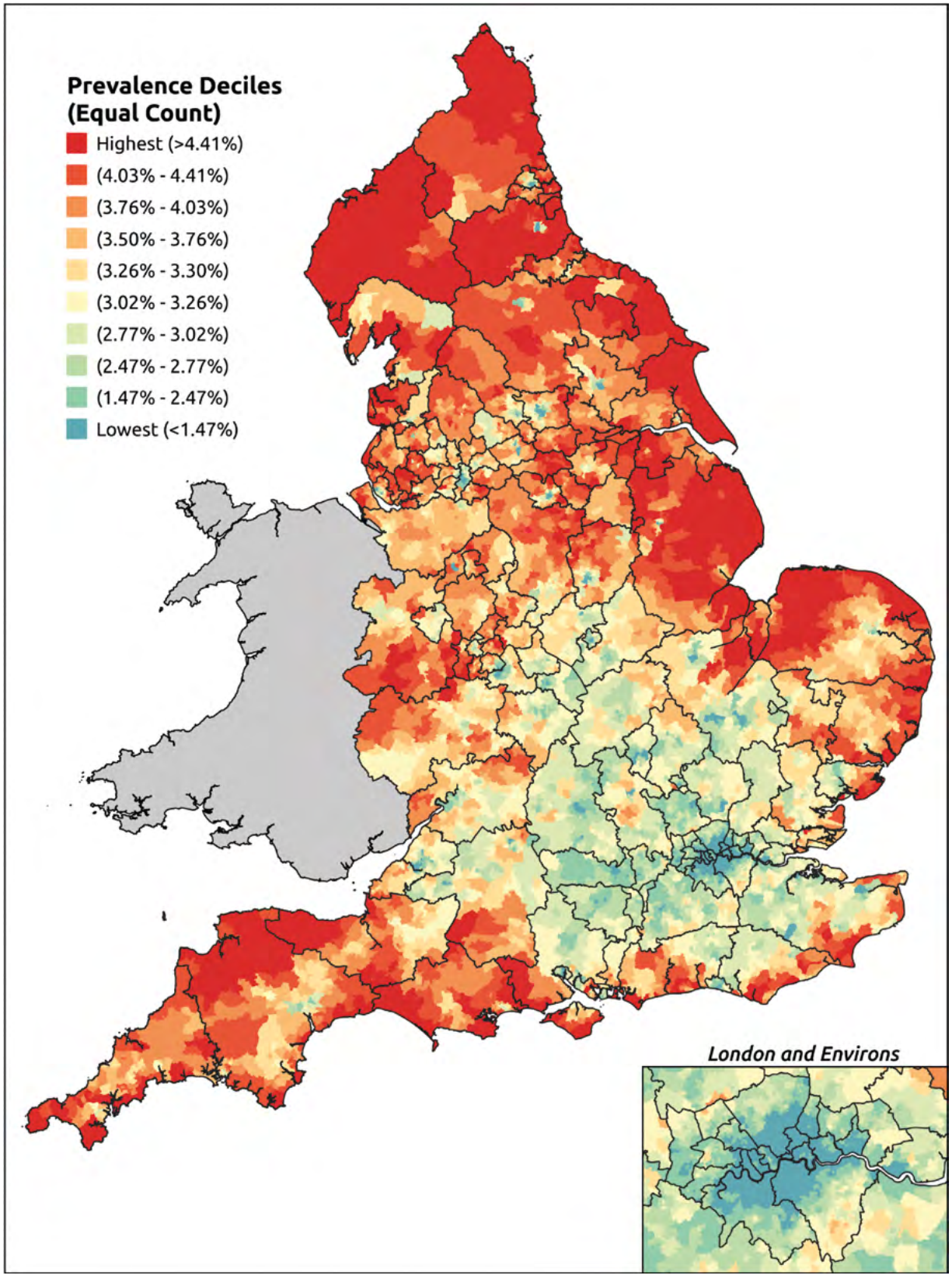
# Ill health is more concentrated in some parts of England

There is a greater proportion of disease and disability in some rural and coastal areas. This is partly driven by age structure and partly by concentration of deprivation.

Figure 2.16 shows this with an example of the crude prevalence of coronary heart disease, taken from the Chief Medical Officer's Annual Report 2021, Health in Coastal Communities.[4]

‡ Additional explanation of the different methods used to calculate healthy life expectancy is included in Appendix B.

**Figure 2.16: Map of England showing the crude GP Quality Outcomes Framework prevalence of coronary heart disease, attributed to small geographical areas, for 2014/15 to 2018/19**



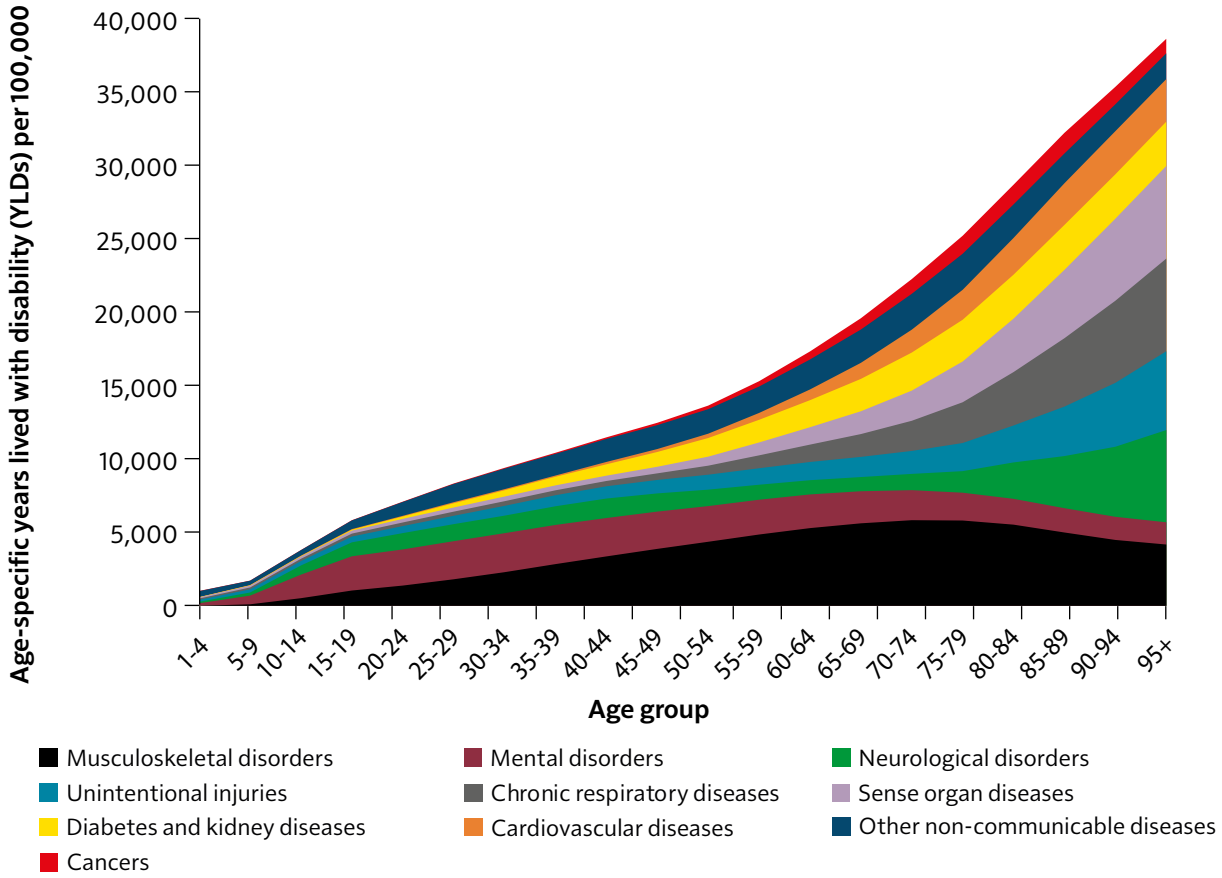

Source data: Analysis of coastal health outcomes by Dr Alex Gibson and Prof Sheena Asthana, Plymouth University[5]
Image source: Chief Medical Officer's Annual Report 2021, Health in Coastal Communities[6]

# Older adults encounter more varied ill health and disability than younger people

People experience more ill health (morbidity) and disability in later life. The top causes of ill health and disability over a lifetime are summarised in Figure 2.17.

Years lived with disability (YLD) is a measure reflecting the impact an illness has on quality of life. Figure 2.17 shows that the years lived with disability is much higher for older adults. Musculoskeletal disorders (such as arthritis), neurological conditions (such as Parkinson's disease), sense organ diseases (such as hearing or visual impairment) and unintentional injuries (such as falls or fractures) make the biggest contribution to years lived with disability in later life.

**Figure 2.17: Morbidity rate by age and top 10 broad causes (level 2 disease groups, age-specific years lived with disability (YLDs), persons England, in 2019**



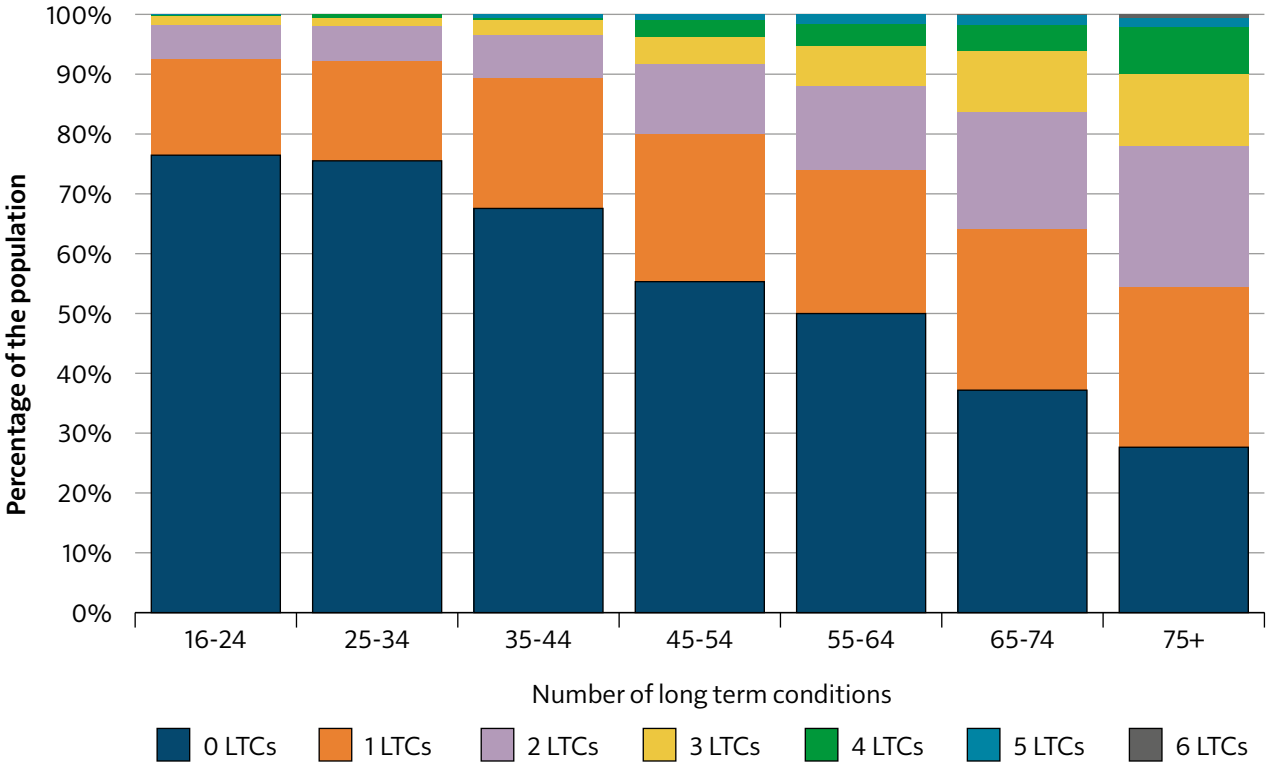

Source data: Global Burden of Disease Study 2019 (GBD 2019), Institute for Health Metrics and Evaluation (2020)[7] – Used with permission. All rights reserved.

# Older adults are more likely to have multimorbidity or multiple long-term conditions

With older age comes an increasing probability of an accumulation of multiple long-term (chronic) conditions, sometimes called multimorbidity. Multimorbidity is defined as the presence of 2 or more conditions.

Figure 2.18 demonstrates that a greater proportion of older adults have two or more long-term conditions.

**Figure 2.18: Percentage of the population with 0 to 6 long-term conditions (LTCs), by age, in 2018**



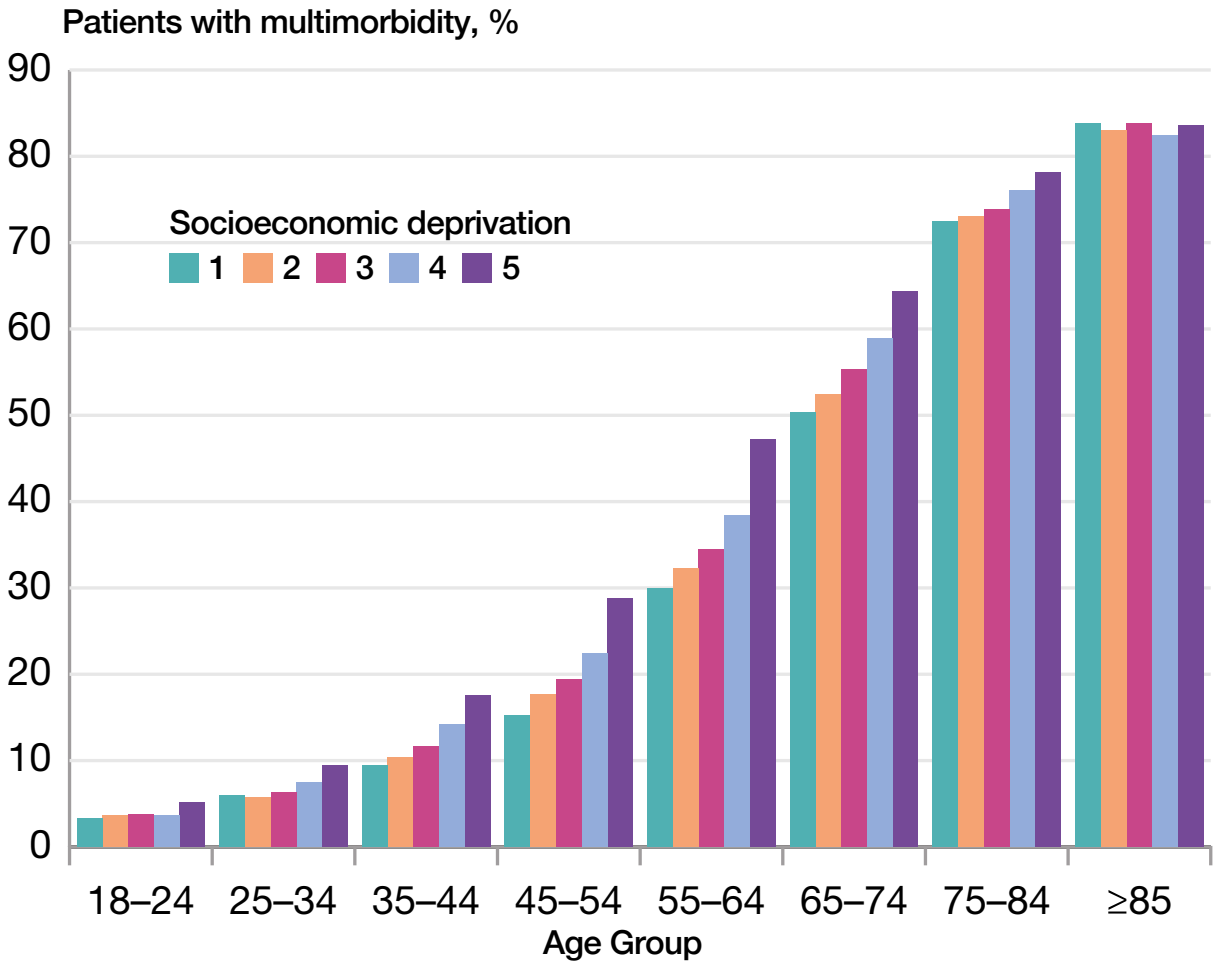

Source data: Department of Health and Social Care, analysis of data from Health Survey for England 2018[8]

Image source: Redrawn from image in Chief Medical Officer's Annual Report 2020, Health trends and variation in England[9]

# Older adults are more likely to have multimorbidity or multiple long-term conditions

Multimorbidity occurs at an earlier age of onset in more deprived areas of England. This is shown in Figure 2.19.

**Figure 2.19: Prevalence of multimorbidity (2 or more conditions) by age and deprivation**




(Index of Multiple Deprivation quintiles: 1 = least deprived, 5 = most deprived)

Source data: Cassell A and others (2018). The epidemiology of multimorbidity in primary care: a retrospective cohort study. British Journal of General Practice[10]

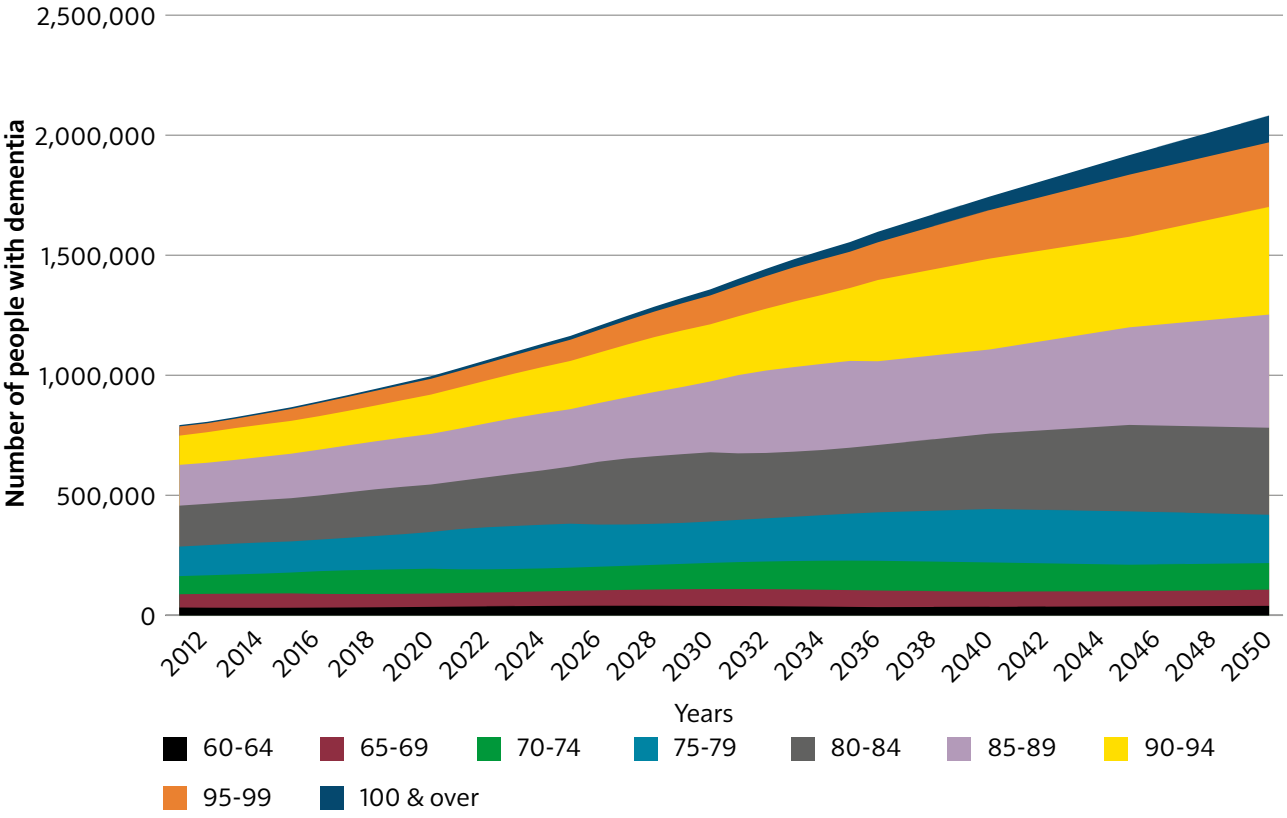
Image source: Chief Medical Officer's Annual Report 2020, Health trends and variation in England[11]

# Age-related health conditions are projected to rise

As people age, they are at increasing risk of developing a range of chronic diseases and disability, and some organs begin to function less well. Therefore, there is a long list of health conditions typically associated with older adults.

Due to the projected rise in the number of older adults over the coming decades, we also expect a rise in the prevalence of age-related health conditions in the total UK population. For example, Figure 2.20 summarises the projected rise in the number of people living with dementia by age group.

**Figure 2.20: Projected increases in the number of people with dementia in the UK, by age group, from 2012 to 2051**




Source data: Prince M, Knapp M, Salimkumar D and others. Dementia UK: Update (2014)[12]

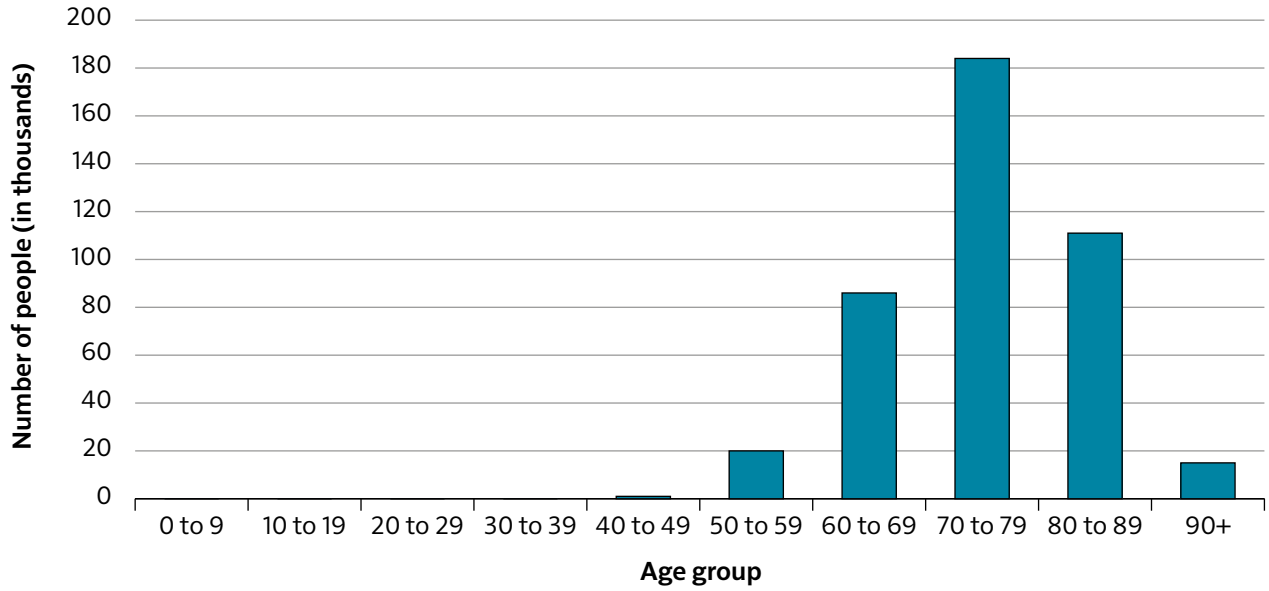
Recently published projections of the number of people with dementia in England and Wales, using data from the English Longitudinal Study of Ageing, are broadly consistent with the projections summarised in Figure 2.20.[13]

# High-quality, granular data does not exist for all age-related illness and disability

There is an old cliché that what gets measured gets done; it remains true. For some health conditions that are more prevalent in older age, there are accessible, high-quality, granular data available at regular time intervals to inform service improvement and delivery. For example,

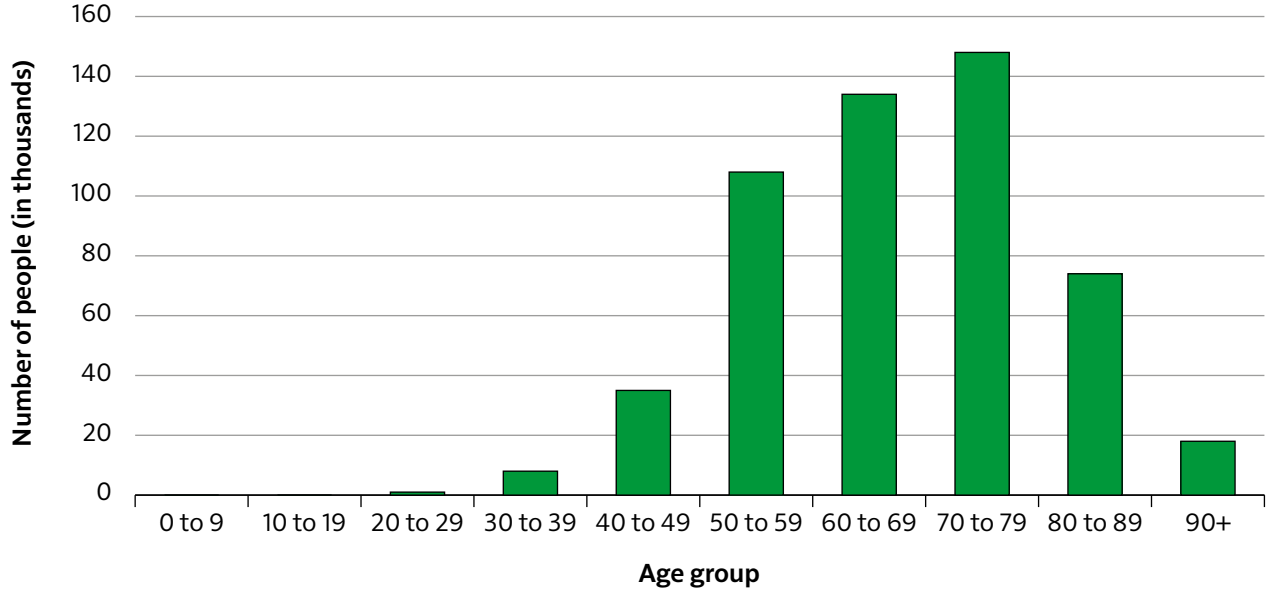
cancer registries enable data collection and publication of detailed data on age-related conditions such as prostate cancer (Figure 2.21) and breast cancer (Figure 2.22).

**Figure 2.21: Number of people living with and beyond prostate cancer in England, by age group, in 2020**




Source data: National Cancer Registration and Analysis Service (NCRAS), National Disease Registration Service (NDRS), NHS Digital[14]

**Figure 2.22: Number of people living with and beyond breast cancer in England, by age group, in 2020**




Source data: National Cancer Registration and Analysis Service (NCRAS), National Disease Registration Service (NDRS), NHS Digital[15]

There is however not the same level of high-quality routine data for all conditions common in older age. Where national registries don't exist, estimates can be provided through research studies. Osteoporosis data has recently been provided by a large-scale European study which

estimated that in 2021, the prevalence of osteoporosis in the total UK population was 5.2%. The study identified that around 22% of women and 7% of men aged 50 years or older were estimated to have osteoporosis.[16]

There can be inequity in data collection, analysis and availability of data for conditions that cause disability. For example, data regarding visual impairment is published regularly through the Office for Health Improvement and Disparities (OHID) Public Health Outcomes Framework.[17] Conversely, estimates of hearing impairment in England rely on a combination of research studies implemented over several decades.[18] For other conditions experienced by older adults, such as incontinence, there is no centrally collected official data. The current estimates regarding the number of patients with continence care needs relies on a single research study from over 10 years ago.[19]

Data helps identify problems and provides a robust basis for responses both by government and by the NHS and social care services. The more granular data are, the better health issues are identified and targeted.

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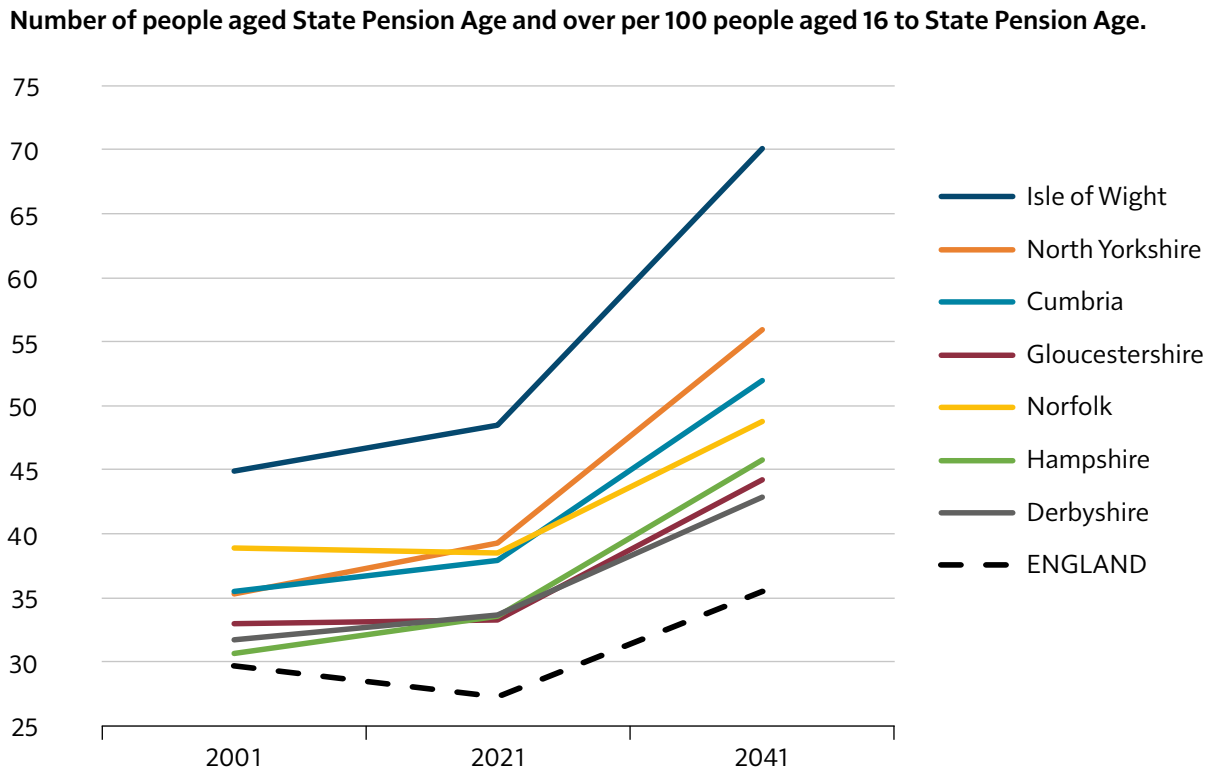
# 3 Local authority context

The population of England is ageing; however, some parts of the country are ageing at a faster rate than others. Older people are concentrated in rural and coastal areas, which presents opportunities and challenges for local and national government.

In this chapter local authority public health teams describe their local experiences of demographic change, the associated opportunities and challenges, and the locally led response.

The Older Age Dependency Ratio (OADR) for the seven local authorities included in this chapter is summarised in Figure 3.1, alongside the average for England. This graph demonstrates how the projected increase of the population above State Pension age (SPA) could lead to relatively higher levels of dependency in the future.

**Figure 3.1: Historical and projected age dependency ratios for seven local authorities, compared to the England average**




Source data: Office for National Statistics, mid-year estimates by local authority,[1] and 2018-based subnational population projections[2]

Local public health leaders recognise this demographic change and are taking steps to maximise the contribution of older adults to communities and support their resident populations.

# 3.1 Hampshire County Council

Rockford Common in the New Forest National Park, Hampshire (upper image)
Winchester, cathedral city and county town of Hampshire (lower image)

# 3.1 Hampshire County Council

**Simon Bryant** – Director of Public Health, Hampshire County Council and Isle of Wight Council

**Sarah Wallace** – Consultant in Public Health, Hampshire County Council and Isle of Wight Council

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**Jenny Bowers** – Principal Public Health Intelligence Specialist, Hampshire County Council and Isle of Wight Council

## Hampshire

Hampshire is the third largest shire county in England with a diverse geography and population. There are two National Parks, a coastline on the south of the English mainland, and the north areas close to London.

Census 2021 results show that with a resident population of over 1.4 million and 300,000 of those people aged 65 years and over, the population continues to age and has aged faster than England. The number of older people living in Hampshire is expected to continue to rise substantially. Local population forecasts show that the biggest increase will be in the 75 years and over population which is forecast to increase by 20% between 2022 and 2029.[3] Life expectancy in Hampshire is good; a man aged 65 years is estimated to live for 19.9 more years and a woman aged 65 years is estimated to live for 22.2 more years.

This section describes two different areas of Hampshire, the varied ageing population needs and programmes to improve public health outcomes. The two districts of focus are Rushmoor and the New Forest which have distinct population structures. This description considers the different demographics, geographies and economic factors and how these influence the local health needs of the older populations living in one county (Figure 3.2).

The New Forest and Rushmoor are compared using census and locally derived wellbeing and social isolation indices and Mosaic segmentation data. The social isolation index aggregates a number of measures of vulnerability associated with social isolation, including sole occupier data, to create an index. Mosaic segmentation data provide pen portraits, which are a softer data asset that provide more insight into people's behaviours, choices and lifestyles.

**Figure 3.2: Map of Hampshire County Council districts**


Image source: Hampshire County Council
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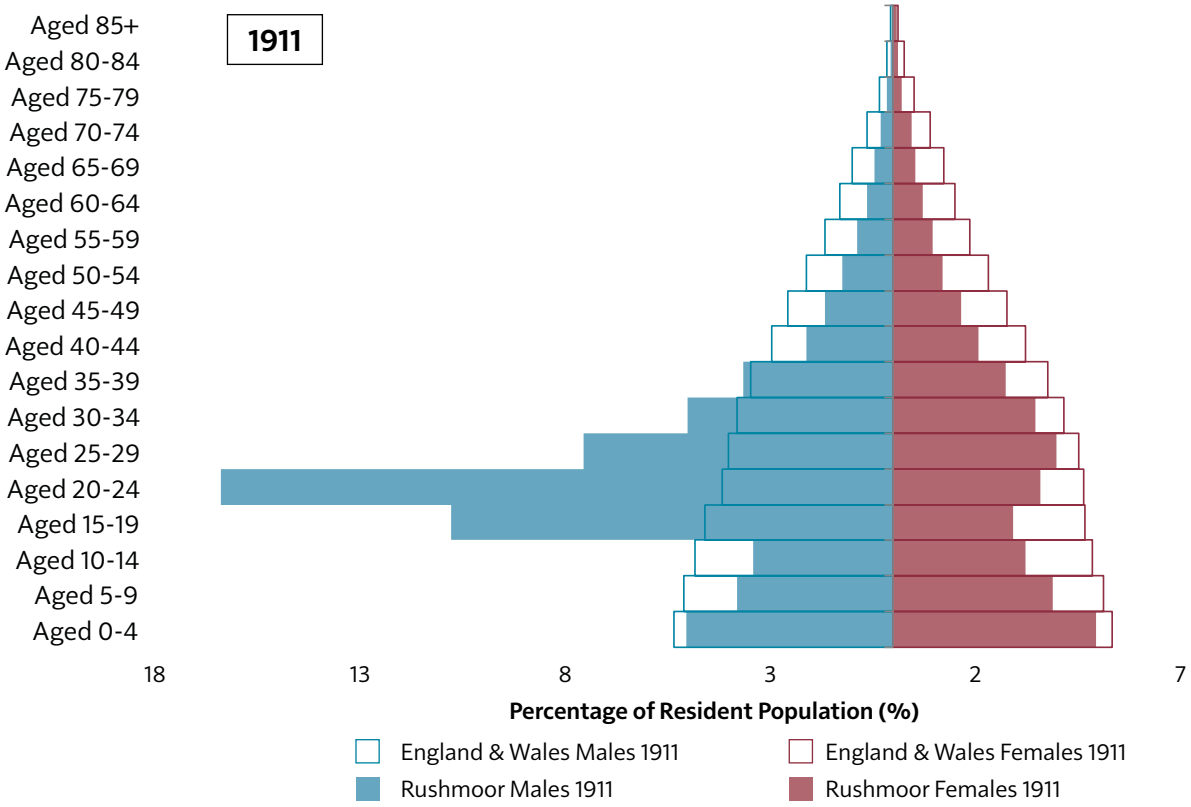
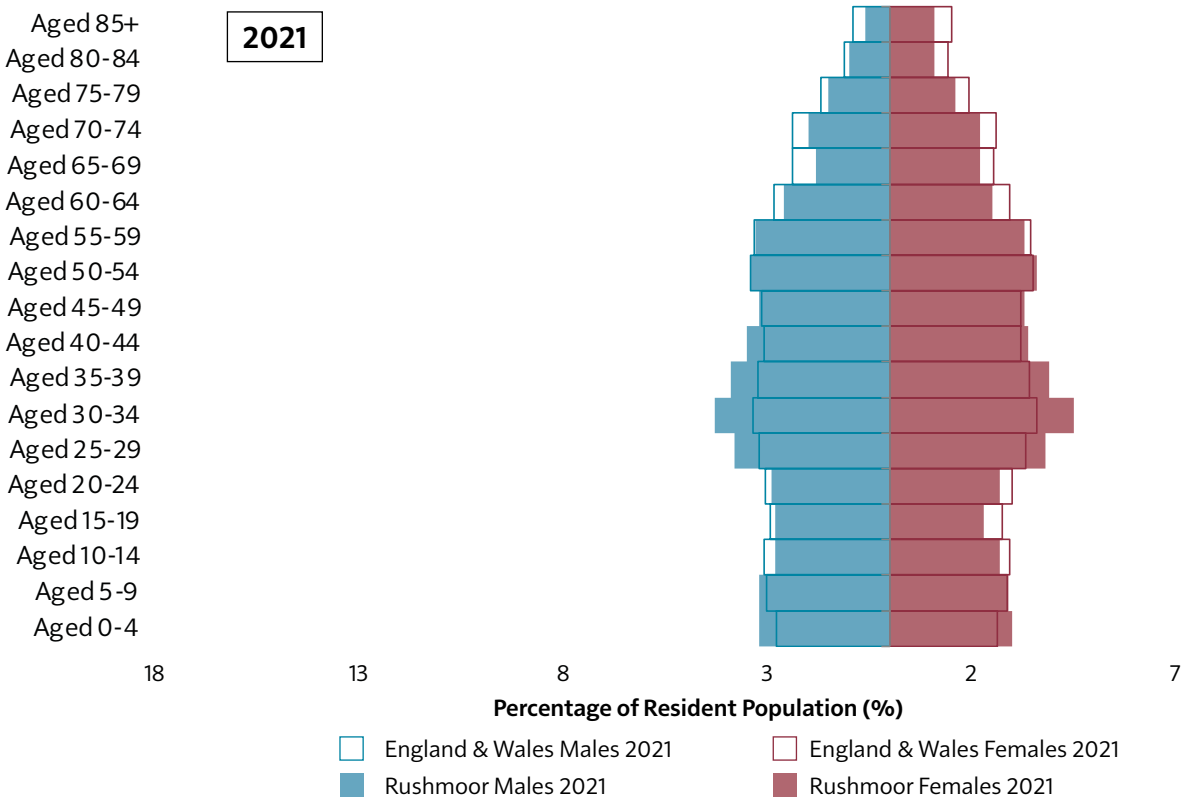
## Rushmoor

Rushmoor is an urban area in the north of Hampshire bordering Surrey and Berkshire.[4] It has a resident population of just under 100,000 and its population structure is relatively young. However, Rushmoor's population is ageing. The county's small area population forecasts suggest that Rushmoor's over 75 population is set to increase by 29.5% between 2022 and 2029, making it Hampshire's most rapidly ageing district. Rushmoor has a long history with the army which influences the population structure. One of the main towns, Aldershot, considered locally as the 'Home of the British Army', hosted the largest training camp in the country during the World Wars. More latterly a significant number of veteran soldiers and their families have settled in Rushmoor following the Gurkha justice campaign in 2009. 6% of the district population are Nepalese.

Figure 3.3 compares the population structure in the Census 1911 to that in the Census 2021 structure and clearly shows the significant number of young males living in the area in 1911, evidencing the connection to military history.

**Figure 3.3: Population age and sex structure of Rushmoor at the time of the 1911 Census and the 2021 Census**






Source data: Vision of Britain[5] and Office for National Statistics Census 2021[6]
This work is based on data provided through www.VisionofBritain.org.uk and uses historical material which is copyright of the Great Britain Historical GIS Project and the University of Portsmouth

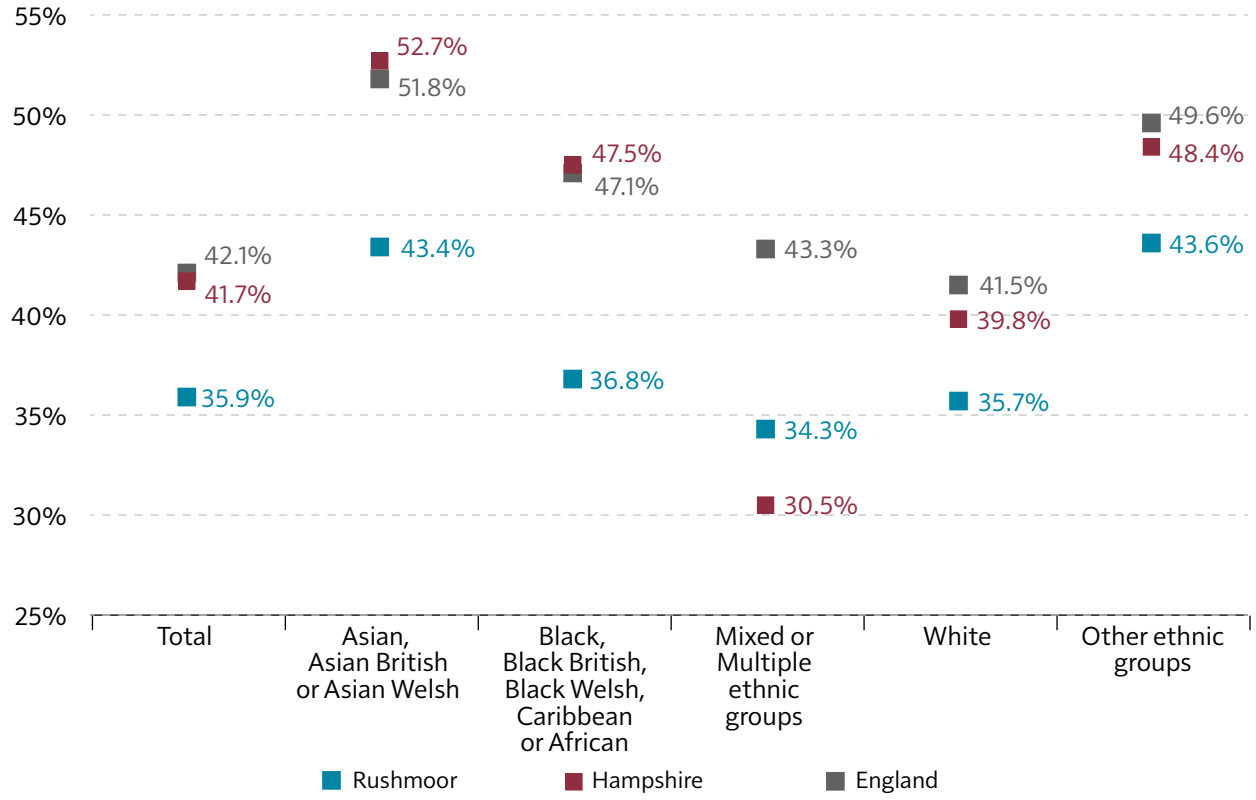
Rushmoor has specific place and people characteristics which make the older and ageing population vulnerable and can drive poorer health outcomes. It is an urban area with high population density, high rates of overcrowding and multi-generational housing – all factors which mean communicable diseases can spread quickly, which was evident during the COVID-19 pandemic. Key vulnerabilities affecting those most vulnerable to social isolation in Rushmoor are the percentage of people classified as disabled, percentage of people living alone with no access to a car or van and income deprivation affecting older people. Mosaic segmentation data detailed further in the report provides better insight into some of these characteristics.

Although Rushmoor is the youngest area in Hampshire it has the highest concentration of older people affected by income deprivation (Income Deprivation Affecting Older People Index) across Hampshire, with one in five LSOAs in the district ranked in the 10% most deprived nationally.

Rushmoor is ethnically diverse with 77.4% of the population in the White ethnic group compared to 92.6% in Hampshire and 81% in England. While ethnic minority population groups in Rushmoor generally are younger than the white populations, there is inequality in how ethnic minority communities experience ageing.[7] Figure 3.4 shows that in England, Hampshire and Rushmoor, a higher proportion of people aged 65 years and over in many ethnic minority groups report their health to be 'not good' compared to White population groups. This is particularly evident in the Asian community in Rushmoor, where over half of the residents of this group report to have 'bad health.' Therefore, to meet the needs of our population as they age and

develop more complex needs, we have to understand this better, including the intersectionality between ethnic diversity, Army influences and any different social and cultural behaviours and beliefs.

**Figure 3.4: Proportion of people aged 65 years and over, who report to have 'not good health' by ethnic group, for England, Hampshire & Rushmoor**

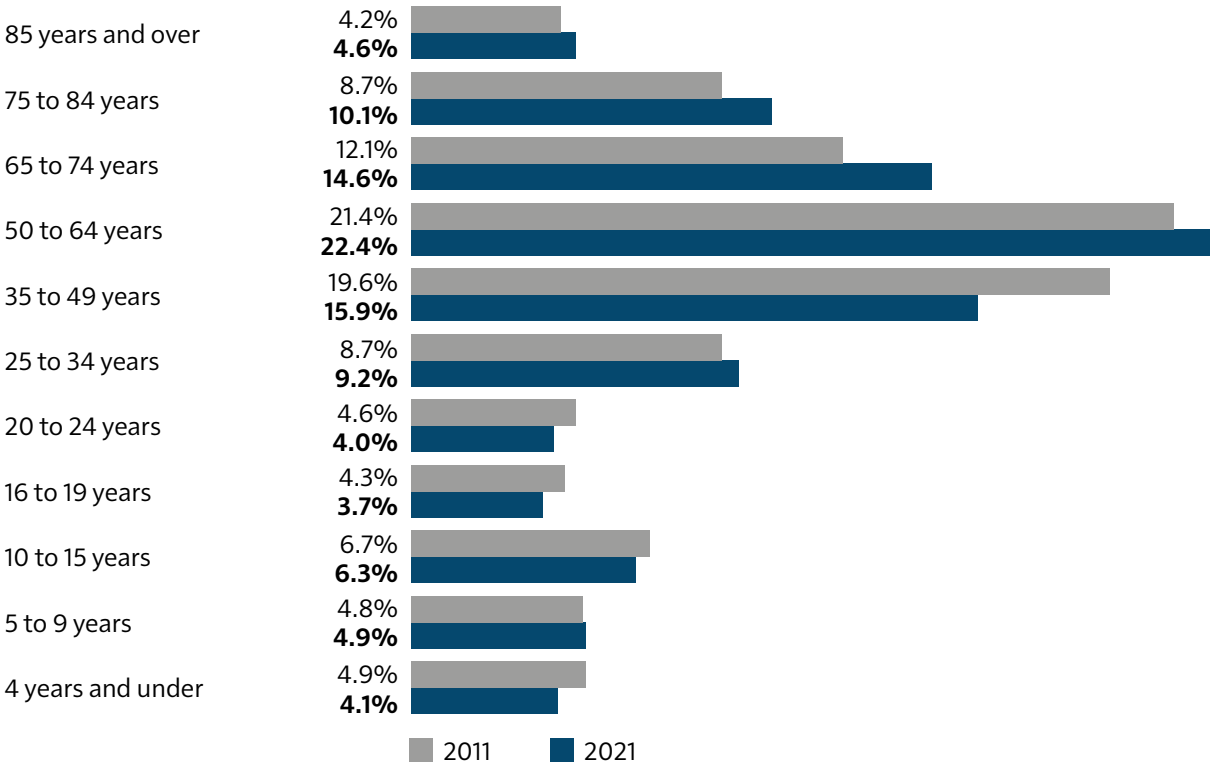



Source data: Office for National Statistics Census 2021[8]

## The New Forest

The New Forest is a significantly rural district in the south of Hampshire and, with a resident population of almost 176,000, is the second most populous district in Hampshire.[9] It has an older population structure with almost one third of the population (29.4%) aged 65 years and over, making the New Forest the district with the highest proportion of over 65 year olds in Hampshire and the sixth highest across England and Wales. The New Forest was one of only two local authority areas in the South East to see its population decline between the last two censuses, however population change data show that the older population groups continue to grow, and the younger age population groups have declined (Figure 3.5). Consequently, the population is becoming much older, and the average (median) age of the New Forest increased between 2011 and 2021 by four years, from 47 to 51 years of age. The New Forest is the least ethnically diverse district in Hampshire, with 96.8% of the population being White.

**Figure 3.5: Population change in the New Forest between the 2011 Census and Census 2021**



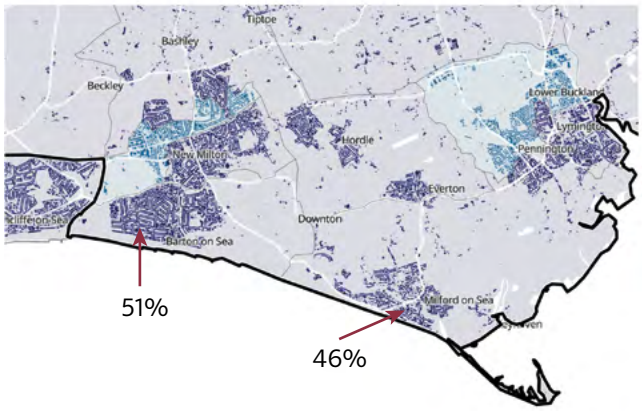

Source data: Office for National Statistics – 2011 Census and Census 2021[10]

Overall, the New Forest is an affluent area with low levels of deprivation. However, there are pockets where older people are affected by income deprivation and these areas are ranked in the 20% most deprived areas nationally. These areas can often be masked due to an overall younger population but are predominantly where older residents who were born in the area reside, or have moved, to be in a more accessible location from the surrounding villages.

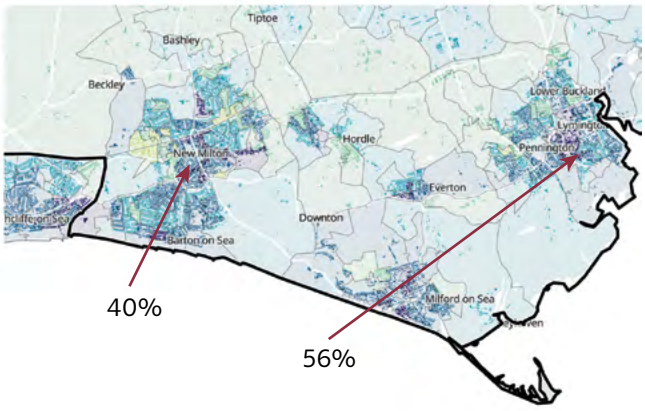
The New Forest is a desirable place to retire, attracting many people to benefit from the natural beauty and the rural location and coastal areas. Figure 3.6 presents census data for the coastal areas in the south of the New Forest. These coastal locations offer huge natural wellbeing benefits but as people age, they can present challenges for local people particularly around housing suitability and accessibility to services. Many of the older people who live in this part of the New Forest live alone, are widowed and do not own a car. These characteristics can impact on how socially connected a person feels, especially if they have retired to the area, as they may not have an established local support network.

## Figure 3.6: Population demographics and household characteristics of the coastal areas in the south of the New Forest

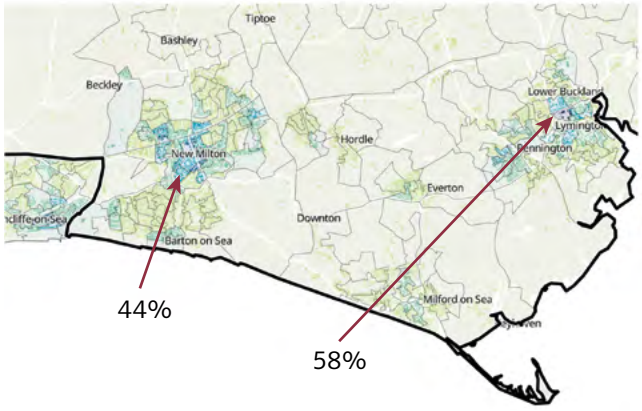
**Proportion of the population aged 65 years and over**



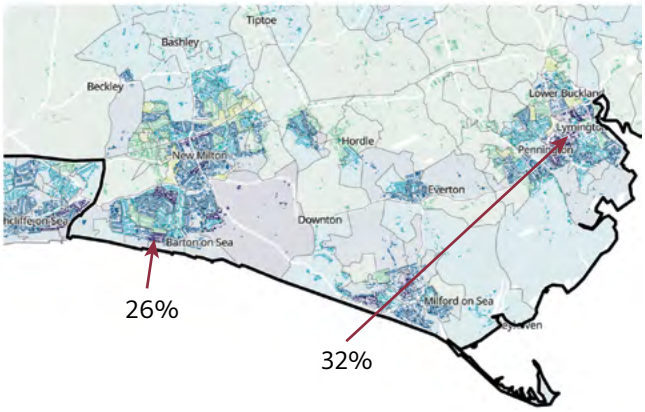

**Proportion of one-person households, aged 66 years and over**




**Proportion of population with no cars or vans in household**




**Proportion of population widowed or are the surviving partner from a civil partnership**




Source data: Office for National Statistics Census 2021 Maps[11]

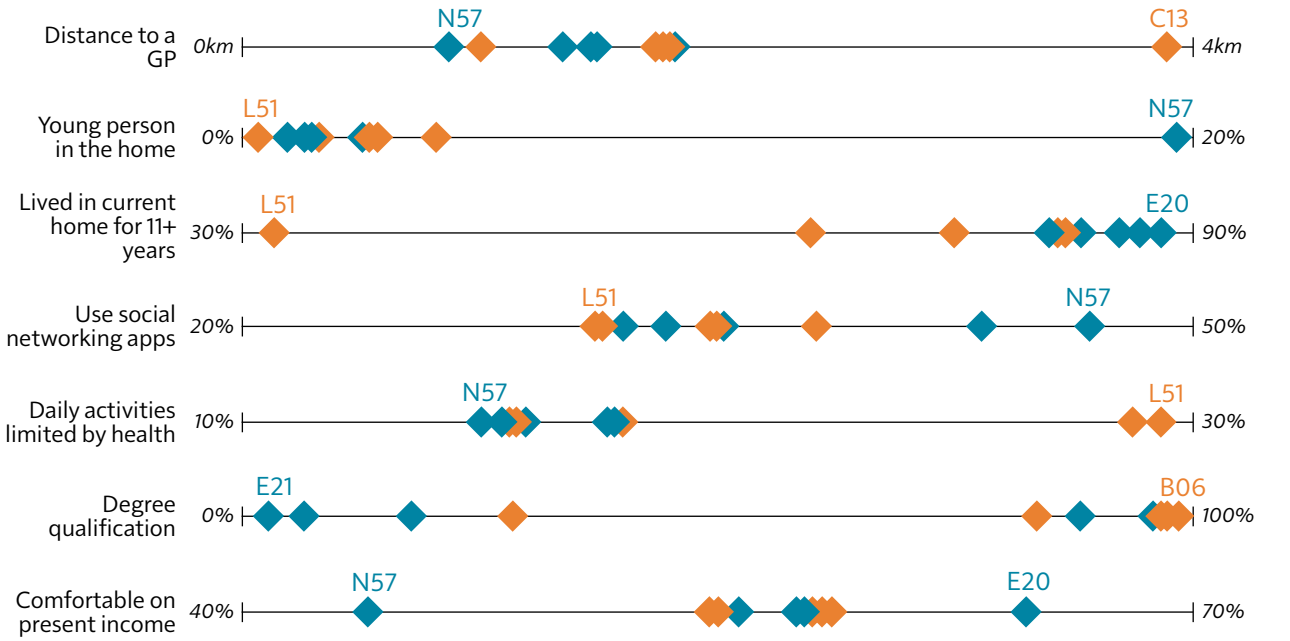
There is some early evidence to suggest that the pandemic has accelerated people moving from high density urban areas to the countryside. Local data also suggest that older people are less likely to be confident going out in the dark due to lack of street lighting in rural areas and the high risk of hitting an animal, which roam freely in the New Forest. This group may therefore be restricted in when and where they travel, especially during the winter when daylight hours are shorter.

Cold homes and fuel poverty are directly linked to excess winter deaths. While there are only small areas with higher proportions of fuel poverty, there is a higher proportion of homes with poor energy efficiency rating in the New Forest, especially in coastal areas. Energy efficiency ratings show that older owner-occupied properties tend to have lower energy efficiency and the New Forest has a greater proportion of homes owned outright than Hampshire and England. In some areas a large proportion of the homes are either owned outright or with a mortgage and half of the households are 'under occupied' suggesting people live alone in large houses that may require more heating. The increasing energy costs experienced over the last year may lead to financial worries connected to heating homes.

## Behaviours, lifestyles and place characteristics

This section compares the New Forest and Rushmoor using Mosaic segmentation data which are a softer data asset that tend to provide more insight into people's behaviours, choices and lifestyles. Mosaic data allocates households into types, with each type having certain characteristics such as age, household structure, income and other lifestyle factors. There are 18 types with a mean age of 66 years or older in the New Forest and Rushmoor. Five types make up around two thirds the older population of each district, shown in the table in Figure 3.7, with the name and code for each type, alongside the percentage of households with a mean age of over 66 in the district that each type makes up.

**Figure 3.7: Experian Mosaic Types: Summary characteristics of households with a mean age of 66 years and above in the New Forest and Rushmoor**




| | New Forest | | | | | Rushmoor | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bungalow haven E19 | Village retirement C13 | Empty nest adventure B09 | Diamond days B06 | Retirement comm-unities L51 | Classic grand-parents E20 | Solo retirees E21 | Community elders N57 | Empty nest adventure B09 | Legacy elders E18 |
| **Percentage of 66+ households** | 21% | 13% | 12% | 9% | 9% | 14% | 12% | 12% | 11% | 10% |

New Forest
Rushmoor

Source data: Experian Ltd – Mosaic Segmentation 2023[12]

Four of the five predominant types in the New Forest paint a picture of living a relaxed retirement with comfortable pensions and personal savings, likely accrued by achieving high qualifications, enabling them to rise up the career ladder. Generally, these people live alone or with a spouse in large, detached homes or bungalows in rural towns and villages. However, these people may still face challenges such as social isolation and cold homes. Figure 3.7 shows that despite living in accommodation which is suited to their health needs, around one third have their daily activities limited by their health. This population makes up around one in five households in the south coastal areas of the district.

In Rushmoor, the 66 years or older population mosaic types are more diverse. Generally, people in Rushmoor live in more affordable homes in suburban, diverse neighbourhoods. Many of these households manage their money carefully, although others live on good pensions. Figure 3.7 shows that those in Rushmoor are less likely to have a degree qualification than those in the New Forest. Those classed as 'Community Elders' are likely to still be working and are unlikely to be comfortable on their present income. They live in city centre terraced housing or apartments and are likely to live in multigenerational households with a young person in the home. Figure 3.7 also shows that these people are likely to use social networking apps. Only 15% of these people have their daily activities limited by their health, which may be reflective of their easy access to amenities and their social connections which may assist them with day-to-day living.

Considering the data presented in Figure 3.7 and using local knowledge and insight into these areas several themes are apparent.

## Digital exclusion

Digital access is key for accessing information and connecting with family and friends. The older population in Rushmoor are likely to be more conversant with online technologies than those in the New Forest, perhaps influenced by the increased likelihood of having a young person living in the home and the desire to keep in touch with family abroad.

Digital isolation is evident in the New Forest for two reasons. Firstly, rurality means access is constrained across large parts of the New Forest, particularly in the National Park area, and speeds can be slow. Secondly, some of the older population prefer to have limited or no digital engagement. Adapting methods of communication is key in ensuring that digital routes are not the sole way of engaging with the outside world.

## Rural and urban areas

As previously discussed, rural retirement hotspots such as the New Forest can be a contributing factor to social isolation and potentially poorer physical and mental health. They are more likely to live further away from a GP and are more likely than those in Rushmoor to have their daily activities limited by their health. They may have less of a social network and support as they have moved into the area in later years and services may not be as accessible due to the constraints of rurality but also by a lack of confidence to travel independently in rural areas. The insights data suggest older people in Rushmoor have lived in their homes for longer and perhaps with a younger member of the family, and therefore may feel more socially connected both physically and digitally. In addition, living in an urban area means fewer travel constraints and the travel time to health and care services is potentially shorter.

## Employment and education

People's financial position in retirement is generally linked to their circumstances over the course of their lifetime. This includes educational and employment opportunities which strongly influence how financially stable a person is later in life. Private pension provision, in

particular, is closely related to employment history – both time spent in work, and earnings levels.[13] Insights data show that there is a wide variation in Rushmoor with some types more likely to have a degree qualification, comparable to most of the New Forest types, but other types such as solo retirees are much less likely to have a degree qualification.

The New Forest relies on tourism with over one in ten of New Forest residents working in the accommodation and food service sector.[14] These jobs are generally seasonal and low paid. Therefore, some older people born and raised locally, particularly those who reside in the more deprived areas, may have limited retirement pensions compared to other older people who have moved into the area.

In Rushmoor there is a clear difference in occupation by ethnic group which may help to explain the wide variation in financial circumstances. A higher proportion of ethnic minority groups work in the caring, leisure and other service industries and elementary occupations. White residents more commonly work in senior official, technical, administrative or skilled trades. Elementary jobs are categorised as the lowest skilled type of occupation and have the lowest annual full-time gross pay compared to other occupations.[15] Over one in five (22%) of Asian/Asian British/Asian Welsh residents work in an elementary occupation.[16]

## Continuing our public health work in partnership across Hampshire

Getting older is something to be celebrated. With better health care and medicine we are able to live longer. There is a greater understanding too of the impact healthy lifestyles at all ages can have on our health and wellbeing later in life.

However, as we have shown, our population's experiences of ageing differ widely, and this is largely attributable to people's life experiences and opportunities. Public Health will continue to work with our partners to improve the health of our residents.

Within Hampshire the differences in demographics, local historical influences, geography and economic factors lead to very different life and health experiences of the population as they age. This may be in ways that are unexpected, therefore our public health and social care system must reflect this.

There have been huge gains over the past decades in terms of better treatment for different health conditions, as well as improvements in our overall population's lifestyles. However, with the number of people living with long term conditions and the number of years spent managing their conditions both projected to increase, being physically and mentally active are key things we can do to influence and ensure we age healthily. It is never too early or too late to start improving our health; action at any stage of life can support us to live happier and healthier in older ages.

There is a lot of good work happening across Hampshire which is proactively supporting people to age well, remain independent, physically active and healthier for longer. Some of these are shared below.

## Hampshire case study: Steady and Strong

Steady and Strong classes have been developed by experts and are delivered by a network of independent instructors, they are open to everyone aged over 65 in Hampshire.[17] Classes focus on increasing strength and balance, helping people to stay stronger for longer and able to keep doing everything that they love. These classes have been offered in Hampshire over a number of years, and we are now working with Later Life Training and the PHIRST LIGHT team (an NIHR funded research collaboration between the Universities of Lincoln, Nottingham and Loughborough) to develop and evaluate a Steady and Strong Dance offer, based on the Otago programme.

## Hampshire case study: Live Longer Better

Physical activity is one of the most important things we can do to stay healthy and independent. Live Longer Better Hampshire is part of a national revolution set up by Sir Muir Gray to support people to live their older years in good health, and is led locally by Hampshire County Council in partnership with Energise Me.[18] The primary aim of the programme is to increase the levels of physical activity in older people, thereby increasing quality of life and healthy life expectancy and enabling the older population in Hampshire to live more independently for longer (by decreasing or delaying care needs).

Alongside workstreams targeting older adults within social care and working in partnership with local stakeholders to support those in the community, the Live Longer Better Hampshire website helps individuals to find ways to stay independent, live life to the full and keep doing what they love.[19] It sets out positive steps those in their 60s, 70s and beyond can take to improve their health and live longer, better. Following conversations with Hampshire residents, Live Longer Better Hampshire focuses on four key areas where older adults can make positive changes now that will give them the best opportunity of staying independent in later life: Being active, staying steady, preventing incontinence and staying connected.

## Hampshire case study: Hitting the Cold Spots

The Hitting the Cold Spots programme seeks to support people who are at risk of harm as a result of cold homes.[20] The services offer advice and support to residents. This includes help with temporary heating and first-time central heating, to arranging home visits and sourcing boiler repair funding.

## Hampshire case study: Hampshire Home Library Service

The Hampshire Home Library Service (HLS) is a free service and is available to anyone that struggles to get to the library due to health or mobility issues, or caring responsibilities. Regular monthly visits by the same volunteer can become a vital social contact for HLS customers and volunteers.

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# 3.2 Isle of Wight Council

Image source: Isle of Wight Council

Village of Seaview, Isle of Wight (upper image)
Shanklin Down, Isle of Wight (lower image)

# 3.2 Isle of Wight Council

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## Isle of Wight

The Isle of Wight is unique* as a local authority in its physical separation from the English mainland. With over half the island designated an Area of Outstanding Natural Beauty (AONB), easy access to beaches and a close-knit community, the island has huge advantages as a place to live and work. However, the natural geography, physical separation of an island, and a considerably older population structure, also pose challenges for both those in the population who require care, and for health and care systems providing current services and planning for the future. For Isle of Wight residents, the experience of ageing and retiring on an island may be very different to mainland England. Furthermore, those who retire to the island may have different experiences and challenges to those older people who were born and grew up on the island.

This report looks at population and geographical factors affecting the Isle of Wight and how they influence the health, wellbeing and experience of health and care of the population.

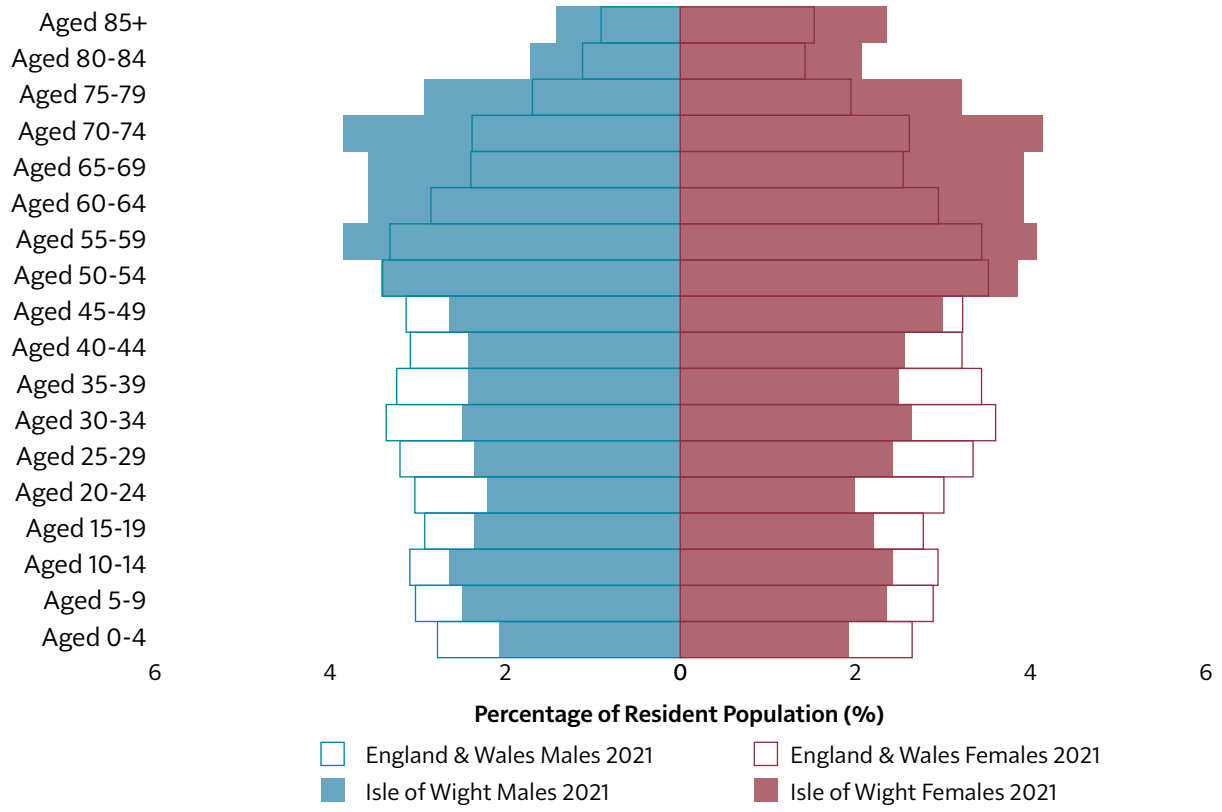
### Population

The Isle of Wight has a resident population of 140,500 and has a significantly older population compared to England, with almost one third of the population (29.2%) aged 65 years and over, and an average (median) age of 51 years. The Island has the seventh highest percentage of population aged 65 years and over across England and Wales local authorities and second highest median age in the South East.

The older population structure (Figure 3.8) means that there is a large proportion of people living with a disability: local data suggests that over half of 85-year-olds are considered disabled. There are also high numbers of people recorded on GP registers with long term conditions. Population forecasts suggest that the older population is expected to increase, with the number over 75 years old expected to increase by 14% over the next eight years. This equates to approximately 3,000 more residents aged 75 years or more living on the island.[1]

* The Isles of Scilly is the other island authority in England, but is very small in comparison with a population of around 2,100 people.

**Figure 3.8: Isle of Wight population structure compared to England and Wales using Census 2021 data**

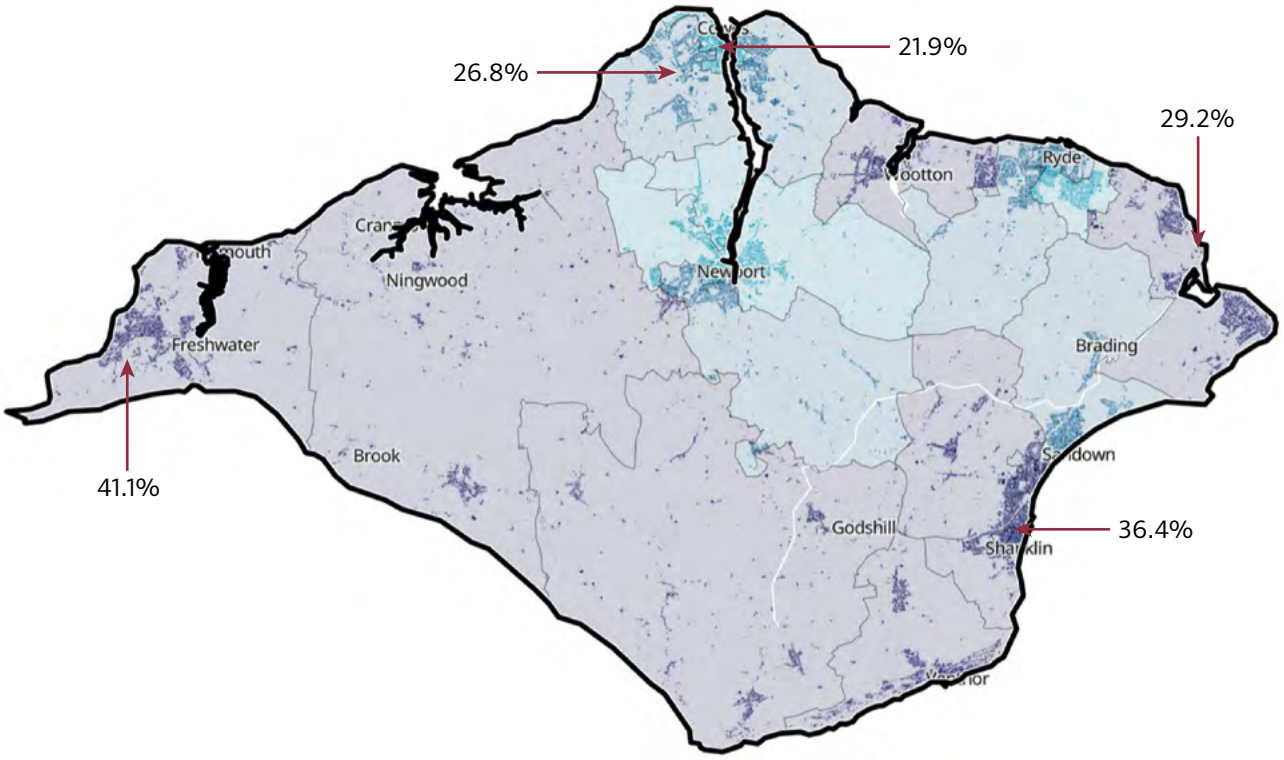



Source data: Office for National Statistics Census 2021[2]

Older people living on the island do experience good health overall with life expectancy at age 65 improving slowly over time and being comparable to mainland England. Inequalities are apparent, although not as wide when compared to mainland England, and deprivation data show that the more income-deprived older people tend to live in the northeast towns of the Island. The island is the 80th most deprived authority in England with pockets on the island that fall within the most deprived areas in the country. The island is not as diverse as other parts of England with the white population representing 98.8% of the population.

The Isle of Wight population is heavily influenced by internal migration (people moving within the UK). A large proportion of university age and young adults move from the Island, whereas the majority of those moving to the Island are of older working age and retirement age. Those older populations that move to the Island are not evenly distributed with some areas having higher concentrations. The island's positive reputation for being a great place to retire increases the number of older people moving to the Isle of Wight, however this may be away from their families and previously established support networks. Figure 3.9 shows that older populations are particularly concentrated around the western and south-eastern areas of the island.

**Figure 3.9: Percentage of the population aged 65 years and over in different locations on the Isle of Wight**



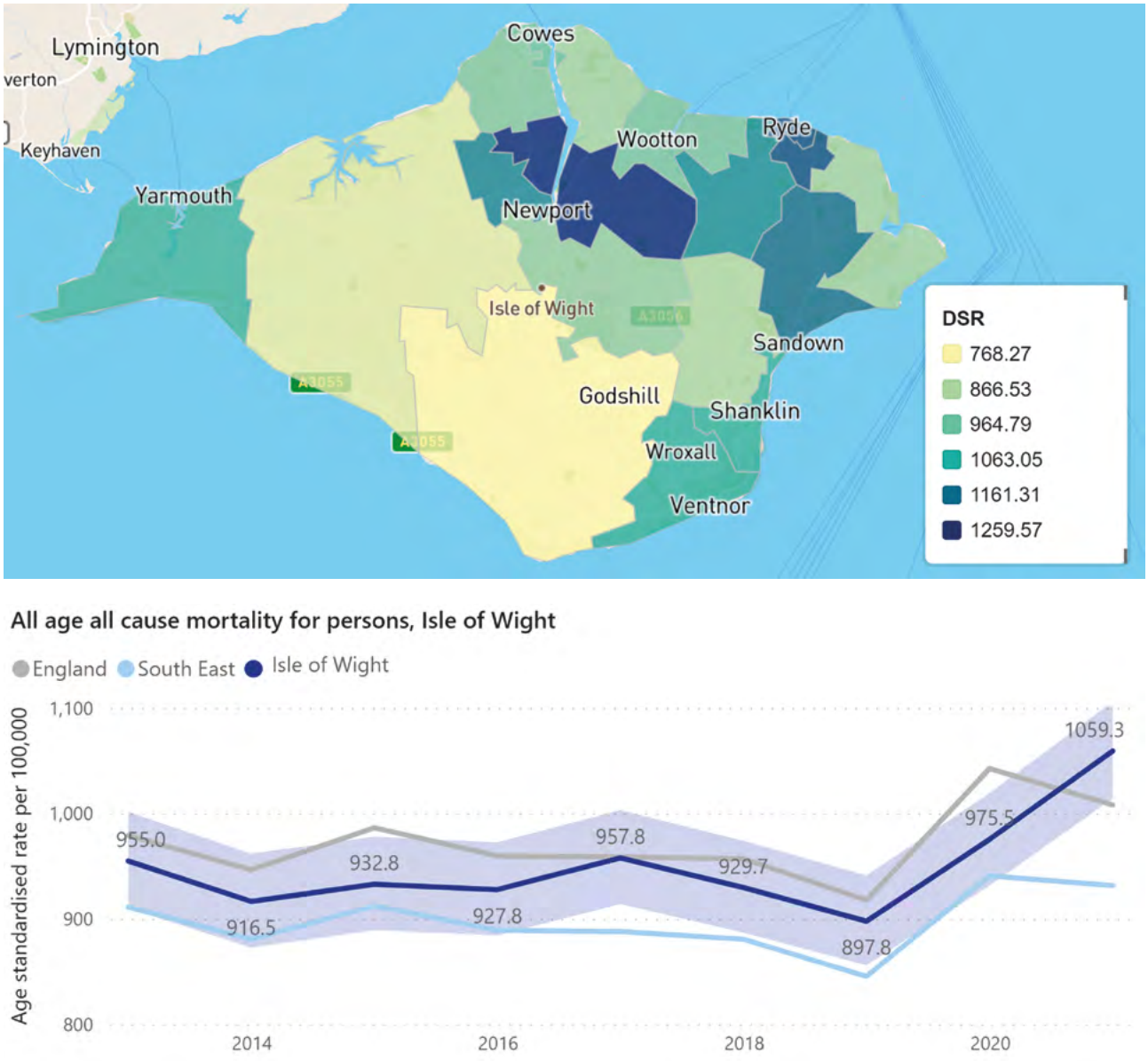

Source data: Office for National Statistics Census 2021 Maps[3]

Differences in levels of all-cause mortality[†] reflect health inequalities between different population groups, for example, between genders, social classes and ethnic groups.[4] Figure 3.10 shows higher rates of all cause all age mortality correlate to the areas of higher multiple deprivation and older people affected by income deprivation. Retirees settling on the Island and to the rural desirable areas, may have had better life opportunities with well paid jobs and occupational pensions. The combined effect of this contributes to a financially comfortable and healthier older person.

† All-cause mortality is a measure of the health status of a population. It represents the cumulative effect of the prevalence of risk factors, the prevalence and severity of disease, and the effectiveness of interventions.

**Figure 3.10: All age, all-cause mortality for all persons, 2016 to 2020 (map) and trends 2013 to 2021 (graph).**

The age standardised mortality rate per 100,000 is calculated using the Directly Standardised Rate (DSR)




Source data: Isle of Wight JSNA Vital Statistics[5]

Areas with a higher proportion of people who have moved and retired on the island have comparatively lower mortality rates and better life expectancy. However, age remains a strong predictor of health especially for the 85 years and over population, when life opportunities and socio-economic factors become less of a significant predictor. These older people on the Island therefore do have health challenges which, as they grow older, mean they are less likely to live an independent life due to decreasing mobility and increasing frailty. This demonstrates the need to understand a population history and context to improve health outcomes and work across the life course to prepare for older age.

## Responding to island needs: Community Transformation Programme

The Isle of Wight Community Transformation Programme is seeking to transform services on the island to better meet the needs of the population, with a particular focus on the needs of the older adult population.

Examples of areas of work has been delivering virtual wards and telemedicine in care homes, which both support people to remain out of hospital. The programme has also implemented the dementia strategy, including creating dementia specific roles in the community and in secondary care to support improved quality of care as well as an island dementia hub.

## Responding to island needs: connecting urgent community falls responses with technology enabled care services

Isle of Wight (IOW) Council, Hampshire and the IOW integrated care board (ICB), Wightcare and the IOW Trust have worked together to pilot a programme to reduce waiting times and hospital admissions for people who fall. Under this service, calls to the Ambulance Service are triaged and category 3 and 4 calls are reviewed by a paramedic and if appropriate are directed to Wightcare (the Technology Enabled Care provider), who will then attend the call. In the pilot 92% of people remained at home with no ambulance service attendance. This service is available 24 hours a day, attended on average in 26 minutes from call out, and is much less costly compared with ambulance attendances.

The island effect is particularly challenging for local Adult Social Care provision which has an overreliance on residential and nursing care. Market forces have resulted in a challenged residential care provision and a small care home market and over the past ten years no new residential or nursing care home providers have been established on the island.[6] The Isle of Wight Council's Adult Social Care team experience a higher proportion of older adults requiring long term support and admission to residential and nursing care homes when compared to their statistical neighbours. The challenging workforce issues experienced on the island exacerbates this issue and as a result there has been increased rates of admission to residential care over time.[7]

## Geographical factors

In 2016, the University of Portsmouth conducted a review of the island which explored the impact of physical separation from the UK Mainland on Isle of Wight Public Service Delivery.[8] This identified three main themes relating to the insularity of an island which have a negative effect:

Forced self-sufficiency reflects the lack of spill over from neighbouring authorities; research shows other local governments benefit from their population being able to use public services provided by neighbouring local government areas.

The Island premium represents the additional cost of conducting business on and with the Isle of Wight. This premium not only encapsulates higher transportation costs, but also the limited opportunities for optimal economies of scale.

Dislocation represents the actual or perceived distance, geographical or social, from the mainland.

Over half of the island is a designated AONB and 80% of the entire Island is agricultural. This provides outstanding views and natural areas, promoting tourism in the area but restricting where infrastructure, housing and other developments can happen.

Housing is a key determinant of health. Poor quality or unsuitable homes directly affect physical and mental wellbeing, creating or exacerbating health issues. Cold homes and fuel poverty are directly linked to excess winter deaths. Housing is a priority for the Council which is developing a sustainable approach to increasing housing on the Island. 4% of homes on the Island are second homes (compared to 1% of homes nationally), and one in five people privately rent their homes on the island. Nationally, this sector has the poorest housing conditions with 23% of these homes not meeting the Decent Home Standard.[9] The rurality of some areas places a greater reliance on having transport to access services. On the island four out of ten people aged 65 and over who live on their own do not own a car. This is much higher than the England average, and may be a barrier to accessing healthcare and impact long term condition management.

Access to and from the island is dependent on ferry services which adds a travel cost not experienced on the mainland of England.

## Responding to island needs: Age Friendly Island

The Isle of Wight (IOW) Age Friendly Island programme was led by Age UK IOW and a wide range of partners who are committed to making the Isle of Wight a great place to grow older.[10] One area of work has been developing a training course for service providers. The training is aimed at improving services by raising awareness of some of the challenges and barriers that older people can face when using services in later life. The Isle of Wight's main bus operator, Southern Vectis, has incorporated Age Friendly training into its compulsory programme for all drivers. Since introducing age-friendly training, Southern Vectis has seen a reduction in incidents involving slips, trips and falls and has seen high rates of customer satisfaction. Tesco has also introduced a 'Time for you' till.

Digital inclusion is becoming more important as more services are offered online. However, although broadband service is generally good across the island, there are some areas in which profile data suggest older residents would prefer not to engage digitally. This communication preference was evident during the Census 2021 collection, when returns data showed a large proportion of Isle of Wight residents returned paper copies.

## Responding to island needs: Age UK Isle of Wight Digital Service

Age UK Isle of Wight has been offering a digital inclusion service since 2016, evolving over time, responding to changes in need, the restrictions of the pandemic and the availability of funding. There is a strong record of partnership working through the Age Friendly Island Steering Group, which has been in place for over seven years, and a Digital Connectivity Steering Group which developed in 2020 as part of our public engagement during the pandemic.

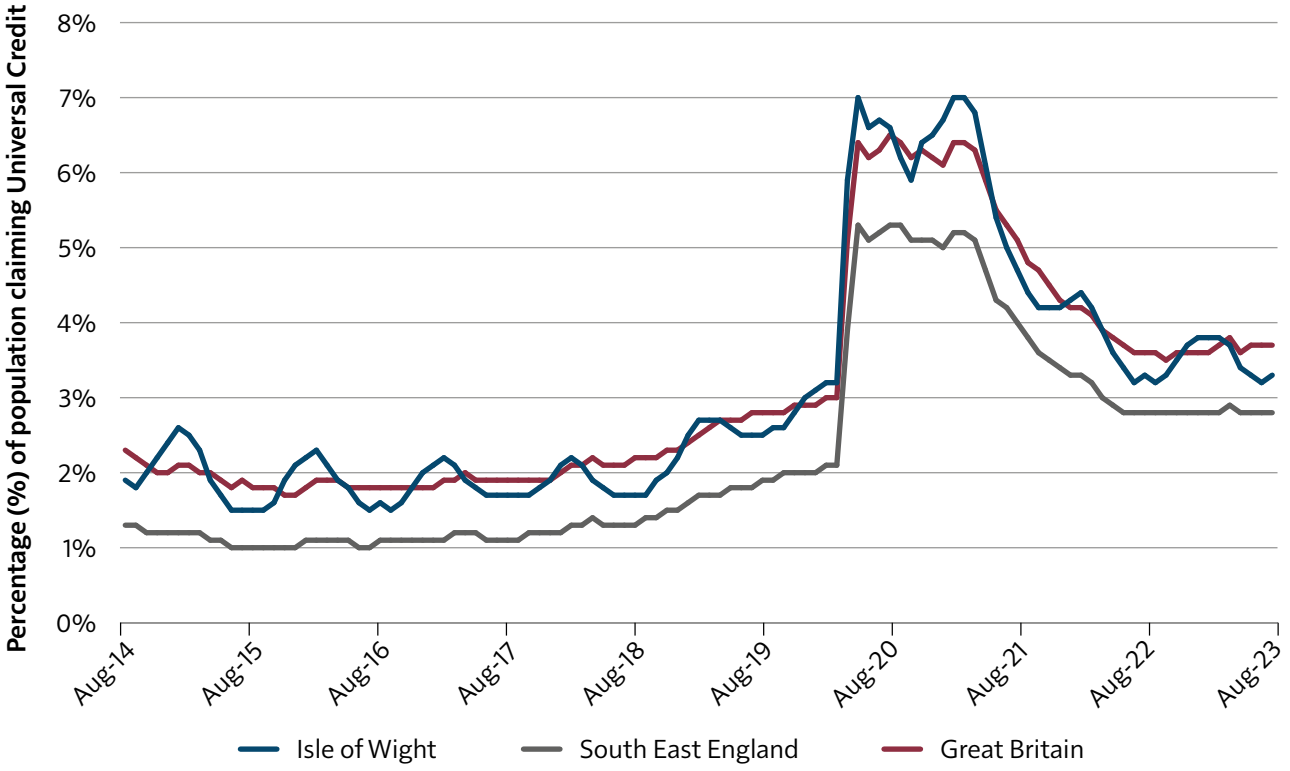
Age UK work closely with the Council and their staff support the online safety workshops. Last year, the Digital Friendly Island scheme was founded with key stakeholders from the Digital Connectivity Steering Group. This is a cross-sector scheme, currently bringing together 25 organisations working to create a more digitally inclusive island.

A variety of support is provided by six staff, supported by 15 digital volunteers, who provide 1-to-1 home visits, group workshops, community drop-ins, talks and support at community groups.

A local area's employment rate is related to how long people are likely to live and how many years they can expect to live in good health. In places with higher economic activity, people are more likely to have a better healthy life expectancy.[11] On the island there are more people who continue to work as they age; the annual Population Survey data show that on the Isle of Wight there is a higher proportion of economically active people aged 50+ when compared to England.

The tourism industry brings huge benefits to the island, although the seasonal effect increases job insecurity and instability and local reliance on this industry is very evident by the fluctuating claimant rates as shown in Figure 3.11. Seasonal employment makes people very vulnerable to cost of living rises as they do not have a stable income. On the island a large proportion of people of all ages are employed in this sector whereas nationally it is dominated by the younger age groups.

**Figure 3.11: Percentage of Universal Credit claimants as a proportion of the resident population aged 16 years and over, August 2014 to August 2023**




Source data: Office for National Statistics, Official Census and labour market statistics[12]

## Continuing our Public Health work in partnership across the Isle of Wight

For Isle of Wight residents, the experience of ageing and retiring on an island can be very different; those who retire on to the island have different experiences and challenges to those older people who were born and grew up on the island. The geographical restrictions of living on an island and the isolation of an AONB creates challenges, as people age, for housing, employment and access. The ageing population means that there is high demand for adult social care and health services.

However, there are also many opportunities and assets which can be maximised to enable people on the Isle of Wight to continue to lead a healthy and happy life as they age. There is an economically active older population, an active voluntary sector, and many local projects and initiatives to address local needs. Tourism is a leading employment sector, although it can be unstable due to seasonality. Promoting the island as a year-round destination will benefit local employment opportunities providing more job stability.

Public Health will continue to work closely with partners to ensure population health decisions are informed by local insight and evidence pertaining to the needs of the island.

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# 3.3 Gloucestershire County Council

Image source: Gloucestershire County Council

Gloucester Cathedral, Gloucester, Gloucestershire (upper image)
Dr Jenner's House, Berkeley, Gloucestershire (lower image)

# 3.3 Gloucestershire County Council

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## Gloucestershire

Gloucestershire is a network of vibrant places and home to just over 645,000 people. The County Council is made up of six districts, each with its own distinct characteristics and demographics: Gloucester, Cheltenham, Forest of Dean, Stroud, Tewkesbury, and Cotswold. With history linked to the Roman era, it is now known for its manufacturing, aviation heritage and agriculture as well as its significant cyber and digital assets.

### A beautiful (but expensive) county

Just over half of Gloucestershire is designated as an Area of Natural Beauty (AONB). As the northernmost Local Authority in the South West region, Gloucestershire has good access to the M5 and M4 motorways, making it easy to get to the South West, Midlands, London, and Wales. This makes the county appealing for businesses and residents to locate but does impact upon housing affordability. In 2022, someone earning a median salary in Gloucestershire required 8.9 times their earnings to purchase a median priced property (England 8.2, regional 9.4). Within Gloucestershire there is considerable variation: Gloucester has the most affordable homes with an affordability ratio of 7.7. Holiday homes impact on house prices and, in Cotswold district where housing is least affordable (ratio of 13.9), account for 1.6% of the dwelling stock.[1]

### A rural county

Over 87% of the county's area is classed as rural and 30.5% of the population live in rural areas. In 2021, there were 243 residents per square kilometre in Gloucestershire.[2] Whilst this was lower than the national average (395), there is significant variation between districts: Cheltenham and Gloucester have respective densities of 2,549 and 3,267 residents per square kilometre, compared to Cotswolds with 78.

As well as being one of our best assets, the rural nature of the county makes it difficult for some people to access the services they need. This is a particular challenge for the 15% of Gloucestershire households that have no access to a car or van.[3] It also creates barriers to accessing employment, and the recent cost of living pressures have exacerbated this for some residents.

## A (mostly) affluent county

Gloucestershire is among the least deprived 20% of Local Authorities in England. With high overall living standards, national statistics often hide areas of need and in some areas, residents' outcomes fall well below national averages. Currently, 19,415 people (3.1%) in the county live in areas falling in the most deprived decile in England. On average, males living in these areas live 8.7 years less than those in the least deprived 10%, and females live 6.5 years less.[4] Furthermore, people living in the wealthiest areas of the county experience on average 11 years longer of 'healthy life' compared with those in the least wealthy areas. Such differences are unacceptable and avoidable.

## An ageing county, with a reducing workforce

Between 2011 and 2021, the population of Gloucestershire increased by 48,092 people (8.1%), a higher rate of growth than seen nationally (England increased 6.6%, Table 3.1). Tewkesbury district is the 8th fastest growing out of the 331 district and unitary authorities in England and Wales (140th in 2011). This likely reflects internal movement of working age people within Gloucestershire from the urban areas of Cheltenham and Gloucester, which are unable to accommodate larger developments due to existing density, rather than significant increases in new, working-age residents.[5]

**Table 3.1: Population change between 2011 and 2021 for Gloucestershire County Council districts compared to Gloucestershire, South West England and the England average**

| | 2011 Population | 2021 Population | Net Change 2011-2021 | % Change 2011-2021 |
|---|---|---|---|---|
| Cheltenham | 115,732 | 118,836 | 3,104 | 2.7% |
| Cotswold | 82,881 | 90,832 | 7,951 | 9.6% |
| Forest of Dean | 81,961 | 87,004 | 5,043 | 6.2% |
| Gloucester | 121,688 | 132,416 | 10,728 | 8.8% |
| Stroud | 112,779 | 121,104 | 8,325 | 7.4% |
| Tewkesbury | 81,943 | 94,884 | 12,941 | 15.8% |
| **Gloucestershire** | **596,984** | **645,076** | **48,092** | **8.1%** |
| South West | 5,288,935 | 5,701,186 | 412,251 | 7.8% |
| England | 53,012,456 | 56,490,048 | 3,477,592 | 6.6% |

Source data: Office for National Statistics, 2011 Census and Census 2021[6]

Gloucestershire's relative affluence leads to many residents living longer and in better health than the England average. This combined with the internal migration of older adults to Gloucestershire is creating a population that is ageing at a faster rate than the rest of the country. Our increase in over-65s between 2010 and 2020 was 26.3% (South West, 24.19%; England, 22.19%).

Whilst the South West and England saw increases in the working age population of 3.43% and 4.27% respectively, Gloucestershire saw a smaller increase of 3.24% (Figure 3.12). Considering that 9% of households in Gloucestershire are "Not in Work" with over 17,000 individuals currently unemployed, the available workforce is further affected. Compounding this is a net loss of people in the younger age groups: on average Bristol attracts 4,000 young people (19-25 year olds) every year while Gloucestershire loses 400.

**Figure 3.12: Population age and sex structure for Gloucestershire and England in 2011 and 2021**


Source data: Office for National Statistics, 2011 Census and Census 2021[7]

The ageing population will bring increasing numbers of retired people who have experience, resources and time to contribute to their communities, but as they grow older and frailer they may require more support from health, social care and safeguarding services. Crucially, the slower increase in the county's healthy working age population could lead to a higher financial burden on them. Dependency ratios can illustrate this: in 2021, for every 100 working age people in Gloucestershire, there were 36 dependents aged over 65 years, higher than England and a narrowing gap to the South West.

**Table 3.2: Old-age dependency ratios for Gloucestershire County Council districts compared to Gloucestershire, South West England and the England average**

| | 2011 | 2021 |
|---|---|---|
| Cheltenham | 0.25 | 0.30 |
| Cotswold | 0.37 | 0.45 |
| Forest of Dean | 0.33 | 0.43 |
| Gloucester | 0.23 | 0.26 |
| Stroud | 0.31 | 0.39 |
| Tewkesbury | 0.32 | 0.38 |
| **Gloucestershire** | **0.29** | **0.36** |
| South West | 0.31 | 0.37 |
| England | 0.25 | 0.29 |

Source data: Office for National Statistics, 2011 Census and Census 2021[8]

Projections suggest this situation will worsen: the ageing population, increasing numbers of people with disabilities and long-term conditions, coupled with the high housing costs will have implications for the workforce. The number of jobs is expected to exceed the number of working age people by 2035. If nothing is done to address this, by 2039 there will be 79,000 more people over 65, but only 7,000 more people aged 18 to 64.

## A compounded problem

As a system, we explicitly recognise the need to keep our working age adults healthy and provide for our ageing population. However, workforce sustainability in the health and social care sector is one of the biggest challenges we will face over the next 5 to 10 years. Over 28,000 people work in health and social care in Gloucestershire, but there are average vacancy rates of 7 to 12%. The average age of our workforce is 43 years. 21% of NHS staff and 25.4% of social care staff are aged over 55. Predictions from Skills for Care tell us we need an extra 6700 posts in the over 65s market by 2035 but, like in other areas of the country, we are struggling to recruit.[9]

In social work and domiciliary care, recruitment is increasingly difficult, and the cost-of-living crisis has aggravated this. Social care workers and providers in rural areas particularly struggle due to poor public transport and fuel costs – staff cannot afford to drive to and from their clients and the rural nature means fewer clients can be seen due to journey times. Where property prices are highest, the pool of working age adults from which to recruit is more limited

than other areas of the county. Availability of staff restricts providers' ability to take on work and the overarching market challenges mean this area cannot grow capacity to meet demand.

National research suggests other factors such as the perception of social care and pressure on staff to work more hours contribute to workforce shortages. However, our rural county, lower numbers of people of working age, and more expensive housing costs are exacerbating this problem.

## Addressing the challenges

We know there is an urgent need to ensure the delivery of significant future economic growth in Gloucestershire to address the challenges of an increasingly older and dependent population. We also know we must act now to attract people to the county to work. We need to continue our approach to tackle inequalities and support people to live as much of their lives as possible in good health and good work, reducing the need for social care and support, and benefitting the economy.

Addressing these challenges are central to both the County Council's Building Back Better[10] and our One Gloucestershire Integrated Care strategies.[11] Linked to our current Health and Wellbeing Strategy,[12] the latter provides the local blueprint for delivering better health and care with and for the people in the county with a clear focus on prevention, ensuring independence, resilience and equity through working in collaboration with our communities.

In addition, we are:

### 1. Addressing workforce shortages

We need to address the acute shortages in our health and social care workforce. Rather than tackle this as individual organisations, we are working together as system partners to find solutions. Through a shared People Plan we aim to create a sustainable health and care workforce for Gloucestershire by maximising education and training opportunities, strengthening our approach to apprenticeships, exploring opportunities around international recruitment, and identifying opportunities for joint working and innovative approaches.

### 2. Increasing independence and health as we age

Addressing health inequalities is crucial to enabling all residents to have the skills, education, health and opportunity to secure and sustain good work. It will ensure that as people age, they do so in better health, reducing the need for support. Our Health and Wellbeing Strategy[13] sets out key priorities, which focus particularly on addressing wider determinants of health, and some elements of primary prevention, to help keep people healthy and live longer, happier lives. Our Healthy Lifestyles Service,[14] and Community Wellbeing Service,[15] provide important physical and mental health support.

Secondary prevention is addressed via our Clinical Programme Groups, which work collaboratively to improve quality of care, outcomes for residents, and value for money.[16] They

provide the opportunity to improve health equity holistically across the whole patient journey and consider alternatives to traditional care, such as creative health and psychological support.

Recognising that our communities are different, we have established six Integrated Locality Partnerships, broadly coterminous with district council boundaries. These are non-statutory partnerships of Local Government, NHS, the Voluntary, Community and Social Enterprise sector, housing, and increasingly communities, people and wider partners such as police, education etc. Their aim is to:

- proactively reduce the impact of root causes of health inequalities
- improve health and wellbeing
- work collectively to redesign care for and with people in the locality to enable people to live well at home.

Our Ageing Well programme, (Figure 3.13) is a partnership approach helping people to maintain their physical and mental wellbeing in older age.[17] For example, our Frailty Strategy aims to prevent and identify early those who may be at risk of frailty, and has led to local solutions with the voluntary sector.[18] As another example, the Alzheimer's Society deliver our Dementia Adviser Service, alongside our Community Dementia Nurses and the Managing Memory Together diagnostic service which aims to identify and support people as early as possible.[19,20] There is also the Active Gloucestershire's Fall Proof programme which supports older people who may be at risk of falls with strength and balance classes.[21]

**Figure 3.13: Summary of Gloucestershire's Ageing Well Programme**

The ageing well, frailty and dementia programmes all use the transformation approach to improve the quality of life for older adults and those living with these conditions. Key programmes of work include:

**Anticipatory care:** to proactively manage health and care intervention at individual and population level.

**Urgent community response:** to avoid unnecessary hospital admission and support discharge.

**Enhanced health in care homes:** to ensure that people living in care homes receive the same level of care and support as those living in their own homes.

**Digital enablement:** to ensure community health services provide a comprehensive digitally enabled service.

Image source: Gloucestershire County Council

## 3. Creating good health and good work

There is an inter-relationship between health and work: being in good employment is protective of health and vice versa. A physically and mentally healthy workforce is also good for the economy. Research shows that healthy employees are up to three times more productive than those in poor health.[22]

Access to stable and rewarding employment is not fairly distributed and this has an impact on the health of Gloucestershire residents. Furthermore, we know some communities are impacted more than others in terms of good employment. Our Director of Public Health's 2018/19 annual report focused on the critical relationship between health and wealth, exploring how we tackle health inequalities through inclusive growth.[23] Employment and skills development is now embedded as a key theme in the new Integrated Care Strategy for the county.[24]

The Gloucestershire Going the Extra Mile (GEM) project is an example of a unique public, voluntary and private sector partnership. It supported those who were vulnerable, disadvantaged or excluded from the mainstream economy and society in Gloucestershire to move closer or into education, employment, and developing skills.[25] Reaching into communities, GEM supported over 2,000 participants, reduced isolation and developed an extensive and diverse partnership that built capacity and cohesion (Figure 3.14). GEM provided us with an evidence base which led to the formation of the Employment and Skills Hub Outreach project. Using a similar model, it provides intensive 1:1 support to individuals who are economically inactive, helping them return to volunteering, education, training or employment.

Anchor organisations are often large employers, rooted in place and connected to their communities. We have focussed on our anchor roles through the 2021/22 Gloucestershire DPH annual report, *Sources of Strength*.[26] 1 in 10 people employed in Gloucestershire work in the public sector including these anchor organisations and by addressing employment, social value, procurement, estates and reducing our environmental impact we can help to tackle longstanding inequalities in our local communities as well as help to drive economic improvement.

**Figure 3.14: Key outcomes from the GEM project**


Image source: Insights into the GEM Journey – Summary Evaluation Report[27]

### 4. Creating an economically sustainable county

Longer term, we need a strong and robust Gloucestershire wide plan for economic growth. Currently being developed through consultation and engagement, it explicitly recognises the challenges of supporting an ageing population.[28] The vision is for inclusive growth driven by creating opportunities for all communities in a way which improves the life chances for all residents and businesses whilst recognising we must create sustainably for a greener Gloucestershire. It will balance the need for additional infrastructure, affordable housing, the need to combat climate change, and the need to increase our healthy, working age population with sustainably managing our natural and historic environment. Only by achieving this will we be able to ensure that all partners across the county can continue to deliver excellent services to the population.

## Acknowledgements

We would like to acknowledge the work of the Economy, Environment and Infrastructure Team and the *GFirst* Local Enterprise Partnership for the development of their Economic Strategy for Gloucestershire Engagement Document that has supported this case study.

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# 3.4 Cumberland Council

Image source: Cumberland Council

England's highest mountain, Scafell Pike, Cumberland (upper image)
England's deepest lake, Wastwater, Cumberland (lower image)

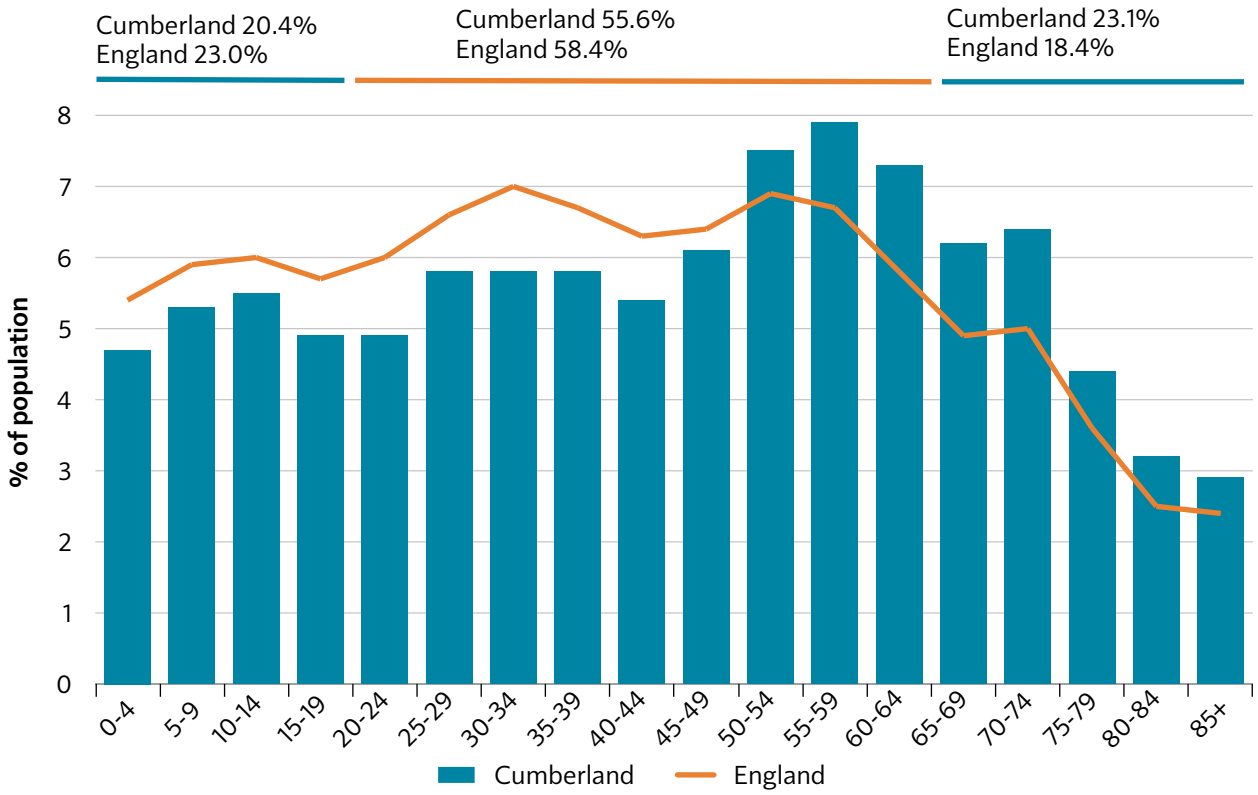
# 3.4 Cumberland Council

**Colin Cox** – Director of Public Health and Communities, Cumberland Council
**Clare Paling** – Development Officer, Active Cumbria

## Cumberland

Cumberland is a new local authority, established on 1 April 2023, from the split of Cumbria County Council and the merger of Carlisle, Allerdale and Copeland District Councils. It is in the most north-westerly corner of England, and comprises both highly rural (and often more affluent) areas and coastal towns (often much more deprived). This social geography has resulted in both outward migration of younger people and inward migration of older people, giving the area a considerably older age profile than the England average (Figure 3.15).

**Figure 3.15: Graph showing the population age profile, by 5-year age band, for Cumberland compared to the England average**

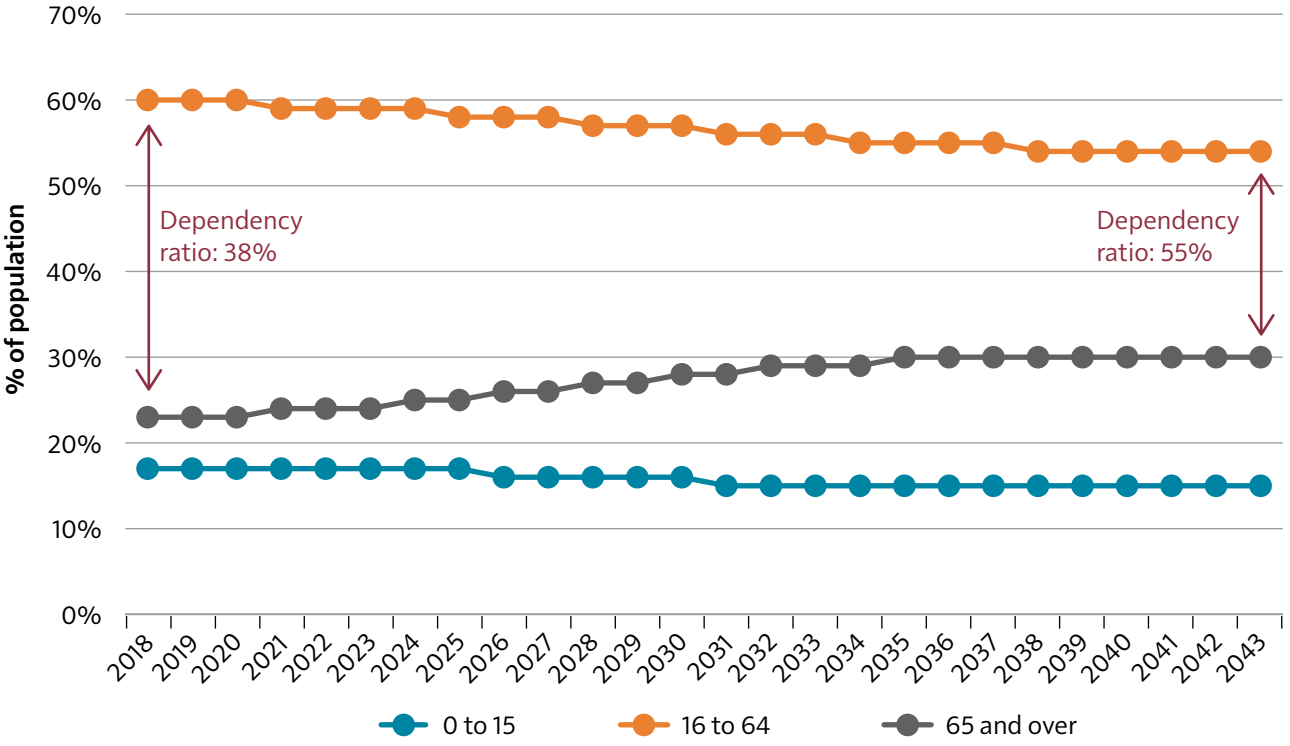



Source data: Office for National Statistics 2021, mid-year population estimates[1]

This age profile brings with it obvious challenges, particularly around health and social care. Demand for services is high, and the workforce to meet that demand simply isn't there. But that goes beyond health and social care – we have problems in many sectors, including in our seasonal tourism and hospitality industry. In economic terms, the key difficulty in Cumberland is not unemployment, but recruiting to the jobs that are available. And this challenge is set to

rise as the traditionally working-age population shrinks and the older population grows (Figure 3.16).

**Figure 3.16: Graph showing the population projections, by age group, for Cumberland**




Source data: Office for National Statistics (ONS), 2018 Sub-national population projections[2]

While figures such as these prompt headlines about a "demographic time bomb" and concerns about the collapse of health and social care services, it is far from too late to take action to mitigate the impact of what is to come. After all, our current projections suggest that it will take Cumberland until the late 2060s to get to the sort of age dependency ratio that Japan had in the early 2000s – and while the demographics of Japan are certainly creating problems, society there is still functioning effectively.[3-4]

So what sort of action is needed? The emerging Cumberland approach sees two important and connected strands of work. One is about investment in healthy and active ageing; the other is about challenging entrenched attitudes to older people. For too long the ageing process itself has been blamed for some of the factors which truly influence our ability and resilience as we age. Namely: a loss of fitness brought about by too little physical activity, the impact of preventable diseases and illnesses, and psychological damage caused by a negative attitude towards old age. As long as we see older people mainly as a burden on society, and social attitudes to ageing amount to a shrug of the shoulders about the inevitability of physical and cognitive decline, that decline is likely to come earlier than it needs to, meaning that the burden of ageing becomes a self-fulfilling prophecy. Instead, in Cumberland we aim to create a culture that sees older age as an active and vibrant time in which people can continue to make a valuable contribution to society.

In November 2022, the public health team in what was then Cumbria County Council allocated £250k to running a significant Live Longer Better programme. Live Longer Better is a national campaign delivered at local level by the area's Active Partnership, Active Cumbria.[5] It strives to empower us all to understand what is happening to us as we age and take action to tackle those factors which would speed up our rate of decline, by getting fitter, tackling disease and finding a sense of purpose as we age. Live Longer Better in Cumbria aims to:

- increase activity (physical, mental and social), promoting physical reconditioning and recovery of confidence;
- extend healthy lifespan and compress the period of dependency; and
- reduce the need for health and social care services.

The majority of the available investment in Cumberland has been established as a Reconditioning Fund, which is available to local physical activity providers and third sector organisations to enable them to support older people to become more active, more often. The Active Cumbria team works with local providers to identify opportunities to engage more with older people, particularly in more socioeconomically deprived areas. All parties are encouraged to be both creative and collaborative, often connecting with health partners, social prescribers and wellbeing coaches to ensure that investment is driven by an understanding of both data and community knowledge.

The reconditioning fund has been a great success, with nearly half of what was meant to be a 3-year budget allocated in the first 8 months, to 16 different organisations. The successful applicants include physical activity professionals who will bring strength, suppleness and stamina training to new audiences, including older adults in health and social care settings. Grants have also been made to representatives of the voluntary and community sector who are seeking to incorporate physical activity to their existing offers of support. All these organisations have participated in training and development to help raise awareness of, and tackle, ageist attitudes, and to help them identify appropriate methods for increasing physical activity safely in older populations. They are now delivering work which ranges from aiming to reduce sedentary behaviour in those recently discharged from hospital, through yoga for health courses and skills-based games sessions for dementia patients and their carers, to walking routes incorporating bench themed exercises in areas of social deprivation and even bouldering sessions for the visually impaired. There have been over 115 beneficiaries so far, with 1,200 people expected to benefit over the rest of this year alone.[6]

The next steps for this work across Cumberland will be to embed it into mainstream services rather than seeing it as a short-term programme, as its impact will be of benefit to all parts of our systems and networks. Active Cumbria will proceed with the Live Longer Better in Cumbria programme in order to:

- Share knowledge and understanding about living longer better among health professionals and physical activity and movement providers, as well as the older adults they engage with, to counteract the detrimental effects of ageism.

- Continue to work with partners and providers to increase physical ability and movement, resilience and healthspan, prevent falls and frailty, reduce the risk of, and delay or prevent dementia, and prevent and minimise the effects of disease and multimorbidity including long COVID.
- Further target resources to minimise and mitigate the effects of deprivation on health in older adults and prevent and mitigate social isolation.

Knowledge is power, and our approach will incorporate a local communications and engagement campaign aimed at promoting positive perspectives on ageing in the local community. This will then extend into working with local businesses to encourage them to consider the benefits of employing older people, and further work to support linking older people to volunteering opportunities. Our public health strategy recognises that an occupation, or participating in other meaningful activity that helps gives life a sense of purpose and value, is an essential part of positive wellbeing, and sets as a key aim "to ensure that everyone in Cumbria has the opportunity for high quality employment or other meaningful activity as part of their daily life." This applies to older people as much as it does to everyone else. To borrow from Dylan Thomas, in Cumberland we have no intention of going gentle into that good night; we will indeed rage, rage against the dying of the light.

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# 3.5 North Yorkshire Council

Image source: North Yorkshire Council

Countryside and hills around Swainby, Hambleton, North Yorkshire (upper image)
Whitby Beach and Whitby Abbey, North Yorkshire (lower left and lower right images)

# 3.5 North Yorkshire Council

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**Liz Meade** – Stronger Communities Delivery Manager, North Yorkshire Council
**Chris Watson** – Alliance Director, Harrogate and Rural Alliance

## North Yorkshire

North Yorkshire is England's largest county covering 8,000 square kilometres. 98% of the county is either sparsely (13%) or super-sparsely (85%) populated, with just over a third of the population living in these areas (Figure 3.17). This results in a population density of just 77 people per square kilometre, compared with an England average of 432 per square kilometre. This presents challenges around the delivery and sustainability of rural services, which sits alongside issues around fuel poverty, affordable housing and digital exclusion. Figure 3.17 below highlights how sparse North Yorkshire is, with only 2% of the county classed as urban.[1]

**Figure 3.17: Diagram demonstrating the proportion of North Yorkshire that is defined as Urban, Sparse and Super-sparse, and the proportion of residents that live in Urban, Sparse and Super-sparse areas**

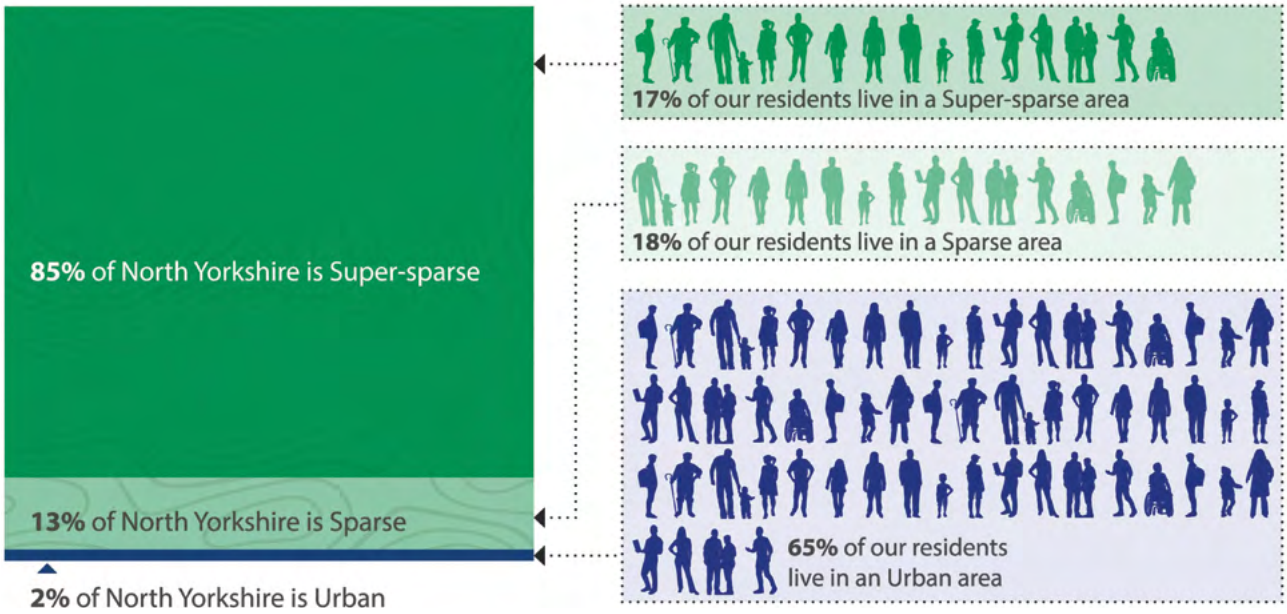
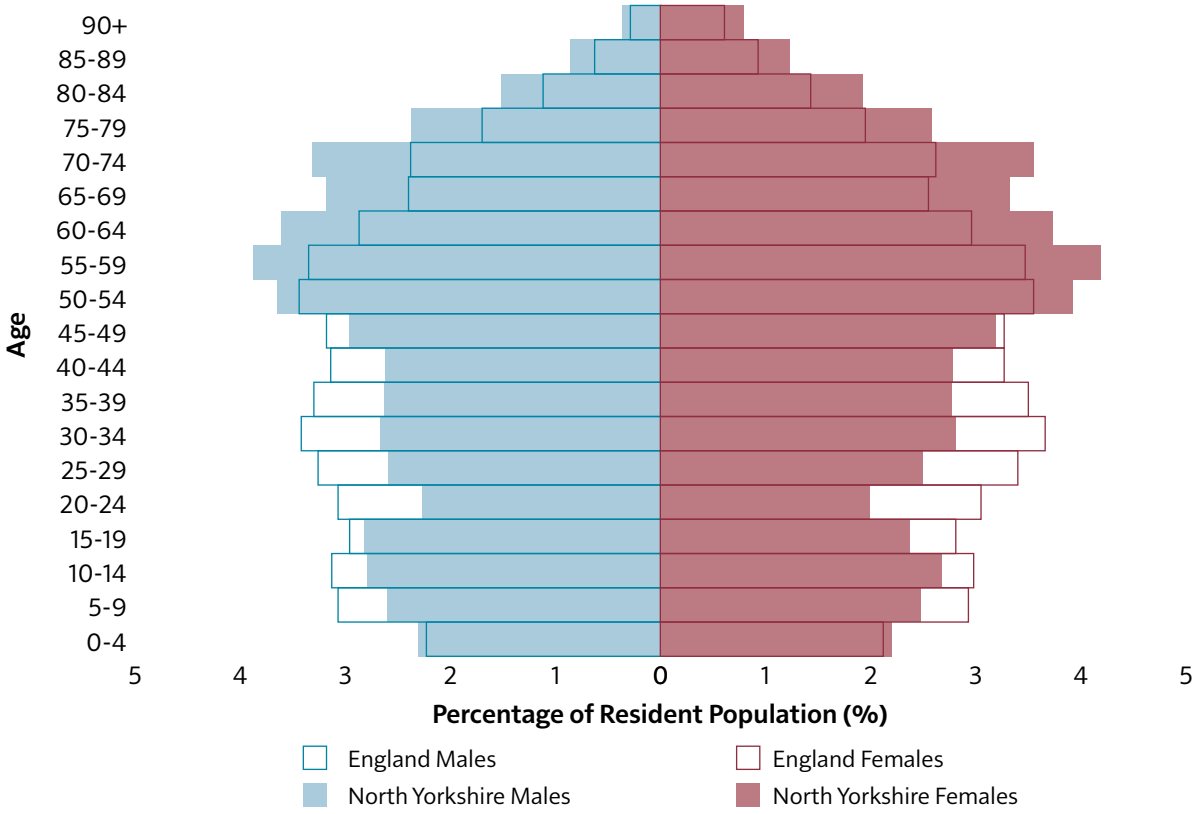



Image and data source: North Yorkshire Rural Commission[2]

North Yorkshire has a higher proportion of older adults than the national average, with 25% of the population aged over 65; this is expected to rise to 33% by 2043. There are more people aged 65 and over (158,827) in North Yorkshire than people aged under 20 (124,575).[3]

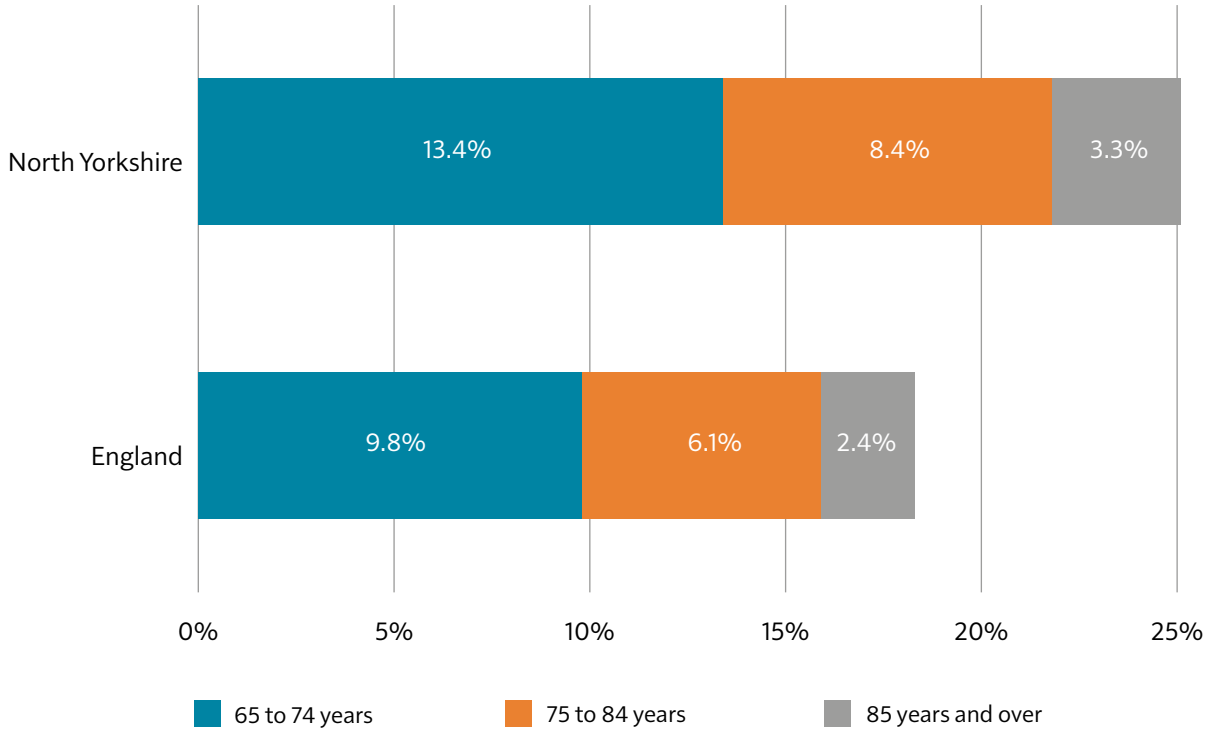
Figures 3.18, 3.19 and 3.20 show the current demographic picture compared to England, and the projected increase in older adults in North Yorkshire.

**Figure 3.18: Population age and sex structure for North Yorkshire compared to England, in 2021**



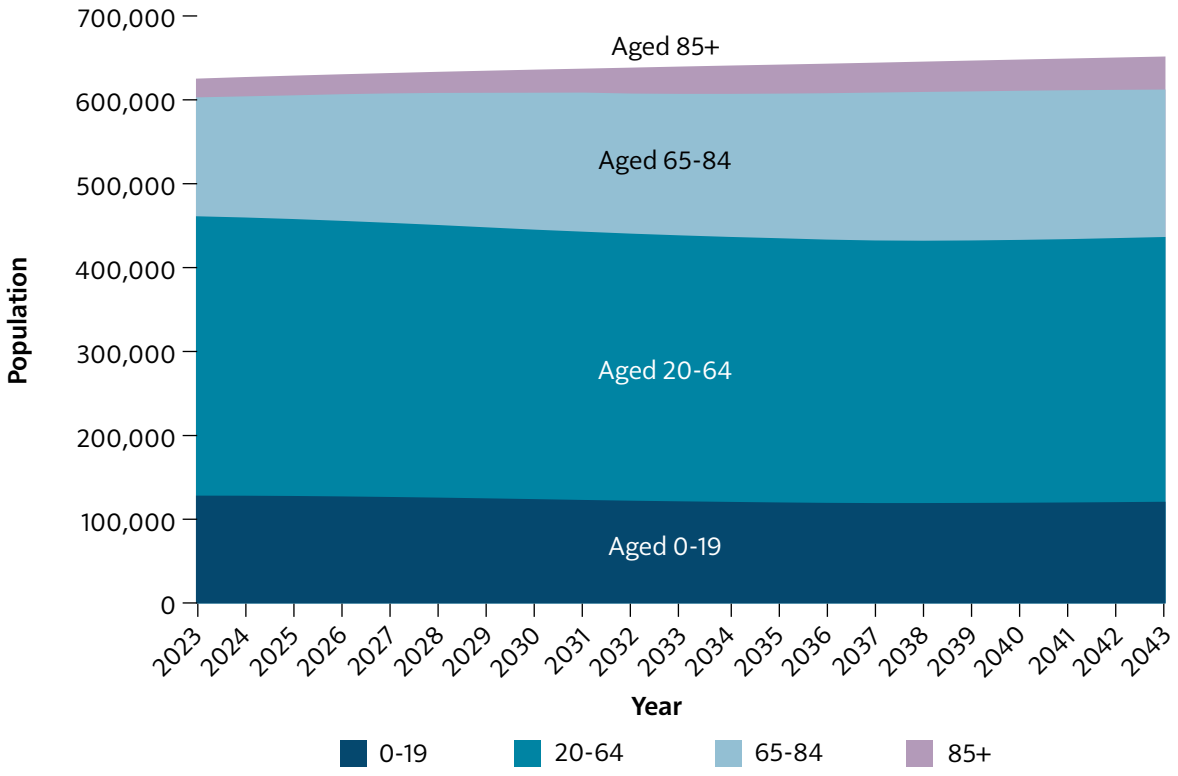

Source data: Office for National Statistics, Census 2021[4]

## Figure 3.19: Proportion of North Yorkshire population in older age groups compared to England, in 2021




Source data: Office for National Statistics, Census 2021[5]

## Figure 3.20: Projected change in broad age groups from 2023 to 2043 in North Yorkshire




Source data: Office for National Statistics (ONS), 2018 Sub-national population projections[6]

Four priorities for healthy ageing have been identified and are being driven by the North Yorkshire Council public health team:

- Health and reducing inequalities (including falls, dementia, increasing physical activity, care home interventions, screening and immunisation and dying matters awareness).
- Housing (including extra care housing, fuel poverty in lower-income homes, lifetime homes and age friendly planning and development, adaptations and assistive technology).
- Employment and financial security (including age friendly workplaces, pension credits and income maximisation and support for unpaid carers in the workplace).
- Age friendly communities. North Yorkshire Council was the first rural area to sign up to the UK network of Age Friendly Communities.[7]

Underpinning all this work is the voice of older adults, which is led by a countywide over 50s network. A recent survey found that the top three key issues for older adults include transport, access to primary care and concerns about the reliance on digital technology.

# Support for local communities

North Yorkshire Council supports and runs several initiatives to support older adults in North Yorkshire communities. Since 2014/15, the council has invested in two new programmes: Stronger Communities and Living Well. In addition, North Yorkshire Council allocates resource to Extra Care Housing schemes and is an active partner in the Harrogate and Rural Alliance (HARA).

## Stronger Communities

The Stronger Communities programme invests time and money in ways that seek to empower communities where they are routinely participating in creative local action and increase their ability to influence things that matter to them and to improve residents lives. In practice this means delivering support to Voluntary, Community and Social Enterprise Organisations, community support/anchor organisations, community hubs, networks and partnerships, grass roots groups, communities of interest and to 'places' where different stakeholders come together to create change in their locality.[8]

Working with local residents, community groups and other partners from the public and private sectors across North Yorkshire, the Stronger Communities team identify opportunities to co-design and co-produce a range of local support and services aimed at reducing inequalities and improving the wellbeing and social connectedness of people of all ages.

Their most recent project is focusing on the development of place-based Community Anchor Organisations (CAOs). This is a three-year development programme with a total investment of £1.5 million to develop CAOs, and these organisations will work in their geographical location as our system partners and provide a 'gateway' into those places for the local authority and other partners such as health. This investment supports the core aims of the wider Stronger Communities Programme which include prevention and reducing health inequalities, community resilience and social regeneration.

In February 2023, as part of the long established 'Achieve Together' Investment Programme, Stronger Communities opened this new opportunity to establish a Community Anchor model for North Yorkshire. 24 place-based organisations from across the county are progressing to the next stage of development work. For the ten localities where a suitable CAO has not been initially identified, development work will continue to explore the potential for a local voluntary sector organisation to become a CAO, or to look at alternative models.

One of the organisations involved is Nidderdale Plus, based in North Yorkshire's Nidderdale Valley Area of Outstanding Natural Beauty (AONB).

## Nidderdale Plus

Nidderdale Plus are deeply rooted in a large, sparsely populated rural community.[9] They have an understanding of how rural areas work and what qualities and strengths people who live in rural areas can contribute. It is recognised that people have personal pride and want to be self-sufficient and live independent lives, yet they also understand the importance of their community in their lives and will quite naturally want to help others. Much of this is due to the fact that services tend to be more limited in rural areas compared to urban centres owing to the large distances between small communities, and the limited infrastructure to deliver services at scale.

The activities of Nidderdale Plus focus on services that are preventative and reduce the impact of social isolation and loneliness, and as much as possible support people in continuing to live independently in the rural communities they value and call home. The activities provided by Nidderdale Plus and the wider community network in Nidderdale include: digital support, community transport, befriending schemes, a community shop, and a meal delivery service.

As well as working with local community groups and partners, Nidderdale Plus can link with specialist charity partners such as Citizens Advice, MIND and Carers Resource, so that information and support services from these specialist organisations has direct access into local communities.

## Living Well

Living Well is a free service that aims to improve the health, wellbeing and independence of adults.[10] We work with people who are isolated, vulnerable, bereaved, lacking confidence and may soon require health or social care services.

Living Well aims to support individuals in making changes to their lives to prevent them from needing more formal and regular support from social care services. Living Well coordinators work with individuals who may soon need formal social care, by visiting them in their homes and working with them on a one-to-one basis. Living Well coordinators help individuals identify solutions to address their health and wellbeing goals. On average 60% of people referred to Living Well are diverted away from requiring Adult Social Care services.

## Extra Care Housing

To address challenges around housing, North Yorkshire Council has always been clear about its ambition to deliver extra care housing (ECH) and is one of few authorities investing in a dedicated resource to achieve this.[11] 28 schemes operate across the County, delivering 1540 self-contained apartments, with 12 different housing providers. ECH replaces traditional residential care, contributes to community regeneration and creates local employment. Determined to make a positive impact on the lives of older adults, vulnerable people and their

carers, we apply passion with pragmatism and vision and have become adept at navigating the County's complex context.

Large traditional schemes are not always viable in smaller communities and apart from identifying and securing suitable sites, the topography and development costs associated with rurality can cost significantly more than urban schemes, meaning housing providers often have difficulty making schemes financially stack up. We have achieved delivery of rural ECH in North Yorkshire at Esk Moors Lodge in Castleton, Sycamore Hall in Bainbridge and Bowland View in Bentham.

Escalating development costs, Central Government grant funding uncertainty beyond 2026 and increasing North Yorkshire Council grant funding contributions will impact the County's ability to expand the extra care programme. Plans are in place to commission three more schemes over the next few years. In addition, there are plans to recommission a framework to support delivery of traditional extra care, supported living, hybrid models of accommodation and, importantly, smaller models of extra care. The future funding of schemes is going to be challenging for both North Yorkshire Council and housing providers.

## The Harrogate and Rural Alliance

The Harrogate and Rural Alliance (HARA) was launched on 30th September 2019, bringing NHS and social care partners together to transform the way community health and social care services are provided for adults in the Harrogate area.[12] HARA built on the work that had been piloted in the area as one of the national integrated working Vanguard sites.

It had three aims when it was launched:

- Improving the Health and Wellbeing of people in Harrogate and Rural District (Better Health, Good Quality of Life, Reduced Inequalities).
- Maintaining the high quality of care, with people at the heart of everything we do.
- Making the Health & Social Care System affordable and sustainable.

The core services which are currently being managed and delivered by HARA include Community Adult Social Care, Community Nursing Services, North Yorkshire Council Occupational Therapy Service, Community Discharge Hub, Urgent Community Response, Acute Response and Rehabilitation – Community and Hospital Service, and Virtual Beds – Hospital at Home. These services are delivered by just under 400 staff which include social workers, nurses, occupational therapists, physiotherapists, and a range of vocationally qualified staff that support the assessment of peoples' needs and the delivery of services.

Over the next five years we want to further develop the HARA model, including implementation of an Integrated Intermediate Care Hub and Integrated Neighbourhood Teams whilst further developing the Hospital at Home Service.

# Summary

Healthy ageing is one of three cross-cutting council priorities for public health. We know that we already have an ageing population with almost half of our residents over the age of 50. Over the next few years this will rise further with more people living with one or more long term health conditions in later life.

In April 2023, North Yorkshire Council replaced eight councils as a single unitary authority. This provides many opportunities to work more effectively as one council and influence services on important issues such as healthy ageing.

We are working with older residents to identify what is important to them and to look at how we can work together to improve outcomes as people get older.

Our local efforts could be boosted by further national work to tackle key challenges around developing equitably funded, integrated social care; recognition of the increased costs of delivering services across large rural areas; and shifting the balance of health more in favour of prevention.

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# 3.6 Derbyshire County Council

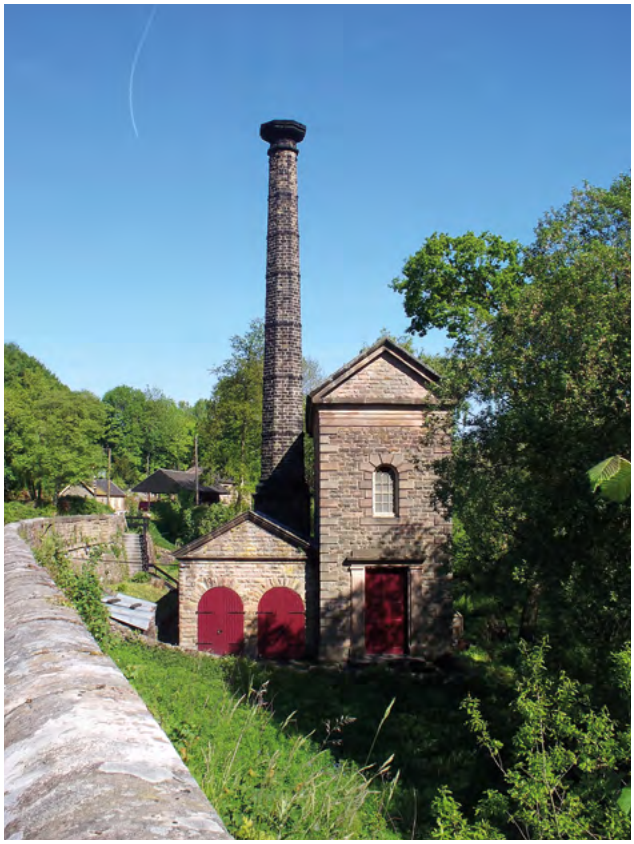

Image source: Derbyshire County Council

Dark Peak in the Peak District National Park, Derbyshire (upper image)
Curbar Edge in the Peak District National Park, Derbyshire (lower left image)
Leawood Pump House near Cromford, Derbyshire (lower right image)

# 3.6 Derbyshire County Council

**Ellie Houlston** – Director of Public Health, Derbyshire County Council
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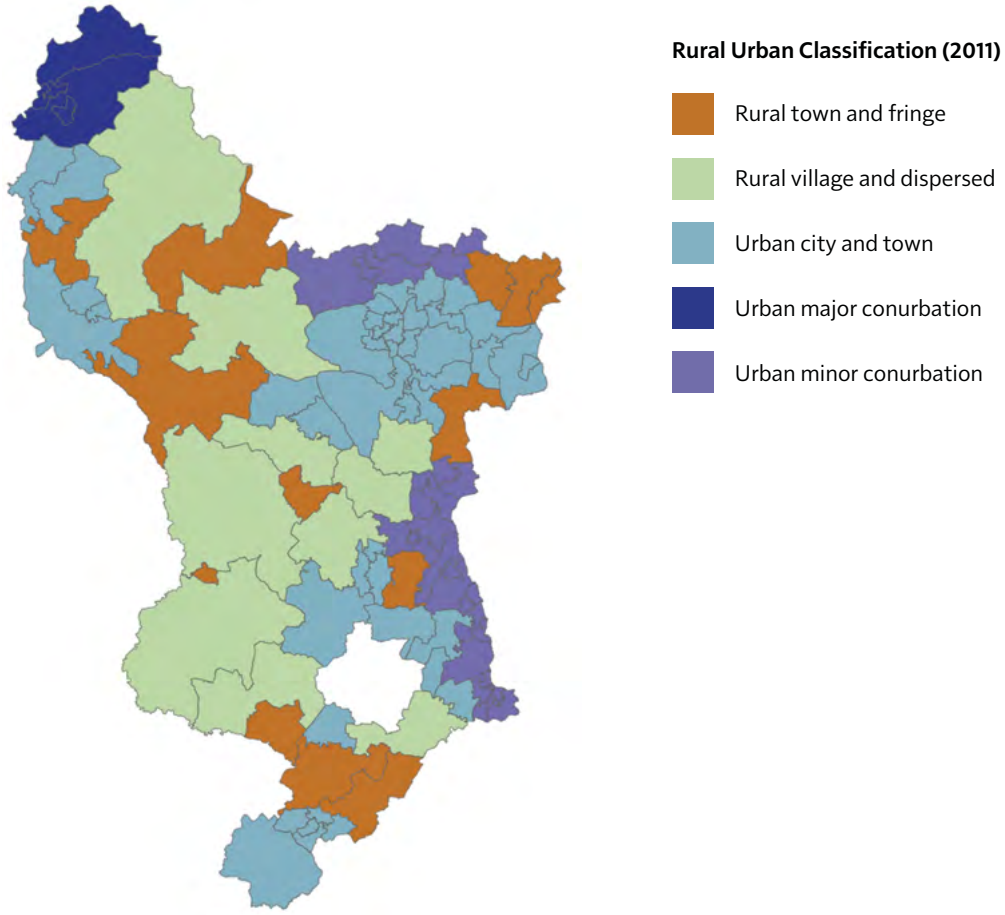
**Shirley Devine** – Public Health Group Manager, Derbyshire County Council
**Caroline Mackie** – Public Health Lead, Derbyshire County Council

## Derbyshire

Derbyshire is a large county in the East Midlands and includes the Peak District National Park. Derbyshire is a mainly rural county with many sparsely populated areas alongside larger urban towns and villages (Figure 3.21). The county has a total population of 794,636 people, across eight districts and boroughs.

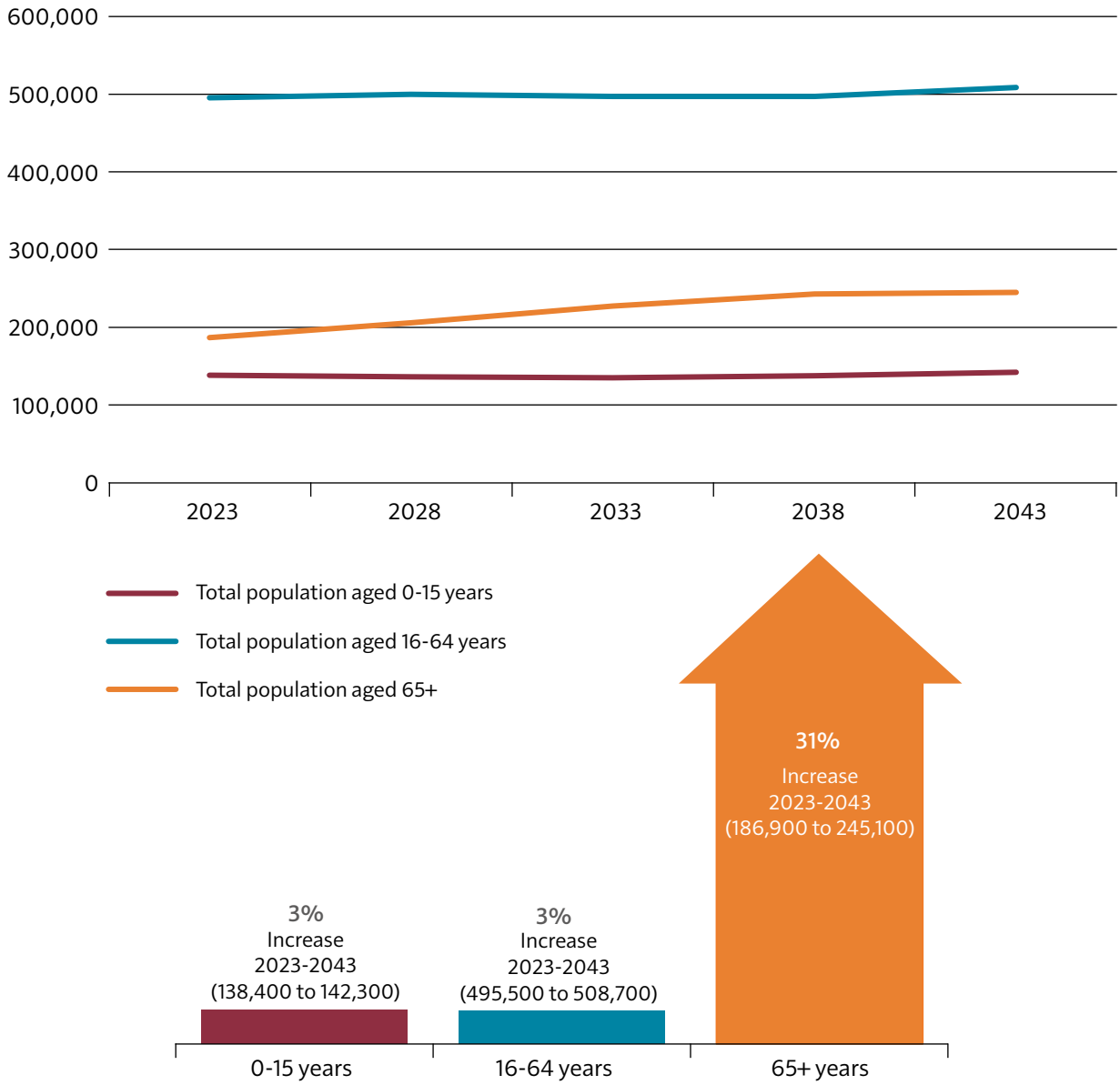
**Figure 3.21: Map of Derbyshire showing the Rural Urban Classification for Middle Layer Super Output Areas (MSOAs)**




Source data: Office for National Statistics, Rural Urban Classification 2011[1]
Image source: Derbyshire County Council

Figure 3.22 shows population projections in Derbyshire and that the population of people aged 65 years and over is expected to increase by 31% by 2043. This extends into older age groups as well, with the population aged 85 and over set to double by 2043.[2] Data from the 2021 Census indicates that the rural Derbyshire Dales district is one of the top three local authorities in England that has seen the largest increase in the percentage of their population aged 65 years and over since 2011.[3]

**Figure 3.22: Derbyshire population growth projections by age, between 2023 and 2043**




Source data: Office for National Statistics, Population Projections ONS Office For National Statistics, 2018[4]

Table 3.3 shows the proportion of adults aged 65 years and over by the type of rural or urban area in Derbyshire. As a semi-rural county with a growing ageing population there is a need to understand needs, services, and interventions.

**Table 3.3: The proportion (%) of the population in each of the rural or urban areas aged 65 years and over**

| Rural Urban Classification | Proportion (%) of population aged 65 years and over |
|---|---|
| Rural village and dispersed | 25.3% |
| Rural town and fringe | 22.9% |
| Urban city and town | 21.6% |
| Urban minor conurbation | 21.1% |
| Urban major conurbation | 19.7% |

Source data: Derbyshire County Council

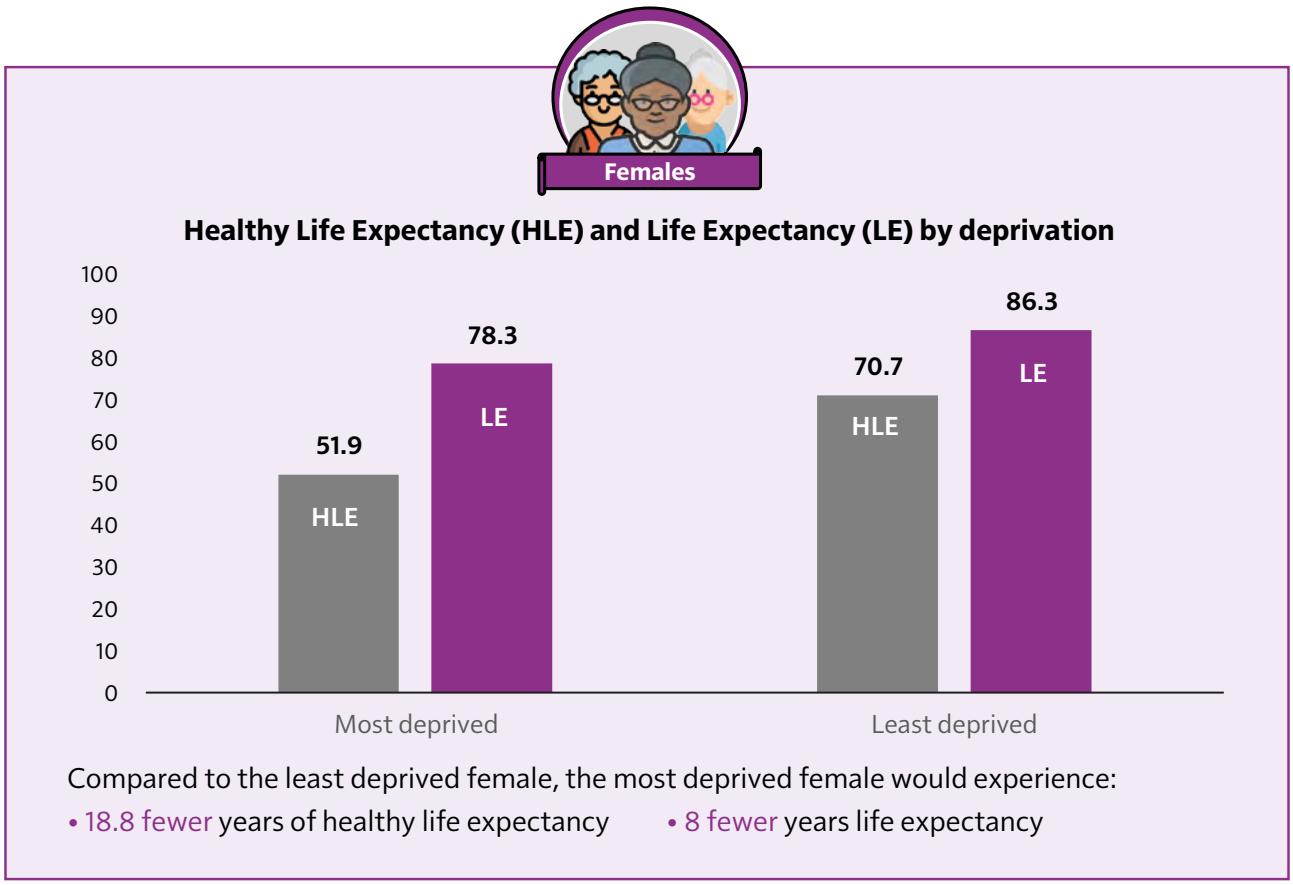
## Demand on health and social care systems

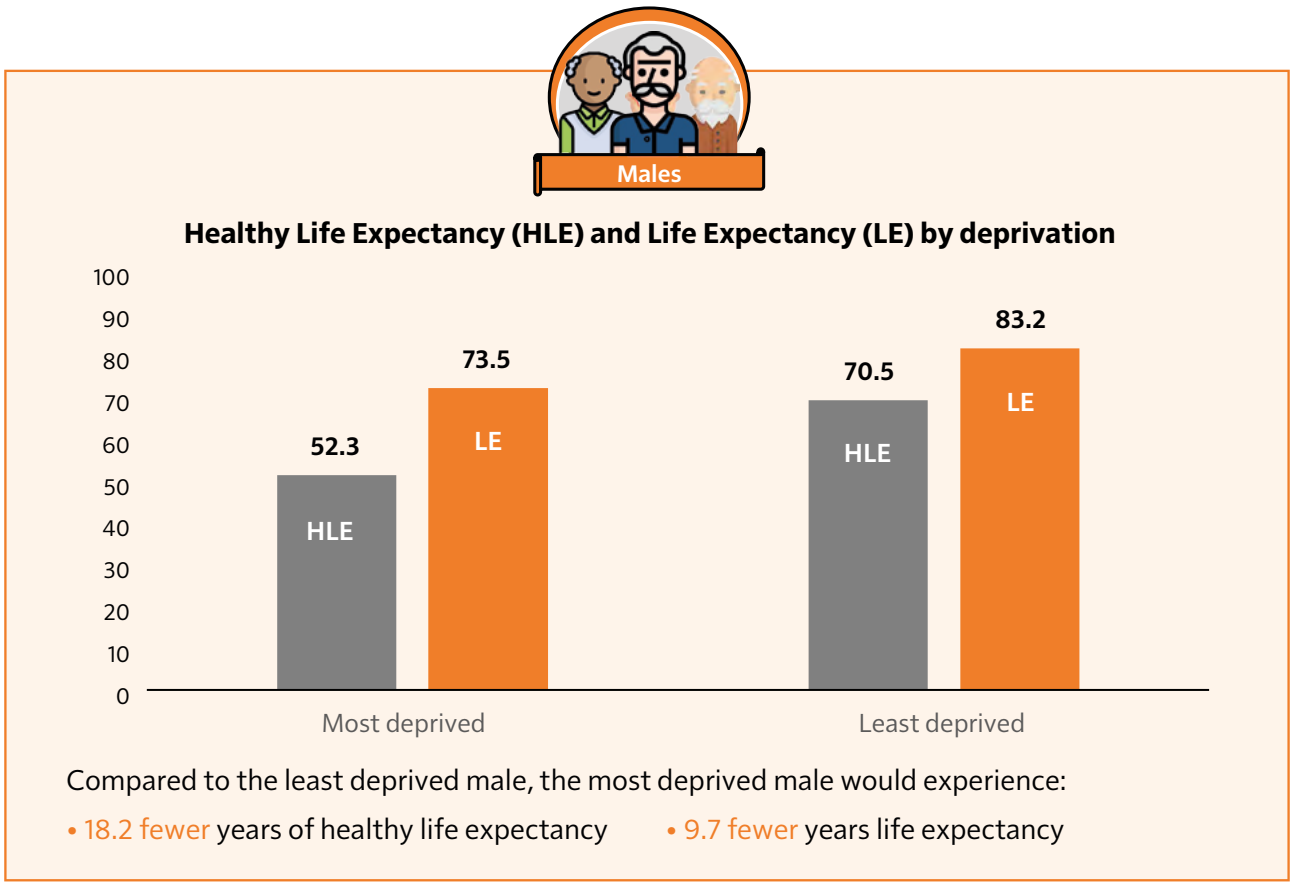
Derbyshire's growing ageing population and increase in people living with frailty adds to pressures on health and social care systems. There are approximately 53,000 frail people in Derbyshire, of which approximately 23,000 are moderately or severely frail.[5] The moderately and severely frail population in Derbyshire had just over 100,000 non-elective hospital bed days between May 2022 and April 2023.[6] Older adults living with frailty are the highest users of services across health and social care and have the highest levels of emergency admissions to hospital.

## Health inequalities

Derbyshire has an almost 20-year age gap in healthy life expectancy (HLE) between the most and least deprived areas which is shown in Figure 3.23. Reducing inequalities in HLE remains a key priority for Derbyshire County Council's (DCC) Public Health team, especially as inequalities widen as people age. Therefore, ageing well is a priority for Derbyshire public health team and the Integrated Care System (ICS).[7]

**Figure 3.23: Derbyshire County Council healthy life expectancy infographic**



## A public health approach

DCC's Public Health team have developed a public health approach to deliver the team's vision of '*Working together to ensure everyone in Derbyshire lives well and thrives*'. Figure 3.24 shows how the DCC public health team has used a public health approach to determine the local ageing well agenda. The public health approach has highlighted both challenges and opportunities of an ageing population spread over a large, predominantly rural, geographical area.

**Figure 3.24: Diagram summarising the Derbyshire Public Health Approach to Ageing Well**

**Support system partners to recognise and act on the need for preventative action to address our ageing population.**

**Provide targeted interventions for specific demographics and geographical areas. This approach helps provide effective and targeted use of resources.**

**Develop the evidence base with local analysis and context allows us to design and deliver interventions that support older people in Derbyshire more effectively.**

**Utilise frameworks such as the 8 Domains of Age-friendly Communities to address the social determinants of health for our older population.**

**Work collaboratively within Public Health, the Council, the third sector and the Integrated Care System to ensure a joined-up approach to improving the health and wellbeing of our older population.**


## Opportunities

Evidence and local insight show the importance of not stereotyping populations when referring to older adults. DCC's Public Health team is using a strengths-based model for interventions and seeks to ensure that older adults are not incorrectly portrayed as disempowered and vulnerable. Our older population:

- Provide the largest proportion of unpaid carers (60% of carers in Derbyshire are aged 50 years and over).
- Bring skills and expertise to our workforce.
- Provide a significant contribution to our Voluntary Community Social Enterprise (VCSE) sector.
- Are integral in supporting social cohesion and providing intergenerational learning.
- Run "50+" Forums across the County, helping to give those aged 50 years and over in Derbyshire a voice.

DCC's Public Health team is working collaboratively with Integrated Care System (ICS) partners to address the challenges its ageing population presents. Derbyshire's Integrated Care Strategy

takes a life course approach, including Start Well, Live Well and Age/Die Well.[8] As part of Age Well/Die Well, DCC Public Health are supporting Team Up (Derbyshire's approach to Proactive Care). Team Up has an innovative approach to enable older adults to live healthy and independent lives at their normal place of residence for as long as possible. It is providing integrated and strength-based services that will prioritise health and wellbeing, help people in a crisis to remain at home where possible, and maximise return to independence following a health or care need. DCC Public Health are supporting greater place-based working, development of a joint strategic needs assessment and application of the Public Health Approach to Ageing Well.

## Key prevention areas identified through the public health approach

Rural communities can experience considerable challenges and masked inequalities within and between individual communities.

### 1. Housing

- Accessibility and supply issues with an older housing stock less suited to adaption as people age, and an increased risk of fuel poverty.
- Issues finding appropriate and affordable housing in their communities, particularly where second homes are more common or when people retire to rural areas.[9]
- Falls hazards: Derbyshire has a significantly higher rate than England of people aged 65 years and over who have had an emergency hospital admission due to falls. Many falls in older adults can be prevented and those who have fallen can be supported not to fall again.[10]

### 2. Access to services

- Access to and availability of services remains a significant challenge for rural communities. Additional barriers, such as frailty, travel options, and travel costs contribute to these challenges and exacerbate the inequalities experienced by many older adults. The recruitment, retention and workforce development of carers in rural areas is a recognised challenge.[11]

## Case study

The Derbyshire Dementia Support Service (DDSS) is one of many services across Derbyshire responding to these challenges. Dementia is the leading cause of death in England. Age is the most significant factor, and the risk of developing dementia increases with age. It is estimated that there were approximately 12,300 people living with dementia in Derbyshire in 2020 and that this will rise to 15,700 by 2030. DDSS received 3308 referrals into their service in 2022/23, which is an 86.7% increase from the previous year.[12]

DDSS provide locality specific dementia advisors to respond to the challenge of delivering their service across a largely rural area. DDSS try to match areas based on where dementia advisors live. This ensures they are embedded in the area, have a greater understanding of need and can respond accordingly. DDSS have also worked in partnership with some GP surgeries across Derbyshire to provide pre-diagnostic support. Being located in a GP surgery has helped advisors connect with people who live in more rural areas, which may have fewer services that can inform them of available support. DDSS work collaboratively with wider networks and researchers to overcome potential challenges in accessing their service.

## 3. Financial inclusion

The UK Poverty 2023 report shows that one in four 60- to 64-year-olds are living in poverty, which is the highest poverty rates of any age group. The Department for Work and Pensions (DWP) estimate that 34% of pensioners eligible for pension credit are not claiming.[13] The DCC Financial Inclusion team take a collaborative and prevention-based approach to increasing income in the older population. A recent joint project between the DCC Welfare Rights Team and South Derbyshire District Council (SDDC), enabled those potentially underclaiming to be identified. A written offer was sent by SDDC offering a benefit check. 454 requests for a benefits check were received in response, leading to 612 benefit claims or revisions. This resulted in £1.1 million awarded to pensioners in South Derbyshire in the first project year.

## Case study

Anne responded to the offer of a benefit check she received through SDDC. She is over 80 and suffering from multiple health conditions affecting her ability to manage daily life. She had a State Retirement Pension and three small private pensions but no savings. She received a small amount of Housing Benefit and Council Tax Reduction in benefits.

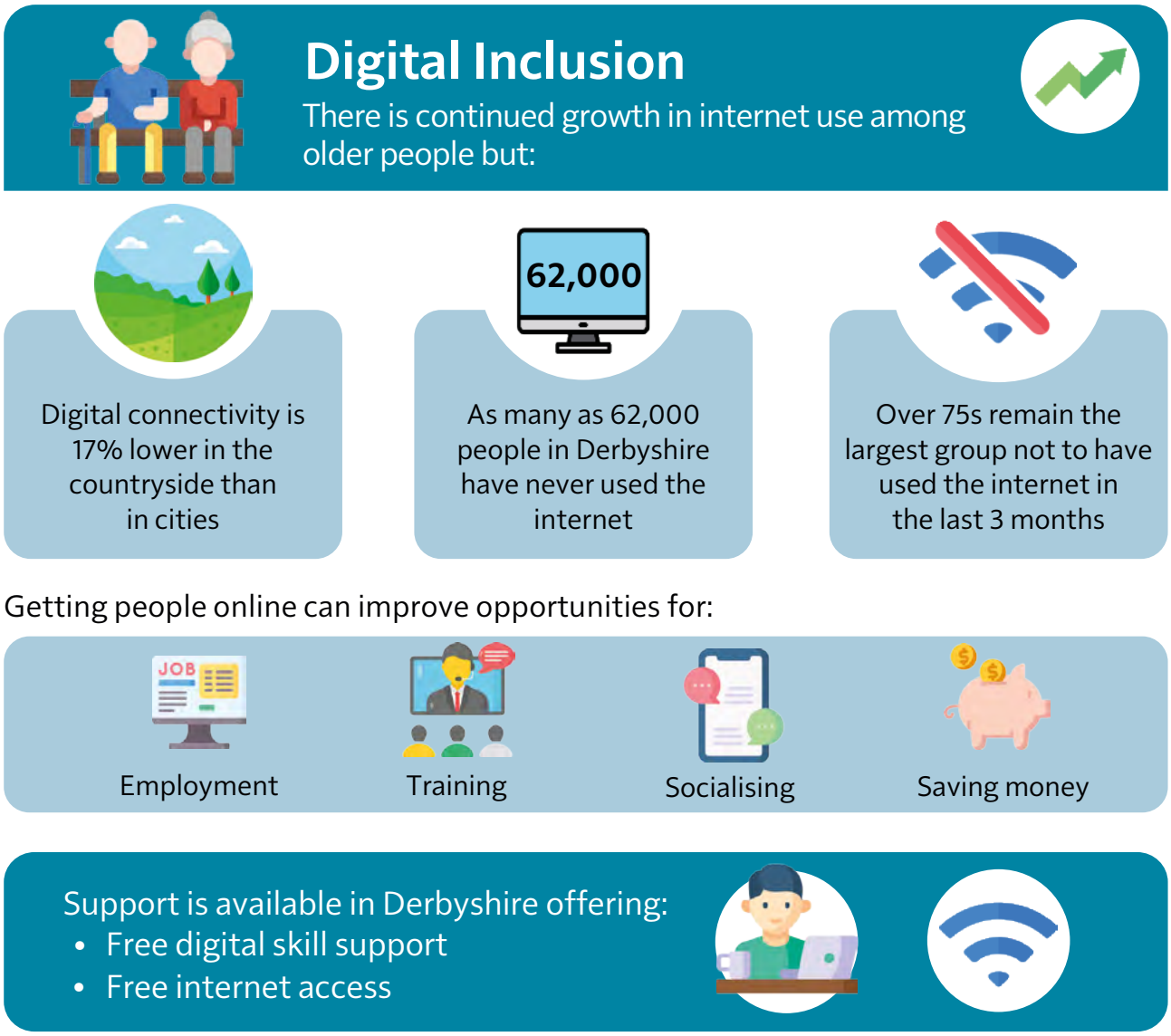
She previously applied for Attendance Allowance but had been turned down. The team supported her with a new application which was awarded the allowance at the higher rate, with an arrears payment. Once Anne had Attendance Allowance, she became entitled to higher rates of means tested benefit, meaning she now receives Pension Credit and full Housing Benefit and Council Tax Reduction. Following the support of the project she is £198.52 a week better off.

Anne was delighted and explained that she now does not have to worry each week about paying her bills. She said she can pay for a taxi when she goes for her blood tests, and she bought herself a new settee and a mattress topper which help her manage her back pain. She was also happy to hear that being on Pension Credit means she gets a Free TV licence.

## 4. Digital inclusion

The generation gap is narrowing with continued growth in internet use amongst older adults, however there is still a large difference between the generations and over 75s remains the largest group not to have used the internet in the last three months.[14] As many as 62,000 people in Derbyshire have still never used the internet, and many who do use it are not fully confident. Digital connectivity is 17% lower in the countryside than in cities. Getting people online can lead to better life experience and opportunities to work, train, socialise and save money. Figure 3.25 shows DCC's Public Health team are supporting older adults to become digitally included by offering free digital skill support and internet access across Derbyshire.[15]

**Figure 3.25: Infographic summarising the opportunities and challenges to digital inclusion in Derbyshire**




Sources: Internet users, UK – Office for National Statistics (ons.gov.uk), Opening the door to the Digital World | Rural Action Derbyshire

## 5. Mental health and isolation

Mental health and wellbeing are as important in older age as at any other time of life. Mental health problems are under-identified by healthcare professionals and older adults themselves, and the stigma surrounding these conditions makes people reluctant to seek help.[16] In 2020 almost 1 in every 10 people aged 65 and over were predicted to have depression in Derbyshire. Living in a rural area oftens means people can feel socially isolated, particularly when transport options may become more limited in older age. 32% of older adults in Derbyshire (aged 65+) were predicted to live alone in 2020.This is almost 57,000 people, with a rise to around 81,000 predicted by 2040.

# Summary

Ageing well in a semi-rural area is a key area of focus for the health and wellbeing system in Derbyshire. There are challenges of living in rural areas for an ageing population, however, there are also multiple enablers, including committed support from partners, to overcome these challenges. Using a public health approach to ageing well is key in Derbyshire. This approach defines how we work as a system to understand the population, and how we support people to live longer, healthier lives.

Using the public health approach shows a need to focus on prevention and to consider the life course approach to ageing well. Co-production with older adults will support innovative approaches to identify how we age well, and we would value sharing this with similar semi-rural areas. The ageing well agenda will require national commitment and advocacy that will further help local systems like Derbyshire collaborate on preventative measures across the life course.

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# 3.7 Norfolk County Council

Image source: Norfolk County Council

Cromer, town on the north coast of Norfolk (upper image)
Norwich, cathedral city and county town of Norfolk (lower image)

# 3.7 Norfolk County Council

**Stuart Lines** – Director of Public Health, Norfolk County Council

**Alison Gurney** – Head of Place and Community, Norfolk County Council

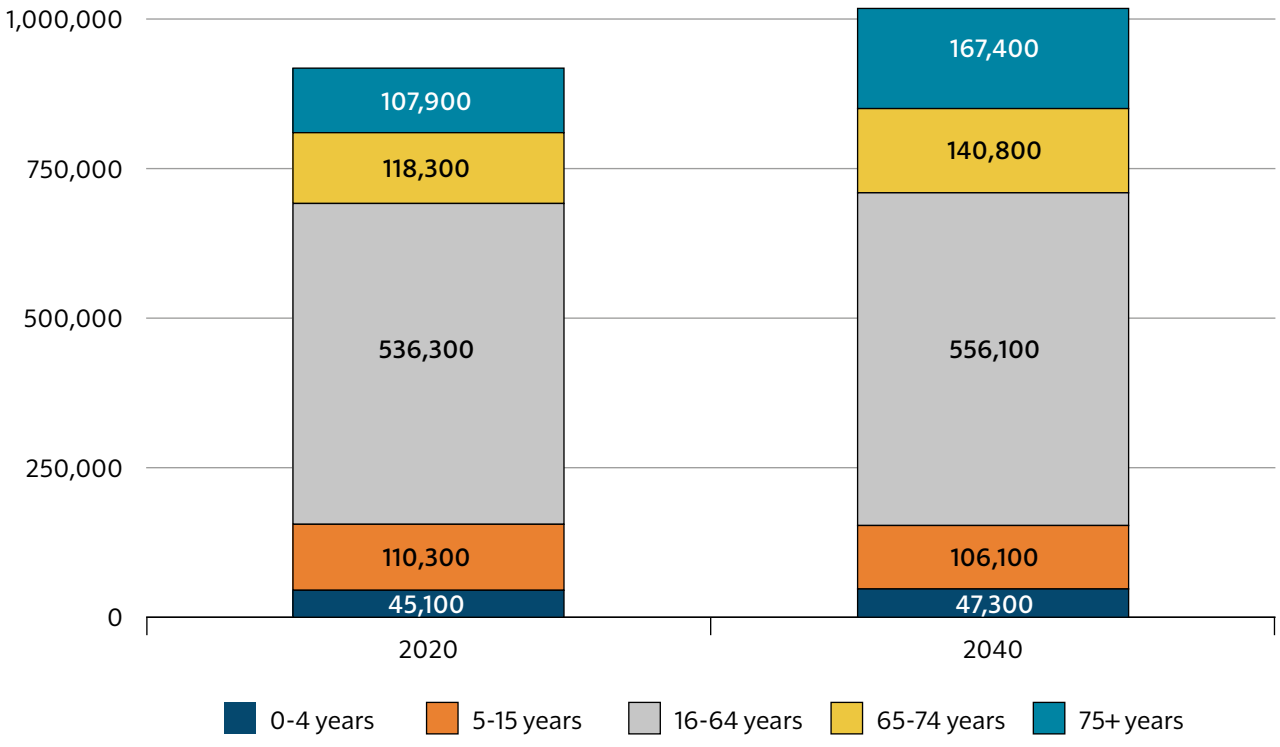
**Joshua Robotham** – Head of Public Health Information and Intelligence, Norfolk County Council

**Nicola Coburn** – Advanced Public Health Officer, Norfolk County Council

## Norfolk

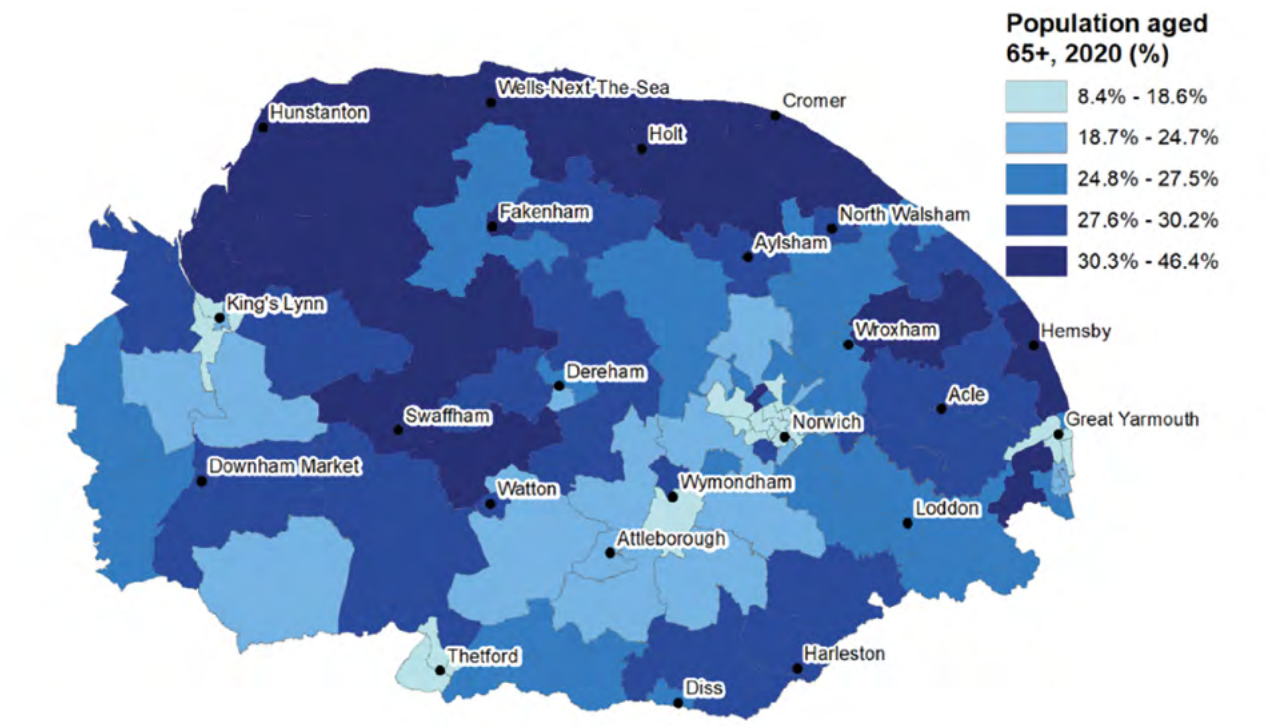
Norfolk is a mainly rural county in the east of England with a population of 916,100 split between seven districts and boroughs.[1] Norfolk has a 90-mile-long coastline and is home to the Broads National Park. The population of Norfolk is ageing rapidly, with the median average age already above the England average. In the past decade the proportion of people aged 65 and over has increased and more than 25% of the county's population are now aged over 65 years. This trend is expected to continue with projections suggesting that by 2040 we will see an increase of 55% in people aged 75 and over. Most of Norfolk's population increase will be in the older age groups, with those aged over 65 years increasing by 82,000 (Figure 3.26). North Norfolk has an older population compared to other areas in the county with a third of the population aged over 65 years, and has the highest proportion of people aged 85 years and over in the country (Figure 3.27).

**Figure 3.26: Norfolk population growth projection by age**




Source data: Office for National Statistics (ONS), 2018 Sub-national population projections.[2]

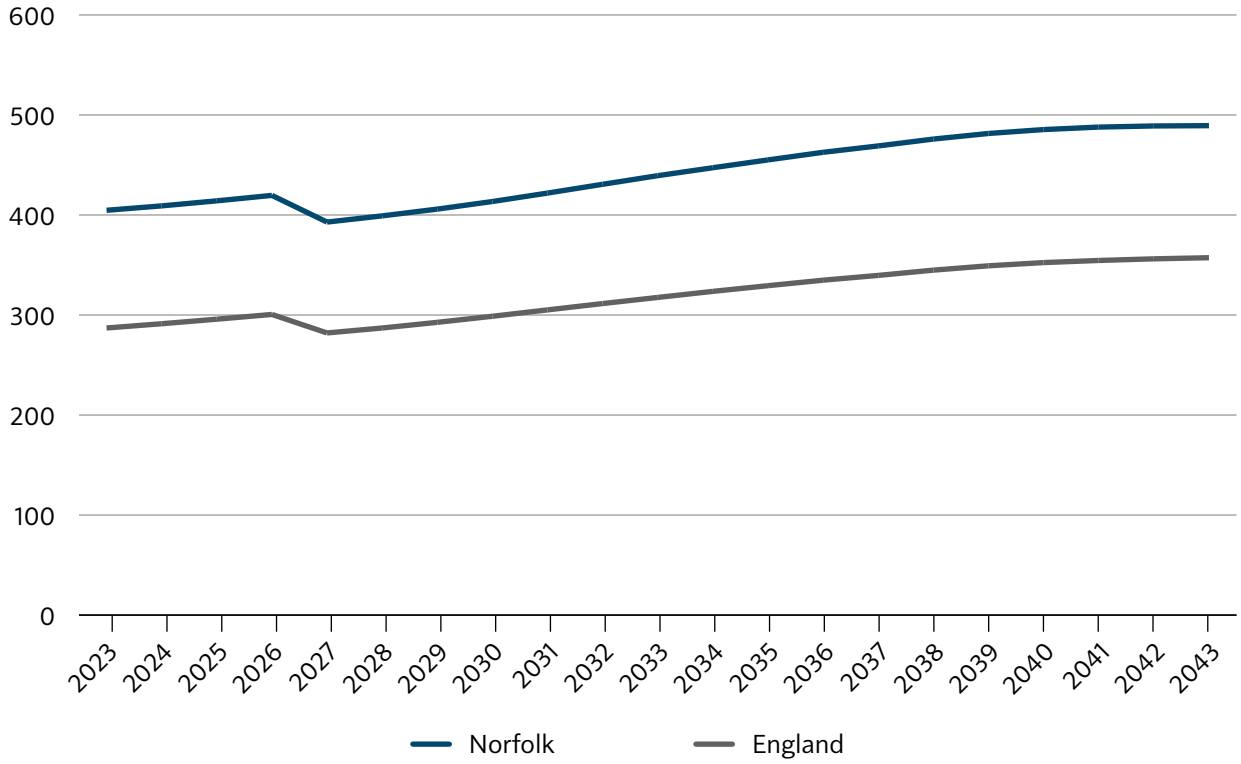
**Figure 3.27: Proportion of Norfolk population aged over 65 years in 2020, grouped by Middle Super Output Area (MSOA)**




Source data: Norfolk County Council

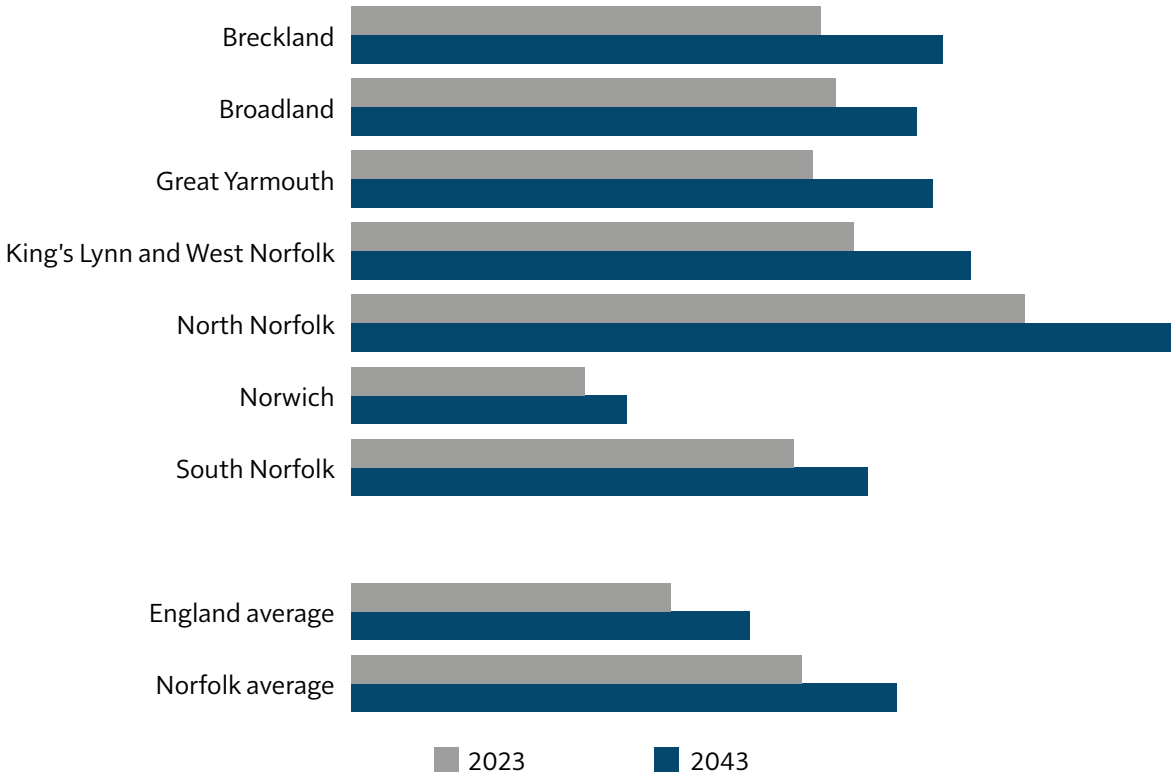
Norfolk's age dependency ratio is well above the England average and is increasing (Figure 3.28). The old age dependency ratio is the proportion of the population who are above state pension age, relative to the working-age population. North Norfolk currently has the second highest old age dependency ratio in England (Figure 3.29). This increase is likely to put extra pressure on the working age population and potentially affect the availability of a workforce to deliver services.

**Figure 3.28: Old Age Dependency for Norfolk and Waveney compared to the England average for 2023 to 2043**




Source data: Norfolk County Council

**Figure 3.29: Old Age Dependency by Norfolk District in 2023 and 2043**

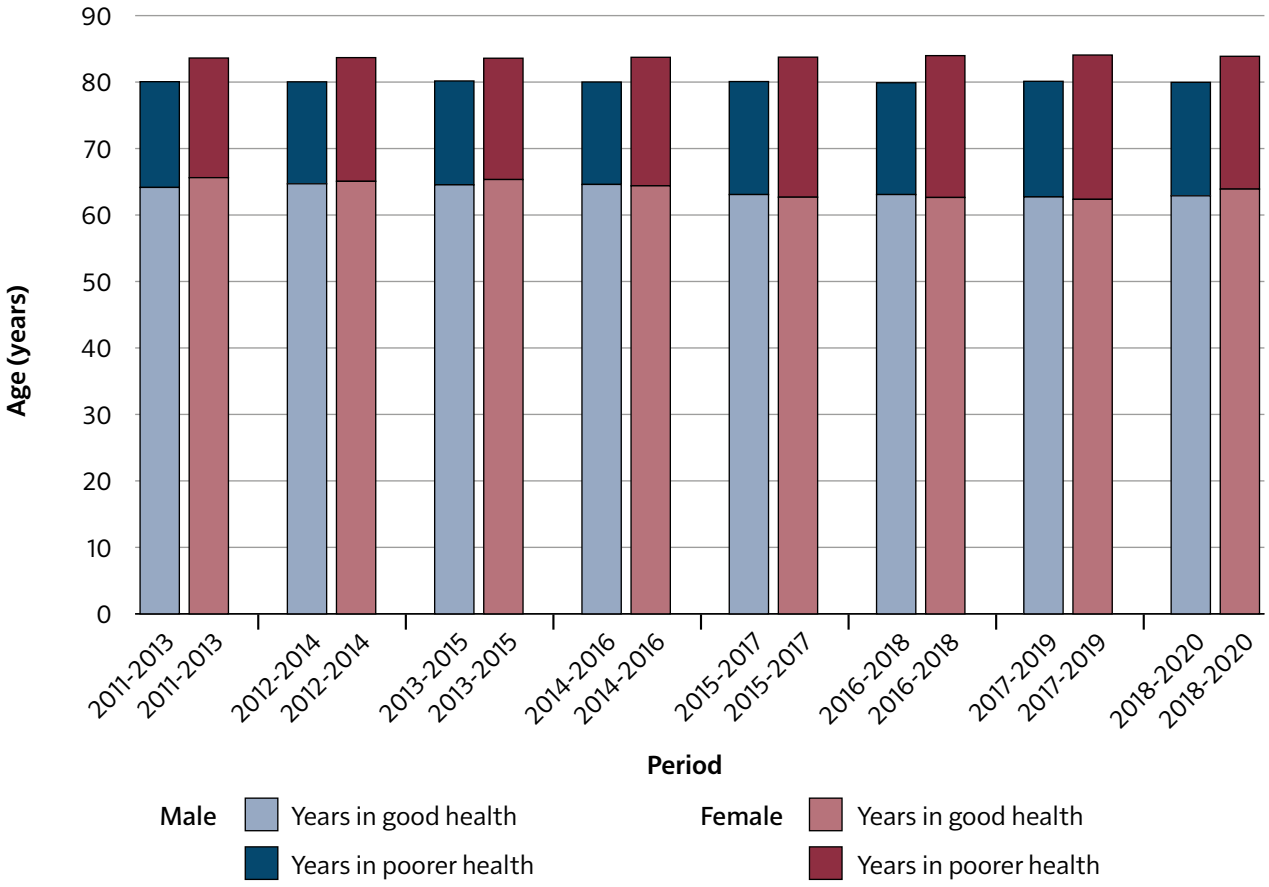



Source data: Norfolk County Council

## Health inequalities

In Norfolk, as elsewhere in England, living a healthy life is as important as living a long life. 'Healthy life expectancy' is the average number of years that a person can expect to live in "full health". Latest data (2018 to 2020) shows, on average, that a female in Norfolk would expect to live for approximately 84 years but have a healthy life expectancy of 64 years.[3] This means that, on average, a female in Norfolk is likely to spend approximately 24% of her life, or 20 years, in poor health (figure 3.30). Males, in contrast, are expected to live to approximately 80 years, with a healthy life expectancy of 62.9 years, meaning that they are likely to spend 21% of their total life (or 17 years and 1 month) in poor health. Although females live longer than males, they are likely to spend more years living in poorer health. This is in line with what we see nationally.

**Figure 3.30: Life expectancy and healthy life expectancy by sex in Norfolk**



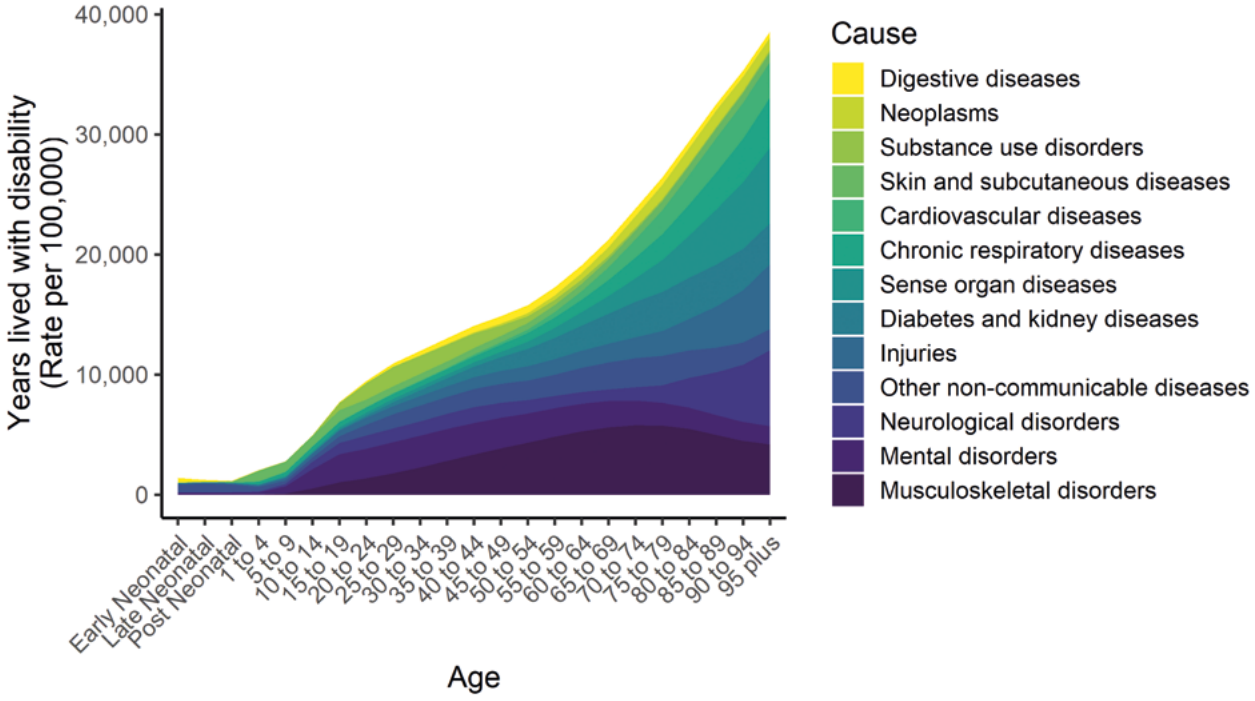

Source data: Office for National Statistics, Health state life expectancies UK: 2018-2020[4]

Physical health problems typically seen in older age, such as cancer, heart disease, diabetes, dementia, and musculoskeletal issues, are more prevalent in the areas of Norfolk with older populations (such as North Norfolk). There are approximately 14,800 people living with dementia in Norfolk currently, with this forecast to double by 2040. Overall health-related quality of life in Norwich and Great Yarmouth is poorer than other districts in the county.[5]

As we age, the type and number of health conditions that we experience changes and in old age we experience more neurological disorders and problems with eyesight and hearing loss. Ill health increases with age, with rates for those in their 80s almost double the rates for those in

their 60s, which in turn are almost double that of those in their 20s (Figure 3.31). Most deaths are now associated with frailty conditions such as dementia. This change in pattern of health and care need has significant implications on health and social care services.

**Figure 3.31: Causes of years lived with disability across age groups in Norfolk in 2019**




Source data: Institute for Health Metrics and Evaluation, Global Burden of Disease Study 2019 (GBD 2019)[6] – Used with permission. All rights reserved

## Demand on health and social care systems

Due to growth in population and increasing numbers of people in later life we can expect to see an increase in demand for appointments at doctors, dentists and hospitals, emergency admissions, an increase in the numbers of people with long term conditions and increased need for care. For example, if nothing changes and current rates apply to the increasing population then over the next five years in the local health system of Norfolk & Waveney:

- the demand for appointments with a GP is likely to have increased by more than 1,000 per day;
- the number of people with 4 or more long term conditions which need ongoing management is likely to have increased by about 1,800 per year;
- the number of people attending A&E is likely to have increased by about 900 per month; and
- the number of people who are admitted to hospital, having arrived as an emergency, is likely to have increased by about 500 per month.

Around 120,000 people aged 65 and over with mild, moderate, or severe levels of frailty live in Norfolk and Waveney. This can put a pressure on the local health and care system and increase costs. The number of care and nursing home beds available to older adults is decreasing relative

to the size of the population. In addition, there is increasing demand for hospital beds for people in the older age groups. This may also indicate a shift in care being provided in the community and other settings.

The introduction of the Better Care Fund (BCF) has allowed NHS and local government to create a single pooled budget to support local systems to successfully deliver the integration of health and social care in a way that supports person-centred care, sustainability and better outcomes for people and carers. The aim of this is to join up health and care services to help people manage their own health and wellbeing, enabling them to live independently in their communities for as long as possible.

## Economic impact

The proportion of older adults in Norfolk who are economically active (either in work or actively seeking work) has been increasing. This may reflect the trend towards working beyond the traditional retirement age, as well as financial pressures such as the rising cost of living.

As the workforce is ageing there will be more people in work managing long term conditions, disability, and sickness. Employers can adapt to be age-friendly, be flexible, enable employees to move to less physically demanding work managing long term conditions, and helping prepare people for retirement. In Norfolk most employers are small or medium-sized enterprises (SMEs) and do not have the infrastructure (access to HR and Occupational Health) to support this adaptation, which is exacerbated by the acute labour shortages in some sectors.

The old age dependency ratio (see above) is increasing in Norfolk. Projections suggest that there will be 49 people aged 65 and over for every 100 people of working age by 2043. This is particularly acute in coastal and rural Norfolk which has seen rapid demographic change, accelerated by the pandemic, with migration of older adults seeking to retire from cities and other parts of the country (notably the Midlands, the East & London) to coastal or rural areas. This is accompanied by an outward migration of young people from these areas to seek work or study opportunities.

The migration of older and retired people to rural and coastal areas of Norfolk has an impact on the communities and infrastructure. Some of these areas have poor transport links and digital connections. This may increase loneliness and isolation and complicate accessing health and social care services.

## Place-based approaches to improving health for our older population

Supporting the 'Living Well' aspect of Norfolk County Council's overarching strategy 'Better Together for Norfolk',[7] public health has identified older adults and promoted independence as priorities in our Public Health Strategy, 'Ready to Change…Ready to Act'.[8] Through focusing on the prevention and early help element of the Council's Promoting Independence Strategy, we aim to enable people to live independently for as long as possible, empowering older residents to be healthy, active, and socially connected, and will work with partners to develop a healthy ageing programme.[9]

At the core is facilitating access to services tailored to older adults, which incorporates identification of complex health conditions, opportunities for physical activity to maintain mobility, and which are supported by community-based activities addressing social isolation. As a leading partner within each of the seven Norfolk Health and Wellbeing Partnerships (HWPs), Norfolk County Council public health team is also providing funding and driving delivery of collaborative targeted interventions at a local place level, promoting a system wide focus on the needs of older adults within the integrated care system (ICS).

Each HWP delivers a prevention focussed approach to reducing health inequalities and addressing the wider determinants of health. Based on the same geography as the district or borough council, and chaired by a local councillor, membership includes representatives from local authority public health, adult social care, children's services, the voluntary, community and social enterprise sector, acute hospitals, and the Integrated Care Board (ICB). The HWPs have supported 68 projects across Norfolk in the last year around topics such as mental health, loneliness and social isolation, older adults, and migrant communities. The following are some examples of prevention-led work focused on our older population in three different areas.

## North Norfolk

North Norfolk health and wellbeing partnership have committed to three priorities. One of these includes a focus on the ageing population such as: developing Age Friendly Communities; promotion of activity for wellness; improving recruitment and retention in care services; and promotion of dementia awareness to increase diagnosis. An older adults Working Group has been established including partners from statutory and voluntary organisations across dementia support, community transport and public health to ensure the intentions of the partnership are delivered.

The partnership has provided funding to grow their provision of community connectors across seven areas within North Norfolk. The community connectors role is to raise awareness of groups and support available across the district, including the management of an interactive map signposting local services to support isolated communities. Feedback has been positive with people reporting feeling empowered to make social connections.

## Norwich

The Norwich Complex Health Enhanced Social Support (CHESS) project brings health, social care, and voluntary agencies together to support older adults who are waiting for a social care assessment. Older adults are referred to Age UK Norwich's CHESS team who provide practical support, access to information, advice and health coaching, and referral to specialist services. Over a 12-week intervention the support workers aim to improve or maintain older adults' health by tackling some of the wider issues such as financial resources or housing.

The Age Healthy Norwich project focuses on older adults from two city centre GP surgeries with pre-diabetes, obesity, or hypertension. It offers a six-month programme of home-based exercise with a qualified Age UK Norwich Health Coach, and then support to join local community groups so that activity levels can be sustained. Evaluation of both projects shows positive improvements in older adults' self-assessment of their health.

### Great Yarmouth

The Great Yarmouth HWP has committed to a Community Falls Prevention programme. Data and intelligence from Adult Social Care, Public Health, ICB, Primary Care Networks and the Great Yarmouth Borough Council Community Hub have identified people at risk of a fall and developed two community prevention services:

- Lofty Heights – decluttering service for people over 65 who have been identified by the Community Hub as needing support to prevent a fall in their home.
- Your Health Norfolk – community exercise classes to improve mobility and strength for people at risk of a fall.

## Summary

We know that encouraging and supporting people to adopt healthy lifestyles and behaviours is important for overall health and wellbeing – both physical and mental. This is important throughout the life course; from starting well and preparing for a long and healthy life ahead, through to adulthood, and then into our older years.

It is also vital to remember that there is no standard 'older adult,' and that older adults are an essential part of a vibrant, intergenerational and diverse community. As such, older adults are an asset to communities through contributing to the local economy, taking community leadership roles, contributing skills, experience and expertise in a variety of ways, volunteering, offering care of grandchildren, taking part in democratic processes, being active community members, caring for others, making and creating, being active consumers and having full, active lives.

However, ageing of course also presents risks, particularly around health issues. The severity and nature of health issues will inevitably vary from person to person and community to community. Often, those in poorer health may have developed multiple long-term conditions (MLTCs) or comorbidities that will need to be managed simultaneously. These may affect mobility, social connectedness, mental wellbeing and levels of engagement. There is also very likely to be a corresponding increase in demand on both health and social care services. With people living for longer but with a greater proportion of their time in poorer health, services increasingly need to respond by taking a more holistic approach to individual care and taking advantage of innovative approaches and digital technologies. In designing these services, it is essential that health inequalities are addressed through making best use of available data and

information. Other issues such as transport, digital connection, social isolation, and employment that supports older workers and that attracts and trains younger workers, also become increasingly relevant in enabling older adults to 'stay connected' with wider society. Taking a system-wide approach to promoting healthy ageing therefore has the potential to benefit individuals, families, communities, the local economy and public services.

With an older than average population in Norfolk, work continues on several fronts, from addressing the wider determinants of older age health, to improving management of MLTCs, and supporting the design of services in order to help achieve healthy ageing for all. However, there is always more that can be done and the health and care system in Norfolk continues to work together through a variety of forums to improve outcomes. Through a relentless focus on prevention wherever possible, we collectively aim to support older adults to be healthy, active, socially connected, and safe and well at home for longer.

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# 4 Enabling older adults to live free from disease for longer

## 4.1 Introduction

It is possible to delay the onset and progression of many debilitating or disabling diseases, either to the point they are only present for a short period at the very end of life or, ideally, are never present at all. Death is inevitable for us all, whereas many diseases that limit the freedoms and enjoyment of older adults are not.

Some diseases which can be significantly delayed cause ill health and disability but are not generally fatal. Other conditions can cause prolonged ill health before causing death. Both scenarios rob people of a good quality of life in their later years and lead to dependence on others for many years. For example, in heart disease the headline statistics tend to concentrate on people dying of heart attacks, but equally important are the large numbers of people confined to a limited life for many years by heart failure. Similarly, deaths from lung cancer are more widely recognised than the many years of disability caused by chronic obstructive pulmonary disease (COPD), although the risk factors for both conditions are broadly the same.

Three groups of people can intervene to delay disease and minimise the period of older age limited by poor health.

- The first are **individuals themselves**.
  Provided that individuals are given the opportunity, and this is an important proviso, increasing exercise, eating a healthy diet, stopping smoking and limiting alcohol intake are all examples of things that will delay debilitating disease. The earlier these start in life the better, but it is never too late to make a positive difference and delay or minimise the impacts of disease.

- The second is **local and national government** leaders.
  Government (the State) has the capacity to intervene to delay significantly debilitating disease for the whole population, ideally before disease even starts. This is generally termed primary prevention, and the positive effects are most clearly seen in older age from a lifetime of prevention. Sometimes this is through the provision of areas for all citizens, including older citizens, to exercise. Many of the interventions involve the built environment the State owns; pavements older people feel safe to walk on or parks, recreational facilities and cycle-paths designed for the old as well as the young. It also involves legal and planning measures to stop smoking before it condemns millions to years of disability in later life, and to limit the drivers of over-consumption of unhealthy food or high alcohol intake. Reducing air pollution, which I covered in detail in my last Annual Report,[1] will delay the incidence of many debilitating diseases of older age including cardiovascular disease (CVD) and cancer.

- The third are the **NHS and healthcare workers**, including my fellow doctors. Secondary prevention by identifying and treating early disease and risk factors, such as hypertension or atrial fibrillation, can substantially delay significant disease.[2] Screening and early clinical diagnosis can identify a disease early enough to maximise the effectiveness of treatment and minimise the impact of the condition on quality of life. Treatment following late diagnosis is less effective, generally more invasive, with greater risk of long-term side effects even if it is technically successful. This is the responsibility of health and care professionals working together with citizens. If these interventions are successful, they can delay the substantial impact of disease on quality of later life by many years.

This section explores some of the areas where intervention is known to have an effect on the delay and prevention of ill health.

# 4.2 Promoting and improving health in later life

**Jeanelle de Gruchy** – Deputy Chief Medical Officer for England
**Amy Bleakley** – Private Secretary, Office to the Chief Medical Officer for England
**Beth Smout** – Public Health Registrar, Office to the Chief Medical Officer for England

## Introduction

Ill health in older age is not inevitable. Our health is strongly influenced by the environments in which we live, work and socialise.

As this chapter will explore, there is a strong and long-established evidence base that being physically active, eating a healthy, balanced diet, not smoking and moderating alcohol consumption improves health outcomes and increases the proportion of life spent in good health. Many of the modifiable long-standing health inequalities that exist across the country can be attributed to these key risk factors. There are things we can do, both as a society and as individuals, to adopt healthier behaviours and address inequalities.

This chapter aims to set out the key evidence around physical activity, diet and nutrition, smoking and alcohol, their relationship to health in older age, and how the trends in these risk factors may change over the coming years.

## Physical activity

### Current trends

There is strong evidence that being physically active is good for health throughout our lives and has distinct benefits for maintaining mobility and functional independence in older age.

Regular physical activity reduces the risk of developing major conditions, such as cardiovascular disease (CVD), type 2 diabetes and several types of cancer.[3] Physical activity also helps to maintain physical function and strength and reduce the risks of falls.[4] As well as preventing physical ill health, there is evidence that engaging in physical activity benefits mental health and wellbeing and improves overall quality of life in older age.[5] Tackling low physical activity and sedentary behaviour can therefore increase the number of years spent in good health.

The UK Chief Medical Officers (CMOs) provide recommendations on the frequency, intensity, duration and types of physical activity at different life stages.[6] It is recommended that older adults aim to accumulate 150 minutes of moderate intensity aerobic activity per week and do strength and balance activities twice a week. In addition to aerobic exercise, strength and balance activities are important for quality of life and often require separate activities.

A key message is that any amount of physical activity is better than none. Figure 4.1 illustrates that the greatest health gains come from somebody moving from a physically inactive or low active status to a more physically active status.

**Figure 4.1: Graph illustrating that the greatest health benefits are gained from increasing weekly physical activity from 0 minutes to 100 minutes**

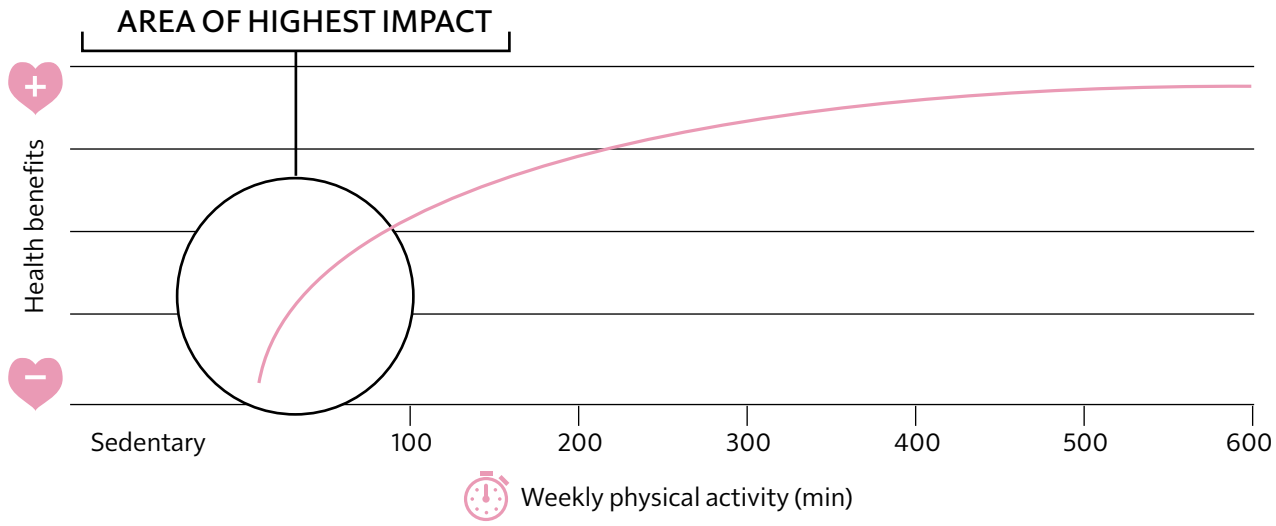



Image source: UK Chief Medical Officers' physical activity guidelines (2019)[7]

However, despite the evidence on health benefits, physical activity is decreasing in England in all age groups including older citizens. People tend to become less active as they get older and physical activity levels are lowest among the oldest age groups. Data from the Active Lives Survey shows that 33.4% of 75 to 85 year olds and 56.8% of people aged 85 and over are physically inactive, doing less than 30 minutes of moderate physical activity per week. This is substantially higher than the England average for all ages of 22.3%.[8]

## Opportunities to enable increased physical activity

Exercise delays many diseases which present in older age. In the case of older adults, the benefits of physical activity have often been understated and the risks overstated.[9] Healthcare professionals have an important role in promoting physical activity to their patients to prevent and manage health conditions, highlighting the benefits for health and providing reassurance about potential risks. This includes clarifying that there are many ways of incorporating physical activity into daily routines (for example, around the house) and the importance of doing so gradually, building up from current activity levels. Even short bursts of activity to break-up sedentary behaviour are beneficial to health. It is important that health care professionals are provided with relevant training and guidance to enable informed conversations with patients about physical activity, taking advantage of the regular contact points that older adults may have with healthcare services. For example, physical activity is often recommended as a treatment for age-related conditions, such as arthritis, because it can reduce stiffness in joints and improve muscle strength, which is important for maintaining functional independence. Furthermore, strength-based activities improve bone strength[10] and balance exercises reduce vulnerability to falls.[11] The Live Longer Better movement is a good example of a system

supporting older adults to be physically, mentally and socially active. Through Live Longer Better, local networks of AgeUK, the Active Partnerships of Sport England, NHS organisations and local authorities increase older adults' physical ability, resilience and healthspan, and prevent falls and frailty.[12]

However, healthcare professionals promoting physical activity to their older patients can only go so far when older adults face external barriers to being physically active.[13] When designing environments to encourage physical activity, it is important for local authorities and private companies to consider accessibility and usefulness for older adults; for example, the terrain of walking paths and ensuring that active travel routes are well connected to local amenities. This may enable older adults, and other population groups, to embed physical activity into their everyday routines and gain health benefits.

Being physically active throughout the life course is important for maintaining good health and delaying the onset of ill health. Physical activity has distinct benefits to older adults and contributes to the process of healthy ageing. Policy action should focus on removing barriers to support the inactive to become active, and to create environments which encourage and make it easier for everyone to be active, no matter their age.

# Diet and nutrition

## Current trends

An unhealthy diet makes a substantial contribution to the risk of ill health and premature mortality over the life course and in older age. A balanced and nutritious diet is protective of health and can delay disease. For example, consuming recommended levels of fruit and vegetables reduces and delays the risk of major conditions which are predominantly seen in older adults, including hypertension, chronic heart disease and stroke. Conversely, poor diet and living with overweight increase and accelerate the risk of conditions including CVD, diabetes and several types of cancer.[14] Living with obesity and its complications in older age is likely to impact upon quality of life and increases an individual's need for social care services.[15]

The Scientific Advisory Committee on Nutrition (SACN) found that many older adults exceed maximum recommendations for intakes of saturated fat, free sugars and salt but fail to meet recommendations for fruit and vegetables, fibre and oily fish. This is similar to the dietary intakes for the wider UK adult population.[16]

The majority of older adults are now living with overweight or obesity. In England, the prevalence of overweight and obesity is highest among adults aged 45 to 74 (with 73% of adults aged 65 to 74 living with overweight or obesity), before reducing to 64% in those aged 75 and over.[17] The current cohort of older adults grew up in a time when childhood obesity was far less common. Given current rates of childhood obesity, and the fact that those who live with overweight or obesity as children are likely to continue living with overweight or obesity into adulthood,[18] we can expect more older people to live with overweight and associated health conditions well into the future. The prevention of excess weight gain and the promotion of healthy diets early on in life is therefore critical for maintaining good population health. In

addition, maintaining muscle strength and bone health depend on factors such as Vitamin D which in turn rely on a good diet in older age.

## Opportunities for improving diet and nutrition

Improving diet and nutrition among older adults requires multiple approaches, taken simultaneously. Firstly, to prevent and manage overweight and obesity among individuals who will be older adults in the future; and secondly, to take action that supports the health of the current cohort of older adults.

### Preventing obesity and improving diet and nutrition

Living with overweight and obesity accelerates multiple conditions which reduce independence in older age. These include mechanical problems such as knee arthritis, balance, diabetes, heart failure and stroke as well as several cancers. The majority of people living with overweight or obesity in older age will have done so for many years. Creating an environment that promotes healthier diets and prevents obesity is far better than waiting until people are already living with excess weight to intervene, when intervention is much harder. Preventing obesity and improving diet therefore needs to begin at an early age and continue throughout the life course to maximise independence in older age.

The types of food we purchase and consume are strongly influenced by the food industry and the environments in which we live. The availability of foods high in fat, salt and sugar (HFSS) has increased and the out-of-home (OOH) sector has grown significantly, selling large portion sizes of high-calorie foods.[19] These changes to our food environment have occurred in unequal ways, meaning that not everyone has the same opportunity to consume a healthy, balanced diet.

There are a number of evidence-based options for preventing obesity and improving population health through diet and nutrition. Primary prevention options focus on making changes to the food environment to reduce the consumption of HFSS products. Regulation and reformulation can play an important role in reducing the salt and sugar content of food and drink, improving the quality of the food that we consume. There is evidence that restricting the promotion of HFSS products has a positive effect on reducing consumption.[20]

Changes to the built environment also have a role in tackling obesity, for example using the planning system to restrict the concentration of hot food takeaways in an area and reduce the associated cumulative effect these have on people's diets. Public health teams in local authorities can support this by compiling and presenting the evidence base on the links between the food environment, consumer behaviours and health outcomes in a clear and consistent way.

Secondary prevention activities also provide an opportunity to intervene at an individual and family level, among those at high risk or who are already living with overweight or obesity. These activities include weight management services, personalised risk assessment, and advice and treatment to reduce the risk of comorbidities, for example prescribing antihypertensives to individuals with hypertension. The practical role of newer drug treatments for obesity, such as GLP-1 agonist drugs, to reduce disability is not yet clear in older adults.

### Supporting the current cohort of older adults

Alongside preventing obesity, it is important to support the health of the current cohort of older adults. Weight management services should be available and accessible to older adults who require them.

Several age-related physiological changes can make it challenging for older adults to meet nutritional recommendations. For example, older adults can experience loss of appetite and changes in sense of smell and taste. Poor oral health may be the result of a person's diet, but in turn can also affect nutrient intake and the variety of food consumed by older adults.[21] Professionals working across the health and social care sector can support good nutritional intake among older adults by being aware of the challenges that these individuals may experience and provide advice and practical support. Many older adults may be dependent on others for care. Oral health promotion and nutritional support within care homes can therefore help improve quality of life among residents.

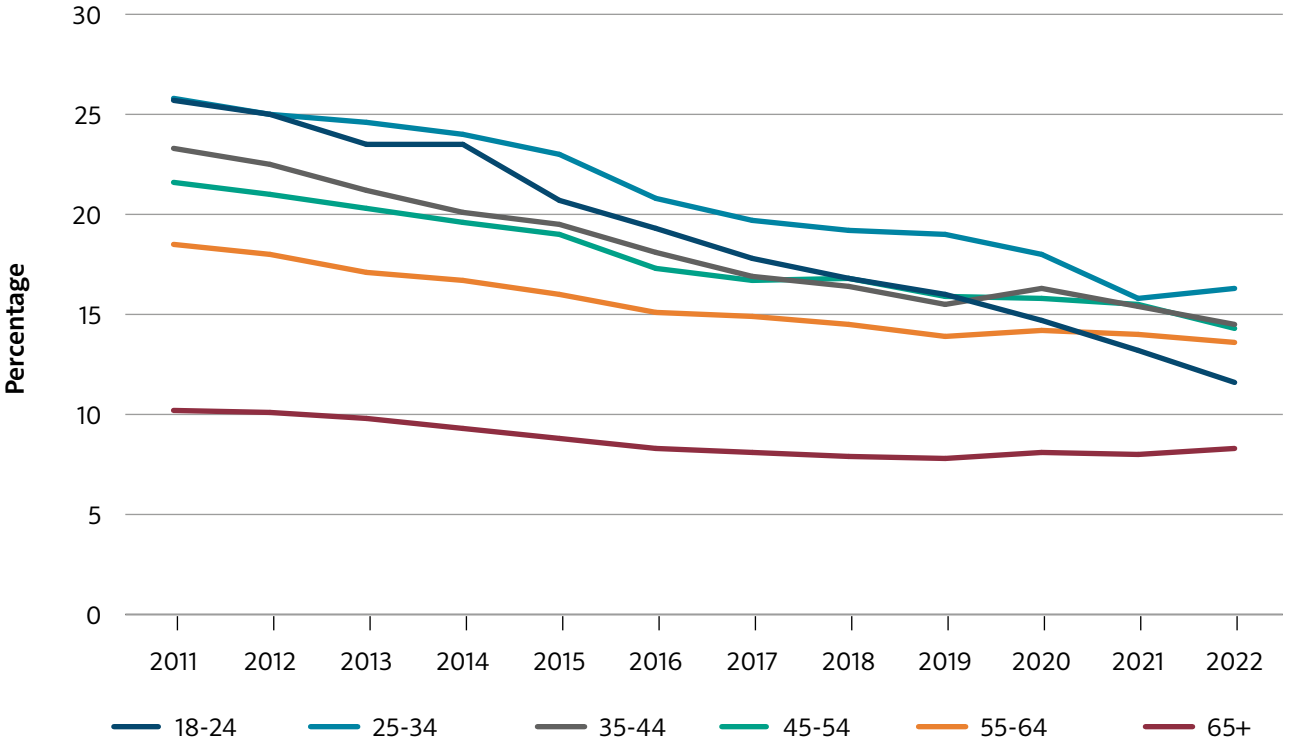
SACN has highlighted the need to improve the evidence base around nutrition-related health outcomes in older people.[22] There is a need for further research around the impact of dietary patterns and specific nutrients on some of the major conditions that are most common in older age, including CVD and cancers. Other recommendations include conducting research that specifically considers nutrition and health among adults aged over 85 and those from Black, Asian and other minority ethnic groups. Together, this would provide greater insight into potential nutritional interventions for older people.

## Smoking

Tobacco is the single biggest cause of preventable illness and death in England,[23] with approximately 64,000 people killed by smoking each year.[24] Smoking causes around 25% of all UK cancer deaths, including the great majority of lung cancer, the UK's most common cause of cancer deaths. It is also a major cause of premature heart disease, stroke and heart failure, and increases the risk of dementia. It underlies most chronic obstructive pulmonary disease (COPD), triggers severe asthma, and exacerbates many chronic diseases. Since smoking increases risks for multiple diseases in one person it increases multimorbidity and can cause particularly complex disease states.

The UK has made substantial progress on tackling smoking. The latest data show that 12.9% of UK adults smoke cigarettes – the lowest rates on record – down from 45% in 1974.[25] Smoking rates are lowest among people aged 65 and over: 8.3%, compared to 16.3% among those aged 25 to 34 (Figure 4.2). This is due to a combination of premature mortality in older smokers and accumulated cessation over the life course. However, those who smoke in older age consume a higher number of cigarettes per day than other age groups.[26]

**Figure 4.2: Proportion of the UK population who are current smokers, by age group, 2011 to 2022**




Source data: Annual Population Survey from the Office for National Statistics[27]

Smoking is one of the main causes of health inequalities in England, with smoking-related harms continuing to disproportionately affect the poorest and most vulnerable.[28]

## Opportunities to tackle smoking

Two approaches are needed in combination to prevent smoking-related harm: preventing smoking initiation and supporting those who do smoke to quit.

Smoking is largely an addiction that begins in childhood. Two-thirds (66%) of smokers start before the age of 18, and 83% before the age of 20.[29] Preventing smoking-related harms in older adults therefore needs to start right from childhood, recognising that the most effective way of preventing harm is to ensure that people do not take up smoking in the first place (primary prevention). The Khan review outlines several recommendations to achieve this, including raising the age of sale of tobacco, making tobacco less affordable, rethinking how cigarettes look by placing anti-smoking messages on individual cigarette sticks and using dissuasive colours, mandating anti-smoking health promotion messages in films and television shows, and increasing smoke-free places to further shift social norms around smoking.[30] Recognising the importance of stopping the initiation of smoking is essential. The Prime Minister has recently announced that Parliament will be asked to legislate to prevent all those currently under 14 from ever legally being sold cigarettes.[31] In the long run, if passed by Parliament this will have a massive impact on ill health and disability in older age.

At the same time, smoking cessation needs to be available to support smokers of any age to quit. It is never too late to stop smoking with some of the effects on disability being felt rapidly. Quitting at any age increases life expectancy and reduces the risk of developing smoking-related diseases.[32]

The introduction of vaping (using an e-cigarette) has contributed to the reduction we have seen in smoking rates. While not risk-free, vapes are less harmful than the multiple health harms of smoking (a low bar) and are one effective tool to help smokers quit, particularly when used in conjunction with support from local smoking cessation services.[33] Vaping has contributed to an estimated additional 50,000 to 70,000 quits per year.[34]

However, while vaping is relatively common among younger current and former smokers, older smokers are less likely to vape or have tried vaping. In 2021, 7% of adults aged between 25 and 34 currently used vapes, compared to 2% of those aged 75 and over.[35]

The National Institute for Health and Care Excellence (NICE) recommend that smoking cessation advice is available to all smokers, regardless of age. However, evidence suggests that older smokers are less likely to be offered support to stop smoking than younger smokers.[36] This could be for a number of reasons. Targeted smoking cessation campaigns are rarely focused on older adults. The location and accessibility of services may act as a barrier to older people. Healthcare professionals may be more reluctant to offer smoking cessation advice to older adults, for example if they have concerns around interactions with existing medication.[37,38] Older people who smoke have often smoked for a long time and are therefore highly addicted, making it harder to quit. While the majority of smokers over the last five years have indicated that they want to quit, some older people may feel as though there is 'no point' quitting at an older age.[39] From a health point of view it is almost never too late to have some positive effect on health outcomes.

Given the high levels of contact that many older people have with health and social care services, there are likely to be regular and repeated opportunities to signpost to smoking cessation services. There is a clear need for health and care professionals working in the NHS and social care to use the principles of Making Every Contact Count (MECC)[40] to highlight the role of smoking cessation in secondary prevention and delay of significant disease.

In summary, smoking is a significant cause of preventable ill health in the UK. The most effective way to prevent smoking-related harms is to stop people from becoming addicted in the first place, largely in childhood. However, it is never too late to stop smoking. Health and social care services play a vital role in encouraging older smokers to quit, whatever their age.

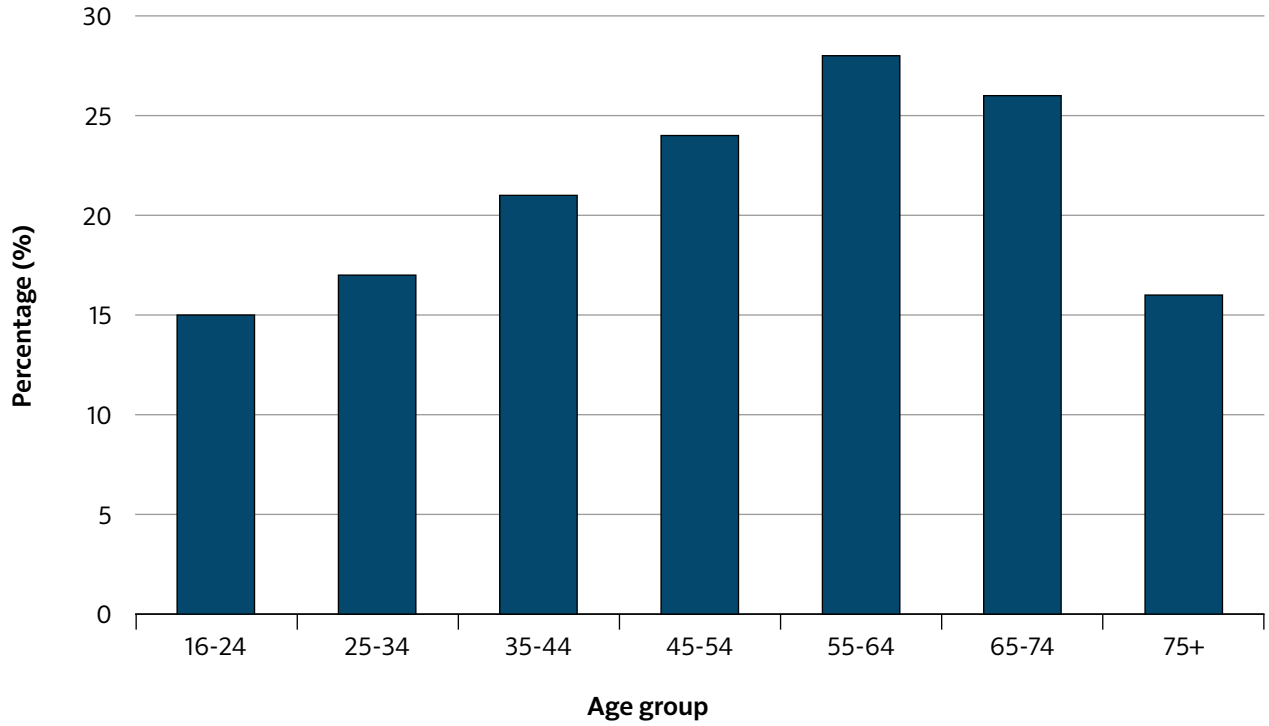
## Alcohol

Alcohol is a key risk factor for many major conditions including a number of different cancers, CVD and liver disease.[41] Alcohol can also exacerbate or accelerate the start of health concerns associated with ageing, such as cognitive impairment and an increased risk of falls, accidents and injuries.[42]

Older people are more susceptible to alcohol-related harm. Physiological changes that result from the ageing process impact the body's ability to process alcohol, reducing alcohol tolerance.[43] Older people are also more likely to be taking prescribed medicines that may interact with alcohol, compounding these effects.

There is a complex relationship between alcohol consumption and age. The prevalence of adults consuming more than 14 units of alcohol per week (placing them at increasing or higher risk of alcohol-related harm) increases for each age group, up to the age of 55 to 64, before then declining again from the age of 65 onwards (Figure 4.3).[44]

**Figure 4.3: Prevalence of adults drinking over 14 units of alcohol per week, by age**




Source data: Health Survey for England 2021[45]

Alcohol-related hospital admissions in England follow a similar pattern, with 24% of all alcohol-related hospital admissions occurring among patients aged between 65 and 74.[46] Alcohol-specific liver disease is the only leading cause of death in England that is increasing significantly, having increased by 87% between 2001 and 2021.[47]

Alcohol consumption has a complex inter-relationship with socioeconomic status. Despite those living in the most deprived areas drinking alcohol at similar, or even lower, levels than those living in less deprived areas, individuals in more deprived areas are disproportionately affected by alcohol-related harms.[48] The rates of alcohol-related hospital admissions tend to be higher in coastal communities, which also experience higher rates of deprivation.[49] The North East of England has had the highest rate of alcohol-specific deaths for the last eight consecutive years, with current rates double that of the East of England.[50]

## Opportunities to address excess alcohol consumption

Alcohol-related harms in older adults may be the result of two different patterns of alcohol consumption. Firstly, older adults are more likely to experience major health conditions that may be the result of high levels of alcohol consumption that have accumulated over many years.[51] Secondly, there are older adults who only start to develop an alcohol problem in older age, which may be associated with major life transitions such as bereavement, retirement and loss of a sense of purpose.[52]

Given this, the prevention of alcohol-related harm needs to begin early in life and continue right through to older age, recognising that the risk of drinking at harmful levels is not limited only to young people. In fact, there has been a downward trend in alcohol consumption among younger people in recent years, which may influence future trends in alcohol-related harm in older age.

The neighbourhoods in which we live, work and socialise have an important influence on our health. Neighbourhoods with a greater density of alcohol outlets are associated with increased overall alcohol consumption and a wide range of harms, including alcohol-related hospital admissions, deaths, suicide and violence.[53,54] This relationship is stronger in areas of deprivation. As discussed in the 2021 CMO annual report on Health in Coastal Communities, improving the ability of Directors of Public Health to input into licensing applications in their local areas is likely to have a significant impact on alcohol-related harm, particularly in areas of deprivation.[55]

For those who drink alcohol at harmful levels, support services play an important role in helping people to limit or stop their alcohol consumption. However, older people may experience barriers to seeking support from alcohol treatment services. Evidence suggests that harmful drinking among older people is less easily identified by professionals, with incidents such as falls being ascribed to frailty or other chronic health conditions, rather than alcohol.[56] A reduction in social contact may also enable excess alcohol consumption to be hidden. Alcohol treatment services are usually targeted towards younger people, contributing to stigma around drinking in older people and a potential reluctance to seek help.[57] This highlights the need for healthcare professionals to be alert to the potential heightened risk of alcohol dependency related to significant life events in older age, with tailored services then available to support those older adults who require advice and treatment for excess alcohol consumption.

In summary, excess alcohol consumption is associated with premature mortality and a number of age-related conditions. Alcohol consumption is highest among older age groups, contributing to higher rates of alcohol-related harms in older people. Reducing alcohol-related harm can be achieved throughout the life course by creating local environments that limit the promotion and harmful use of alcohol, together with ensuring that services recognise and provide appropriate treatment for those experiencing alcohol dependency in later life.

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# 4.3 Secondary prevention and early diagnosis in older age

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## Introduction

Secondary prevention and early diagnosis of disease play a critical role in preventing the onset of ill health and ensuring that people live into older age with a good quality of life. Secondary prevention activities refer to evidence based, preventive measures to help stop or delay disease based on an individual's risk, taken during an interaction between a patient and a clinician. Detecting disease at an early stage, when treatment options are more effective and less invasive, is also essential for improving health outcomes. National screening programmes are key to this, detecting disease early before people develop any symptoms.

The evidence base for secondary prevention and screening programmes is one of the strongest in medicine, and many of the interventions are cheap, highly effective and work rapidly to prevent more significant illness. Secondary prevention activities are different from, but mutually beneficial with, primary prevention, which generally involves government-led interventions occurring at a population level. Services focused on secondary prevention and early diagnosis were heavily impacted by COVID-19. Significant focus now needs to be given to restoring these services, enabling everyone to have the best chance of living well into older age.

## Secondary prevention of cardiovascular disease (CVD)

Cardiovascular disease (CVD) can have a significant impact on the lives of older people, making daily activities difficult and reducing independence. It is the largest contributor to disability adjusted life years (DALYs) and a major driver of health inequalities.[1] Poor cardiovascular health can lead to a number of major conditions more common in older age, including heart attacks, strokes, heart failure, chronic kidney disease and vascular dementia.

85% of CVD is estimated to be preventable, in part through actions to address physical activity, diet and nutrition, tobacco and alcohol.[2] These have been laid out in more detail in the previous section 4.2 on promoting and improving health. Action can also be taken to improve secondary prevention and early diagnosis of CVD. Many older people are living with undetected conditions such as atrial fibrillation, high blood pressure and high cholesterol. It is important to identify these individuals and provide them with the appropriate intervention to reduce their risk of a more significant CVD event such as a heart attack or stroke, which can lead to severely impacted quality of life.

The combination of an ageing population and improved medical care means that increasing numbers of people are living with CVD in later life. In 2020, 6.4 million people in England were

estimated to be living with CVD. Coronary heart disease (CHD) is the most common form of CVD in England, and is increasingly likely to develop as people get older. CHD can cause symptoms that interfere with daily life, such as angina, or can lead to even more significant CVD events such as a heart failure, stroke or heart attack. Secondary prevention interventions such as medications to lower blood pressure, decrease cholesterol levels and prevent blood clots can work rapidly and effectively to reduce the risk of a serious CVD event. In addition, the NHS Health Check programme aims to reduce CVD risk by providing personalised prevention advice. Preventing serious CVD events reduces the likelihood of someone being admitted to hospital and having to undergo cardiac interventions or stroke rehabilitation, both of which have potential long-lasting impacts on health, quality of life and independence.

920,000 people in the UK are estimated to be living with heart failure, with the average age of a heart failure patient being 75 years.[3] Improving early diagnosis of heart failure is particularly important; research shows that 80% of heart failure cases are diagnosed in hospital, despite 40% of these individuals experiencing symptoms that should have triggered an earlier assessment of their condition.[4] Early diagnosis of heart failure enables patients to live for longer in better health and reduces the need for hospital treatment.

## Cancer screening

Cancer is a major cause of ill health and poor quality of life in older age. One in two people in Britain will be diagnosed with cancer at some point in their lives.[5] The likelihood of developing cancer increases with age, largely due to genetic changes within our cells accumulating over time. This damage can occur naturally or as a result of exposure to risk factors such as smoking, alcohol and obesity. Someone's risk of cancer can therefore be reduced by adopting healthy behaviours across the life course, as discussed in the earlier health improvement chapter.

With life expectancy increasing, more people are now living to an age where they have an increased risk of developing cancer. Survival for many cancers has improved significantly over recent decades, as a result of advances in diagnosis and treatment, together with primary prevention such as reduced smoking rates. Many more people are therefore now surviving cancer and living into older age. The long-term side effects of treatments for cancers caught and treated early are generally significantly lower than for those caught late, and this can substantially reduce the impact of these cancers in older age.

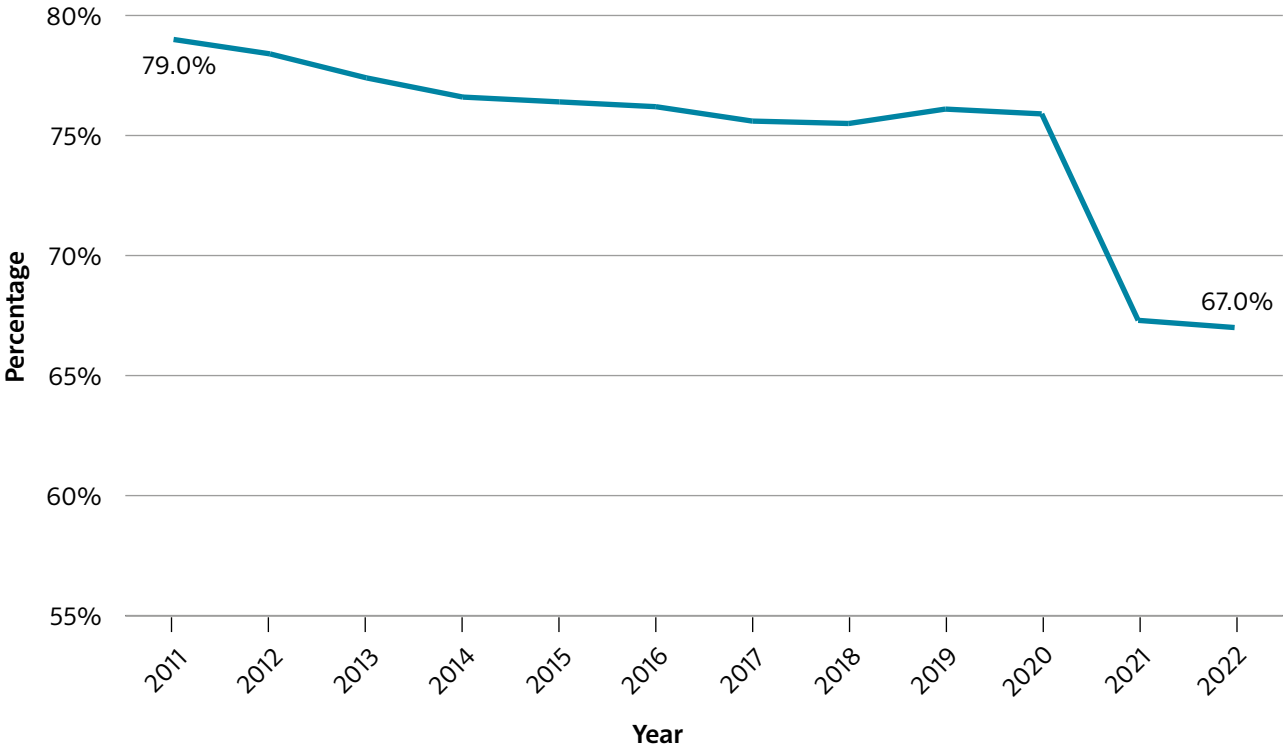
Identifying cancer early is a key way of reducing the impact of the disease on an individual's quality of life. Early diagnosis can be achieved through the provision of screening programmes, which are an effective tool for preventing cancer mortality and morbidity. Screening enables cancer to be detected at an earlier stage, when cancers are smaller, less likely to have spread, and where treatment is therefore both less invasive and more likely to be successful. Screening programmes are available for bowel and breast cancer, and a new targeted lung cancer screening programme has recently been announced. Screening is also available for cervical cancer, but this does not target older adults as incidence is greatest in younger women, and will decrease in the future due to human papillomavirus (HPV) vaccination.

## Breast screening

Breast cancer treatment is usually highly effective if disease is caught early. Breast cancer screening was introduced in 1988 and is currently offered to women from age 50 up to their 71st birthday, although there are studies to determine if this should be extended to higher ages. Breast cancer is the most common cancer among women in the UK. The incidence of breast cancer increases with age, with rates highest in women aged 90 and above.[6] In 2021/22, just over 20,000 women had breast cancers detected through screening, the majority of which were detected at an early stage.[7]

There has been a decline in coverage of breast screening over the last decade, which worsened when screening was disrupted by the COVID-19 pandemic (Figure 4.4). Screening coverage increases with age, from 45.0% among 50 to 52 year olds to 67.7% among those aged 70.[8]

**Figure 4.4: Breast screening coverage, women aged 50 to 70 years in England, 2009/10 to 2021/22**




Source data: NHS Digital, NHS Breast Screening Programme, England 2021-22[9]

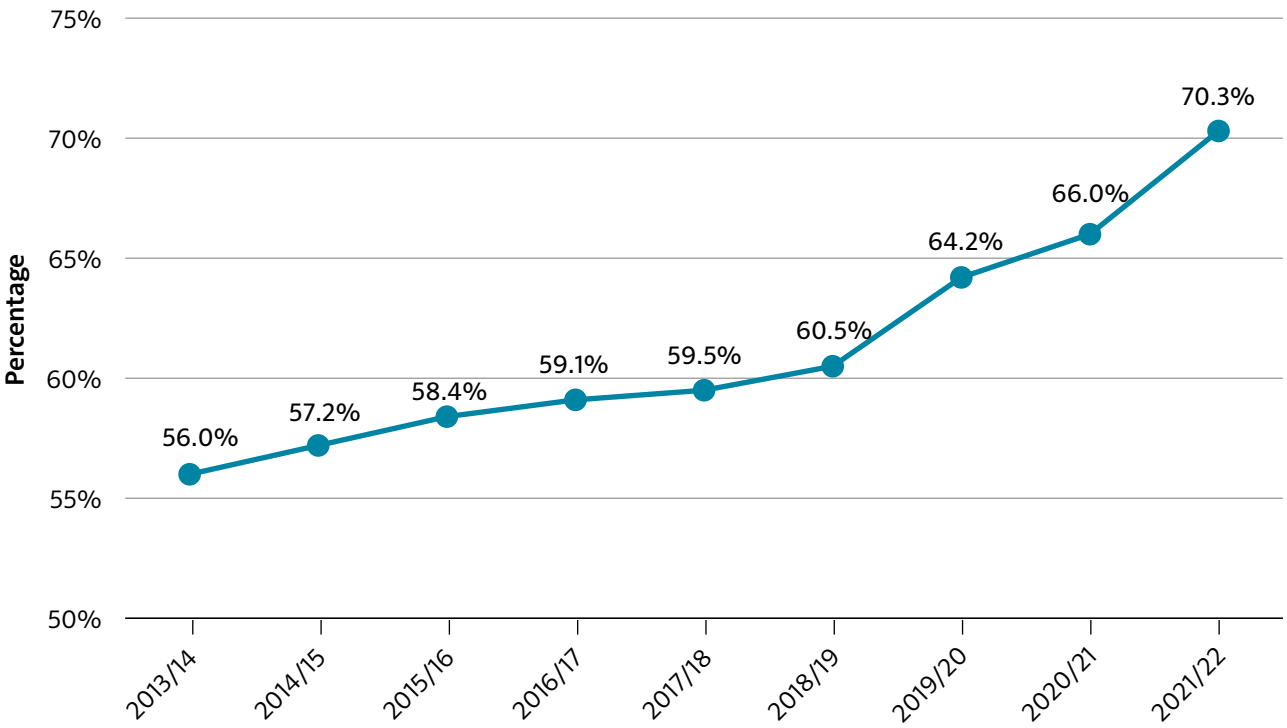
## Bowel cancer screening

Since 2006, bowel cancer screening has been offered every two years to men and women aged 60 to 74. Since 2021, the programme has been gradually expanding to lower the starting age for screening to 50 years. Bowel cancer is the second most common cancer in males and females aged 45 and over and this risk extends into older age.[10] The incidence of bowel cancer is strongly associated with age, rising considerably from the age of 50 and being highest in those aged 85 to 89.[11] Bowel cancer screening aims to detect bowel cancer early, before symptoms have developed. Treatment is less invasive for those diagnosed at an earlier stage and treatment

outcomes are more successful. 4,209 people were diagnosed with bowel cancer and 7,687 were diagnosed with high-risk adenomas (which have the potential to develop into bowel cancer) through the screening programme in 2019/20.[12]

Unlike with breast cancer, bowel cancer screening coverage has steadily increased over recent years, from approximately 56% in 2013/14 to 70% in 2021/22 (Figure 4.5).[13] Coverage particularly improved from 2019 onwards, when the faecal occult blood (FOB) test, which required multiple samples from different stools, was replaced by the faecal immunochemical test (FIT), which needs only a single stool sample.

**Figure 4.5: Bowel cancer screening coverage, people aged 60 to 74 years old in England, 2013/14 to 2021/22**




Source data: Office for Health Improvement and Disparities, NHS Screening Programmes in England[14]

## Targeted lung cancer screening

In 2023, the government announced the introduction of targeted lung cancer screening in England. The programme will target those aged 55 to 74 who are current or former smokers, assessed as being at high risk of developing lung cancer.

Lung cancer is primarily a condition of older age. Incidence is highest in those aged 85 to 89, and more than 40% of cases occur in people aged 75 years and over. The great majority of lung cancer cases are preventable. The greatest predictor of lung cancer is smoking status, with over 70% of lung cancers caused by smoking.[15] Air pollution is another important preventable risk factor, albeit less important than smoking.

Early diagnosis of lung cancer is critical. Outcomes are particularly poor as the disease tends to be diagnosed late, with many cases being diagnosed following an emergency presentation to

hospital Emergency Departments. Lung cancer symptoms are often not apparent until the disease has progressed to a late stage, when treatment is unlikely to be effective. Quality of life in those with lung cancer is poor; symptoms such as shortness of breath, fatigue and pain can be debilitating and treatment options are very limited, and related secondary brain cancer can cause debilitating symptoms. However, outcomes can be significantly improved if disease is detected early.[16] This is where a new, targeted screening programme could make a difference in improving the lives of those diagnosed with lung cancer.

## Inequalities in cancer screening

For all screening programmes, coverage varies across different groups in society and many groups experience barriers to attending screening. While screening uptake tends to be higher in older adults than in younger eligible cohorts, not all older people will be able to easily attend screening appointments. Screening coverage is consistently lower in people from more deprived groups and in those with disabilities.[17] There is evidence that people from ethnic minority groups are also less likely to attend screening, but estimates vary by ethnic group and across different screening programmes.[18] The impact of this on health in older age can be substantial.

## Other national screening programmes

Additional national screening programmes that screen for diseases other than cancer are provided across the life course. At present, there are two non-cancer national screening programmes that are available to older adults:

### Abdominal aortic aneurysm screening:

Abdominal aortic aneurysm (AAA) refers to a swelling of the aorta. It often occurs without any symptoms but is at risk of rupturing. A ruptured AAA is fatal in 80% of cases and causes approximately 5000 deaths each year in the UK.[19] Screening for AAA was introduced in 2015. The programme offers a one-off ultrasound scan to men aged 65, with follow-up scans or intervention determined by the diameter of their aorta.

### Diabetic Eye Screening:

In England the Diabetic Eye Screening programme has been implemented since 2003. The eligible population for these programmes is all people with type 1 and type 2 diabetes aged 12 or over. Following the introduction of the programme, the number of people with visual impairment caused by diabetic eye disease has reduced. This has fallen from 1334 in 2009/10 to 840 in 2018/2019. This reduction has been principally in adults aged 35 years and older, with a reduction from 1207 to 758 in the same period. Given the impact of significant visual impairment in older age this is an important programme.

# Early diagnosis of other age-related conditions

In addition to the well-evidenced screening programmes and early diagnostic services already established, additional tools may enable early diagnosis of health conditions that negatively impact quality of life for older adults. Earlier diagnosis can lead to earlier treatment and enable individuals to do the activities they enjoy for longer. The evidence-base for each of the conditions below is developing and national programmes are not widely available to older adults at the time of publication.

## Osteoporosis

Osteoporosis increases the risk of fracture of most bones; hip, wrist and spinal fractures are especially common and debilitating in older age. The QFracture and FRAX risk assessment tools predict the absolute risk of hip fracture, and major osteoporotic fractures (spine, wrist, or shoulder) over 10 years. A 10-year fracture risk of 10% is considered to be the threshold for arranging a dual-energy X-ray absorptiometry (DEXA) scan in men and women. The UK National Screening Committee (NSC) regularly reviews recommendations regarding national screening programmes. In 2019, the UK NSC published its most recent review into whether systematic screening strategies using these tools for populations of post-menopausal women would reduce the likelihood of osteoporotic fracture. The UK NSC concluded that a screening programme for osteoporosis should not be recommended.[20] However, analysis of a secondary outcome in one of the trials suggested that there may be an impact for screening on hip fracture.[21] Any conclusions based on secondary outcomes should be treated with caution. The committee acknowledged that the reduction in hip fractures may warrant further investigation. This highlights an area of ongoing research which will inform future reviews regarding national screening programmes for targeted populations.

## Dementia and Alzheimer's disease

Dementia in older age can be one of the most debilitating, and feared, outcomes in later life. Many causes of dementia, especially infectious and dietary causes, are less common than they were but Alzheimer's disease, vascular dementia and dementia with Lewy bodies remain major risks for older age. Mild dementia may have limited impact on people's lives, but as it progresses it can cause very significant reductions in quality of life. Three things are worth stressing. Most older people do not get dementia, and of those that do much is mild disease. There are several interventions which can delay dementia, including increased exercise and reduced vascular risk factors. We can diagnose and start to manage dementia earlier than we do currently.

An early diagnosis and access to the right services and support can help people take control of their condition, plan for the future and live well with dementia. There is strong evidence that an early diagnosis helps some people with dementia to continue to live independently in their own home for longer.[22] This helps to avoid early or unnecessary admission to a care home or hospital, enhancing the quality of life for people with dementia and carers, and providing substantial savings on long-term care costs.[23]

Drug and non-drug treatment are likely to be more effective the earlier that someone is diagnosed, and this is increasingly likely to be true in the future as new drugs are developed. Recent trials into novel immunotherapies for Alzheimer's disease suggests that the earlier in the disease process that the novel treatments were given, the greater the benefit to patients.[24]

However, dementia can be difficult to diagnose, especially if an individual has mild symptoms. Currently diagnosis relies on an initial assessment followed by referral to a memory specialist.[25]

Initial assessment includes a combination of physical examination, appropriate blood and urine tests to exclude reversible causes of cognitive decline, and cognitive testing. For cognitive testing, the National Institute for Health and Care Excellence (NICE) recommends the use of a validated brief structured cognitive instrument.[26] Memory specialists may offer a range of further investigations such as brain scans, genetic testing or psychiatric evaluation to enable a diagnosis.

Alzheimer's disease is the most common cause of dementia. There is ongoing research to better understand the causes of Alzheimer's disease and identify potential biomarkers of the condition. Researchers hope to identify biomarkers which may indicate developing dementia, in order to enable earlier diagnosis and treatment.

Some groups are more at risk of potentially preventable dementia than others and there are disparities in dementia diagnostic rates across the country.[27-28] More research is needed into dementia risk factors, including disparities such as those that exist between different ethnic groups, by gender and by deprivation. We are confident however that evidence shows many of the measures which improve wider health, such as stopping smoking, exercising regularly, reducing hypertension and other cardiovascular risk factors and decreasing alcohol intake will delay the onset of dementia including in those genetically susceptible to it.

## Frailty

Frailty is a health state indicating that an individual is likely to be at greater risk of a negative outcome following a minor change in their health or circumstances.[29] Early recognition of frailty by health and social care staff provides opportunity for earlier intervention. Holistic assessment-based interventions for adults with frailty are discussed in section 5.2. It is possible to recognise frailty either because of the clinical condition with which the individual presents or because it is actively looked for.

The British Geriatrics Society (BGS) 'Fit for Frailty' guideline recommends that older people should be assessed for frailty at all healthcare encounters using gait speed, the timed up and go test (TUGT) or the PRISMA 7 questionnaire.[30] The BGS note that these three tests have been shown to be highly sensitive but only moderately specific for identifying frailty, meaning that they may identify more patients with frailty than actually have it. Combining two of these tests may reduce the number of false positive results.[31] NICE recommend assessing frailty in patients with multimorbidity in primary care and community settings using the same tests.[32]

Within the last decade, an electronic frailty index (eFI) has been validated for identifying those within a large population at risk of frailty.[33] The eFI uses data in primary care electronic health

records on 36 conditions associated with frailty, such as fragility fracture, weight loss, mobility and polypharmacy. The tool helps primary care professionals identify mild, moderate and severe frailty and was found to be a robust predictor of nursing home admission, hospitalisation and mortality.[34]

The eFI is recommended for identifying people within population groups with multimorbidity who are at risk of unplanned hospital or care home admission.[35] There is also good quality evidence that physical frailty indicators are predictors of a reduced ability to carry out activities of daily living (ADLs) in people aged 65 years and older living in the community.[36]

## Sensory loss

In addition to those conditions discussed above, sensory impairment is a major contributor to disability in older age. Early identification of sensory impairment, such as sight or hearing loss can enable early treatment and prevent negative impacts on older adults' quality of life.

### Sight loss

Sight loss or impairment can have a profound effect on quality of life in older age. Visual impairment can also interact negatively with other sensory loss such as hearing or loss of balance. Many of the causes of sight loss can be slowed, prevented, reduced or in some cases reversed. These include refractive errors (short and long sightedness), cataracts, glaucoma, macular degeneration and diabetic eye disease.

In 1999, free sight tests were introduced for adults in England and Wales aged 60 years and over. Those aged over 60 are entitled to an NHS sight test every two years, or more regularly if deemed clinically necessary by an ophthalmic practitioner or optometrist.[37] Regular attendance at eye tests ensures that any changes in vision can be detected and any eye health risks can be managed appropriately. Attending an eye test will also increase the likelihood of early diagnosis of any eye health problems.[38]

### Hearing loss

Loss of hearing, which is often under-appreciated, can have a substantial effect on quality of life including social interaction. It is common in older age. Several causes of hearing loss can be slowed, and the effects reversed by current technology. Hearing loss is generally slowly progressive.

Hearing tests are available on the NHS following a General Practitioner (GP) assessment and referral. A GP may offer initial examination and advice before referring to an NHS audiologist for a full hearing assessment.[39] Some causes of hearing loss in older age, such as wax build-up, are entirely reversible. There is strong evidence that hearing technology, including hearing aids and (more rarely) cochlear implants, enable most people with hearing loss to stay socially active, reduce the risk of depression, and may reduce the risk of dementia.[40]

# Opportunities to improve secondary prevention and early diagnosis in older age

Many secondary prevention interventions and national screening programmes are focused on older age groups, who are often at the highest risk of developing disease. They help to delay the onset of disease and prevent ill health in later life. However, the importance of these activities can often be overlooked. Opportunities to engage in secondary prevention exist throughout the NHS and should not be seen solely as a role for general practice or the relevant specialty, such as cardiologists. There are many professionals across the health and social care sector and beyond, who can play a role in supporting secondary prevention activities. This is especially important to consider for older people, who are often in contact with a wide range of services to support their health and wellbeing. Initial risk assessment to inform personalised secondary prevention interventions could also take place in a broader range of settings including supermarkets, libraries, pharmacies and other settings that form part of older people's daily lives. This is particularly important for ensuring that interventions reach those at the greatest risk, as uptake of secondary prevention and screening is often lowest among population groups where disease prevalence is highest.

Secondary prevention and screening activities were heavily impacted by the COVID-19 pandemic. It is essential to continue restoring these services, and to do more to extend these services to groups with historically low uptake. Narrowing the gap between the best and least good areas for outcomes such as CVD and cancers remains one of the most important mechanisms for reducing the inequalities that exist in health outcomes across England and enabling everyone to experience the best possible quality of life into older age.

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# 4.4 Reducing the risk of falls

## Falls prevention

Falls, and their resulting fractures, are a common and serious health issue faced by older people in England. People aged 65 and older have the highest risk of falling; around a third of people aged 65 and over, and around half of people aged 80 and over, fall at least once a year. Falling is a cause of distress, pain, injury, loss of confidence, loss of independence and mortality.[1]

Falls and related injuries are increasingly common. In England, emergency admissions for falls in people aged 65 have increased over the last 10 years, from 185,000 in 2010/11 to 223,000 in 2020/21.[2]

The causes of falls can be complex and overlapping, therefore preventing older adults from falling is a societal challenge that requires involvement from multiple sectors and organisations. Falls prevention includes medical, environmental, behavioural, and human factors, which impact across the NHS, social care, housing and the built environment and the voluntary and community sector.

Published in September 2022, the *World Guidelines for Falls Prevention and Management for Older Adults: A Global Initiative* provide a framework and expert recommendations to healthcare and other professionals working with older adults on how to identify and assess the risk of falls.[3] This helpful review of the most up to date evidence highlights some key areas of focus for falls prevention.

Health care professionals cannot rely solely on older adults reporting falls, as studies indicate that many adults do not report falls for a variety of reasons.[4] This is especially true for men with less than a third mentioning them to their clinician if not asked directly.[5] In view of this, it is recommended that clinicians routinely ask about falls in all their interactions with older adults. Furthermore, older adults may have a low level of knowledge about causes and prevention of falls, their personal risk of falling and how best to minimise the likelihood of future falls.[6-7]

There is consistent evidence that gait and balance impairment are the domains which most consistently predict the likelihood of future falls.[8] Therefore, the guidelines recommend including gait speed for predicting falls risk.[9]

There is strong evidence that the use of several widely used medications increases fall risk in older adults, that a structured approach to prescribing improves identification of fall-risk-increasing drugs, and that medication review and deprescribing of these drugs can reduce fall risk.[10-11] Polypharmacy, which refers to the concurrent use of multiple medications by one individual, can also increase the risk of falls.

Dementia and mild cognitive impairment double the risk of falls and falls-related injuries including hip fractures, fractures of the arm and head injuries.[12] This means that it is important that an assessment of cognition should be included as part of a fall risk assessment in older adults.

Recurrent unexplained falls are commonly associated with a cardiovascular cause, and therefore a fall risk assessment should also include a detailed cardiovascular assessment.[13] The management of many of the risk factors for falls (such as gait and balance problems) has wider benefits beyond falls prevention such as improved physical and mental health capacity, function and quality of life.

A key part of any fall risk assessment and efforts to prevent falls should include an evaluation of environmental factors. Environmental risk factors are influenced by the interaction between a person's exposure to environmental fall hazards (such as slippery stairs, poor lighting at entrances, lack of a grab rail), behaviour of the individual (such as clutter in walkways, unsafe climbing on chairs or ladders) and their physical capacity.[14]

The evidence consistently recommends assessment by clinicians trained to do so, such as occupational therapists. This should include the assessment of environmental hazards, physical and cognitive capacity and behaviours of the individual, and an understanding of the effect of the environment on function.[15]

There is an increasing volume of evidence for the effectiveness of exercise programmes for fall prevention for older adults. The effective programmes typically include balance and functional exercises combined with strength exercises. Exercise programmes need to be of sufficient intensity and duration and should be delivered in a way that ensures safety and considers functional abilities.[16]

The guidance recommends that exercise programmes should be delivered by appropriately trained professionals, such as physiotherapists, who can adapt exercises appropriately to functional status and co-morbidities.[17]

In addition, there is specific evidence linked to the secondary prevention of falls following a hip fracture. The strength of evidence for tailored exercise in preventing falls in older adults after hip fracture is moderate.[18] Recommendations for this group focus on mobility rehabilitation after hip fracture and include balance training and adequate pain control.[19]

Falls are often multifactorial. Some factors may be difficult to reverse such as a loss of proprioception. Others such as visual loss (for example, due to cataracts), loss of muscle strength due to deconditioning and drugs which lead to postural hypotension can be improved.

Although the causes of falls and fractures can be complicated, the simple measures that health and social care professionals can undertake should not be underestimated. By acknowledging the risk of falls in older adults and adopting some of the principles outlined in this section, the prevention of some of the harm caused by falls is an achievable goal.

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# 4.5 Maintaining cognitive and mental health in older age

## Introduction

Cognitive health refers to a person's ability to think, learn, and remember, whereas mental health is our psychological or emotional health. However, the two are linked. Without good cognitive health, we may be at greater risk of poor mental health, and struggles with mental health conditions can affect our cognitive wellbeing.

Cognitive functions include the domains of perception, memory, learning, attention, decision making, and language abilities. For example, mild cognitive impairment happens when a person has a slight decline in their cognitive abilities, like issues with memory or the completion of complex tasks. Whereas, mental health disorders include anxiety, depression and personality disorders.

## Cognitive health

Some changes in cognition are normal with age, such as slower reaction times and reduced problem-solving abilities. The speed with which information is encoded, stored, and retrieved also generally slows as people age.[1] However, many older adults outperform their younger counterparts on intelligence tests that draw on accumulated knowledge and experience. The main medical causes of impaired cognition in later life are dementia and cognitive impairment following a stroke. Most older people reach the end of their days without either. They are however very important in reducing quality of life and independence in those who experience them.

### Dementia

The predominant cause of poor cognitive health in older adults is dementia. The overall number of people living with dementia is expected to rise over the next few decades as the number of older adults rises (see the graph of projected dementia prevalence, figure 2.21 in section 2.3). The most common types of dementia seen in older adults are Alzheimer's disease, vascular dementia and dementia with Lewy bodies.

A 2020 *Lancet* Commission on dementia prevention, intervention and care identified 12 modifiable risk factors which may prevent or delay up to 40% of dementias.[2] The recommendations linked to these risk factors are summarised in Table 4.1.

**Table 4.1: Recommendations for the prevention of dementia identified in the 2020 Lancet Commission**[3]

| **Recommendations for the prevention of dementia identified in the 2020 *Lancet* Commission**[4] | |
|---|---|
| Minimise diabetes | Maintain frequent exercise |
| Treat hypertension | Reduce occurrence of depression |
| Prevent head injury | Avoid excessive alcohol |
| Stop smoking | Treat hearing impairment |
| Reduce air pollution | Maintain frequent social contact |
| Reduce obesity | Attain a high level of education |

The evidence presented recommends that to prevent dementia, blood pressure should be maintained within the normal range from around age 40 years. Blood pressure medication (antihypertensives) should be used when necessary.

As discussed in Section 4.2, the Commission reiterates the importance of limiting alcohol use, doing frequent exercise and the avoidance of smoking to reduce the risk of dementia. In addition, a reduction in rates of obesity and diabetes will support prevention of dementia.

The Commission encouraged the use of hearing aids for hearing loss and suggested reducing the risk of hearing loss by protecting the ears from excessive noise exposure. Further recommendations include reducing exposure to air pollution and second-hand tobacco smoke, and the prevention of head injuries. An additional societal recommendation is the provision of childhood education. Higher levels of education have been associated with a lower risk of dementia.

Many of the above risk factors are likely to be seen at a higher prevalence in groups encountering health inequalities. Those that identify as being from minority ethnic groups or marginalised populations may be at increased risk.[5] It is therefore important to provide opportunities for these populations to stay healthy as they age. Examples may include developing environments that enable more physical activity, improving air quality in more polluted areas, and to reduce potential exposure to excessive noise.

## Stroke-related cognitive dysfunction

Mild, moderate or severe cognitive impairment can occur in individuals following a stroke. The majority of strokes in older adults are caused by underlying cardiovascular disease, and can therefore be delayed, prevented or reduced in severity through primary or secondary prevention measures discussed in sections 4.2 and 4.3.[6] In addition, rapid treatment of stroke

and access to stroke rehabilitation can reduce the likelihood of long-term cognitive impairment and lead to improvements in cognitive function.

# Mental health

Older people are no less prone to mental health problems than younger adults, although such difficulties often manifest differently in older age.[7] Mental ill health may be associated with considerable individual suffering, reduced social interaction, higher use of health and social care services and poorer outcomes for physical illness. However, mental health symptoms in older people are far less likely to be volunteered, detected or treated. Specifically, older people are less likely to complain about loss of ability linked to mental health as they may consider these symptoms to be a normal part of ageing. The presentation of mental illness in older people is more likely to be with physical rather than emotional symptoms.[8] The stigma attached to mental health multiplies the difficulties for older people with mental health problems.[9]

Mental health and wellbeing of older people is often neglected across the spectrum of mental health improvement interventions and services.[10] Unfortunately, older age can be when the cumulative impacts of poor mental health and adversity throughout life are most evident.

## Depression

Depression is the most common mental health condition in people aged 65 years and over. One in four older people experience depression, but fewer than one in six seek help from their General Practitioner. Rates are higher among people living in care homes, with around four in ten residents experiencing depression.[11] There has been growing concern amongst mental health professionals about the sometimes overlooked prevalence of depression in older people, particularly in those with underlying chronic physical health conditions. In addition, depression has been linked to dementia, which can compound the risks of isolation, disempowerment and cognitive decline.[12]

## Anxiety

Anxiety is another common mental disorder which may affect between 10 and 20% of adults aged 65 years and over.[13] Anxiety in older adults is most often seen in the context of a life-long history of anxiety, which the factors associated with ageing may have exacerbated. Anxiety can also be a presenting feature of dementia, depression, and physical illness, and should always prompt investigations to exclude any underlying medical cause.

## Severe mental illness in later life

Older adults may also experience severe mental illness, usually a longstanding condition that developed at a younger age. It is uncommon to develop new onset severe mental illness such as bipolar affective disorder or psychotic disorder in later life.

Older adults with pre-existing bipolar disorder have different symptoms to those with late-onset disease. Schizophrenia developed after the age of 65 is more common among women

and often presents with a different symptom profile to when developed at a younger age. Although only a small percentage of older adults will experience these serious mental illnesses, as a result of the ageing population the absolute number of older adults with these conditions will increase and comprise a larger proportion of all people with these diagnoses in the future.

Eating disorders also occur in later life but are often unrecognised. Triggers for disordered eating in older age include life transitions, loss and trauma, bereavement and the onset or worsening of other health symptoms.[14]

Suicide rates fall as people age, but then rise again in later old age, particularly in men. Self-harm is less common in later life but older adults who self-harm have increased suicidal intent and should be considered at high risk of suicide. Risk factors for suicide and self-harm in later life include: underlying psychiatric illness (particularly depression); a deterioration of physical health that impairs independence; chronic pain; and stressful life events such as loss, breakdown of relationships and serious financial problems. These can be compounded by feeling socially disconnected and the perception of being a burden to others.

## Prevention and delay of poor mental health in later life

To maximise mental wellbeing for all, preventing mental health problems in later life is vital. Poor mental health in older age is not normal and should not be treated as if it is. Mental health conditions can often be prevented or treated. Retirement can be associated with a period of high wellbeing. This can be a time when people pursue leisure activities and volunteering, which can have as many benefits as paid employment. For others at a similar stage, a lack of choice may impair wellbeing. This could be enforced retirement or feeling compelled to continue to work for economic necessity beyond their intended retirement age.[15]

Effective interventions exist to prevent or delay mental ill health arising, promote mental wellbeing and resilience, and to treat mental disorders and their associated impacts. [16] However, evidence for public mental health intervention is more limited compared to interventions focused on physical health.

In June 2022, the Royal College of Psychiatrists summarised the evidence on public mental health interventions.[17] Within this publication, they highlight evidence to maintain mental health in adults of all ages, which may be relevant for older adults.

For example, existing evidence supports that interventions which promote social interaction, such as volunteering or enhancing community engagement, may improve wellbeing and reduce depression. There is strong evidence that physical activity prevents, reduces or delays depression and anxiety. For individuals that have engaged with primary care-based psychological and educational interventions, small reductions in depressive symptoms have been identified. The evidence review identified that loneliness is associated with development of depressive symptoms especially later in life. In relation to this, simple signposting services are effective to reduce social isolation and loneliness in older people.[18]

Early medical intervention can have useful effects to delay or prevent mental health outcomes. For example, a meta-analysis suggested that antidepressant prophylaxis following acute stroke

is likely to reduce risk of depression.[19] Wider medical studies are needed to examine the interactions of physical and mental health in older age.

Although there is evidence to suggest that some of these interventions are effective across the life course, older adults are underrepresented in practice and in research.[20] Given that older adults may present differently and can face barriers to accessing relevant services, their needs should be considered when evaluating how best to prevent mental ill health in this group.

## Summary

Mental and cognitive health conditions in older adults are not an inevitable part of ageing. There are positive things people can do at any age to maintain their mental and cognitive health. Dementia prevention, delay and care continues to be prioritised by research funders. However, mental health is a major cause of poor health and disability in older age, and it arguably does not receive the same attention as cognitive or physical health conditions.

If an older adult does develop a mental health condition, the right support can enable recovery and have a profound impact on wider quality of life. However, as it stands, older adults experience reduced access to talking therapies compared to other age groups and can find that specialist support (for example, from psychiatrists specialising in older adult's mental health) may not be available in their area. Given that mental health care and research is being increasingly seen as a priority for improvement and investment, it is important that older people's mental health needs are not left behind.

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# 4.6 Preventing infections in older adults

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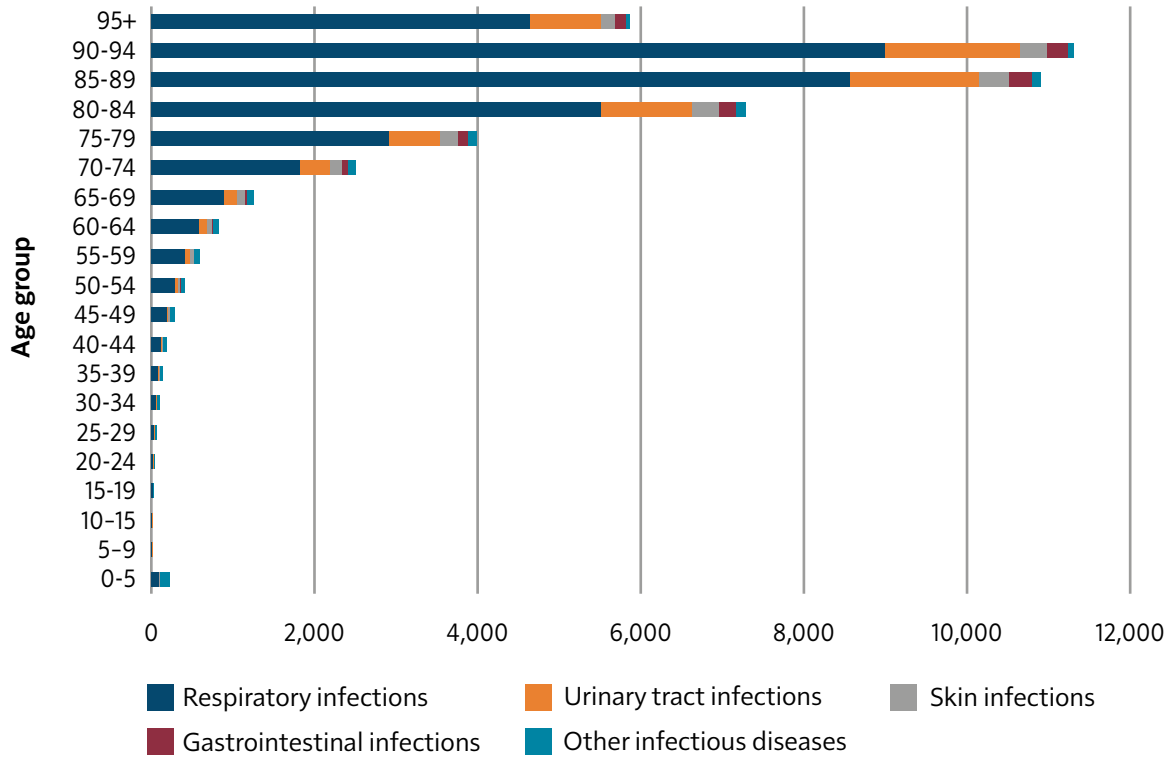
## Introduction

Worldwide, great progress has been made in reducing both illness and deaths due to infectious diseases. Improvements in sanitation and hygiene, vaccination and advances in medical treatment have all contributed to this decline.

Despite this however, infections remain a major cause of illness and death in older adults, particularly those with multiple morbidities. As people age, their immune system weakens, making them both more likely to catch infections, and more likely to get seriously ill if they catch them.

Infections which in younger life would cause annoying but minor symptoms can cause significant impacts in later life. For example, relatively common infections such as urinary tract infections (UTIs) or pneumonia, are far more likely to lead to sepsis, delirium and subsequent cardiovascular events such as stroke or heart disease in older citizens than those who are younger. These can have a significant impact on subsequent quality of life. Substantial functional decline can be seen after many infections. Furthermore, repeated infections can have a direct negative impact on quality of life of older people if they lead to repeated hospital admissions. Mortality is also much higher in older age groups. Figure 4.6 compares the number of deaths from infectious diseases for different age groups in 2019.[1]

**Figure 4.6: Estimated number of deaths from infectious diseases for different age groups in 2019, England**




Source data: Global Burden of Disease Study 2019 (GBD 2019), Institute for Health Metrics and Evaluation (2020)[2] – Used with permission. All rights reserved

Factors that may contribute to the increased risk of infectious disease among older adults include altered immune function, changes to mobility and functioning, nutrition and the influence of the environment, with a higher risk of infection seen in certain hospitals and residential care settings.[3]

Severe infection and sepsis are associated with unplanned hospital admissions.[4] Between 2021 and 2022, there were over 100,000 emergency admissions for sepsis in England and Wales, and the mean age for patients admitted with sepsis was 71 years.[5] Older adults make up the majority of those admitted to hospital with sepsis and are likely to have multimorbidity and some functional limitations.[6]

The most common forms of infection causing hospitalisation are infections of the respiratory system and urinary tract. In addition, skin and gastrointestinal infections are a common cause of ill health in older adults.

Prevention and control options depend on the continued availability of antibiotics and include population vaccination programmes and infection prevention in key community settings.

In this chapter we cover some of the major pathogens contributing to infectious disease morbidity and mortality in older people, current and future control options available to protect people from avoidable disease and the risk of antimicrobial resistance.

# Infection types in older people

## Respiratory infections

Community-acquired pneumonia (CAP), influenza and other respiratory infections remain significant causes of admission to hospital among older people.

CAP is a common acute infection in older adults. The risk of serious illness and hospitalisation increases with age. The most commonly identified cause is the bacteria *Streptococcus pneumoniae*, for which there are an estimated 22,000 admissions per year among 65 to 74 year olds and more than 43,000 admissions per year among over those aged 75 and over.[7] *Streptococcus pneumoniae* can cause severe invasive diseases such as meningitis and therefore a one-off dose of vaccine is offered to everyone aged 65 or over in the UK. Once a person is infected, pneumonia can increase the impact of frailty and vice versa. This has been linked to both an acceleration in functional decline and mortality.[8]

Influenza virus also causes significant levels of illness among older people. In winter 2022/23, an estimated 49,000 people of all ages were admitted to hospital with confirmed influenza. The highest rates of influenza hospitalisation were seen in those aged 75 years and over.[9]

The hospitalisation rate of many other common respiratory pathogens increases with age, including respiratory syncytial virus (RSV), human metapneumovirus, group A Streptococcus and parainfluenza. English data from 2010 to 2017 show that the hospitalisation rate for RSV and parainfluenza viruses is over three times greater for those aged over 75 years compared to those aged between 65 and 74 years.[10]

## Urinary tract infections

Urinary tract infections (UTIs) are a common cause of ill health and antibiotic usage in older people. The rate of UTIs increases with frailty. It is also higher among women than men, and among those who are diabetic.[11] A 2022 survey of all pharmacies in England identified that 20% of antibiotic prescriptions collected were for urinary infections.[12] Whilst UTIs seldom result in severe outcomes in younger adults they can be much more serious in older adults with significant morbidity and mortality.

Whilst most UTIs are managed in primary care, between 2009 and 2020, the rate of emergency admissions for UTIs increased.[13] The most common cause of *E. coli* (*Escherichia coli*) bloodstream infections (septicaemia or sepsis) is from an initial infection of the urinary tract. One in ten people with *E. coli* bloodstream infections are care homes residents, of whom it is estimated that a quarter have an indwelling urinary catheter.[14] There is a vital role for infection prevention and control measures, such as management of catheters, as well as good antibiotic stewardship, in reducing the occurrence and recurrence of UTIs and especially antibiotic-resistant UTIs in older people.

## Gastrointestinal infections

Norovirus is one of the most common causes of viral gastroenteritis in older people in England. It is estimated to be responsible for up to 20% of gastroenteritis hospitalisations in older adults and has been associated with an increased risk of death in this age group.[15] Norovirus is commonly seen in older adults and is reported as being the most frequent cause of infectious gastroenteritis outbreaks in care homes.[16] Norovirus is highly infectious and can pose a risk for care home residents, visitors and staff. Reports of norovirus outbreaks in care homes and hospitals have increased due to improvements in surveillance and dominance of highly infectious strains.[17]

Another gastrointestinal infection associated with outbreaks is *Clostridium difficile* (*C. difficile*). *C. difficile* infection typically occurs after use of antibiotic medications. It most commonly affects older adults in hospitals or in residential care settings and spreads from person to person via contaminated living environments.[18] Food-borne bacteria such as *Salmonella* can also cause gastroenteritis and hospital admission, especially in older adults.[19]

## Skin infections

There are a variety of skin infections that are more common in incidence and severity in older adults compared to younger people. These include cellulitis (in particular of the lower legs), folliculitis, impetigo, infected ulcers and shingles. Older adults are more prone to skin disease, such as infections, because older skin is less oily, less elastic, thinner and it takes longer to heal.[20] Reductions in immunity can make these infections more severe.

*Staphylococcus aureus* and ß-hemolytic streptococci are the most common organisms that cause bacterial skin infections. They are typically associated with cellulitis, impetigo and folliculitis.[21]

Herpes zoster (also known as shingles) is caused by reactivation of latent varicella zoster virus. Shingles is more frequent in the frailest older people, and can lead to a reduction in function and quality of life.[22]

The rate of hospital admission for infections of the skin and subcutaneous tissue increased year on year between 1999 to 2020, with rates 1.4 times higher in 2020 than they were in 1999.[23] Skin diseases are the most frequent reason for general practice consultations in older adults, in England and Wales.[24]

# Countermeasures

Society can protect older adults from infectious diseases by introducing and maintaining a number of important countermeasures.

## Vaccination

Vaccination can help prevent or reduce the severity of certain infections across the life course. Since the introduction of vaccines in the UK, diseases that used to kill or disable millions of

people have either been either eradicated or are seen very rarely. One hundred years ago, infectious disease was the most common cause of death for older adults.[25]

Vaccination can benefit older adults directly as receiving a vaccine will prime their immune response to future infections, or indirectly through vaccination of other population groups. For example, vaccine programmes for children decrease the prevalence or incidence of some infections in the population making it less likely for older adults to be exposed.

The first vaccination programme for all older adults in England was introduced in 2000. This influenza (flu) vaccine programme was available to all adults over the age of 65.

Since that time, technological developments have improved the effectiveness of these vaccines and new vaccine programmes have been added. In the UK today, there are adult vaccine programmes for flu, pneumococcal disease, shingles and COVID-19.

We anticipate improvements in the effectiveness of existing vaccine programmes and the introduction of new vaccines for older adults. We discuss some of these developments in more detail below.

### Influenza (flu)

The flu vaccination was recommended in the UK for clinically at-risk groups from the late 1960s. In 2000, the programme was expanded and made available to all people aged 65 years and over.

Since then, technological developments have allowed us to improve the vaccine programme for older adults to enable one vaccine to cover more flu subtypes (quadrivalent) and improve the body's immune response (adjuvanted).

Each year when the available flu vaccine strains match circulating influenza virus strains well, the vaccines typically provide between 40% to 60% protection. In years with a poor matching of vaccines to strains, protection will be lower. Technologies that are likely to improve flu vaccine effectiveness include mRNA-based vaccine developments which are currently in Phase 3 clinical trials. The flexibility of mRNA technology and its rapid manufacturing process could potentially enable better strain matches in future years, and generate broader immune responses.[26-27]

### Pneumococcus: reducing pneumonia, sepsis and meningitis.

Pneumococcus (*Streptococcus pneumoniae*) is a common cause of pneumonia and sepsis in older adults, and can cause meningitis. Pneumococcal vaccination of children can reduce incidence in older adults; vaccination of older adults confers additional advantages. The pneumococcal vaccine has been recommended for clinically at-risk groups since 1992.[28] The adult pneumococcal immunisation programme was introduced in the UK in August 2003 and offered a single dose of pneumococcal polysaccharide vaccine (PPV) to people aged 80 years and over in addition to those at high risk under 65 years of age.[29,30] In April 2004, the programme was expanded to include all people aged 75 years and over. Since April 2005, all people aged 65 years and over have been eligible for a single dose of PPV.

PPV (also currently known as PPV23) is an inactivated vaccine that contains purified polysaccharide from 23 serotypes of pneumococcus. Most healthy adults develop a good antibody response to a single dose of PPV.[31] Among people aged 65 years and over, PPV offers moderate short-term protection against invasive pneumococcal disease caused by the 23 serotypes targeted by the vaccine.[32]

## Shingles

Shingles, caused by reactivation of chicken pox virus in later life as the immune response fades, can cause severe pain. This can be long-lasting leading to significantly decreased quality of life. A national shingles immunisation programme was introduced into the routine schedule for adults aged 70 years in September 2013. At the time, the programme vaccinated eligible individuals using a single dose of Zostavax®, which is a live attenuated vaccine. The choice of age group was based on evidence of cost effectiveness of Zostavax®. This age group were considered likely to have the greatest ability to benefit from vaccination.[33]

In 2019 the Joint Committee on Vaccination and Immunisation (JCVI) recommended Shingrix®, a non-live vaccine, should replace Zostavax® in the routine programme and that it should be offered routinely to adults aged 60 years based on cost effectiveness modelling.[34] From the 1st September 2023, those turning 65 and 70 became eligible to get the vaccine after their birthday, in addition to those already aged between 70 and 80. The current plan is for eligibility to be expanded to include those 60 and up by September 2033, in line with the JCVI recommendation.

## COVID-19

COVID-19 does not need much introduction; it is an example of an infection whose health harms are strongly tilted towards older adults. A COVID-19 vaccine was first offered to all adults aged 70 and over in January 2021. Since then, further doses have been offered and eligibility for these has varied over time. The vaccines available have also been updated according to the latest technology and to match with the latest circulating variants.

Protection increases with the number of doses received, for example the effectiveness of the vaccine against hospitalisation rose from 55.7% with one dose to 77.6% with three doses.[35] Due to the continuous and rapid evolution of the virus, this vaccine programme is under constant review and it is too early to say how long it will be needed for.

In addition to improvements to existing vaccine programmes, advances in vaccine technology provide opportunities for new vaccine programmes in response to developing infectious disease threats. For example, recent developments in vaccines for infections such as respiratory syncytial virus (RSV) and *Clostridium difficile* may enable us to protect older adults from future health harms.

## Respiratory syncytial virus (RSV)

The JCVI recognises the significant burden of RSV infection in the UK older adult population. They have identified the unmet public health need and the considerable impact on NHS

services during the winter months. There are currently three RSV vaccine products in development, and in June 2023 JCVI recommended the introduction of an RSV vaccine programme for older adults aged 75 years old and above. Plans for delivery and implementation of this programme are still under development.[36]

### *Clostridium difficile* (*C. difficile*)

*Clostridium difficile* can cause prolonged morbidity as well as mortality in older adults, generally after antibiotic treatment, which is in itself much more common in older adults. Emergence of new *C. difficile* strains which are more infectious and more likely to cause severe illness and death has made treatment more challenging. Few drugs have proven to be effective against *C. difficile* infection and there are concerns about antibiotic resistance even to these.

Vaccination provides an opportunity to prevent *C. difficile* infection. There are vaccines currently in development with Phase 3 clinical trials of some candidate toxoid-based vaccines completed last year.[37]

The vaccine market has historically focused on childhood vaccines, but the changing demographic structure of UK society supports the need for vaccine programmes that target more older adults too. The development of current and new vaccination programmes provides an opportunity to reduce the burden of infectious disease in future older adult populations.

## Infection prevention and control measures

Preventing and reducing the transmission of infectious diseases through basic infection prevention and control (IPC) practices is another countermeasure essential to ensuring older adults stay healthy.

Infectious diseases can spread more easily in settings where older adults often spend time, such as in hospitals and care homes. Regular contact with others in shared spaces mean that infection can be passed around and it is vital to take steps to prevent infection occurring.

Interrupting the route of transmission is key to infection prevention and control. The five main routes of transmission for infections can be summarised as:

- respiratory;
- ingestion of contaminated food or water;
- touching an infected individual;
- through vectors (for example, through insect bites from mosquitoes or ticks); and
- sexual contact or exposure to infected bodily fluids (such as blood).

Respiratory, ingestion of contaminated food and touch are all particularly important routes for infection in older people. Older people often need more manual care, making touch diseases more common in this age group. The need to have close care and minimise heat loss in winter can be risk factors in older people for respiratory infections. Interrupting transmission routes can be achieved through a combination of simple measures such as hand hygiene, respiratory

and cough hygiene and, where close contact is needed, use of personal protective equipment (PPE). In home and caring environments, the safe management of equipment, clothing, waste and body fluid spills are all important.

Certain issues related to some of the transmission routes which will become increasingly critical to solve in future are:

- Respiratory: A particularly important health protection challenge in health and care settings is ventilation, where the risks of infection, air pollution and cold exposure intersect and conflict with one another, so a balance needs to be struck or innovative engineering solutions need to be found.
- Ingestion of contaminated food: Advice regarding the preparation and eating of certain food products for vulnerable groups needs to be balanced with the importance of healthy nutrition. An appropriate risk judgement will need to be considered when making recommendations for all older adults.
- Sexual contact: Sexually transmitted infections (STIs) are more common in younger adults but in recent years there has been a rise in the number of STI diagnoses in older adults. Sexual health services and campaigns typically focus on younger populations. Given rising rates in older people, current sexual health provision may need to adapt to target a broader demographic.

## Reducing the risk of antimicrobial resistance

Antimicrobial resistance (AMR) is a global problem that makes infections harder to treat with existing medicines. Older adults are more susceptible to AMR-related illness for several reasons including physiological changes leading to higher incidence and greater severity of infections, and comorbidities.[38] In addition, this population may be at greater risk of developing AMR-related illness due to higher exposure to infection from health and care settings.[39,40] Long-term care facilities for older people may also increase exposure to antimicrobial resistant bacteria because they have been recognised as reservoirs of resistant bacteria and have high rates of antimicrobial prescribing.[41,42] High standards of IPC reduce the opportunities for infections to spread and for resistance to develop.

Given that older adults are more susceptible to infections and are more likely to develop serious illness following infection, frequent prescribing of antibiotics for older patients is common practice. For example, pneumonia is the major infection-related cause of death in older adults, and UTI is the most common bacterial infection seen in older adults. The large volume of antibiotics prescribed has contributed to the emergence of highly resistant pathogens among older adults, including methicillin-resistant *Staphylococcus aureus* (MRSA), penicillin-resistant *Streptococcus pneumoniae*, vancomycin-resistant enterococci, and multiple-drug-resistant gram-negative bacilli.

Actions we can take to reduce the risk of AMR as outlined in the UK's AMR National Action Plan[43] are:

- Improve IPC measures in animals and humans;

- Optimise prescribing practice;
- Improve professional education, training and public engagement;
- Support development of new drugs, treatments and diagnostics;
- Improve access to and use of surveillance data; and
- Identify and prioritise AMR research needs.

## Summary

Infectious disease poses a significant and often underappreciated risk to an ageing population. However, many infections are preventable through the countermeasures discussed in this section. Vaccines and new technological developments are essential tools to mitigate the risk of established and novel infections. Future prevention and mitigation strategies will be based on the latest technology, population demographics and environmental circumstances. However, it is important not to forget the substantial contribution of existing, proven techniques including stringent IPC practices, antimicrobial stewardship and current vaccine programmes. We should continue to promote these activities, to ensure we maintain the significant progress already made in reducing the burden of infectious disease for older adults.

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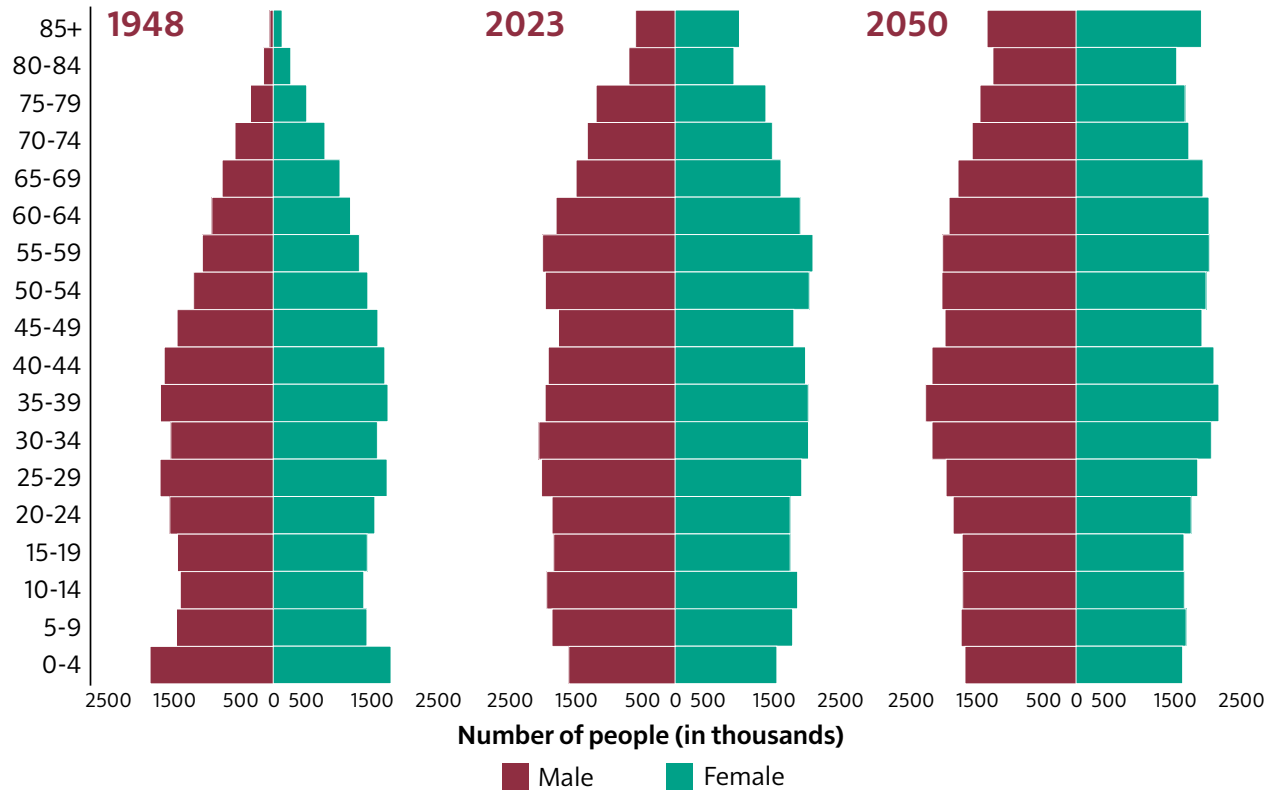
# 5 Supporting older adults to live well with disease

## 5.1 A health care system for those with multimorbidity and multiple long-term conditions

If we live long enough, we will gradually accumulate medical conditions which are more likely in older age. This has been known since the dawn of medicine. What has changed is the proportion of the population living old enough to reach the point when this becomes likely. If we compare, using population pyramids, the proportion of the population old enough to have multimorbidity associated with older age in 1948 (at the start of the NHS), now and in 2050, the size of the potential population at risk of age-related multimorbidity has increased and will continue to do so at a steady rate (Figure 5.1).

**Figure 5.1: Population pyramid showing the distribution of the age and sex of the population for England and Wales, for 1948, 2021 and 2050**




Source data: Office for National Statistics (ONS), UK population estimates and National population projections: 2020-based interim

Medicine is currently optimised for people with single diseases. This is however not the lived reality for a very high proportion of older citizens; once they start to have one medical condition several more may follow on fairly soon after – what is often termed multimorbidity. The greatest drivers of multimorbidity are older age and poverty. In the UK, a high-income country, age is the most important driver of multimorbidity. Many citizens will begin to accumulate medical conditions as they enter later middle-age and these steadily increase in number over the rest of the life course. Those living in deprivation will start to accumulate these much earlier in chronological life, and may enter older age with several medical conditions. This is shown in a classic study from 2012 by Barnett and others (Figures 5.2 and 5.3),[1] and has been shown repeatedly since.[2] The medical profession needs to adapt quite significantly to face this future reality, as the proportion of the population living in older age becomes greater. Although multimorbidity has classically been seen only as chronic (long lasting) conditions in older age, these may coexist with and complicate more acute conditions such as urinary tract infection, COVID-19 or influenza. Many people in older age also have a coexistence of mental and physical ill health and these interact.

**Figure 5.2: Percentage of patients from 314 medical practices in Scotland with either 0, 1, 2, 3, 4, 5, 6, 7 or more than 8 chronic conditions by age group**

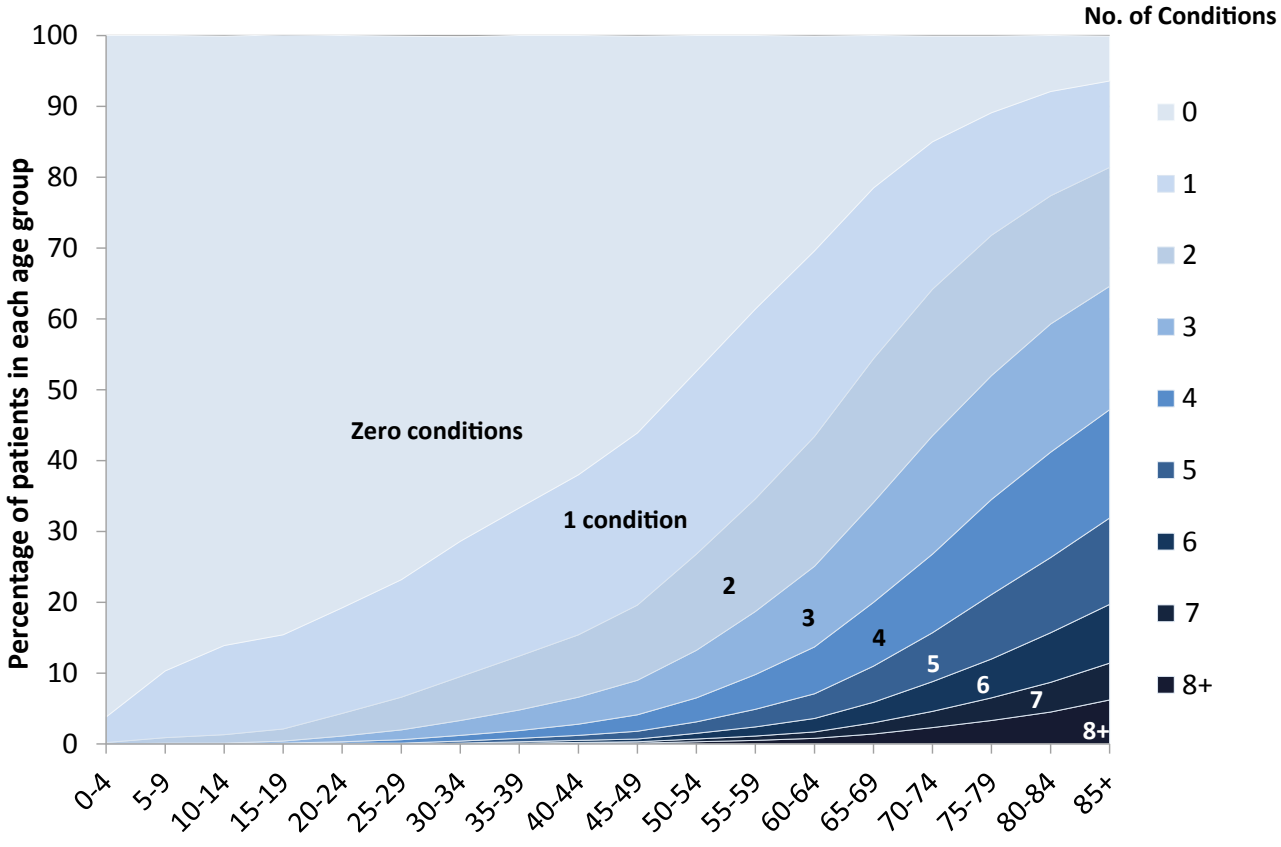



Image source: Barnett and others (2012), The Lancet

# The problems of multimorbidity

The combined effect of having several conditions simultaneously has functional, medical, organisational and scientific implications.

Functionally each condition may cause problems for an older person, but the combination can be significantly worse than the individual components. For example, the combination of cataracts, loss of balance (proprioceptive loss), thin bones (osteoporosis) and dizziness on standing up (postural hypotension) is far more likely to lead to falls and subsequent complications, such as broken hips or wrists and subdural or extradural bleeds, than any one of them alone.

Medically, older citizens often have multiple conditions treated as if they were effectively independent of one another. This leads to them being on many treatments or National Institute for Health and Care Excellence (NICE) clinical pathways with multiple drugs (polypharmacy) or devices which may interact in known or unknown ways. General practitioners and geriatricians tend to be better at reducing this risk than many other specialties.

Organisationally, older patients with multimorbidity can end up having to attend multiple different specialist clinics at different times and often in different places. Medical training tends to be organised around single diseases or single organ systems (gastroenterology, chest medicine, cardiology etc). As the proportion of the population with multimorbidity (requiring more generalist skills) has increased, the medical profession outside general practice has become more specialised. This is not ideal for either patients or the NHS.

Many of the great medical advances have been driven by science going along a disease pathway from bench to bedside. There is much less scientific investigation of the interactions between different diseases, both at a basic science level and in clinical studies including clinical trials. It is still the case that many clinical trials exclude people with coexisting conditions despite the fact that it is normal to have multimorbidity for a significant minority of the population, or even the majority of the intended treatment population.

Deprivation and poverty tend to accelerate the rates at which multimorbidity accumulates (Figure 5.3). Many components of this are predictable and preventable, including smoking and obesity, both of which are risk factors for multiple conditions.

At a certain point, multimorbidity phases into frailty but there is a great deal of overlap between the two and most people with multimorbidity do not have frailty. This is discussed further in section 5.2.

**Figure 5.3: Prevalence of multimorbidity by age group and socioeconomic status. On the socioeconomic status scale, 1=most affluent and 10=most deprived**

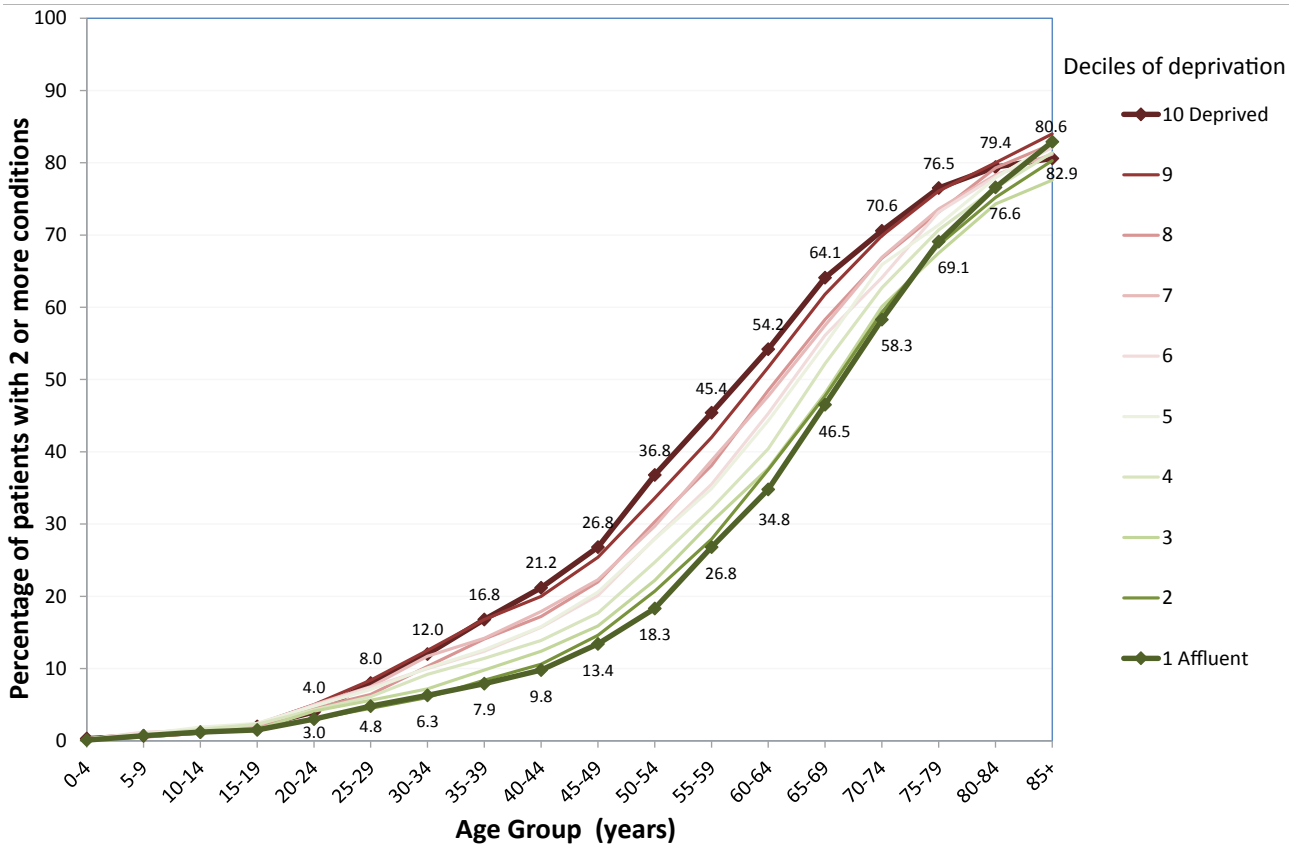



Image source: Barnett and others (2012), The Lancet

# What we need to do to reduce and treat multimorbidity in older patients

Since a much higher proportion of patients, and predominantly older patients, will have multimorbidity in the future than historically was the case, we need to be much more systematic about addressing it. Broadly, this can be divided into reducing the amount of multimorbidity in the population and improving treatment for those who have it.

## Reducing multimorbidity in older age – pushing disease to the right in time

Many of the diseases that typically make up the multimorbidity of older people cannot necessarily be stopped indefinitely, but they can be delayed by many years. We do not live to an indefinite old age; we have a finite span of years. The later in the life course each component of multimorbidity occurs, the smaller the problem. If some of the potential diseases can be pushed out beyond the natural lifespan altogether, they will not cause any problem to the person during their lifetime. The individual components of this have been considered in previous chapters.

The best way to reduce multimorbidity is therefore to do all the things we know can delay disease in as many dimensions as possible, whilst minimising any interference with the quality of life of older citizens. Some of these require action at a societal level, some by the individual and some by the medical profession or other healthcare professionals. The combined effect however can be to push much of the disease off to the right in time and therefore compress the period and severity of multimorbidity very substantially. Very few of the interventions we currently need are new; they just need to be applied wholeheartedly and systematically.

## Action at a societal and government level – primary prevention

Society, and government which represents society, has a very major role to play in delaying disease. This role is well known but worth rehearsing. Reducing smoking, and stopping people from starting to smoke, is the single measure which would have the biggest impact on delaying multimorbidity, particularly in areas of deprivation. Smoking massively accelerates or exacerbates multiple chronic diseases including heart disease, stroke, cardiac failure, chronic obstructive pulmonary disease (COPD), asthma, dementia, cataracts and other causes of blindness, as well as many cancers.[3] Obesity is a risk factor throughout the life course but causes particular problems for people living with obesity in older age. Obesity accelerates diabetes, heart disease, stroke, dementia, joint and back problems and repeated infections among others.[4] Excessive alcohol use over the life course accelerates liver disease, cardiovascular disease, dementia and proprioceptive problems among other conditions. In a positive direction, increasing exercise at any stage of life delays many physical and mental diseases.[5]

Actions we can take at a societal level to increase exercise, stop smoking, decrease obesity and reduce dangerous alcohol intake will therefore slow down the onset of multimorbidity at a population level and for individual citizens.

Similarly, all actions we can take to increase physical activity will be beneficial and delay or prevent multiple diseases, both physical and mental. In particular, making active transport, including walking and cycling, safe and attractive for people as they head towards and enter old age would be a major win. Interventions are often only targeted at younger adults, forgetting that a small increase in activity by an older citizen may be substantially more beneficial to improve health and reduce or delay multimorbidity than an extra 10 km cycle by an already highly active younger adult.[6]

## Action by the medical profession and wider NHS – secondary prevention

It is possible to delay many diseases by vigorous secondary prevention. Secondary prevention is where individual practitioners identify risks of disease, or early disease, and take action to delay progression. Examples include: reducing hypertension using drugs and non-medical interventions to delay heart disease and stroke; identifying people with atrial fibrillation and reversing it or treating with anticoagulants where appropriate to delay stroke; giving people targeted smoking, alcohol and weight management advice; active treatment of diabetes. Screening can also identify disease early before it causes major problems.

# Responding to increasing multimorbidity in older people – medicine and science must adapt

## Maintaining generalist skills in the medical profession

Medicine has benefited hugely from the skills that have come with specialisation. This benefit should not be discarded. However, increasing specialist skills does not need to lead to a reduction in generalist skills. UK medical training trains all doctors, not just general practitioners and geriatricians, in general medicine. Recently, there has been an assumption that as doctors specialise they will lose their generalist skills. This makes no sense in an area where we move into increasing multimorbidity driven by a higher proportion of the population living in old age.

The medical profession therefore needs to think seriously about how to maintain generalist skills while specialisation occurs for many practitioners. For most older people living with multimorbidity they may have a principal complex medical problem which requires highly specialised training, but many of the concurrent diseases will be relatively straightforward to manage. It should be seen as our responsibility as a medical profession to be able to manage the great majority of simple medical conditions alongside our specialist training. It should not be seen as acceptable that a doctor specialising in, for example, infectious diseases can treat the infection but expect the uncomplicated cardiac failure, COPD, diabetes and hypertension in our patients to be managed by referring onto other specialist clinics. This is both bad medicine and bad organisation with older people being shunted around multiple unrelated clinics often with great difficulty to them and their families. We need to organise medical services and training around common clusters of disease so that older patients do not have to go to multiple clinics.

## Identifying clusters of disease that commonly occur and why – the role of science

Some combinations of diseases causing multimorbidity in older people occur by chance alone because they are common. Others are clustered together more commonly than would be expected by chance alone and this implies a common risk factor, whether genetic, cultural, environmental or other.[7] Well known clusters are those caused by diabetes, smoking, or obesity. For example, heart disease, stroke, peripheral neuropathy, retinal disease of the eyes and foot ulcers are all diseases of multiple organ systems but are all made much more likely by having uncontrolled diabetes. Looking for clusters of diseases that are more common than would be expected by chance alone will help us to identify common risk factors which are currently unknown. In turn, this will help to delay and push off to the right in time the onset of multimorbidity.

Alongside this, scientific exploration needs to take account of the interactions of diseases making up multimorbidity, and their common causes. Currently, science is optimised for single diseases and this needs to change.

Current multimorbidity research considers multiple chronic diseases, but often ignores equally important comorbidities with infectious diseases.[8] COVID-19 is an example of an infection which was more severe in older adults living with obesity, diabetes or other chronic diseases.

There is a particular responsibility to ensure that clinical trials and other clinical studies do not exclude older citizens with multimorbidity. Although this is less common than it was, it remains a worryingly common set of exclusions in trials which makes no medical or scientific sense.

## Summary

As the population of older people increases, age related multimorbidity will increase unless we take active steps to prevent it. Many well-known public health measures will reduce the impact of multimorbidity. We need a reorganisation of medical services and training which takes account of multimorbidity, including maintaining generalist skills and organising services around patients. Scientific research needs to take account of the reality that most patients have multiple diseases in older age and that this will increase over time, all other things being equal.

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# 5.2 Identifying and responding to frailty

## Defining frailty

Frailty has been defined as an increased vulnerability to stressors.[1] This means, among other things, that people who are living with frailty may not bounce back from infections or non-infectious disease episodes, compared to people of the same chronological age who do not have frailty. The prevalence of frailty increases with age and so it is typically assessed for in older populations. As the English population becomes older, the number of people with frailty is rising.[2] 2020 estimates suggest that the proportion of adults aged over 50 years living with frailty is 8.1%. Most older people are however not living with frailty, and like multimorbidity it can be delayed.

The concept of frailty can help clinicians and researchers to understand the mechanisms of ageing and identify people at greater risk of poor health outcomes. As discussed earlier in this report, the functional and health status of people of the same age can vary despite a similar 'chronological age'. The measurement of frailty may add a helpful indication of the 'biological age' of the individual.[3] For example, a 68 year old in one area may be living with frailty, whereas a 78 year old in another part of England may be more resilient to physical or mental illness, an accident or other stressful event. Historically, descriptions of frailty prevalence have been in adults aged 65 years and over, but recent studies acknowledge that frailty is already present in some parts of the population before age 65.[4]

Although frailty is often clinically recognisable, there has been variation in the criteria used to measure it. Debates about how to measure frailty have led to two prevailing models: the cumulative deficit model and the phenotype model. The cumulative deficit model was developed through consideration of biological theories of ageing. It considers frailty as an accumulation of deficits including clinical signs and symptoms, disability and diseases. In simple terms, this can be described as "the more things somebody has wrong with them, the more likely they are to have frailty".[5] The phenotype model was developed through epidemiological study and clinical observation. This categorises frailty by the presence of three or more of the following criteria: exhaustion, weight loss, reduced gait speed, loss of muscular strength and low physical activity.[6]

## Association with multimorbidity and multiple long-term conditions

Multiple long-term conditions (MLTCs) or multimorbidity are associated with a decline in function and may contribute to frailty.[7] A recent review estimated that 72% of adults with frailty have multimorbidity. On the other hand, only 16% of adults with multimorbidity also have frailty.[8] Recognising that frailty results in rapid changes to overall health following an insult or

injury, it follows that frailty-related health deterioration can lead to comorbidities and an increased likelihood of subsequent multimorbidity.

# Geographical variation of frailty

Evidence suggests there are inequalities in the health of older people associated with geographic location in the UK largely due to levels of deprivation. Sinclair and others (2021) used data from the English Longitudinal Study of Ageing (ELSA) to estimate the district-level prevalence of frailty. This analysis identified higher rates of frailty in people aged over 50 years in areas of higher deprivation. This includes the more deprived areas of cities and coastal towns. Greater prevalence of frailty is seen in more deprived parts of the country (Figure 5.4).[9]

**Figure 5.4: Estimated prevalence of frailty among people aged over 50 in each local authority district in England, 2020**

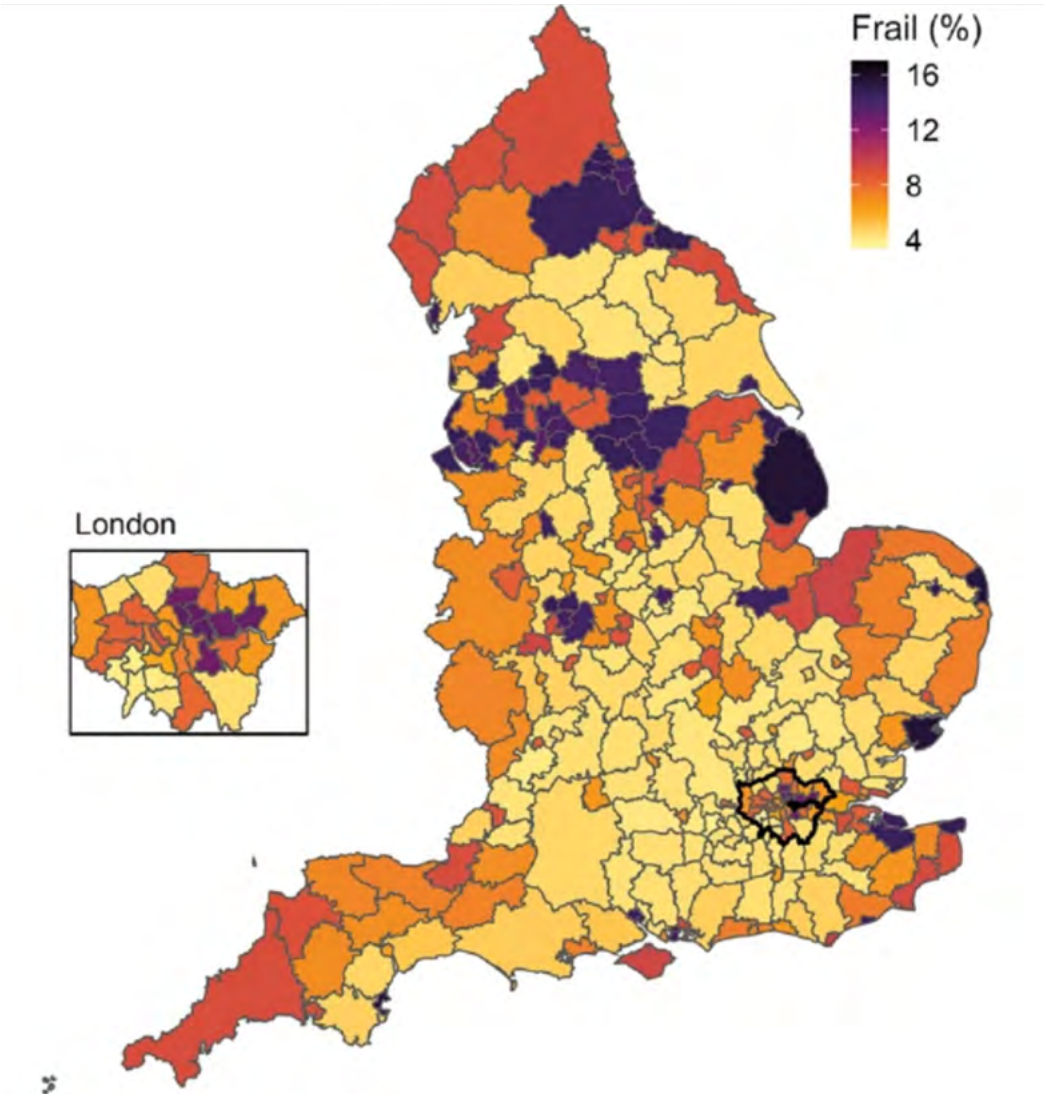


Image source: Sinclair and others, The Journal of Frailty & Aging (2022)

## Measurement of frailty

Measurement of frailty is increasingly common across the NHS and is used in primary and secondary care when caring for adults aged 65 years and over. The British Geriatrics Society (BGS) 'Fit for Frailty' guideline recommends that older people should be assessed for frailty at all healthcare encounters using gait speed, the timed up and go test (TUGT) or the PRISMA 7 questionnaire.[10] The BGS note that the Clinical Frailty Scale (CFS) is a well evidenced "ready reckoner" that allows even practitioners with limited experience in frailty identification and management to identify those with frailty. The National Institute for Health and Care Excellence (NICE) recommend assessing frailty in patients with multimorbidity in primary care and community settings using the same tests.[11] The recent guidance, 'Six steps to better care for older people in acute hospitals', from Getting It Right First Time (GIRFT) and the BGS to accompany the new GIRFT Hospital Acute Care Frailty Pathway, highlight the importance of frailty measurement. The use of a holistic assessment-based intervention, such as the Comprehensive Geriatric Assessment, in patients identified as living with frailty can improve health outcomes.[12]

## Complex interventions to meet the care needs of older adults

In hospital settings, a range of complex interventions have been developed to meet the care needs of older adults, including Comprehensive Geriatric Assessment (CGA), other kinds of discharge planning and more complex reorganisations of care. The term holistic assessment-based intervention is used to describe an approach to assessment designed to determine an older person's medical conditions, mental health, functional capacity and social circumstances.

The purpose of a holistic assessment-based intervention, such as CGA, is to develop and implement a coordinated and integrated plan for treatment, rehabilitation, support and long term follow up. For example, CGA is based on the premise that a full evaluation of an older adult living with frailty by a team of healthcare professionals from multiple disciplines may identify a variety of treatable health problems, resulting in a co-ordinated plan and delivery of health care, social care and rehabilitation care leading to better health and wellbeing outcomes.[13]

CGA is the most comprehensively researched model for healthcare delivery to older patients with frailty, and there is clear evidence that it is effective in hospital inpatients. Multiple trials and reviews have concluded that older adults that receive the CGA in hospital are more likely to return home, and less likely to be admitted to a care home within a year of hospitalisation.[14] CGA delays the progression of frailty and can slow deterioration in older adults.[15]

The CGA is associated with geriatric medicine and specialist care for older adults, but reports suggest tools and aspects of CGA are increasingly used outside of geriatric medicine.[16] The principles of holistic person-centred care for those with multimorbidity or frailty can be applied by any clinician. Although the tools and multidisciplinary team working may be more familiar to those working in the geriatric medical speciality, they are relevant for anybody involved in the health and care of older adults.

There is some evidence of effectiveness of interventions such as the CGA in the community, although this has been challenging to evaluate due to variability in how community-based complex interventions to improve quality of life for older adults are implemented and evaluated.[17] There is a view amongst professionals that there are benefits to older adults' level of function, health and life satisfaction when similar interventions are implemented by primary care. However, further evidence on complex interventions is required.

There is a key role for research in social care, nursing and allied health professions in the development of the evidence base when it comes to evaluating complex interventions that seek to support adults in later life. Future research programmes that include a range of disciplines may enable developments in this area.

## Acknowledgement

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# 5.3 Multidisciplinary team working

The aim to improve quality of life for older adults described in this report will only be possible with the involvement of multiple health and social care professionals across acute, primary and community care. As CMO I have inevitably concentrated in particular on the medical side but improving the health of older people requires skills from many professions.

Research evidence indicates that the integration of care, and multidisciplinary teams (MDTs) in particular, can be effective for people with complex needs and long term-conditions. This inter-professional collaboration has been shown to be effective for a range of populations, including older people. MDTs linking community and hospital-based services increase functioning, reduce hospital costs and lengths of stay.[1] Examples of some of the professionals that comprise MDTs supporting older adults are included below. Of the two actions we can take to maintain independence – keeping people as healthy as possible and modifying the environment – some are involved in maximising health (such as pharmacists), some in helping adapt the environment to maintain independence (such as occupational therapists) and some are involved in both.

## Nurses

A range of specialists and generalists within the nursing profession support the health of older adults. This includes specialist nurses for frailty, dementia and other conditions typically encountered in later life. Nurses work in primary care, in hospitals and in the community. An increased focus on nurse-led social care provision and further research into adult social care nursing is welcome as the number of adults requiring social care is projected to rise (section 5.4).

## Physiotherapists

Much of the specialist support to get people mobile again, to regain or maintain strength especially after major events, including hospital stays, rely on the skills of physiotherapists. They are also involved in treating many medical conditions such as chest infections.

## Occupational therapists

Occupational therapists help people overcome challenges completing everyday tasks or activities. They are often central in planning around modifications to homes to make them easier for an older person to live in, and for discharge from hospital.

## Pharmacists

Pharmacists play a key role in the care of older adults. As leaders in medicines optimisation, they reduce the risk of polypharmacy and support the safe and effective use of medicines to enable the best possible outcomes. Community pharmacists are likely to be a regular point of contact for adults with long term conditions and they provide older adults with essential care for minor ailments.

## Other allied health professionals

In the preparation of this report, we worked with representatives from the 14 allied health professionals (see Table 5.1) to identify areas in which professionals can work together to improve health in an ageing society.[2]

**Table 5.1: The 14 Allied Health Professionals recognised by NHS England**[3]

| Allied Health Professionals | |
|---|---|
| Art therapists | Osteopaths |
| Dieticians | Paramedics |
| Dramatherapists | Physiotherapists |
| Music therapists | Podiatrists |
| Occupational therapists | Prosthetists and orthotists |
| Operating department practitioners | Radiographers |
| Orthoptists | Speech and language therapists |

Allied health professionals lead important work in preventing ill health, responding to acute illness, the management of long-term conditions and rehabilitation. Involvement may vary between professional groups. For example, paramedics, physiotherapists and radiographers may be more likely to respond to acute health needs in older adults, whereas others may be helping to maintain independence in the community. Aids and adaptations to an older adult's environment are discussed further in section 6.2.

## Mental health practitioners and psychologists

Mental health professionals provide support and care to older adults with a range of mental and cognitive health needs, whether this is through older people's mental health services or community-based psychological therapies.

## Social workers

Social workers play a central role in helping navigate the social care system (see next chapter) and helping assess what would be suitable, as well as what can be provided, for older adults with care needs.

# Summary

It is widely accepted that older adults will benefit from the input and expertise of a range of professionals. It is essential that this care is coordinated. Care coordination by a named professional can prevent duplication by multiple professionals and maximise the benefits of joined-up care in hospital or in the community.

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# 5.4 Social care

Social care is often central to ensuring people with illness or disabilities can live independent lives, or where they cannot that they are supported. It has changed a lot over the last 80 years. There has been a move away from institutional care starting in the 1940s, to the introduction of smaller residential care and nursing homes from the 1960s. This was followed by a greater emphasis on community care assisting people within their own homes from the 1980s, to a current policy to support people to live independently.[1]

Social care for older adults covers a large and complex set of issues, with some significant future challenges including funding models. This CMO report is not the right place to cover these in detail, but some points are worth making.

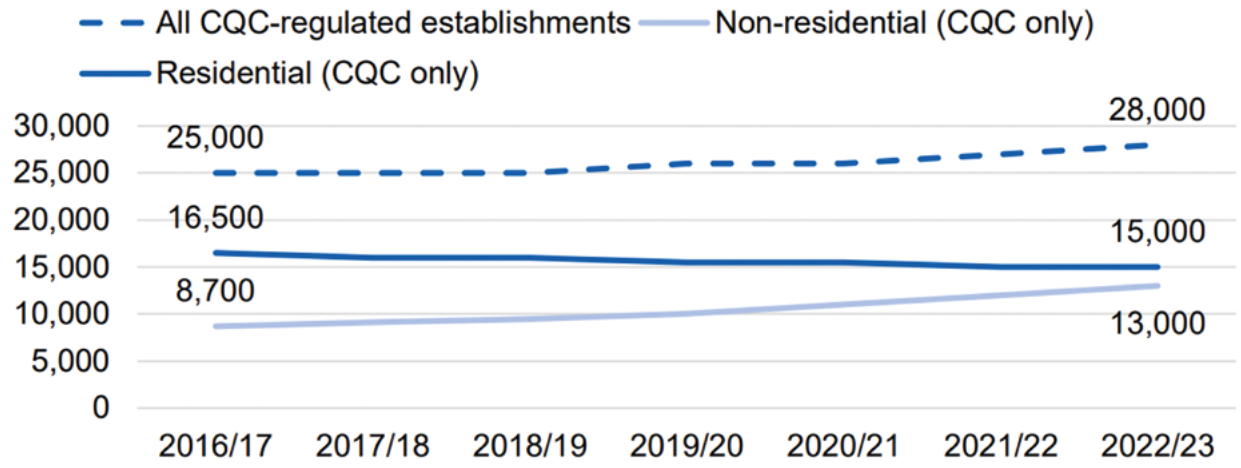
There is often an assumption that people in older age will need a significant amount of care and support, and for many, especially those with frailty, that is true, resulting in a significant loss of independence and often practical and financial strains on families. However, UK census data from 2021 show that around eight in ten people aged over 90 years were not living in care homes and less than 4% of those aged 80 to 84 were in care homes.[2]

In England, social care can be grouped into four service areas:

- adult residential, including care homes with nursing and care homes without nursing;
- adult day care services;
- adult domiciliary care, including supported living and extra care housing; and
- adult community care.

The number of social care establishments has changed over time. Figure 5.5 shows that the number of residential establishments has dropped by 1,500 (a decrease of around 9%), whereas the number of non-residential establishments, such as domiciliary care, has increased by 4,100 (an increase of around 47%) between 2016/17 and 2022/23.

**Figure: 5.5: Number of adult social care establishments regulated by the Care Quality Commission (CQC), 2016/17 to 2022/23**




Source: Skills for Care estimates and Care Quality Commission data[3]

The majority of these establishments are independent providers, and they employ nearly 80% of the social care workforce. Local authorities provide a smaller proportion of residential, day, community, and domiciliary care. The NHS provides some adult community care services.[4]

The number of people requiring social care has risen over recent years. In 2021/22, 1.98 million people requested support from their local authority, 168,000 more requests than in 2015/16.[5] This rate of increase has in part been driven by demographic trends discussed in this report. People are living longer with multiple or complex needs and therefore might require short or long-term social care.

Although the overall social care workforce is estimated to have grown by 1% between 2021/22 and 2022/23, around 9% (152,000) of social care roles in England remain unfilled. Projections from Skills for Care show that if the number of adult social care posts grows proportionally to the projected number of people aged 65 and over in the population between 2022/23 and 2035, an increase of 25% (440,000 extra new posts) would be required by 2035.[6]

Regulated professional roles make up around 5% of the whole estimated social care workforce in England (1,635,000). Registered nurses, occupational therapists and social workers have a key role in social care and are able to support planning and delivery across health and social care systems. However, recent data estimates that the number of filled registered nurse posts decreased between 2016/17 and 2022/23 (from 40,000 to 33,000).[7]

Despite workforce challenges, there is evidence of improvements in social care provision in some areas. Over the past 7 years, the percentage of adult social care services rated 'good' or 'outstanding' by the Care Quality Commission (CQC) has increased. 83% of services are now in these categories compared to 68% in 2016.[8]

# Informal care

Informal caregivers provide a central role in the support of some older adults. An informal carer is generally described as someone who provides unpaid help to a friend or family member

needing support, perhaps due to illness, frailty, disability, or a mental health condition.[9] Increasing health and care needs among older adults may increase the need for informal care. The Family Resources Survey estimated that in 2021/22 around 7% of the UK population (4.9 million people) were providing informal care.[10]

Older adults are also informal carers themselves. The recent State of Caring (2022) report found that an estimated 28% of unpaid carers in the UK are aged 65 years and over, with care recipients especially likely to be older relatives or partners.[11]

Caring responsibilities can have negative impacts on the physical and mental health, and employment potential, of those who provide care, which can result in poorer quality of life.[12] Over a quarter of carers feel lonely often or always. [13] Helping older people maintain their independence for longer can contribute to reducing this.

## Summary

Although not all older adults will require social care, the projected rise in the number of older adults with ill health and disability is likely to lead to greater demands on the social care sector, and place greater pressure on the unpaid carers, families and communities that play an essential role. Efforts to prevent and delay disability and ill health, to avert the need for long-term social care, will be key to supporting older adults, and the wider health and social care system. Furthermore, responsible planning for future need, accompanied by high-quality granular data and insights, will ensure better support for an ageing population.

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# 5.5 Access to care in more peripheral areas

Section 2.2 shows how the growth of need in older adults will mainly be outside the large conurbations. There is already a higher proportion of older adults living in these peripheral areas, away from urban centres, and this will increase.[1] Much of the growth will be in more peripheral areas with less good access to specialist services. They are often beautiful and welcoming places to live, but this does not remove some of the practical issues.

Peripheral areas are generally those referred to as being further away or 'on the edge' of main urban and economic centres. Peripheral regions generally have lower accessibility than the more central ones.[2] In England, peripheral areas are considered to be those rural and coastal areas located further away from urban centres.

The health and care challenges facing those living in rural and coastal areas are well documented.[3,4] People living in peripheral areas experience issues relating to accessing primary and secondary healthcare, domiciliary care, medicines, shopping and transport. The response times of health care professionals are often longer because of the distances involved, which is particularly important for emergency presentations such as stroke and heart attacks. Access to leisure services, cultural events and suitable physical activity can also be limited, which provides additional challenge in accessing activities that prevent and delay onset of poor health. These issues can be compounded by the effect of loneliness which may come from living in a sparsely populated area. Technological infrastructure and limited access to broadband can also impact on health and care provision in remote areas. As discussed in the 2021 Chief Medical Officer's Annual Report 'Health in Coastal Communities',[5] if we do not tackle the health problems of these communities vigorously and systematically there will be a long tail of preventable ill health in peripheral areas which will get worse as current populations age.

## Health and care provision

People living in peripheral areas need to travel further to access treatment and often have less access to specialist provision and to emergency services. A specific example that highlights this disparity is given overleaf.

## Thrombectomy – An example of geographical inequality

Thrombectomy is an evidence-based treatment for specific types of stroke. For those suitable, receiving a thrombectomy within six hours of the onset of stroke can significantly reduce disabilities like paralysis. Access to thrombectomy varies across the country. Data from the Stroke Association shows that almost 8% of stroke patients receive a thrombectomy in London, compared to 0 to 3% in other areas, where geography, funding, ambulance times and workforce pose significant challenges.[6] It will often take people with a possible stroke in a peripheral areas more time to get to a hospital where they can get a CT or MRI diagnosis, and may then experience a further delay in transfer to a specialist centre. Since the effectiveness of thrombectomy decreases with time, this reduces the impact it may have on disability. Ensuring we have services available within reasonable distances to older populations is important.

# Health care workforce

As acknowledged by the NHS Long Term Workforce Plan,[7] the increase in health and care need from an ageing population will not be uniform across the UK, and will grow more rapidly in peripheral areas. Geographies with the oldest populations, especially in rural and coastal areas, have been found to often be most under-served.[8]

## Consultant geriatricians

According to the 2021 Royal College of Physicians Census, there were currently 1,900 fully trained consultant geriatricians in the UK. Analysis by the British Geriatrics Society (BGS) highlights that the rate of consultant geriatricians is not uniform across the UK. For example, there are more geriatricians per older adult in London than there are in the East Midlands (see Table 5.2).[9] Although only one part of the workforce capacity challenge, the geriatrician workforce will be key in the provision of care in an ageing society.

**Table 5.2: Geriatrician numbers per head of the population in London and the East Midlands**

| Region | Number of geriatricians | Population aged 65 years and over | Population aged 65 years and over per geriatrician | Population aged 85 years and over | Population aged 85 years and over per geriatrician |
|---|---|---|---|---|---|
| London | 282 | 1,043,400 | 3,700 | 137,200 | 487 |
| East Midlands | 96 | 951,800 | 9.915 | 118,700 | 1,236 |

Source data: British Geriatrics Society (2023), using data from the Royal College of Physicians (2022)[10] and Office for National Statistics (2022)[11]

## General practitioners (GPs)

Coastal and isolated communities have often struggled in attracting General Practitioners (GPs) despite the beautiful areas these practices often serve.[12] Generally speaking, rural and remote services are made up of smaller teams than those in urban services. Even small gaps in the workforce are felt more intensely if, for instance, sickness absence increases, with cross-cover more difficult and more time spent to attend a single home visit. Variations exist in the number of GPs across the country, with higher vacancies vacancy rates for GPs typically seen in remote, rural and more deprived areas.[13]

The NHS Long Term Workforce plan describes how the provision of new medical schools and additional places in geographical areas with the greatest staff shortfalls and unmet healthcare need, will improve undergraduate medical education. Expansion of postgraduate specialty training places will aim to address workforce shortages in services such as primary care, mental health and cancer; this expansion should, for age-related conditions, be in the areas where need will increase most due to population ageing, which is usually not in the major conurbations.[14] The location in which doctors ultimately settle and practice is often closely tied to the area in which they undertook postgraduate training.

The imbalance in the geographical distribution of training posts, where concentrations of training posts are not in areas of growing older populations, is not confined to the medical workforce. Other professional groups including nurses and allied health professionals, as well as professional carers, also require a more equitable spread of training opportunities, based on current and future patient need.[15] Further work is needed to evaluate how to reduce geographical differences in the numbers of specialist nurses, allied health professionals, specialist pharmacists and others involved in the care of older adults.

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# 5.6 Realistic medicine

Realistic Medicine is an approach to healthcare, laid out by reports of two successive Chief Medical Officers (CMOs) for Scotland Dr Catherine Calderwood[1] and Professor Sir Gregor Smith.[2] The principles of a realistic approach to health have also been championed by others, such as the American surgeon Atul Gawande for example in *Being Mortal*,[3] and builds on centuries of medical thought.

Modern medicine has continued to provide relief from disability and illness. However, all medicine has potential for harm and in some cases a presumption in favour of active intervention may be more likely to reduce, rather than increase, quality of life than a more conservative approach. For example, a major operation or course of chemotherapy which extends life by one month, at the expense of three months of feeling very unwell from the treatment, may be a gain in longevity but a net loss in total quality of remaining life. This is a particular risk in the last years of life. In the NHS in England 48% of total hospital bed-days for people aged 85 years and over were for individuals in their last year of life; overtreatment, if it occurs, therefore is likely to disproportionately affect this group.[4]

An additional example of overtreatment builds on the discussion of multimorbidity in section 5.1. We currently have multiple evidence-based guidelines to support management of single diseases. However, when these guidelines are combined in patients with multiple chronic conditions of older age, it can result in complex medication regimes and an increased risk of drug interactions and side effects caused by polypharmacy. No drug is without side effects on its own and the side effects of the combination is often not known. The overall treatment burden may result in unintended harm to quality of life even if in theory it extends it. Evidence-based guidelines and clinical pathways need to consider these interactions, and clinicians need to discuss them with patients to identify a realistic management plan that will reduce unintended harm.

Patients' preferences are ultimately the key to improving overall outcomes and quality of life. An individual receiving care may choose less treatment, once they are provided with greater detail of the impact, potential benefits and harms of any proposed medical intervention. Honest discussions that treatment may extend life but not quality of life should in my view be more common.

Realistic medicine is an especially important approach to consider in the final months of life. Where a disease or combination of diseases have progressed to a point where death from them is inevitable, this should be recognised and communicated effectively to patients and their family or caregivers.

Ensuring that any patient has both the time and confidence to make their own fully informed decisions is likely to result in a better experience of the remaining time they and their families have together. Some patients will choose more aggressive treatment options, but this should be an informed choice. Many doctors are already effective advocates of realistic person-centred

care, but it often takes more professional confidence and trust between doctor and patient to lay out that active medicine may do net harm.

Timely identification of situations when either there is no curative treatment available, or, more commonly, where it may come at a heavy cost in quality of life should prompt clinicians to consider personalised care and support, advance care planning and the role of palliative care.

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# 5.7 Palliative care

Palliative care improves the quality of life of patients and their families facing the problems associated with life-limiting illness, through the prevention and relief of suffering by means of early identification and assessment and treatment of pain and other problems, including physical, psychological and social needs.[1] Generalist palliative care is delivered by all health-care professionals working with patients with a potentially life-limiting illness, including those at the end of their life. Evidence supports the effectiveness of specialist palliative care, care provided by clinicians dedicated to and expert in palliative and end-of-life care. Patients referred to specialist palliative care services show improvement in physical symptom control,[2] quality of life and survival.[3-4] Specialist palliative care services can support prevention of unplanned admissions and reduced length of acute hospital stay.[5-6]

Although the need for palliative care typically increases towards the end of a person's life, and particularly in the last months of a terminal illness, such care may be required and beneficial at a much earlier stage. Palliative care specialists are often consulted on issues around chronic pain and other long-term distressing symptoms when the medical conditions are not thought terminal.

Specialist palliative care is provided in hospitals, in the community and in hospices by NHS and third party providers. In 2019, National Institute for Health and Care Excellence (NICE) Guidelines stated that designated 24/7 telephone advice lines providing a single point of access to palliative and end of life care services can support better outcomes for patients.[7] The guidelines recommended that people approaching the end of their life, their carers and other people important to them should have access to an out-of-hours end of life care advice line for both professionals, and those caring for the person.

The growing ageing population and rising multimorbidity will almost certainly lead to a rise in palliative care need. Estimates suggest that from 2017 to 2021, around 90% of people who died in England would have benefitted from palliative care.[8] If current trends continue, by 2048 more than 600,000 people will die with palliative care needs in England each year.[9]

There are currently significant inequalities and inequities in palliative care. Inequitable access to and experience of palliative care disproportionately presents in groups experiencing wider societal disadvantage and marginalisation, and in people with non-malignant conditions.

Palliative care inequity is especially prevalent in, although by no means limited to, some groups: people aged 85 years and over; people living in poverty and deprivation; minority ethnic groups; and people living in rural areas.[10,11,12]

People with non-malignant terminal conditions can experience particular challenges in access to, and experience of, palliative care. Existing healthcare treatment pathways for cancer are often well-placed to recognise the condition as potentially incurable, enabling the management of associated palliative care needs. By contrast, people with non-malignant conditions are less likely to be able to access palliative care, or be signposted towards it, despite experiencing equivalent symptomatic burden and having comparable care needs to people with cancer.[13]

Of the nearly 530,000 deaths in England and Wales in 2019, 71.5% were from non-malignant conditions and 28.5% from cancer,[14] yet around 85% of deaths in hospices in 2019 were from cancer and around 15% from non-malignant conditions.[15]

## Acknowledgements

Association for Palliative Medicine of Great Britain and Ireland

Marie Curie

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# 6 Physical environments that enable independence

If as a society we wish people with typical disabilities of older age to maintain their independence and quality and enjoyment of life, not heavily dependent on other people or public services, we need to ensure the environment, and in particular the built environment, is adapted and optimised for them.

Additionally, the built environment can either promote older adults physical and mental health, or be bad for it. Examples of promoting physical health are the availability of exercise opportunities, active travel (including walking) which they consider safe, and making social and cultural activities more accessible to people with some degree of disability. Environmental factors that can negatively impact health include poor or cold housing and air pollution.

Since the geographical concentration of older adults is so clearly and predictably going to be in certain parts of the country, we need to improve the infrastructure for older adults and others with disability rapidly in those areas. This includes transport, access to places of leisure and exercise, and housing. Much of the housing stock is designed for younger families rather than older adults, who sometimes live alone. It will be considerably easier to plan and build for this future of a predictable heavy concentration of older adults in particular geographical areas if we do it now, rather than trying to retrofit at scale later.

# 6.1 Health, housing, and the built environment

## Health and housing

Where a person lives is fundamental to ensuring that they can remain healthy, active and independent in later life.[1] Older people often spend a higher proportion of their time in homes than at other times in life. Unfortunately, millions of older people are living in homes that are cold, damp, prone to overheating, unsafe, or unsuitable for their needs, putting their health at risk.[2]

Poor quality homes contribute to the development and exacerbation of many long-term health conditions affecting older people.[3-4] This may accelerate their pathway to dependence. Improving housing conditions can be an effective means of improving self-reported health and symptom severity for individuals with existing health conditions, as well as reducing levels of primary and secondary care use and waiting times to be discharged from hospital.[5,6,7] The NHS spends over £1 billion per year on treating people affected by poor quality housing.[8]

In recent decades, improvements have typically focused on increasing the range of housing options for older people, for example, the provision of supported living and extra care establishments. While important, the scale of housing-related hazards in the UK, the associated health implications, and the finding that majority of people will live all, or nearly all, of their lives in ordinary housing that was not built specifically for a particular age group means we need a renewed focus on improving the quality of general needs housing. This is key to enabling older adults to maintain independence and stay in their communities for longer. It is estimated that around 96% of people over 55 years live in mainstream homes and around 80% of homes that will exist in 2050 have already been built. This highlights the importance of addressing existing housing stock.[9] It is hoped that the Older People's Housing Taskforce established in 2023 will work across housing, heath, and care sectors to explore some of these challenges.[10]

Some of the specific challenges encountered by older adults in unsuitable housing are described below and overleaf.

## Cold homes:

Cold conditions during winter are a significant risk factor for cardiovascular events (such as a heart attack or stroke), put individuals at a higher risk of chest infections, and can worsen pre-existing chronic health conditions (such as arthritis or mental health).[11]

Older people and those with chronic health problems have been found to be more vulnerable to the negative impacts of cold homes. Older adults are more likely to take medication that affects body temperature regulation, have a chronic illness and spend more time in the home. This is particularly concerning as adults aged 60 years and over are the age group most likely to be living in a cold home.[12]

## Overheating homes:

Although at UK temperatures cold is a bigger risk than heat, older people can be hospitalised after overheating. Older adults are more vulnerable to extreme heat during summer because they are less able to regulate their body temperature, may be more likely to have reduced mobility and less able to adjust their environment during hot spells. Older adults are more likely to be living in a home that overheats in comparison to younger people.[13]

Overheating risk is predicted to get worse with climate change and there is an increased risk of homes overheating in summer.[14] It is important to consider how homes can be kept cool in the summer and warm in the winter.

## Damp and mould:

Older people and people with pre-existing health conditions (such as respiratory or cardiovascular disease, or weakened immune systems) are particularly vulnerable to the most severe health impacts of damp and mould.[15] As mentioned above, low temperatures (cold homes) are a significant risk factor for the development of damp and mould.[16]

## Unsafe and inaccessible homes:

An individual's ability to move safely around their home has significant impact on their wellbeing.[17] Falls and resulting injuries from hazards in the home are a major cause of disability in older adults, and can lead to a serious irreversible decline in older people's physical and mental health.[18,19] Unsafe and inaccessible homes are a greater concern for older adults who may already have pre-existing conditions or impairments which increase the risk of accidents or injury.

The risk of living in poor quality housing is not shared equally across our society; there are some groups of people who are more likely to experience poorer housing and have fewer alternative

options available to them, especially those living in deprivation.[20] Interventions to improve the quality of homes should therefore be targeted at low-income homeowners, and particularly those with pre-existing health conditions.

Geographically, as section 2.2 lays out, older adults are increasingly concentrated in particular places, so we need to prioritise adapting or building housing stock suitable for them in those areas.

In the short term, the UK Health Security Agency (UKHSA) recommends that local organisations work to identify older adults at risk of ill health due to extreme temperatures and assist them however possible, whether through personal advice, support to upgrade homes with insulation or air conditioning or financial help. This recommendation is also relevant to those living in unsuitable housing.

In the longer term, a changing climate means that homes designed to retain heat during winter also need to be designed, or adapted, to reduce summertime indoor temperatures. Along with changes to planning and building regulations, there needs to be a shift in public understanding of how to help older, and more heat-vulnerable, people respond to heatwaves.[21]

## A built environment that benefits older adults

Beyond the homes themselves, the housing developments and neighbourhoods within which homes are situated are also key to supporting an ageing society. Homes for older people need to be located in places where they can easily and safely reach the everyday shops and services that they need, preferably by active transport (walking or cycling) to help maintain their physical health. A growing body of research indicates that older adults' experience of their neighbourhood is moderated by access to, and the accessibility of, of green space and other public spaces and walking infrastructure.[22] Public and green spaces should be designed to meet the needs of older people, including those with sensory and physical impairments.[23] This is key to enabling older people to participate in their communities, stay active, enjoy life and reduce the incidence of loneliness and social isolation.[24]

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# 6.2 Equipment and adaptations

Equipment and adaptations are an essential component of health and social care provision. Providing these often simple solutions in a timely way can enable people living with disabilities and health conditions to maintain independence in their own home, and their local communities, for as long as possible.

There are various names for specially designed equipment that assist people to manage daily living tasks more independently and safely. Broadly speaking, equipment is usually removable or portable, whereas home adaptations are attached to a property and permanently change its fabric.[1]

Community equipment can include that which supports people to be cared for or nursed at home (such as pressure relief mattresses or moving and handling equipment). It also includes equipment to support day to day tasks such as shower chairs and grab rails. Ancillary equipment for people with sensory impairments, includes such as flashing doorbells, textphones and assistive listening devices.[2]

Mobility, independence and safety can be enhanced or maintained by mobility aids like walking frames and sticks, wheelchairs, stair lifts and mobility scooters. These have been shown to positively support the changing needs of older people as their mobility declines, assisting continued independence. Recent evidence also suggests that assistive equipment can support people with specific health conditions. For example, relatively small and inexpensive aids and equipment can make a positive difference to the lives of people living with dementia in their own homes.[3]

Minor home aids and adaptations can improve quality of life for people who are losing mobility. Housing adaptations can reduce difficulties with washing and bathing, using the toilet, getting dressed and eating. Home aids and adaptations can also increase older adults' ability to perform everyday activities and reduce symptoms of depression by around 50%.[4]

There is often a perceived stigma with using aids, and many of them are very uniform in style. We should consider the marketing as well as the provision of such aids.

Evidence suggests that making small changes to homes earlier, alongside repairs to homes, should be a greater priority for local services, and could help to maintain independence for longer and delay or avoid the use of the NHS and social care.[5]

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# 6.3 Transport and mobility

Transport and mobility are necessary for an independent life, and for many forms of enjoyment. Supporting and maintaining active transport (walking and cycling) for as long as possible is good for physical and mental health. As people grow older they may lose the ability to drive safely and having a public transport system which meets the needs of older people is important for independence, especially in more rural areas.

Affordable, reliable and convenient transport options enable older adults to get out and about and continue to do things that matter to them. Whether it is shopping for amenities, meeting friends and family or attending an appointment. However, transport options can be limited in some areas of the country.

Data from the National Travel Survey indicates that active travel tends to decrease with age, while car use increases as people get older.[1] Reliance on cars is compounded by the fact that the population is ageing more rapidly in more peripheral areas, where access to services including public transport, is more limited.[2]

The built environment is an important facilitator of active transport which involves physical activity, such as walking and cycling. Active transport can bring social and physical benefits, but a poorly designed built environment can present perceived and real safety problems for older adults walking and cycling.[3] Older adults have reported report various factors that impact on access to their wider neighbourhood including lack of seating and public toilets, the condition of pavements, lack of provision of local shops and major roads acting as barriers.[4]

Greater consideration of how older adults can access active transport options is required, particularly for those that may be unable or unwilling to use cars as they age. Flexible public transport arrangements that are designed around the needs of older adults may enable increased mobility. Free bus travel is a good example of a successful scheme to improve the mobility of older people and reduce the reliance on car travel while maintaining independence.

National and local sustainable travel policies aim to address health impacts through promoting active travel on foot or by bike. They also promote the use of public transport, which is often combined with walking or cycling, and is less polluting than car travel. However, promoting sustainable active travel can be more challenging in more peripheral areas.[5]

Some transport policies do not consider the active transport needs of an ageing population, or the challenges associated with living in more peripheral areas. Given that there is a higher proportion of older adults living in areas where amenities are more difficult to access, active transport policy needs to consider the needs of this group and the potential benefits to health.

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# 7 Research to improve health in an ageing society

# 7.1 Research priorities for older adults

## Research priorities in an ageing society

Medicine only advances with research. In the UK in general, and England specifically, the amount of research which is aimed mainly at improving the health of older people is significantly below what we should expect given their growing proportion of the population and higher health needs. Almost all health and social care research has some relevance to older people and the range of gaps in our knowledge is very large so it would not make sense to try and summarise all the areas where research is clearly needed. There are however some obvious priorities and this short chapter is a personal view on areas which require particular prioritisation. Appendix A highlights some of the research which is already funded by a variety of the UK's principal research funders. Section 7.2 highlights some of the very important research which is currently investigating the science of ageing. Most research funders want to fund more research relevant to older people because they see it, correctly, as a major future priority. In this area of medicine, it is often limitations in the numbers of researchers rather than availability of money for research which tends to be the bigger problem, although both are issues.

In relative terms we need **a substantially greater research effort for older people than we see at the moment, and this needs to come from all disciplines** rather than expecting it come entirely, or even largely, from scientists trained principally in understanding and improving the care of older adults. A specific issue is that historically, relative to some other disciplines, geriatrics has a smaller focus on research as part of expected career progression than for example cardiology, neurology or infectious diseases. Less time is dedicated to research for most practitioners than would, on average, be normal in many other disciplines in secondary care. This is often justified on the basis of the amount of important clinical service that needs to be delivered, and this need is clearly there. We need experts from geriatrics and the care of older adults more widely to contribute their skills in frailty and multimorbidity research. Expanding the research body of knowledge relevant to older people should however be seen as a responsibility of the whole of the medical profession, nursing profession and allied health professionals as well as nonclinical scientists from many disciplines. Some of the research into the needs of older citizens is particularly relevant to people with expertise in nursing, pharmacy and allied health professions. Primary care research has a major role.

Some specific issues which need particular focus are outlined below but these areas are far from exhaustive. They have been divided into biomedical research, and research in other disciplines.

## Biomedical research – preventing or treating diseases of older age

The quickest, and arguably one of the most important, changes would be to **remove all barriers to older citizens and people living with multimorbidity being enrolled in trials and other clinical studies**. It makes no sense to exclude from research a large portion of the people who may benefit most from many medical interventions. Funders, ethical review bodies and regulatory agencies should be extremely sceptical where exclusion criteria based on age, comorbidity or multimorbidity have been inserted into protocols where older people will often be the most important patient group now or in the future. These exclusions are often inserted for the ease of the analysis by the researchers rather than the benefits of representative science. Health and social care research should wherever possible be in typical or representative settings (for example, in the community or in more peripheral geographical areas where there are higher densities of older people, so that interventions are designed with subsequent commissioning and adoption in mind).

Alongside this there needs to be a substantial expansion in **research relevant to people living with multimorbidity**. This has begun in the UK with significant investments from NIHR and the MRC, but there is a long way to go in terms of methodological innovation as well as in volume of research. An urgent priority is mapping clusters of disease that co-locate commonly in older people. Knowing which diseases cluster together helps considerably in planning services. If, however, the clustering is greater than would be expected by chance alone, this further tells us something about the biological mechanism, as it is likely there is a common risk factor, whether genetic or environmental, and this may help us to design prevention and treatment for these conditions. A linked problem is developing a more systematic approach to investigating the effects of **polypharmacy** in older age.

To prevent or delay multimorbidity we need a concerted effort to shift diseases off to the right in time; **delaying** disease may be realistic where preventing disease is not. This is the most practical way of compressing morbidity and delaying multimorbidity.

For the rest of this section, we have identified a few examples of the kinds of research which need to be undertaken.

Understanding the biological basis of **ageing and frailty**, and designing pathways to combat this is an important goal of basic science, explored in more detail in the chapter authored by colleagues from the Royal Society in section 7.2. Frailty is defined as a distinctive health state related to the ageing process in which multiple body systems gradually lose their in-built reserves.

There are many components of the ageing process which may occur at different rates in different individuals, and for this reason they can be considered independently as well as in clusters and in frail individuals. Many of these have been significantly under-researched, and I

would pull out two in particular: **musculoskeletal** conditions including osteoporosis and muscle loss, and **hearing impairment**.

Research into the major current causes of **dementia** (Alzheimer's disease, dementia with Lewy bodies and vascular dementia), and more importantly prevention and treatment in early disease, has progressed slowly despite relatively steady investment. It remains an extremely important target.

There has been too little investment into **infection** in older adults, and in particular into urinary tract infections which are a major cause of sepsis and reduced quality of life in many older people, especially women, as well as into cellulitis and pneumonia in older age.

## Research to allow older people with disabilities to live the fullest possible lives

Even with optimal prevention and treatment people will be likely to acquire some disabilities. Making the environment possible to thrive in for independent-minded but disabled older people requires a different set of research skills, in particular from several **engineering** fields.

Research to design **built environments, houses and vehicles** to be usable by people with disabilities in the most helpful and efficient ways is going to be essential, particularly in areas of the country with high concentrations of older citizens. As discussed in section 6.1, our housing stock in the UK is largely not designed with older citizens in mind.

There is a paucity of **medical devices and mobility** aids for older people. Designing the most ergonomic and also attractive solutions for older citizens should be as much a priority as it is for babies and young children. Comparing the range of aids to help babies and children to those at the other end of life is often a depressing experience, with an implicit assumption that clunky functionality is all that can be expected in later life. You can get multiple forms of pram or baby carrier, but nothing like that range exists for Zimmer frames or other mobility aids for older citizens.

**Social care research** is a shortage area where we need to expand the quantity of high-quality research to enable people to live the fullest possible lives with some degree of disability or frailty. Social care and occupational therapy are examples of areas where increasing the robust evidence base would help to support older people with some health problems to maintain independence and quality of life to the greatest possible extent.

Overall however, the biggest ask is for a significant expansion in the relative amount of research undertaken in older citizens and those with multimorbidity. They are in my view currently underserved relative to other groups in the national and international research effort.

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Lucy Chappell, Chief Scientific Advisor, Department of Health and Social Care

# 7.2 Can we prevent ageing-related multimorbidity and frailty? The new geroscience approach

**Linda Partridge** – Biological Secretary and Vice President, The Royal Society and Professorial Research Fellow, University College, London

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## What is geroscience?

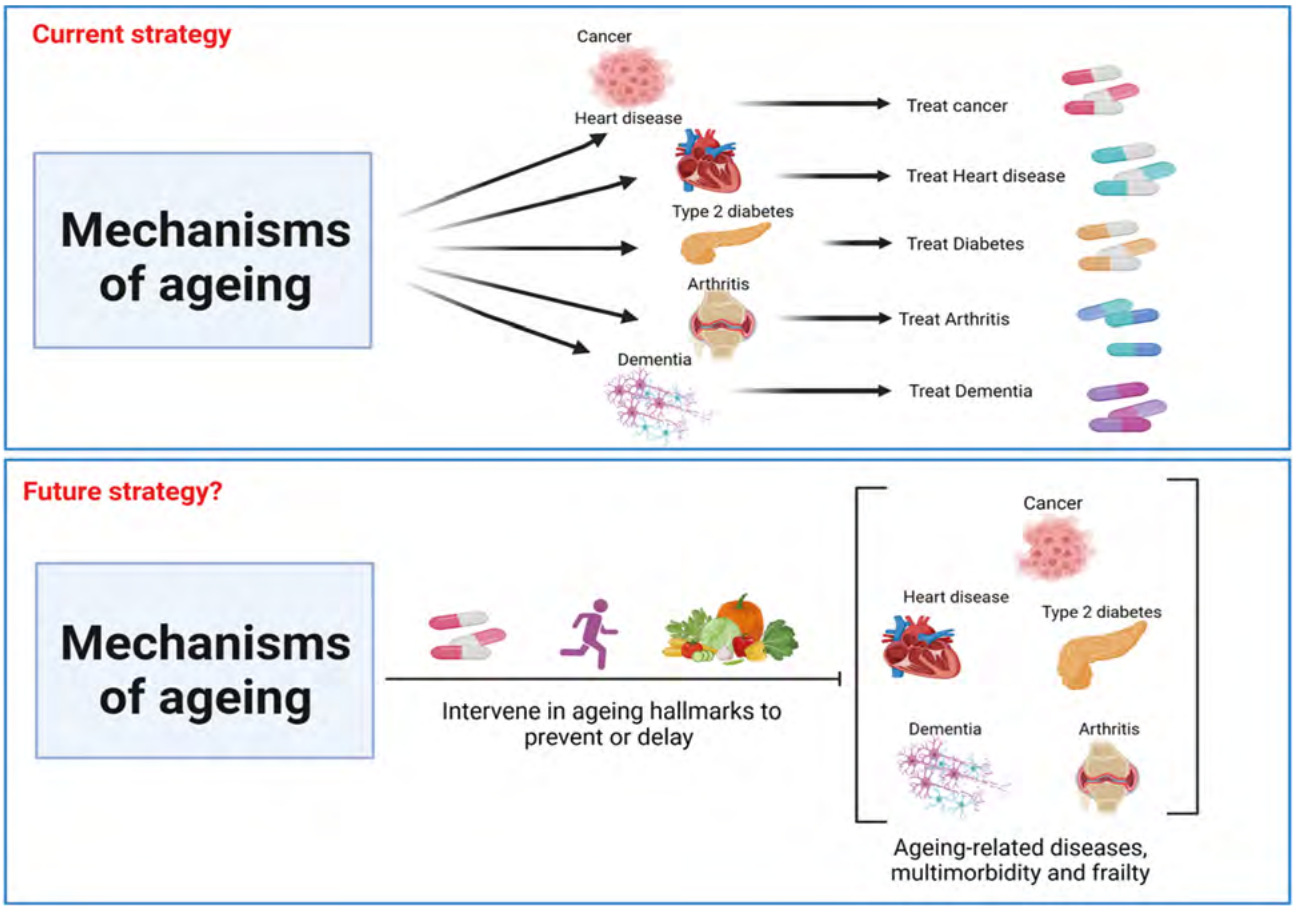
Most diseases are ageing-related including cancers, heart disease, and dementias, which all increase in incidence with advancing age.[1] In addition, these diseases often occur together or with others, termed multimorbidity, making treatment more complicated.[2] The incidence of frailty also increases with age, as people's resilience to multiple stresses including falls, infection, and invasive medical interventions declines.[3] As well as reducing quality of life, both multimorbidity and frailty add significantly to NHS and social care costs, and often require patients to take multiple different medicines to treat their different conditions (polypharmacy).[4] Life expectancy has increased enormously over recent decades, but healthy life expectancy has not kept pace. Therefore, there is an increasing period of ill health and frailty at the end of people's lives. According to recent Office for National Statistics (ONS) data, the average UK male spends the last 16 years of life in poor health, while for the average UK female this is the last 19 years.[5] Healthy life expectancy is hugely variable across and within different regions of the UK and between different socioeconomic groups,[6] reflecting significant health inequalities for older people.

Because advancing age is the main risk factor for multimorbidity and frailty, the attention of researchers has focussed on the possibility of interfering with the biological mechanisms of the ageing process itself, to reduce the risk of developing ageing-related diseases, multimorbidity and frailty.[7] This seemingly futuristic approach is termed 'geroscience' (Figure 7.1) and has arisen from recent advances in our understanding of the biological basis of ageing.[8] Geroscience could have important societal implications, by moving from treatment of single diseases as they arise to a 'preventative' approach that reduces the incidence of multiple ageing-related health conditions simultaneously. The health economics for geroscience are compelling: in 2021 one study estimated that extending healthy life expectancy by just 1 year would yield $38 trillion for the US economy alone.[9]

The geroscience approach to improving health in older age is supported by extensive experimental work on laboratory animals and proof of concept clinical trials in humans.[10] It is also the focus of a rapidly expanding biotech industry. The UK has a high profile in academic geroscience research; a PubMed search for the period from 2013 to 2023 with the search term 'ageing biology' categorised by author affiliation, revealed that the UK was the fourth most prolific producer of research papers in this subject area, after the US, China and Germany. There is therefore real potential for the UK to capitalise on this emerging field.

This chapter outlines this novel science area, and indicates the promise for lifestyle and pharmacological interventions into the ageing process and the potential of the geroscience approach for industry and clinical practice.

**Figure 7.1: Diagram summarising a geroscience approach to improving health in older age**




*The top half of this figure depicts the current medical approach to treating a range of ageing-related diseases. Each disease is treated individually, involving different clinical specialists who prescribe drugs for each disease after they develop. As these diseases often co-occur in the older adult, termed multimorbidity, this results in polypharmacy. The geroscience approach, demonstrated in the lower half of this figure, proposes to treat the primary cause, namely biological ageing processes, to combat multiple diseases before they develop, thus benefitting the NHS, the economy and the patient.*

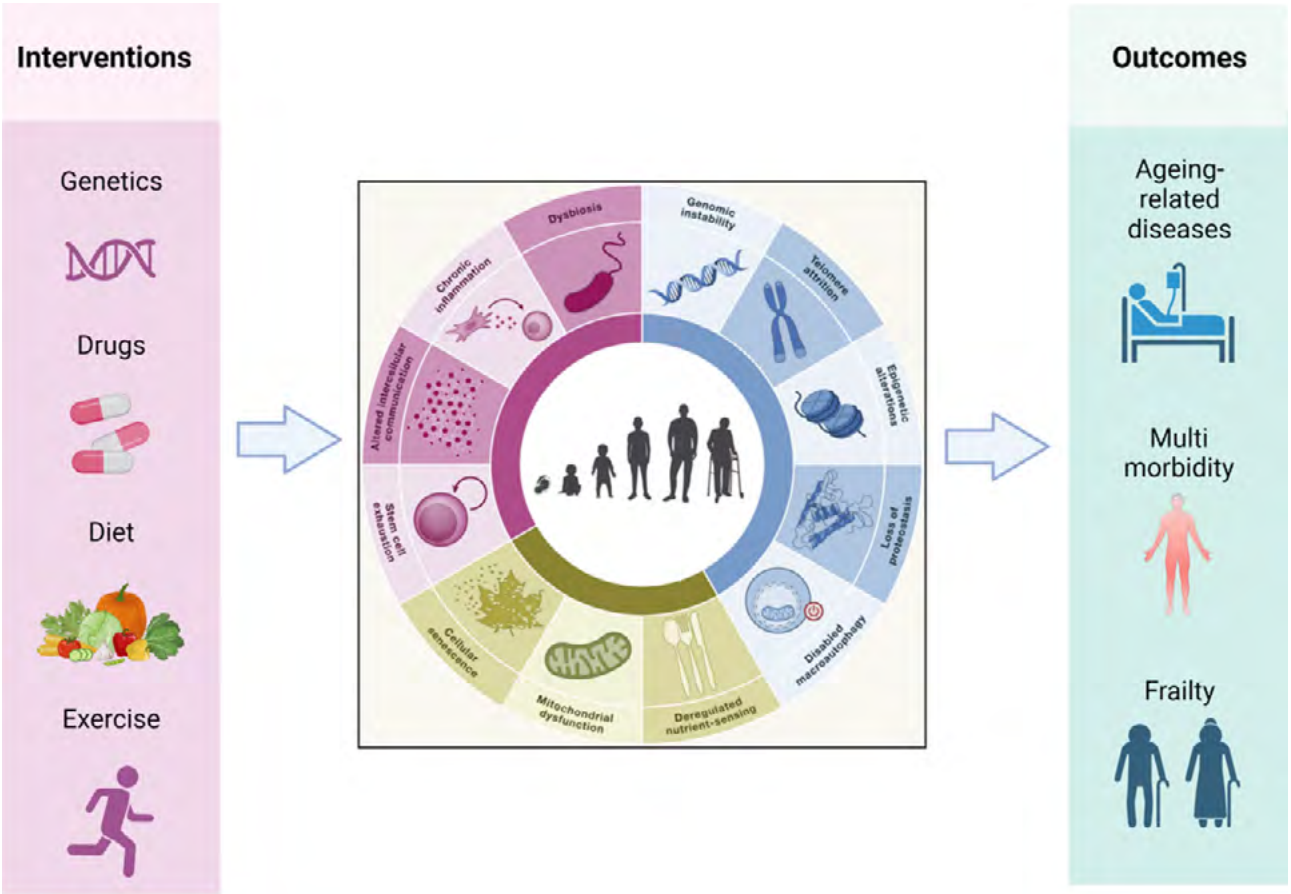
Image source: The Royal Society

# The latest advances in geroscience research

## The biological basis of ageing

The biological mechanisms of ageing are becoming increasingly well understood and have been termed the 'Hallmarks of Ageing'.[11] Much ageing research is now focused on these hallmarks, of which twelve have been identified (Figure 7.2). They are each present in the early stages of specific ageing-related diseases and multimorbidity,[12] and many are targets of existing drugs that could be used to combat their ageing effects and prevent the onset of disease.[13]

**Figure 7.2: Diagram summarising the Hallmarks of Ageing**




*The central wheel shows 12 mechanisms of ageing that promote compromised function with advancing age.[14] They can interact with each other, and each is differentially involved in the ageing of different body systems and contributes to the development of ageing-related diseases, multimorbidity and frailty.*

Image source: The Royal Society

The contribution of these ageing hallmarks to ageing-related loss of function varies between tissues. For example, mitochondrial function is particularly important for muscle[15] and stem cell function is crucial for repairing skin.[16] The hallmarks also interact with each other: DNA damage, reduced proteostasis and impaired immune function contribute to the accumulation of senescent cells* which leads to ageing across multiple organs.[17]

Research in humans also links these ageing hallmarks to ageing-related diseases. For instance, damage to DNA and its interactions with other molecules is related to cancers,[18] failed proteostasis is implicated in neurodegenerative diseases such as Alzheimer's Disease, Amyotrophic Lateral Sclerosis and Parkinson's Disease,[19] and stem cell dysfunction is seen in blood disorders.[20] Furthermore, the ageing-related diseases associated with these individual ageing hallmarks are more likely to co-occur in patients, leading to multimorbidity.[21]

Experiments to modulate the hallmarks in animal models have shown benefits for health and longevity. For example, increasing autophagy (recycling old or damaged cell components) can maintain intestinal structure and function and increase lifespan[22] and removal of senescent cells can combat ageing in multiple tissues and extend lifespan.[23] Importantly, it is now becoming clear that the hallmarks are also amenable to modulation in humans, paving the way for clinical geroscience trials.[24]

## Prevention through lifestyle interventions

### Dietary restriction

Ageing has proved to be a highly malleable process that has been investigated in a broad range of animal model species as well as in humans. Dietary restriction, where food intake is limited while avoiding malnutrition, was discovered in the 1930s to greatly extend lifespan in laboratory rodents.[25] Dietary restriction also leads to improvements in health during ageing and delays the onset of multiple ageing-related diseases in both mice[26] and rhesus monkeys.[27] Clinical trial data for humans are limited but have shown that two years of moderate (15%) dietary restriction significantly reduces multiple cardiometabolic risk factors in young, non-obese adults.[28]

The processes mediating the health and longevity benefits of dietary restriction, and mechanisms of ageing more broadly, have been investigated mainly through genetic manipulations. Mutations in genes affecting growth hormone signalling in mice[29] and in the nutrient-sensing network in nematode worms, fruit flies and mice[30] can improve late-life health and combat ageing-related diseases, including Alzheimer's disease and cancer.

Dietary restriction is not realistic as a public health intervention because of anticipated low compliance with the regime, but, given our developing understanding of its mechanisms of

* In biology, cellular senescence is a process by which a cell ages and permanently stops dividing but does not die. Senescent cells have an important role in development, prevention of cancer and wound healing. However, over time, senescent cells can build up in tissues throughout the body. These cells remain active and can release harmful substances that may cause inflammation and damage to nearby healthy cells. In older age senescence can, paradoxically, play a role in the development of cancer and other diseases.

action, we should be able to develop alternative clinical approaches by targeting these processes. For example, nutrient sensing can be modified by the drug rapamycin.[31]

### Exercise

Studies on exercise have mainly examined the hallmark chronic inflammation, although there is also evidence for benefits of exercise on mitochondrial function and cellular senescence. Exercise can reduce ageing-related inflammation relatively consistently in humans,[32] which may explain its relationship with maintained health into older age, and it has clear potential as an anti-ageing intervention.[33]

Senescent cells, a hallmark implicated in many ageing-related diseases, accumulate in adipose tissue and are highly pro-inflammatory. Studies in mice have shown that exercise reduces the accumulation of these senescent cells, as well as mitigating the effects of already accrued senescent cell burden and resulting metabolic dysfunction.[34]

More recent studies have suggested that high-intensity exercise has additional anti-ageing effects, due to its effect on skeletal muscle, with a reduction in senescent cells and improvements in metabolic outcomes.[35] Exercise also stimulates turnover and renewal of mitochondria, resulting in improved mitochondrial function (which is important for energy and nutrient regulation).[36] This is exciting from a public health perspective: promotion of shorter, high-intensity exercise as a viable alternative to 'normal' lengthier exercise regimes may improve uptake and adherence to exercise guidelines, which is a challenge amongst the over 65s. Among the general population, accurate accelerometer (fit bit) based studies have shown that only 6% of men and 4% of women currently meet the physical activity guidelines set by the Chief Medical Officer, and this is even lower in older age groups.[37]

Lifelong physical activity may also prevent some of the negative impacts of advancing age on the immune system.[38] Bouts of extended physical activity, high levels of habitual physical activity in older age and single bouts of exercise prior to vaccination have all been shown to improve immune responses to the influenza and pneumococcal vaccines.[39, 40, 41]

As exercise targets several ageing hallmarks, it can be seen as one of the main strategies to maintain health into older age and counteract frailty-related physical impairment.[42]

## Pharmacological interventions

### Geroscience-based drugs

Geroscience-informed clinical trials, either by repurposing existing drugs or developing new ones that target ageing processes, are already demonstrating positive health outcomes for use in preventative medicine. For instance, repurposed drugs that induce cell death in senescent cells (senolytics), such as Dasatinib and Quercetin,[43] are being used in trials. This combination was the first to provide evidence for the geroscience approach in humans. After just three weeks of treatment for three days a week (so as not to interfere with the beneficial effects of senescent cells, such as for wound healing), physical function in patients with the debilitating lung disease Idiopathic Pulmonary Fibrosis was improved.[44] New preventative drugs are also

being developed that target ageing processes. For example, in trials targeting the pathways involved in nutrient and energy sensing, immune cell function was improved, leading to better influenza vaccination responses and reduced respiratory infections in older adults.[45]

Excitingly, there are a number of new biotech companies operating in the geroscience space. At the time of writing, there are over 180 established biotech entities worldwide focussed specifically on developing new geroscience-based drugs.[46] Collectively, it is estimated that these will have a market value of $64 billion by 2026.[47] Whilst most companies remain in the pre-clinical phase due to the novelty of the field, there are examples where significant inroads have been made into clinical testing. Denali Therapeutics has identified a small molecule candidate for neurodegenerative disease. Their offering is currently in phase 3 trials.[48] In addition, MITO.tech has a molecule also in phase 3 trials designed to address mitochondrial dysfunction in ageing-related dry macular degeneration and glaucoma.[49]

Geroscience-focussed biotech companies are harnessing several different drug modalities, including small molecules, peptides, cell therapies, and nucleic acid therapeutics. Many companies are using the power of data and AI to identify new target molecules and pathways. This is exemplified by the work of BioAge, which used a combination of longitudinal data sources, multi-level omics and AI to map pathways and targets for adverse ageing phenotypes, identifying a drug target which is in phase 2 trials for muscle atrophy.[50]

Commercialisation in the geroscience sector is based primarily in the US, where 70% of these businesses are located, most frequently in Silicon Valley and Boston. The UK has a small but growing presence, comprising 7% of global geroscience companies, based in London, Cambridge, Newcastle and Exeter.[51] The majority of geroscience enterprises are privately owned, but a number have been started through Initial Public Offering leading to public investment; examples include CohBar Inc, Unity Biotechnologies and Alector. The geroscience commercial arena is a vibrant and expanding market, with potential to deliver new drugs to clinic in the medium to long term.

## Clinical trials using biomarkers

To translate the UK's strengths in ageing research to clinical benefit, innovative clinical trials in humans are required. Trials that could show an extension of healthspan or compression of late-life morbidity in humans would be lengthy and prohibitively expensive. However, there are useful biomarkers indicative of improved healthspan that could be used for clinical trials to demonstrate the effectiveness of geroscience-based interventions: regulatory flexibility on this front has the potential to unlock significant benefits.

Blood-based indicators of cardiometabolic health were traditionally used as biomarkers in lifestyle intervention studies, including trials of dietary restriction.[52] More recently, epigenetic biomarkers, based on DNA methylation, have been developed to indicate how fast an individual is ageing (termed 'epigenetic clocks'), and one trial has already shown that this biomarker is susceptible to modification with drugs targeting ageing processes.[53] Other biomarkers are based on the degree of systemic, ageing-related inflammation (termed 'inflammaging'). This hallmark of ageing is associated with increased risk of most ageing-related diseases[54] and

frailty[55] and is thus a rational target as well as a cheap and readily measured biomarker. Studies to find further predictive biomarkers of more specific ageing-related diseases are also ongoing and required.

# Outlook

By 2050, 25% of people in the UK will be aged over 65.[56] With an increasingly aged population there is an urgent need to translate the current understanding of ageing biology into extended healthspan and a more preventative approach to ageing-related conditions. Geroscience offers the potential to revolutionise how we maintain health in old age[57] and has generated academic and biotech industry excitement, including from the Royal Society, which has commenced a larger piece of policy work on ageing. This emerging field, which examines the biological pathways that cause ageing-related frailty and disease, provides an opportunity for the UK to excel in preventative and clinical medicine. The UK already has a strong research base in this field, and important health research resources such as the UK Biobank.[58] Gearing up the NHS, universities, funders and industry to invest now in a geroscience approach to extending healthspan could have substantial future economic and health benefits.

A strategic and joined up approach will be required to translate geroscience research into clinical and public health practice. Although the basic research effort is strong, it remains unnecessarily fragmented. The geroscience research that we have presented here is just a taster of what this approach could offer through translation. For example, using NHS data and clinical research facilities, research funders could fund and co-ordinate clinical trials of geroscience approaches, based on biomarkers and therapeutic targets identified in UK universities. NHS data could also be used to generate epidemiological evidence for geroscience-based interventions, allowing a greater understanding of multimorbidity and frailty, and could also identify the optimal times to intervene. However, as well as a lack of investment, there is also a lack of academic geriatricians to run these analyses and trials. Funding and incentives might be required to encourage clinicians into this exciting and developing field.

Geroscience research is already demonstrating the clear benefits of lifestyle related interventions to alter ageing-related outcomes and their potential to extend healthspan. How factors such as smoking, alcohol use, obesity, mental health or air quality interact with the ageing process and associated hallmarks is unclear. Better understanding of this issue could start to address the major inequalities in health during ageing in the UK. In addition, geroscience-informed public health messaging and policy will be required as a key component of a move towards a more preventative approach to ageing and to allow the UK to capitalise economically and socially from these research advances.

Additional economic benefit would come from incentivising the commercialisation of geroscience research through the development of geroscience-based drugs that target ageing processes rather than specific diseases. There are already fledgeling companies based in the UK and, given the strong research base at UK universities, these could be expanded. However, the one-drug, one-disease R&D model dominant in large pharmaceutical companies will need to be

addressed to support the phase 3 trialling of promising new geroscience-based drugs arising from UK companies.

Learning from the COVID-19 pandemic, researchers have demonstrated that we have the capacity and potential to implement novel trial designs suited to testing the ability of existing single drugs to combat multiple diseases in multimorbid patients. Running trials that include older and multimorbid patients are key to translating much of this new knowledge and this may require regulatory intervention, as has been the case for drugs to be used in children.

Overall, the UK has the components needed to translate our geroscience research strengths into practice, but co-ordinated action will be required to join them together and capitalise on this promise.

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# Appendix A: Research and innovation

This appendix highlights the range of existing research in England and the wider UK on improving health, delaying ill health and reducing disability and the effects of disability in older age. It points towards some specific areas where research is ongoing, and others where there are research gaps and plans for future work.

## 1. Recent research and evidence

The Academy of Medical Science's 2023 report "*Future-proofing UK Health Research: a people-centred, coordinated approach*",[1] observed that health research "*fuels the discoveries that keep people healthier for longer, highlighting that poor physical and mental health, while clearly being issues for both individuals and their families, are also major societal issues leading to increased demands on health and social care provision as well as reduced economic activity and productivity*".[2]

Research on healthy ageing is wide-ranging. From understanding the biological mechanisms of ageing and the risks of disease and disability to the socio-economic and environmental factors which influence individuals' health outcomes – together with the treatments and interventions needed – it needs to span the range of academic and clinical disciplines. And if it is to influence practice, it needs to encompass all of the steps in the chain of research and innovation.

There are three core themes which run through the emerging ageing-related health research and innovation of recent years, and which will inform research plans and priorities for the future:

- Progress in understanding the biological mechanisms of ageing and age-related disease, which has a substantial contribution make in enabling older adults to live disease free for longer.
- Improving access to – and the experience of – health and social care for the increasing number of people with multiple long-term conditions and complex care needs.
- The recognition that a healthier life is driven as much by social and environmental factors and earlier intervention, as by the natural ageing process or disease, calling for a holistic, person-centred and preventative approach in the delivery of health and social care services.

A focus on these themes will be necessary, but not sufficient, if we are to address the challenges. Equally important are the cross-cutting themes which will facilitate the cultural and organisational changes needed if the research is to influence practice.

- The need to increase ageing research and innovation capacity, capability and opportunities across academia, the healthcare system and voluntary, community, faith and social enterprise (VCFSE) organisations and industry.

- The need to improve capability in working across both national and global networks of expertise and across sectoral and disciplinary boundaries.
- The need to access and use data in protected research environments to link health, social, economic and environmental data to the biological changes influencing healthy life expectancy.
- The need to address equity, diversity and inclusion (EDI) in both the research and in research teams, to recognise the essential importance of patient, carer and public involvement and engagement (PPIE), and to remove barriers to involvement, for example through open science.

## 1.1 Progress in understanding the biological mechanisms of ageing and age-related disease

With ageing comes an increased risk of a number of life-shortening diseases or long-term conditions such as arthritis, diabetes, cardiovascular disease and neurodegeneration with which it shares several biological mechanisms. In addition, there is a decline in physical senses (for example, hearing, continence, eye sight, frailty). It is important to understand these mechanisms if we are to develop aids and interventions which help to identify, manage or delay their onset. Furthermore, different organs in our body age at different rates due to health behaviours or physiological differences.[3]

Genome-wide association studies (GWAS) have identified loci associated with longevity[4], but understanding the molecular function of genetic variants through functional genomic approaches will bring greater understanding of the mechanisms of ageing.[5]

The MRC London Institute of Medical Sciences (LMS)[6] is an interdisciplinary research investment in which scientists and clinicians collaborate to generate mechanistic understanding of biology and advances for improved human health. Recently, the Institute Director has identified multimorbidity as a key human health challenge to link the 30 different research groups and bring synergistic focus to research programmes.

The **UKRI** Strategic Priorities Fund (SPF) Tackling Multimorbidity at Scale programme, a funding partnership between the Medical Research Council (MRC), the Economic and Social Research Council (ESRC), the Engineering and Physical Sciences Research Council (EPSRC) and NIHR, supports 6 large research collaboratives which are analysing large data sets to identify diseases that cluster as we age, and the common biological pathways involved. This information can be used to develop disease prevention, early diagnosis or management strategies and provide the targets for developing new treatments. The MuMPreDiCT research collaborative has devised and published a Multiple Long-term Condition (MLTC) machine learning clustering algorithm[7] and are using the algorithm to identify MLTC clusters and trajectories.

By the age of 65, one-third of people are affected by some degree of hearing loss which can lead to social isolation and disability and has been identified as a risk factor for dementia.

Researchers from King's College London and UCL, supported by the **Royal National Institute for Deaf People (RNID)** analysed the genetic data from over 250,000 participants of the UK Biobank aged 40 to 69 years to see which genes were associated with people who had reported having or not having hearing problems on a questionnaire. [8] 44 genes were identified to be linked with hearing loss.

Despite being a common impairment for older people, little is known about the causes of hearing loss and the only treatment option available is hearing aids which are often not worn once prescribed. The findings of this study will allow researchers to determine how the condition develops as we age and help identify potential targets for new therapies.

Bioscience for an integrated understanding of health, a priority programme of the Biotechnology and Biological Sciences Research Council (BBSRC), aims to improve health and wellbeing across the life course to reduce the need for medical and social intervention. The focus is on understanding the mechanistic basis of lifespan and healthy ageing using human, microbial and animal systems, with the long-term objective of promoting health in later life.

The BBSRC-funded Human Genomic Resources (HAGR) is a collection of databases and tools designed to help researchers study the genetics of human ageing using modern approaches such as functional genomics, network analyses, systems biology and evolutionary analyses.

A very topical example of the importance of such research is the topic of immune resilience which can be held responsible for many morbidities of older age. The recent COVID-19 pandemic was an illustration of how immune resilience declines after the age of 50 – and the consequences.

The ability to respond to infections declines in ageing populations. This is primarily owed to a decline in the body's ability to mount effective immune responses, which provides some challenges. For example, the decline in immunity in older adults can lead to a reduced response to vaccination.[9] Vaccinations are generally given to older people to boost pre-existing immune responses to common endemic pathogens and thus restore immunity that has waned over time; several vaccines have been developed specifically to protect older populations against these infections.[10] As indicated by the response to COVID-19,[11] design of vaccines against novel pathogens should take into consideration the features of the ageing immune system which is the focus of research at the BBSRC strategically funded Babraham Institute.[12]

### Evidence-based changes to the 'flu vaccine

While the initial responses of older people to influenza vaccination are comparable to those observed in younger individuals, studies[13] have shown that the older immune systems fail to maintain or expand on these initial responses, which can render older people more susceptible to influenza infections despite being vaccinated. As a result of this research, the NHS now offers those aged 65 and above a newly introduced enhanced adjuvant version of the traditional trivalent influenza vaccine. This has the effect of boosting their immune response, which increases the vaccine's effectiveness.

### Development and national implementation of the electronic frailty index (eFI)[14]

Frailty is a condition that is common in older age. Older people living with frailty account for around £6 billion of annual NHS expenditure. It develops because, as we get older, our bodies change and can lose their inbuilt reserves. These changes mean that older people with frailty can experience sudden dramatic changes in their health when they have an illness. International guidelines recommend frailty should be identified routinely so a more holistic approach to care can be taken, and effective treatments provided. However, the main historical difficulty with identifying the markers of frailty routinely is that available clinical tools, such as measuring walking speed or frailty questionnaires, require additional resource, and might be inaccurate. In a landmark study, supported by the **National Institute of Health and Care Research (NIHR) and Health Data Research UK**, underpinning research to develop and validate and electronic index using routine GP data to identify frailty was carried out. The national implementation of the eFI enabled a standardised approach to identifying frailty nationally, providing the platform for the 2017/18 NHS England GP contract and inclusion in the 2019 NHS Long Term Plan.

Chronomics Ltd.,[15] co-founded by Wolf Reik and Tom Stubbs as a spinout from the Babraham Institute, uses epigenetic measurements from saliva samples to give customers information and feedback on their health. It uses epigenetic data to provide people with personalised biomarkers or measures at a molecular level, to support them with prevention against the leading causes of age-related and chronic condition.

The importance of research of this nature was reflected in the House of Lords Science and Technology Committee's 2021 report on developments needed to enable healthy living in an ageing population[16] with one of the top 20 priorities identified being to identify accurate biomarkers of ageing to support studies to improve health span.

Over the last half century there have been several attempts to develop biomarkers of ageing but the ageing phenotype is complex and work continues in refining definitions of biomarkers of ageing and the criteria for their selection.[17]

## 1.2 Improving access to – and the experience of – health and social care for the increasing number of people with multiple long-term conditions and complex care needs

In 2019, people aged 85 years and older were reported to have an average of 5.2 diagnosed conditions. By 2040, the number of people aged 85 years and older will increase but projections also suggest that they will have an average of 5.7 conditions.[18] With multiple long-term conditions comes the increased risk of excessive polypharmacy (along with frailty, obesity and mental health status)[19] which in turn comes with the 1.5 to 2 times higher possibility of recurrent falls in older adults,[20] not to mention the avoidable cost.[21] And related to the fact that more people are dying at older ages and with multiple, complex conditions, the number of people with palliative care needs is projected to rise significantly over the next 25 years.[22]

Some of these conditions are individually highly prevalent and impact quality of life to greater or lesser degrees. If experienced together, however, they substantially impact quality of life and increase the complexity of treatment and care. In some cases, addressing a single condition earlier could help address the emergence of another condition later in life.

Finding ways to address the challenges and complexity of this trend was highlighted in the Government's Health and Care White Paper (2021)[23] and is a major strategic priority for the **NIHR** which published a strategic framework for Multiple Long-Term Conditions (MLTC) research in 2020.[24] It reflected in its 2021 Evidence Review[25] that the healthcare system tends to focus on individual diseases or issues, observing that it frequently "*fails to respond to the needs of the whole person*", a situation, it says, which is "*reinforced by medical training models, treatment guidelines, and drug efficacy trials, all of which are typically premised on people with single conditions*".

For example, there has been substantial research over the past 30 years on the effectiveness (in terms of prevention and promoting longer, healthier lives) of the Comprehensive Geriatric Assessment – a multidimensional holistic assessment of an older person's abilities and needs.[26] Evidence provided to the House of Lords Select Committee in 2021[27] highlighted that robust systems are needed nationally to ensure that these evidence-based interventions can be made available and applied consistently and reliably.

The **NIHR** continues to invest significantly in research to better support people with multiple long-term conditions (MLTCs). This includes investing over £45m to understand how conditions develop and cluster over the life course. In conjunction with the **Engineering and Physical Sciences Research Council (EPSRC)**, it is investing £25m into innovative research to understand how health and care services can be configured around the needs of people with MLTCs. The initial stage of this major research programme has commenced, with nine groups awarded a total of £1.75m, allowing them to undertake development work to establish specialist Innovation Hubs which will be commissioned in 2025.

**The Economic and Social Research Council (ESRC)** has several large investments which consider and grow the evidence base on the multifaceted impacts of adult social care on society, including the Centre for Care,[28] and the micro and macro-economic implications of

financing, organisation and demand (via the Institute for Fiscal Studies),[29] together with increasing the quality and implementation of evidence via IMPACT, a £15m co-funded centre with the Health Foundation.[30]

Clearly, multiple specialities are needed to be involved in understanding and managing the care – both during and at the end of life – of each individual. This makes development of a multi-disciplinary, multi professional approach a priority for both researchers and health and care providers to avoid fragmentation and less-than-optimal outcomes, as well as the exploration of new operating models (and funding mechanisms) that facilitate evidence-based changes to policy and practice.

## 1.3 Addressing the wider social and lifestyle determinants of healthier later-life outcomes and earlier intervention

The least wealthy people in society can expect not only to live a shorter life but also to spend a greater proportion of that life with long-term illness(es) than wealthier people.[31] Poverty and financial insecurity, access to educational opportunities, quality of employment, housing and living environment have all been found to affect physical and mental health directly, and influence behaviours like whether people are physically active, smoke, have a poor diet or drink too much alcohol,[32] all of which have been found to increase the risk of disease in later life. For example:

- Research has found that ethnicity and deprivation are independently associated with dementia;[33]
- There is a large corpus of primary research establishing the connection between smoking and vision loss, with smoking cessation being recommended to reduce risk and prevent exacerbation of macular diseases and associated sight loss.[34]
- The Norfolk Arthritis Register, a 30+ year cohort study involving over 4,500 people demonstrated that smoking doubles the chances of developing inflammatory arthritis.[35] Smoking and obesity were also shown as risk factors for developing rheumatoid arthritis.
- Research, published in The Lancet in 2016, found that lower socioeconomic status had almost the same impact on health as smoking or a sedentary lifestyle, and was associated with reduced life expectancy of 2.1 years, similar to being inactive (2.4 years). [36]

**SPECTRUM** – Shaping Public hEalth poliCies To Reduce IneqUalities and harm, is a 5-year research programme to investigate the commercial determinants of health and health inequalities focusing on harm caused by tobacco, alcohol and unhealthy food (for example, high in fat, salt and sugar). It is one of 7 research consortia funded by the UK Prevention Research Partnership (**UKPRP**), a £50m multi-funder initiative to fund research that will generate fresh insights into actionable, sustainable and cost-effective ways of preventing non-communicable diseases in the UK.

As highlighted in the 2021 Chief Medical Officer's report, older, retired people often settle in coastal regions. In smaller seaside towns, for example, 31% of the resident population was aged 65 years or over in 2019, compared to just 22% in smaller non-coastal towns. But it has been found that they do not have the same access to healthcare (or transport) as those living in urban inland areas.

The **NIHR's School for Public Health Research** is:

- undertaking research on coastal rural communities' active and sustainable travel, recognising that for people living in villages and small villages, getting around by walking, cycling or public transport may be challenging and limited. The project aims to inform local authority transport planning policies that support equitable and sustainable active travel in rural settings.
- commissioning new research on the health and health inequality impacts of place-based interventions and aims to increase our understanding of how the places in which we live, work and play affect our physical and mental health.

Here are some examples of interventions which encourage preventative action, healthier lifestyles and to enable people to remain socially connected, delivered in the community, coupled with accessible transport (or active transport for those who are more physically able).

Supported by **Innovate UK** and responding to a growing need for transport options that are safe, affordable, sustainable and desirable for the ageing population, in January 2023 the **Royal College of Art's Design Age Institute** launched a call-out for innovative transport-focused proposals as part of a new Transport Pathfinder Innovation Programme.[37]

Walking Publics / Walking Arts: Walking, Wellbeing and Community during COVID-19 – The Pandemic and Beyond[38] explored the potential of the arts to sustain, encourage, and equitably support walking during and recovering from the pandemic. It examined the impact of COVID-19 on walking practices and how the pandemic informed, and could be informed by, creative walking approaches.

The Centre for Climate Change and Social Transformations (CAST)[39] report on car use found older people should be supported to try and reduce car use through a combination of new technologies and local community-based communications channels. The report noted that awareness can be raised around retirement age as this is a big life event/transition when habits can be broken, and new travel behaviours formed.

CLOSER found that active travel has been shown to increase high-impact physical activity for older adults, which is good for bone health. Urban residents were found to be significantly more likely to frequently engage in active travel than rural residents.[40]

The Sustainable Care programme led by CIRCLE looked at the experiences of ageing migrants in the UK, finding good transportation links in some areas, especially London, but inadequate links in other areas, such as suburban and rural Yorkshire, with public transport generally inaccessible.[41]

The Urban Big Data Centre have found that rural areas face a 75-100% drop in available services at night compared to early morning, meaning older adults reliant on public transport have a limitation on when they can travel later on in the day.[42]

The Responsible Automation for Inclusive Mobility (RAIM) project is looking at how to use AI to develop future transport systems that meet the needs of ageing populations to reduce social isolation and maintain access to health services.[43]

Supported by **EPSRC**, the cycle Boom research project[44] has shaped the approach of cycling manufacturers and policymakers, as well as boosting older people's awareness of the value of both cycling and power-assisted electric bikes (e-bikes). The project explored how technological systems (such as e-bikes and equipment) and the built environment (cycle paths, street layout and cycle routes) affected people's cycling habits over time. It also delved into the effects of information and service provision about cycling. The researchers took a holistic view of people's choices around cycling, like early life experiences, social and cultural factors, the environment and economic impact. 240 participants took part across 4 cities (Oxford, Reading, Bristol and Cardiff). The findings showed that older people who do cycle recognise the positive benefits to their health and wellbeing, but view the UK's infrastructure as generally unhelpful for cyclists.

Supportive, accessible and easy-to-use technology will be key to addressing some of the research challenges described in this appendix. Examples of work to evaluate new technologies is included below.

### Optimising the diagnosis and management of hypertension in primary care through self-monitoring of blood pressure (NIHR study)[45]

High blood pressure affects 12.5 million people in England and is the third biggest risk factor for disease after tobacco smoking and poor diet. The TASMINH4 trial provided conclusive evidence that GPs can use the readings from patients who self-monitor their own blood pressure to achieve significantly lower blood pressure after 12 months compared with conventional approaches. The levels of blood pressure control achieved could translate into a 20% reduction in stroke risk and 10% reduction in coronary heart disease risk. The option for patients to self-monitor blood pressure was integrated into NICE Guidelines in 2019. The TASMINH4 software developed through this research has been licensed to the company Omron BV, and is expected to be used by over 300,000 NHS patients by 2025. This research has also provided the underlying evidence base for NHS England for the BP@Home programme, which, having started in October 2020, is distributing 220,000 blood pressure monitors to primary care in the UK, so that patients can record their blood pressure and send their readings to their GP practice to review, by telephone, email or via a remote monitoring platform.

A systematic review published in 2020 categorised technologies into three groups: accessible communication, emergency assistance and physical and mental well-being.[46] Patient-centredness was extensively addressed by exploring how the participants engaged in the development and evaluation of the technology and how they were trained and monitored. The review observed that research concerning technology to assist age in place performed in an authentic situation, supported with a randomised controlled trial, was rare and that more research on long-term effectiveness was needed. Some examples of current work being carried out in this area are highlighted in the case studies below.

### Technology for an Ageing Population Panel for Innovation (TAPPI)[47]

A collaboration of academics, community organisations, private sector partners and co-production experts led by the **Housing Learning and Improvement Network** (Housing LIN), the **TEC Services Association** (TSA) and funded by **The Dunhill Medical Trust,** TAPPI seeks to address the opportunity that technology has to enhance the lives of our ageing population and the barriers that prevent its adoption.

The first phase of TAPPI, which concluded in 2021, examined current practice and then set out ten practical principles for using technology in housing and care for older people.

In this second phase, 'From Principles to Implementation', which will conclude in autumn 2023, digital services and solutions are being assessed using the original TAPPI principles in six demonstrator sites to ensure they are: Adaptable, Co-produced, Cost-effective, Choice-led, Interoperable, Inclusive, Outcome-focused, Person-Centred, Preventative and Quality-focused. This phase will gather evidence of what is possible and challenge what is perceived to be impossible, building on learning gathered during the pandemic. The goal is to create new, scalable housing service models using technology-enabled care which support personalisation and, put simply, deliver better outcomes for people. The programme is currently being evaluated by the University of Cambridge Centre for Housing and Planning Research and due to report in winter 2023.

Similarly, the **Health Foundation** launched its Tech for Better Care programme in 2023 to explore the potential for using technology to enable better care at home and in the community. The project is supporting teams through a three-phase innovation process. Recognising that "innovations alone will not address the challenges facing social care", the Health Foundation, like the TAPPI programme, is giving teams the resources and support to innovate, and demonstrate that a new way of delivering relational and proactive care, by making the most of technology, is possible.

Many of the evidence-informed recent health and well-being lifestyle interventions have resulted from the work of community-facing organisations, supported by a range of charitable organisations and independent health foundations, taking action locally. In some areas, these are becoming embedded in the local health and social care systems through innovative commissioning models.

Clinical trials have shown that an intervention called **ESCAPE-pain**,[48] supported by **Orthopaedic Research UK**, reduces pain and improves physical function and mental and emotional well-being for up to 2½ years. It implements the NICE clinical guidelines for the management of osteoarthritis and management of low back pain. Initially, the intervention is delivered by physiotherapists in outpatient departments but then a training programme enables exercise professionals to deliver it in community venues where people can continue to exercise after completing the initial programme, facilitating easier access to the programme and its benefits. Consequently, some healthcare commissioners are now forming partnerships with community/leisure organisations to deliver ESCAPE-pain outside clinical settings, freeing up clinical facilities, making better use of the workforce, reducing costs and providing on-going support.

Other programmes include two supported by the **UKRI Healthy Ageing Challenge**: **Good Boost**,[49] which is mobilising the UK leisure sector to deliver inclusive, accessible and personalised health services to address musculoskeletal issues and prevent falls by transforming local gyms into Community Musculoskeletal Hubs, and **Move More Live More**,[50] an inclusive exercise programme working with older and less mobile adults. Specifically tailored to increase users' strength and flex flexibility, it aims to reduce risks of falls at home or whilst out and about.

**Football Fans in Training (FFIT): a randomized controlled trial of a gender-sensitive weight loss and healthy living programme (NIHR)**

Rising levels of obesity and the associated health risks (heart disease, diabetes, stroke, cancer) require more evidence-based interventions to help with weight loss and maintaining that weight loss long term. The FFIT programme enables men to take part in a 12-week weight loss management programme in their local football club. The findings demonstrate that sports club-based fitness programmes are an effective way to engage sports fans in managing their weight and being physically active, influencing the growth of club-based weight management programmes in the UK and beyond.

The **Macular Society** has local collaborations to support patient groups. An example in the Southeast is Sight for Surrey who provide assessments and introductions to a wider range of assistive tools and technologies.[51] **Sight for Surrey** is able to provide a range of support free of charge through local authority budgets. There is, however, a national disparity in such provision, so these support services are not universally accessible.

The National Academy for Social Prescribing's evidence review published in 2022 recommended a multidisciplinary and locally co-ordinated approach to ensure that all services and professionals in a locality are able to work together to provide the support an older person needs.[52] It observed that for the recently introduced Integrated Care Boards, this means much more than just identifying those at risk of frailty, instead developing personalised care solutions for older people that encompass all of the services needed to support the food, energy, digital, social and financial aspects of an older person's life. This would involve drawing on the range of community assets and developing mechanisms to facilitate long-term commissioning of VCFSE organisations. Early evidence points to the potential of this coordinated and community-based approach to reduce demand on health and social care services.

A four-year proof-of-concept programme in Northern Ireland, the Impact Agewell® service, convened by the **Mid and East Antrim Agewell Partnership (MEAAP)** and funded by the **Dunhill Medical Trust**, aimed to improve quality of life for older people by connecting them to their community. The service, funded for a further two years by the Northern Health and Social Care Trust in Northern Ireland, goes beyond the "signposting" model, instead building in a funding stream to invest in the community-based, often volunteer-led, organisations which deliver these services (commonly referred to as 'social prescriptions') such as befriending, transport, physical activities, luncheon clubs and handyperson services. Older people who are eligible to take part in the programme can submit an expression of interest or be referred to the programme by their GP or other Partnership member. This integrated, community asset-based approach demonstrated, through a robust, three-part evaluation validated by the Social Care Institute for Excellence and the University of York, that for every £1 invested there has been at least £2.38 of savings generated in terms of unscheduled health and social care and,[53] as the Northern Ireland Demonstrator project for the **ESRC-Health Foundation IMPACT programme**, provides important learning and contribution to the evidence base for the future operating models for Integrated Care Boards.

**The Arts and Humanities Research Council's** current £26M investment in 'Mobilising community assets to tackle health inequalities' takes an interdisciplinary approach to funding research that aims to use local, cultural, and natural assets and activities to support improvements in health inequalities in the UK. It is supported by a partnership with the **National Centre for Creative Health (NCCH)** and will fund projects in three phases. Projects funded through the third phase of the programme will start in February 2024.

Suitable housing has been shown to be one of the key determinants of healthier later life outcomes[54] and this has been reflected in recommendations to shape adult social care: "*Every decision about care is a decision about housing*", so wrote the Association of Directors of Adult Social Services (ADASS) in its paper *Nine statements to help shape adult social care reform*[55]. Households headed by someone aged 75 or over are disproportionately likely to be living in a non-decent home. The cost of this to the NHS has been estimated at £1.4 billion per annum with people needing to be treated from the effects of excess cold or falls[56]. £513 million is spent on first year treatment costs alone for households headed by someone aged over 55 living in poor housing. These treatment costs are often driven by inadequate or inefficient heating, insulation or ventilation (which can result in higher blood pressure, respiratory diseases, and psychological distress) and trips and falls (as a result of inadequate adaptation and/or hazards).[57]

The first research trial of a housing adaptation in the UK was carried out in 2016: the BATH-OUT study,[58] supported by **NIHR**. Housing adaptations have been identified as an important environmental and prevention intervention for older adults as the onset of disability in bathing can act as a warning for further disability in other activities and may therefore be a judicious time-point for intervention. The aim of this study was to determine the feasibility of conducting a randomised controlled trial (RCT) of bathing adaptations, to evaluate whether they improve older adults' perceived health status and quality of life, prevent further functional deterioration, and reduce the use of other health and social care resources. It confirmed the feasibility of carrying out RCTs of this nature and recommended further research of this nature.

**The impact of home energy efficiency interventions and winter fuel payments on winter- and cold-related mortality and morbidity in England supported by NIHR[59]**

Research on the impact of Home Energy Efficiency (HEE) interventions and winter fuel payments on winter/cold related mortality and morbidity showed that since the introduction of winter fuel payments, the association between winter temperatures and mortality rates amongst older people has weakened. The results showed that the impact of Home Efficiency (HEE) measures contributed to a reduction in winter cold-related deaths (of approximately 280 per year).

FLEX (Flexible Dwellings for Extended Living), [60] funded through Connected Communities (AHRC), sought to address the issue of an increasing older population that wants to age 'at home'. By looking at how people might dwell more socially as they age, better serving companionship, resource sharing and social resilience, focusing on resident in Newcastle and Dundee. The project influenced local councils and evidence was submitted as part of a review to RIBA.

Supported through the **UKRI Healthy Ageing Challenge**, Blackwood Homes and Care's Peoplehood project set out to co-create "beautiful places for independent living that offer what people need to live healthier and happier for longer". It has created three demonstrator sites in Dundee, Glasgow and Buckie featuring elegant design, home automation and non-intrusive health monitoring to enable people to live independently within their neighbourhood. Alongside new homes, the Blackwood Design Guide enables individuals or housing organisations to adapt existing homes to better support people as they age.

Examples of how **ESRC** has supported work on healthy ageing at home are included below:

- The Sustainable Care programme led by CIRCLE studied ageing well in the home, finding that technology, including assistive and new developments in at-home monitoring, could offer alternative and improved approaches in home care.[61]

- Diversity in Care Environments research showed those receiving some form of care support (including residential care) are less lonely than they would be if they were living independently in the community. Schemes providing care also provide positive opportunities for social inclusion. Discrimination remains a problem with pockets of isolation amongst residents from minority groups.[62]
- ESRC research exploring using new technology to support 'ageing in place' found that while the use of technology is growing Local Authorities need better access to information and expert guidance.
- The ESRC International Centre For Lifecourse Studies in Society and Health found strong evidence that external housing modifications protected against a range of disability outcomes.[63]
- Research completed through the ESRC Growing Older research programme and ESRC-funded International Network on Population Ageing and Urbanisation led to the first empirical comparative research project to demonstrate the multiple risks of exclusion facing older people living in deprived neighbourhoods in the UK and Belgium, with a focus on policies and initiatives that promote active ageing in urban contexts. Common barriers to implementing age-friendly policies included the prevalence of ageist attitudes, economic and political barriers, and potential limitations associated with the concept of 'age-friendliness'.[64]
- The PLACE-AGE project developed guidelines for policymakers to enable city spaces to become more ageing friendly including building more adaptable, affordable housing.[65]
- Current research funded by ESRC on intersectional stigma examines lived experiences of older disabled adults. The research is exploring tailored interventions that support accessible home and neighbourhood modifications.[66]

Much of the research and many of the pilot studies highlight the part that co-production and patient, carer and public involvement and engagement (PPIE) play in prioritising developments in health and social care and translating research into service delivery.

Investors in innovation look for robust evaluations and data about adoption to support their investment decisions, which can be so crucial in moving research into practice, and the encouragement (or in some cases, requirement) of researchers to collaborate with businesses or third sector organisations is becoming an increasingly common condition of funding.

**Social Finance,[67] in partnership with the Dunhill Medical Trust and the Alzheimer's Society,** is currently carrying out a piece of research and development activity, working directly with existing organisations that have been developing innovative alternative services for older people with complex care needs such as dementia. The intention is to develop and prime a pipeline of potential services and multi-disciplinary, multi-sector approaches as well as funders and investors and define the mechanisms through which to deliver alternative outcome-based approaches at scale.

### Dementia Roadmap (NIHR)

The GP Dementia Roadmap is a tool for GPs to use in consultations with families living with dementia that has been widely adopted. The roadmap provides information about the dementia journey alongside local information about services, support groups and care pathways to assist primary care staff to more effectively support people with dementia and cognitive impairment, as well as their families and carers. This roadmap has been rolled out across NHS organisations throughout England and, in 2015, was further expanded by Dementia Pathfinders,[68] a national social enterprise community interest company.

### The START (STrAtegies for RelaTives) study (NIHR)

Research has demonstrated the cost effectiveness of therapy to support the mental health of those caring for people with dementia. This is achieved by decreasing carers' anxiety and depression and improving their quality of life in the short and longer term, which in turn results in reduced use of services. This funding award has influenced government policy on dementia and NICE guidance on best practice, leading to application of the strategy more widely across England and Wales.

This exploration of alternative delivery solutions has also been the focus of UKRI's Healthy Ageing Challenge[69] – which concludes in March 2024. This programme combines social, behavioural and design research with investment in innovation, including supporting the scaling of social ventures. It encompasses a diverse landscape with a wide range of sectors involved, including health, social care, housing, financial services, fitness and leisure and technology. The portfolio of nearly 230 projects engages partners across academia and business including social enterprises, as well as public sector and private equity investors. 80% of the investments have included lower income groups and the Challenge has leveraged £43m of co-investment from industry.

One of the programmes supported by the Challenge is the **Healthy Ageing Catalyst Awards** in which **UKRI** and **Zinc**[70] have partnered to fund entrepreneurial academics who want to translate their research into impactful and scalable products, services and interventions.

During 2023, Zinc is supporting its fourth cohort of researchers to create innovations that:

- Allow everyone to remain active, productive, independent and socially connected across generations for as long as possible.
- Narrow the gap between the experiences of the richest and the poorest.

The award winners explore innovative ideas with the potential to transform the physical, mental, or social wellbeing of people as they age and all ideas are expected to fit with the priority areas of the UKRI Healthy Ageing Challenge. These include supporting social connections; living well with cognitive impairment; managing the common complaints of ageing; sustaining physical activity; maintaining health at work; design for age friendly homes and creating healthy active places.

### EPSRC/NIHR Transforming Care and Health at Home Grants

In 2022 EPSRC and NIHR co-funded 14 new research projects to develop technologies such as self-care apps, smart devices, and wearables to help people transform their care and health at home.

The projects, which total £10m in funding, span a wide range of innovative devices and initiatives aiming to improve both housing and care, to support healthier living and greater independence for people in their homes.

The studies include a project led by King's College London and the University of Chester that aims to develop a monitoring and communication system with electronics built into clothing and home furniture. The system will measure loneliness levels in older people.

A team led by Loughborough University will work with housing providers and developers, local authorities, and government departments to determine:

- the key environmental factors in sleep degradation
- how people can achieve better quality sleep
- how existing homes can be refurbished to both reduce energy demand and improve comfort in summer.

Researchers at the University of Southampton aim to develop new interactive technology that will help to build and preserve the strength needed to maintain independence at home.

The changing demographics, and therefore needs, of the population mean that different, integrated and person-centred approaches, such as some of those highlighted in these case studies, are emerging. These provide important contributions to understanding how the organisation and delivery of health and social care might look in the future.

## 2. Future needs and plans

The **UK Ageing Research Funders' Forum** ("the Forum")[71] is the representative body for funders of research into the mechanisms of ageing and age-related disease, understanding ageing across the life course and improving health and social care for an ageing population. The membership is comprised of the constituent parts of UKRI, the NIHR and independently endowed charitable foundations such as the Dunhill Medical Trust, the Health Foundation and the Nuffield Foundation, together with some of the leading national medical research charities

which encompass or focus on addressing age-related conditions/disease or improving health and social care for older people. The recent revitalisation of the Forum is in itself an important enabling step forward and provides a mechanism through which the specific challenges of ageing-related health research can be understood and addressed by funders. The gap between the cost of research and the income received for that research is widening in the UK and, in common with other parts of the health research system,[72] there is an increasing dependence on cross-subsidy from other sources. In an area such as ageing research, where contributions to research projects are often dependent on input from a variety of sectors, including universities, the NHS, local authorities, other social care providers, medical research charities and the VCFSE sector, it is important that all of the partners are valued for their time and expertise. The VCFSE sector is often regarded as simply a source of research participants, whilst other professionals do not always have the time or there is a lack of incentive or support from their organisations or the existing funding mechanisms to participate.[73] In this, the business, charities, research Support and Higher Education Innovation Fund elements of the universities' Quality-Related research allocation play a helpful and important contribution allowing universities to recover some of the indirect costs of research not covered by some grants. There is a need, at a time of many competing priorities for funding, for funders to collaborate to avoid waste and duplication.

With a number of current research plans due to conclude in the next 12 to 24 months, Forum members[74] are in the course of setting out their research priorities for the medium and longer term and reflect the body of research and evidence around improving our understanding of the underlying biological mechanisms of ageing, prevention, and addressing health disparities – both geographical and social – which can increase healthy lifespan. The following highlights some of these.

## 2.1 Research and innovation enablers

As noted in the introduction, there are some clear cross-cutting "enabling themes" to be addressed if ageing-related research findings are to have the best chance of becoming embedded in the health and social care system – a system which has the additional complexity of consisting of a wide range of agencies and organisations beyond the NHS.

### 2.1.1 Increasing research capacity and opportunities across academia, the healthcare system and voluntary/community organisations.

The Academy of Medical Sciences in its 2023 report: *Futureproofing health research*[75] lists a number of key areas to address across health research as a whole, and which, with the strategic importance of ageing-related research, deserve attention. For example:

> *"Research culture and career structures can be inflexible, precarious and exclusive, undermining the ability of diverse individuals with diverse expertise to fully explore their potential and be part of the health research system."*

Growing research capacity in geriatric medicine is a particular priority. As the report observes, clinical delivery pressures are creating a healthcare system that finds it difficult to prioritise

research. Clinical academics find it hard to develop their dual careers between academia and the NHS,[76] and currently, involvement of geriatricians in research lags behind other specialities. The reasons for this are multifactorial, but a lack of training infrastructure within geriatric medicine higher specialist training is said to be contributory (Welch 2020).[77]

In recognition of the need to encourage and support the development of clinical research careers in geriatric medicine, the **British Geriatrics Society** and the **Dunhill Medical Trust** entered into a partnership in 2019 to co-fund a clinical research training fellowship.

A call for proposals is made annually, for this fully funded PhD studentship award to which applications from front-line healthcare professionals working with older people – including doctors, nurses and allied health professionals – with an interest in developing a career in ageing-related research are invited. Fellows join the Dunhill Medical Trust's network of Early Career Researchers as well as receiving the wider support of the British Geriatrics Society as student members, connecting them with a broad cross-disciplinary range of researchers and the wider ageing research community.

**NIHR** has introduced programmes to strengthen and promote nurse leadership in health and social care research, and created an accredited register for clinical research practitioners, to raise their profile and establish a community of practice. An 'Associate Principal Investigator' scheme, endorsed by appropriate professional colleges, to fast-track junior doctors, nurses and AHPs to become the PIs of the future has also been introduced, with AHP Champions to actively encourage more AHPs to become involved in research.

It also plans to boost capacity in social care, supporting individuals along the full career path supported by NIHR School for Social Care Research and NIHR Academy initiatives.

While there is a range of options available to finding funding for doctoral research, addressing the precarity in the post-doctoral career stage so as to retain early career talent and guarantee the future pipeline of talent will also be important.

**Post-doctoral fellowships**

In recognition of the need to support post-doctoral researchers in under-addressed and under-funded areas, the **RNID** has partnered with the **Dunhill Medical Trust** to fund a post-doctoral fellowship award to contribute to building research capacity in hearing research, by supporting the career development of the UK's most talented new investigators towards becoming independent scientists.

The **Dunhill Medical Trust** has further launched a biennial call for proposals to co-fund future leaders at the post-doctoral career stage towards permanent positions in partnership with UK universities which are able to demonstrate a strategic commitment to ageing-related research. It has also launched an annual "Excellence Award" which provides flexible three-year funding for "rising stars" and established leaders in ageing-related research.

**UKRI Career Transition Support**

UK Research and Innovation (UKRI) supports capacity development at key career transition points including Centres of Doctoral Training (CDTs), postdoctoral fellowships to carry out supervised research gaining critical skills, discovery fellowships to undertake independent research within someone else's laboratory, research and fellowship programmes to support the transition to independence, and prestigious senior fellowships to support the transition to international leadership. The breadth of fellowship support will allow fellows to move between academic and industry settings, to undertake research in the UK and in other countries, and to spend time in a policy setting to support better translation of research findings into policy and practice.

Investment in networks and team incentives will be important contributors to ensuring that such conditions are nurtured and developed in UK research and innovation to retain those who have chosen ageing-related research as a specialism. They provide mentorship, training and support for early career researchers and promulgate the multi-disciplinary "team science" approach.

The **NIHR** has launched the first round of the Team Science Award. The Team Science Award aims to bring together individuals to form teams to address a research challenge from different disciplinary perspectives. The award recognises the importance of an interdisciplinary approach to tackle complex current and emerging health and care challenges. The award is designed to be different from traditional "investigator-led" awards and aims to recognise the contribution of every member of the research team. The Team Science Award is a development award of up to £100k per team, designed to support research teams to collaborate on a future application to other research programmes, expand their research network, and develop research capacity in the Multiple Long-Term Conditions field.

There is a growing community providing a broad-based foundation of research across the UK with many university centres specialising in aspects of healthy ageing (UK Ageing Research Network or UKANet).[78] These are currently funded by the **Biotechnology and Biological Sciences Research Council (BBSRC)** and the **Medical Research Council (MRC)** for 11 research networks connecting 28 universities across the UK.

These networks aim to promote research to address health inequalities, improve health resilience, and increase health and quality of life in older age. Members include researchers spanning multiple academic disciplines as well as a range of other stakeholders including health care practitioners, industry and biotech, policy makers, funders, the third sector and the public.

The networks are:

- building UK capacity in ageing research
- facilitating new collaborations (within the UK and with international partners)

- stimulating new research
- promoting knowledge exchange of ageing research

### 2.1.2 Improving capability in working across both national and global networks of expertise and across sectoral and disciplinary boundaries.

The Academy of Medical Science's report further observes the:

> *"...lack of multidirectional movement of research talent between public, private and charitable research sectors and that the system struggles to embed health research."*

These are particular issues for ageing-related research. We have seen earlier in the report that there are evidence-based recommendations yet to be adopted consistently and/or at scale. If individuals feel unable to (perceived or actively disincentivised) move between sectors to gain the capabilities, understanding and experience necessary, the cross-cutting skills and insights that can drive innovation and the change needed at scale can be missed.

**Innovation Fellowships in Health and Care**

**Zinc** with **NIHR** and the **Dunhill Medical Trust** launched "Innovation Fellowships in Health and Care" earlier in 2023. This is an opportunity for postdoctoral researchers to join a 6 to 9 month programme in which successful applicants have the opportunity to immerse themselves in the world of commercial innovation, supporting the development of new products and services that improve mental health, contribute to healthy ageing, and/or mitigate the health impacts of environmental degradation and climate change. Researchers also have the opportunity to engage in training, support and mentoring to help them translate their skills, explore new career opportunities, and connect with other talented researchers.

The 3rd **NIHR** Newcastle Biomedical Research Centre Academic Geriatric Medicine Workshop, when it met in 2022, underlined that high-quality care for older people is best delivered by multidisciplinary teams involving a range of professions. Similarly, if research evidence is to inform practice effectively, it needs to be designed and executed by teams that are both multidisciplinary and multi-professional. It went on to recommend the creation of a national "School of Older People's Care Research" to catalyse progress in growing multi-professional, multidisciplinary research for older people and is now working with the British Geriatrics Society and the Dunhill Medical Trust to explore how its Academy might facilitate this.

The **Dunhill Medical Trust** launched its multi-disciplinary Academy in 2023. The Academy is an inclusive body of researchers, clinicians and third sector organisations and professionals working across the disciplinary and professional range. It aims to facilitate better understanding and foster relationships between the academic and clinical researchers and community organisations working with older people, and to make connections and create a supportive place to find new collaborators, mentors and advisors, as well as to sustain nascent networks for the longer term.

In terms of embedding research into the system, the plans for the **University of Newcastle's Health Innovation Neighbourhood**[79] are an innovative and ambitious development. As observed in the NIHR's report Best Research for Best Health: The Next Chapter,[80] applied health and care research, whether to improve clinical outcomes, public health or social care, should be conducted with patients and citizens in those communities and geographies most affected.

The **University of Newcastle** is currently convening a consortium of contributors from across the public, private and charitable sectors to support the development of their "Health Innovation Neighbourhood".

The Health Innovation Neighbourhood is a 29-acre brownfield site which will co-locate:

- intergenerational residential and later living with green and blue space to encourage activity and play
- primary interdisciplinary healthcare provision incorporating education and research

This is interwoven with a 'spine' of research and innovation in both academic and commercial infrastructure.

By acting as a 'living laboratory' focussed on digital enablement, health and care and the anthropogenic environment, the neighbourhood aims to "improve lives at local, regional and global levels".

The embedded research programme will explore interdisciplinary solutions for longer and healthier lives. From medical sciences to humanities, this ambitious programme seeks to generate new insights and innovations. The site will host research activity across discovery, translation and application of new ideas.

By developing hybrid models of health and care the neighbourhood will be a living test bed:

- Academics and NHS practitioners will trial innovative methods of diagnosis and treatment
- Smart Homes and wearables will enable ethical data collection to develop comprehensive insights into health and wellbeing for individuals
- Real-time data from smart homes and wearables will improve diagnostics and research into provision for health and ageing

- Positive adaptations can be trialled in housing and leisure venues across the site before rolling out more widely

By integrating research and innovation with urban living and placemaking, the neighbourhood will be a centre for frontier approaches to health and wellbeing.

### 2.1.3 Addressing equity, diversity and inclusion (EDI) in both the research and in research teams, to recognise the essential importance of patient, carer and public involvement and engagement (PPIE)

There are specific issues in ageing-related research, for example, multimorbidity and changed immune system reactions of older people, that require the representation of older people in research studies.

The **Medical Research Council (MRC)** now requires researchers to include diverse groups within the study design if the outputs are to benefit everyone in society.

MRC requires the researchers it funds to embed diversity and inclusion into the design of any research involving humans (including samples and data) and animals (including cells and tissues). This means that researchers designing studies involving human participants should consider participant characteristics, such as sex, gender, age, ethnicity and socio-economic status.

More than that, though, as the Nuffield Council on Bioethics 2023 Report: *The Future of Ageing: ethical considerations for research and innovation* highlighted,[81] who is involved in setting the research agenda and the issue of how success is defined in a piece of research is hugely important.

**Nuffield Council on Bioethics** 2023 Report: *The Future of Ageing: ethical considerations for research and innovation*

*"to what extent decisions about research priorities incorporate input from older adults and wider public, and if so, the extent to which public contributors reflect the diversity of experience across these populations…criteria such as 'high-quality science' are not sufficient on their own in driving the direction of research.*

*It cannot be ethical to allocate resources into areas of science and technology in ways that do not take account of the priorities and needs of the people who are ostensibly the beneficiaries."*

Organisations and initiatives such as **VOICE**[82] and **VOCAL**[83] – the community of the public, patients and carers who work with researchers and support public and patient involvement and engagement in research are hugely important, as is **NIHR's ENRICH** network,[84] a resource

providing information for researchers, care home staff and the public to help them engage with research in care home settings.

PERCCI – Person-Centred Care Inventory[85] – is a tool that allows for robust empirical assessments of person-centred care approaches which was developed following research supported by **NIHR and Wellcome**, and has since led to the launch of the 'Curious about Care' recruitment quiz that has been adopted by Skills for Care[86].

Emphasising many of the themes of this report, the recent work of the NIHR Oxford Biomedical Research Centre provides a useful tool to assist in prioritising what matters to users, carers and professionals in health and care research.

The **James Lind Alliance (JLA)** is a non-profit initiative which brings together service users, carers and professionals in Priority Setting Partnerships (PSP). These partnerships each focus on a particular area of health or care, working to agree on the Top 10 priorities which most urgently need addressing by research. The **NIHR Oxford Biomedical Research Centre** has conducted a research project[87] analysing and synthesising information from the JLA's PSPs to identify overarching topics among all of the Top 10 priorities and developed a tool to enable researchers, funders and others to prioritise their research work, based on the voices of users, carers and professionals.

## 2.2 Thematic priorities

### 2.2.1 Progressing understanding of the biological mechanisms of ageing and age-related disease enabling older adults to live disease free for longer.

Building on UKANet, **UKRI** have initiated a £75m cross-council investment – Securing better health, ageing and wellbeing (HAW) – to improve population health, tackle health inequalities affecting people and communities, and advance interventions that keep us healthier for longer. The HAW programme made 16 Ageing Research Development Awards (ARDAs), funding to provide proof-of-concept for the development of interventions that will reduce the time spent in poor health in later life. The interdisciplinary teams span the remit of UKRI councils and include industry and community stakeholders. Other elements of the HAW programme include a large investment in Population Health Improvement through community/national intervention development, a functional genomics platform to interrogate functional readout of genetic variation and advance our understanding of the complexity of human physiology and how it changes over time. Investment from HAW into BBSRC-NC3Rs joint programme enabled funding of non-animal technologies for ageing research.

The recent launch of Wellcome Leap's Dynamic Resilience programme aims to address some of the questions around the biological mechanisms of ageing. Three of the fourteen successful applicants are UK-based research organisations: the University of Birmingham, King's College London and Loughborough University.

**Dynamic Resilience: a new framework to promote healthy ageing 2023**

Wellcome Leap's $60M Dynamic Resilience programme[88] seeks to identify and validate causal measures and models of dynamic resilience, at multiple scales, with predictive value sufficient to make clinical decisions and to test interventions. Importantly, reducing progression to frailty in those over the age of 65 by 25% would protect over 75,000 adults in the UK alone, and potentially as many as 87 million older adults worldwide. It is realistic to believe that this is possible – frailty can be halted and even reversed.

The programme goals seek to address key fundamental questions to drive the measurement, modelling and testing capabilities needed to advance new methods of promoting healthy, whole lives: How do we measure and identify who is at greatest risk of health deterioration after a stress event? Why do some people stay in good health and others not? (in particular why is it that people who appear equally frail using steady state measures can show very different dynamic responses to stressor events?) What causes increased risk of health deterioration after a stress event (independent of individual disease states)? And how can we promote dynamic resilience and thus healthy ageing for a greater number of people worldwide?

**RNID** intends to focus on research into the biological mechanisms underpinning age-related hearing loss, and therapeutic approaches to slow decline or improve hearing is needed to meet unmet clinical need, and improve health.

**Dunhill Medical Trust** intends to continue to provide project funding support for the development of interventions that address vision and hearing loss, improve functional independence and in understanding the biological mechanisms of ageing.

**BBSRC**'s Tools and Technologies programme includes projects to develop non-animal technologies to further ageing research and neurotechnologies.

**BBSRC** funded research at the University of Birmingham aims to develop new computational methods that take advantage of large amounts of multi-omics data available on the web, and our own compilations of the effects of hundreds of ageing-related drugs, to predict new drugs with anti-ageing properties. Specifically, methods will be developed that determine which attributes make some drugs extend animal lifespan.

As part of the **UKRI** Health, Ageing and Wellbeing programme, there is an ageing cluster within the **MRC** National Mouse Genetics Network (NMGN). The clusters within the NMGN are pursuing distinctive, but complementary, challenge-led research in partnership with the Mary Lyon Centre at MRC Harwell, generating and robustly phenotyping novel mouse strains, performing pre-clinical trials, and providing training. A key aspect of the NMGN is the collaboration between experts in developing mouse genetic models, and translational and clinical scientists bringing human data, to provide a clear path to clinical translation.

**BBSRC's** long term strategic investment in the Babraham Institute[89] supports innovative research into the molecular mechanisms that underlie normal cellular processes and functions with particular focus on how we age. The research at the Institute focuses on epigenetics, immunology and signalling.

### 2.2.2 Addressing the needs (both for individuals and the system change required) arising from the increasing number of people with multiple long-term conditions and complex care needs

- The ADMISSION Research Collaborative funded by the UKRI/NIHR SPF Tackling Multimorbidity at Scale programme is using big data approaches to understand care pathways for patients living with multiple long-term conditions. The collaborative will also identify key gaps in the evidence base to better understand health inequality. Qualitative research will provide a better understanding of the quality of stay in hospital, while healthcare professionals will provide valuable information to map current care pathways.
- The MuMPreDiCT research collaborative is working with women, their partners, and health professionals to understand experiences of care during pregnancy, birth and after birth to improve care pathways for mothers with MLTC.
- The **NIHR** reflects the Department of Health and Social Care's Areas of Research Interest [90] in its priorities: research to optimise a public health, NHS, social care and wider health workforce that is effectively structured, trained, deployed and supported to deliver future effective and efficient models of healthcare which meet the needs of the UK's ageing population. It highlights the need for more trials of strategies designed to manage people with common multiple condition clusters, and an understanding and approach which recognises that the solutions require actions beyond the remit of healthcare, requiring evidence synthesis, systems thinking and the input of social, behavioural and anthropological expertise to ensure that innovations and services are designed to be acceptable, feasible and scalable, as well as effective. It is investing £100 million in a set of Policy Research Units to tackle important emerging health and social care issues and deliver high quality evidence to support government policy making. These new Units, which will begin work in January 2024, cover a range of topics including supporting health across the life course, with dedicated Units in Healthy Ageing, Healthy Weight, Addictions, Mental Health and Public Health.
- The **Health Foundation's** recently-published Health in 2040 report[91] observed that the fastest growth in need is in addressing conditions that are predominantly managed in primary or other non-acute care settings, "*making this an important area for further research*", as will be the issues arising from the growth in numbers of people living with multiple conditions and the consequent complexity of care delivery.
- **RNID:** Further research is needed on the contribution that hearing loss interventions have to play in the prevention of dementia. It is estimated that 7.5 million people who could benefit from hearing technology have not yet accessed it. Furthermore, hearing service pathways have remained largely unchanged for decades. More evidence is also needed regarding the

optimal use of remote technology to deliver hearing services, as well as determine the efficacy of emerging technology such as over the counter hearing devices in improving uptake of hearing loss interventions. The growing demand for services, combined with workforce shortages, underlines the need for innovation.

- **Diabetes UK** has published its strategy for Clinical and Applied Diabetes research in December 2022[92] with NIHR. The research priorities of people living with the condition and identified through James Lind Alliance Priority-Setting Partnerships and the Diabetes Research Steering Groups. In 2021 it brought together people living with diabetes, and healthcare and scientific experts, for a series of virtual workshops, and reported on the most important research questions where answers could lead to better care for older people with diabetes,[93], and will now be working with the research community and funders to stimulate research in these areas of unmet need, including further work on understanding the range of diverse needs, making care more personalised, and how technology can be used to support people to manage their condition in their own home.
- **Nuffield Foundation** will be investigating models of support and care that older people and their families might need to draw on, and how older people (and their families) currently experience care and support in the final stages of life.

### 2.2.3 The recognition, through systemic change in delivery and earlier intervention/prevention, that a healthier later life is driven as much by social and environmental factors, as by the natural ageing process or disease.

**AHRC**'s £26m interdisciplinary Mobilising community assets to tackle health inequalities Programme is funding research that aims to better integrate local, cultural, and natural assets into health and care systems, enabling better community-led, place-based interventions to tackle health inequalities and support health improvement across the life course.

Understanding how food can impact health, including ongoing discussions around Ultra Processed Foods (UPFs) and their involvement in disease such as diabetes and obesity, is being addressed through the **BBSRC** Food, Nutrition and Health programme. Current investments include work on the gut-brain immunology axis and the impact that food, stress and the external environment can have on the gut physiology, microbiome, immune system and mental health. Interests in personalised nutrition to help maintain health across the life course.

The **NIHR** is enhancing its offer to local government through the expansion of the Health Determinants Research Collaborations, supporting researchers and local authorities to collaborate and use evidence to make decisions. £50 million has already been allocated to the process, helping 10 local authorities. The ambition is for the NIHR to continue to develop and extend its commitment to enabling local government to become more research-active on a systematic and sustainable scale. More broadly, it aims to increase its support for social care by:

- Engaging the sector, developing, supporting and embedding research culture, and widening involvement in research including service users, practitioners and managers.

- Supporting the development of new research, including through NIHR Research Programme for Social Care (from Autumn 2023), NIHR Applied Research Collaborations, the new NIHR Research Support Service (from Sept 2023) and the NIHR Research Delivery Network (RDN) (from April 2024).
- NIHR's Policy Research Unit in Healthy Ageing plans to provide evidence to better understand how healthy ageing policy can increase healthy life expectancy and improve quality of life. This includes exploring what policies are needed to reduce the gap in healthy life expectancy in specific geographic areas, such as coastal towns and rural communities. The Unit will also deliver evidence on interventions, including technology, to extend the period of independent living at home and prevent or delay the onset of long-term conditions and disability.
- NIHR also plans to prioritise the support of innovation in social care, encouraging ways of embedding innovation and learning from best practice, improving the data landscape and promoting new approaches in social care (linking with the ESRC-Health Foundation IMPACT programme)

**Innovate UK's** Healthy Ageing Challenge draws to its conclusion in March 2024, and has identified a number of emerging gaps to inform future research and innovation programmes:

- Supporting transitions across the life course: moments where choices are made that can affect long-term healthy ageing prospects. Menopause, nutrition/obesity, dementia and palliative care have emerged as key areas.
- Supporting issues affecting work in later life: people leaving the workforce early, through ill health and/or to take on caring responsibilities. Mental health and musculoskeletal diseases are key areas.
- The need for healthier homes and environments: retrofitting, home adaptations and assistive tech/care are key areas. Also includes climate change and ageing as well as regenerating communities as active places supporting multi-generational interactions.
- Social care: Supporting new models of homecare, out of hospital care and selfcare. Involves managing multiple long-term conditions.

**RNID** will be working to innovate in the hearing loss treatment pathway to reduce unmet need.

**Dunhill Medical Trust** will support activities and programmes that enable communities to engage more closely with the research base by providing co-funding, social investment and supporting nascent networks. It will collaborate with others to understand and address the barriers to adoption and to develop mechanisms that have the potential to create systemic change. It will also provide project funding support for:

- interventions that target the social determinants of healthy life expectancy;
- the development and delivery of age-friendly housing, and adaptation and technology-based solutions that promote independence;

- interventions that have the potential to prevent, delay or reduce future health and social care requirements, in particular those which improve the ability to maintain functional independence for older adults.

Future **UKRI** research activity will include personalised prevention and increasing healthy lifespan including linking population-based approaches to individuals; understanding the links between biology and behaviours and how this may affect ageing trajectories; bringing in a life course approach focussing on key life transition points; and considering vulnerable people and how to reduce health inequalities. What interventions and assistance can we put in place to support and increase healthspan? What are the impacts of the current environment – climate change, air quality, natural environmental hazards such as pollution and wildfires, water quality, sedentary living, screen time, ultra-processed food – and how can we integrate multidimensional data to support intervention development? This also links into the technologies and AI agenda from the perspective of new data approaches and wearables and sensors, and the **EPSRC** theme of Engineering Healthier Environments.

**UKRI** seeks to establish a new high profile, national interdisciplinary research network for population health improvement which will explore novel ways to transform health through change at the population level across the UK and reduce health inequalities. This network will be formed by multiple research clusters that address a specific challenge to progress systems interventions in communities.

**MRC** and **ESRC** have a long history of supporting longitudinal population studies which provide a unique resource within the UK research community. Recently, analysis of combined data sets has become easier through the UK Longitudinal Linkage Collaboration (LLC). It was commissioned by MRC and the UK Government during the COVID-19 pandemic to bring together longitudinal population study data within a safe environment for analysis. The MRC and ESRC have recently extended the funding for LLC to link data from the Department of Education, the Department of Work and Pensions and administrative data to support interdisciplinary research using multidimensional data to better understand the links between environmental factors and ageing trajectories. While the LLC will start by linking data from 24 core longitudinal population studies, provision will be made to facilitate the inclusion of other studies as systems are automated. Administrative Data Research UK (ADR UK)[94] has demonstrated the value of enabling access for researchers to administrative data about children's social care and vulnerable children, and there may be potential for a similar value of data on adult social care to be collected under the government's roadmap for better data for adult social care.

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# Appendix B: Definitions and data sources

### Activities of daily living

Activities of daily living are routine, everyday tasks related to personal care and mobility about the home. They tend to be tasks we learn as young children, including walking (including getting up and down stairs), eating, toileting, bathing, and dressing.

### **'Good health'** and **'poorer health'**

'Good health' and 'poorer health' expectancies represent healthy life expectancy at birth, and the difference between life expectancy and healthy life expectancy at birth, respectively. More detail on the healthy life expectancy methodology available from the Office for National Statistics (ONS): Quality and Methodology Information for health state life expectancies – Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/methodologies/healthstatelifeexpectanciesukqmi

Please note, the definitions of life expectancy and healthy life expectancy used by the World Health Organization (WHO) Global Health Observatory are different to those used by ONS. Figure 2.14 and 2.15 in this report are therefore not directly comparable as they use different definitions and data sources.

Crucially, while both measures are described as 'healthy life expectancy', they take quite different approaches to accounting for years of expected life spent in good versus poorer health. The WHO approach relies on Years Lived with Disability (YLD) from the Global Burden of Disease 2019, which is based on observed and modelled disease prevalence and clinician-defined disability weights, whereas the ONS data is based on self-reported health status collected through a survey of the population. The respective data sources and methodologies used to calculate the data are different.

### Population pyramid

Graphical representation of the age and sex composition of a defined population. The age and sex structure of the population determines the ultimate shape of a population pyramid.

### Settlement types

The Rural-Urban Classification is used to distinguish Rural and Urban areas. The Classification defines areas as Rural if they fall outside of settlements with more than 10,000 resident population. Census Output Areas are the smallest areas for which data are available from Censuses. These Census Output Areas are assigned to one of four Urban or six Rural categories based on dwelling densities. Those described as "in a sparse setting" reflect where the wider area is sparsely populated.

More information on the Rural-Urban Classification is available from the Department for Environment, Food and Rural Affairs (DEFRA): About the Digest and Rural Definitions – Available from: https://www.gov.uk/government/statistics/about-the-digest-and-rural-definitions/

### State Pension Age

The Pensions Act 2011 accelerated the timetable for equalising State Pension age at 65, so that it was completed in November 2018, and brought forward the increase in State Pension age to 66 to between 2018 and 2020. The Pensions Act 2014 brought forward the increase to 67 to between 2026 and 2028.

### Years lived with disability (YLD)

Years lived with disability (YLD) is a measure reflecting the impact an illness has on quality of life. One YLD represents the equivalent of one full year of healthy life lost due to disability or ill-health.

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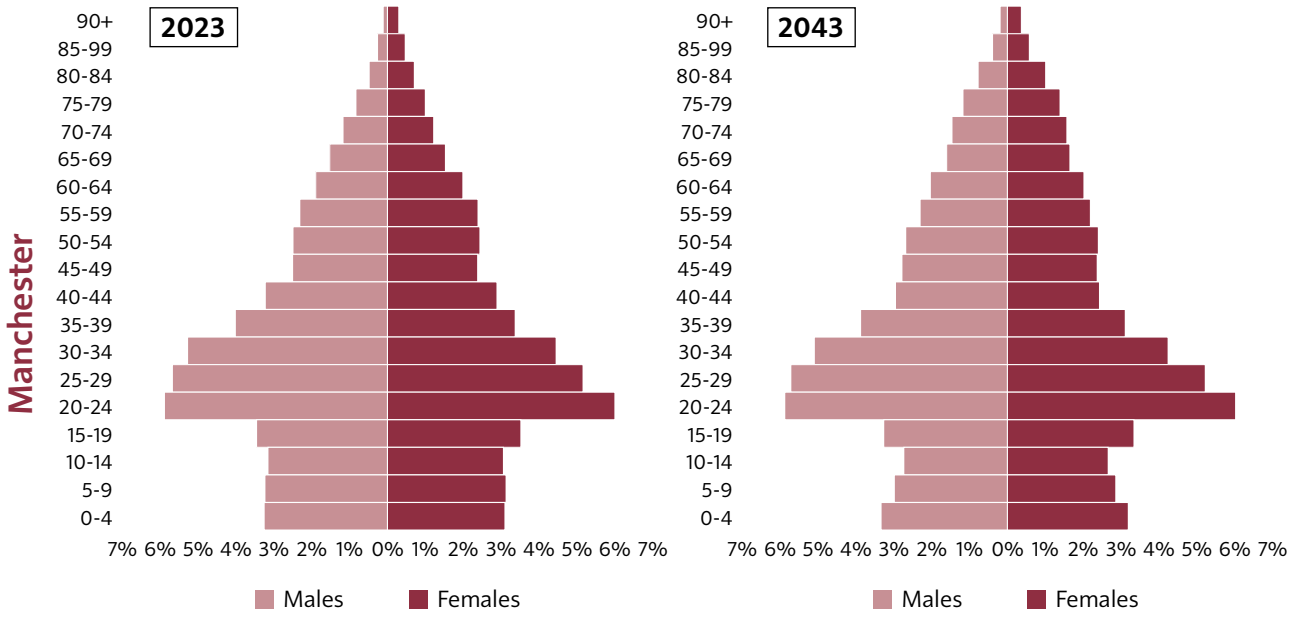
Source data: Office for National Statistics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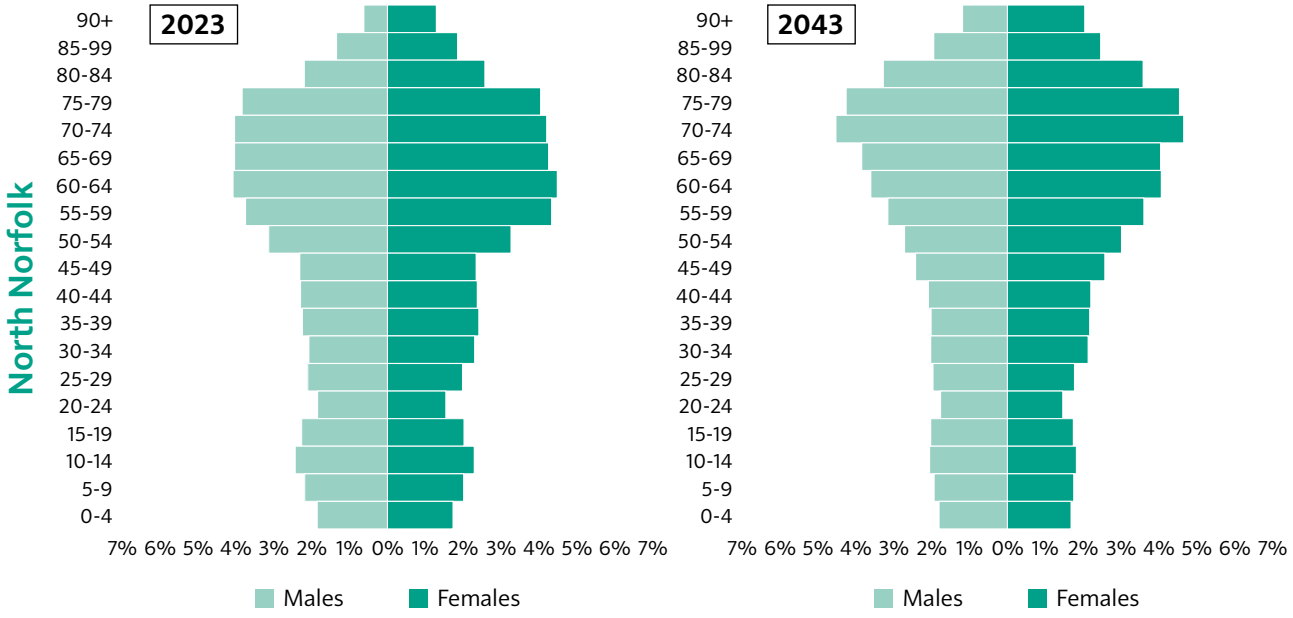
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