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Future of an ageing population: evidence review

What developments in the built environment will support the adaptation and ‘future proofing’ of homes and local neighbourhoods so that people can age well in place over the life course, stay safe and maintain independent lives?

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Executive summary

Do housing and neighbourhoods meet the needs of an ageing population, and what developments are needed to enable people to live well in their communities over the next 25 years? This review draws on literature from research, reports from government, studies from professional and policy organisations and design guidance that address these questions.

- A large majority (93%) of older people live in mainstream housing: three-quarters of these are owner-occupiers, and 57% of people aged 65 or over own their homes outright. The rest live in rented accommodation. Much smaller numbers live in specialist accommodation designed for older people; 5.6% are in supported housing (survey data from 2008–09 and 2009–10). There are also around 465,000 places in residential care homes, most of which are occupied by older people.
- The housing stock is mismatched with the needs of older people. Thirty-five per cent of households consist of older people, in households consisting of one or two people, but most homes are designed for families, with three bedrooms. There are concerns that housing that would be more appropriate for families is being occupied by older people. The evidence suggests that there are substantial numbers of people who would like to move to 'right sized' properties but they are not available. Most specialist housing provides only one bedroom, whereas most people prefer two.
- Evaluations of specialist housing have shown high levels of satisfaction among residents. It has been estimated that there are 70,000 people seeking housing with support, a figure expected to rise to 300,000 by 2019.
- Neighbourhoods that are supportive to older people are universally recognised as important. The research evidence points to various benefits: to health by providing opportunities to exercise, mental health, well-being, social connectedness and access to essential services. A socially cohesive neighbourhood has been shown to have a positive impact on well-being in deprived areas as well as advantaged ones.
- If the immediate neighbourhood is not accessible and supportive, older people can become isolated, even if they live in an ideal house.
- Interventions that foster the development of age-friendly neighbourhoods have been shown to be successful. Key factors in achieving an age-friendly neighbourhood are the involvement of older people as participants and responding to local conditions. Neighbourhood hubs which enable people to access health and social care, local services and facilities are able to demonstrate positive advantages in better health outcomes, and reductions in emergency hospital admissions.
- There has been a great deal of research into the design requirements of older people in terms of their needs for support for well-being, and for the conditions associated with ageing, such as accessibility, sensory support, dementia, and health and safety. Good-quality design guidance is available, both in general terms and in specialised areas. The Housing Learning and Improvement Network (LIN) provides an easily accessible gateway to most design guidance.

- However, while there is a good deal of guidance available it is mainly concerned with specialist rather than mainstream housing. Most older people live in mainstream housing, which does not serve their needs very well; for example only 5% of homes have the key features required for access. Lifetime Homes Standards set criteria for housing that would be reasonably accessible and adaptable over a lifetime, and some of these criteria were incorporated into the Building Regulations. The recent review of housing standards is proposing a three-tier Accessibility Standard for new homes: visitability, accessible to Lifetime Homes Standard and wheelchair accessible, and a new set of space standards. The new standards will not be mandatory, and local authorities may decide whether or not to require them.
- There is a body of excellent research concerning the views of older people of their living environments, but as with research into design this has nearly all been conducted in the context of specialist housing. There is an urgent need for more research into how the needs of older people are met in the places where the vast majority of them live, i.e. mainstream housing and normal neighbourhoods.
- There has been widespread support across public and private sectors and the political spectrum for the development of new models of housing to meet the needs of older people, and some exemplary developments in the public sector. However there has been little change in mainstream housing provision. There remains a need to find ways of encouraging new development in this sector.

I. Aims of this review

This Evidence Review aims to summarise what is known about the design of mainstream, community-based housing and neighbourhoods for older people, and to identify what will support the adaptation and development of homes and neighbourhoods for older people over the next 25 years. It draws on literature from various sources: peer-reviewed research papers, government reports, reports from research organisations and design guidance. This is a desk-based narrative review based on knowledge of the area. It is not a systematic review.

The review first considers the current provision of housing and neighbourhoods in the UK and predictions of how these are expected to develop over the next 25 years. Secondly it summarises what older people need and want from their housing in terms of personal satisfaction and well-being, physical support and accessibility, sensory support, support for dementia, and health and safety. Finally it summarises existing design guidance. The review aims to identify areas of consensus and contradictions in the literature, to identify gaps in knowledge and highlight areas where there is a need for further research.

2. Housing and neighbourhood provision

2.1 Where older people live

Pannell *et al.* (2012), in a study produced for the New Policy Institute, gives an overview of the housing provision for older people based on data from the English Housing Survey for 2008–09 and 2009–10. There are around 15 million people aged 55+. The great majority live in mainstream housing within the community, and remain in their homes for their entire lives. There are around 7.3 million older person only households, which contain only older people (that is no one under the age of 55). A much smaller number (5.6%) live in specialist housing designed for people over 55. The Elderly Accommodation Counsel (EAC) estimated that there were 533,000 units of specialist housing available in 2012. Specialist housing takes various forms, all offering some degree of support for old age. Distinct types of specialist housing have been identified, offering varying levels of care and support. The EAC defines the types as:

- age-exclusive;
- housing with support;
- housing with care (also known as very sheltered housing, and assisted living);
- extra care housing (both care and support are available);
- close care.

Specialist housing is provided in both the public and private sectors, 77% for rent and 23% for sale. There is more specialist housing in the South than the Midlands and the North of England.

A relatively small number of older people live in residential care homes. These are communal settings where 24-hour care is provided, categorised as offering residential care, nursing care or specialist care for people with dementia. The Care Quality Commission (CQC) estimated there were 465,000 beds in care homes at the end of 2013–14 (Care Quality Commission, 2014).

People over 65 are as diverse as any other section of the population. There are differences in economic status, living arrangements, location, ethnicity and health. Rising property values have benefitted some older home owners; 31% of people over 65 live in households with a total household wealth greater than £500,000. At the same time, 14% of people over 65 have a total household wealth of less than £50,000. There is considerable regional variation in wealth status. Nearly 1 in 4 of the poorest households are in the North East (Office for National Statistics, 2013a). Poverty has been reduced but there remain large numbers of people living on low incomes with low savings; in 2010 30% of couples and 48% of single women had savings below £1500 (Adams and Ellison, 2010). Household structure has altered; data from the 2011 census indicates that 54% of people over 65 are married or live in civil partnerships (an increase from 2001) and 31% are one-person households (a decrease from 2001). The number of older people living with an activity-limiting long-term health problem or disability has increased to 52% (Office for National Statistics, 2013b). There are larger proportions of older people living in rural populations than urban ones; 29% of the rural population is over 60 compared with 21% of the urban population. The number of 60–74 year olds in rural locations increased by 4.1% from 2001 to 2011 compared with an increase of 0.8% in the urban population (Office for National Statistics, 2013b). In terms of ethnicity there are smaller numbers

of BME people in the older age groups than the rest of the population, but this will change as cohorts of immigrants age. An analysis of 2001 census data for Age Concern shows that in the 65+ age group 97.08% were white, with 2.92% in the BME group, consisting of 1.52% Asian or British Asian, 0.94% Black or Black British, 0.22% Chinese or other, and 0.24% Mixed (Savita and Matthews, 2007).

2.2 Mainstream housing

The large majority (93%) of older people live in mainstream housing. Around three-quarters of these are owner-occupiers. The remainder rent their homes, split fairly evenly between the public and private sectors. A characteristic of older owner-occupiers is that most own their homes outright; 57% of people over 65 own their properties outright, a much higher proportion than the rest of the population who are still paying off mortgages.

While there are older people living in all types of housing, there are disproportionate numbers in some types. Data from the English Housing Condition Survey show that from the age of 65 there are fewer people living in detached houses than the rest of the population but more living in bungalows and flats. The numbers living in terraced and semi-detached houses are similar to the rest of the population (Pannell *et al.*, 2012).

Across the regions older people occupy around 35% of all houses, with little variation between different areas of the country. The exception to this is London and the South West, which have 22% and 40% of houses occupied by older people, respectively. This appears to reflect a pattern of migration from London as people age. The discrepancy raises the question of how age-friendly London is as a place to live, an issue that would merit further investigation.

2.3 Under-occupation

Older people's households are small, mostly consisting of one or two people. The implication is that there are high levels of under-occupation, because the majority of the housing stock consists of properties with three or more bedrooms. A house is deemed to be under-occupied if it has more than one spare bedroom in addition to the bedrooms required by the household; a married couple are assumed to need one bedroom. It is recognised that in a time of acute housing shortage there would be considerable benefits if older people were to move out of houses that are too big for them. The HAPPI (Housing our Ageing Population Panel for Innovation) investigation of housing options for older people argued for the production of new models of housing tailored to their needs, which would offer an attractive alternative to staying in place, and drew attention to the potential advantages of the release of family-sized homes back into the housing market (Homes and Communities Agency, 2009). There is evidence that some people do wish to downsize but the issue is complex. Croucher *et al.* (2009) examined housing needs and supply in a report for the RICS. They report that people need to be trading down from a relatively large or expensive home to release enough equity to make moving worthwhile, as the price differential between three and two bedroom houses is not very great. Pannell *et al.* (2012) also discuss the attractions of trading down to older people. Their report finds that most people want two bedrooms, while the majority of specialist housing has only one bedroom. However there can be benefits from moving to specialist accommodation in both health and well-being, and evaluations of specialist housing schemes indicate high levels of satisfaction among residents (Bartlam *et al.*, 2004; Vallely *et al.*, 2006; Croucher and Bevan, 2010; Orrell *et al.*, 2013).

The consensus is that there is not enough choice of appropriate housing available either in the specialist housing sector or in the private sector, despite the evidence that people would downsize (or 'right size') if the options were available to them. Pannell *et al.* (2012) report that by 2033 the number of older person households is expected to increase by 40%, from 9.3 million to 13 million, with the largest increase being in the oldest group, aged 85+. The Living Well at Home Inquiry in 2011 found that although the desirability of increasing housing options available for older people had been widely discussed and supported across all provider sectors there had been little progress in achieving this goal (All Party Parliamentary Group on Housing and Care for Older People, 2011). The report cites evidence provided by the National Housing Federation that in 2011 there were 70,000 people seeking housing with support services, a figure which is expected to rise to 300,000 by 2019, as well as a large group of people looking to release equity and move to smaller homes (National Housing Federation, 2011).

The older population is so diverse that it is inappropriate and undesirable to suggest that there is an 'ideal' home, however there is consensus that the home should enable people to maintain a good quality of life and be capable of supporting people if, as, and when their care needs develop (Homes and Communities Agency, 2009; Bevan and Croucher, 2011; Pannell *et al.*, 2012). Practically this means:

- Bathrooms and toilets should be capable of being converted to disabled standards and large enough to allow for carers to provide assistance by helping people to get onto the toilet and for bathing or showering. Converting bathrooms to wet rooms is one way of achieving this.
- There should be level access and flush thresholds at the entrance level.
- It should be possible to accommodate living and bedroom space at the entrance level.
- There should be enough living space for people to maintain their lifestyle, social contacts and hobbies.
- There should be at least two bedrooms, although many people prefer three, which allows for couples to sleep in separate rooms with a spare bedroom.
- There should be sufficient storage space.
- A pleasant accessible outside space should be available. This could be a manageable private garden, a balcony, terrace or communal area.
- The home should be energy efficient, easily heated, well ventilated, well lit and easily manageable.
- There should be good access to local facilities.

3. What people want from their homes and neighbourhoods

3.1 Identity, well-being and belonging to place

The home and neighbourhood are seen as having a crucial role in the well-being of older people. Peace *et al.* (2006), in their book *Environment and Identity in Later Life*, argue that the home and place in which people live are an essential element of their quality of life; the home cannot simply be viewed as a 'setting'. The sense of belonging to a place is connected with identity; deterioration in a neighbourhood and fear of crime have a strong negative influence on well-being by limiting activity and engagement with the outside world. The book discusses the value people place on their relationship with the natural environment, although maintaining gardens can become a source of stress for some.

The emotional attachment to place is an aspect of identity. There is a considerable body of research into the meaning of home and the emotional attachment to place experienced by older people (Rowles, 1983, 2000; Sixsmith, 1990; Rubinstein and Parmelee, 1992; Peace *et al.*, 2006). People who have lived in one place for many years and brought up their families there see their homes as an aspect of themselves, which makes them reluctant to move, and those who do move away from their homes experience a loss of autonomy and control.

In studies of the way older people themselves identify sources of well-being, the home and neighbourhood are recurring themes (among others). In a large-scale study of people living in private houses, Gabriel and Bowling (2004) discuss how neighbourhood social capital contributes to a good quality of life. The features of neighbourhood that were prized by participants in the study were: a safe, supportive environment where people enjoy good relationships with their neighbours; the ability to go for walks; good views and the availability of good services and facilities. Hoban *et al.* (2013) identify social connectedness as an aspect of well-being, and being in a comfortable home within a community. In a study of life in rural neighbourhoods, Manthorpe *et al.* (2008) found that the changes that have been occurring in rural areas, such as rising house prices and inward migration, have had a negative impact, with a perceived loss of accommodation available. Participants in the study said that the centralisation of health and other services, and reduction in transport provision, had made life more difficult.

There has been a great deal of research into loneliness and isolation in older people. In a 7-year longitudinal study based in the Netherlands, Dykstra *et al.* (2005) found older people become lonelier with time, and that the loss of a partner and ill health were associated with a greater increase in loneliness. de Jong-Gierveld (1998) draws attention to the importance of the quality of relationships to the experience of loneliness. People with a small number of relationships may be socially isolated but they are not necessarily lonely, and conversely (de Jong-Gierveld, 1998). Scharf *et al.* (2001) carried out research in the most deprived electoral wards in England, where they found older people faced multiple risks of exclusion including social isolation and severe loneliness.

A recent study by Milligan *et al.* (2013) considers the issue in relation to older men, and finds that they can experience greater difficulty in obtaining social support than older women. The context of the study is the Men in Sheds initiative, a movement that originated in Australia in the

1990s and has been growing in the UK. Sheds modelled on the typical garden shed have been set up as a community resource in a number of areas, where older men can meet to learn new skills, or practice existing skills and work on community projects. The shed provides a setting for social interaction in which men feel comfortable.

The neighbourhood social environment has been shown to have an impact on mental health. In a study arising from the English Longitudinal Study of Ageing (ELSA), Stafford *et al.* (2001) looked at the relationship between the neighbourhood social environment and symptoms of depression, involving 7,500 participants. Neighbourhoods that could be described as cohesive were associated with better personal relationships, better sense of control and fewer symptoms of depression. Social cohesion appears to have a strong positive influence notwithstanding the quality of the neighbourhood. Gale *et al.* (2011), in a study in Hertfordshire, found the sense of cohesion and belonging in a neighbourhood had a positive impact on well-being in deprived areas as well as advantaged ones.

The study of place as the context for ageing has been a growing area of research. In 2003, Wahl and Lang drew attention to the relative lack of studies of the physical and spatial contexts of old age, as compared with studies of personal aspects of ageing, and proposed a research agenda that focused on environments based on Lawton's concept of environmental press: the limiting aspect of the environment in relation to the competency of the individual (Lawton, 1982; Wahl and Lang, 2003). Phillipson (2007) considers the impact of globalisation, and the social, cultural and economic changes that are transforming communities, which are the source of the problems faced in particular by older people who are marginalised or rejected by their communities. Scharf *et al.* (2005), in a study in Manchester, found that social exclusion was experienced by a considerable number of older people, and multiple social exclusion was correlated with ethnic origin, housing tenure, health and quality of life.

There is recognition that robust processes are needed to develop age-friendly neighbourhoods. The World Health Organization (WHO) has responded to the twin drivers of growing urbanisation and an ageing population by building an age-friendly network of cities all over the world. It has produced a guide to the age-friendly city, which identifies eight domains or core features: outdoor spaces and buildings, transportation, housing, respect and social inclusion, social participation, civic participation and employment, communication and information, community support and health services (WHO, 2007).

There are good examples of supportive neighbourhoods in Europe. Gibeleich Alterszentrum in Zurich is a 'hub and spoke' scheme, where the services required to support specialist residential housing are also available to older people living in the neighbourhood. Gibeleich consists of two nursing homes offering different levels of care and an apartment block for independent living. The scheme has grown organically, and now includes a community centre with shop, restaurant, conference centre, a charity shop staffed by volunteers, sensory gardens and an aviary. An industrial-scale laundry and kitchen on the site services the scheme and also provides a volunteer-run laundry and meals-on-wheels service to older people living locally. Integration with the community is actively promoted; the restaurant is open to all, and is used by local office workers. A similar scheme in the Netherlands is Maartenshof in Groningen. Also developed incrementally, Maartenshof now offers 200 nursing home and day-care places in a range of buildings, with a new elegant tower block of apartments for sale aimed at 'younger' older people. The complex is linked to a centre with a shop, restaurant, chapel and multi-use hall, and is sited on a main pedestrian and cycle route to the town centre. Both Gibeleich and Maartenshof are proactively managed to foster links between the residents and the wider community (see Homes and Communities Agency, 2009).

Rural neighbourhoods have other approaches. A successful example is a project based in west Cornwall, Living Well at Home, which aims to offer older people seamless access to health and social care based in their own community. Older people are invited to discuss their needs in conversation, and helped to make connections to the health and social support resources they need. The project has been able to demonstrate positive advantages in better health outcomes, and reductions in emergency hospital admissions (Murray and Roose, 2014).

The complex nature of the external environment makes it hard to evaluate. In recognition of this Burton *et al.* (2011) have developed an environmental assessment tool, based on a checklist for evaluating environments to support well-being of older people.

3.2 Support for the conditions associated with old age

3.2.1 Physical support, accessibility and mobility

Recent estimates of the prevalence of disability indicate that there are 5.1 million disabled people over State Pension Age, and 45% of adults over State Pension Age are disabled (Department for Work & Pensions and Office for Disability Issues, 2014). Numbers of older disabled people in the community have risen, as would be expected from the increasing numbers of older people in the population. Government statistics estimate there were 4.7 million disabled older people in 2002–03, and the number had risen to 5.1 million in 2011–12. The most common disabilities are mobility and difficulty with lifting and carrying. One in five disabled people requiring adaptations to their homes believe their accommodation is unsuitable. The adaptability of the existing housing stock to meet the needs of disabled people has been shown to be problematic. Lansley *et al.* (2004), in their study of the adaptability of the housing stock, found that ground floor flats and bungalows were the most capable of being adapted, but houses, maisonettes and flats in converted houses were the least adaptable. The latest review by government of the housing stock (Department for Communities and Local Government, 2014) found there had been a small improvement in accessibility since 2007, but only 5% of homes had the key features required for access: level access, flush thresholds, sufficiently wide doors and circulation space and entrance level toilets. To make inaccessible homes accessible 12% would need minor works, 45% would need works involving structural alterations, 16% would need works involving major structural alterations and in 28% of homes alteration work would not be feasible.

The Lifetime Homes Standard, developed by Habinteg and The Joseph Rowntree Foundation, established a set of 16 criteria for housing that would be reasonably accessible and adaptable over time (Lifetime Homes, 2010). Some – although not all – of the standards were incorporated into the Building Regulations for England and Wales Approved Document M in 1999 in provisions for new dwellings. The standards provide basic accessibility and visitability at the entrance level of new dwellings and access to service controls. Following the recent review of housing standards (Department for Communities and Local Government, 2013) a new Accessibility Standard is proposed which is a three-tier set of requirements for new homes: Level 1, ‘visitability’, is intended to give adequate accessibility for most people; Level 2 is an accessible and adaptable standard that closely echoes the Lifetime Homes Standard; and Level 3 is accessible for people using wheelchairs, based on the Wheelchair Housing Design Guide (Thorpe and Habinteg Housing Association, 2006). The review also proposes a new set of minimum space standards. While the rationalisation of standards and the inclusion of minimum space standards have been welcomed, there has been some criticism that they will be voluntary, with responsibility for their implementation passed from central government to local authorities in line with the localisation agenda of the 2010–14 Coalition Government.

Imrie (2014) points to a dismantling of the legislation protecting disabled people as a result of the localisation agenda, and highlights concerns that recent reductions in public expenditure has impacts on home, transport and public space.

Older people need access to neighbourhoods as well as within their homes. It is recognised that the configuration of the external environment to support old age has until relatively recently received less attention than the design of the home, and there has been some effort to redress the balance. Lifetime Neighbourhoods, published by DCLG (Bevan and Croucher 2011), sets out the main components of a lifetime neighbourhood: supporting older people as participants in developing neighbourhoods, access, services and amenities, the built and natural environment, social networks and well-being, and housing. It includes examples of good practice from across the UK. The benefits to older people of engaging with their neighbourhood is the subject of a number of research studies. In a review paper Gilroy (2008) considers the literature on quality of life of older people and draws attention to the contribution that planners could make in creating places that are usable by older people. A study by Sugiyama and Ward Thompson (2007) found that neighbourhood environments contributed to health by providing opportunities for exercise, and to well-being by providing opportunities for social interaction and contact with nature. A further study (Sugiyama *et al.*, 2009) considered the role of neighbourhood open space, and found that the ability to access open space influenced people's satisfaction with life. Walking behaviour was associated with provision of good paths, although the study did not find an association between health status and the availability of open space.

A key component of the development of a lifetime neighbourhood is the participation of older people themselves (Bevan and Croucher, 2011). Access is seen as the central requirement, which can be compromised by broken connections between people, places and activities. In Lifetime Neighbourhoods access is described as a linked chain of activity: a break in any part of the chain is enough to deny access. It is self-evident that participation and access are linked: there can be no participation in neighbourhood activity if people are not able to go out. While records are kept of the condition of housing in the English Housing Survey (see Department for Communities and Local Government, 2014), there is no regular systematic audit kept of the condition of external space. The Inclusive Design for Getting Outdoors (I'DGO) research consortium, in their study of the external environment, found older people reporting various problems accessing their local environment: lack of seating and public toilets, poor design and lack of maintenance of facilities where they were provided. Participants were also critical of tactile paving, which was found to be used inconsistently, and hard to walk on, causing people to feel unsteady or slip on the studs (Newton and Ormerod, 2009). There is a lack of academic literature in these areas, but a number of reports of local neighbourhood studies echo the themes found in the I'DGO research. For example in a participatory study of the Old Moat area of Manchester conducted by the Southway Housing Trust in partnership with the University of Manchester, older people talked of pavements in poor condition, lack of provision of local shops, fear of crime, fear of going out after dark, lack of space for community activities and a major road acting as a barrier between a local park and the housing area (Southway Housing Trust, 2013).

Lack of public accessible toilets has been identified as an important issue for older people, particularly those who experience incontinence. Richard *et al.* (2006) found an increasing number of toilet closures due to spending cuts and vandalism, and reported that users were critical of the design of the accessible toilets that were provided. Since this research was completed public expenditure restrictions can only have made the situation worse (see Imrie, 2014).

3.2.2 Sensory support: vision and hearing

Sight loss is a common condition in older people, and increasing longevity means that there are substantial numbers in the population living with some degree of sight loss. Estimates indicate that in the UK one in eight people over 75 and one in three people over 90 has sight loss that is serious enough to be registerable (Goodman, 2008). Most registered blind people fall into the older age categories: NHS statistics show that 64% of registered blind and 66% of partially sighted people were aged 75 or over in 2011 (The NHS Information Centre, 2011). Symptoms of sight loss vary according to the condition, but they include: sensitivity to glare, slower adaptation to changes from light to dark, reduced sensitivity to contrast, colour saturation and retinal illuminance, inability to focus and reduced ability to see blue light (Littlefair, 2010). Older people who do not have a serious visual impairment are still likely to have some degree of sight loss.

There are more than 10 million people in the UK with some form of hearing loss, or one in six of the population. From the total figure, around 6.4 million are of retirement age (65+) and about 3.7 million are of working age (16–64). Approximately 1 in 10 of these has severe or profound hearing loss. Due to the ageing population of the UK, there will be an estimated 14.5 million people with hearing loss by 2031 (Action on Hearing Loss, 2011).

It is clear that the environment of the home and neighbourhood needs to support the needs of large numbers of older people with loss of vision and/or hearing. In a study of lighting in the homes of people with sight loss, Evans *et al.* (2010) found lighting levels to be generally low, and raised concerns that areas known to be dangerous, such as stairs and landings, were not well lit. Falls in the home are the most common cause of injury, and a review by Martin (2013) found that the risk of falling downstairs to be doubled for people with sight loss. Littlefair (2010) reviewed research on daylighting and windows in the homes of people with sight loss. He found controlled daylighting is beneficial to partially sighted people as it offers high light levels and even spread of light, and that exposure to daylight has health benefits as it helps people maintain their circadian rhythms, and concludes that research is required to establish people's preferences in terms of visual privacy, and amount of, and control of daylighting.

People with sight loss navigate the external environment by using recognisable features such as pavement edges or building lines. Their requirements can be in conflict with those of other users. Imrie and Kumar (2011) suggest that the introduction of shared space or home zones in new urban developments can be difficult to navigate and are critical of the lack of consultation by planners with people with sight loss. This is not the only area where the needs of people with sight loss differ from those of others. Goodman and Watson (2010) found in a review of the design requirements for people with dementia and those with sight loss that while many requirements are similar there are important differences: features that have been identified as helpful to people with dementia could be hazardous to people with sight loss. Some examples cited are meandering routes and curved walls, provision of distinctive features along routes and the use of glazed doors to reveal the contents of a room.

3.2.3 Support for dementia

The Alzheimer's Society estimates that there will be 850,000 people living with dementia by 2015, and the number will increase to 1 million by 2025. Most of these are in the older age group. The Prime Minister's Challenge on Dementia (Department of Health, 2012) recognises the importance of improving care and research in this area. Among the issues raised in the report is the need to treat suitable housing as a priority. While many people with dementia live in residential care homes, two-thirds live in mainstream housing. It has been noted that research

on design for dementia is largely concerned with specialist accommodation and there is very little on normal housing, and that further research in this area is needed (Mitchell, 2012). Similarly there is excellent design guidance available for the design of specialist accommodation for people with dementia. While some of the issues covered can be applied to any building, the guidance is focused on communal living in large buildings that have little in common with mainstream houses.

The external environment can be challenging for people with dementia. Mitchell and Burton (2006) researched the usability of external environments in a series of accompanied walks with people with dementia. They found that people with dementia do go out but restrict themselves to familiar areas. The research identified six principles of a dementia-friendly environment: familiarity, legibility, distinctiveness, accessibility, safety and comfort. A checklist of recommendations for neighbourhood design based on this research is available (Mitchell *et al.*, 2004).

3.2.4 Health and safety

Poor-quality housing has been linked to poor health for at least 200 years. Data on poor housing is systematically recorded in the English Housing Survey. In 2012, 22% of homes failed to meet the decent homes standard (a reduction since 2006, when 35% of homes failed to meet the standard). The private rented sector had the highest proportion of non-decent homes (33%), as compared with 20% of owner-occupied homes (Department for Communities and Local Government, 2014). Adams and Ellison's report on older housing (2010) shows that older people are disproportionately represented in housing in serious disrepair. The health hazards most associated with poor housing are falls, and ill health related to living in cold, damp homes. Davidson *et al.* (2010) consider the health costs of poor housing in a BRE publication. They find that 22% of housing has hazards falling into Category 1 of the Housing Health and Safety Rating System (HHSR), which categorises hazard areas as: physiological, psychological, protection against infection and protection against accidents. Lack of insulation, damp penetration, poor heating systems, unsafe stairs and low levels of daylight are associated with poor health. The greatest risk to health results from cold damp houses; there are 40,000 excessive winter deaths in England. Falls are the other major health risk, with falls from heights (i.e. falling down stairs) responsible for most serious injuries. The costs of these injuries to the NHS are estimated to be £600 million a year.

Respiratory health is examined by Webb *et al.* (2013) in a study based on data obtained in the English Longitudinal Survey. The study looked for associations between respiratory health and housing conditions in a large population sample. It found significantly worse respiratory health in older people who were in fuel poverty living in rented accommodation.

Exposure to daylight and sunlight is important in maintaining health. Littlefair (2010) draws attention to the physiological response to light that triggers the circadian rhythms which regulate bodily functions such as sleep and appetite. Daylight levels can be low in houses with small windows, and it is known that older people spend more time at home: it has been estimated that people over 65 spend 80% of their time at home, rising to 90% of time for people over 85 (Adams and White, 2006). In a discussion of lighting for people with dementia, Torrington and Tregenza (2007) indicate that at latitudes of 50° or more illumination levels outside barely reach the levels recommended for therapies to prevent SAD (seasonal affective disorder), and someone confined inside would need to spend several hours a day sitting next to a window to receive a therapeutic dose.

The relationship of health and the external environment was considered by Day (2008) in a study involving older people in three urban neighbourhoods of Glasgow. The study identified several key areas valued by the participants: clean pollution-free spaces, peace and quiet, places that facilitate exercise, free from obstacles with seating and key services, places that support social interaction and places that give an emotional uplift. In the words of one participant: "Everybody wants to look at a thing of beauty."

4. Design guidance

There is a great deal of excellent and well-established design guidance available concerning older people, in the form of general guidance and guidance to design for specific conditions associated with ageing, such as accessibility, support for low vision, support for dementia and the design of neighbourhoods. Specialist housing is not the subject of this review, but there is a compelling argument that if mainstream housing was better fitted to the needs of people at all stages of their lives there would be less need for specialist housing, and the design of mainstream housing should be inclusive. Design guidance for extra care housing is available in Nicholson *et al.* (2008). The key design guides for housing are listed in Table 1, with brief notes on their content and areas where there are conflicts or tensions with other guidance.

Table 1: Design guidance and briefing documents in current use

General housing guidance

Guidance	Author	Content
Lifetime Homes Design Guide	Goodman (2011)	Design criteria for accessible and adaptable homes
London Housing Design Guide	Mayor of London (2010)	Detailed design guidance, includes minimum space standards
HAPPI: Housing our Ageing Population	Homes and Communities Agency (2009)	Calls for greater range of housing options, identifies set of design principles
EVOLVE: Evaluation of Older People's Living Environments	Lewis <i>et al.</i> (2000)	Building evaluation tool, usable as a design checklist
Housing Standards Review	Department for Communities and Local Government (2013)	Consultation document on review of accessible design standards, includes new minimum space standards
Guidelines for the Planning of Houses for Senior Citizens	Welhops (2007)	Design guidelines, with checklist illustrated with photographs
Design and Quality Standards	The Housing Corporation (2007)	Minimum standards for publicly funded housing

Accessibility

Guidance	Author	Content
Wheelchair Housing Design Guide	Thorpe and Habinteg Housing Association (2006)	Detailed design guidance, some tensions between requirements for wheelchair users and low vision, dementia and privacy
Design of Accessible and Adaptable General Needs Housing – Code of Practice BS 9266:2013	British Standards Institution (2013)	Design guidance
Designing for the Disabled	Goldsmith (1976)	Background reading
Designing for Special Needs	Harker and King (2002)	Briefing guide, with case studies
Barrier-Free Design	Holmes-Siedle (1996)	Detailed design guidance
Universal Design Handbook	Ostroff and Preiser (2001)	Discusses the concept of universal design in a global context

Vision and lighting

Guidance	Author	Content
Building Sight – A Handbook of Building and Interior Design Solutions to Include the Needs of Visually Impaired People	Barker <i>et al.</i> (2000)	Detailed design guidance
Housing for People with Sight Loss: A Thomas Pocklington Trust Design Guide	Goodman (2008)	Detailed design guidance
Homes and Living Spaces for People with Sight Loss: A Guide for Interior Designers	Smith (2014)	Detailed design guidance
Code for Interior Lighting	CIBSE (2012a)	Criteria for lighting
SLL Lighting Guide 10: Daylighting and Window Design	CIBSE (2012b)	Guidance to daylight design
EVOLVE for Vision: Building Evaluation Tool	Lewis and Torrington (2011)	Post-occupancy evaluation tool, usable as a design checklist
Lighting the Homes of People with Sight Loss: An Overview of Recent Research	O'Neill (2003)	Study of lighting in homes with recommendations for improvements
Housing Sight: A Guide to Building Accessible Homes for People with Sight Problems	Rees and Lewis (2003)	Detailed design guidance

Dementia

Guidance	Author	Content
Design for Dementia	Judd <i>et al.</i> (1997)	Discusses design for dementia, illustrated by case studies
Designing Gardens for People with Dementia	Pollock (2001)	Detailed design guidance
Designing Interiors for People with Dementia	Pollock (2002)	Detailed design guidance
Designing Lighting for People with Dementia	Pollock <i>et al.</i> (2008)	Detailed design guidance
Good Practice in the Design of Homes and Living Spaces for People with Dementia and Sight Loss	Greasley-Adams <i>et al.</i> (2014)	Evidence-based good practice guidelines to make living spaces more supportive for people with dementia and sight loss
Landscape Design for Dementia Care	Delhanty (2013)	Discussion of design principles illustrated with examples of good design
Designing Homes for People with Dementia	Utton (2007)	Discusses design for dementia illustrated with case studies from around the world
Light and Lighting Design for People with Dementia	McNair <i>et al.</i> (2013)	Guidance on lighting the homes of people with dementia
The Complete Guide to Alzheimer's-Proofing your Home	Warner (2000)	A comprehensive guide to adapting the home, written by an architect. It is American, so some aspects, for example electricity regulations, do not apply to UK houses
Making your Home a Better Place to Live with Dementia	Care and Repair England	Advice summarising dementia symptoms and some design adaptations that can be made to the home
10 Helpful Hints for Dementia Design at Home: Practical Design Solutions for Carers Living at Home with a Person who has Dementia	Andrews and Cunningham (2010)	Advice for carers on adapting the home
Building Dementia and Age-Friendly Neighbourhoods	Alzheimer's Australia NSW (2011)	Discussion papers and an Australian dementia-friendly checklist for the design of external environments

Neighbourhood design

Guidance	Author	Content
Neighbourhoods for Life: A Checklist for Designing Dementia-Friendly Outdoor Environments	Mitchell <i>et al.</i> (2004)	Checklist of design requirements
Good places for ageing in place: development of objective built environment measures for investigating links with older people's wellbeing.	Burton <i>et al.</i> (2011)	Checklist of design requirements with paper describing the development of the checklist
Building for Life	Birkbeck and Kruczkowski (2012)	Set of criteria for well-designed neighbourhoods
Manual for Streets	Department for Communities and Local Government (2007)	Design manual for residential streets
Global Age-friendly Cities: A Guide	WHO (2007)	Identifies age-friendly features for world cities with a checklist
The Design of Streets with Older People in Mind: Design Guide 001: Seating	Inclusive Design for Getting Outdoors (I'DGO) (2012a)	Detailed design guidance
The Design of Streets with Older People in Mind: Design Guide 002: Bus Stops	Inclusive Design for Getting Outdoors (I'DGO) (2012b)	Detailed design guidance
The Design of Streets with Older People in Mind: Design Guide 003: Tactile Paving	Inclusive Design for Getting Outdoors (I'DGO) (2012c)	Detailed design guidance
The Design of Streets with Older People in Mind: Width of Footways and Footpaths	Inclusive Design for Getting Outdoors (I'DGO) (2007a)	Detailed design guidance
The Design of Streets with Older People in Mind: Adjacent and shared use (cyclists and pedestrians) of footways and footpaths	Inclusive Design for Getting Outdoors (I'DGO) (2007b)	Detailed design guidance

Neighbourhood design

Guidance	Author	Content
The Design of Streets with Older People in Mind: Materials of footways and footpaths	Inclusive Design for Getting Outdoors (I'DGO) (2007c)	Detailed design guidance
The Design of Streets with Older People in Mind: Changes in level of footways and footpaths	Inclusive Design for Getting Outdoors (I'DGO) (2007d)	Detailed design guidance
The Design of Streets with Older People in Mind: Kerbs including tactile dropped kerbs of footways and footpaths	Inclusive Design for Getting Outdoors (I'DGO) (2007e)	Detailed design guidance
The Design of Streets with Older People in Mind: Signage	Inclusive Design for Getting Outdoors (I'DGO) (2007f)	Detailed design guidance
The Design of Streets with Older People in Mind: Public toilets	Inclusive Design for Getting Outdoors (I'DGO) (2007g)	Detailed design guidance
The Design of Streets with Older People in Mind: Street art	Inclusive Design for Getting Outdoors (I'DGO) (2012d)	Detailed design guidance
The Design of Streets with Older People in Mind: Street greenery	Inclusive Design for Getting Outdoors (I'DGO) (2007h)	Detailed design guidance
Sight Line: Designing Better Streets for People with Low Vision	Atkin (2010)	Sets out design features for streets derived from the perspective of people with sight loss

5. Conclusions

The vast majority of older people live in mainstream housing in normal communities; specialist housing, although popular with people who live there, caters for only 7% of the older population. The housing stock does not meet the needs of older people very well; only 5% has the key features required for access for disability; older people are disproportionately represented in houses in poor repair, and although many older people own their own homes there are significant numbers who do not have sufficient means to finance repairs and adaptations required to bring them up to acceptable standards. There are a lot of people living in family-sized homes with gardens who have problems maintaining them. Many wish to remain living in homes they are strongly attached to, although they find it hard to get help in organising the home adaptations and maintenance they require. There is evidence that some people would like to move to more manageable and appropriate accommodation, but the option is not available. Most specialist housing provides only one bedroom, whereas most people prefer at least two. The case for developing age-appropriate housing within the mainstream has been made, and widely supported, and some highly successful schemes have been built but they are rare.

Neighbourhoods that support and sustain older people are highly valued. However if neighbourhoods cannot be accessed from the home people become isolated. There are models of successful supportive neighbourhoods both in the UK and in Europe. Neighbourhood-based hubs that are actively managed to provide support for older people have been shown to have benefits greater than simply amenity; schemes can point to evidence of better health, and reductions in emergency hospital admissions.

There is a body of excellent research, and evidence-based design guidance concerning older people and their housing, but with a few notable exceptions this has been conducted in the context of specialist housing. There is an urgent need for research investigating the views of older people living in mainstream housing and normal neighbourhoods.

The key challenge is to bring an understanding of the research and knowledge about older people and their needs to the agencies of the mainstream; the house builders, developers, service engineers, planners, estate agents, local politicians, parish councils and so on who mediate the physical environment.

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