

Housing with support for older people

An evidence review

Camille Coyle
Sarah Buggy
Olivia Cagney
Louise Farragher
Caitriona Lee
Darren Patje
Jean Long

February 2021

Funding

This report was funded by the Healthy and Positive Ageing Initiative (HaPAI), a research programme led by the Department of Health in collaboration with the Health Service Executive, Age-Friendly Ireland, and The Atlantic Philanthropies. HaPAI was established in order to achieve Goal 4 of the National Positive Ageing Strategy – support and use research about people as they age to better inform policy responses to population ageing in Ireland.

Disclaimer

Any views expressed in this report are those of the authors and not necessarily those of the Minister for Health, the Department of Health, or the Health Research Board.

Publisher

Health Research Board, Dublin, Ireland
© Health Research Board 2020

t 353 1 234 5000
f 353 1 661 2335
e hrb@hrb.ie
w www.hrb.ie

Table of contents

TABLE OF CONTENTS.....	1
ACKNOWLEDGEMENTS	4
ABBREVIATIONS.....	5
LIST OF TABLES.....	6
LIST OF FIGURES.....	6
HIGHLIGHTS	7
PERCEPTIONS AND EXPERIENCES OF HOUSING WITH SUPPORT	7
IMPACT OF HOUSING WITH SUPPORT	7
EXECUTIVE SUMMARY	8
POLICY CONTEXT	8
BACKGROUND	8
RESEARCH QUESTIONS	8
METHODS	9
PERCEPTIONS AND EXPERIENCES OF HOUSING WITH SUPPORT	9
<i>Deciding to move</i>	9
<i>Transition and adaptation</i>	10
<i>Living independently</i>	10
<i>Staying physically active</i>	11
<i>Social engagement</i>	11
<i>Key findings from the perceptions and experiences review</i>	12
IMPACT OF HOUSING WITH SUPPORT	12
<i>CCRCs, independent living, assisted living, and planned retirement communities</i>	12
<i>Extra care housing</i>	14
<i>Senior housing</i>	15
<i>Key findings from the impact review</i>	16
SYNTHESIS OF QUALITATIVE AND QUANTITATIVE FINDINGS	17
CONCLUSION	19
1 INTRODUCTION	20
1.1 POLICY CONTEXT	20
1.2 BACKGROUND	20
1.3 RESEARCH QUESTIONS	20
1.4 DEFINING HOUSING WITH SUPPORT	20
2 METHODS.....	22
2.1 INCLUSION AND EXCLUSION CRITERIA	22
2.2 SEARCH STRATEGY	23
2.2.1 <i>Limits</i>	24
2.2.2 <i>Databases</i>	24
2.2.3 <i>Grey literature search</i>	25
2.2.4 <i>Supplementary searching</i>	25
2.3 SCREENING	25
2.4 STUDY SELECTION	26
2.5 QUALITY ASSESSMENT AND CONFIDENCE IN EVIDENCE	26
2.6 DATA EXTRACTION	27
2.7 DATA ANALYSIS	27
2.7.1 <i>Perceptions and experiences review</i>	27
2.7.2 <i>Impact review</i>	27
2.7.3 <i>Synthesis</i>	27

3	OLDER PEOPLE'S PERCEPTIONS AND EXPERIENCES OF HOUSING WITH SUPPORT	28
3.1	DECIDING TO MOVE TO HOUSING WITH SUPPORT	30
3.1.1	<i>Reasons for moving.....</i>	30
3.1.2	<i>Ownership of the decision</i>	32
3.2	TRANSITION AND ADAPTATION	35
3.2.1	<i>Moving to housing with support.....</i>	35
3.2.2	<i>Nostalgia for previous life</i>	37
3.2.3	<i>Adapting to housing with support</i>	37
3.3	LIVING INDEPENDENTLY	41
3.3.1	<i>Asserting independence</i>	41
3.3.2	<i>Balancing independence and dependence</i>	41
3.3.3	<i>Independent activities.....</i>	43
3.4	STAYING PHYSICALLY ACTIVE.....	44
3.4.1	<i>Individual preferences and habits.....</i>	44
3.4.2	<i>Access to physical activities and physical therapy</i>	45
3.4.3	<i>Access to gyms.....</i>	45
3.4.4	<i>Outdoor accessibility.....</i>	45
3.4.5	<i>Care responsibilities</i>	46
3.4.6	<i>Culture of physical activity</i>	46
3.5	SOCIAL ENGAGEMENT	47
3.5.1	<i>Benefits of proximity to family and friends</i>	47
3.5.2	<i>Opportunities to socialise.....</i>	47
3.5.3	<i>Engaging with peers</i>	49
3.5.4	<i>Friendships</i>	50
3.5.5	<i>Romantic relationships.....</i>	52
3.5.6	<i>Challenges to social engagement</i>	53
3.5.7	<i>Mutual support.....</i>	55
3.6	CONCLUSION OF THE PERCEPTIONS AND EXPERIENCES REVIEW	57
4	IMPACT OF HOUSING WITH SUPPORT FOR OLDER PEOPLE ON THEIR QUALITY OF LIFE.....	58
4.1	CONTINUING CARE RETIREMENT COMMUNITIES	60
4.1.1	<i>USA</i>	60
4.1.2	<i>Israel</i>	64
4.2	INDEPENDENT LIVING	65
4.2.1	<i>Study characteristics</i>	65
4.2.2	<i>Study population characteristics.....</i>	66
4.2.3	<i>Outcomes and their means of measurement</i>	66
4.2.4	<i>Quality assessment.....</i>	68
4.2.5	<i>Findings by outcome</i>	68
4.3	ASSISTED LIVING	69
4.3.1	<i>Study characteristics</i>	69
4.3.2	<i>Study population characteristics.....</i>	70
4.3.3	<i>Outcomes and their means of measurement</i>	70
4.3.4	<i>Quality assessment.....</i>	72
4.3.5	<i>Findings by outcome</i>	72
4.4	PLANNED RETIREMENT COMMUNITIES	73
4.4.1	<i>Study characteristics</i>	73
4.4.2	<i>Study population characteristics.....</i>	73
4.4.3	<i>Outcomes and their measurements.....</i>	74
4.4.4	<i>Quality assessment.....</i>	74
4.4.5	<i>Findings by outcomes.....</i>	74
4.5	EXTRA CARE HOUSING	75
4.5.1	<i>Study characteristics</i>	75
4.5.2	<i>Study population characteristics.....</i>	81
4.5.3	<i>Outcomes and their measurements.....</i>	83
4.5.4	<i>Quality assessment.....</i>	85

4.5.5	<i>Findings by outcome</i>	86
4.6	SENIOR HOUSING	87
4.6.1	<i>Canada</i>	87
4.6.2	<i>Finland</i>	89
4.7	NARRATIVE SYNTHESIS OF FINDINGS FROM THE IMPACT REVIEW	91
4.7.1	<i>CCRCs, independent and assisted living, and planned retirement communities</i>	91
4.7.2	<i>Extra care housing</i>	94
4.7.3	<i>Senior housing</i>	100
5	MODEL OF HOUSING WITH SUPPORT	102
6	DISCUSSION	105
6.1	KEY FINDINGS	105
6.2	COMPARISON WITH THE LITERATURE	105
6.3	STRENGTHS AND LIMITATIONS	106
6.4	FUTURE RESEARCH	107
7	CONCLUSION	108
	REFERENCES	109
	APPENDICES	115
	APPENDIX A: PRISMA-S CHECKLIST	115
	APPENDIX B: DATABASE SEARCH PARAMETERS	117
	APPENDIX C: SEARCH STRATEGY	118
	APPENDIX D: SYSTEMATIC REVIEWS AND GREY LITERATURE REVIEWS USED FOR FORWARD CITATION SEARCHING AND REFERENCE CHASING FOR BOTH SYSTEMATIC REVIEWS	132
	APPENDIX E: LIST OF ORGANISATIONS SEARCHED AS PART OF THE SUPPLEMENTARY GREY LITERATURE SEARCH	134
	APPENDIX F: PRIORITY SCREENING IN EPPI-REVIEWER	135
	APPENDIX G: QUALITY ASSESSMENT TOOL FOR THE PERCEPTIONS AND EXPERIENCES REVIEW	136
	APPENDIX H: QUALITY ASSESSMENT TOOL FOR THE IMPACT REVIEW	137
	APPENDIX I: QUALITY ASSESSMENT OF STUDIES IN THE PERCEPTIONS AND EXPERIENCES REVIEW	138
	APPENDIX J: STUDY CHARACTERISTICS FOR THE PERCEPTIONS AND EXPERIENCES REVIEW	140
	APPENDIX K: STRUCTURE OF ANALYTICAL THEMES FROM THE PERCEPTIONS AND EXPERIENCES REVIEW	145
	APPENDIX L: CERQUAL EVIDENCE PROFILE FOR THE PERCEPTIONS AND EXPERIENCES REVIEW	148
	APPENDIX M: QUALITY ASSESSMENT OF STUDIES IN THE IMPACT REVIEW	151
	APPENDIX N: STUDY CHARACTERISTICS FOR THE IMPACT REVIEW	153
	APPENDIX O: OUTCOMES AND THEIR MEASURES FOR THE IMPACT REVIEW	160
	APPENDIX P: DESCRIPTIVE ANALYSIS OF PRIMARY STUDIES OUTCOMES FOR THE IMPACT REVIEW	168

Acknowledgements

We would like to thank the Department of Health and the Department of Housing, Local Government and Heritage for commissioning this review, and Atlantic Philanthropies for funding this review. We would also like to thank the Health Service Executive, Age Friendly Ireland, and the Health and Positive Ageing Initiative for their support. We thank our peer reviewers for their time and careful consideration of our report. Finally, we thank our copy editors Brenda O’Hanlon and Liz Shepherd.

Abbreviations

CCRC	continuing care retirement community
GB£	pound sterling
GP	general practitioner
HRB	Health Research Board
MeSH	Medical Subject Headings
NHS	National Health Service
UK	United Kingdom
US\$	United States dollar
USA	United States of America

List of tables

Table 1: Eligibility criteria for the perceptions and experiences review	22
Table 2: Eligibility criteria for the impact review	23
Table 3: Outcomes and their means of measurement in CCRC evaluations	62
Table 4: Outcomes and their means of measurement in Israeli CCRC evaluation.....	64
Table 5: Outcomes and their means of measurement in independent living evaluations.....	67
Table 6: Outcomes and their means of measurement in assisted living evaluations	71
Table 7: Outcomes in planned retirement community evaluations	74
Table 8: Number of cases and control participants in Kingston 2001	76
Table 9: Number of cases in Netten 2011, Callaghan 2009, Bäumker 2011, and Darton 2011b.....	77
Table 10: Number of cases at each data collection timepoint in Netten 2011 and Darton 2011c.....	78
Table 11: Number of cases and community-based control participants in Holland.....	80
Table 12: Cumulative numbers of extra care participants in Holland.....	81
Table 13: Age and gender of extra care study samples at baseline.....	81
Table 14: Outcomes and their means of measurement in the four extra care evaluations.....	84
Table 15: Number of cases at each data collection timepoint in Smith 2008	87
Table 16: Age and gender of study samples at 12 months in Smith 2008	87
Table 17: Outcomes measured and their means of measurement in Smith 2008	88
Table 18: Number of cases at each data collection timepoint in Lotvonen 2018.....	89
Table 19: Age and gender of study samples at baseline in Lotvonen 2018	89
Table 20: Outcomes measured and their means of measurement for Lotvonen 2018	90

List of figures

Figure 1: Search concepts	24
Figure 2: PRISMA flow diagram for the perceptions and experiences review	29
Figure 3: PRISMA flow diagram for the impact review	59
Figure 4: Model of housing with support for older people	104
Figure 5: EPPI-Reviewer priority screening curve for the perceptions and experiences review	135
Figure 6: EPPI-Reviewer priority screening curve for the impact review.....	135

Highlights

Perceptions and experiences of housing with support

Our analysis of older people's perceptions and experiences of housing with support identified five overarching themes: deciding to move; transition and adaptation; living independently; staying physically active; and social engagement.

Key findings included:

- Individual choice and autonomy are integral to successfully transitioning to, ageing in place in, and dying in place in housing with support.
- Moving to housing with support in a location that allows older people to maintain previous social networks can ease their transition to their new home.
- Older people highly valued new friendships formed in housing with support, and many reported feeling less lonely after the move.
- Personal care and support services are a key aspect of housing with support, yet older people felt that opportunities to socialise were essential to their well-being and to creating cohesion in the community.

Impact of housing with support

We assessed the impact of housing with support across seven outcomes: self-rated health; objective health; physical well-being; mental well-being; social well-being; health and social care utilisation; and costs.

Key findings included:

- An accessible home and environment are important facilitators of housing with support, but social and physical well-being programmes are key to maximising physical and mental health.
- Staying in their own locality allows older people to retain contact with family and friends.
- The main changes in health service utilisation following a move to housing with support were a minor increase in use of practice nurses, a minor reduction in use of GPs, and decreased length of stay in hospital, but not in admissions to hospital.
- Older people's subjective perceptions of their new home may contribute more to their mental well-being and self-rated health than objective measures of features of the senior housing neighbourhood.
- Activities organised within housing with support were shown to positively impact older people's satisfaction and quality of life.

Executive summary

Policy context

The Department of Health and the Department of Housing, Local Government and Heritage are jointly developing a policy framework on housing for older people so that a wider range of residential care choices will be available to them. This is in line with Sláintecare, which highlights the importance of allowing people to live in their own communities for as long as possible. This evidence review will support policy development by exploring older people's perceptions and experiences of housing with support and by examining its impact.

Background

Housing plays a fundamental role in quality of life, particularly for groups of people who spend more time in the home, including older people. It is well established that older people prefer to live and die in their own homes, which is referred to as 'ageing in place'. Yet, the quality and appropriateness of an older person's home environment modulates the extent to which they can take care of themselves or be cared for at home. Housing with support aims to enable older people to age with dignity by providing independent and accessible housing and by connecting them with services that meet their social and healthcare needs. Moreover, housing with support may have the potential to reduce hospitalisation and institutionalisation among older people.

The implementation of housing with support is rapidly expanding, particularly as life expectancy is increasing throughout the world. This expansion of housing with support is likely to intensify in the context of Covid-19, which has made the risks of relying primarily on nursing homes tragically clear. As we reduce our reliance on nursing homes and shift towards housing with support, our efforts ought to be informed by both qualitative and quantitative evidence. In order to ensure that housing with support meets the needs of the population it aims to serve, we need to understand the perceptions and experiences of older people themselves. Doing so can allow those involved in policy and practice to incorporate the preferences of older people, which could contribute to more appropriate and desirable housing models, thus potentially increasing demand for housing with support among older people. Additionally, it is imperative that the expansion of housing with support be informed by a systematic and comprehensive assessment of its impact thus far on older people's quality of life. Addressing these key knowledge gaps would make an important contribution to the literature and to public policy. Therefore, the objectives of this mixed-methods evidence review were to: 1) explore older people's perceptions and experiences of housing with support, and 2) examine the impact of housing with support for older people on their quality of life.

For the purposes of this evidence review, we define 'housing with support' as purpose-built, non-institutional accommodation where older people have their own front door and where support or care services are available. Support services for housing with support are dependent on country context and housing typology. The services could include health and social well-being programmes and/or a volunteer programme. They could also include help with housekeeping, gardening, and general maintenance. The facility usually includes a central hub where each day hot meals can be purchased. In addition, care services could include assistance with activities of daily living, basic nursing care, and help with medication. Furthermore, the health and social care services provided and their costs are influenced by the country's publicly funded health and social care context and/or the residents ability to pay (through their own means, through health and social care insurance, or a combination of personal and insurance payments).

Research questions

This mixed-methods evidence review addressed two questions. The first explored qualitative research, and the second examined quantitative research:

1. What are older people's perceptions and experiences of housing with support?
2. What is the impact of housing with support for older people on their quality of life?

Methods

We searched four bibliographic databases (MEDLINE, CINAHL, Social Policy & Practice, and SocINDEX) and grey literature using a predetermined search strategy to identify qualitative, quantitative, and mixed-methods studies. All search results were imported into EPPI-Reviewer 4, and screening was carried out separately for the qualitative and quantitative research questions. EPPI-Reviewer's priority screening function was used, whereby machine learning via text mining shows screeners the most relevant studies first.

This mixed-methods review employed convergent parallel design; as such, qualitative and quantitative findings were analysed separately in the initial stage of synthesis. Thematic analysis was used to synthesise the results of included qualitative studies exploring older people's perceptions and experiences. Joanna Briggs Institute's Critical Appraisal Checklist for Qualitative Research was used to assess the quality of these studies, and the CERQual approach was used to assess confidence in the qualitative findings. For the included quantitative studies, we present a narrative synthesis of the studies' findings and combine findings where feasible and appropriate. Quality assessment of quantitative studies was carried out using an adapted version of a tool developed by the National Institutes of Health for observational cohort and cross-sectional studies, and the GRADE tool was used to assess the certainty of the quantitative findings. The results from the qualitative and quantitative syntheses were integrated in the final stage of the synthesis, in accordance with convergent parallel design.

Perceptions and experiences of housing with support

Following screening of 18,474 titles and abstracts, of which 465 articles were screened on full-text review, 39 articles were included in the review of older people's perceptions and experiences of housing with support. Among these 39 included articles, there were 38 unique studies conducted in the following countries: the United States of America (USA) (20), Canada (4), the United Kingdom (4), Sweden (4), Finland (2), Iceland (1), Netherlands (1), Australia (1), and New Zealand (1). All the included studies were found to be of moderate to high quality.

Our analysis of older people's perceptions and experiences of housing with support across these countries identified five overarching themes: deciding to move, transition and adaptation, living independently, staying physically active, and social engagement. Based on our CERQual assessment, we have moderate confidence that our findings are a reasonable representation of older people's perceptions and experiences of housing with support.

Deciding to move

Older people described a variety of factors that motivated them to move to housing with support. Many described loneliness and decreases in social interaction over time, and they looked forward to the social opportunities that housing with support would provide. For some, joining a community of older people and the sense of belonging this would bring was the most important reason for making the move.

The burden of maintaining a home was also frequently reported as a motivating factor. Regarding accessibility, older people noted that the presence of fall risks such as doorsteps, as well as the lack of a lift in their previous home, made purpose-built environments more appealing. Neighbourhood accessibility also influenced older people's decisions to move to housing with support; this was expressed in terms of physical accessibility, surrounding amenities, and transportation.

Many older people reported that they moved to housing with support to access care and assistance, particularly because they did not want to burden their children. Some described sudden health events that led to their need for more care, including falls, injuries, and major illnesses. Others described cumulative increases in dependency marked by a gradual deterioration in health, decreases in mobility, and declining ability to perform self-care. In some cases, older people described having felt resigned to their need for support – moving to housing with support was an undesirable yet unavoidable outcome. However, others conveyed a sense of acceptance of their increasing care needs.

Older people also expressed varying degrees of ownership over the decision to move. Many said that their children had been instrumental in their move to housing with support. Among them, some felt that they had been encouraged by their children, while others said that their children had made the decision for them. Other older people reported that they had decided independently to move to housing with support. They described a sense of pragmatism, a desire to maintain autonomy, and a sense of empowerment in making the decision for themselves. Some had decided to move after visiting a friend living in the community, which demonstrates the role that peer influence can play in motivating a move to housing with support.

Transition and adaptation

The move to housing with support was often an emotionally wrought process for older people. Deciding what to keep and what to give away was described as particularly painful, and in some cases traumatic. However, those who were able to give away belongings to their children and friends said that this eased the process. Notably, older people who had moved directly from hospital to housing with support were not able to participate in the move at all, and many of them expressed deep sadness that they were not able to choose which of their belongings to keep.

After moving to housing with support, many older people described nostalgia for their previous home and previous life. Attachment to the previous home and to the memories held within it was especially strong for those who had lived in the same house for a long time, as one would expect. Yet, personalising the new home with treasured belongings was described as easing the transition. Some residents of newly built communities had also been given the opportunity to make interior design choices – including choosing kitchen cabinet colours, kitchen worktop material, and paint colours – and they said that this helped them feel at home.

Importantly, older people who felt they had ownership over their decision to move tended to describe settling into housing with support as a positive experience. Additionally, many older people reported that staying in control of their daily activities, keeping routines, and staying busy helped them adjust to their new home. Older people who moved within their original neighborhood also highlighted the benefits of living in their comfort zone. They valued being able to see the same GP, go to the same shops, and attend the same church as before. Moreover, some who had not been able to move within their original neighbourhood wished that they could have.

Older people also described specific challenges to adaptation. For some, adjusting to a smaller living space was difficult. Additionally, some of those who had sold their home and were tenants in housing with support found it difficult to get used to paying rent. Although they appreciated not needing to pay to keep up their home, they said that making monthly payments for rent and for individual services and personal assistance was an adjustment, even when it was affordable. Other older people reported that they had not anticipated the loss of privacy that came with living near so many others, particularly in communal spaces. However, on balance, many felt that the social opportunities that this provided outweighed the loss of privacy.

For many older people, the process of transitioning to housing with support was marked by the need to adjust to the presence of death. The removal of bodies, death notices, memorial services, and a communal sense of grief when a resident passed away were all reminders of mortality. Yet, most older people reported that they had come to accept the reality of death. They described feeling content and at home in housing with support, and they hoped that their new home would be their 'last stop'.

Living independently

Older people primarily conceptualised living independently in housing with support as asserting and maintaining their autonomy alongside increasing care needs. The importance of having control over one's life was frequently expressed, and access to life outside the community was important.

Many described becoming increasingly aware of their dependency while living in housing with support. Some described it as a 'crossroads' – they wanted independence but acknowledged they would need help in the future. Many said that making decisions about which activities to engage in helped them retain a sense of independence, despite declining health.

Additionally, older people highlighted key activities that helped them feel independent, including keeping up their own hobbies and shopping for themselves. Notably, those who left urban areas missed being able to shop for themselves.

Older people also frequently expressed satisfaction with the support services they received. They described their sense of security from having staff on call, which helped them feel independent.

Staying physically active

Physical activity is a crucial aspect of healthy ageing. Older people described several factors that influenced their level of engagement in physical activity. Former lifestyle played a key role; those who had been active before moving to housing with support often remained so. Additionally, self-efficacy facilitated engagement with physical activity, whereas, quite understandably, older people who had experienced falls lacked self-efficacy in terms of physical activity.

Some older people felt that having a diligent routine helped them maintain physical activity, and those whose family members were encouraging of physical activity felt they were more active because of this. Access to a gym on-site was also described as a key facilitator and was considered especially important when the weather was poor.

Opinions varied regarding organised physical activities on offer. Most older people were satisfied with the available activities, yet others felt that the activities did not meet their needs and were either too easy or too difficult. This is indicative of the challenge of addressing the needs of a community with varying degrees of mobility and ability.

Design features of the indoor and outdoor environments were also described as influencing levels of physical activity. In particular, older people valued non-slippery footpaths, flat surfaces with few hills or slopes, and benches so that they could rest during walks.

The culture of the community also played a key role in physical activity. Some said there was little encouragement from staff with regard to physically active. Yet, others reported a strong culture of physical activity in their community, exemplified by informal exercise groups such as walking and aerobic groups.

Social engagement

Older people provided rich descriptions of their social worlds in housing with support communities. Those who moved within their original community highlighted the importance of proximity to family and friends, which allowed them to maintain previous relationships. Additionally, many older people moved to housing with support communities to be closer to their children and grandchildren. Older people also noted that the home-like environment in their new community was conducive to having visitors, which they felt made their children and grandchildren more inclined to visit.

Across the included studies, older people highly valued the social opportunities that housing with support provided. Organised activities were described as staving off boredom and encouraging engagement in the community. Some said that without them, they would have been more reclusive and less likely to venture out of their apartment. Additionally, group membership, for instance in croquet clubs and music groups, was often described as integral to personal identity and fostered a sense of belonging.

Communal spaces also provided meaningful opportunities to socialise. They facilitated happenstance interactions, which helped older people feel socially connected. In particular, on site cafés, restaurants, and pubs were highly valued by older people; indeed, mealtimes were described as fundamental to socialising. They were essential to relationship building by creating opportunities for casual greetings, meaningful conversations, tiffs, helping, and sharing.

Additionally, older people valued the social opportunities that volunteering within their housing community provided. Some volunteered by supporting the running of their community, either in administrative roles or as resident representatives, and others volunteered by supporting residents who were less able. This involved personal support like pushing wheelchairs and taking less able residents for meals, as well as more formal activities like choral concerts for less able residents.

Older people frequently described making new friends while living in housing with support. Those who had friends living in the community before they moved in found it easier to form friendships, and those who were proactive felt that this had helped them engage socially. Some older people described romantic relationships that had developed. Older people also reported that friendships with staff formed a key part of their social world. While some older people reported that their friends in the community were different from their lifelong friendships, many said that their friends in housing with support felt like family.

Living in a community of peers led to a palpable sense of belonging for many older people. They felt understood without much effort or explanation, and they felt that this fostered camaraderie and familiarity. Yet, some missed the presence of younger people and families.

Older people also described several challenges to socialising in housing with support communities. These included language barriers (among those whose first language was not the national language), social cliques, and stigma against those less able. Indeed, some even reported concealing their own decline, to avoid shame and social exclusion. However, most older people described a strong sense of mutual support in their communities, which they felt fostered a sense of belonging and created social cohesion.

Key findings from the perceptions and experiences review

Incorporating older people's preferences into the design and implementation of housing with support is crucial, and our findings from the included qualitative studies represent an amalgamation of what older people from around the world value in housing with support. Our analysis of older people's perceptions and experiences reveals three overarching facilitators of well-being in these communities. The first is that individual choice and autonomy are integral to successfully transitioning to, ageing in place in, and dying in place in housing with support. Second, moving to housing with support in a location that allows older people to maintain previous social networks, either by moving within the same community or by moving closer to family, can ease their transition to their new home. Third, personal care and support services are a key aspect of housing with support, yet from the perspectives of older people themselves opportunities to socialise are essential to their well-being and to creating cohesion in the community. As such, housing with support communities ought to maximise social engagement by using social contact design in communal spaces, organising a wide range of social activities, and encouraging a culture of volunteerism and mutual support.

Impact of housing with support

Following screening of 19,246 titles and abstracts, of which 104 articles were screened on full-text review, 36 articles were included in the review of the impact of housing with support. Among these 36 included articles, there were 17 unique studies conducted in the following countries: the USA (10), the United Kingdom (4), Canada (1), Finland (1), and Israel (1). Below, we synthesise our findings from continuing care retirement communities (CCRCs), independent living, assisted living, and planned retirement communities jointly, because all of the studies took place in the USA, with the exception of one study of CCRCs in Israel. Extra care housing and senior housing are presented separately. Extra care housing was evaluated in the United Kingdom, and senior housing was evaluated in Canada and Finland.

The quality of the included studies ranged from low to high. We assigned a level of evidence of 3 using *British Medical Journal* guidelines, as this is a systematic review of longitudinal or cohort studies, some of which had high loss to follow-up and/or very small sample sizes. With respect to certainty of evidence, we have low to moderate confidence in the evidence. Therefore, there is insufficient high-quality evidence to date to make definitive conclusions regarding the impact of housing with support.

CCRCs, independent living, assisted living, and planned retirement communities

Continuing care retirement communities (CCRCs) provide a spectrum of support, from independent living to nursing home-level care. Independent living communities consist of housing for older people

with some supports, but they emphasise the independence of the older person. Assisted living provides more care than independent living, but less care than a nursing home. Notably, some assisted living communities in the USA effectively function as nursing homes, and such facilities were not included in this review. Planned retirement communities do not provide care, but instead provide support in the form of amenity-rich environments for older people, and they are typically located in the warmer southern regions of the USA.

Self-rated health

Self-rated health is an important indicator of mortality, morbidity, and psychological well-being. In one CCRC in the USA, residents were found to have improved self-rated health over time, and greater self-rated health compared with the general population. Similarly, in one independent living community, both self-rated health and health satisfaction improved. People who moved locally to one CCRC experienced better self-rated health than those who moved long distance to the CCRC. When comparing a nursing home population with an assisted living population, self-related health was found to increase for both over time.

Objective health outcomes

In one CCRC, both comorbidities and self-rated health increased. This may be related to residents having access to more medical services, leading to identification of previously undiagnosed conditions. It is also possible that individuals with higher levels of previously undiagnosed comorbidity were more likely to move into a CCRC. In addition, comorbidities increase with increasing age. Another finding was that residents who moved locally to a CCRC had better measurable health outcomes than those who moved long distance to the CCRC.

When comparing the outcome trajectories of residents of an assisted living community and a nursing home, facility type was not found to predict health outcomes, mortality, or relocation to a higher level of care. However, it is possible that in this case, the residents of the assisted living community had care needs more comparable to those typically living in a nursing home. Within one CCRC, the strongest predictors of moving from living independently to needing nursing care were depression, incontinence, impaired cognition, and diminished competency to complete activities of daily living. Depression and incontinence are the more modifiable factors of these four, and interventions focusing on these may defer people's need for increased nursing care and/or delay residents' transfer to a nursing home.

Physical well-being

Regarding activities of daily living, findings were mixed, with functional abilities remaining consistent in one assisted living community over 12 months, dependencies increasing in another assisted living community, dependencies remaining consistently low in one CCRC, and dependencies remaining relatively low but increasing over an 8-year period in independent living. Continence rates decreased overtime for residents of both the CCRC and independent living communities.

Mental well-being

The move to senior housing is a stressful event in an older person's life. In one independent living community, measures of biomarkers of stress indicated that stress levels peaked around the move and balanced out around 3 months later. Fewer women in one independent living community reported feeling depressed after their move, with a small decrease in mean scores for depression. In an Aging in Place programme within an independent living community, psychological well-being scores improved, whereas depression scores remained constant. In an Aging in Place in a CCRC, residents showed some improvements in their psychological health and depression scores at follow-up. Psychological well-being scores showed no change over 12 months in both an assisted living community in Ohio and a sample of assisted living communities in Oregon.

Social well-being

Social engagement in CCRCs was associated with quality of life and satisfaction. Older people engaged in the same level of activity pre- and post-move, but the pattern of activities that people engaged in changed after they moved into a CCRC. Some cultural and social activities increased in frequency,

whereas maintenance activities such as housekeeping and grocery shopping decreased in frequency. The more activities people engaged in after their move, the greater their residential satisfaction. CCRC residents who attended organised activities in the first year of living in a CCRC experienced slower declines in their quality life over the following 4 years.

In Israeli CCRCs, loneliness was associated with social standing in that those of higher social standing were less likely to experience loneliness. In the USA, social role identities have also been found to change after moving to a CCRC, and people who moved to their new home from farther away experienced the social aspect of their new location differently than those who moved locally. In both a CCRC and a planned retirement community, those who moved from farther away made more new friends than local movers. However, distant movers in the planned retirement community reported decreases in subjective social support due to reduced contact with their former community. Local movers benefited from increased social support as a result of continued access to their previous community, in addition to making new friends in their new community. However, in one CCRC, overall social support outcomes were similar for both local and distant movers. This indicates that their relative levels of social support evened out; those who moved from far away made more new friends, and those who moved within their community maintained their previous friendships.

Health and social care utilisation

Notably, residents of CCRCs in the USA were found to be hospitalised slightly less often than the general population, but they used slightly more home-based services than the general population; this finding was not statistically significant, however.

Costs

Two evaluations in the USA assessed cost-effectiveness analyses of an Aging in Place programme within a CCRC. Both evaluations found that among residents of independent living who had qualified for nursing home placement, those who stayed in independent living and used extra health services as needed (instead of moving to a nursing home) had lower cost of living when compared to the average regional cost of living in nursing homes.

Extra care housing

The extra care housing initiative in the United Kingdom aims to be a home for life for residents. Staff are available on the premises 24 hours per day. The main reason that many extra care participants cited for moving to extra care was in order to age in place, and ultimately die in place, and to avoid a move to a residential care home or nursing home.

Self-rated health

Self-reported health in extra care housing was found to have remained stable or increased over time. However, self-rated health was lower in extra care housing residents than in healthy community-based volunteers. Chronic diseases were common among people aged 65 years or over, and their prevalence increased with age. Those with chronic diseases lived successfully in either extra care housing or in the community.

Objective health outcomes

The incidence of death and institutionalisation was similar in two evaluations, one taking place over 2.5 years and one over 5 years. Less than 10% of extra care residents moved to care or nursing homes, and approximately 25% died, within 5 years of moving into extra care housing. It is likely that the level of personal care and household management assistance available in the extra care scheme influenced the residents' risk of moving. It appears that the courtyard-type schemes provide higher levels of care than the village schemes; therefore, more people in courtyard schemes were able to age in place and subsequently die in place. In addition, reduced informal home care may also have increased the risk of moving to a care home, as women who had cared for their husbands but had no one left to care for them after their husbands had died were more likely to transfer to institutional care.

Physical well-being

Three evaluations measured instrumental activities of daily living (household management) and activities of daily living (personal care) but used different measurement instruments. It seems that people with higher physical functional limitations moved to extra care schemes in order to live in a more age-friendly environment and access care. The proportion of people living in extra care who had high dependency levels decreased over time in two longitudinal evaluations. This could be explained by increased resilience due to physical well-being interventions (such as exercise and fall prevention interventions), or by those who were in poor health either moving to institutional care, or refusing to participate in later waves of the study, or some combination of these three explanations.

An evaluation of average walking speed in metres per second found that the average walking speed was higher for community-based control participants than for extra care participants at each measurement time point between baseline and final follow-up. Average walking speed increased in both groups during the evaluation period.

Mental well-being

The little data available on quality of life indicated that it may increase in the first 12 months living in extra care housing, and this was associated with participation in social and physical well-being interventions. It seems that people with higher levels of cognitive impairment moved to extra care schemes in order to live in a more age-friendly environment and access care. Average cognitive impairment scores decreased over time in two longitudinal evaluations; likewise, the proportion of people with severe cognitive impairment decreased over time in the same two evaluations. This is counter intuitive but could be explained by increased resilience due to mental and social well-being interventions, or by those with severe cognitive impairment moving to institutional care or being unable to participate in later waves of the study. One evaluation reported no change in psychological well-being over a 12-month period, whereas another evaluation reported reductions in the proportion of participants experiencing anxiety or depression over a 36-month period.

Social well-being

Three evaluations measured social well-being, but all three used different measurements. The findings were mixed, with one evaluation reported no change in social well-being, one reported a decrease in social well-being, and the third, more in-depth examination reported improved social well-being. The study that reported decreased social well-being did not measure well-being at baseline, and the authors pointed out that participants were not experiencing social isolation.

Health and social care utilisation

Three evaluations measured health and/or social care utilisation, and two evaluations measured hospitalisations. The main changes in health service utilisation were a minor increase in use of practice nurses, a minor reduction in use of GPs, and decreased length of stay in hospital but not in admissions to hospital. The reduction in length of stay could be explained by the presence of personal care and reablement programmes in extra care schemes.

Costs

Regarding costs, one study reported that living in extra care housing was more expensive than living in the community, as the overall cost per person increased after moving to extra care housing, but that this increase was associated with improved social well-being outcomes and improvements in quality of life. Another study also reported incremental cost-effectiveness ratios for extra care housing in 2006 compared with care homes in 2005 and concluded that extra care was of equal cost but more effective. Another study found that there was no overall reduction in healthcare costs over the first 36 months in extra care housing, but there was by 60 months, at which point extra care housing saved the National Health Service GP£1,992 per person over 5 years.

Senior housing

The philosophy of senior housing in Canada was different than that in Finland. Canada used senior housing as one step in the care pathway, which was preceded by life in the family home and followed

by life in a nursing home. Finland's senior housing was for any older person who could make decisions for themselves, and nursing home places were limited to those who could no longer make their own decisions. Mental well-being was the only thematic outcome evaluated in both Canada and Finland. However, this outcome was measured using different approaches, and so commonalities could not be identified.

Mental well-being

A study from Canada reported that significant predictors of the four outcomes measured (self-perceived health status, morale, depression, and self-esteem) were changes in personal resources; everyday travel; and residents' judgements of service, social, and physical components of the senior housing neighbourhood. Older people's subjective interpretations of their new residential setting were found to have greater influence on the four outcomes than objective measures of the settings.

A study from Finland reported that older people's self-reported mental capability and loneliness did not change significantly during the first 12 months in senior housing.

Physical well-being

There were significant reductions in instrumental activities of daily living scores, dominant hand grip strength, and walking speed during the first 12 months in Finland's senior housing. Participants reported that this limited their ability to move outside their home and take part in social activities.

Social well-being

Feelings that life is safe increased significantly over the first 12 months in senior housing, and the respondents stated that they had freedom to do whatever they liked in their senior house or apartment. The respondents felt that they had adequate contact with relatives and friends. However, the participants felt that opportunities to make decisions about their life decreased significantly over the first 12 months in senior housing. Increases in loneliness and sleep problems were associated with reductions in walking speed and increased fear of falling, while limitations in moving outdoors were associated with reductions in dominant hand grip strength.

Key findings from the impact review

An accessible home and environment are important facilitators of housing with support, but social and physical well-being programmes are key to maximising physical function, maintaining or improving mental well-being, and minimising the frailty associated with ageing and chronic diseases. Activities organised within housing with support were shown to positively impact older people's satisfaction and quality of life. Additionally, many housing with support communities aim for a balance of residents with high, medium, and low or no care needs to create an active community and avoid overwhelming the social care services provided.

When older people can stay in their own locality, they can retain contact with family and friends. In addition, proximity to grocery shops, pharmacies, and primary care services are integral to well-being, according to the study from Canada.

Older people's subjective perceptions of their new home and community may contribute more to their mental well-being and self-rated health than objective measures of the physical components of the senior housing neighbourhood. This indicates that consultation and involvement in decision-making is key.

The main changes in health service utilisation following a move to housing with support were a minor increase in use of practice nurses, a minor reduction in use of GPs, and decreased length of stay in hospital, but not in admissions to hospital. For extra care schemes, the reduction in length of stay could be explained by the presence of personal care and reablement programmes.

A study of cost-effectiveness of extra care housing compared to care homes reported that they were equal cost but more effective. Another small case study examined the cost of extra care housing compared to residents' previous homes and reported that extra care housing cost more per month, but people living in extra care housing had better social well-being and improved quality of life. Additionally, two evaluations in the USA assessed cost-effectiveness analyses of an Aging in Place

programme within a CCRC. Both evaluations found that among residents of independent living who had qualified for nursing home placement, those who stayed in independent living and used extra health services as needed (instead of moving to a nursing home) had lower cost of living when compared to the average regional cost of living in nursing homes.

Notably, some authors of the included quantitative studies suggested a shift in the approach to evaluating housing with support. Longitudinal cohort studies measuring older people's physical and mental well-being are prone to high levels of bias. In particular, loss to follow-up is a major challenge, not necessarily because older people do not want to participate, but often because they are too ill, too cognitively impaired, or because they pass away. As a result, older people who remain in cohort studies are likely to be healthier and more able in comparison to those who are lost to follow-up, making it very difficult to assess the true impact of housing with support on cognitive and physical functioning. Moreover, cohort studies are very costly and may not be measuring the most important quality-of-life parameters for older people, such as autonomy and social well-being.

An alternative approach is to use existing health records to measure the impact of housing with support through time series analysis. This would also prevent older people having to repeat tests of their physical and mental well-being, which are already integrated into their routine care. Studies using existing health records ought to focus on three key outcomes for measuring success in housing with support – time spent in hospital, transfer to institutional care, and death in housing with support.

Additionally, simple and cost-effective surveys can be used to measure older people's self-assessed quality of life, self-rated health, participation in well-being activities, and satisfaction with housing. These outcomes are crucial indicators of physical and social well-being and of overall quality of life.

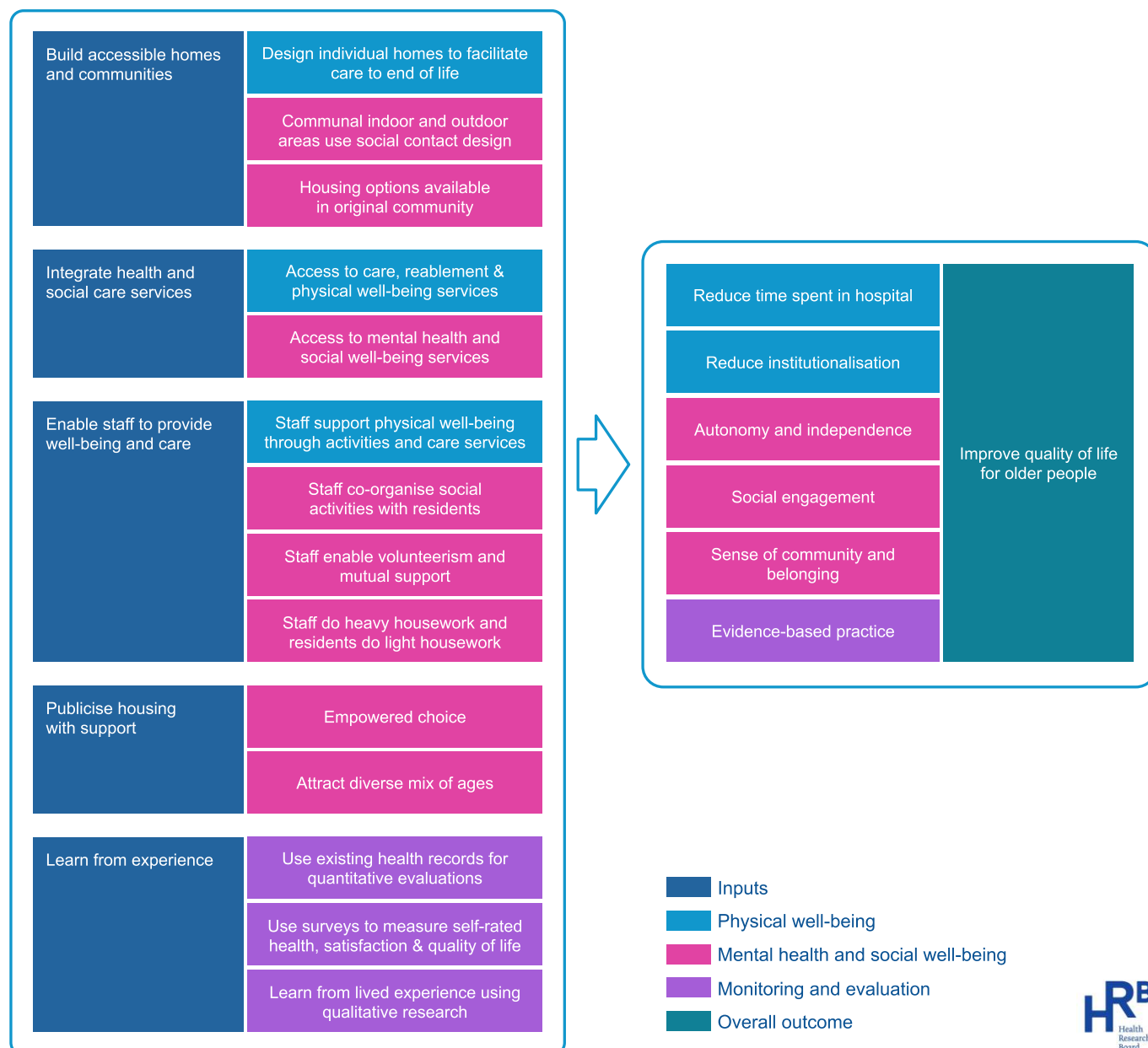
Synthesis of qualitative and quantitative findings

We created a conceptual model synthesising what we learned from the included studies regarding the key aspects of housing with support that older people valued, the desired outcomes of housing with support, and how to best evaluate it going forward (see Figure 1). We chose to synthesise our findings by creating a conceptual model because the low level of evidence among the studies included in the quantitative review meant that we were not able to draw definitive conclusions regarding the impact of housing with support. Therefore, our model illustrates intended rather than proven outcomes, and as such it must be interpreted as an aspirational model of housing with support.

Our conceptual model categorises the components of housing with support that we identified in the qualitative and quantitative literature under five overarching inputs: 1) build accessible homes and communities; 2) integrate health and social care services; 3) enable staff to provide well-being and care; 4) publicise housing with support; and 5) learn from experience. Our understanding of the literature led us to identify these five inputs as integral to the process of implementing housing with support. Within these inputs, we present potential pathways to physical well-being for older people, pathways to mental health and social well-being for older people, and strategies for monitoring and evaluation of housing with support. These potential pathways and strategies are grounded in our findings regarding older people's preferences for housing with support from the qualitative review and our findings regarding the impact of housing with support from the quantitative review. We translated our findings into actionable activities for policy makers under each overarching input.

The intermediate desired outcomes of housing with support in our model, which we drew from the literature, are to: reduce time spent in hospital (quantitative review); reduce institutionalisation (impact review); support autonomy and independence in an accessible environment (both reviews); enable social engagement (both reviews); create a sense of community and belonging (both reviews); and ensure evidence-based practice (both reviews). The overall aim of housing with support across the literature is to ensure that it improves quality of life for older people and allows them to age and die in place.

Model of housing with support for older people



Conclusion

The qualitative and quantitative studies we have analysed show that an accessible home and environment are the first steps for housing with support, but the philosophy and principles that it is based on are what makes it a success. Individual choice and autonomy are crucial for older people to successfully transition to, age in place in, and die in place in housing with support. Additionally, housing with support can allow older people to continue to live in their own locality, allowing them to maintain their previous social networks and access the same amenities and community services, which eases their transition to their new home. Personal care and support services are a key aspect of housing with support, and reablement, cognitive support, and mental health services are particularly important. Yet communal spaces, organised social activities, volunteerism, and mutual support are also fundamental to well-being as they foster social engagement and create cohesion in the community. Above all, housing with support enables a self-directed life that maximises free choice and independence, which is integral to improving quality of life for older people.

1 Introduction

1.1 Policy context

The Department of Health and the Department of Housing, Local Government and Heritage are jointly developing a policy framework on housing for older people so that a wider range of residential care choices will be available to them. This is in line with Sláintecare, which notes the importance of allowing people to live in their own communities for as long as possible. This evidence review will support the development of the joint policy framework by exploring older people's perceptions and experiences of housing with support and by examining its impact.

1.2 Background

Housing plays a fundamental role in quality of life, particularly for groups of people who spend more time in the home, including older people.¹ It is well established that older people prefer to live and die in their own homes or in a new accessible home, which is sometimes referred to as 'ageing in place'.² Yet, the quality and appropriateness of an older person's home environment modulates the extent to which they can take care of themselves or be cared for at home.³ Housing with support aims to enable older people to age with dignity and independence by providing accessible housing and by connecting them with services that meet their social and healthcare needs.⁴ Moreover, housing with support may have the potential to reduce hospitalisation and institutionalisation among older people.⁴

The implementation of housing with support is rapidly expanding, particularly as life expectancy is increasing throughout the world. This expansion of housing with support is likely to intensify in the context of COVID-19, which has made the risks of relying primarily on nursing homes tragically clear. As we reduce our reliance on nursing homes and shift towards housing with support, our efforts ought to be informed by both qualitative and quantitative evidence. In order to ensure that housing with support meets the needs of the population it aims to serve, we need to explore the perceptions and experiences of older people themselves. Doing so will allow those involved in policy and practice to incorporate the preferences of older people, which could contribute to more appropriate housing models and to efforts to increase demand for housing with support. Additionally, it is imperative that the expansion of housing with support be informed by a systematic and comprehensive assessment of its impact thus far. Addressing these key knowledge gaps would make an important contribution to the literature and to public policy. Therefore, the objectives of this mixed-methods evidence review are to: 1) explore older people's perceptions and experiences of housing with support, and 2) examine the impact of providing housing with support for older people.

1.3 Research questions

This mixed-methods evidence review addresses two questions. The first explores qualitative research, and the second examines quantitative research:

1. What are older people's perceptions and experiences of housing with support?
2. What is the impact of housing with support for older people on their quality of life?

1.4 Defining housing with support

Applying a single overarching definition of housing with support is challenging, as very few schemes are exactly alike.⁵ However, there are more commonalities than differences between housing with support schemes.⁶ All models of housing with support fundamentally focus on developing a homely rather than institutional environment and incorporate services that promote independence and autonomy.⁵ For the purposes of this evidence review, we define 'housing with support' as purpose-built, non-institutional accommodation where older people have their own front door, and where support or care services are available. Support services for 'housing with support' are dependent on the country context and housing typology. The services could include health and social well-being programmes and/or a volunteer programme. It could also include help with housekeeping, gardening,

and general maintenance. The facility usually includes a central hub where each day hot meals can be purchased. In addition, care services could include assistance with activities of daily living, basic nursing care, and help with medication. Furthermore, the health and social care services provided and their costs would appear to be influenced by the country's publicly funded health and social care context and/or the residents ability to pay through their own means, through health and social care insurance, or a combination of personal and insurance payments.

2 Methods

2.1 Inclusion and exclusion criteria

The full inclusion and exclusion criteria and their justifications are presented in Tables 1 and 2. These were used as search limits and screening criteria.

Table 1: Eligibility criteria for the perceptions and experiences review

Domain	Inclusion criteria	Exclusion criteria
Population	People aged 50 and over. This younger age cut-off allowed us to include a wider selection of housing typologies and countries	Family members and carers
Intervention	Purpose-built housing with support where older people have their own front door and personal living quarters. This was an important concept for the Department of Health, as it was interested in independent accessible homes, rather than institutional facilities.	Adaptations to the family home Age-friendly cities Age-friendly neighbourhoods Hospitals Housing purpose-built for homeless older people, blind older people, older people with dementia or disabilities Housing with shared rooms Inpatient care centres Naturally occurring retirement communities Nursing homes Skilled nursing facilities
Study design*	Grounded theory research Ethnographic research Phenomenological research Qualitative case studies Narrative analyses This study design criterium was introduced to ensure that the analysis included qualitative research that used a well-documented and tested approach to the study which would enhance the credibility and reliability of the findings	Conceptual or theoretical articles Conference abstracts Letters to the editor Opinion pieces Books
Publication date	2000-present	

*Only studies that used one of five widely recognised qualitative methodologies, as outlined by Creswell & Poth (2017),⁷ were considered for inclusion.

Table 2: Eligibility criteria for the impact review

Domain	Inclusion criteria	Exclusion criteria
Population	People aged 50 and over. This younger age cut-off allowed us to include a wider selection of housing typologies and countries	Family members and carers
Intervention	Purpose-built housing with support where older people have their own front door and personal living quarters. This was an important concept for the Department of Health, as it was interested in independent accessible homes, rather than institutional facilities.	Adaptations to the family home Age-friendly cities Age-friendly neighbourhoods Hospitals Housing purpose-built for homeless older people, blind older people, older people with dementia or disabilities Housing with shared rooms Inpatient care centres Naturally occurring retirement communities Nursing homes Skilled nursing facilities
Study design	Studies must have at least two data collection time points, such as: Before-and-after studies Cohort studies Longitudinal studies Time series Randomised controlled trials	Conceptual or theoretical articles Conference abstracts Letters to the editor Opinion pieces Books
Publication date	2000-present	

Studies for the impact review were selected according to the criteria outlined in Table 2. We considered any study that had at least two data collection time points as per Table 2. The studies we identified all followed a group of older people entering housing with support and were primarily longitudinal or cohort studies with or without comparison groups. These studies collected data at baseline and at one or more follow-up time points allowing the researchers to measure changes in exposures and outcomes overtime. Studies were not excluded based on outcome, because we did not define outcomes, apart from quality of life, and wanted to be open to including all possible outcomes. Also, studies were not excluded if they did not have a comparison group as we wanted to collect as much data as possible on the impact of housing with support on older people's overall quality of life.

2.2 Search strategy

At an early stage in the review process, following preliminary scoping searches, the research team decided to undertake one comprehensive search of the published, peer-reviewed research on housing with support for older people in order to answer both research questions. The search strategy was initially developed for the MEDLINE (Ovid) database. Two specific concepts underpinned the search strategy for both systematic reviews: the concept of older people, and the concept of housing with support. The language used to describe housing with support is varied, complex, and often geographically specific. Therefore, this concept was informed by terminology identified previously in an evidence brief of housing models for older people;⁸ from an overview of terminology

on the subject of housing for older people by Howe *et al.* (2014)⁶; and from a review by Croucher *et al.* (2006).⁵ We compiled a list of housing models as keywords for the search strategy. In addition, the information specialists on the team identified relevant controlled vocabulary terms from the Medical Subject Headings (MeSH) database of terms.

The same process was used for compiling terminology to describe older people: terminology was derived from the evidence brief by Coyle *et al.*,⁸ and was supplemented by terminology derived from search filters compiled by the information specialists and filters developed by the Canadian Health Libraries Association.⁹ This list was then supplemented by MeSH terms, as described above, with an emphasis placed on terminology used to describe populations of older people rather than on clinical geriatric terminology.

The first research question was qualitative in nature and sought to explore the perceptions and experiences of older people, while the impact review was quantitative in nature, seeking to examine the effectiveness of housing with support for older people. Therefore, in addition to the two primary concepts, an adapted search filter was applied in order to capture qualitative, quantitative, and mixed-methods research.¹⁰ Figure 1 illustrates the three overarching search concepts.

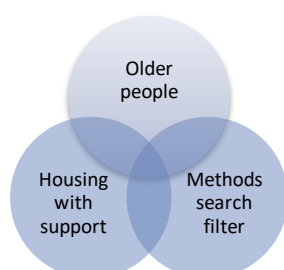


Figure 1: Search concepts

2.2.1 Limits

No language limits were applied to the searches. Following trial searches of MEDLINE and the examination of references from previously published reviews, the decision was taken to limit the search to articles published from the year 2000 to present. While the term ‘housing with support’ is well established in the housing literature, trial searches indicated that much of the research of interest had been undertaken since 2000. In addition, it was clear from the MEDLINE search results that the final search strategy would yield a very high number of results, and a pragmatic decision was taken to focus on recently published literature, using reference chasing and grey literature searches to alert us to older relevant research if necessary. For the purposes of this review, older people have been defined as adults aged 50 years and over, so where possible, limits to include only research on older people were applied. Certain types of publications, such as books, letters, commentary pieces, editorials, and newspaper articles, were excluded from the final search results. The complete inclusion and exclusion criteria and their justification are presented in Tables 1 and 2.

The search strategy was developed by an information specialist (LF) in consultation with the research team. It was peer reviewed and modified following consultation with another information specialist on the team (CL). All searches were undertaken between 18 and 22 November 2019. A complete PRISMA-S checklist¹¹ for reporting literature searches in systematic reviews is available in Appendix A.

2.2.2 Databases

Preliminary scoping searches indicated that research articles informing both research questions were to be found across a range of sources, including medical and sociological sources. The search strategy was initially developed for the MEDLINE (Ovid) database and was subsequently translated for use in the CINAHL, SocINDEX (both on the EBSCO platform), and Social Policy & Practice (Ovid) databases. These databases cover a range of subject areas and professions and emphasise different geographical areas, ultimately providing a wide scope of research sources. The database search parameters are available in Appendix B, and the full search strategies and search filters used in the four databases are available in Appendix C.

2.2.3 Grey literature search

A separate grey literature search was undertaken to inform each systematic review. The following steps were taken for both searches:

1. Relevant organisation websites and publication lists were searched by CL and LF. Websites were searched using a combination of the relevant keywords ('extra care housing', 'independent living', 'assisted living', 'continuing care retirement community', 'sheltered housing', and 'senior housing'). Relevant publications were retained for full-text screening. See Appendix E for a list of the websites that were searched.
2. Relevant policy reviews and literature reviews identified from the database search, the Google search, and from a previously undertaken Health Research Board (HRB) evidence brief⁸ were selected for citation chasing and reference checking. Relevant papers were retrieved for full-text screening. All grey literature reviews that were included for citation chasing and reference checking are listed in Appendix D.
3. Google's search engine was used to search more broadly for grey literature. Two information specialists (CL and LF) searched Google using a combination of the following keywords: 'extra-care housing', 'independent living', 'assisted living', 'continuing care retirement community', 'sheltered housing', and 'senior housing'. The first 100 results were screened for relevance, and any relevant publications were retained for full-text screening.

The inclusion and exclusion criteria were applied to grey literature sources are presented in Tables 1 and 2.

2.2.4 Supplementary searching

It is well recognised that qualitative research can be difficult to retrieve using conventional systematic review search methods due to inadequate descriptions of methods in published abstracts.^{12 13} Consequently, it was considered important to supplement the main database searches. The following supplementary search strategies were used:

- Reference checking: The reference section of each included article was checked for relevant articles.
- Citation chasing: Articles that cited the included articles were checked for relevance. This was done for each article using the 'cited by' function in Google Scholar.

These strategies were used for each included study, including studies that were found through the supplementary search strategies and through the grey literature search. In addition, any systematic reviews that were identified at any stage in the screening process were targeted and their reference sections were checked for relevant studies. All systematic reviews used in the supplementary search are listed in Appendix D.

2.3 Screening

All database search results (18,175) were imported into EPPI-Reviewer 4 for title and abstract screening for each systematic review. A PRISMA flow diagram for each systematic review is provided in Figure 2 and Figure 3. Given the high number of abstracts to be screened for each systematic review, and the limited time in which to complete the reviews, the research team decided to use EPPI-Reviewer's priority screening function to improve the efficiency of title and abstract screening. Priority screening uses text mining to make screening for systematic reviews more efficient by prioritising the abstracts shown to the reviewer. The priority screening function pushes the more relevant studies towards the beginning of the screening process and pushes the less relevant ones towards the end. As a result, the relevant abstracts can be found earlier in the screening process, and the review can proceed more quickly through to the full-text retrieval and screening phases.¹⁴

Priority screening was undertaken for each systematic review by two members of the review team in order to ensure that each reference was reviewed by two reviewers. For the purposes of this review, EPPI-Reviewer's priority screening was set to the 'Multiple: auto complete (code level)' reconciliation mode. Using this option, EPPI-Reviewer marked the coding as complete if there was agreement

between the two reviewers. Differences between reviewers were reconciled independently by a third reviewer.

This process was continued until 6,000 abstracts had been screened for each systematic review. At that stage in the screening process, none of the previous 2,000 abstracts had been selected for inclusion by the reviewers, and we were satisfied that saturation of relevant studies had been achieved. At this point, EPPI-Reviewer's priority screening was set to 'Single (auto-complete)', meaning that for each review a single reviewer screened the remaining abstracts, which were prioritised by the EPPI-Reviewer software. No new abstracts were included during this part of the screening process, confirming that abstract saturation had indeed been achieved for each systematic review. See Appendix F for additional information regarding the outcome of the screening process using EPPI-Reviewer's priority screening approach.

Following title and abstract screening, relevant articles were retrieved for both systematic reviews for full-text screening by the research team. Again, each full-text paper was reviewed by two reviewers. Disagreements regarding inclusion were resolved through consensus and discussion.

2.4 Study selection

Studies for the perceptions and experiences review were selected according to the criteria outlined in Table 1. Studies for the impact review were selected according to the criteria outlined in Table 2. Studies were not excluded based on outcome or comparison group, because we did not want to risk excluding studies with outcomes that we may not have considered.

2.5 Quality assessment and confidence in evidence

For the review of older people's perceptions and experiences, the Joanna Briggs Institute's Critical Appraisal Checklist for Qualitative Research was used.¹⁵ This is a 10-item checklist, and the full list of questions is available in Appendix G.

Each overarching qualitative finding was assessed using the CERQual (Confidence in the Evidence from Reviews of Qualitative Research) approach. The CERQual method enables reviewers to transparently assess and describe the extent to which a review finding is a reasonable representation of the phenomenon of interest, such that the phenomenon of interest is unlikely to be substantially different from the research finding.¹⁶ The CERQual includes four elements: (1) methodological limitations; (2) relevance to the review question; (3) coherence; and (4) adequacy of data.¹⁶ These elements are used to assess overall confidence in qualitative findings. There are four levels of confidence: high, moderate, low, or very low.¹⁶

For the impact review, we used an adapted version of a tool for observational cohort and cross-sectional studies from the National Heart, Lung, and Blood Institute's of the National Institutes of Health in the USA.¹⁷ This tool uses 12 items to assess the quality of cohort studies. We excluded Question 8, as blinding was not possible in the study designs selected for inclusion, and we adapted Question 11 to align with our inclusion criteria on the minimum number of time points, allowing only studies with at least two time points to be included. Our adapted version of the tool is available in Appendix H.

We also used *British Medical Journal* guidelines to assign levels of evidence to each quantitative study,¹⁸ and the GRADE certainty of evidence tool¹⁹ to write our strength of evidence recommendation for the impact review. The levels of evidence range from one to four. The certainty of evidence can be high, moderate, low, or very low. The quality of evidence drives the strength of recommendation, which is one of the last translational steps of research and is most proximal to patient care.

For both reviews, each included study was independently assessed by two reviewers, with any disagreements being resolved by consensus. Quality assessment results were not used to exclude studies; instead the results were used to describe the strengths and limitations of the studies.

2.6 Data extraction

For each review, data were extracted by a single reviewer into a bespoke extraction sheet. Extracted data were verified independently by a second reviewer. Journal websites for the included articles were checked for supplementary data and errata, and authors were contacted if data required for quality appraisal and analysis were missing. For included mixed-methods studies, only the relevant qualitative or quantitative data were extracted.

For qualitative studies, the following data were extracted: country, housing model, study design, data collection method, dates of data collection, population age, number of, proportion of males and females, and findings. For quantitative studies, the following data were extracted: country, housing model, study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females, and findings.

2.7 Data analysis

2.7.1 Perceptions and experiences review

Thematic synthesis was used to integrate the results of the qualitative studies included in the perceptions and experiences review. Thematic synthesis has three stages: 1) line-by-line coding of text; 2) the development of descriptive themes; 3) and the generation of analytical themes.²⁰ We used Dedoose to code text and to develop our descriptive themes.²¹ The generation of analytical themes represents the stage of synthesis whereby reviewers integrate the primary studies and generate novel interpretations of findings.²⁰ Once we had developed descriptive themes, which we drew inductively from the included studies, we developed analytical themes by revisiting the descriptive themes in light of our research question. This process was carried out iteratively until our analytical thematic structure was finalised.

2.7.2 Impact review

Due to the high level of heterogeneity between the interventions themselves, their expected outcome measurements, and the means of measurement for each outcome among the included quantitative studies assessing impact, we were unable to conduct a meta-analysis (the statistical pooling of two or more studies assessing the same intervention). Instead, we present a narrative synthesis by country and typology of the studies' findings and combine findings where feasible and appropriate. A core assumption underpinning meta-analysis is that the studies being pooled are homogeneous with respect to intervention and outcome; therefore, all sources of heterogeneity and variation must be assessed before meta-analysis. We conducted a feasibility assessment and determined that the level of heterogeneity among the included quantitative studies was too high to warrant a meta-analysis. Our feasibility analysis considered population, comparator, intervention, outcome, measurement scale, and length of time to follow-up.

As a result, we conducted a narrative synthesis of the quantitative studies included in the impact review. We used summary statistics, where available, and we described the influence of covariates, where such analysis was completed.

2.7.3 Synthesis

This mixed-methods review employed convergent parallel design. As such, qualitative and quantitative findings were initially analysed and presented separately, and the findings were then integrated.²² We chose convergent parallel design because it allowed us to consider qualitative and quantitative studies in isolation prior to synthesising our findings, meaning that we were able to do justice to each of the two overarching research paradigms before we integrated our results. Our synthesis takes the form of a conceptual model of housing with support, in which we integrated what we learned from the included studies regarding the key aspects of housing with support that older people valued, the desired outcomes of housing with support, and how to best evaluate it going forward.

3 Older people's perceptions and experiences of housing with support

Five overarching themes were identified through our analysis of older people's perceptions and experiences of housing with support: deciding to move, transition and adaptation, living independently, staying physically active, and social engagement. These themes were drawn from 39 included articles, following screening of 18,474 titles and abstracts, of which 465 articles were screened on full-text review. Among the full-text articles that were screened, 358 were excluded because they did not use one of the five qualitative methodologies identified in our inclusion criteria: case studies, ethnographies, grounded theory studies, narrative analyses, and phenomenological studies. The remaining studies that were reviewed on full-text screening were excluded because the intervention did not qualify as housing with support (n=57), they did not focus exclusively on older people (n=5), or they were duplicates (n=6). The PRISMA flow diagram in Figure 2 illustrates the full screening process.

Following quality appraisal, all the included studies were found to be of moderate to high quality (all studies scored at least six out ten in our quality appraisal tool). The full results of the quality appraisal are available in Appendix I. Among the 39 included articles, there were covered 38 unique studies. These studies were conducted in the following countries: the United States of America (USA) (20), Canada (4), the United Kingdom (4), Sweden (4), Finland (2), Iceland (1), the Netherlands (1), Australia (1), and New Zealand (1). Study characteristics are provided in Appendix J and include country, housing model, study design, data collection method, dates of data collection, population age, number of participants, and proportion of males and females. The studies covered a range of models of housing with support, including assisted living, retirement communities, extra care housing, and continuing care retirement communities. While the specific aims of the studies varied, all studies focused broadly on drawing meaning from older people's experiences of housing with support.

The five overarching themes that were identified in our analysis – deciding to move, transition and adaptation, living independently, staying physically active, and social engagement – are described in detail below. The structure of our analytical themes is available in Appendix K, and our CERQual summary of findings table is available in Appendix L.

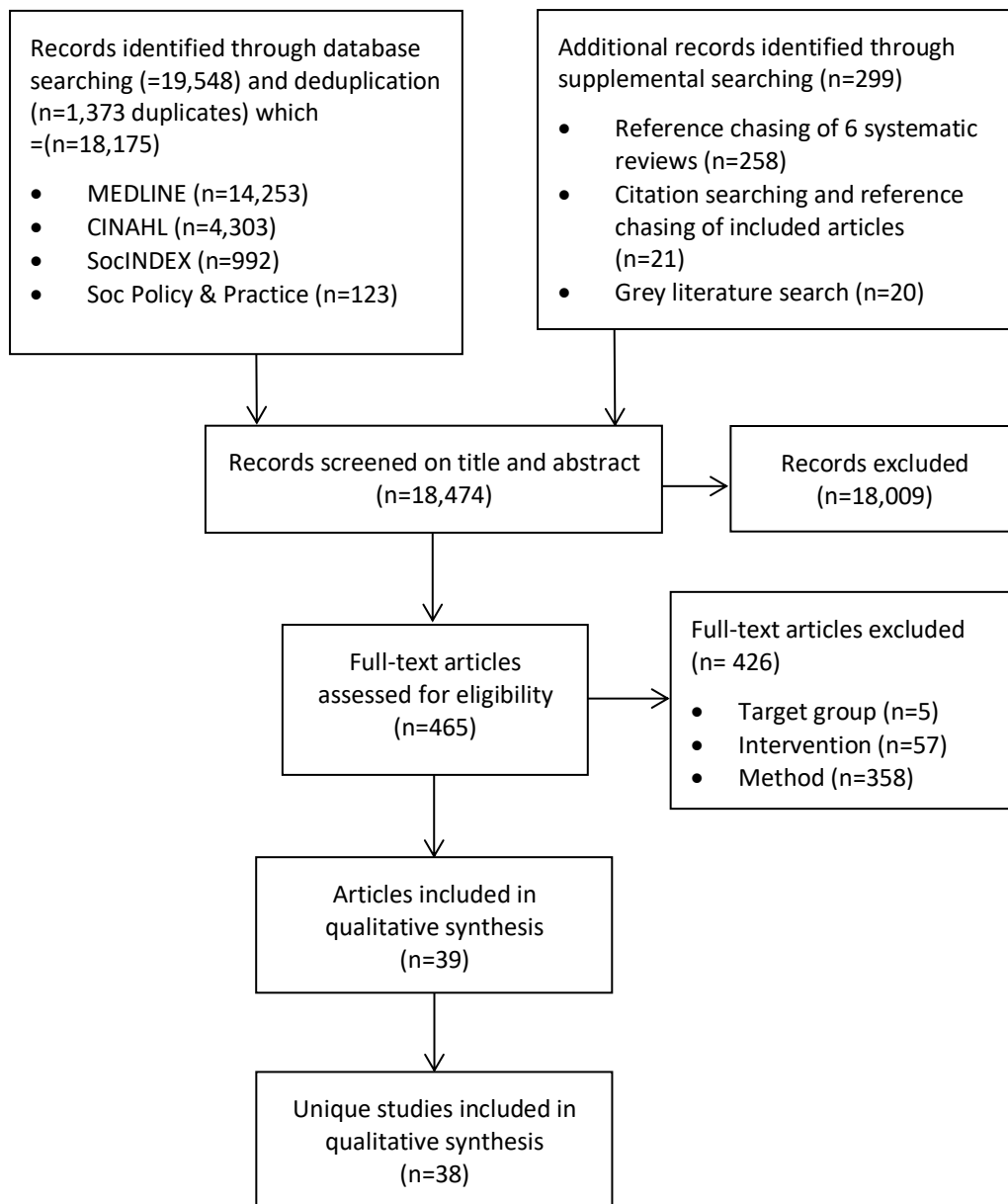


Figure 2: PRISMA flow diagram for the perceptions and experiences review

3.1 Deciding to move to housing with support

Older people described a variety of factors that motivated them to move to housing with support. These included loneliness and isolation, the burden of maintaining a home, the appeal of living in a more accessible neighbourhood, accessing support services, and not wanting to burden their children with their care. They also expressed varying degrees of ownership over the decision to move; some reported having been influenced by their children, whereas others conveyed a strong sense of agency.

3.1.1 Reasons for moving

3.1.1.1 Loneliness and isolation

Many older people chose to move to housing with support because they felt increasingly lonely and isolated.²³⁻³¹ They frequently described decreases in social interaction over time, and as a result they looked forward to the social opportunities that housing with support would provide.^{23 26 28-30} A woman living in senior housing in Finland said:^{24 p64}

Well...loneliness was the most important factor for me. I thought that loneliness wouldn't be a problem here, and it hasn't been.

Some who had previously lived in apartment complexes that were not purpose-built for older people felt that these buildings provided limited opportunities for socialising.²⁵ They also noted that the other tenants were typically younger, noisier, and employed.²⁵ A woman who moved to senior housing in Canada described it this way:^{25 p145}

I felt I was alone in those apartments. You just go in, you go out, there's no contact. You have to make your own entertainment and your own activities. I felt very isolated, just the four walls.²⁵

As a result, for some, joining a community of older people and the sense of belonging this would bring was the most important reason for making the move to housing with support.^{24 30} A woman who moved to senior housing in the USA said:^{30 p401}

My neighborhood was mostly young couples with children. I need companionship with others my own age.

Some also looked forward to the opportunity to change their own behaviour and habits by becoming more social, as with this woman who had recently moved to senior housing in Finland:^{24 p65}

I'm not the type of person who goes out and does things. I like to read, and if I'd moved into a block of apartments on my own that's probably what it would be like: me on the couch reading. So I have to make myself be more active. But living with like-minded people or people who have the same hobbies as me, there'll surely be groups that I can get involved with, that will make me get up and be active.

Many also sought to decrease their sense of isolation by moving closer to family.^{26-28 31-33} A woman living in senior housing in the USA explained that:^{28 p327}

I moved to the South because my daughter lives here...then I picked this town here because I've always liked it.

For some older people, loneliness following the death of their spouse led to the decision to move.^{25 26 29 30} This was particularly frequently reported among women.^{25 26} A woman in assisted living the USA described her experience as follows:^{26 p93}

I was just getting tired of living alone after my husband died. It is just not too much fun to be alone. Even though I had friends and I did play bridge once a week, that's still not the same. Your house gets very lonely when you don't have anyone in it. You know five rooms to keep, three bedrooms. So I just made a change.

3.1.1.2 Burden of maintaining a home

The burden of maintaining a home was frequently reported as a motivating factor for moving to housing with support.^{24 25-28 30 33 34} This was often a gradual process; older people realised over time that their home was no longer appropriate relative to their needs and abilities.²⁵ They cited heavy housework, yard work, routine maintenance, and structural repairs as significant burdens.^{24 25} An assisted living resident in the USA described this by saying:^{26 p93}

I was not able to, at my age, do all the yard work, repairs and things like that, it became a problem.

Some noted that the burden of maintaining a home combined with a health incident had led to their move. An older man in assisted living in the USA said:^{27 p29}

We talked about moving before I broke my hip. I couldn't do the work – snow and grass.

Older people found it particularly difficult to maintain their homes after losing their partners.²⁵ An older woman who moved to senior housing in Canada described this as follows:^{25 p149}

My husband was a gardener and he had a lot of fruit trees in the backyard, and I couldn't take care of them because I had no idea how to.

Other older people reported that the primary impetus for moving was the increasing cost of maintaining their homes.^{23 28 33} A woman living in senior housing in the USA explained:^{28 p326}

I was paying \$100 just to have the grass cut, and I said, 'Betty, you can't afford this...it's crazy to keep on with it.'

In Australia, a woman who moved to a retirement village expressed similar sentiments.^{33 p448}

And so then I thought here I am in this big house and it's all getting expensive because you've got to pay for a lot of help. It was beginning to need things, like fixing rusty gutters. So I looked around, and I found this place advertised.

Additionally, avoiding the cost of renovating a home was identified as a motivating factor for moving to housing with support.²⁴ This was described in terms of modernising a home and making it more accessible.²⁴ A man living in senior housing in Finland said:^{24 p59}

I won't have to renovate in the near future. Looking after your own house is hard work for old people. In our new apartment...even the curtain rails were already in place.

In terms of accessibility, older people noted that the presence of fall risks such as doorsteps, as well as the lack of a lift in their previous home, made purpose-built environments more appealing.²⁴

3.1.1.3 Neighbourhood accessibility

Neighbourhood accessibility also influenced older people's decisions to move to housing with support.^{24 28 30 35} An older man who moved to senior housing in Finland described the appeal of his new neighbourhood:^{24 p61}

The most important factor probably was that I knew the suburb of Hervanta to be a neighborhood of easy access...accessibility and being able to move around easily, they're important things.

Others focused on surrounding amenities when discussing their choice of neighbourhood.^{24 28 30} A woman who moved to senior housing in the USA said:^{28 p328}

I wanted to be some place I could walk. I love the idea of having little shops nearby. My son, when he has a free moment, we walk to Starbucks together and get coffee...that's what's so neat, is the neighborhood itself.

Another American woman in senior housing framed this in terms of giving up driving:^{28 p328}

I wanted to be close to a grocery store, close to a drug store, close to a post office...I didn't want to have to drive anymore but still be able to be part of it all. Here, I can walk there.

Older people also noted that they moved to urban areas so that they could access public transport.^{35 40}

3.1.1.4 Accessing support

Many older people reported that they moved to housing with support to access care and assistance. Some described sudden health events that led to their decision to move;^{26 27 29-31 34 36} these included falls, injuries, and major illnesses.²⁶ According to a woman who moved to assisted living in the United States of America (USA):^{27 p29}

My daughter brought me here because I needed supervision. I had fallen at home, and I laid there for two days.

Yet, older people also described cumulative increases in dependency marked by a gradual deterioration in health, decreases in mobility, and declining ability to perform self-care.^{24-26 30 31 36} Their “increasing awareness of their loss of self-reliance”^{25 p144} led to a realisation that they needed easier access to care and support services.^{24-26 30} In some cases, older people described having felt resigned to this. Moving to housing with support was an undesirable yet unavoidable outcome.^{36 37} However, others conveyed a sense of acceptance of their increasing care needs.^{24 26}

Among those who had moved to communities with access to higher levels of care either on-site or nearby, this was noted as having been an important factor in their choice.^{24 30} According to an older man living in senior housing in Finland:^{24 p65}

As we grew older and my wife became ill, we looked for an apartment located close to services. A nurse visits every fortnight. She is also in contact with the health center doctor...As we are getting older, it is likely we will need daily assistance in the near future. We hope to be able to get that help here...in the assisted living unit next to us.

As this quote indicates, older people reported that their spouse’s increasing care needs resulted in a move to housing with support.^{24 29 30 36} Some also said that they had chosen to move out of housing with support after their spouse passed away, but subsequently returned to housing with support when they no longer felt they could live in their home by themselves.³⁸

Older people also reported that they looked forward to accessing on-site services while still being able to live independently.³⁰

3.1.1.5 Reducing burden on children

Older people frequently reported that they moved to housing with support because they did not want to burden their children.^{25-27 29 36} A woman in assisted living in the USA said:^{26 p95}

My daughters both asked me to live with them when my husband died. But, I don’t want to do that. I think it changes their lives too much. This way is better. Be close to them, but not live with them.

Another older woman who moved to assisted living in the USA described her own experience of living with her mother-in-law as a factor in her decision:^{26 p95}

We lived with my mother-in-law. We had two bundles of family. And, I would not want to do that to my kids.

3.1.2 Ownership of the decision

Older people’s experiences varied in terms of their degree of ownership over the decision to move to housing with support. In many cases, their children played a pivotal role, while others felt that they had made the decision independently.

3.1.2.1 Influence of children

Many older people reported that their children had been instrumental in their move to housing with support.^{23 26-30 35 37} Some felt that they had been encouraged by their children,^{26 35} while others said that their children had made the decision for them.^{26 37}

A resident of a retirement community in Iceland who felt encouraged by their children illustrated this by saying:^{35 p5}

This was a big change, but it just felt good to get it done. It was especially the children who were the driving force in all this change.

Older people also reported that they moved to appease their children.^{27 30} A woman living in senior housing in the USA said:^{30 p401}

I moved to be nearer four of my five children. They've been needling me for two years to come up here. I miss Florida. I miss my condo. I miss my friends. But, I love my kids most of all.

Others moved to allay their children's fears, as described by another woman living in senior housing in the USA:^{30 p401}

My children wanted me to move because they worry about me. They fear I'll die and won't be found.

Conversely, some older people felt disempowered by their family's involvement, and reported that their children had made the decision for them.^{26 37} According to an assisted living resident in the USA:^{26 p98}

My son helped me sell my home when I was in the nursing home for four months after my hip replacement. He said I could not stay at home alone and nobody could be home with me...so I moved here.

Another assisted living resident in the USA had moved directly from the hospital to assisted living, and felt that her daughter had made the choice for her:^{26 p96}

I left the hospital and went straight to an assisted living facility. My daughter just paid them \$500 and I moved in at 6 o'clock.

3.1.2.2 Individual agency

Older people also reported that they had decided independently to move to housing with support.^{23 24 26 28 29 33 36 37 39} This was marked by pragmatism, a desire to maintain autonomy, and a sense of empowerment in making the decision for themselves.

3.1.2.2.1 Pragmatism

Some described having taken a pragmatic approach to making the decision to move to housing with support.^{24 26 28 29 39} According to an older person who moved to assisted living in the USA:^{26 p95}

When my husband passed away, I called my daughter and asked her to come and pick me up. She came and stayed for a week. I went home with her and stayed there for two months. We get along all right. I was content living that way. But, when life falls apart you have to do something about it.

Another resident of assisted living in the USA described being pragmatic in accepting the advice of her children:^{27 p29}

I had to school myself to accept it, and I said to myself, 'You know that they are right. Don't carry on about it'.

A sense of pragmatism was also evident among older people who moved to housing with support in anticipation of their future care needs.^{24 26 28 29 39} They proactively chose to relocate before their care needs and their day-to-day functioning changed, in the hope of facilitating ageing in place.^{24 28} A resident of assisted living in the USA described this by saying:^{26 p98}

I moved here to have somebody close by in case I needed assistance. I don't need assistance now but I might someday.

Some also felt that moving to housing with support could ease an eventual transition to a nursing home, as with this American resident of assisted living:^{26 p95}

I thought if I came here and if I got worse, I would then make a decision to move into a nursing home. It would be a lot easier to come from a place like assisted living to a nursing home (silent). I hope I would never have to go to a nursing home you know. We all hope for that I guess (chuckle).

3.1.2.2.1 Maintaining autonomy

Older people also described moving to assisted living in order to maintain their autonomy.^{25 26 29 33} An older person in assisted living in the USA expressed this by saying:^{26 p96}

I am a little bit of an independent person and I hate to be a responsibility of anyone. So that played a part in deciding that I was going to sell my house.

Similarly, another American assisted living resident said:^{26 p96}

I could have stayed at my home that I own. But I had made a decision when I became 90, I would quit driving. I am not going to depend on my friends to take me to places.

Others chose to move while they could still decide for themselves.^{29 33} According to a woman in the USA who was preparing to move to assisted living:^{29 p4}

I'm in my late 80s. And...maybe I ought to reconstruct my life a little bit before something happens and someone has to do it for me.

A woman in Australia who had decided to move to a retirement village echoed these sentiments:^{33 p448}

See, that's why I want to do it now. A lot of people wait so long that the decision's taken out of their hands. And then it's not a voluntary decision.

3.1.2.2.2 Empowered choice

Many older people took pride in their ability to actively assert their power over their own lives by making the decision to move.^{23 26 28 36} Some noted that despite encouragement from their children, they still owned the decision, as with this woman who moved to senior housing in the USA:^{28 p326}

My son and his wife sent me all these folders with information, but...come on...it was my decision to make!

Others said that visiting friends who already lived in housing with support empowered them to make the move. A resident of assisting living in the USA said:^{26 p95}

My friend invited me over for dinner and that's all it took. I said 'Hey I could live here' and so the next day I went down and plopped my down payment!

Another American assisted living resident expressed a similar sense of spontaneity and independence in her decision to move following a visit with a friend:^{26 p94}

A friend invited me to visit her and that's when I found out what it was like and I said 'Ah, this is for me!' And that's when I made up my mind, right then and there. I put my house on the market the next day.²⁶

These women's experiences illustrate the powerful role that peer influence can play in motivating a move to housing with support. Indeed, older people have also noted that positive feedback from family and friends "validated their decisions and strengthened their resolve to move."^{28 p326}

Notably, Leith (2006) reported that older women living in senior housing in the USA felt that being able to control the decision to move contributed to a sense of both comfort and adventure in their search for a new home.²⁸

3.2 Transition and adaptation

The move to housing with support was often an emotionally wrought process for older people. Many described nostalgia for their previous home and previous life after moving in, yet they identified several important factors that enabled them to adapt to their new home. These included maintaining autonomy, keeping routines and staying busy, moving within the same neighbourhood, accepting the reality of ageing and death, letting go of the past, and embracing change. Many older people expressed acceptance of and appreciation for their new community and ultimately described feeling content and at home in housing with support.

3.2.1 Moving to housing with support

Moving to housing with support comprised choosing a community, the process of moving itself, and personalising the new home. Notably, in some cases, older people moved directly from hospital and were not able to take part in any aspect of moving.

3.2.1.1 Choosing a community

Many older people relied on advice from family and friends in their search for a new home.²⁸ Some reported having explored many options, as with this resident of senior housing in Canada:^{32 p119}

I had seen more than twenty residences before I visited this one. As soon as I stepped into this place, I knew I wanted to get an apartment here.

In a retirement village in Australia, older people reported that exploring their options had helped ease the transition to living in their new home.³³ In contrast, a woman who had not been able to explore alternatives worried that she and her husband had made the wrong decision:^{33 p450}

We perhaps didn't look closely enough, and didn't realise that a big village like this...well it may have been the wrong move to come here.

Among those who chose a community in their original neighbourhood, familiarity was a key factor, in terms of both social connections and the neighbourhood as a whole.^{30 32 40}

3.2.1.2 The emotional impact of moving

The process of moving and downsizing was physically and emotionally challenging for many older people.^{25 27-30 33 36} An older woman in the USA who moved to senior housing expressed her attachment to her belongings:^{30 p403}

I was attached to my possessions. I had taken care of the antiques given to me by my grandparents.

Deciding what to keep and what to give away was often described as a painful process.^{25 30 33} A woman who moved to senior housing in Canada expressed this:^{25 p144}

I had a lot of things in bags that I didn't know what to do with, and I had a friend who delivers things to poor families, so I'd say to [daughter], 'This bag is for [friend] and this one is for a garage sale...' I'd just lie on the bed crying and tell her what to do.

Indeed, for some the process was traumatic, as with this woman who had moved to a retirement village in Australia:^{33 p449}

Making the decision was all right but putting it into action was the traumatic part...having to clean out the living cupboard and clean out the children's bedrooms.

Other older people conveyed a pragmatic approach to sorting through their possessions. A woman who moved to senior housing in the USA expressed this by saying:^{28 p328}

Well now, I really love my books...I had lots of books, but when I was moving, I picked them up, one by one, and thought, 'Well, would I like to read that one more time?' and that way, I ended up sorting them and then gave most of them away.

Older people also reported that preparation helped ease the moving process.³³ A woman who moved to a retirement village in Australia described it this way:^{33 p450}

Well, before we came here, of course we drew a plan of the place and measured all our furniture and worked out what would fit in and where it would go. There were certain things that we would keep, definitely. I mean, like that's a family historic piece and there's various family history things around the place but the ones that we couldn't bring, we then spread out around the family.

Those who were able to give their belongings to friends and family found comfort in this.^{27 29} A woman who moved to assisted living in the USA had been unsuccessful in her attempts to sell her art and antiques, and smiled when she said, "you were not going to get anything for them."^{29 p5} Instead, she found satisfaction in selecting specific items that each of her children and grandchildren would like and in having friends come by to choose things that they liked.²⁹ Similarly, another American woman in assisted living described the satisfaction she derived from giving her items to loved ones:^{29 p5}

I loved downsizing...I loved seeing my things in my children's homes.

Some older people expressed strong emotional ties to their possessions while acknowledging that "many of these things represented ties that could hold them back in their efforts to re-adjust".^{28 p328} This led to a realisation that their physical belongings were not crucial to their sense of feeling at home, and as a result they were more easily able to let go of them.²⁸

Older people also continued to re-evaluate their belongings after the move, paring them down to only their most cherished items.^{28 30} A woman living in senior housing in the USA described this:^{28 p328}

I have this grandfather clock...at the time I thought I could never part with it...but now...I look at it now, and I think, 'Ugh...Lord.' Now, I am ready to get rid of it.

As one would expect, attachment to the previous home and to the memories held within it was especially strong for those who had lived in the same house for a long time.^{25 33} A woman who moved to senior housing in Canada gave this evocative description:^{25 p148}

Well, what made it so difficult was closing up. I had four bedrooms, and there was vacancy there...to empty a house you lived in for 20 years. It was the emotional ups and downs we had, and all the happiness, and so that was a heartbreak and you leave a bit of yourself there. It's only a structure, but what we did in those walls meant a lot to me.

In some cases, older people reported that they had moved directly from hospital to housing with support and were not able to participate in the move at all.^{26 29 30 39} These older people often felt regret that they could not choose what to keep and expressed sadness at the loss of their belongings.²⁹ Furniture and art pieces had been left behind in some cases, which an American resident of assisted living illustrated:^{29 p5}

A lot of stuff got left behind, a lot of stuff I'd like to look at...but it's gone now...went to the thrift shop.

Others felt grateful for their children's assistance with the move, but still mourned the loss of their belongings.²⁹ A woman who had expressed gratitude towards her daughter also said:^{29 p5}

I had a beautiful china closet with beautiful things in it, but I didn't get any of it, I don't know where it went.

An older woman who lived in senior housing in the USA wished that she, rather than her son, could have chosen which belongings to keep:^{30 p403}

Now there are things I know I could have brought with me, but it's too late now. He packed, but he didn't pick what I would have.

Yet, some who moved directly from hospital saw it in a positive light. A woman in assisted living in Finland saw her move from hospital as a success story of being lucky enough to attain residency.³⁹ She said:^{39 p61}

I'd never thought of it...but sometimes it did occur that I had four rooms and a kitchen, and that, with that, all that climbing the stairs and everything, that I should start looking, but I don't remember thinking of this place. But now, now I'm really pleased that I got here.

3.2.1.3 Personalising the new home

Older people frequently highlighted the importance of being able to personalise their new home.^{25 27 28 41} This included family photos, family heirlooms, paintings, and treasured trinkets.^{33 41} A woman living in a retirement village in Australia expressed the importance of her possessions:^{33 p449}

They're the things that are specific to you. They give you your identity...the things you've chosen over the years that you love.

These objects played a pivotal role in the older person's ability to adjust to housing with support.²⁷ According to a woman who moved to assisted living in the USA:^{27 p30}

The pieces I wanted were brought up here. I knew everything would fit. So my apartment I am happy with. It is, to me, very attractive and has my own favorite things. It meant sorting out and getting rid of a lot and saving some that I did not have the heart to get rid of. But anyway, my apartment is very pretty and that has a lot to do with me being happy here.

Additionally, some residents of newly built communities had been given the opportunity make interior design choices.⁴² These included kitchen cabinet colours, kitchen worktop material, and paint colours.⁴² Additionally, some residents of newly built communities had been given the opportunity make interior design choices.⁴² These included kitchen cabinet colours, kitchen worktop material, and paint colours.⁴²

3.2.2 Nostalgia for previous life

Among older people who were not able to remain in their original neighbourhood, many expressed nostalgia for their previous life.^{25 27 30 33 36} They missed their communities and churches,³⁰ and many described missing their friends.³⁶ A woman living in senior housing in the USA described this by saying:^{30 p403}

It was hard to leave the neighborhood where I lived, my life, my friends.

The need to build a new community was challenging for some older people, as described by a woman in senior housing in Canada:^{25 p143}

I knew all my neighbours, and while we didn't run back and forth all the time, there was a friendliness there...when I started looking for another place...I ended up where I didn't know anybody from that area and it got very lonely.

Letting go of the past was particularly difficult for those who had been in their original homes for a long time and for those who were relocating on their own.³³ Yet, some older people retained a sense of pragmatism, as with another woman in senior housing in Canada:^{25 p147}

I wouldn't want to have to do it all over again. No, I'd still want my own home. But that's not possible so you just make do with what you have.

3.2.3 Adapting to housing with support

The time that it took for older people to adapt to their new home and life varied. For some, the adjustment period was as short as a week, while others described it taking many months.^{27 29 36} Older people described several key factors that eased the adjustment to housing with support, along with the challenges they faced.

3.2.3.1 Autonomy and adaptation

Older people who felt they had ownership over their decision to move tended to describe settling in to housing with support as a positive experience.^{28 29 33 36} Walker and McNamara (2013) found that among residents of a retirement village in Australia, “exercising agency through making decisions, either about the process itself or around modifying the physical space, was essential.”^{33 p449} Older people also reported that staying in control of their daily activities helped them adjust to living in their new home.²⁹ An older man in Sweden who had chosen to move to senior housing of his own accord said:^{36 p13}

I am very pleased with my living arrangements...I have a model apartment and the staff are wonderful.

Moreover, those who felt ownership over the decision and felt that they had chosen the right community tended to see its qualities in a positive light, thereby confirming that they had in fact made the right decision.²⁸ Conversely, older people who did not have autonomy over the decision to move often found it more difficult to adjust.^{23 37}

A woman who lived in a retirement village in New Zealand described the influence of autonomy succinctly:^{23 p27}

Your social experiences depend on what drove you here.

3.2.3.2 The benefits of routines and keeping busy

Some older people also reported that maintaining routines and keeping busy helped to ease their transition.^{33 43} A woman who moved to a retirement village in Australia said:^{33 p449}

When I first came here and I was on my own it was a little bit sort of, distressing...it took a while to adjust. I had to gain the confidence and carry on as normal...just keep occupied. Get to meet the people.

Engaging in new activities and keeping busy was especially important for older people who did not feel that they had ownership over the decision to move.³³

3.2.3.3 The benefits of a familiar neighbourhood

Older people who moved within their original neighbourhood highlighted the benefits of living in their “comfort zone”.^{33 p449} In particular, they valued being able to see the same GP, go to the same shops, and attend the same church as before.³³ Notably, in a senior housing community in Iceland, older women who had not been able to move within their original neighbourhood wished that they could have.⁴⁰

3.2.3.4 Ageing and death in housing with support

The process of transitioning to housing with support was marked by the ever presence of ageing and death.^{27 29 34 44-46} A man living in extra care housing in the United Kingdom (UK) described his recognition of his own ageing:^{45 p7}

You know the old tripe they used to have hanging in the butchers shops? My arm drops like that...My legs are skinny...deterioration I suppose, lack of activity. I’m getting older.

A resident of a housing with support community in the Netherlands described the challenge of seeing fellow residents age:^{46 p15}

You can see people...that were fresh and cheerful half a year ago and now...have Alzheimer’s written on their chest.

Some found it difficult to adjust to the increased presence of death in a community of only older people.⁴⁴ They noted that the removal of bodies, death notices, memorial services, and a communal sense of grief when a resident passed away were all reminders of their own mortality.⁴⁴

However, some older people accepted the reality of death,^{29 44} as with this resident of assisted living in the USA:^{44 p9}

You have to realize that death is part of living, or it's part of life, anyway you want to put it, and I think you will be much better off if you can accept it, you know.

Some also hoped that their new home would be their last stop. A resident of assisted living in the USA lightheartedly described this by saying he wanted to leave "feet first".^{44 p9} Another said:^{44 p9}

I moved in, they take care of me, and I'll die.

3.2.3.5 Letting go of the past

Many older people also took a pragmatic approach to letting go of their previous home and life.^{28 36 37 39 45} They "neither denied the value of their previous home nor romanticised it with nostalgia, but acknowledged that there was a proper time for everything".^{39 p61} A resident of senior housing in Sweden described this by saying:^{36 p13}

I am now so old that this is the best for me but my home was my home and I will never get that back so I have to live my life here. I have to make the best of the situation.

A woman in senior housing in the USA expressed similar sentiments:^{28 p327}

I got over here and the first night, I laid down in bed, and I just...you know...I said, 'Well, I'm here, and I'm going to make the most of it.'

Additionally, a man who moved to extra care housing in the UK said:^{45 p9}

You've got to try and do the best you can with what you've got...You've got to look at your life and you say I'm going to make the best of that. And you do.

Pragmatism was also evident among some of those who had not had control over the decision to move, as a woman in extra care housing in Sweden expressed:^{37 p7}

But seeing as I didn't have a choice and I was forced to move, this is the best imaginable. This was the only place available. We had to take it, and we did so with light hearts, so that we got somewhere to stay.

Older people who described themselves as flexible, adaptable, and easy-going felt that these qualities had made the transition easier for them.^{23 28} They felt that dwelling on the past was counterproductive, and they deliberately thought of their new community as their home and took steps to turn it into just that.²⁸ According to a woman in senior housing in the USA:^{28 p327}

The more you go along with it, the happier you are.

3.2.3.6 Embracing change

Older people who viewed their move to housing with support as an opportunity rather than a loss reported a smoother transition.^{27 28 30 33} A resident of assisted living described this by saying:^{27 p30}

It is a matter of attitude. If you decide that it is an adventure, the next stage in life, then you accept it and go on from there.

Similarly, a woman who moved to assisted living in the USA said:^{30 p403}

I've adjusted to transitions all of my life. I'm good at it. I enjoy every step.

Additionally, two women in senior housing in the USA evocatively expressed the value of embracing change.^{28 p327}

Saint Paul said that wherever he was, he could make himself content...I hope I can do that too, and I will surely try!

No matter where I go I would try to make it a home for myself...try to acclimate to the conditions...I mean you could move into a barn and make it a home...I feel content here.

These women's descriptions illustrate how those who had a positive outlook also tended to proactively focus on feeling at home in their new environment.²⁸ They felt that they themselves

controlled whether or not they felt at home, and therefore they engaged in activities and socialising to facilitate the transition to their new homes.²⁸

3.2.3.7 Challenges to adaptation

Older people also described specific challenges to adaptation. For some, adjusting to a smaller living space was difficult.^{25 28} Additionally, some of those who had sold their home and were tenants in housing with support found it difficult to get used to paying rent.²⁷ Although they appreciated not needing to pay to keep up their home, they said that making monthly payments for rent and for individual services and personal assistance was an adjustment, even when it was affordable.²⁷

In terms of the initial arrival to housing with support, a woman from Sweden felt that the first staff member she met had been cold and unpleasant, which had influenced her ability to adjust.^{36 p13}

It was so distressing to leave my home, that I could not even turn around and wave to my friends...and then I was met by a person who did not introduce herself, just asked my name and gave me the safety alarm and told me that from now on I had to wear it always around my neck. I could feel my spirit sink and wondered what kind of place this was and what it would be like living here...it has been haunting me ever since.

Other older people reported that they had not anticipated the loss of privacy that came with living near so many others, particularly in communal spaces.^{26 30} However, on balance, many felt that the social opportunities that this provided outweighed the loss of privacy.²⁶

Some older people also described feeling resigned to living in housing with support,²⁹ while others hoped to return to their original home.³⁴ A woman in the USA had continued to pay rent for her apartment and hoped to return, by saying that:^{34 p19}

Most people expect to live out their lives in this place...I don't want to do that...This is not what a kind, compassionate heavenly Father wants for his children.

3.2.3.8 Acceptance and appreciation

Despite these challenges, many older people reported that they felt at home in housing with support.^{24 26 29 31 32 34 36} According to a resident of assisted living in the USA:^{27 p29}

I didn't want to leave my home, but when I go back, it is not my home anymore. When I come back here, I am just as happy to turn the key in my door as I was back home.

Likewise, a resident of senior housing in Canada said:^{32 p120}

Things couldn't be better here, it is home.

Some noted that they appreciated the building itself, particularly in terms of modernity and cleanliness.^{24 26 31 32 36} According to a resident of senior housing in Canada:^{32 p119}

Everything here is beautifully arranged and they serve our needs well...I truly appreciate this place.

Many older people valued the sense of safety and security that living in housing with support provided.^{24 25 31 34 47} This was particularly important for older people who lived in neighbourhoods with relatively higher crime rates.⁴⁷

Importantly, older people reported that their appreciation for their new circumstances grew over time.^{25 36}

3.3 Living independently

Older people primarily conceptualised living independently in housing with support as asserting and maintaining their autonomy alongside increasing care needs. Additionally, they highlighted specific activities, including keeping up their own hobbies and shopping for themselves, that represent important aspects of living independently.

3.3.1 Asserting independence

Many older people expressed a strong sense of independence.^{24 28 29 33 34 48} According to a woman living in senior housing in the USA:^{28 p329}

I just feel like...well...this is mine! Ain't nobody else got no business in here unless I let them in! If I want to sit here and read, or watch television...or whatever...by myself...I can!

Another woman in the same community echoed these sentiments:^{28 p329}

I can do what I want to...I can eat when I want to...I can sleep when I want to...I could get up early and meet some of the others, but if I didn't want to, I didn't have to...it's a feeling of...especially at our age...to be independent.

A similar sense of the importance of having control over one's own life was expressed by a woman in a retirement village in Australia:^{33 p449}

I've heard people say they wouldn't go into a village because they're too controlled. I don't feel that at all. Nobody's controlling us.

Additionally, a man in Finland highlighted the importance of access to life outside of his senior housing community to his sense of independence:^{24 p61}

The best thing is that there are services and all sorts of activities, but you don't have to participate in anything. I mean you can just live normally. All your hobbies could be outside this building if you wanted.

For some, the classification of their community as 'independent living' was integral to their identity and sense of autonomy,^{43 48} as with this resident in the USA:^{48 p8}

The name says it...independent living...I am independent and not a burden on anyone.

3.3.2 Balancing independence and dependence

3.3.2.1 The impact of increasing dependency

Older people described becoming increasingly aware of their dependency while living in housing with support.^{27 29 43 45} A woman in assisted living in the USA expressed this by saying:^{29 p6}

Physically, you know, I can tell the difference. I'm certainly not getting any better, I know that...and it's getting difficult for me to walk, you know. I am more wobbly than I was before...don't expect I will ever get better, but...I'm very fortunate to even be here.

Some struggled with acknowledging their needs and seeking help.²⁷ A woman in extra care housing in the UK described her experience of this in detail:^{45 p7}

I have health issues which are a little bit personal, and I don't know that I can handle at the moment...somebody doing what I might need help with...I would rather struggle on. Now that might sound like pride, it's not, it's embarrassment...So I'm at a bit of a crossroads I think. I would like not to have to change anything because I fiercely want to keep my independence...But I feel worried about that, if I am going to deteriorate any more and I do need some help, erm, coming to terms with having what feels a little bit invasive.

In one case, an older man's declining abilities influenced his perception of his home.⁴⁵ He reported that initially, he had felt content and settled in his apartment in extra care housing. However, as his health declined and his mobility decreased, he began to feel confined:^{45 p7}

I love this place and I love the garden and I love the flat, but you're in between the same four walls, day in day out, 24/7 and it's...I go nowhere, I can't go nowhere you see.

For those who were more mobile, making decisions about which activities to engage in helped them retain a sense of independence despite declining health.^{27 29}

3.3.2.2 Satisfaction with support

Many older people expressed satisfaction with the support services they received.^{24 26 29 31 32 36 45} In particular, they noted that having staff on call gave them a sense of security.^{29 31 36} According to a man living in extra care housing in the UK:^{31 p6}

The carers are marvellous, and they're on call 24 hours a day. I wouldn't change them for the world, they're marvellous...and the managers they do a very good job.

A woman who also lived in extra care housing in the UK expressed similar sentiments when describing her sense of security from staff support:^{31 p11}

You've got no worries. It's so secure and that's what I think everybody's so thrilled about.

Additionally, a resident of assisted living in the USA said:^{26 p98}

I can feel the independence, yet they are close by.

3.3.2.3 Resistance to relocation within the community

In communities with multiple levels of care, many older people expressed a strong desire to avoid the need to move within their community.^{23 29 43 49 50} A woman in the independent living section of a retirement community in the USA said:^{43 p7}

Well, I think all of us want to feel independent here. We try to avoid having to go [to the nursing home] as long as we possibly can.

Residents frequently referred to on-site nursing homes as "the other side"^{49 p280} and "hell on earth".^{29 p6} Older people feared the isolation, exclusion, and stigma that they associated with higher levels of care.²³

Moreover, residents in a retirement village in New Zealand reported frustration with not being able to access certain support services unless they moved to a high level of care.²³ This included personal care, housekeeping, and medication support. Many participants felt that they had been misled when they purchased their apartments in the independent living section of the community. They reported that independent living had been marketed as 'continuing care', which led them to believe that they would receive care while living there. A male resident said:^{23 p29}

If the sales management made this clear, people wouldn't want to come. It goes back to the core business of the owners. First and foremost, this is about real estate, second, it's about care. But the care is the thing they hang it on.

This was particularly problematic for married couples with differing care needs. If one spouse's health declined and they needed more support, the couple had to either live in and thus pay for separate apartments or move together to the nursing home. As a result, couples remained in the independent living section of the community for as long as possible, forgoing needed care.²³

3.3.3 Independent activities

Older people in housing with support highlighted the importance of being able to engage in their own hobbies and shop for themselves, and both activities represent integral aspects of living independently.

3.3.3.1 Valuing hobbies

Many older people reported that being able to maintain their own hobbies while living in housing with support was important to their quality of life.^{24 28 30 32 33 36 41 45 51} In particular, they noted reading, as well as doing puzzles, needlework, and genealogy.^{28 30 41 45 51} A woman in senior housing in the USA said:^{30 p403}

As long as I have a good book and visitors, I'm happy. It's an escape.

Similarly, a woman in the same community conveyed pride in her genealogy work:^{30 p403}

I keep busy. I do genealogy complete with pictures for each son. It's been 20 years' worth of work.

Some also described having taken on new hobbies while living in housing with support.^{32 33} According to a woman in senior housing in Canada:^{32 p120}

I'm a hobby gal, since I've come here I've been making greeting cards more.

3.3.3.2 Shopping independently

Older people's ability to shop for themselves also enabled independent living in housing with support communities.^{28 33 40} A woman in a retirement community in Iceland described this by saying:^{40 p556}

I just found it very nice moving here. There was a store close by, and I just went there and did not need any help...that meant I could go to the store sometimes more than once a day.

Similarly, a woman in senior housing in the USA said:^{28 p328}

I love...having little shops nearby.

In contrast, those who left urban areas in order to move to housing with support missed being able to shop for themselves.²⁷

3.4 Staying physically active

Older people described several factors that influenced their level of engagement in physical activity. These included: individual preferences and habits; access to physical activities and physical therapy; access to a gym on-site; outdoor accessibility; care responsibilities; and the culture of physical activity in the community.

3.4.1 Individual preferences and habits

3.4.1.1 Influence of former lifestyle

Previous habits and former lifestyle played a pivotal role in physical activity among older people. Those who had been active before often remained so when they moved to housing with support.³⁵ As an Icelandic woman explained:³⁵ p6

I have always done some walking, especially after I retired...then I walked a lot.

Likewise, many of those who said they were less physically active in housing with support also reported not having been very active previously. An older woman in Iceland said:⁴⁰ p557

I have just never done it, have never been in any kind of physical exercise.

3.4.1.2 Self-efficacy

Self-efficacy was identified as an important facilitator for physical activity.⁴⁰ A woman in a retirement community in Iceland said:⁴⁰ p557

I am also not afraid of just going out and doing...I can be outside for up to an hour. I can do that without a problem.

Notably, and quite understandably, some older people who had experienced falls lacked self-efficacy regarding physical activity, as described by these two Icelandic women: ⁴⁰ p558; ³⁵ p5

I fell, and I haven't gotten around since then...I have less courage.

[I am] petrified, it really gets to you.

3.4.1.3 Benefits of structured daily life

Some older people reported that having a structured daily life and a diligent routine helped them maintain physical activity.³⁵ According to a woman living in a retirement community in Iceland:³⁵ p5

I have kind of a program, which comes in handy...I go downstairs for lunch and then I go outside for a walk.

In contrast, those without a routine found it more difficult to motivate themselves to be physically active.³⁵ Another woman in Iceland said:³⁵ p5

At night when I go to sleep I think, 'I need to go to the swimming pool'...then the day passes and then it's evening and you just sit there. I have no drive.

3.4.1.4 Motivation for physical activity

Motivation to engage in physical activity varied among older people. Some were highly motivated, as with this Icelandic woman in a retirement community:⁴⁰ p557

I find it fun, but it is also to get fresh air, oxygen...I really enjoy that. I feel so much better afterwards.

Others struggled, as another woman in Iceland explained:⁴⁰ p557

I don't move around very much...[inactivity is] like a spider web that you can't get out of if you've gotten stuck in it.

Moreover, those who were very physically active often reported having encouraging family members.⁴⁰ An Icelandic woman described her daughter's support by saying:^{40 p557}

She encourages me to go out and be independent.

3.4.1.5 Sociability

Older people who considered themselves to be sociable preferred to engage in physical activity in company.⁴⁰ For them, even simple activities such as group walks in the neighbourhood were an important form of exercise.⁴⁰

Those who said they were less social also said they were not as physically active.⁴⁰ Moreover, the death of a spouse was described as resulting in social withdrawal and decreased physical activity.³⁵

3.4.2 Access to physical activities and physical therapy

Opinions varied among older people regarding physical activities in housing with support. Some were very positive, as with this resident of senior housing in Canada:^{32 p120}

We like the activity programs very much. It's five times a week. We gained a lot of knowledge on how to keep active and be healthy.

Others believed the activities did not meet their needs, as one woman in senior housing in Finland explained:^{24 p66}

I think activities are aimed at those in poor health, so I think they don't quite meet the needs of the residents. Why should people start going to 'chair exercise classes' when they retire? It's hard for me to understand.

Yet some who were keen to exercise in groups found it difficult to keep up and take part, as an Icelandic woman explained:^{35 p6}

It is more fun doing exercises with others. [But] I think, I'm not fit for this...hard to take part in a group when you can't do the exercises like the others.

Another woman in a retirement community in Iceland expressed similar sentiments:^{40 p558}

They [physical educators] come here, but I can't handle it because of my back...I have gone to the pool, but I don't think that it is good for me.

Some described the benefits of having access to physical therapy on-site, as with this Icelandic woman:^{40 p557}

I often go out here in the hallways to walk, and I go over the exercises that my physical therapist has me do.

3.4.3 Access to gyms

Older people frequently described valuing access to a gym on-site in housing with support.^{24 35 40} A man in senior housing in Sweden said:^{36 p14}

Since I came here I have improved considerably. I started on the exercise bicycle and with balls. I have decided to continue because of the wonderful results...I feel both physically and mentally in balance.

Access to indoor exercise facilities was considered especially important when the weather was poor.⁴⁰ Additionally, older people living in housing with support without a gym wished they had one.⁴⁰

3.4.4 Outdoor accessibility

Both the design of housing and the outside environment seemed to influence how active older people were.³⁵ Many older people spoke of how they enjoyed walking outdoors and getting fresh air.³⁵ In relation to this, the importance of non-slippery footpaths was mentioned by several women living in a retirement community in Iceland.³⁵

According to one woman:^{35 p5}

It is so nice when the pavements are non-slippery; it is just unbelievable how much better it is.

Benches along footpaths were also noted as important for allowing older people to rest.³⁵ Older people also reported preferring flat surfaces with few hills or slopes.⁴⁰ A woman in Iceland expressed this by saying:^{40 p557}

I am so tired of the hills here just near the building. It takes a lot of effort to walk when you have a walker.

Additionally, among older people who had moved to housing with support within their original community, some felt that familiarity with their surroundings encouraged physical activity.³⁵ Whereas some of those who had moved to housing with support outside of their original community reported exercising less, as with this Icelandic woman:^{40 p557}

It was just very nice there; we went out every day and walked a lot, but here I go out very little.

3.4.5 Care responsibilities

Caring for a spouse also limited some older people's opportunities for physical activity.⁴⁰ A woman in senior housing in Iceland whose husband was less able described her experience of this in detail:^{40 p558}

When you are used to doing everything together, you are lazier about getting out on your own...I am, of course, a bit bound because of this, [I] think about not being gone too long...of course, something can always happen, he is so unstable you see, could fall...If he had an emergency or something...it would be terrible to not be available...It's just guilt, isn't it? It is quite possible [to go out for walks] if you are decisive enough about it. Maybe I'm too complacent. You just let others decide for you.

This woman's perspective demonstrates the complex interplay between external factors that inhibit physical activity and individual motivation.

3.4.6 Culture of physical activity

Older people's descriptions of the culture of physical activity in their communities are indicative of the role that culture plays in the level of physical activity among individuals.³⁵ In Iceland, an older woman felt that staff in her retirement community did not motivate residents to be physically active.^{40 p558}

We get no encouragement.

In another retirement community in Iceland, a woman reported a strong culture of physical activity among residents:^{40 p557}

In the summer, we just go and exercise with a special exercise program on the radio. Though I've done it for years at home, it's very clever to meet up in the dining area. There are a few of us who go together sometimes.

3.5 Social engagement

Older people provided rich descriptions of their social worlds in housing with support communities. They highlighted the importance of proximity to family and friends in their previous community, as well as the social opportunities in housing with support that allowed them to form new friendships. Some also said that romantic relationships had developed. Older people also identified several challenges to socialising in housing with support, including personal challenges, social cliques, stigma against the less able, and language barriers. However, despite these challenges, many described a strong sense of mutual support in their communities.

3.5.1 Benefits of proximity to family and friends

Proximity to family and friends allowed older people to maintain their previous relationships after they moved to housing with support.^{23 25 27 28 30-33 41 52} In some cases, older people preferred the company of their relatives and relied primarily on family for social interaction.^{30 41} An older man living in a retirement village in Australia described the importance of living near his family:^{33 p449}

The thing that really...made this attractive was the fact that our daughter and her husband lived just up around the corner and they had three young kids, two of which went to school just around the back here, and I used to go get them every afternoon and bring them back here...so it was great from our point of view that we got to know the grandkids very well.

Older people also noted that the home-like environment of their communities was conducive to having visitors, which they felt made their children and grandchildren more inclined to visit.²⁷

3.5.2 Opportunities to socialise

Across the included studies, older people highly valued the social opportunities that housing with support provided. They highlighted organised activities, volunteering, communal spaces, and mealtimes as particularly important for socialising.

3.5.2.1 Organised activities

Organised activities were described as a key feature of housing with support.^{23-25 29 31-33 36 43 45 53 54} They highlighted a wide variety of activities, including bingo, billiards, bowling, bridge, choir, crafts, dances, gardening, knitting, movie nights, happy hours, and morning teas.^{23 25 29 32 33 43} A woman in assisted living in the USA described the influence of organised activities on her happiness by saying:^{29 p6}

I'm happy when I wake up in the morning, and I know it's Monday...I'll play Bingo...and tomorrow I will play bridge.

Older people also noted that organised activities staved off boredom and encouraged engagement.^{24 32} A man living in senior housing in Finland expressed this:^{24 p65}

Without the communal events, elderly people would probably become more reclusive and stay in their own apartments.

Group identity was an important component of the social world in housing with support.^{23 43 54} Some older people even introduced themselves in terms of their group membership.²³ In particular, older people identified as part of bowling groups, bridge groups, croquet clubs, happy hour groups, and music groups.²³ A man living in extra care housing in the UK highlighted the importance of the croquet club in his community:^{54 p209}

This croquet club's got everybody to know one another. We were all strangers, but we soon knew one another's Christian names, so were soon chatting together and we got into a little group all through the summer. By the time the end of the summer came, we were into sort of having coffee with one another, drinks, and things like that. We gelled together. And that's gone on from that now and it's a good social unit, really. Very nice people. I couldn't wish for a better place to live in really. I'm much better than if I'd been living at home.

Additionally, a man in an independent living community in the USA highlighted the importance of organised activities in creating a sense of community:^{43 p8}

Participating in social activities that the activities director sets up makes me feel like we are a part of this place...This is what develops friendships, camaraderie, and a feeling of community.

3.5.2.2 Volunteering

Older people also valued the social opportunities that volunteering within their housing communities provided.^{28 32 36 43} Some volunteered by supporting the running of their community, either in administrative roles or as resident representatives,^{36 43} as with this man from an independent living community in the USA:^{43 p9}

I wanted to be a part of community building. I was active in the landscaping group and vice president of the council for the first two years...we are a resident-driven facility.

Others, in communities with multiple levels of care, volunteered to entertain residents who were less able.³² According to a resident of senior housing in Canada:^{32 p120}

I...volunteer in the choir, sing every Wednesday, and sing for the long-term care residents. Being active was very helpful because being home was lonely.

Another woman living in senior housing in the USA also emphasised the social value of volunteering:^{28 p328}

When I first came here...I went to the front desk and volunteered...well, if I'm going to live here, then I might as well get involved with everybody, do what I can to...get to know all of them and be a part.

Notably, older people highlighted the importance of resident age mix as a facilitator of volunteering.^{46 50 54} According to a resident of a housing with support community in the Netherlands:^{46 p15}

Put in some youngsters, they can do voluntary work so we can help each other.

Similarly, a woman in senior housing in the USA said:^{50 p194}

You have to continue to attract enough people who are in reasonable shape...this community is built on volunteerism.

3.5.2.3 Communal spaces

Many older people also noted that communal spaces provided meaningful opportunities to socialise.^{25 31 32 41 43 45 46 51 54} In particular, some noted that they facilitated happenstance daily interactions,^{32 45 51} as this man in extra care housing in the UK described:^{45 p9}

I sit on the chairs outside, my hat on, and people come past, 'How are you?', you talk to them...and the woman who has a dog, she comes up to me, she says, 'Hello, shall I put the dog on your lap?' and she sits there.

Another resident of extra care housing in the UK highlighted the importance of casual encounters in feeling socially connected:^{54 p208}

That has been a wonderful bonus, to have all these people on the spot. You don't go out of your door without someone saying, hello! Now the way we've all lived in towns, you don't see neighbours now. So this is very good.

An older woman who lived in senior housing in the USA valued the sense of social liveliness that housing with support provided:^{47 p8}

There's always something going on and somebody's around, so if you feel like talking there's always somebody that you can talk to.

One woman in senior housing in Canada described the sense of community that communal spaces created:^{25 p149}

We get very close to each other without interfering, we have a wonderful library, the bank, the post office, a cafeteria, a hair salon – it's like a village.

Some older people who did not consider themselves very social still enjoyed the presence of others in communal spaces.⁴¹ A woman in assisted living in Sweden who liked to watch television in the common area but preferred not to interact put this simply:^{41 p140}

I want to have people around me.

Others highlighted the importance of communal spaces in their sense of feeling at home, as this resident of senior housing in Canada described:^{32 p119}

I see friendly faces every day. Things couldn't be better, it's home!

Notably, the design of communal spaces could either facilitate or inhibit social interaction.^{37 54} In a community in the UK with multiple levels of care, some residents felt that the spatial clustering of residents with different care needs reduced social interaction.⁵⁴ However, in the same community, many residents highlighted the social importance of the building's large glass atrium.⁵⁴ The atrium "created the ambience of an indoor street" with café-style seating areas and space for leisure activities, thereby facilitating both casual social encounters and organised activities.^{54 p210}

3.5.2.4 Mealtimes

Mealtimes were also fundamental to socialising.^{24 27 31 33 46 51 54 55} They were considered essential to relationship building, and were marked by casual greetings, meaningful conversations, tiffs, expressions of concern, helping, and sharing.⁵¹ Cafés, restaurants, and pubs within housing with support communities were all highly valued by residents.^{25 31 54} A resident of assisted living in the USA illustrated the value of shared meals in creating social cohesion:^{27 p29}

Now that we are here, we have made friends around the dinner table, people that we never knew, and we are a big happy family.

3.5.3 Engaging with peers

Living in a community of peers led to a palpable sense of belonging for many older people.^{24 28 32 50 54} By being "with their own kind", they felt understood without much effort or explanation, and they felt that this fostered camaraderie and familiarity.^{28 p328} A woman in senior housing in the USA expressed this as follows:^{28 p328}

I found that living in a place with all older people...it's better! Here, you have friends that know your problems!

An older woman in an extra care housing community in the UK echoed these sentiments:^{54 p211}

If you're not 100 per cent, you know that the other person isn't 100 per cent, so you can talk about it and tell one another...we don't want to be interspersed with lots of young people who wouldn't understand.

A woman in senior housing in Finland also felt that her community benefited from not having young people:^{24 p66}

I don't think that 20 to 30-year-olds and 60 to 70-year-olds belong in the same building. We're in such different phases of life. I think this is a really good system, and I think it's something that's worth developing in the future because for example my generation will retire...so they'll probably really enjoy living away from young people's antics, so they can lead their own life.

Similarly, a woman living in a retirement community in the USA felt that young neighbours in her previous community had viewed her as a grandparent, which made her feel "a little decrepit",^{50 p195} whereas, in the retirement community, she had a lot more in common with other residents and as a

result felt much younger⁵⁰ Indeed, she said that she wished she had moved to the retirement community earlier.⁵⁰

In contrast, some older people felt that the lack of younger people made them feel like they were not living in a real community.^{24 54} A resident of an extra care housing community in the UK expressed this:^{54 p211}

It still doesn't feel like a community. It can't, can it, when it's all one age?

A woman in senior housing in the UK also wished that her community had more young people:^{24 p61}

I'd like to see young families living here, too. At least some. Children bring joy to older people. It's lovely to have children playing in the yard. I'd like to see people of different ages living here.

3.5.4 Friendships

Housing with support provided older people with many opportunities to make new friends. Older people varied in the ease with which they made friends and the depth of friendships they developed. They also reported that friendships with staff formed a key part of their social world. Additionally, older people valued being able to maintain their previous friendships, and proximity facilitated this.

3.5.4.1 Familiarity with the social environment

Older people who had friends in the community before they moved in felt that this had facilitated their social experience.^{23 25 43} They described being introduced to others,^{23 25} as this woman living in senior housing in Canada said of her friend:^{25 p148}

She took me to hymn sing on Sunday night and she took me to the senior citizens' club and she also took me to some of the sales, and each time I went I got to know other people...I try to participate in activities and not be an onlooker, and they always want somebody to serve food or brew coffee.

Those who had friends already living in the community also tended to describe their initial social experience in a more positive light.²³

Among older people who did not have friends in their community before they arrived, some found that being introduced to other residents in small groups by staff members was helpful.⁵¹

3.5.4.2 Proactively seeking friends

Many older people described proactively seeking new friends.^{23 25 27 30 36 43 50 51 54} A man living in a retirement village in New Zealand described his approach succinctly:^{23 p27}

You have to put your best foot forward and talk to people.

Those who sought out friends tended to have done so throughout their lives.²⁵ However, for some, the move to housing with support represented a shift in lifelong social patterns.⁵¹

3.5.4.3 Self-reliance

Other older people were less interested in making friends in their new community and conveyed a sense of self-reliance.^{51 52 54} A resident of assisted living in the USA said:^{51 p494}

I'm a bit peculiar. I love people, but I don't socialize that much.

Similarly, according to a woman in extra care housing in the UK:^{54 p208}

Some people...have to have someone to talk to. I don't.

Some expressed resignation alongside self-reliance, such as this resident of assisted living in the USA.^{51 p499}

It's too much trouble to make friends. I don't care about having them. I am happy in my room.

Others did not want to form friendships because they wanted to avoid inevitable loss, as this man in assisted living described:^{55 p223}

I don't want friends anymore. I don't want to see the friend die. Or, eat supper and be dead by breakfast time. And they come in and they go out to nursing homes.

Notably, reluctance to invest in new friendships was more commonly reported among older residents and those who had lived in housing with support for longer periods.⁵⁵

3.5.4.4 Gradients of friendship

Older people frequently described close friendships with other residents.^{24 27 30 33 36 43 51 52 54} According to a man living in extra care housing in the UK:^{54 p208}

It's nice to have half a dozen or so who are quite close.

Similarly, a man living in a retirement village in New Zealand said:^{23 p27}

It's so important when you get older to keep up being social, it gets harder to make friends as you get older, being here helps.

A woman from Finland illustrated the strength of her commitment to her friends in the context of considering whether she might one day move to a different senior housing community:^{24 p55}

I can't imagine moving out at the moment. However, they're now building a second phase of Loppukiri, and if all my friends here wanted to move there, then maybe I'd want to follow them.

Indeed, many said that their friends felt like family.^{24 27 43 51 52} A woman in a senior housing community in Canada described this by saying:^{52 p1192}

We're all connected and we are not alone. It's like a family here since I've been getting to know the girls. I just call them the girls. Nobody calls me "Mrs." anymore.

Similarly, a woman in an independent living community in the USA said:^{43 p5}

Well, everybody treats everybody like we are part of a big family. It's not as big...that's the reason I think. And people are friendly.

Older people also reported enjoying the ease with which they could visit friends in the same community.^{30 33} A woman in a retirement village in Australia said:^{33 p448}

I visit different people in their apartments for a cup of tea or they come here.

Additionally, those living in communities with multiple levels of care also reported having friends in other care levels.⁵⁴

Some older people noted that their friends in housing with support were separate from their lifelong friends.⁵¹ A man in assisted living in the USA described this as follows:^{51 p494}

I mean they're all friends but I don't confide in them, you know what I mean. We're all separate. It's not like when you're younger.

A woman from another assisted living community in the USA expressed similar sentiments:^{51 p494}

I consider a lot of them friends, but don't have the 'I have something I want to tell you' relationship.

Others expressed gratitude for their friendships in housing with support while acknowledging that they would inevitably be different from lifelong friendships. Another woman in assisted living in the USA expressed this in reference to a friend who had recently passed away:^{51 p494}

I'm glad that we had the good times...I don't think it was the intensity that one would have with a 40-year old friendship...there wasn't any reason for it to be.

3.5.4.5 Friendships with staff

Many older people described having meaningful friendships with staff in housing with support, which formed an important part of their social world.^{26 27 32 34 36 45 53} Many were highly complimentary of the support they received from staff, as with this woman living in extra care housing in the UK:^{45 p8}

Even the Queen couldn't be treated better.

A resident of senior housing in Sweden also praised the staff in her community:^{36 p14}

The staff are wonderful, I can talk about anything I like...the girls are exceptional, always helpful and in a good mood. Not even in my dreams could I have expected it would turn out so well.

Some even felt that particular staff members were like family,³² and many wished they had more time to interact with staff socially.³⁶

3.5.5 Romantic relationships

Older people also developed romantic relationships while living in housing with support.^{36 51 56 57} They described their perceptions and experiences of dating and of sexual intimacy.

3.5.5.1 Dating

Older people also developed romantic relationships in housing with support.^{36 51 56 57} One couple who met in assisted living in the USA said that they attended activities together, supported each other through illness, and occasionally slept in each other's rooms.⁵⁶ Similarly, an older man living in senior housing in Sweden described his relationship and how much he enjoyed it:^{36 p14}

I visit Glynnis once a week and she comes here every Saturday. I think I have given her a new lease on life because she trusts me...We phone each other often and have a lot of fun at the old people's dances...I try to keep up and not feel that life is over.

Additionally, a woman in assisted living in the USA described her relationship as deeply meaningful and rewarding.^{38 p847}

I just fell in love with that man. You know, I didn't even love my husband like I love him...He'll call me to come down to his apartment and look at a movie or something with him or listen to music.

However, older women also noted that the large proportion of women in housing with support was a barrier to dating. As one woman in assisted living said:^{57 p33}

The pickings are very slim.

Another described the scarcity of men in her assisted living community by saying:^{57 p33}

We have...only three men. And grumpy old men. And so I don't think there's any relationships.

Moreover, in some communities, older people felt that dating was not allowed, as a woman in assisted living in the USA expressed:^{57 p34}

I don't think they'd let you date here. Uh uh.

Some older people said that they avoided dating because they feared being the subject of gossip.⁵⁷ According to another American woman in assisted living:^{57 p34}

I think it would be difficult for a woman and a man in the same place to meet and start dating here. Because boy-oh-boy everybody would be yapping from the minute that happened.

Older people also reported that they were not interested in dating.⁵⁷ Among them, some felt that moving to housing with support was an opportunity to focus on their own needs, as with this woman in assisted living in the USA:^{57 p35}

Well, you know when you have a man or somebody...you have to consider them and have to kinda concede to what they want to do at times and I, at 86 years old, I don't want anybody to look after but myself (chuckles).

Others said that they were not interested because they felt committed to their spouse who had passed away.⁵⁷ A woman in assisted living in the USA described this sentiment:^{57 p35}

When you're married almost 60 years to the same man it's hard to go on without him period. But especially somebody that wants to have a real deep relationship. I can't handle it...I don't even think about that because I just loved him so much. And so I don't want to do anything that would look bad or make me feel bad and so I just stay away.

3.5.5.2 Intimacy

Romantic relationships were also framed in terms of intimacy. Older people in housing with support described expressing intimacy in a variety of ways, from affectionate touch to sexual intimacy.^{38 56} Interestingly, less physically intense expressions were found to be more common in many cases.^{38 56 57}

Some described longing for affection and intimacy, including this woman in assisted living in the USA:^{57 p33}

I think people want relationships, I really do...everybody needs a human touch. You know whether it's friendly, sexual, or just somebody walking by and patting you on the arm, or patting you on the back. We all crave, you know, that kind of touching or attention. You know we don't want to be a number. We have room numbers, but I'm a real person behind that door.

A man in assisted living also longed for affection but did not consider sex to be important.^{57 p33}

The hell with sex...you just want companionship. Sex is the last thing at my age you want...you just want to have someone to talk to and someone you can count on. I'm not looking for sex. I'm looking for companionship...Someone to talk to. Cuddle with.

Others, however, were clear that they were not interested in affection or sex, as with one woman in assisted living in the USA:^{56 p29}

I like men. I like to talk to them, but as far as that goes – that's it. My sex days are over.

Lack of interest was often attributed to declining health, diminished desire, or feeling "too old".^{57 p36}

For those who were interested in sexual intimacy, however, lack of privacy was described as a barrier.⁵⁷ Although all older people in the included studies had their own front door, in some cases the behaviour of care staff impeded on residents' privacy.⁵⁷ A woman in assisted living explained this:^{57 p34}

One of the main barriers I would think of would be privacy. And we don't have it here...talk to anybody in here. Most of 'em it's one quick knock and the door's open. Some don't even do that...that's wrong...You know there's a lock on the door but that doesn't stop 'em. They have keys. Which they should. But you know to have intimacy? That'd be real tough unless you plan, you know hanging out in the bathroom, I don't know how a person would even manage it. Because, as I said, one quick knock and some of 'em don't do that.

However, older people in other communities noted that staff did not enter their apartments without permission,²⁸ so this was not a consistent problem in the included studies.

3.5.6 Challenges to social engagement

Older people described several challenges to social engagement. These included personal challenges, social cliques, stigma against the less able, and language barriers.

3.5.6.1 Personal challenges

Some older people found it difficult to make new friends after moving to housing with support.⁵⁴ A man living in a retirement village in New Zealand expressed this succinctly:^{23 p27}

If you're inhibited...life is hard.

Additionally, older people's degree of autonomy in the choice to move to housing with support influenced socialising. According to a woman in assisted living in the USA:^{38 p845}

I didn't make an effort to know people when I first came. I was miserable...I didn't want to be here in the first place. I wanted to go back to my home.

However, that woman's social engagement did increase over time.³⁸ In discussing the present, she said, "I get along with all the residents."^{38 p845}

3.5.6.2 Stigma against the less able

Stigma against those who were less able was identified as a problem by many older people in housing with support.^{23 43 50 54 58} A resident of an extra care housing community in the UK expressed his frustration with the challenge of socialising with those less able:^{54 p211}

I don't like being here I'll be honest, because I don't like being surrounded by decrepit old people. With the best will in the world, you talk to some of them and they don't answer – I've given up trying to hold a conversation.

A woman in a retirement village in New Zealand said succinctly:^{23 p29}

People don't want to socialise with frail people.

Similarly, another woman in the same community said:^{23 p29}

Those people come and sit with you, when you don't want them to.

Some felt that there were residents who did not belong in housing with support because of their level of dependency. In the retirement village in New Zealand referenced above, which was privately owned and operated, residents blamed management for prioritising selling apartments over assessing care needs.²³

Moreover, many residents in a senior housing community in the USA described concealing their own decline.⁵⁹ Some said explicitly that they did so to avoid shame and social exclusion, while others said that they wanted to avoid troubling anyone.⁵⁹

3.5.6.3 Cliques

Social cliques were a common feature of housing with support.^{23 25 49-51 58} A man in New Zealand described his retirement village by saying:^{23 p28}

It's all cliques and gangs.

Another man in a retirement village in New Zealand explained how his billiards group intentionally excluded someone who wanted to join:^{23 p28}

He's been hanging around, trying to muscle in, hoping someone might offer to stand down so he can play, well that's not going to happen!

Those on the periphery of cliques described feeling socially excluded and isolated.^{23 58} A couple in New Zealand described repeatedly being told "this is our seat" or "you can't sit there" when asking to join groups in their retirement village.^{23 p28} As a result, they mostly remained in their apartment.²³

Social hierarchies also played a role in social exclusion.^{23 54} A man living in extra care housing described the tension resulting from socioeconomic diversity in his community by saying:^{54 p209}

I think that there's obviously an automatic, not barrier, but wall between the council people and the people who bought theirs, it's different. I mean, it wasn't cheap to buy here and obviously you're in a different, well, not social position, but financial position to them, and that is always a bit of a barrier to communication.

A man living in a retirement village in New Zealand also described the role that social hierarchy played in his community:^{23 p29}

The old boys' club is very strong here. People identify with the school they went to.

Although this man felt that he was part of the "old boys' club", he described needing to constantly work to maintain membership, and he felt conscious that his wife's family background had gained him entry.^{23 p29} Similarly, a woman in the same retirement village felt that "it was very easy to be propelled out of a group".^{23 p27} Yet, older people also acknowledged that, as in any community, not everyone will get along.⁵⁴

Some older people described the influence of their own perceptions on cliques.²⁵ A woman living in senior housing in Canada said that:^{25 p147}

When I first came in here I thought there was a little clique, and I guess it was me more than they. And I thought I'd never get into that inner circle. But gradually...I think now I'm one of them, but it took a while.

3.5.6.4 Language barriers

Language barriers also posed a challenge to socialising in housing with support, among those whose first language was not the national language. Older people with language barriers found it more difficult to socialise and often reported feeling isolated as a result.³² A Chinese resident of senior housing in Canada who had limited English expressed this:^{32 p121}

We could only say 'Hi' when we see others here.

Some wished they could live in a community with more people from their home country, as with this resident of senior housing in Canada:^{32 p120}

I would like to stay in a place that there are more Chinese.

3.5.7 Mutual support

Despite these challenges, older people described a strong sense of mutual support in housing with support communities.^{23 25 27 38 43 52 54 55 60 61} A resident of assisted living in the USA described this by saying:^{27 p30}

We watch out for each other, and I try to hold the elevator for those who need more time.

They often expressed concern for one another, particularly in terms of illness or frailty.^{23 51 55 61} According to another resident of assisted living in the USA:^{51 p495}

I worry about my neighbor and I'll mention something to the staff if I think it needs their attention. I have nothing in common with her other than I worry about her.

A resident of supported housing in the UK described a specific incident in which a neighbour had helped her:^{61 p172}

Mrs ----, across the hallway said that she saw my paper sitting on the door at about 12 o'clock and she thought that there was something wrong, so she pulled her cord and contacted CareCall, and then I was taken away to hospital.

Older people also reported helping less able residents, by, for instance, checking in on them, pushing their wheelchair, and reminding them to take medications.^{23 51 52} In one case, a woman in assisted living in the USA had developed a close, supportive friendship with a fellow resident who was less able, to the extent that she considered herself her friend's caretaker.⁵⁵ They shared meals together each day, she escorted her friend to the elevator, and they hugged and kissed as they departed.⁵⁵

Sharing personal items was also described as engendering a sense of camaraderie.⁵¹ This included food, books, newspapers, CDs, glasses, and walkers.⁵¹

Notably, some older people felt that the small size of their community facilitated mutual support and camaraderie.^{25 43} A woman in a senior housing community in Canada described this:^{25 p149}

If you're not feeling well, people are concerned about you. They'll have little goodies tied to your door knob. I think I appreciate a place where you have someone around you.

A resident of extra care housing in the UK conveyed a similar sense of mutual support:^{54 p207}

You generally get somebody knock on the door and come in and say, "How are things going? Are you alright?" You know, come in and have a chat. It's like a community, all together.

Some older people also noted the importance of reciprocity.^{51 52 55} According to one man in assisted living in the USA:^{55 p222}

I could lean on you, you could lean on me, and it's better than one trying to lean on himself.

Another American resident of assisted living felt that helping others was a gratifying experience:^{51 p498}

If you see somebody hung up or can't get around and you have strength to do that, that's a waste of love not to help. If I can do anything to help somebody, it's pleasing to me.

Older people also described the importance of mutual support as they processed the loss of a spouse while living in housing with support.^{38 43} One woman in an independent living community in the USA expressed this by saying:^{43 p7}

When Bob passed, all these women who have survived it gave me great support...They were there for me...Angela and Marla have been great. A little note of encouragement from Ruby was also sweet.

Personal loss and widowhood were part of older people's reality in housing with support, yet as this quote demonstrates, living in a community of older people provided meaningful opportunities for social engagement, empathy, and emotional support.

3.6 Conclusion of the perceptions and experiences review

Incorporating older people's preferences into the design and implementation of housing with support is crucial, and our findings from the included qualitative studies represent an amalgamation of what older people from around the world value in housing with support. Our analysis of older people's perceptions and experiences reveals three overarching facilitators of well-being in these communities. The first is that individual choice and autonomy are integral to successfully transitioning to, ageing in place, and dying in place in housing with support. This is evident in our finding that older people who made their own decision to move to housing with support felt that they settled in to their new home more easily. Additionally, older people reported that being able to decide which activities to engage in day to day in housing with support gave them an important sense of autonomy. The second key facilitator is that moving to housing with support in a location that allows older people to maintain previous social networks can ease their transition to their new home. This is evident in our findings that those who moving within the same neighbourhood valued being able to maintain the same social support network, and those who moved to be closer to their children appreciated being able to strengthen these relationships. The third and final key facilitator is that while personal care and support services are a key aspect of housing with support, from the perspectives of older people themselves opportunities to socialise are essential to their well-being and to creating cohesion in the community. This is evident in our findings regarding the older people's positive perceptions of social engagement in housing with support communities. As such, housing with support communities ought to maximise potential for social engagement by using social contact design in communal spaces, organising a wide range of social activities, and encouraging a culture of volunteerism and mutual support.

4 Impact of housing with support for older people on their quality of life

The review of the impact of housing with support identified 35 studies and 1 technical report evaluating the following housing models: continuing care retirement communities (5 studies in 9 publications), independent living (3 studies in 4 publications), assisted living (2 studies in 3 publications), planned retirement communities (1 study in 2 publications), extra care housing (4 studies in 15 publications), and senior housing (2 studies in 3 publications). Our analysis of the impact of these models drew on 35 included articles following screening of 19,246 titles and abstracts, of which 104 articles were screened on full-text review. Among the full-text articles that were screened, 47 were excluded because the intervention did not qualify as housing with support according to our inclusion criteria, 15 were excluded because their methods did not meet our criteria, 3 were excluded because they were duplicates, and 2 did not exclusively focus on older people. A further paper was excluded due to inadequate data. The PRISMA flow diagram in Figure 3 illustrates the full screening process.

The quality of the included studies ranged from low to high; the full results of the quality appraisal are available in Appendix M. Among the 36 included articles, there were 17 unique studies. These came from the following countries: the USA (10), the UK (4), Canada (1), Finland (1), and Israel (1). Study characteristics are provided in Appendix N and include country, housing model, study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females. The studies in Appendix M and N are presented by housing model and country. Support services for 'housing with support' are dependent on the country context and housing typology or model. The health and social care services provided and their costs would appear to be influenced by the country's publicly funded health and social care context and/or the residents ability to pay through either their own means, the presence of health and social care insurance, tax rebates, public funding, or a combination of payment methods. For example, the USA provides little funding for housing with support while the UK provides means tested support to those on basic pensions and tax refunds for those with substantial pensions. Therefore, the different typologies serve different populations.

The results of our analysis of the impact of each of the models of housing identified in this review – continuing care retirement communities, independent living, assisted living, planned retirement communities, extra care housing, and senior housing – are described in detail in the following section.

We had only one preidentified outcome (quality of life) and identified seven principal outcomes in the literature measuring the impact of housing with support:

1. Self-perceived health status
2. Objective health outcomes
3. Physical well-being
4. Mental well-being (including quality of life)
5. Social well-being
6. Health and social care utilisation, and
7. Costs.

Within the seven principal outcomes, there were subcategories for some of the outcomes. For example, objective health status included outcomes such as morbidity, comorbidity, move to residential care, and mortality. Physical well-being included level of independence, exercise, and falls. Mental well-being included quality of life, cognitive functioning, and psychological well-being. Social well-being included social connectedness, loneliness, social life, and social participation. Health and social care utilisation included community and hospital service utilisation. Costs included cost comparisons and cost benefits.

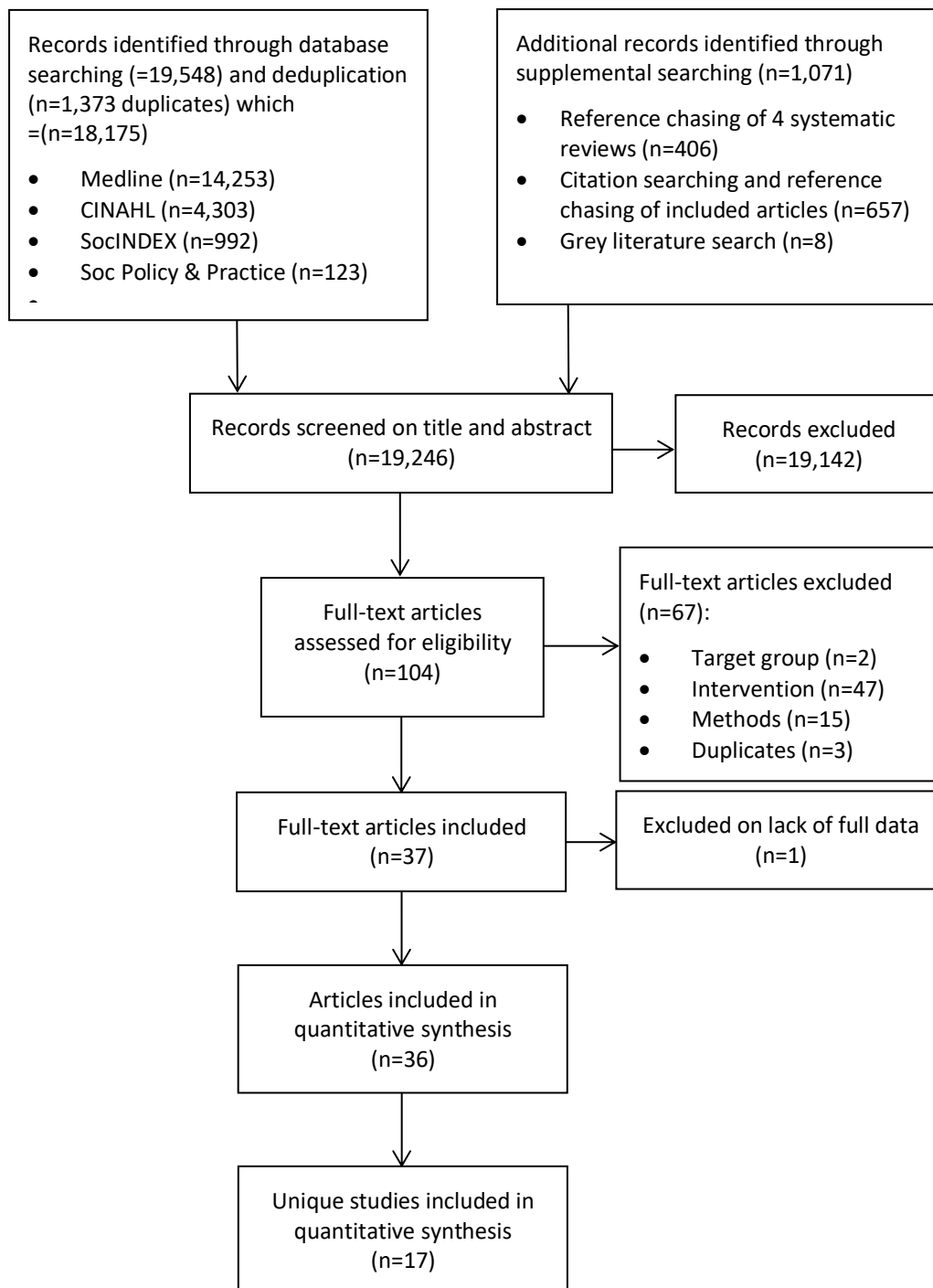


Figure 3: PRISMA flow diagram for the impact review

4.1 Continuing care retirement communities

Continuing care retirement communities (CCRCs), also known as life care communities, were evaluated in the USA and Israel.

4.1.1 USA

CCRCs merge independent living, assisted living, and nursing home care in one setting. People enter when they are fit and independent, meaning that the move is an intentional and conscious decision by the older person, rather than a reactive move, as is often the case in moves to nursing homes.⁶² CCRCs provide older people with a continuum of care and continuity of place, matching services to the needs of the individual and allowing people to stay in one location as they age. CCRC apartments have traditionally attracted residents who are educated, affluent, white, and female.⁶³ They are regarded as an expensive option for older people, as they often have large upfront entry fees,⁶² and this is reflected in the salaries or pensions of the populations who reside in CCRCs. However, as noted by Young (2009), living in a CCRC can act as a type of insurance, as the residents have instant access to long-term nursing care whenever they may eventually need it.⁶⁴ Services provided on-site can include housekeeping, dining, and social activities. The initial move to CCRCs in the USA is typically a planned move.⁶⁵ Although moving to a CCRC is a major life change, there are ample opportunities within a CCRC to create or maintain a social and healthy environment for older people with a high quality of living and reduced institutionalisation compared with many nursing homes and assisted living facilities.

We identified four evaluations of CCRCs presented in seven publications published between 2000 and 2018:

- The Pathways to Life Quality evaluation^{62 66 67}
- The Erickson Life evaluation^{65 68 69}
- Cutchin *et al.*⁷⁰
- Young⁶⁴

4.1.1.1 Study characteristics

The study characteristics for the CCRC evaluations are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.1.1.1.1 Pathways to Life Quality evaluation

Three articles evaluating the Pathways to Life Quality study met our inclusion criteria.^{62 66 67} The study focused on a CCRC in Ithaca, New York. The evaluations of Pathways to Life Quality reported in this review analysed data from 1995 and 1997. The first wave of data was collected in late 1995, when 204 people who were about to move to the CCRC were invited to take part in the study through a letter sent by the facility's director. Almost half of these individuals decided to take part, providing a baseline sample of 101 participants pre-move. At follow-up in 1997 there were 92 participants, with nine lost to follow-up: five died before the second wave of data collection, and four decided not to move to the CCRC. Moen *et al.* (2000) focused on social role identities of people within the CCRC, while Moen *et al.* (2001) investigated decision-making and satisfaction of CCRC residents. Both studies used the same dataset, analysing the data from 1995 (baseline) and 1997 (follow-up).^{62 66} A more recent study by Heisler *et al.* (2003) used the same dataset to examine the health and social outcomes of those who had moved to the CCRC, and compared the outcomes of local and distant movers.⁶⁷

4.1.1.1.2 Erickson Life evaluation

The Erickson Life Study is a longitudinal cohort study of CCRC residents from four CCRCs in Maryland and Virginia which collected data between 2003 and 2009.^{68 69} The details of baseline recruitment for

the Erickson Life evaluation are described in Bintrim *et al.* (2005).⁷¹ The study participants were aged 60 years or over, spoke English, and had adequate cognitive function.⁶⁸ The authors of the two included papers noted that the analysis only includes residents who were living in the independent living section of the CCRC, not those in the assisted living or nursing home sections.^{68 69} The sample in the Erickson Life Study was 300 at baseline; 58 were lost to follow-up after 2 years, leaving a sample of 242 (81%). Reasons for people leaving the study included cognitive decline (indicated by a Mini-Mental State Examination score below 24) and death.

Gaines *et al.* (2011) matched data from the Erickson Life evaluation with a nationally representative, community-based sample from the Health and Retirement Study.⁶⁸ The data used in Gaines *et al.*'s paper were collected between 2003 and 2005. The Erickson Life evaluation and the Health and Retirement Study were matched using a 1:1 ratio based on the following demographic variables: age at baseline, gender, education, income, and race. The match was made based on data from the 2002 and 2004 waves of the Health and Retirement Study. This gave a total matched sample of 458 participants (229 from each study). Gaines *et al.* (2011) used these combined datasets to examine health and social care utilisation.⁶⁸

Roberts and Adams (2018) also used data from the Erickson Life evaluation, although their data were slightly different from the data used in Gaines *et al.* (2011).^{68 69} This paper examined quality of life in four CCRCs over 5 years and measured how social engagement in the first year of living in a CCRC influenced quality of life over the following 4 years. The baseline in this study (Year 1) is 1 year after the participants moved to the CCRC. The sample size in Year 1 was 267 and in Year 5 the sample was 69% of the sample at baseline (n=184). Over those 5 years, 37 participants voluntarily withdrew, either due to lack of interest in the study or a move to another independent living community. Others died, became ineligible, or moved to a nursing home.

4.1.1.1.3 Cutchin evaluation

Cutchin *et al.* (2010) completed a case study of a CCRC in North Carolina and examined residents' activity patterns before and after their move to the CCRC.⁷⁰ The CCRC is owned by the residents and is located within a mixed-use development in the city. Residents were invited to take part in the study just before their move to the CCRC, with a follow-up questionnaire 12 months after the move. A total of 115 residents participated. The response rate was 57% for the first wave of data collection and 68% for the second wave.⁷⁰ The original, pre-move questionnaire collected information on items related to demographics, health and psychosocial variables, and activities within the home and community. The follow-up questionnaire also asked questions about a similar list of activities within the CCRC and the broader community. Both questionnaires asked respondents whether and how often they took part in 20 activities pre- and post-move.

4.1.1.1.4 Young evaluation

Young *et al.* (2009) obtained data from a CCRC located on the east coast of the USA. The CCRC has 300 independent living units and 90 nursing home beds. A total of 298 residents met the inclusion criteria for the study. Data were collected through medical charts, interviews with social workers, and administrative records.⁶⁴

4.1.1.2 Study population characteristics

In the Pathways to Life Quality study cohort, women comprised more than half of the sample (64%), and the sample was highly educated (61% were educated to third level).⁶⁶ The majority (79%) were earning more than US\$50,000, and 21% were earning less than that.⁶² Almost four-fifths (78%) of the residents were local movers from North Carolina. The mean age of the cohort was 77 years (range: 64–94).⁶² The Heisler study used slightly different data as they had complete information for 88 residents. However, the demographics were similar with an average age of 77 years, most earning between US\$50,000 and US\$75,000, and more than half held a professional or graduate degree.⁶⁷

Gaines *et al.* (2011) used data from the Erickson Life evaluation and a matched comparison from the Health and Retirement Study.⁶⁸ The total number of participants in the combined matched sample in the 2005 wave of data collection was 458, with 229 in each cohort. At baseline in 2003, two-thirds (66.8%; n=306) of this combined sample were women. The mean age was 77.5 years (standard deviation: ± 6.1). Slightly more than half (51.1%; n=234) held a college degree or higher. Nearly all

participants (97.4%; n=446) were white. The sample was wealthy, with 64.8% (n=297) earning more than US\$35,000 annually.⁶⁸

Roberts and Adams (2018) used an extended version of the Erickson Life evaluation data used in the Gaines *et al.* (2011) study.^{68 69} The baseline used by Roberts and Adams (2018) is 1 year after moving to the CCRC, so the baseline data for Gaines *et al.* (2011) and for Roberts and Adams (2018) are different. The mean age of the 5-year cohort at baseline (n=267) was 78.8 years (standard deviation: ± 6 ; range: 60–94). Nearly two-thirds (65.9%) were women and the majority (69.5%) were earning more than US\$35,000 per year. This analysis did not use a matched cohort.

The total sample in the Cutchin *et al.* (2010) CCRC case study comprised 115 residents at baseline and follow-up.⁷⁰ The mean age of the sample was 78.9 years, and all participants were aged 62 years or over, as that was the minimum age of entry to the CCRC. The majority (59%) were female and all (100%) were white. Similar to the Erickson Life evaluation sample, the majority (82%) had a college degree, and only 24% were local movers who moved from within North Carolina. The response rate was 57% for the first wave of data collection and 68% for the second wave.⁷⁰

Young *et al.* (2009) reported that the mean age of participants was 83.4 years (range: 75–94; standard deviation: ± 4.7).⁶⁴ As was the case in other studies of CCRCs, the population was mostly white (97%), and 69% of participants were women.⁶⁴

4.1.1.3 Outcomes and their measurements

CCRCs were evaluated using a variety of outcomes and measures and are presented in Table 3 and Appendix O. The outcomes cover five principal topics: self-perceived health status, objective health outcomes, mental well-being, social well-being, and health and social care utilisation. Within the seven categories, there are a number of subcategories.

Table 3: Outcomes and their means of measurement in CCRC evaluations

Study ID	Outcome(s)	Means of measurement	Additional detail
Pathways to Life Quality			
Moen 2000	Social role identities	Current, past, and expected social role identities	
Moen 2001	Decision-making strategies and satisfaction	Satisfaction with continuing care Satisfaction with retirement community Satisfaction with investment Satisfaction with home Overall satisfaction	
Heisler 2003	Health and social care outcomes for local and distant movers	Social support Health rating Health conditions Contact with family members/familial networks	Social Provisions Scale (social integration and reliable alliance subscales) Self-rated health List of 24 conditions
Gaines 2011	Self-rated health	Fair/poor health or good/very good/excellent health	
	Total comorbidity	Presence of any of 6 health conditions	Hypertension Arthritis Cancer Heart condition Diabetes Stroke
	Home-based services		

Study ID	Outcome(s)	Means of measurement	Additional detail
	Hospital use	Use of home-based care or hospital admission over the past two years	
Erickson Life evaluation			
Roberts 2018	Quality of life Social engagement	Perceived Quality of Life Scale (Patrick <i>et al.</i> 2001)	
Cutchin 2010	Residential satisfaction	"In general, how satisfied are you with your current living situation?"	
	Activities	20 activities	Reading Eating out at restaurants Visiting friends or family Watching television Grocery shopping Other shopping Emailing Entertaining friends and family Exercising in the home Exercising outside of the home Attending parties Attending concerts Attending cinema Cooking or baking Playing games Doing housekeeping Attending meetings Attending religious services Gardening Practicing hobbies
Young 2009	Transfer to higher level of care	Incidence of transfer	

4.1.1.4 Quality assessment

The Pathways to Life Quality studies are moderate- to high-quality studies. The questions used in Moen *et al.* (2000) that asked about social role identities were not validated prior to use.⁶⁶ The domains of satisfaction measured in Moen *et al.* (2001) were also not validated.⁶² Heisler *et al.* (2004) used defined measures that were validated.⁶⁷ Loss to follow-up was very low for all three studies. However, due to the small sample sizes, the study outcomes are difficult to generalise to the wider CCRC population.

The studies using data from the Erickson Life Study are high-quality studies, scoring positive responses on most of the quality assessment items.^{68 69} In Gaines (2011) over 80% of respondents participated at follow-up 2 years later. However, in Roberts and Adams (2018) this 80% standard was not achieved, as there was a 5-year follow-up and larger attrition.

Cutchin *et al.* (2010) is a case study. As a result, the study is of moderate quality, as it comprised a convenience sample with a small sample size and its findings are not generalisable. Confounding factors were controlled for by regression modelling.⁷⁰

Young *et al.* (2009) was a high-quality study with only one limitation: it did not control for confounding factors. The study is a prospective census cohort of everyone who entered the studied CCRC who fit the inclusion criteria.⁶⁴

4.1.1.5 Findings by outcome

The descriptive findings for the five outcomes measured (self-perceived health status, objective health outcomes, mental well-being, social well-being, and health and social care utilisation) are presented in Appendix P.

4.1.2 Israel

CCRCs in Israel provide around-the-clock health and social care services that are paid for by residents or their private insurers. In this single study, the researcher examined outcomes at CCRCs and adult day care centres.⁷² For this review, we will focus on the population within the CCRCs, as this housing model fits with our research question. We excluded the information on the adult day care centres in this paper, as it did not meet our inclusion criteria.

4.1.2.1 Study characteristics

Data were collected from 172 CCRC residents through interviews at baseline, and from 159 residents at 12 months follow-up.⁷² The three CCRCs were located in urban (Jerusalem) and rural areas in Israel, although the rural CCRC declined to participate in the second wave of data collection, and as a result its data are not included in the analysis. Data analysis was conducted on 104 residents in Jerusalem who completed interviews at both time points.⁷²

The study characteristics for the CCRC evaluations are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.1.2.2 Study population characteristics

The CCRC residents lived either in Jerusalem or in a more affluent and liberal area in the “centre of Israel”.^{72 p921}

The population studied had no cognitive impairments. The majority (80.7%) of CCRC residents were female, and their average age was 85 years (standard deviation: ± 7 years; range: 67.2–117.1). On average, residents had 13.1 years of education (standard deviation: ± 4.9 ; range: 0–40).⁷²

4.1.2.3 Outcomes and their measurements

This study measures the relationship between subjective social status and loneliness (Table 4 and Appendix O). The outcomes cover one principal topic – social well-being.

Table 4: Outcomes and their means of measurement in Israeli CCRC evaluation

Author (year)	Primary outcome(s)	Means of measurement
Ayalon (2019)	Loneliness	Revised UCLA Loneliness Scale
	Subjective social status	MacArthur Scale of Subjective Social Status

4.1.2.4 Quality assessment

The Ayalon study was of low to moderate quality. The required sample size was not calculated prior to the study beginning. There were 428 residents in the three CCRCs, and 172 took part in the baseline data collection (response rate of 40%).⁷² There were a large number of participants lost to follow-up (44%), mainly due to one CCRC opting out of the study at 12 months, leaving a sample of 104 residents across the other two CCRCs who took part in both waves of data collection.

4.1.2.5 Findings by outcome

The descriptive findings for the only outcome measured (social well-being) are presented in Appendix P.

4.2 Independent living

Independent living communities in the USA are described as places where older people can continue living independently in a sheltered environment, with help and supportive services available when needed.⁷³ 'Independent living' and 'assisted living' are terms with definitions that vary across states in the USA. In general, independent living provides fewer services and less care than assisted living, which in turn provides less care and fewer services than a nursing home. However, in practice, given the varying definitions and regulations, there may be overlap across these housing models. For example, whereas the state of Oregon has a strict definition and robust regulation of assisted living requiring individual, self-contained living units where six or more older people can reside in homelike surroundings,⁷⁴ these individual living units may correspond more closely with independent living in some other states. This makes it difficult to parse the different models into discrete, standalone typologies due to a lack of shared understanding of where the line between independent and assisted living is drawn. Many of the studies excluded from our review were excluded on the basis that the living arrangements were too similar to those of nursing homes. To combat this, we ensured that our inclusion criteria stipulated that accommodation for both independent living and assisted living must be an independent apartment with its own front door, and must have personal living quarters and cooking facilities. The independent living facilities in the Rantz *et al.* evaluations are not dissimilar to assisted living facilities, as there is registered nurse care coordination available within the Aging in Place programme.^{75 76} However, for this section of the review, we have referred to the models using the definitions that were provided by the authors of each of the studies examined. The studies from the USA included in this review had similar follow-up time points, and examined similar housing models. We have three studies published in four papers that we classified as independent living.

4.2.1 Study characteristics

The study characteristics for the independent living evaluations are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

Lutgendorf *et al.*'s study compared a group of people who moved to independent living (n=30) with a control group who did not move (n=28).⁷⁷ All 30 of the movers were moving on a voluntary basis and were moving to their own apartment within a congregate living community. They were assessed at three time points – 1 month pre-move, 2 weeks post-move, and 3 months post-move – through interviews describing the psychosocial experiences of moving and through a blood test measuring biological indicators in order to determine any impact of the move on their immune systems.⁷⁷

Rossen and Knafl's (2007) study focuses on a population of women moving to independent living. The study is part of a larger study that includes a qualitative component, which is not reported in this review due to exclusion criteria. A convenience sample of 32 women were interviewed just before their move to a number of independent living facilities in the Midwest, and again at 3 or 4 months after their move. One woman was excluded from the analysis as her husband was sick and she did not take part in the second interview, providing a final sample of 31 women. The study measures quality of life, mental and emotional well-being (self-esteem and depression), and person-environment interactions.⁷³

Rantz *et al.* conducted two evaluations of Aging in Place programmes in two independent living facilities in Missouri.^{75 76} The evaluation outcomes focused on cost-effectiveness, as well as on physical and mental health. The first evaluation was published in 2011 and evaluated the years 2005–2008, inclusive.⁷⁵ In the 2011 paper, the evaluation measures outcomes of the programme at two locations: an independent living community called TigerPlace, and an independent living section of a CCRC. The second evaluation was published in 2014 and evaluated the programme from 2009 to 2012, inclusive, and measured outcomes for the TigerPlace community only.⁷⁶ In both locations, people lived in independent apartments, with social activities, housekeeping, and meals provided.

The Aging in Place programme was devised by the School of Nursing at the University of Missouri and consisted of a registered nurse and personal care coordination programme. Although the settings in

Rantz *et al.*'s evaluations were referred to as independent living, the programme itself provided residents with a relatively high level of care. However, as the care provided was optional, living independently was feasible in this setting for those who were able to do so. TigerPlace was an intermediate care facility and emphasised independence.^{75 76} Residents had their own apartments, which they were free to decorate and could keep pets. There were common areas including dining rooms, a gym, a common living room, and a theatre. TigerPlace initially consisted of 31 apartments, which was increased to 54 apartments in 2009.⁷⁵ The study's other location was the independent living building within a CCRC, consisting of 68 one- and two-bedroom apartments. In both locations, meals, housekeeping, and transportation were provided.⁷⁵ Through the Aging in Place programme, both locations had a wellness centre where residents could have well-being assessments, and a registered nurse was on call at all times.

4.2.2 Study population characteristics

In the independent living congregate setting in Lutgendorf *et al.*'s (2001) study, 30 people moving to the setting were examined.⁷⁷ The average age in the sample of movers was 78.8 years (standard deviation: ± 5.7 ; range: 67–89). The gender split was 60% female and 40% male. All residents were moving to the setting voluntarily after spending up to 2 years on waiting lists.⁷⁷

Rossen and Knafl (2007) interviewed 31 women living in 12 independent living communities in a city in the Midwest. The study population's mean age was 78 years (standard deviation: ± 6.3 ; range: 61–91). The population was mostly white (93%), and 6.5% were African American. Almost half (42%) earned less than US\$20,000 per year, 29% earned between US\$20,000 and US\$40,000, and 22% earned more than US\$40,000 per year. 45% of the women were educated at third level, 26% had a high school education, and 29% had less than a high school education. 19.4% of participants were married, and 80.6% were not married (64.5% were widowed, 12.9% were single, and 3.2% were divorced).⁷³

In Rantz *et al.* (2011), there were 66 residents admitted to TigerPlace in 2004. At the end of 2008, there were 30 residents remaining in the study (36 had died or moved to other accommodation). There were 95 residents living in the independent living section of the CCRC at baseline, and 47 in 2008, with 48 having moved or died over that time period. The median age on admission to TigerPlace was 84.0 years (standard deviation: ± 6.2), and in the CCRC it was 84.9 years (standard deviation: ± 6.6). The majority of these residents were women in both locations; 73% were women at TigerPlace, 75% were women in the CCRC, and 74% of the sample comprised women.⁷⁵

In Rantz *et al.* (2014), there were 128 residents living at TigerPlace between 2009 and 2012. The median age at baseline was 84 years (standard deviation: ± 6.27). The sample comprised about two-thirds women (65.6%; $n=84$) and one-third men (34.4%; $n=44$). Most participants were white, with one Asian participant and one Hispanic participant. The CCRC was not studied in the second evaluation.⁷⁶

4.2.3 Outcomes and their means of measurement

Independent living communities were evaluated using a variety of outcomes and measures, as seen in the Table 5 and Appendix O. The outcomes cover six principal topics: self-perceived health status, objective health outcomes, physical well-being, mental well-being, social well-being, and costs.

Table 5: Outcomes and their means of measurement in independent living evaluations

Study ID	Outcome(s)	Means of measurement
Two single studies		
Lutgendorf 2001	Psychosocial responses to move	Profile of Mood States (short form)
		Impact of Events scale
	Immunologic measures	Antibodies for Epstein Barr virus
		Natural killer cell cytotoxicity
Rossen 2007	Interleukin-6	
	Physical well-being:	
	Self-rated health	Self-reported health
	Chronic medical conditions	Number of conditions in the past 12 months
	Health satisfaction	Excellent, good, fair, or poor health satisfaction
	Health limitations	
	Health habits	Smoking, drinking, exercise
	Quality of life	Quality of Life Index
	Emotional well-being:	
	Self-esteem	Rosenberg Self-Esteem Scale
	Depression	Geriatric Depression Scale
	Person-environment:	
	Perceived confidants	Number of confidants
	Social activities	Number of social activities
Ageing in place		
Rantz 2011	Cognitive functioning	Mini-Mental State Examination
	Depression	Geriatric Depression Scale
	Health survey	Short Form-12 Physical Health Subscale
	Mental health	Short Form-12 Mental Health subscale
	Continence	Minimum Data Set
	Activities of daily living	Minimum Data Set
	Physical health	Short Form-12 Physical Health Subscale
	Cost-effectiveness	Average care cost plus average housing cost compared with nursing home costs
Rantz 2014	Cognitive functioning	Mini-Mental State Examination
	Depression	Geriatric Depression Scale
	Health Survey	Short Form-12 Physical Health Subscale
	Mental health	Short Form-12 Mental health subscale
	Continence	Minimum Data Set
	Activities of daily living	Minimum Data Set
	Physical health	Short Form-12 Physical Health Subscale
	Cost-effectiveness	Average care cost plus average housing cost compared with nursing home costs

4.2.4 Quality assessment

The Lutgendorf *et al.* (2001) study was scored as moderate quality during appraisal. The outcome measures were clearly defined and described, the aim was clearly stated, and the statistical methods were appropriate. However, it was not possible to determine whether the sample was representative of all independent living residents, and due to the small sample size (n=30) it is difficult to generalise the results.⁷⁷

Rossen and Knafl scored comparably to Lutgendorf *et al.*, with 7 of 12 quality appraisal questions receiving a positive response. The small sample size of 31 is similarly difficult to generalise from. The participants were not representative of the general population, as they were older and wealthier, and although confounding factors were identified, they were not controlled for in the analysis. However, the study aim was clearly stated, the loss to follow-up was very small (n=1), and the outcomes were measured multiple times, including self-rated health, depression, quality of life, and depressive symptoms.⁷³

Rantz *et al.* (2011; 2014) were both high-quality studies. The data provided were census data. Some people moved on to different long-term care facilities or died over the course of the evaluations, but none were lost to follow-up. The outcome measures were valid, reliable, and consistent. The authors did not control for confounding, but all other quality appraisal questions were answered positively.^{75 76}

4.2.5 Findings by outcome

The descriptive findings for the six outcomes measured (self-perceived health status, objective health outcomes, physical well-being, mental well-being, social well-being, and costs) are presented in Appendix P.

4.3 Assisted living

Assisted living in the USA provides an intermediate level of care to residents: more care and monitoring than independent living, but less care than a nursing home. However, there is variance in the type of care provided within the assisted living model. Some providers may be independent homes on a campus, while others may be remodelled/repurposed nursing homes with reduced levels of staffing.

Articles chosen for this review needed to have independent dwellings for older people, as per our inclusion criteria; without this specification we may have been looking at nursing or residential care homes under the guise of assisted living. For older people living in apartment-style accommodation, assisted living provides high security and high service.⁷⁴ Meals may be provided, but residents still have the flexibility to cook for themselves. The state of Oregon has a robust system of funding, regulating, inspecting, and auditing their assisted living programmes, and the Frytak *et al.* (2001) and Gaugler *et al.* (2005) studies reflect this.^{74 78} To be licensed as a provider of assisted living in Oregon, a community must offer single-occupancy apartments with full bathrooms including a shower, facilities for refrigerating and heating food, and a lockable apartment door. The assisted living facilities are also required to serve three meals a day in a communal dining room, and to offer care plans that promote ageing in place. We have two studies published in three papers that we classified as assisted living.

4.3.1 Study characteristics

We identified three studies examining the impact of assisted living facilities that fit our inclusion criteria of having self-contained, independent units where residents have their own front door, as opposed to former nursing homes or congregate settings with low-level care. All three studies compared the outcomes of people in assisted living with those living in nursing homes at several time points.

The study characteristics for the evaluations of assisted living are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.3.1.1 Pruchno evaluation

Pruchno and Rose (2000) is the earliest study and compares the effect of long-term care environments (assisted living facilities and nursing homes) on health outcomes using face-to-face interviews at baseline, 4, 8, and 12 months, as well as using medical records at these timepoints and up to 15 months to track mortality and relocation. The study took place in a non-profit organisation in Cleveland, Ohio, consisting of an assisted living community and a nursing home close by but on a separate campus. The assisted living community had 66 individual apartments. In Pruchno and Rose's (2000) study, data are presented for a total number of 158 residents at baseline: 76 from the nursing home and 82 from the assisted living community. The authors report that a 'minority' of people who fit the eligibility criteria declined to participate in the study. Forty-two people from the full sample, including 19 assisted living residents, were lost to follow-up, either through death or refusal to continue participating (numbers for each are not clear), with a final sample of 63 at 12 months in the assisted living community. The authors report that those lost to follow-up were similar to the studied sample at baseline in terms of gender, age, private versus Medicaid payments, marital status, education, depression, length of stay, and self-reported health.⁷⁹

4.3.1.2 Oregon evaluation

Two studies use the same dataset from Oregon to compare outcomes between assisted living and nursing homes in the state.⁷⁴ Respondents were interviewed at three time points (baseline, 6 months later, and 12 months later). Interviewers asked participants about functional status, cognitive functioning, psychological well-being, and social functioning. Chart reviews also provided information at each time point, complementing the interviews.⁷⁴ Of 39 assisted living facilities invited to participate in the Oregon studies, 38 agreed to take part. The authors then randomly sampled one-third of the residents of these 38 facilities.^{74 78} Both studies had a total sample of 605 at baseline, split

between proxy and non-proxy respondents (proxy respondents were used in instances where residents were too cognitively impaired to undertake an interview). The majority (n=478; 79%) of respondents at baseline did the interview themselves (non-proxy) and 127 (21%) participated through a proxy. Six months later at the second time point, there was a total of 517 (86%) respondents, with 367 (71%) responding directly and 150 (29%) having proxies respond on their behalf. At the final time point 12 months later, there was a total of 441 (73%) participants; 285 (65%) responded themselves and 156 (35%) responded via proxies.

Frytak et al. (2001) used hierarchical linear modelling to investigate outcome trajectories for assisted living residents compared with nursing home residents in an assisted living complex in Oregon.⁷⁴ Gaugler et al. (2005) used the same dataset to examine changes in activity levels between residents of nursing homes and assisted living facilities over the same 12-month period.⁷⁸

4.3.2 Study population characteristics

In Pruchno and Rose's (2000) study, data are presented from a total number of 158 residents at baseline: 76 from the nursing home and 82 from the assisted living community. All participants were white and Jewish. For the assisted living cohort, the mean age was 86.2 years (standard deviation: ± 5.8). Nearly three-quarters (n=45; 72%) were women, and 68% (n=47) were widowed. The mean number of years spent in education was 13.0 years (standard deviation: ± 3.5). The full cohort of assisted living residents was paying privately. The mean length of stay was 3.8 days (standard deviation: ± 3.2), with a range of 1 day to 13.3 years. The authors highlight the similarities in baseline characteristics and subsequent outcomes between the nursing home and assisted living samples.

Both Oregon evaluation had a total sample of 605 at baseline, split between proxy and non-proxy respondents.^{74 78} Proxy respondents were used in instances where residents were too cognitively impaired to undertake an interview themselves. The mean age reported at baseline was 84.9 years (standard deviation: ± 7.0). The majority of respondents were women (83.8%; n=507) and white (98.7%; n=595). At baseline, 78.3% (n=474) had been living in the assisted living community for at least 6 months.⁷⁸

4.3.3 Outcomes and their means of measurement

Assisted living communities were evaluated using a variety of outcomes and measures presented in Table 6 and Appendix O. The outcomes cover five principal topics: self-perceived health status, objective health outcomes, physical well-being, mental well-being, and social well-being. Within the seven categories, there are a number of subcategories. For example, objective health outcomes include outcomes such as morbidity, comorbidity, move to residential care, and mortality.

Table 6: Outcomes and their means of measurement in assisted living evaluations

Study ID	Outcome(s)	Means of measurement	Other information
Pruchno & Rose 2000			
Pruchno 2000	Subjective health	Part of the Multilevel Assessment Instrument	
	Cognitive status	Mini-Mental State Examination	
	Functional abilities	Multilevel Assessment Instrument	Activities of daily living: Eating Dressing Grooming Getting around the home Getting in and out of bed Bathing and toileting
			Instrumental activities of daily living: Housework Laundry Preparing meals Grocery shopping Getting around Using the telephone Managing money Taking medication
	Depression	Center for Epidemiologic Studies Depression Scale	
	Relocation	Facility census data	
	Mortality	Facility census data	
Oregon evaluation			
Frytak 2001	Functional abilities	Activities of daily living	Continence, feeding, toileting, transferring dressing
	Pain and discomfort	Pain and Discomfort Scale	
	Psychological well-being	Short Form-36 Mental Health subscale	
Gaugler 2005	Activities	Nine social activities	Going to see a movie, play, going to a restaurant, etc. Going to church, senior center, club, etc. Staying overnight elsewhere Relatives or children visiting External friends visiting Having a conversation with other tenants Having telephone contact with family members or friends Doing activities such as reading books or newspapers Doing group activities such as bingo, cards, exercise groups

4.3.4 Quality assessment

Pruchno and Rose's (2000) study was of moderate to high quality.⁷⁹ We could not determine whether the participants in the study were representative of the population studied. The sample size of 63 was not large enough to provide confidence in the findings presented, and more than 20% (n=19) were lost to follow-up.⁷⁹

Frytak et al.'s (2001) study was of high quality. Statistical power was modelled, and the sample size was found to be adequate for detecting effects.⁷⁴ The sample was representative, as it was a random sample of census data from eligible facilities. Among the assisted living sample, 19 participants could not be reached or refused to participate in the second wave of data collection, which only amounted to 3.7% of participants. However, descriptive information on the sample's mean age, gender split, or number of years living in assisted living were not presented, limiting the study's generalisability. Gaugler (2005) used the same dataset, and so was determined to be of similar quality.⁷⁸

4.3.5 Findings by outcome

The descriptive findings for the five outcomes measured (self-perceived health status, objective health outcomes, physical well-being, mental well-being, and social well-being) are presented in Appendix P.

4.4 Planned retirement communities

Planned retirement communities are age-restricted, leisure-focused retirement communities generally located in sunny climates in the USA. The communities emphasise active lifestyles and leisure. They are purpose-built for older people but do not provide care services, and as such the people who move to them are referred to as ‘amenity migrants’. Many people move quite far from home to live in these retirement communities.

The review of planned retirement communities features one study published in two journal articles by Waldron *et al.* (2005a; 2005b) on this model of housing for older people.^{80 81} The retirement community studied in these two articles was located on a campus containing social groups, a golf course, and computer facilities. The social groups indicate that these planned retirement communities emphasise socialising and creating opportunities for residents to get to know one another. There may be differences experienced in the social bonds between residents, and in the social bonds people have with their family or had in their own communities prior to the move.

4.4.1 Study characteristics

Waldron *et al.* published two papers from the same longitudinal study, and as such, both papers have the same study characteristics.^{80 81} The papers investigate an active retirement population in the Southwest of the USA, and participants were interviewed 6 months and 48 months after they joined the community, referred to as Activetown.

Waldron *et al.* (2005a) examined the impact on supportive relationships of local and distant movers to this community after 4 years in the retirement community.⁸⁰ Waldron *et al.* (2005b) examined the impact of gender differences on supportive relationships, and on ‘mediated communication’ use (i.e. email).⁸¹

The initial response rate was 51%, with 453 first-wave surveys completed out of 889 surveys distributed. At 48 months, 255 (56%) participants completed the second survey.^{80 81}

The study characteristics for the evaluations of planned retirement communities are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.4.2 Study population characteristics

The study population for both papers consisted of 225 movers.^{80 81} These residents completed the second survey after 4 years of living in the planned retirement community of interest. The average age at baseline was 66 years (standard deviation: ± 6 years), more than half (53%) of the study population was women ($n=132$), and almost all (98%) were white. Ninety-one per cent of people in the sample were ‘satisfied with their income’, indicating a high socioeconomic class/status. The majority (69%) of participants had moved from out of state to the Activetown retirement community. The sample was also very healthy, with 93% reporting good health at baseline.^{80 81} Table 7 presents the outcomes and their means of measurement.

The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

Table 7: Outcomes in planned retirement community evaluations

Study	Study ID	Outcome(s)	Means of measurement
Activetown	Waldron 2005a	Differences in social support between local and distant movers	Adapted Quality of Relationships Inventory
	Waldron 2005b	Gender differences in social support	Adapted Quality of Relationships Inventory
		Gender differences in email use	Frequency of email usage in the past 30 days

4.4.3 Outcomes and their measurements

4.4.3.1 Social well-being

Waldron's (2005a;2005b) evaluations measured social well-being outcome including: perceived social support as well as gender differences in social support and email use (Appendix O).

4.4.4 Quality assessment

Both of Waldron *et al.*'s papers were of relatively low quality.^{80 81} The eligibility criteria were not clearly defined, the sample size was relatively small, no variance was reported in Waldron *et al.* (2005a),⁸⁰ the loss to follow-up was 44% after 48 months, and although confounders were identified, they were not controlled for in the analysis.

4.4.5 Findings by outcomes

The descriptive findings for the social-well-being outcome are presented in Appendix P.

4.5 Extra care housing

Extra care housing in the UK is targeted to people aged 55 years or over.⁸² Kingston *et al.* (2001) evaluation of extra care housing reported that retirement communities, such as ExtraCare Charitable Trust villages, can be seen to combine a retirement element, a community element, a degree of collectively, and a sense of autonomy with security.⁸³

The University of Kent team evaluating the extra care housing initiative reported that there is no universal definition of the term,^{84 85} but cite LaingBuisson (2010), who suggest that extra care housing can be recognised by several characteristics: it is primarily for older people; it is self-contained; it is ergonomically designed and accessible; it includes a private kitchen; personal care can be delivered flexibly, usually by a team of staff based on the premises; support staff are available on the premises for 24 hours per day; domestic care is available; communal facilities and services are available; meals are usually available and charged for when taken; and it aims to be a home for life.⁸⁶ Darton *et al.* state that “extra care housing has also been viewed [by other researchers and government] as a possible alternative to moving into a care home ... However, it is likely to have more impact on homes providing personal care [in the UK], formerly termed ‘residential homes’, because care homes will still be needed for residents requiring high levels of nursing care or continuous monitoring.”^{87 p88} Darton *et al.* (2012) reported that a move to a care home is likely to be as a result of a crisis, whereas a move into extra care is likely to be a planned move.⁸⁷ Extra care schemes aim for a balance of residents with high, medium, and low or no care needs in order to create an active community and avoid overwhelming the social care services provided.⁸⁷

The University of Kent team goes on to say that extra care housing encourages independent living in one’s own self-contained, accessible dwelling and offers security of tenure. Extra care housing schemes offer a variety of housing tenures, including rented, leasehold, or shared ownership arrangements. Schemes are intended to support residents with a range of disabilities, as well as to provide facilities for members of the local community. Smaller extra care schemes typically have an average of 40 housing units, while retirement villages have more than 100 units. Village-type accommodation provides a wider range of social and leisure activities. Extra care schemes involve either the refurbishment of existing older age residences or new builds on ‘brownfield sites’.

Holland *et al.* (2017) describe similar features of the ExtraCare Charitable Trust housing schemes included in their research, and add that other terms for extra care housing also include ‘very sheltered housing’, ‘care plus housing’, ‘assisted living housing’, and ‘category 2.5 housing’.⁸⁸ We identified four evaluations of extra care housing schemes presented in 16 publications published between 2001 and 2019.

4.5.1 Study characteristics

We identified four evaluations of extra care housing schemes presented in 15 publications published between 2001 and 2019.

The earliest evaluation of extra care housing schemes was carried out in the late 1990s by Dr Paul Kingston and colleagues from Keele University, who published one peer-reviewed journal paper on a single extra care-type scheme.⁸³

The University of Kent has published several documents on the evaluation of extra care housing schemes built in England between 2006 and 2008. We reviewed four peer-reviewed journal papers,^{84 87 89 90} four published reports,^{82 91-93} and one technical report.⁸⁵

Kneale and Smith (2013) published one peer-reviewed paper that used routine data about 1,188 residents living in one of nine extra care housing schemes. The nine extra care schemes comprised four villages and five courtyard developments, and were operated by the ExtraCare Charitable Trust. The paper assessed whether extra care housing can be a home for life.⁹⁴ This paper was part of a larger study by the International Longevity Centre and included extra care communities managed by three housing providers: Audley Retirement, Retirement Security Limited, and, as already mentioned, the ExtraCare Charitable Trust.⁹⁵

The Aston University team evaluated ExtraCare Charitable Trust villages between 2012 and 2016. The research was led by Professor Carol Holland and was published in one peer-reviewed journal paper⁸⁸ and three reports.⁹⁶⁻⁹⁸

All evaluations took a longitudinal approach; that is, they collected baseline data and carried out at least one follow-up. In addition, all four evaluations compared the experiences in extra care-type housing with a group of independent control participants.

The study characteristics for the evaluations of extra care housing are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.5.1.1 Keele University evaluation

Kingston *et al.* (2001) assessed the health impacts of age-specific extra care-type housing on consenting tenants living in one retirement community, and compared these with older people attending three local day centres.⁸³ The authors measured physical and mental health outcomes at baseline and again at 12 months. The research team invited all 47 residents in the extra care housing village to participate in the study. The total number of participants at baseline was 47 living in age-specific housing and 98 attending one of three day centres in the same geographical region, and at follow-up there were 42 participants (89%) living in extra care-type housing and 74 (76%) attending day centres (Table 8). Residents in the extra care village were originally living in the area prior to their move to extra care housing.⁸³

Table 8: Number of cases and control participants at each data collection timepoint in Kingston 2001

Participant group	Baseline	12 months
Extra care	47	42 (89%)
Control	98	74 (76%)
Total sample	145	116

4.5.1.2 University of Kent evaluation

The University of Kent completed several pieces of research on extra care schemes. All residents in the extra care schemes agreed to participate in the evaluation as a condition of being allocated tenure of an extra care house.

The extra care residents' experiences of their new living environment were assessed at baseline and at 6 months in 19 schemes, and residents of 15 schemes were assessed again at 12 months.^{84 90 91 93} At baseline, 1,182 residents participated in the survey recording their experiences, but at 12 months only 599 took part (51% of the total sample) (Table 9). By 30 months, 280 (24%) extra care residents had died, 163 (14%) had moved out of the scheme, and 739 (63%) were still living in extra care. The data were collected between 2008 and 2010.

Table 9: Number of cases completing the self-completed questionnaire in Netten 2011, Callaghan 2009, Bäumker 2011, and Darton 2011b

Group	Number of schemes used in denominator	Baseline (3 months after moving)	6 months	12 months	30 months
Participated	19 schemes	1,182	650	599	Not applicable
Moved		Not available	Not available	Not available	163
Died		Not available	95	Not available	280
Still living in extra care		Not available	Not available	Not available	739
Declined to participate		Not available	248	Not available	Not applicable

In addition, 817 residents who required assistance had a care assessment record, and these records were examined in order to determine the physical and mental well-being of the extra care population availing of the care component of the scheme. An additional seven participants joined the assessment process during the 30-month evaluation period.⁹² The extra care residents requiring care assessments had their data reviewed at baseline, 6 months, 18 months, and 30 months. However, the number of schemes participating at 18 months had dropped to 16, and at 30 months only 11 schemes were still participating.^{90 93} The 30-month evaluation included the data for 130 residents who had a care assessment at 30 months (which included the 7 additional residents who required a care assessment at some point after the baseline data collection), plus the 694 residents whose care assessment end point was at 18 months or earlier (Table 10).

Table 10: Number of cases at each data collection timepoint based on care assessment records in Netten 2011 and Darton 2011c

Group	Number of schemes used in denominator	Baseline	6 months	18 months	30 months	Cumulative
Extra care	19 schemes	817	627	453	241/248 (total/plus 7 new entrants)	817/842 (total/plus 7 new entrants)
Moved		31	23	8	2	64
Died		81	58	17	10	166
Lost to follow-up		78	38	12	3	131
Refused but had care assessment		0	55	175	103	333
Alive and available to participate		627	453	241	130/123 (total/minus 7 new entrants)	130/ 123 (total/minus 7 new entrants)
Other refusals		159	192	84	0	
Final participation at this point		468	261	157	123	
Extra care	11 schemes	496	378	243	146	123
Moved (cumulative)		21	18	7	2	48
Died (cumulative)		56	50	16	10	132
Lost to follow-up (cumulative)		41	23	9	3	76
Refused but had care assessment		0	44	65	8	117
Alive, available and participated		378	243	146	123	123
Final participation at this point		163	155	55	123	

Callaghan *et al.* (2009) combined data from the routine self-completed questionnaire examining 599 (51%) of 1,182 residents' experiences of extra care at 12 months with a bespoke, face-to-face interview with 166 residents exploring their social well-being.⁹¹ The authors' interview sample of 166 residents was different than the sample of non-interviewed residents, as a higher proportion of residents with care packages participated in the interviews.⁹¹ We assume that the 166 interviewees also completed the self-completed questionnaire.

Bäumker *et al.* (2010) assessed the comparative cost before and after residents moved into an extra care housing scheme in Bradford, England, and placed these costs in context by considering the achieved outcomes for residents.⁸⁹ The case study was a before and after evaluation. Residents were interviewed about their previous circumstances soon after moving into the scheme (baseline) and again after 6 months. Information was collected from 40 of 52 eligible residents at the baseline interview, and from 22 residents at the 6-month follow-up.⁸⁹

Bäumker *et al.* (2011) purposefully designed the extra care costs and outcomes evaluation to record information – likely to influence effectiveness, resource utilisation, and costs – in a way that was comparable to the information collected in the 1995–1999 and 2005 University of Kent studies of publicly funded admissions to care homes.⁸⁴ The analyses presented in their paper are based on 408

(50% of the 817 care assessment population) of 650 individuals (80% of the 817 care assessment population) who were alive and available to participate at 6 months when individualised cost and outcome data were collected. However, the extra care evaluation experienced a 45% loss to follow-up between baseline and 6 months. A higher proportion of individuals died before the 6-month interview stage in the care homes sample (17%) compared with the extra care group (8%). In the extra care group, 21% of the individuals were not available to participate, or withdrew before, the 6-month follow-up interview.

4.5.1.3 International Longevity Centre evaluation

Kneale and Smith (2013) assessed whether extra care housing can be a home for life through analysis of an existing dataset containing complete data for 1,188 cases living in one of nine extra care schemes.⁹⁴ The nine extra care schemes were all operated by the ExtraCare Charitable Trust. The residents moved into the schemes between 1995 and 2006 and were observed to the end of 2010. The authors examined movement into institutional care compared with those living in the community and receiving domiciliary care. The extra care data file included dates of entry and exit, destination on exit, age, gender, living arrangements, care level on entry, and subsequent change in care level.

Kneale is part of a larger study that examined the extra care housing managed by three providers for between 5 and 15 years. It examined outcomes related to physical functioning and health, and to social care services, in addition to objective health outcomes.⁹⁵ The authors compared extra care residents with 2,942 people aged 65 years and over living in the community and receiving domiciliary care who participated in the longitudinal British Household Panel Survey (which started in 1991) in 2008/2009; this survey also collects data on age, gender, care level, and the required outcomes (hospitalisation, entry to residential care, and death). The authors used propensity scoring to match extra care residents with community residents who participated in the survey. They used the characteristics age, gender, entry year, and living arrangement as predictors of entering extra care housing and then matched those characteristics with the same or a very close predicted match within the community sample. The authors compared lengths of stay in the respective environments using event history models in order to analyse the duration of stay in extra care housing and community-based housing.⁹⁴

4.5.1.4 Aston University evaluation

Holland *et al.* evaluated whether the extra care approach produced positive outcomes for healthy ageing that resulted in measurable care cost savings. Outcomes included health and social care usage and costs.^{88 96-98} The authors recorded health, well-being, cognitive ability, and mobility measurements of consenting residents and community-based control participants living in the Midlands at baseline, 3, 12, 15–18, 24, 36, 48, and 60 months (Table 11).⁹⁸ The residents lived in 13 ExtraCare Charitable Trust housing schemes, and 17% of residents entering extra care housing participated in the research.^{97 98} The number of extra care research participants varied over time and declined substantially after 18 months, while the number of community-based control participants declined substantially after 36 months (Table 11).^{97 98} The extra care participants could not be compared with community-based control participants after 36 months due to a high level of attrition among the controls. Twelve extra care study participants had died by 18 months follow-up, another 14 cited their own or their partner's illness as a reason for not continuing in the study, 15 withdrew saying they found the assessments demanding, 12 did not respond to contacts or withdrew without giving a reason, 2 people moved out of the village, 6 said they were no longer interested, and 1 was not assessed further because of concerns about capacity (Table 11). Of the control participants, none had died and five could not be contacted by 18 months follow-up.⁹⁷ There is no further explanation of deaths or other loss to follow-up in either the extra care or control group beyond the 18-month time point. The plan was to allow a small number of new extra care participants (up to 10) and community-based control participants (up to 5) to enter the study at subsequent data collection time points to address attrition, so the percentages of remaining participants at follow-up were an overestimate of the true percentage.⁹⁷ The authors acknowledged that attrition was greater among participants who had poorer health. The 18-month findings indicated that those who left the study had statistically significantly lower average self-perceived health scores, a significantly higher average number of chronic diseases, and significantly lower average cognitive functioning scores when compared with

their counterparts who remained in the study.⁹⁷ However, there was no difference in the age profile of those who left the study compared with those who remained in the study at 18 months.

Table 11: Number of cases and community-based control participants at each data collection timepoint as reported by Holland

Group	0 months	3 months	12 months	15–18 months	24 months	36 months	48 months	60 months
ExtraCare interview participants	162	134	111	97	60	51	43	22
New ExtraCare interview participants	Not applicable	10	10	2	Not available	Not available	No additions	No additions
ExtraCare lost to follow-up	Not applicable	24	24	14	Not available	Not available	Not available	Not available
Not accounted for but lost to follow-up*	Not applicable	4	13	14	Not applicable	Not applicable	Not applicable	Not applicable
Well-being data	151	91	96	69	Not available	Not available	Not available	Not available
Control	31	32	33	29	30	45	12	2
New control participants	Not applicable	2	6	0	Not available	Not available	No additions	No additions
Well-being data	33	31	31	29	Not available	Not available	Not available	Not available
Total sample	193	178	160	128	90	96	55	24

*Lost to follow up but not accounted for by authors under cumulative numbers of extra care participants lost to follow-up (Table 12)

Table 12: Cumulative numbers of extra care participants lost to follow-up as reported by Holland

Group	3 months	12 months*	18 months
Died	3	6	12
Moved out	1	3	2
Refused with or without a reason or unable to contact	20	39	47
Lack of capacity to consent	0	0	1
Total	24	48	62

*Includes 3-month controls

4.5.2 Study population characteristics

The four evaluations of extra care housing had different comparison populations and only two covariate measures, age and gender, were recorded across all four evaluations (Table 13).

Table 13: Age and gender of extra care study samples at baseline

Evaluation	Study ID	Characteristics	Extra care	Control
Keele University	Kingston 2001	Age in years (mean)	80.1	76.4
		Gender (% male)	28%	25%
University of Kent	Darton 2012	Age in years (mean)	77	85
		Gender (% male)	34%	27%
International Longevity Centre	Kneale 2011	Age in years (mean)	75.8	Not required as matched
		Gender (% male)	34%	Not required as matched
Aston University	Holland 2017	Age in years (mean \pm standard deviation)	75.2 \pm 8.2	71.8 \pm 6.3
		Gender (% male)	38%	26%

4.5.2.1 Keele University evaluation

Kingston *et al.* (2001) reported that the extra care population had a mean age of 80.1 years and the day centres' population had a statistically significant lower mean age of 76.4 (Table 13).⁸³ The gender mix was similar for both the extra care population and the day centres' populations. Kingston *et al.* (2001) reported health service use as an indicator of health status. People living in extra care-type accommodation were less likely to use health visitors, physiotherapists, or social workers than their counterparts in day centres at 12 months.⁸³ The authors did not control for the effects of age or health service use in their analysis.

4.5.2.2 University of Kent evaluation

In the University of Kent evaluation, information was collected from all permanent residents who consented to participate about their expectations and their experiences of moving into extra care housing (N=1,182 at baseline). In the villages studied, most residents entered without a care assessment, so information was only collected about their expectations and experiences. Information was also collected about the demographic characteristics and care needs of residents who had

received an assessment for care services (n=817; 172 in the villages and 645 in the smaller schemes). Of 817 individuals, 609 moved into the schemes within 6 months of them opening, 132 to the villages and 477 to the smaller schemes. There were 909 units of accommodation in these schemes, excluding accommodation designated for intermediate care and for residents in the villages who did not require care services. Darton *et al.* (2012) compared the baseline characteristics of the 609 residents in extra care schemes with residents entering care homes.⁸⁷ The mean age of residents living in extra care housing (77 years) was lower than the mean age for people entering residential care (85 years). This is explained by the fact that 24% of extra care residents were aged under 70 years, compared with 9% of residential care entrants. A higher proportion (34%) of extra care residents than care home entrants (27%) were male. A lower proportion of extra care residents (47%) than care home entrants (68%) were widowed. The vast majority of both extra care residents (97%) and care home entrants (99%) were of white ethnic origin. A larger proportion of extra care residents (65%) moved directly from their private home, compared with the proportion of care home entrants (27%); a much lower proportion of extra care residents (4%) moved directly from hospital to extra care housing compared with the proportion of care home entrants (38%). The proportion of extra care participants who were homeowner/occupiers was somewhat higher among those who moved into extra care housing (33%) than among those who moved into care homes (26%). Equal proportions of local authority tenants moved to extra care schemes (57%) and to care homes (57%). A higher proportion (76%) of people living alone entered care home than the proportion (60%) who moved to an extra care scheme.⁸⁷

Callaghan *et al.* (2009) reported that they interviewed two population samples at 12 months: those who did the self-completed questionnaire (n=599) and those who participated in a face-to-face interview (n=166) in 15 extra care schemes.⁹¹ In some areas of the research, the authors report on 13 schemes only. The ages of residents in both groups ranged from 51 years to 103 years, with an average age of 77.4 years for those who completed the questionnaire and 76.3 years for those who took part in the interview. The majority of participants were female: 64% for the self-completed questionnaire and 62% for the face-to-face interview. A higher proportion (45%) of participants who did the face-to-face interview required care than the proportion (24%) who completed the questionnaire.

Bäumker *et al.* (2010) assessed the comparative cost before and after residents moved into an extra care housing scheme in Bradford, England, and placed these costs in context by considering the achieved outcomes for residents.⁸⁹ Information was collected from 40 of 52 eligible residents at the baseline interview, and from 22 residents at the 6-month follow-up. The 22 residents were, on average, 2 years younger than those in the initial group of 40 residents. The proportion of men to women was the same at baseline and at the 6-month follow-up, and there were similar proportions of residents in each marital status category. No residents were recorded as being of non-White origin. The difference between the mean Barthel Index for Activities of Daily Living and Minimum Data Set Cognitive Performance Scale scores for the 22 residents who participated at the 6-month follow-up and those who were not followed up on was not significant at the 5% level of significance; however, the Minimum Data Set Cognitive Performance Scale score difference was significant at the 10% level. It seems that in terms of cognitive impairment, a note of caution is needed because there was some indication that those who declined to participate at the follow-up stage were more cognitively impaired than those who remained in the study.

Bäumker *et al.* (2011) purposefully designed the extra care costs and outcomes evaluation to record information in a way that was equivalent to that collected in the 1995–1999 and 2005 University of Kent studies of publicly funded admissions to care homes.⁸⁴ Bäumker *et al.* (2011) included 408 extra care residents across the 19 schemes for whom cost data were available at the 6-month interview stage. The mean age was 77 years, with half of participants between the ages of 70 and 85 years. About 66% of extra care participants were female, and 57% of participants lived alone at the time of the interview. There were 614 care home entrants in the 1995–1999 survey and 469 in the 2005 survey. Those who remained in the study for at least 6 months were slightly less cognitively impaired than those who dropped out (average Minimum Data Set Cognitive Performance Scale scores were 0.82 for remainers compared with 1.17 for dropouts). The mean Barthel Index for Activities of Daily Living scores were almost identical for remainers and dropouts (13.98 and 14.05, respectively). Propensity score matching between extra care residents and care home admissions was done to control for age, gender, and level of care required.⁸⁴

4.5.2.3 International Longevity Centre evaluation

The authors described the characteristics of residents living in extra care housing managed by three organisations.⁹⁵ The average age on entry to extra care housing was in the mid-70s. The ratio of men to women was approximately 1:2, and the ratio of single to couple households was 2:1. Most residents entered extra care housing without being in receipt of an additional care package.⁹⁵ Propensity score matching between extra care residents and community-based surveys was done to control for age, gender, level of care required, and other factors of interest.

Kneale examined movement into institutional care by those living in nine extra care schemes and by people living in the community receiving domiciliary care in order to compare the proportion of residential care admissions by place of residence.⁹⁴ The age range of the extra care population was 50 years to 85 years and over. Seventy-five per cent of extra care residents were aged over 70 years and 34% were men.⁹⁴ The authors reported that the nine extra care housing schemes included in this study were located in both deprived and affluent areas of England, and the residents could occupy properties through renting, leasing, or part ownership. The extra care participants in this study were matched to people from the 2008/2009 British Household Panel Survey using propensity score matching, which only allowed close matches, in order to select a suitable control group.⁹⁴ The authors applied propensity score matching using the nearest neighbour method with no replacement and a low caliper value. They randomly sorted the data before undertaking the matching process. The authors matched both datasets based on age, gender, living arrangement, the year follow-up began, and with community members who were in receipt of some form of domiciliary care.⁹⁴

4.5.2.4 Aston University evaluation

Holland *et al.* used community-based control participants and reported that at baseline, the extra care movers (mean age: 75.2 years; standard deviation: ± 8.2) were older than the community-based control participants who remained in their original homes (mean age: 71.8 years; standard deviation: ± 6.3).⁸⁸ There were proportionately more men (38.3%) in the extra care sample than in the community-based control sample (25.8%).⁹⁷ Holland *et al.* also reported that extra care participants had more chronic illnesses at baseline than the control group.⁹⁷ In addition, the socioeconomic status of the research participants from the extra care villages was lower than that of the community-based control participants. However, the control participants were a self-selected population of people willing to take part in university-based research and may not be representative of the overall population living in the community (known as the 'healthy volunteer effect'). The analysis controlled for age differences, gender differences, attrition, and ceiling effects related to some measures (healthy people having no reported problems on some measures) through standardisation or regression.⁹⁷

The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

4.5.3 Outcomes and their measurements

Table 14 presents the outcomes measured for the extra care housing in the four evaluations examined. The outcomes cover seven principal topics: self-perceived health status, objective health outcomes, physical well-being, mental well-being, social well-being, health and social care utilisation, and costs. Within the seven categories, there are a number of subcategories (Table 14). For example, objective health outcomes include outcomes such as morbidity, comorbidity, move to residential care, and mortality.

Table 14: Outcomes and their means of measurement in the four extra care evaluations

Institution/Study ID	Outcome(s)	Means of measurement
Keele University Kingston 2001	Self-rated health Physical well-being (physical functioning) Mental well-being (quality of life) Social well-being Health and social care utilisation	Short Form-36 - self-rated health and questions on activities of daily living Life Satisfaction Index 18 semantic differentials Loneliness
University of Kent Callaghan 2009	Quality of life Social well-being: Social participation Scheme-based friendships Contact with scheme-based friends and other friends Contact with relatives Participation in activities Level of choice of, and fulfilment through, activities Level of social support Social climate	Bowling's Older People's Quality of Life Questionnaire CASP-19 scale The first six social indicators were measured through a single question on the topic and were included in the self-completed questionnaire given to all participating residents at baseline and 12 months. The level of social support was measured using three questions that were asked in the face-to-face follow-up interview at 12 months only Three relevant subscales of the Social Care Environment Scale – Cohesion, Conflict, and Independence were used to assess social climate
University of Kent Bäumker 2010	Self-rated health Physical well-being (functioning) Mental well-being: Quality of life Cognitive functioning Costs of extra care	Based on care assessment at 6 months Activities of daily living and instrumental activities of daily living CASP-19 scale Minimum Data Set Cognitive Performance Scale
University of Kent Bäumker 2011	Comparative costs between extra care and care homes	Costs were measured comprehensively to include as many service components as possible at an individual level. Costs excluded primary health care, hospital, and social security costs Gross weekly placement fee excluding primary health care, hospital, and social security costs Costs were set at 2008 GB£ rates
University of Kent Darton 2011a Darton 2011b Darton 2011c Darton 2012 Netten 2011	Comparative costs between extra care and care homes Baseline physical and mental well-being Physical well-being, mental well-being, and survival	Minimum Data Set Cognitive Performance Scale Activities of daily living and instrumental activities of daily living Incidence of death Incidence of institutionalisation

Institution/Study ID	Outcome(s)	Means of measurement
International Longevity Centre	Time to residential care or death in extra care population and population receiving domiciliary care	Incidence of institutionalisation (entry to residential care)
Kneale 2011		Incidence of death
Kneale 2013	Physical functioning	Incidence of falls in 2008
	Health and social care utilisation	Assessment of care requirements
		Hospitalisations
Aston University	Self-rated health	Self-perceived health was rated as 'excellent', 'very good', 'good', 'fair', or 'poor'
Holland 2014	Physical well-being: functioning	
Holland 2015	Mental well-being:	Activities of daily living, instrumental activities of daily living, and Functional Limitations Profile
Holland 2017	Cognitive functioning	
	Autobiographical memory	Mini-Mental State Examination
	Anxiety and depression	Addenbrooke's Cognitive Examination III measure and modified
	Costs	Autobiographical memory test
		Hospital Anxiety and Depression Scale
Aston University	Self-rated health	Self-rated health was rated as: 'excellent, very good, good, fair or poor'
Holland 2019	Physical well-being: functioning	
	Mental well-being:	Activities of daily living, instrumental activities of daily living, and functional limitations profile
	Cognitive functioning	
	Autobiographical memory	Mini-Mental State Examination
	Anxiety and depression	Addenbrooke's Cognitive Examination III measure and modified
	Costs	Autobiographical memory test
	Added at 24 months:	Hospital Anxiety and Depression Scale
	Physical well-being: grip strength	
	Mental well-being: quality of life	CASP-12
	Social well-being: loneliness and social isolation	Brief University of California Los Angeles Loneliness Scale
	Resilience	10-item Connor-Davidson Resilience Scale (CD-RISC 10)
	Self-perceived exhaustion	Age-Friendly Environment Assessment Tool
	Age friendliness	

4.5.4 Quality assessment

Kingston *et al.* (2001) is a moderate- to high-quality study, with loss to follow-up below the allowed 20% threshold in the intervention group and marginally above the allowed 20% threshold in the control group.⁸³ The intervention could have been better described, but it was clear that it was housing with support for older people. The other weakness was that the authors did not control for confounding factors that may have influenced their outcomes.⁸³

The University of Kent studies were a very large undertaking and comprise multiple papers and reports (see Table 14). The survival study based on care assessments was of low to moderate quality, as it had very high loss to follow-up after 6 months and, as acknowledged by the authors, the sample was biased to include those well enough to participate in the assessment.⁹² The cost-effectiveness

study that used care records appear to be of high-quality with appropriate statistical and econometric analysis, good follow-up, and serious attempts to control for confounding in the studies.⁸⁴ The case study by Bäumker *et al.* (2010) is not generalisable to other extra care housing schemes, a limitation noted by the authors themselves. It had high loss to follow-up and is a moderate-quality case study.⁸⁹ The evaluation by Callaghan *et al.* (2009) was judged to be of moderate quality, as it had high loss to follow-up and did not control for confounding factors.⁹¹

The evaluation reports by Kneale (2011)⁹⁵ and Kneale and Smith (2013)⁹⁴ are two high-quality studies meeting all applicable assessment criteria.

The evaluation by Holland *et al.* (2017) at 3 months is judged to be of moderate to high quality, as it had low loss to follow-up and controlled for confounding factors.⁸⁸ However, the sample size calculation was not justified and the representativeness of the sample were demonstrated. The evaluations by Holland *et al.* (2014; 2015) at 12 and 18 months are also judged to be of moderate to high quality.^{96 97} The evaluation by Holland *et al.* (2019) at 60 months⁹⁸ is judged to be of low to moderate quality, as the authors did not justify their sample size calculation or its representativeness, and the study had high loss to follow-up at this stage.

4.5.5 Findings by outcome

The descriptive findings by outcome are presented in Appendix P.

Appendix P contains descriptive findings for self-perceived health status, objective health outcomes, physical well-being, mental well-being, social well-being, health and social care utilisation, and costs

4.6 Senior housing

The study characteristics for the evaluations of senior housing are presented in tabular format in Appendix N to allow comparison across studies. The studies in Appendix N are presented by housing model and country. Study characteristics are provided include study design, timepoints, participants at baseline, participants at follow-up, loss to follow-up, population age, and proportion of males and females.

Senior housing was evaluated in Canada and Finland. We identified two evaluations of senior housing presented in 4 publications published between 2008 and 2018. For each country, the included studies' characteristics, outcomes, and measures are described below.

4.6.1 Canada

Smith and Sylvestre (2008) investigated the role of neighbourhood and individual factors in the residential adjustment of recent movers to Canadian government-subsidised senior citizen apartment buildings.⁹⁹

4.6.1.1 Study characteristics

The authors' sample included 137 (33%) out of 415 recent movers in 25 subsidised senior citizen apartment buildings in Winnipeg, Manitoba. A purposive sample of senior citizen apartment buildings was selected to comprise a reasonable balance of projects from the inner city (13 projects) and the suburbs (12 projects). A convenience sampling procedure was used to select senior citizen apartment residents for inclusion in the interview survey. The researchers invited 415 residents who had moved to one of these apartments between 1 and 3 months earlier to participate in the research, and a total of 230 residents completed the baseline questionnaire, representing a response rate of 55%. Of the 230 residents in the baseline sample, only 60% completed the follow-up questionnaire at 12 months (Table 15). At 12 months, 30 individuals refused to participate in the follow-up survey, 54 (23.5%) of the initial survey participants had moved out of their senior citizen apartment, and 9 (3.9%) had died.⁹⁹ The authors' findings were not compared with an independent control population.

Table 15: Number of cases at each data collection timepoint in Smith 2008

Study ID	Housing model	1-3 months	12 months
Smith 2008	Senior housing	230	137 60% of the total baseline sample 82% of the baseline sample when adjustments were made for migration out and death

4.6.1.2 Study population characteristics

More than three-fifths (63%) of recent movers were aged 65 years or over and 62% were women (Table 16).⁹⁹ Most women in the sample were classified as single (87%), which included those who had either never married or were widowed, separated, or divorced. Fifteen per cent of the participants reported that their income was not adequate to meet their needs. Slightly more than 20% had an education level of grade 6 or below, and 17% had gone to college or university. Limitations to activities of daily living and instrumental activities of daily living, as well as the presence of chronic diseases, were collected as covariates. Regression models were used to control for confounding factors.⁹⁹

Table 16: Age and gender of study samples at 12 months in Smith 2008

Study ID	Characteristics	
Smith 2008	Age in years (\pm standard deviation)	Not available
	Gender (% male)	38%

4.6.1.3 Outcomes and their measurements

The outcomes measured at 3 and 12 months after the move were self-perceived health status and mental well-being (depression, self-esteem, and morale).⁹⁹ Each of these outcomes was measured using existing validated scales (Table 17). Four separate regression models were formulated and tested, with each of the personal state outcomes (self-perceived health status, morale, depression, and self-esteem) treated as a dependent variable. The first model was a logistic multiple regression model that predicted self-perceived health coded as a dichotomous variable. The second, third, and fourth models were ordinary least squares multiple regression models that predicted morale, depression, and self-esteem measured using continuous data. The regression models were created using a stepwise approach. For each of the four exploratory regression analyses, two blocks of independent variables were entered into the equation: the four sociodemographic control variables and the change variables. The final analytic models contain variables significant at the 0.05 level for model 1, and variables significant at the 0.10 level for models 2–4. The model results do not present numbers by independent and dependent variable.⁹⁹

Table 17: Outcomes measured and their means of measurement in Smith 2008

Study ID	Outcome(s)	Means of measurement
Smith 2008	Personal state outcomes of the movers:	Self-perceived health was assessed based on responses to a global question concerning health status. Specifically, respondents were asked to rate their health on a 5-point scale ranging from 'bad' to 'excellent'.
	Self-rated health	
	Self-esteem	The Bachman revision of Rosenberg's Self-Esteem Scale was used as a unidimensional measure of global self-esteem. The scale consists of 10 items with a yes-or-no format. The scores on the scale range from 0 (low self-esteem) to 10 (high self-esteem).
	Morale	
	Depression	The morale of respondents was evaluated using a shortened version of the Philadelphia Geriatric Center Morale Scale, a multidimensional measure of the subjective well-being of older adults. The scale includes 14 items related to agitation, attitude towards ageing, and loneliness with responses based on a yes-or-no format. The scores on the scale range from 0 (low morale) to 14 (high morale). Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale, which was developed to identify depression in the general population. To indicate the frequency of occurrence of 20 depressive symptoms in the past week, the scale includes 20 items with a 4-point response format ranging from 'rarely or none of the time' (0 points) to 'most of the time' (3 points). Based on the addition of these points, the scores on the scale can range from 0 (low or not depressed) to 60 (severely depressed).

4.6.1.4 Quality assessment

Smith and Sylvestre's (2008) study comprised a purposive sample of senior housing apartment blocks and a convenience sample of recent entrants, so it cannot be said to represent all such housing in Canada.⁹⁹ Given that the study used a convenience sample, it would have been inappropriate to apply variance measures. The authors described the intervention clearly and pre-specified their outcomes. Their outcome measures were assessed using validated measures. Their loss to follow-up was less than 20% after adjusting for migration out of senior housing and death.⁹⁹ However, the study findings are valid only for the sample in the study.

4.6.1.5 Findings by outcome

The descriptive findings by outcome are presented in Appendix P.

Appendix P contains descriptive findings for self-perceived health status and mental well-being. There were no findings for objective health outcomes, physical well-being, social well-being, health and social care utilisation, or costs.

4.6.2 Finland

Lotvonen *et al.* (2018) reported that independent living communities in Finland comprise rental properties built especially for older people who have functional limitations, and that these communities are known as senior housing.¹⁰⁰ Senior housing services such as home care, healthcare, and social activities enable older people to continue to live independently in a supportive environment with limited assistance. Senior housing properties are usually owned by national housing providers, non-profit corporations, or foundations. Rents are market driven and vary depending on the location, amenities, and services provided. The residents pay for rent and services. Those with low income can apply for rent allowance from the Social Insurance Institution of Finland. In addition, the municipality gives income-related service vouchers to allow residents with regular needs to avail of services. Most senior housing residents are older women who do not need assistance 24 hours per day, but who may benefit from an age-friendly environment with supportive services and increased social opportunities. In Finland, municipalities also offer nursing homes and institutional care for seniors who need around-the-clock assistance. The difference between senior housing and nursing home populations is that senior housing residents are independent and able to make their own decisions. Nursing home or institutional care residents are no longer able to take care of themselves or make independent decisions.¹⁰⁰

4.6.2.1 Study characteristics

Lotvonen *et al.* (2017; 2018) measured 71 participants' physical, mental, and social well-being at 3 and 12 months after relocation to senior housing.^{100 101} The study authors contacted 121 participants who were planning a move to 1 of the 11 senior housing facilities owned by three private organisations in northern Finland. Following invitation, 22 people (18%) declined and 18 people (15%) did not meet the inclusion criteria for senior housing. Of the 103 who met the inclusion criteria, 81 (79%) participated in the baseline interview and 71 participated in both the baseline and 12-month follow-up interviews (Table 18).^{100 101} There was no independent control population.

Table 18: Number of cases at each data collection timepoint in Lotvonen 2018

Study ID	Housing model	3 months	12 months
Lotvonen 2018	Senior housing	81	71 (88%)

4.6.2.2 Study population characteristics

The mean age of participants at baseline was 81 years (standard deviation: ± 7.71 years) and the age range was 59–93 years; 70% were women (Table 19).^{100 101} Three-quarters of participants lived alone and 72% used home care or personal care services. The three most common medical conditions reported by participants were coronary heart disease, musculoskeletal disease, and neurological disease. Seventy-two per cent perceived their state of health to be moderate.^{100 101}

Table 19: Age and gender of study samples at baseline in Lotvonen 2018

Study ID	Characteristics	
Lotvonen 2018	Age in years (\pm standard deviation)	81 years (± 7.71 years)
	Gender (% male)	30%

4.6.2.3 Outcomes and their measurements

The outcomes measured were physical, mental, and social well-being using the Finnish Oldwellactive questionnaire and an adapted Environmental Support Instrument (Table 20).^{100 101}

Table 20: Outcomes measured and their means of measurement for Lotvonen 2018

Study ID	Outcome(s)	Means of measurement
Lotvonen 2018	Physical well-being (functioning):	The modified Oldwellactive questionnaire included measures of physical performance, which included: assessment of instrumental activities of daily living performance, measurement of grip strength of the right and left hand to the nearest kilogram using a dynamometer, appraisal of lower body strength through number of full stands older people could do in 30 seconds from a straight-backed chair without arms, and measurement of walking speed.
	Instrumental activities of daily living	
	Grip strength	
	Lower body strength	
	Walking speed	
	Mental well-being:	The modified Oldwellactive questionnaire assessed participants' perceptions of their mental and social well-being. The assessment consisted of 26 items inviting Likert-type responses with five alternatives on the Likert scale. Mental capability was measured by nine questions, mood by eight questions, loneliness by three questions, and safety by six questions.
	Mental capability	
	Mood	
	Safety	
	Social well-being:	An adapted Environmental Support Instrument, used to assess the degree to which the participants' environments promoted their well-being, consisted of 30 items inviting Likert-type responses designed to evaluate the perceived supportiveness of the physical environment (9 items), symbolic environment (9 items), and social environment (12 items) for participants' well-being. This study focuses on results pertaining to the social environment as measured in four sub-dimensions: interpersonal relationships (4 items), getting support (3 items), pleasantness of the social environment (2 items), and feeling of social restrictiveness (3 items).
	Interpersonal relationships and support	
	Loneliness	
	Social environment	

4.6.2.4 Quality assessment

Lotvonen *et al.*'s (2017; 2018) study, published as two peer-reviewed papers, is a high-quality study. The only weakness was that the authors did not control for confounding factors that may have influenced their outcomes.

4.6.2.5 Findings by outcome

The descriptive findings by outcome are presented in Appendix P.

Appendix P contains descriptive findings for physical well-being, mental well-being, and social well-being. There were no findings for self-perceived health status, objective health outcomes, health and social care utilisation, or costs.

4.7 Narrative synthesis of findings from the impact review

In the USA and Israel, continuing care retirement communities (CCRCs) were evaluated, while independent living, assisted living, and planned retirement communities were only evaluated in the USA. Extra care housing was evaluated in the UK, and senior housing was evaluated in Canada and Finland.

4.7.1 CCRCs, independent and assisted living, and planned retirement communities

4.7.1.1 Self-rated health

Self-rated health is a strong indicator of an older person's general well-being, and is strongly associated with functional impairments, mental health status, and mortality.¹⁰² Rossen and Knafl (2007) measured self-rated health and health satisfaction in women living in an independent living community. There were no significant changes in self-rated health between pre- and post-move, with the vast majority describing themselves as satisfied with their health both pre-move (87%) and post-move (94%).⁷³ In Pruchno and Rose's (2000) analysis of people living in an assisted living community, the authors found that participants' self-rated health improved over the 12 months they were studied.⁷⁹ In the Erickson Life evaluation paper by Gaines *et al.* (2011), when comparing a CCRC sample's self-rated health over time with a nationally representative sample, not only did self-rated health improve for the CCRC group over 2 years, but the share reporting good or excellent self-rated health increased from 94.8% at baseline to 95.6% at follow-up, and it was consistently higher than that of a nationally representative matched cohort.⁶⁸ These improvements in self-rated health are a positive finding for residents of these USA housing with support communities.

4.7.1.2 Objective health outcomes

Only two studies measured objective health outcomes. One measured mortality and needing higher level (hospital-based) care and the other measured the predictors of moving from independent living to nursing home care. In Pruchno and Rose's (2000) study, logistic regression modelling showed that the type of facility, whether it was assisted living or a nursing home, had no impact on mortality rates or transfer to a higher level of care.⁷⁹ Resident age was the only factor that predicted mortality in that study, while relocation was predicted by education, pay status, functional ability, and cognitive functioning.⁷⁹ However, in that study, the authors noted that the nursing home and assisted living sample, as well as the philosophy of care, might have been more similar than they had previously assumed.⁷⁹ In Young *et al.*'s (2009) analysis of CCRCs and the transition from independent living to a nursing home, they found that incontinence, depression, reduced cognitive function, and impairments in activities of daily living predicted earlier transfer to the nursing home.⁶⁴

4.7.1.3 Physical well-being

Rossen and Knafl (2007) found that 87% of the women in their study had at least one comorbidity before moving to the independent living community, and this was consistent post-move. Blood pressure had significantly decreased post-move, whereas walking for exercise had increased.⁷³ Gaines *et al.* (2011) found that even after controlling for activities of daily living and depression, the CCRC sample was more likely to have comorbid conditions compared with the general population. This was despite their greater self-rated health compared with the general population.⁶⁸

In Pruchno and Rose (2000), functional abilities stayed constant between baseline and 12 months. However, these results are cross-sectional, so they are biased in favour of those who stayed in assisted living and did not die or need to relocate to a higher level of care.⁷⁹ In Frytak *et al.*'s (2001) analysis of data from Oregon, functional ability increased every 6 months in assisted living. Mean scores for pain and discomfort stayed consistent over the same period.⁷⁴

In the Aging in Place evaluations by Rantz *et al.* (2011; 2014) in the independent living community TigerPlace, cross-sectional analysis of the cohorts between 2005 and 2008 and between 2009 and 2012 showed that physical well-being stayed consistent. Throughout the two evaluation time periods, mean scores on the Short Form-12 Physical Health subscale stayed between 38.8 and 42.8 on a scale

of 0–100. Activities of daily living scores increased from 0.1 in 2005 to 2.6 in 2012, indicating that dependence increased in the cohort over time.^{75 76}

In the CCRC studied within the Aging in Place evaluation, mean scores on the Short Form-12 Physical Health subscale rose from 39.0 in 2005 to 41.2 in 2008. Mean activities of daily living scores were 0.1 in 2005 and fell to 0.0 in 2008, representing no functional dependency in this cohort.

These data indicate that people with comorbidities were more likely to enter housing with support. It is not possible to comment on physical functioning over time, as it is influenced by those with declining physical function refusing assessments, moving to higher level of care, or dying.

4.7.1.4 Mental well-being

4.7.1.4.1 Cognitive functioning

In Pruchno and Rose's (2000) study, Mini-Mental State Examination scores for the assisted living sample were consistent between baseline and 12 months.⁷⁹ However, as noted in the study, residents of the assisted living community needed a Mini-Mental State Examination score of at least 15 to reside in that location, so the sample's score may show bias. In the Aging in Place evaluation, Mini-Mental State Examinations were performed on residents who had an annual health assessment because of a fall or health issue, and mean scores for TigerPlace were consistently over 22.7 between 2005 and 2012, and over 24.2 for the CCRC between 2005 and 2008.^{75 76} However, as only those residents who had an assessment were scored, these scores do not include many people living independently who did not need an annual assessment and who may have had even higher scores. These findings indicate that it is not possible to conclude whether housing with support in the USA prevents a decline in cognitive function.

4.7.1.4.2 Quality of life

Quality of life was measured in two evaluations: Roberts and Adams (2018)⁶⁹ and Rossen and Knafl (2007).⁷³ In the Rossen and Knafl (2007) study comprising only women in independent living, the authors found that the women studied had a small but statistically significant increase in their quality of life after their move to the facility, especially in their social and economic functioning and in their psychological and spiritual functioning.⁷³ Roberts and Adams (2018) evaluated quality of life over a 5-year period of residence in four CCRCs and found that quality of life for the sample increased during the first 12 months, but declined over the following 4 years. However, early social engagement slowed the rate of decline in quality of life, and residents who took part in organised group activities showed slower rates of decline in their quality of life over the period studied.⁶⁹ The findings on quality of life indicate that the provision of social well-being programmes can improve quality of life in housing with support in the USA.

4.7.1.4.3 Psychological well-being

In one assisted living community evaluated by Pruchno and Rose (2000), the prevalence of depressive symptoms over the study period remained fairly constant over 12 months.⁷⁹ The Oregon assisted living facilities study also reported that psychological well-being remained relatively constant throughout the 12-month study period.⁷⁴ In the Erickson Life Study CCRCs, 96.1% of respondents showed no depressive symptoms at baseline, and 94.3% showed no symptoms at follow-up. By comparison, far fewer people in the nationally representative sample had no symptoms, with 75.5% showing no symptoms both at baseline and at follow-up.⁶⁸ In the first evaluation of the Aging in Place programme, depressive symptoms improved in residents at both TigerPlace and the CCRC.⁷⁵ The findings on psychological well-being in housing with support in the USA are variable.

4.7.1.5 Social well-being

4.7.1.5.1 Satisfaction

Satisfaction with life in the CCRC was higher in women than in men in the Pathways to Life Quality evaluation. Older people were more likely to be satisfied than younger people, and wealthier people were more likely to be satisfied than those earning less.⁶² In Cutchin *et al.* (2010), those who engaged

in more activities in their first year of residence were more satisfied with living in the CCRC. This corresponds with Roberts and Adams' (2018) findings on quality of life and early social engagement.⁶⁹

4.7.1.5.2 Social engagement

Four studies measured social engagement but using different measures and or methods. Rossen and Knafl (2007) found that residents' social activity levels changed after their move to independent living, with more people engaging in social activities post-move.⁷³ Cutchin *et al.* (2010) analysed a case study to observe the change in patterns of social activities before and after people moved into a CCRC. Of 17 activities, some of the most common both before and after a move were reading, eating out at a restaurant, watching TV, and visiting friends and family. After the move, some activities were performed less often, including eating out at a restaurant, cooking, and baking. People more frequently attended meetings, concerts, and parties post-move. Other activities showed no significant change in frequency post-move: visiting friends and family, exercising, and attending religious services, for example. People who engaged in more activities showed higher rates of satisfaction.⁷⁰ Gaugler *et al.*'s (2005) assisted living residents had a slight increase in activity levels between baseline and 6 months. The authors suggested that the level of independence encouraged in assisted living may facilitate that initial increase in activity levels.⁷⁸ However, after 12 months, there was no significant difference between the facility type (assisted living compared with nursing homes) and residents' level of participation in activities. The authors noted that as Oregon's definition of assisted living means that residents live in apartment-style units, there may be a greater prevalence of informal activities like chatting with a neighbour rather than formal/organised events or communal dining. The authors also went on to speculate that it may have been that people were more likely to focus on smaller numbers of activities that interested them, rather than joining all activities provided.⁷⁸

Additionally, Ayalon (2019) found that residents who saw themselves as being of low social standing were found to be more likely to experience loneliness within a CCRC in Israel.⁷² They concluded that this was likely related to the intensiveness of the CCRC; people live there full-time and for many years.⁷²

Overall, we can conclude that social activities are an important tool for social engagement and people will try them to make new friends, avoid loneliness, and preserve physical and cognitive function.

4.7.1.5.3 Experiences of local and distant movers

Heisler *et al.* (2004) examined social connectedness and the differences between local and distant movers, finding that those who moved from farther away experienced greater changes in their social relationships than those who moved locally.⁶⁷ This is consistent with the experiences of participants in Waldron *et al.*'s (2005a; 2005b) study on planned retirement communities.^{80 81}

Heisler *et al.* (2004) found that all movers to the CCRC, both local and distant, found it easy to make new friends.⁶⁷ However, distant movers to the CCRC made more new friends on average than local movers.⁶⁷ This is echoed in the results from Waldron (2005a).⁸⁰ In the planned retirement community study, people who moved long distances experienced a reduction in the number of friends they had who lived outside the retirement community.⁸⁰ However, those who moved long distances also made more new friends within the retirement community after their move, compared with local movers.⁸⁰ Retirement communities with a strong social element afford residents many opportunities to form new friendships with other residents.

In the planned retirement communities that Waldron *et al.* (2005a) studied, local movers experienced a lasting increase in social support after moving, whereas distant movers experienced reductions in their social support.⁸⁰ While local movers can continue to rely on their contacts from their existing social networks after moving to the planned retirement community, for distant movers, many of those networks may be difficult to keep a connection with as a result of the distance.⁸⁰ That said, levels of social support were similar between local and distant movers in the planned retirement communities after 4 years.⁸⁰ In the Pathways to Life Quality evaluation, perceptions of social support remained high for both local and long-distance movers.⁶⁷ There are also gender differences in experiences of social support; Waldron *et al.* (2005b) found that men experienced an increase in their levels of social support after their move, whereas women experienced a decrease or no change.⁸¹

From the USA's Pathways to Life Quality evaluation, Heisler *et al.* (2004) also found that objective and subjective health measures declined for long-distance movers, but not for local movers, after 24 months living in the CCRC. The authors found no clear reason for this observation, but suggested that it may be due to the disruption in place attachment experienced by the long-distance movers as a result of moving to a new community.⁶⁷

Generally, it would appear a move within the local community is better than a long-distance move for retaining family and other social supports from outside the community.

4.7.1.6 Health and social care utilisation

Using data from the USA's Erickson Life evaluation, Gaines *et al.* (2011) found that CCRC residents used the same amount of health and social care services as the general population.⁶⁸ None of the other USA-based studies measured this outcome.

4.7.1.7 Costs

Cost-effectiveness analyses were performed by Rantz *et al.* (2011; 2014) in both evaluations of the Aging in Place programme.^{75 76} Both evaluations found that among residents of independent living who had qualified for nursing home placement, those who stayed in independent living and used extra health services as needed (instead of moving to a nursing home) had lower cost of living when compared to the average regional cost of living in nursing homes.^{75 76} None of the other USA-based studies measured this outcome.

4.7.2 Extra care housing

We considered a meta-analysis for the extra care housing, as the population and intervention were the same. However, comparator groups varied, comprising community-based volunteers,^{88 96-98} day centre attendees,⁸³ and care home entrants.^{87 89 92} In addition, the University of Kent did not use a comparison group for its longitudinal survival study⁹² or social well-being study.⁹¹ Similar thematic outcomes were evaluated, but only one outcome – physical functioning, measuring activities of daily living – was the same across three^{83 87 88 93 96-98} of the four evaluations. However, this outcome was measured using different assessment tools for each evaluation. The statistical variances for main study outcomes were not available for all time points in two evaluations.^{87 88 93 96-98} Considering the differences in comparators and outcomes, we decided that a narrative synthesis was a more appropriate approach for all outcomes than a meta-analysis.

4.7.2.1 Self-rated health

Holland *et al.* (2015; 2019) reported that individuals' perception of their own health status is a very good indicator of their actual physical and psychological well-being, and that this perceptiveness occurs even in the absence of a clear medical diagnosis.^{97 98} There was no difference found in self-perceived health in two evaluations: one that followed up at 6 months⁸⁹ and one that followed up at 12 months.⁸³ There was, however, an increase in self-perceived health status at 36 months in the Holland *et al.* (2014; 2019) evaluation.^{96 98} Perceived health ratings fluctuated over time for community-based control participants in Holland *et al.* (2019); however, average self-perceived health ratings remained significantly lower at each time point for the extra care participants compared with average ratings for the control group of community-based volunteers, who are usually healthier than the general population (a phenomenon known as the 'healthy volunteer effect').⁹⁸

4.7.2.2 Objective health outcomes

4.7.2.2.1 Morbidity

Chronic diseases were common among people aged over 65 years old,^{84 98} and their prevalence increased with age.⁹⁸ Only two of four evaluations measured chronic disease status, and morbidity measures were not comparable across the two evaluations. In terms of residents' medical histories, more than 80% of the University of Kent participants were assessed as having at least one long-term health condition at 6 months.⁸⁴ In the Holland *et al.* (2019) evaluation, just under 45% of extra care participants aged over 65 years had two or more chronic diseases at baseline, and this measure was 50% for participants aged over 85 years.⁹⁸ At 36 months, 61% of extra care participants aged over 65

years had two or more conditions, and this measure was just under 55% among those aged over 85 years. When comparing the extra care participants with the community-based control participants and controlling for age, there was no difference in the average number of chronic diseases experienced at each of the measurement time points between baseline and 36 months.⁹⁸

4.7.2.2.2 Institutionalisation and death

The main reason for moving to extra care cited by many extra care participants was in order to age, and ultimately die, in place, and to avoid a move to a residential care home or nursing home.

The University of Kent evaluation team found that 739 (63%) of the 1,182 residents who completed a self-complete questionnaire at baseline were still living in extra care accommodation at 30 months follow-up. At 30 months follow-up, 163 (14%) had moved and 280 (24%) had died. Among those who died, just over three-fifths (63%) died in an institution and just under two-fifths (37%) died in their extra care residence, as was their intention at baseline.^{90 93}

The University of Kent evaluation team had more detail on people for whom care assessment information was collected at baseline, and reported that 456 (56%) of the 817 residents were still living in the scheme at 30 months. At least some information was obtained about the destination of 688 (84%) of the participants.⁹² Just 64 (9%) had moved; the authors had data for 54 of the 64 who moved. Of the 54 participants whose subsequent residence was known, 45 (7% of the 688) moved to a care or nursing home. Almost one-quarter (24%; 166) had died. Of the 166 who died, 62 (37%) died in their extra care home and 104 (63%) died elsewhere. The vast majority of those who died elsewhere died in a hospital or hospice. For the 166 residents who died, the average time between moving into extra care and death was about 18 months. The University of Kent reported that extra care housing is not equipped to provide services for people who have or acquire challenging behaviour associated with severe cognitive decline or for those requiring high levels of nursing care or continuous monitoring of medical status.^{82 84} The University of Kent authors also report that extra care housing should consider developing or facilitating palliative care services within extra care schemes.

Darton *et al.* (2011c) reported that the information collected in their care assessment questionnaire was designed to be compatible with that collected in the 1995–1999 University of Kent longitudinal survey of care homes, so that the results of an analysis of survival of care home residents in 1995 were comparable with the survival analysis of extra care residents in the later study.⁹² Darton *et al.* applied the previously developed survival model for care homes to the extra care data and calculated a median survival estimate of 32 months for residents aged 65 years or over. By comparison, application of the same model to data collected in the survey of admissions to care homes in 2005 produced a median estimated life expectancy of 21 months for residents of care homes providing personal care, and 10 months for residents of care homes providing nursing care.⁹² Netten *et al.* (2011) reported that when compared with survival predictions for care home residents, mortality was much lower in extra care housing than predicted.⁹³ The model predicted that 50% of the residents aged 65 years or over would die within 32 months. Among the residents aged 65 years or over who were followed up on over the full 30-month period, 34% had died – that is, around 70% of the predicted proportion. This indicated that being in extra care housing may extend life expectancy when compared with being in a care home.

Kneale and Smith (2013) estimated the incidence of moving from extra care to a care home and the incidence of death in an extra care home. At 5 years, the cumulative incidence of extra care housing residents who moved into institutional accommodation was 8.2%,⁹⁴ similar to that calculated by Darton *et al.* (2011c).⁹² Those in receipt of a level 1 or 2 (very low or low support) care package on entry to extra care were two or three times more likely to have moved to institutional accommodation in the first 5 years of residence compared with those who were not in receipt of a care package.⁹⁴ After accounting for other factors, those in village-type schemes were also twice as likely to move into institutional accommodation compared with those in courtyard-style developments. Residents who moved into extra care housing between 1999 and 2002 were almost twice as likely to move to institutional accommodation than those who moved into extra care between 1995 and 1998.⁹⁴

The proportion of individuals who died while in extra care housing was 25% at 5 years,⁹⁴ similar to that calculated by Darton *et al.* (2011c).⁹² The care package received on entry to extra care housing was a significant predictor of the risk of death, with those receiving the most substantial care packages approximately four times more likely to die in their extra care accommodation within 5 years of their move compared with those receiving no additional care package.⁹⁴ Women were half as likely to die in their extra care home than men. Every year of additional age was associated with a 6% greater likelihood of dying in extra care, which was the movers' intention at baseline. The type of extra care scheme was also a predictor of dying in an extra care home, with those living in courtyard schemes more likely to achieve ageing in place.⁹⁴

When Kneale and Smith (2013) compared the extra care residents to a comparison sample of those in receipt of domiciliary care in the community and participating in the British Household Panel Survey over a 5-year period, they found no statistically significant difference in transition rates to institutional accommodation in those aged 65 years and over.⁹⁴ However, when the authors restricted the domiciliary matched sample to those aged 75 years and over, the risk of experiencing a move to institutional care was 35% lower among the extra care housing group than among the matched community setting sample in receipt of domiciliary care. Among the population aged 80 years and over, those in extra care housing were 44% less likely to move into institutional accommodation compared with those in the community in receipt of domiciliary care.⁹⁴

The authors compared the experience of dying in the extra care group with the matched community survey population receiving domiciliary care.⁹⁴ They found that the risk of dying was equal in both groups for those aged 65 years and over and for those aged 75 years and over.⁹⁴

4.7.2.3 Physical well-being

4.7.2.3.1 Physical function

Three evaluations measured instrumental activities of daily living (household management) and activities of daily living (personal care), but they used different instruments.^{83 92 96 98} It seems that people with higher physical functional limitations moved to extra care schemes in order to live in a more age-friendly environment and access care.⁹⁸ Activities of daily living measures are tools that estimate a person's ability to live independently. For the extra care samples, the average scores remained similar throughout the evaluation period.^{83 92 96 98} For the two studies with controls, average scores for the instrumental and other activities of daily living decreased for their control populations over the evaluation period, indicating that dependence increased.^{83 96 98} Darton *et al.* (2011c) reported that the proportion of residents whose score indicated total dependence was small at baseline (3.2%) and decreased steadily over the study period to 1.7% at 30 months.⁹² However, it should be noted that a proportion of residents died or moved to institutional care during the study period.

Holland *et al.* (2014; 2019) used an additional measure to assess independence, the Functional Limitations Profile, which is a measure that assesses the effect of health issues on everyday functions. Higher scores indicate more functional limitations. At baseline, the extra care participants had higher average functional limitations scores (299.4) than the community-based control participants (59.2), and this difference between extra care and control participants was maintained throughout the study period.^{96 98} The general trend in scores was very slightly downwards for all participants, indicating that functional limitations were decreasing over time, although this trend was not statistically significant.⁹⁸

4.7.2.3.2 Falls

Two evaluations measured the incidence of falls. Kneale (2011) estimated falls in 63 residents in one extra care housing scheme compared with matched controls living in the community, and reported that extra care residents were significantly less likely to experience a fall in 2008 than those in receipt of care at home (31% and 44%, respectively).⁹⁵ Of extra care residents who experienced a fall in 2008, more than half fell once, with the remainder falling between two and nine times. Those who fell were more likely to be older and male. Concentration, dizziness, and alcohol were triggers for falls. Holland *et al.* (2019) reported that despite their older age and higher levels of frailty, extra care participants did not experience a statistically significantly higher rate of falls than community-based control participants during the evaluation period.⁹⁸ There was a significant reduction in the average number

of falls per year for extra care participants from baseline (0.65) to 3 months (0.4). This reduction was not sustained at 18 (0.8), 24 (0.8), or 36 months (1.1).⁹⁸

4.7.2.3.3 Weekly exercise

Holland *et al.* (2019) – the only evaluation that measured the frequency of exercise – reported that one of the main lifestyle changes recommended to prevent or reduce frailty is physical activity through exercise and an active lifestyle.⁹⁸ Over the 36-month period, both the extra care and control participants significantly increased the weekly number of times they exercised for 30 minutes. Extra care participants increased weekly exercise from an average of 2 times per week at baseline to an average of 3.9 times per week at 36 months, while control participants increased weekly exercise from an average of 3 times per week at baseline to an average of 5 times per week at 36 months.⁹⁸ Overall, participants in the control group exercised more frequently than extra care participants.

4.7.2.4 Mental well-being

4.7.2.4.1 Quality of life

Three of the four extra care evaluations measured quality of life. Two longitudinal studies measured quality of life using one of two CASP instruments, but neither reported longitudinal results.^{91 98} The study by Callaghan *et al.* (2009) reported that more positive social outcomes were related to an increased quality of life.⁹¹ Kingston *et al.* (2001) used the Life Satisfaction Index and the semantic differentials assessment, and reported increased satisfaction with life for extra care participants and positive attitudes towards extra care-type housing over the 12-month evaluation period.⁸³

4.7.2.4.2 Cognitive functioning

Cognitive functioning comprises memory, attention, fluency, language, and visuospatial processing. Cognitive impairment was measured over time in two evaluations using the Minimum Data Set Cognitive Performance Scale, with scores ranging from 0 (intact) to 6 (very severe impairment). The proportions of participants in the University of Kent's study whose score indicated intact cognitive abilities increased steadily over the time period, from 66% at baseline to 75% at 18 months and 79% at 30 months.⁹² At baseline, 3.5% of residents had severe levels of cognitive impairment, scoring 4 or higher on the Minimum Data Set Cognitive Performance Scale. This proportion decreased to 2.9% at 6 months and to 0.9% at 18 months, although it increased somewhat at 30 months to 1.7%.⁹² Holland *et al.* (2014; 2015; 2016; 2019) reported that the extra care participants' group average Mini-Mental State Examination scores were stable over time.^{88 96-98} However, there was a significant decline in average Mini-Mental State Examination scores in the community-based control group.

Holland *et al.* (2014; 2019) also employed a more detailed cognitive assessment known as the Addenbrooke's Cognitive Examination III.^{96 98} The authors reported that there was a steady but non-significant increase over time in the average Addenbrooke's Cognitive Examination III scores for extra care participants, from 84 at baseline to 89 at 36 months, and the initial difference between extra care participants (84) and community-based control participants (93) was no longer significant at 36 months, when average scores were 89 and 92, respectively.^{96 98}

Both Darton *et al.* and Holland *et al.* (2014; 2015; 2016; 2019) report that increases in average cognitive scores could be a result of selective study retention, as those who had poorer health were more likely to be unable to participate in the study, to be transferred to care homes, or to have died at each subsequent follow-up time point.^{88 92 96-98}

4.7.2.4.3 Psychological well-being

Two evaluations measured psychological well-being, but they used different measurement scales: Kingston *et al.* (2001) and Holland *et al.* (2014; 2019).^{83 96 98}

At baseline, respondents from the extra care community in Kingston *et al.* (2001) rated their mental health higher than the day centre participants using the Short Form-36.⁸³ When longitudinal analysis was conducted, there were no significant changes in average mental health ratings between baseline and 12 months in either the extra care participants or the day centre participants.⁸³

Holland *et al.* (2014; 2019) measured psychological well-being through experience of depression and anxiety using the Hospital Anxiety and Depression Scale.^{96 98} At baseline, the average anxiety score was significantly higher in extra care participants (5.8) compared with control participants (3.8).^{96 98} By 36 months, extra care participants had lower average anxiety scores (3.4) than control participants (3.8), but this difference was not statistically significant.⁹⁸ By 60 months after moving into extra care housing, the average anxiety score for extra care participants had reduced by 23% when compared with baseline numbers.⁹⁸ The trends for depression were also examined over a 36-month period in order to assess any change between participant groups.⁹⁸ The average depression score was higher (3.6) for extra care participants at baseline than for controls (1.6). The extra care group's average depression score decreased to 2.7 at 36 months, whereas the average score for the control group remained stable at 1.7.^{96 98} Holland *et al.* (2019) reported that average depression scores for extra care participants were 24% lower at 36 months than at baseline, but this effect is not statistically reliable.⁹⁸ Regression analyses were conducted to examine some potential predictors of depression. The effects of frailty, mobility, and walking speed on depression were significant; however, the effect of mobility was more significant for the community-based controls.⁹⁸

4.7.2.5 Social well-being

Three evaluations measured social well-being, but all three used different measurements.^{83 91 98} The findings were mixed, with one programme reporting no change in social well-being,⁸³ one reporting a decrease in social well-being,⁹⁸ and the third, more in-depth examination reporting improved social well-being.⁹¹

Kingston *et al.* (2001) reported that there were no significant changes in the extra care participants' average Short Form-36 ratings for the social functioning domain between baseline and 12 months, and that day centre controls reported better social functioning than extra care participants.⁸³ In contrast, Callaghan *et al.* (2009) found that, for most residents in their sample, levels of social well-being were high. Around 41% reported that they had a 'good' social life, while a further 42% reported that it was 'as good as it can be'.⁹¹ More than half felt that their social life had changed for the better following their move to extra care housing, and 90% had made new friends at their scheme. Callaghan *et al.* (2009) found that residents' ratings of their social life improved with increased frequency of participation in social activities or social groups.⁹¹ Most residents indicated that their time was fully occupied in 'activities of their choice', including social/leisure activities and formal or voluntary work. Holland *et al.* (2019) reported that the average score for social interaction decreased steadily over the study period, from 42 at 24 months to 35 at 60 months, indicating reduced social interaction with family and/or friends.⁹⁸ However, Holland *et al.* reported that the averages remained high, indicating that the extra care participants were not classified as socially isolated at 60 months.⁹⁸

Callaghan *et al.* (2009) found that loneliness was an issue in the extra care schemes studied. For example, 25% of participants in the smaller schemes said that they were 'sometimes lonely' or 'often lonely'.⁹¹ In contrast, Holland *et al.* (2019) reported that the average score for loneliness varied between 10 and 11 out of a maximum of 12 between 24 and 60 months using the University of California Los Angeles Loneliness Scale, indicating that extra care participants were not lonely and showing little variation in perceived loneliness scores over time.⁹⁸

Callaghan *et al.* (2009) assessed the social climate using measures of cohesion, conflict, and independence. Only 3 smaller schemes of the 13 schemes (11 smaller schemes and 2 villages) included in the study had the 'ideal' pattern of social climate scores, with high levels of cohesion and independence alongside low levels of conflict. The two villages had slightly lower cohesion scores on average (52 versus 62), and higher conflict (48 versus 31) and independence (72 versus 50) scores, than smaller schemes.⁹¹ None of the evaluations measured social climate.

4.7.2.6 Health and social care utilisation

Three evaluations measured health and/or social care utilisation,^{83 95 98} and two evaluations measured hospitalisations.^{95 98}

4.7.2.6.1 Community-based services

Kingston *et al.* (2001) asked respondents about contact with a variety of health and social care professionals.⁸³ The data suggest that participants living in the extra care community were significantly less likely to see a health visitor or a social worker compared with the participants attending day centres. There was no statistically significant difference between the two groups in the proportions attending the GP or being visited by the district nurse, a community psychiatric nurse, or a physiotherapist.⁸³ Holland *et al.* (2019) reported that planned nurse visits increased by approximately 1 visit per year, whereas planned GP visits decreased by almost 1 visit per year.⁹⁸ When frailty was controlled for, there was no significant change over the 36-month period in GP or practice nurse visits in either the extra care or the control participants.⁹⁸

4.7.2.6.2 Outpatient appointments, hospital visits or hospital admissions

After controlling for age, there was no significant difference between extra care and control participants in relation to the number of outpatient appointments, hospital visits, or number of planned or unplanned admissions to hospital over the 36-month assessment period.⁹⁸ Older age was a highly significant predictor of unplanned hospital admissions for both groups.⁹⁸

There was no significant difference in total length of stay in hospital between extra care and control participants during the 36-month period.⁹⁸ Older age was a significant predictor of longer length of stay for the both groups. There was a significant (31%) reduction in length of stay for extra care participants during the 60-month period, which equated to an average of 3 fewer days spent in hospital per year per participating resident over 5 years. Frailty had an impact on length of stay in hospital. That is, although frailty level has an impact on how long people spend in hospital when they are admitted, this was reduced for extra care participants between 36 and 60 months.⁹⁸

Kneale (2011) found that extra care residents were in hospital for an average of 5.4 nights per year per resident.⁹⁵ For those aged 80 years or over, the estimated annual hospital bed occupancy was 4.8 nights per year per person, compared with a higher 5.8 nights for matched controls living in the community.⁹⁵

Both evaluations demonstrate reductions in length of stay in hospital for extra care participants when compared to community controls or baseline measures.

4.7.2.7 Costs

The University of Kent and Aston University both examined costs.^{84 89 97 98} However, their methodologies differed, and so we have presented a separate summary of the findings for each research team.

4.7.2.7.1 University of Kent

Bäumker *et al.* (2010) investigated the cost and outcome consequences for a sample of people who moved into one specific extra care housing scheme in England.⁸⁹ The main finding of this case study was that the overall cost per person increased after a move to extra care housing, but that this increase was associated with improved social care outcomes and improvements in quality of life. The average cost per resident was GB£380 per week before moving in, compared with an average of GB£470 per week 6 months after moving into the extra care scheme, an average difference of GB£90 per person per week.⁸⁹ The cost calculations comprised healthcare (which decreased after the move), social care (home and personal care), social and well-being amenities (which increased after the move), accommodation, living expenses, and personal expenses.⁸⁹ It was estimated that approximately GB£385 (82%) of the GB£470 per week per extra care resident was the average cost of extra care housing funded by the public sector.⁸⁹

Bäumker *et al.* (2011) completed a cost-effectiveness evaluation of extra care compared with care homes. The extra care evaluation was purposefully designed to record costs and outcomes information in a way that was equivalent to the information collected in the 1995–1999 and 2005 University of Kent studies of publicly funded admissions to care homes. Both settings (extra care and care homes) support a broad range of care needs, and thus it was thought that care needs would overlap between settings. The statistical propensity score matching methodology identified a group of individuals in all three datasets who could be equally well served in either setting.⁸⁴ The final

sample included 240 matched pairs between extra care (2006) and residential care (1995–1999). In a second exercise the authors applied the same propensity score approach to a 2005 University of Kent survey of admissions to care homes in 16 local authorities in England. This 2005 study was conducted just one year before the first extra care scheme opened. The 2005 dataset consisted of 469 admissions, 136 (29%) of which were matched to the 240 matched pairs (2006 extra care and 1995 care homes).⁸⁴

The average weekly extra care cost (excluding healthcare) was GB£374. The minimum cost per extra care resident was GB£172, while the maximum cost was GB£892. Over the 6-month follow-up period, extra care housing on average saved more money (GB£902) than a placement in a care home in 1995. The 240 matched cases distribution was simulated using a bootstrapping exercise and estimated that incremental cost effectiveness ratios for extra care housing compared to care homes was that extra care was “less costly and more effective”.^{84 p528}

For the 136 matched pairs, the cost of extra care per person per week increased from GB£374 to GB£403 and the cost for the care homes group increased from GB£409 to GB£413.⁸⁴ The minimum 2008 adjusted cost per care home resident was GB£310, while the maximum adjusted cost was GB£663. The 136 matched cases distribution was simulated using a bootstrapping exercise and estimated that incremental cost-effectiveness ratios for extra care housing compared to care homes was that extra care was “equal cost but more effective”.⁸⁴

4.7.2.7.2 Aston University

Holland *et al.* (2019) found that there was no overall reduction in healthcare costs over the first 36 months.⁹⁸ For extra care participants over the full 60-month study period, there was a reduction in costs; accumulated over 5 years, living in extra care was saving the NHS an average of GB£1,992 per person, or an average of GB£400 per person per year. In order to investigate the prediction of healthcare costs up to 36 months, a multiple regression analysis was conducted with age, frailty, time living in extra care, and perceived health as potential predictors. The model was significant, with both age and frailty being significant predictors of total annual NHS cost. A 0.1-point increase/decrease in score on the frailty index was related to a GB£550 increase/decrease in annual NHS costs, indicating the potential average impact on costs of interventions that reduce frailty.⁹⁸

Holland *et al.* (2015) also examined social care costs up until the 18-month time point and reported that across the care levels, extra care cost GB£428 less per annum for the study participants than it would have done outside of extra care in the wider community.⁹⁷

Taken together, extra care may be as or almost as expensive as residential care, but the quality of life for extra care residents is better than for that experienced in care homes.

4.7.3 Senior housing

We considered a meta-analysis for the senior housing, as the population for both evaluations was older people; however, Canada’s senior housing was targeted to older people who had constrained economic circumstances, whereas Finland’s senior housing was allocated to older people regardless of means. There was no comparator group for either evaluation. The philosophy of senior housing in Canada was different than that in Finland. Canada used senior housing as one step in the care pathway, which was preceded by life in the family home and followed by life in a nursing home.⁹⁹

Finland’s senior housing was for any older person who could make decisions for themselves, and nursing home places were limited to those who could no longer make their own decisions.^{100 101}

Mental well-being was the only thematic outcome evaluated in both Canada and Finland. However, this outcome was measured using different approaches, and so commonalities could not be identified.

4.7.3.1 Mental well-being

Smith and Sylvestre (2008) reported that significant predictors of the four outcomes examined (self-perceived health status, morale, depression, and self-esteem) were changes in personal resources; everyday travel; and residents’ judgements of service, social, and physical components of the senior housing neighbourhood.⁹⁹ Smith and Sylvestre (2008) concluded that “the older person’s subjective

interpretations of a new residential setting assumed more importance in producing [the four] outcomes than objective measures of that setting".^{99 p592}

Lotvonen *et al.* (2018) reported that older people's self-reported mental capability and loneliness did not change significantly during the first 12 months in senior housing.¹⁰⁰

4.7.3.2 Physical well-being

There were significant reductions in instrumental activities of daily living scores, dominant hand grip strength, and walking speed during the first 12 months,^{100 101} which the participants reported limited their ability to move outside senior housing and to take part in social activities.¹⁰¹

4.7.3.3 Social well-being

Feelings that life is safe increased significantly over the first 12 months in senior housing,¹⁰⁰ and the respondents stated that they had freedom to do whatever they liked in their senior house or apartment.¹⁰¹ The respondents felt that they had adequate contact with relatives and friends.¹⁰¹ However, the participants felt that opportunities to make decisions about their life decreased significantly over the 12-month period.¹⁰⁰ Increases in loneliness and sleep problems were associated with reductions in walking speed and increased fear of falling, while limitations in moving outdoors were associated with reductions in dominant hand grip strength.¹⁰⁰

5 Model of housing with support

We created a conceptual model synthesising what we learned from the included studies regarding the key aspects of housing with support that older people valued, the desired outcomes of housing with support, and how to best evaluate it going forward (see Figure 4). We chose to synthesise our findings by creating a conceptual model because the low level of evidence among the studies included in the quantitative review meant that we were not able to draw definitive conclusions regarding the impact of housing with support. Therefore, our model illustrates intended rather than proven outcomes, and as such it must be interpreted as an aspirational model of housing with support.

Our conceptual model categorises the components of housing with support that we identified in the qualitative and quantitative literature under five overarching inputs: 1) build accessible homes and communities; 2) integrate health and social care services; 3) enable staff to provide well-being and care; 4) publicise housing with support; and 5) learn from experience. Our understanding of the literature led us to identify these five inputs as integral to the process of implementing housing with support. Within these inputs, we present potential pathways to physical well-being for older people (colour coded in blue), pathways to mental health and social well-being for older people (colour coded in pink), and strategies for monitoring and evaluation of housing with support (colour coded in purple). These potential pathways and strategies are grounded in our findings regarding older people's preferences for housing with support from the qualitative review and our findings regarding the impact of housing with support from the quantitative review. We translated our findings into actionable activities for policy makers under each overarching input. These activities are linked to the qualitative and quantitative reviews as follows:

Build accessible homes and communities:

- Design individual homes to facilitate care to end of life (qualitative section 3.2 and quantitative sub-section 4.7.2.2)
- Communal indoor and outdoor areas use social contact design (qualitative section 3.5 and quantitative sub-sections 4.7.1.5.2 and 4.7.2.5)

Integrate health and social care services:

- Housing options available in original community (qualitative section 3.5 and quantitative sub-section 4.7.1.5.3)
- Access to care, reablement, and physical well-being services (qualitative section 3.4 and 3.5, and quantitative sections 4.7.1.5.2 and 4.7.3)
- Access to mental health (quantitative sections 4.7.1.4, 4.7.2.4, and 4.7.3) and social well-being services (qualitative section 3.5 and quantitative sections 4.7.1.5 and 4.7.2.5)

Enable staff to provide well-being and care:

- Staff support physical well-being through activities and care services (qualitative sections 3.3 and 3.4 and quantitative section 4.7)
- Staff co-organise social activities with residents (qualitative sections 3.3.3, 3.4 and 3.5, and quantitative sections 4.7.1.5, 4.7.2.5 and 4.7.3)
- Staff enable volunteerism and mutual support (qualitative section 3.5 and quantitative sections 4.7.1.5, 4.7.2.5)
- Staff do heavy housework and residents do light housework (qualitative section 3.1 and quantitative sections 4.1.1 and 4.5)

Publicise housing with support:

- Empowered choice (qualitative section 3.1.2.2.2)
- Attract diverse mix of ages and abilities (qualitative section 3.3.2.2, qualitative section 4.7, and evidence brief)

Learn from experience:

- Use existing health records for quantitative evaluations (quantitative review). Ensure resident records include age, sex, level of care required, address, date of entry to housing, date of any illness-related exit, exit reason and date of death in the records retained by the housing with support institution as this will permit in expensive survival analysis
- Use surveys to measure self-rated health, satisfaction, and quality of life (quantitative review)
- Learn from lived experience using qualitative research (qualitative review)

The intermediate desired outcomes of housing with support in our model, which we drew from the literature, are to: reduce time spent in hospital (quantitative review); reduce institutionalisation (quantitative review); support autonomy and independence (both reviews); enable social engagement (both reviews); create a sense of community and belonging (both reviews); and ensure evidence-based practice (both reviews). The intermediate outcomes are colour coded, linking them to associated activities (blue for physical well-being outcomes, pink for mental health and social well-being outcomes, and purple for the outcome related to monitoring and evaluation). Regarding the outcome evidence-based practice, which would result from monitoring and evaluation activities, we make an assumption that ongoing quantitative and qualitative research activities would enable evidence-based practice.

The overall desired outcome in the model is to ensure that housing with support improves quality of life for older people.

Model of housing with support for older people

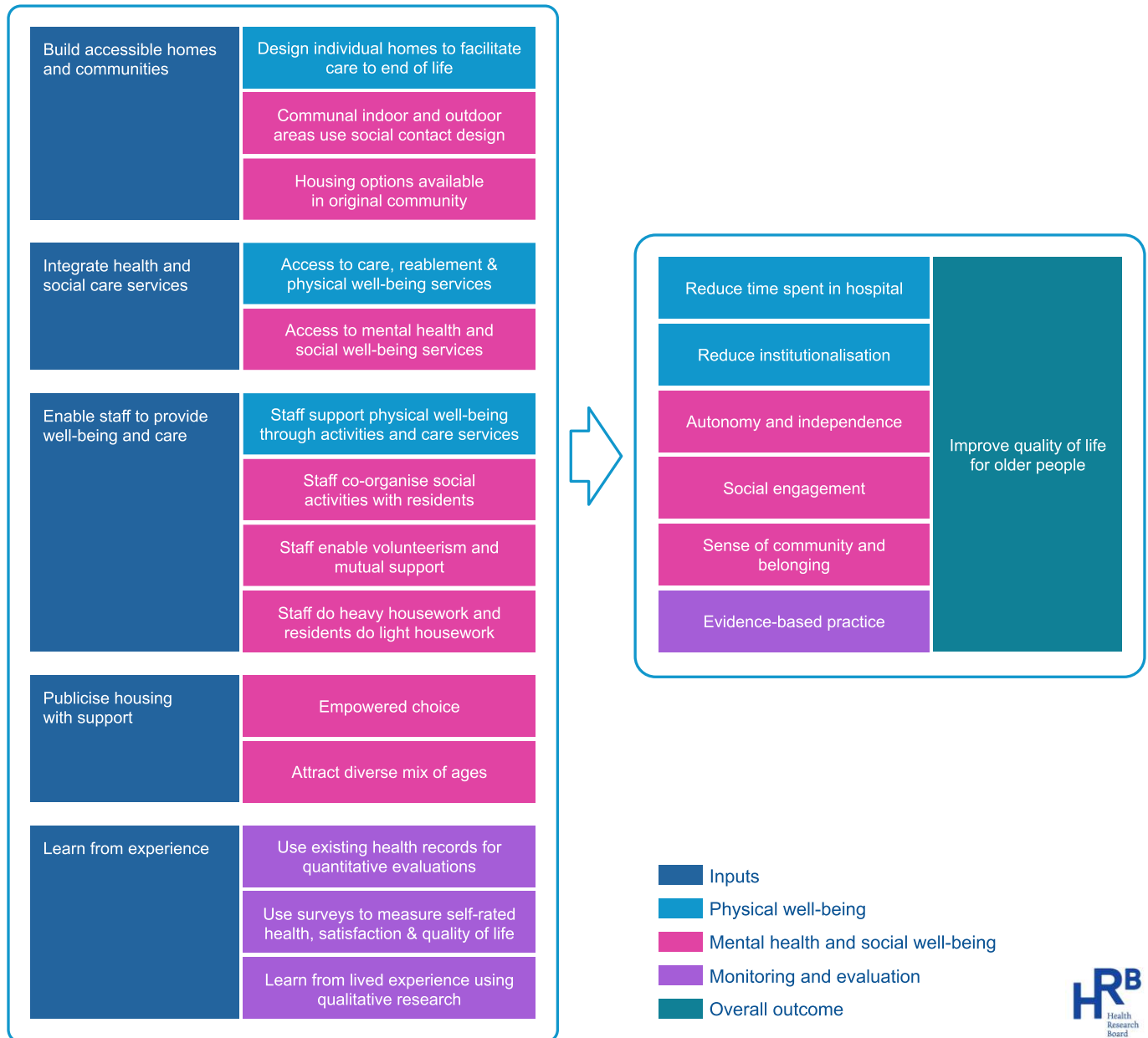


Figure 4: Model of housing with support for older people

6 Discussion

6.1 Key findings

Our analysis of older people's perceptions and experiences of housing with support reveals three overarching facilitators of well-being in these communities. The first is that individual choice and autonomy are integral to successfully transitioning to, ageing in place, and dying in place in housing with support. Second, moving within the same community allows older people to maintain their previous social networks and access the same local amenities and community services, which they feel eases their transition to their new home. Third, personal care and support services are a key aspect of housing with support, yet from the perspectives of older people themselves opportunities to socialise are essential to their well-being and to creating cohesion in the community.

Our analysis of the impact of housing with support reveals that people want to live and die in their own home and not in an institution. People living in housing with support can have a good quality of life while they can care for themselves with minimum support from personal care assistants. The presence of health and social-well-being programmes provide opportunity for reablement, exercise, counselling and social interaction to promote health and well-being. Housing with support may slow the inevitable decline of old age or make it easier for those with functional decline to live independently. It reduces inappropriate use of general practitioner and hospital services somewhat. The costs of housing with support are at worst equal to residential care but the quality of life in housing with support is better than in care homes. Those with challenging behaviour, severe cognitive decline, or complex nursing requirements cannot be facilitated in the models of housing with support investigated in this review and these cohorts were the groups who moved to nursing home or high-level care. However, more intensive links with palliative care and community nursing may increase the numbers that can live and die in housing with support.

Our integration of the qualitative and quantitative syntheses demonstrate that the aspects of housing with support that address mental health and social well-being are crucial components of the model, alongside supports for physical well-being.

6.2 Comparison with the literature

This is the first review to integrate global evidence regarding older people's perceptions and experiences of housing with support and the impact of housing with support for older people. To our knowledge, there have been no other systematic reviews of quantitative studies assessing the impact of housing with support, however, there have been several relevant reviews of qualitative research. None have specifically focused on older people's perceptions and experiences of housing with support, yet our findings align with the reviews that have been conducted.

Serrano-Gemes *et al.* (2020) reviewed qualitative studies focusing on the decision-making process regarding the location of care for older people, and they found that families frequently played an integral role in the decision to move.¹⁰³ Roy *et al.* (2018) examined the factors that influenced older people's decisions to move and, based on their included studies, they concluded that older people highly valued being able to live in a residential environment that was familiar to them.¹⁰⁴

Gilbert *et al.* conducted a review of the factors that influence relocation transitions for older adults considering a move to assisted living.¹⁰⁵ Their included studies were primarily qualitative, and they found that older adults who participated in the decision-making process adjusted to their new living environments more easily than those who felt that their relocation was forced on them.¹⁰⁵

Croucher *et al.* (2006) reviewed the evidence related to new and emerging models of housing with care for later life and concluded that independence and autonomy are crucial for older people in these communities.⁵ They specifically noted the importance of older people playing a role in running their communities as volunteers. Additionally, they found that older people valued their ability to make choices about their day to day lives, for example whether or not to take part in outings and social activities or the timing of carer visits.⁵

Rosenwohl-Mack *et al.* (2020) conducted a review of qualitative studies focusing on ageing in place in the USA, and they concluded that individual agency was integral to identity and that connectedness was a crucial aspect of ageing in place.¹⁰⁶ Additionally, Bradshaw *et al.* (2012) reviewed studies related to residents' quality of life in care homes and identified four key factors – acceptance and adaptation, connectedness with others, a homelike environment, and caring practices.¹⁰⁷

6.3 Strengths and limitations

The search strategy that we designed for this review allowed us to capture studies from a wide variety of countries and contexts. Our use of machine learning via text mining allowed us to access more relevant studies sooner, and this was highly beneficial. Full-text review and quality assessment were both conducted by two independent reviewers, and this enhanced the validity of our analysis.

Our integration of qualitative and quantitative findings enabled triangulation of the evidence regarding housing with support, which represents a key contribution to the literature. Moreover, our synthesis of these findings into a conceptual model of housing with support provides a highly usable output.

Despite these strengths, there are also several limitations to this mixed-methods review. Our inclusion criteria required that residents had their own front door and did not share rooms. If a study did not specify whether or not residents shared rooms, it was excluded. As a result, we may have left out studies in which residents did in fact have their own front door, but the authors did not clarify this.

Additionally, we only included qualitative studies that used one of five widely recognised qualitative methodologies – case study research, ethnography, grounded theory research, narrative analysis, and phenomenology – as outlined by Creswell & Poth (2017).⁷ We did this to maximise the quality, credibility, and reliability of the qualitative studies included in the analysis. As a result, many qualitative studies that did not use one of the five qualitative methodologies were excluded. Given that qualitative methodologies are often ill-defined, even in peer-reviewed literature, we felt that it was important to limit our included studies to those that used proven methodologies.

Our included qualitative studies rarely identified race, ethnicity, or socioeconomic background of participants, therefore we were unable to explore the role that these demographic factors may have played in perceptions and experiences of housing with support for older people. Moreover, none of the included studies explored the perceptions and experiences of the LGBT+ population, which is a key gap in our review.

Regarding the quantitative studies, the high cost of the models of housing with support evaluated in the USA means that we have not captured how poorer older people are cared for in housing with support the USA. Additionally, across the included countries, the quantitative studies focused on white older people. Therefore, we did not capture the impacts of housing with support in terms of race and ethnicity, which is also a key gap in this review.

The included quantitative studies used a wide range of measures to assess impact, which prevented us from conducting a meta-analysis. It is also difficult to generalise the findings of included quantitative studies due to the context-driven nature of housing with support.

Moreover, the quantitative studies were prone to high levels bias, particularly due to loss to follow-up. Participants who remained in the included studies for all timepoints were generally physically fit and cognitively well, whereas older people who become less well and less fit may have been more likely to drop out.

The included quantitative studies provided limited evidence regarding older people's quality of life in housing with support. While many studies reported proxy measures for quality of life, it would have been very useful to have a quality of life measurement for each evaluation and to have used the proxy measures as covariates.

Our conceptual model integrating the qualitative and quantitative findings is a key contribution to policy makers and researchers. However, it must be interpreted as an aspirational model of housing with support, as it illustrates intended rather than proven outcomes. We were constrained by the quality of the available data – the low level of evidence among the included quantitative studies

meant that we were not able to draw definitive conclusions regarding the impact of housing with support.

6.4 Future research

Qualitative findings play a fundamental role in incorporating older people's preferences into design and practice. The qualitative studies in this review provided extremely valuable insights into older people's perceptions and experiences of housing with support, thus it is important that qualitative research continues as the implementation of housing with support expands globally. However, this research ought to use well-defined qualitative methodologies. High-quality qualitative research exploring the roles of socioeconomic background, race, ethnicity, gender identity, and sexual preferences is particularly important, so that housing with support can meet the needs of all older people.

Regarding quantitative research, as we described previously in our conclusion to the impact review, we found that longitudinal cohort studies measuring older people's physical and mental well-being are prone to high levels of bias. In particular, loss to follow-up is a major challenge, not necessarily because older people do not want to participate, but often because they are too ill, too cognitively impaired, or because they die. As a result, older people who remain in cohort studies are likely to be healthier and more able in comparison to the general population, making it very difficult to generalise the results to all older people in housing with support. Moreover, cohort studies are very costly and may not be measuring the most important quality-of-life parameters for older people.

An alternative approach is to use existing health records to measure the impact of housing with support through time series analysis. This would also prevent older people having to repeat tests of their physical and mental well-being, which are already integrated into their routine care. Studies using existing health records ought to focus on three key outcomes for measuring success in housing with support – time spent in hospital, transfer to institutional care, and death in housing with support. These three outcomes are important because they are indicative of what older people want out of housing with support – to move to a community in which they can live and die in place.

Additionally, simple and cost-effective surveys can be used to measure older people's self-assessed quality of life, self-rated health, participation in well-being activities, and satisfaction with housing. These outcomes are crucial indicators of physical and social well-being and of overall quality of life.

Finally, our integration of qualitative and quantitative research using convergent parallel design is a key strength of this review. This allowed us to consider qualitative and quantitative in isolation prior to synthesising our findings, which meant that we did justice to each of the two overarching research paradigms before we integrated our results. Future reviews of the literature regarding housing with support for older people could take a similar approach, as the triangulation of methodologies and their findings makes an important contribution to theory, policy, and practice.

7 Conclusion

Housing with support has potential to play a pivotal role in providing creating communities for older people that. The qualitative and quantitative studies we have analysed show that an accessible home and environment are the first steps for housing with support, but the philosophy and principles that it is based on are what makes it a success. Individual choice and autonomy are crucial for older people to successfully transition to, age in place in, and die in place in housing with support. Additionally, housing with support can allow older people to continue to live in their own locality, allowing them to maintain their previous social networks and access the same amenities and community services, which eases their transition to their new home. Personal care and support services are a key aspect of housing with support, and reablement, cognitive support, and mental health services are particularly important given the needs of older people and the challenges of undergoing a major life transition by moving to a new setting. Yet communal spaces, organised social activities, volunteerism, and mutual support are also fundamental to well-being as they foster social engagement and create cohesion in the community. It is important to note that while the qualitative evidence indicates potential benefits, the evidence of impact is somewhat limited and susceptible to bias and should therefore be interpreted with caution. Yet, the evidence suggests that housing with support may have potential to enable a self-directed life for older people that maximises free choice and independence, which is integral to improving quality of life.

References

1. Centre for Ageing Research and Development in Ireland. Focus on housing and the health of older people Belfast: Centre for Ageing Research and Development in Ireland,; 2013 [Available from: <https://www.cardi.ie/userfiles/Focus%20on%20Housing%20and%20the%20Health%20of%20Older%20People.pdf>.
2. Friedland RB, Summer L. Demography is not destiny, revisited. New York, NY: The Commonwealth Fund, 2005.
3. Cullen K, Delaney S, Dolphin C. The role and future development of supportive housing for older people in Ireland. Dublin, Ireland: National Council on Ageing and Older People, 2007.
4. Ewen HH, Lewis DC, Carswell AT, et al. A model for aging in place in apartment communities. *J Hous Elderly* 2017;31(1):1-13. doi: 10.1080/02763893.2016.1268555
5. Croucher K, Hicks L, Jackson K. Housing with care for later life: A literature review. York: Joseph Rowntree Foundation, 2006.
6. Howe AL, Jones AE, Tilse C. What's in a name? Similarities and differences in international terms and meanings for older peoples' housing with services. *Ageing Soc* 2013;33(4):547-78. doi: 10.1017/S0144686X12000086
7. Creswell JW, Poth CN. Qualitative Inquiry and Research Design: Choosing Among Five Approaches. New York: SAGE Publications 2017.
8. Coyle C, Cagney O, Buggy S, et al. Housing with support for older people. An evidence brief: Health Research Board 2019.
9. Canadian Health Library Association. [The elderly] Personnes âgées: Canadian Health Library Association,; 2018 [Available from: http://extranet.santecom.qc.ca/wiki/lbiblio3s/doku.php?id=concepts:personnes_agees accessed 03 Nov 2019.
10. Pluye P, El Sherif R, Gore G, et al. Facilitating the identification of qualitative, quantitative and mixed methods studies: Pilot evaluation study of a database filter for mixed studies reviews. . Mixed Methods International Research Association (MMIRA) conference. Boston, USA, 2014.
11. Rethlefsen M, Kirtley S, Waffenschmidt S, et al. PRISMA-S: An Extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews 2020 [updated 27/02. Available from: <https://mfr.osf.io/render?url=https://osf.io/sfgvq/?direct%26mode=render%26action=download%26mode=render> accessed 22/02/2020.
12. Noyes J, Booth A, Cargo M, et al. Chapter 21: Qualitative evidence. In: Higgins JPT, Thomas J, Chandler J, et al., eds. Cochrane Handbook for Systematic Reviews of Interventions version 6.0 (updated July 2019): Cochrane 2019.
13. Booth A. Searching for qualitative research for inclusion in systematic reviews: a structured methodological review. *Systematic reviews* 2016;5:74. doi: 10.1186/s13643-016-0249-x
14. Eppi Centre. EPPI-Reviewer 4: software for research synthesis. User manual London: EPPI-Centre; 2018 [Available from: https://eppi.ioe.ac.uk/CMS/Portals/35/ER4_8_0%20user%20manual.pdf.
15. The Joanna Briggs Institute. The Joanna Briggs Institute critical appraisal tools for use in JBI systematic reviews. Checklist for qualitative research Adelaide: The Joanna Briggs Institute,; 2017 [Available from: https://joannabriggs.org/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Qualitative_Research2017_0.pdf.
16. Lewin S, Bohren M, Rashidian A, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings—paper 2: how to make an overall CERQual assessment of confidence and create a Summary of Qualitative Findings table. *Implementation Sci* 2018;13(10)
17. NIH National Heart LaBI. Study quality assessment tools. Quality assessment tool for before-after (pre-post) studies with no control group Bethesda, Maryland: NIH National Heart, Lung and Blood Institute; [No date] [Available from: <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>.
18. Murad MH, Asi N, Alsawas M, et al. New evidence pyramid. *Evidence-based medicine* 2016;21(4):125-27. doi: 10.1136/ebmed-2016-110401

19. Schünemann H, Brożek J, Guyatt G, et al. Overall confidence in estimates of effects. In: GRADE handbook for grading quality of evidence and strength of recommendations. GRADE handbook for grading quality of evidence and strength of recommendations: Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group,, 2013.
20. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology* 2008;8(1):45. doi: 10.1186/1471-2288-8-45
21. Dedoose, 2020. <https://www.dedoose.com/>
22. Hong QN, Pluye P, Bujold M, et al. Convergent and sequential synthesis designs: implications for conducting and reporting systematic reviews of qualitative and quantitative evidence. *Systematic reviews* 2017;6(1):61. doi: 10.1186/s13643-017-0454-2
23. Nielson L, Wiles J, Anderson A. Social exclusion and community in an urban retirement village. *J Aging Stud* 2019;49:25-30. doi: 10.1016/j.jaging.2019.03.003
24. Tyvimaa T, Kemp CL. Finnish seniors' move to a senior house: examining the push and pull factors. *J Hous Elderly* 2011;25(1):50-71. doi: 10.1080/02763893.2011.545742
25. Dupuis-Blanchard SM. Building a new nest: the experience of women relocating to a seniors-designated apartment building. *Can J Nurs Res* 2007;39(4):137-53.
26. Chen S-L, Brown JW, Mefford LC, et al. Elders' decisions to enter assisted living facilities: a grounded theory study. *J Hous Elderly* 2008;22(1/2):86-103. doi: 10.1080/02763890802097094
27. Tracy JP, DeYoung S. Moving to an assisted living facility: exploring the transitional experience of elderly individuals. *J Gerontol Nurs* 2004;30(10):26-33. doi: 10.3928/0098-9134-20041001-09
28. Leith KH. "Home is where the heart is...or is it?" Qualitative exploration of the meaning of home for older women in congregate housing. *J Aging Stud* 2006;20(4):317-33. doi: 10.1016/j.jaging.2005.12.002
29. Scott JM, Mayo AM. Adjusting to the transition into assisted living: opportunities for nurse practitioners. *J Am Acad Nurse Pract* 2019;31(10):583-90. doi: 10.1097/JXX.000000000000184
30. Ewen HH, Chahal J. Influence of late life stressors on the decisions of older women to relocate into congregate senior housing. *J Hous Elderly* 2013;27(4):392-408. doi: 10.1080/02763893.2013.813428
31. Burns J. The benefits of extra care housing on the quality of life of residents: The impact of living in Campbell Place, Fleet. Housing LIN Case Study 93. London, England: Housing Learning & Improvement Network (Housing LIN), 2014.
32. Dong W. Quality of life at an elder's collective dwelling community: a case study of a Toronto seniors' residence. *J Appl Soc Sci* 2018;12(2):113-26. doi: 10.1177/1936724418785414
33. Walker E, McNamara B. Relocating to retirement living: an occupational perspective on successful transitions. *Aust Occup Ther J* 2013;60(6):445-53. doi: 10.1111/1440-1630.12038
34. Kennedy D, Sylvia E, Bani-Issa W, et al. Beyond the rhythm and routine: adjusting to life in assisted living. *J Gerontol Nurs* 2005;31(1):17-23. doi: 10.3928/0098-9134-20050101-08
35. Björnsdóttir G, Arnadóttir SA, Halldorsdóttir S. Physical activity of older women living in retirement communities: capturing the whole picture through an ecological approach. *J Geriatr Phys Ther* 2019 doi: 10.1519/JPT.000000000000237 [published Online First: 15 Mar 2019]
36. Svidén G, Wikström B, Hjortsjö-Norberg M. Elderly persons' reflections on relocating to living at sheltered housing. *Scand J Occup Ther* 2002;9(1):10-16. doi: 10.1080/110381202753505818
37. Nord C. Resident-centred care and architecture of two different types of caring residences: a comparative study. *Int J Qual Stud Health Well-being* 2018;13(1):1472499. doi: 10.1080/17482631.2018.1472499
38. Kemp CL, Ball MM, Perkins MM. Couples' social careers in assisted living: reconciling individual and shared situations. *The Gerontologist* 2016;56(5):841-54. doi: 10.1093/geront/gnv025
39. Vasara P. Not ageing in place: negotiating meanings of residency in age-related housing. *J Aging Stud* 2015;35:55-64. doi: 10.1016/j.jaging.2015.07.004
40. Björnsdóttir G, Arnadóttir SA, Halldorsdóttir S. Facilitators of and barriers to physical activity in retirement communities: experiences of older women in urban areas. *Phys Ther* 2012;92(4):551-62. doi: 10.2522/ptj.20110149

41. Nord C. A day to be lived. Elderly peoples' possessions for everyday life in assisted living. *J Aging Stud* 2013;27(2):135-42. doi: 10.1016/j.jaging.2012.12.002
42. Perry TE. Make mine home: spatial modification with physical and social implications in older adulthood. *J Gerontol B* 2015;70(3):453-61. doi: 10.1093/geronb/gbu059
43. Shippee TP. On the edge: balancing health, participation, and autonomy to maintain active independent living in two retirement facilities. *J Aging Stud* 2012;26(1):1-15. doi: 10.1016/j.jaging.2011.05.002
44. Ball MM, Kemp CL, Hollingsworth C, et al. "This is our last stop": Negotiating end-of-life transitions in assisted living. *J Aging Stud* 2014;30:1-13. doi: 10.1016/j.jaging.2014.02.002
45. Shaw RL, West K, Hagger B, et al. Living well to the end: a phenomenological analysis of life in extra care housing. *Int J Qual Stud Health Well-being* 2016;11:31100. doi: 10.3402/qhw.v11.31100
46. Spierings TGM, Ache PM. Assessing social quality of sheltered independent housing: challenges of scale and group mix. *J Hous Built Environ* 2018;33(2):339-58. doi: 10.1007/s10901-017-9567-0
47. Portacolone E, Halpern J. "Move or suffer": is age-segregation the new norm for older Americans living alone? *J Appl Gerontol* 2016;35(8):836-56. doi: 10.1177/0733464814538118
48. Mahoney DF, Goc K. Tensions in independent living facilities for elders: a model of connected disconnections. *J Hous Elderly* 2009;23(3):166-84. doi: 10.1080/02763890903035522
49. Hrybyk G, Rubinstein RL, Eckert K, et al. The Dark Side: stigma in purpose-built senior environments. *J Hous Elderly* 2012;26(1-3):275-89. doi: 10.1080/02763893.2012.651384
50. Roth EG, Keimig L, Rubinstein RL, et al. Baby Boomers in an active adult retirement community: comity interrupted. *The Gerontologist* 2012;52(2):189-98. doi: 10.1093/geront/gnr155
51. Kemp CL, Ball MM, Hollingsworth C, et al. Strangers and friends: residents' social careers in assisted living. *J Gerontol B Psychol Sci Soc Sci* 2012;67(4):491-502. doi: 10.1093/geronb/gbs043
52. Dupuis-Blanchard S, Neufeld A, Strang VR. The significance of social engagement in relocated older adults. *Qual Health Res* 2009;19(9):1186-95. doi: 10.1177/1049732309343956
53. Svensson A-M, Martensson LB, Muhli UHH. Well-being dialogue: elderly women's subjective sense of well-being from their course of life perspective. *Int J Qual Stud Health Well-being* 2012;7:1-12. doi: 10.3402/qhw.v7i0.19207
54. Evans S. 'That lot up there and us down here': social interaction and a sense of community in a mixed tenure UK retirement village. *Ageing Soc* 2009;29(2):199-216. doi: 10.1017/S0144686X08007678
55. Park NS, Zimmerman S, Kinslow K, et al. Social engagement in assisted living and implications for practice. *J Appl Gerontol* 2012;31(2):215-38. doi: 10.1177/0733464810384480
56. Frankowski AC, Clark LJ. Sexuality and intimacy in assisted living: residents' perspectives and experiences. *Sex Res Social Policy* 2009;6(4):25-37. doi: 10.1525/srsp.2009.6.4.25
57. Bender AA, Burgess EO, Barmon C. Negotiating the lack of intimacy in assisted living: resident desires, barriers, and strategies. *J Appl Gerontol* 2020;39(1):28-39. doi: 10.1177/0733464817746756
58. Funk LM, Herron R, Spencer D, et al. More than "petty squabbles" - Developing a contextual understanding of conflict and aggression among older women in low-income assisted living. *J Aging Stud* 2019;48:1-8. doi: 10.1016/j.jaging.2018.11.001
59. Roth EG, Eckert JK, Morgan LA. Stigma and discontinuity in multilevel senior housing's continuum of care. *The Gerontologist* 2016;56(5):868-76. doi: 10.1093/geront/gnv055
60. Lawrence AR, Schigelone ARS. Reciprocity beyond dyadic relationships: aging-related communal coping. *Res Aging* 2002;24(6):684-704. doi: 10.1177/016402702237187
61. McCaig M, Waugh A, Duffy T, et al. The lived experience of older people using assistive technology. *Work Older People* 2012;16(4):170-74. doi: 10.1108/13663661211286693
62. Moen P, Erickson MA. Chapter 3 Decision-making and satisfaction with a continuing care retirement community. *J Hous Elderly* 2001;14(1-2):53-69. doi: 10.1300/J081v14n01_03
63. Croucher K, Hicks L, Bevan M, et al. Comparative evaluation of models of housing with care for later life [Research Report]. York: Joseph Rowntree Foundation; 2007 [Available from: <https://www.jrf.org.uk/report/comparing-models-housing-care-later-life>].

64. Young Y. Factors associated with permanent transition from independent living to nursing home in a continuing care retirement community. *Journal of the American Medical Directors Association* 2009;10(7):491-97. doi: 10.1016/j.jamda.2009.03.019
65. Roberts AR. A longitudinal study of the influence of social engagement on quality of life among older adults living in senior housing [PhD Thesis]. Case Western Reserve University, 2013.
66. Moen P, Erickson MA, Dempster-McClain D. Social role identities among older adults in a continuing care retirement community. *Res Aging* 2000;22(5):559-79. doi: 10.1177/0164027500225005
67. Heisler E, Evans GW, Moen P. Health and social outcomes of moving to a continuing care retirement community. *J Hous Elderly* 2003;18(1):5-23. doi: 10.1300/J081v18n01_02
68. Gaines JM, Poey JL, Marx KA, et al. Health and medical services use: a matched case comparison between CCRC residents and national health and retirement study samples. *Journal of gerontological social work* 2011;54(8):788-802. doi: 10.1080/01634372.2011.595476
69. Roberts AR, Adams KB. Quality of life trajectories of older adults living in senior housing. *Res Aging* 2018;40(6):511-34. doi: 10.1177/0164027517713313
70. Cutchin MP, Marshall VW, Aldrich RM. Moving to a continuing care retirement community: occupations in the therapeutic landscape process. *Journal of cross-cultural gerontology* 2010;25(2):117-32. doi: 10.1007/s10823-010-9113-y
71. Bintrim KA, Gaines JM, Resnick B, et al. Recruitment and retention strategies for a longitudinal study in continuing care retirement communities (CCRCs). *Long-Term Care Interface* 2005;6(8):25-30.
72. Ayalon L. Subjective social status as a predictor of loneliness: The moderating effect of the type of long-term care setting. *Res Aging* 2019;41(10):915-35. doi: 10.1177/0164027519871674
73. Rossen EK, Knafl KA. Women's well-being after relocation to independent living communities. *Western journal of nursing research* 2007;29(2):183-99. doi: 10.1177/0193945906292539
74. Frytak JR, Kane RA, Finch MD, et al. Outcome trajectories for assisted living and nursing facility residents in Oregon. *Health Serv Res* 2001;36(1 Pt 1):91-111.
75. Rantz MJ, Phillips L, Aud M, et al. Evaluation of aging in place model with home care services and registered nurse care coordination in senior housing. *Nursing outlook* 2011;59(1):37-46. doi: 10.1016/j.outlook.2010.08.004
76. Rantz M, Popejoy LL, Galambos C, et al. The continued success of registered nurse care coordination in a state evaluation of aging in place in senior housing. *Nursing outlook* 2014;62(4):237-46. doi: 10.1016/j.outlook.2014.02.005
77. Lutgendorf SK, Reimer TT, Harvey JH, et al. Effects of housing relocation on immunocompetence and psychosocial functioning in older adults. *The journals of gerontology Series A, Biological sciences and medical sciences* 2001;56(2):M97-105. doi: 10.1093/gerona/56.2.m97
78. Gaugler JE, Kane RA. Activity outcomes for assisted living residents compared to nursing home residents: findings from a longitudinal study. *Act Adapt Aging* 2005;29(3):33-58. doi: 10.1300/J016v29n03_03
79. Pruchno RA, Rose MS. The effect of long-term care environments on health outcomes. *The Gerontologist* 2000;40(4):422-28. doi: 10.1093/geront/40.4.422
80. Waldron VR, Gitelson R, Kelley D, et al. Losing and building supportive relationships in later life. . *J Hous Elderly* 2005a;19(2):5-25. doi: 10.1300/J081v19n02_02
81. Waldron VR, Gitelson R, Kelley DL. Gender differences in social adaptation to a retirement community: Longitudinal changes and the role of mediated communication. *J Appl Gerontol* 2005b;24(4):283-98. doi: 10.1177/0733464805277122
82. Darton R, Baumker T, Callaghan L, et al. Evaluation of the extra care housing funding initiative: Initial report. Kent, UK: Personal Social Services Research Unit, University of Kent, 2008.
83. Kingston P, Bernard M, Biggs S, et al. Assessing the health impact of age-specific housing. *Health Soc Care Community* 2001;9(4):228-34. doi: 10.1046/j.1365-2524.2001.00298.x
84. Bäumker T, Netten A, Darton R, et al. Evaluating extra care housing for older people in England: A comparative cost and outcome analysis with residential care. *J Service Sci Manage* 2011;4(4):523-39. doi: 10.4236/jssm.2011.44060
85. Darton R, Bäumker T, Callaghan L, et al. Evaluation of the extra care housing initiative: PSSRU technical report. PSSRU Discussion Paper 2783/2. Canterbury, England: University of Kent, 2011a:78.
86. LaingBuisson. Extra-care housing UK market report, 2010.

87. Darton R, Bäumker T, Callaghan L, et al. The characteristics of residents in extra care housing and care homes in England. *Health Soc Care Community* 2012;20(1):87-96. doi: 10.1111/j.1365-2524.2011.01022.x
88. Holland C, Boukouvalas A, Wallis S, et al. Transition from community dwelling to retirement village in older adults: cognitive functioning and psychological health outcomes. *Ageing Soc* 2017;37(7):1499-526. doi: 10.1017/S0144686X16000477
89. Bäumker T, Netten A, Darton R. Costs and outcomes of an extra care housing scheme in England. *J Hous Elderly* 2010;24(2):151-70. doi: 10.1080/02763891003757098
90. Darton R, Bäumker T, Callaghan L, et al. Improving housing with care choices for older people: the PSSRU evaluation of extra care housing. *Housing, Care and Support* 2011b;14(3):77-82. doi: 10.1108/14608791111199741
91. Callaghan L, Netten A, Darton R. The development of social well-being in new extra care housing schemes Kent, England: Joseph Rowntree Foundation,; 2009 [Available from: <https://www.jrf.org.uk/report/development-social-well-being-new-extra-care-housing-schemes>.
92. Darton R, Bäumker T, Callaghan L, et al. Residents in extra care housing: changes in dependency over time, survival and destinations of leavers. PSSRU Discussion Paper 2775/2 Canterbury, England: Personal Social Services Research Unit, University of Kent.; 2011c [
93. Netten A, Darton R, Bäumker T, et al. Improving housing with care choices for older people: an evaluation of extra care housing Kent, England: Personal Social Services Research Unit, University of Kent; 2011 [Available from: <https://www.housinglin.org.uk/Topics/type/Evaluation-of-Extra-Care-Housing-initiative/>.
94. Kneale D, Smith L. Extra care housing in the UK: Can it be a home for life? *J Hous Elderly* 2013;27(3):276-98. doi: 10.1080/02763893.2013.813423
95. Kneale D. Establishing the extra in extra care. Perspectives from three extra care housing providers London, England: The International Longevity Centre - UK (ILC-UK); 2011 [Available from: <https://ilcuk.org.uk/establishing-the-extra-in-extra-care-perspectives-from-three-extra-care-housing-providers/>.
96. Holland C, Collins J, Hagger B, et al. Collaborative research between Aston Research Centre for Healthy Ageing (ARCHA) and the ExtraCare Charitable Trust. A second year update and portfolio of outputs. Birmingham, England: Aston University, 2014:91.
97. Holland C, Carter M, Cooke R, et al. Collaborative research between Aston Research Centre for Healthy Ageing (ARCHA) and the ExtraCare Charitable Trust. The final report. Birmingham, UK: Aston Research Centre for Healthy Ageing, Aston University, ; 2015 [Available from: <https://www2.aston.ac.uk/migrated-assets/applicationpdf/lhs/245545-final%20report1.pdf>.
98. Holland C, Garner I, O'Donnell J, et al. Integrated homes, care and support. Measurable outcomes for healthy ageing. The ExtraCare Charitable Trust research report: The ExtraCare Charitable Trust.; 2019 [updated Mar 2019. Available from: <https://www.extracare.org.uk/media/1169231/full-report-final.pdf>.
99. Smith GC, Sylvestre GM. Effects of neighborhood and individual change on the personal outcomes of recent movers to low-income senior housing. *Res Aging* 2008;30(5):592-617. doi: 10.1177/0164027508319655
100. Lotvonen S, Kyngäs H, Koistinen P, et al. Mental well-being of older people in Finland during the first year in senior housing and its association with physical performance. *Int J Environ Res Public Health* 2018;15(7) doi: 10.3390/ijerph15071331
101. Lotvonen S, Kyngäs H, Koistinen P, et al. Social environment of older people during the first year in senior housing and its association with physical performance. *Int J Environ Res Public Health* 2017;14(9):960. doi: 10.3390/ijerph14090960
102. Lea C, Quiñones A, Whitson H, et al. Changes in self-rated health during the transition to retiring living among Medicare managed-care recipients. *J Hous Elderly* 2016;30(1):76-88. doi: 10.1080/02763893.2015.1129383
103. Serrano-Gemes G, Rich-Ruiz M, Serrano-Del-Rosal R. Systematic review of qualitative studies on participants in the decision-making process about the location of care of the elderly. *BMJ Open* 2020;10(3):e036551. doi: 10.1136/bmjopen-2019-036551 [published Online First: 2020/03/25]
104. Roy N, Dubé R, Després C, et al. Choosing between staying at home or moving: A systematic review of factors influencing housing decisions among frail older adults. *PLoS One*

- 2018;13(1):e0189266. doi: 10.1371/journal.pone.0189266 [published Online First: 2018/01/03]
105. Gilbert S, Amella E, Edlund B, et al. Making the move: A mixed research integrative review. *Healthcare (Basel)* 2015;3(3):757-74. doi: 10.3390/healthcare3030757
106. Rosenwohl-Mack A, Schumacher K, Fang ML, et al. A new conceptual model of experiences of aging in place in the United States: Results of a systematic review and meta-ethnography of qualitative studies. *International journal of nursing studies* 2020;103:103496. doi: 10.1016/j.ijnurstu.2019.103496 [published Online First: 2019/12/31]
107. Bradshaw SA, Playford ED, Riazi A. Living well in care homes: a systematic review of qualitative studies. *Age Ageing* 2012;41(4):429-40. doi: 10.1093/ageing/afs069

Appendices

Appendix A: PRISMA-S Checklist

Section/topic	#	Checklist item	Location(s) Reported
INFORMATION SOURCES AND METHODS			
Database name	1	Name each individual database searched, stating the platform for each.	Methods chapter and Appendices
Multi-database searching	2	If databases were searched simultaneously on a single platform, state the name of the platform, listing all of the databases searched.	N/a
Study registries	3	List any study registries searched.	N/a
Online resources and browsing	4	Describe any online or print source purposefully searched or browsed (e.g., tables of contents, print conference proceedings, web sites), and how this was done.	Methods chapter and Appendices
Citation searching	5	Indicate whether cited references or citing references were examined, and describe any methods used for locating cited/citing references (e.g., browsing reference lists, using a citation index, setting up email alerts for references citing included studies).	Methods chapter and Appendices
Contacts	6	Indicate whether additional studies or data were sought by contacting authors, experts, manufacturers, or others.	N/a
Other methods	7	Describe any additional information sources or search methods used.	
SEARCH STRATEGIES			
Full search strategies	8	Include the search strategies for each database and information source, copied and pasted exactly as run.	Appendices

Section/topic	#	Checklist item	Location(s) Reported
Limits and restrictions	9	Specify that no limits were used, or describe any limits or restrictions applied to a search (e.g., date or time period, language, study design) and provide justification for their use.	Appendices
Search filters	10	Indicate whether published search filters were used (as originally designed or modified), and if so, cite the filter(s) used.	Methods chapter and References
Prior work	11	Indicate when search strategies from other literature reviews were adapted or reused for a substantive part or all of the search, citing the previous review(s).	Methods chapter and References
Updates	12	Report the methods used to update the search(es) (e.g., rerunning searches, email alerts).	N/a
Dates of searches	13	For each search strategy, provide the date when the last search occurred.	Appendices
Peer review			
Peer review	14	Describe any search peer review process.	Methods chapter
Managing records			
Total Records	15	Document the total number of records identified from each database and other information sources.	PRISMA flow diagrams in Methods chapter
Deduplication	16	Describe the processes and any software used to deduplicate records from multiple database searches and other information sources.	Methods chapter

PRISMA-S: An Extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews

Rethlefsen ML, Kirtley S, Waffenschmidt S, Ayala AP, Moher D, Page MJ, Koffel JB, PRISMA-S Group.

Last updated 27 February 2020.

Appendix B: Database search parameters

Database	Platform	Dates	Date of search
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to November 15, 2019	Ovid	2000-present	18 November 2019
CINAHL Complete	EBSCO	2000-present	21 November 2019
SocINDEX	EBSCO	2000-present	21 November 2019
Social Policy & Practice	Ovid	2000-present	21 November 2019

Appendix C: Search strategy

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
N	Terms	N	Terms	N	Terms
1	Case Reports/	S1	(MH "Case Studies")	S1	DE "CASE method (Teaching)"
2	Organizational Case Studies/	S2	(MH "Qualitative Studies+")	S2	DE "QUALITATIVE research"
3	Qualitative Research/	S3	TI qualitative W1 research OR AB qualitative W1 research	S3	TI qualitative W1 research OR AB qualitative W1 research
4	qualitative research*.mp.	S4	TI "qualitative stud*" OR AB "qualitative stud*"	S4	TI "qualitative stud*" OR AB "qualitative stud*"
5	qualitative stud*.mp.	S5	TI "action research" OR AB "action research"	S5	TI "action research" OR AB "action research"
6	action research.mp.	S6	(MH "Action Research")	S6	TI "ethnograph*" OR AB "ethnograph*"
7	Community-Based Participatory Research/	S7	TI "participatory research" OR AB "participatory research"	S7	TI "grounded theory" OR AB "grounded theory"
8	participatory research.mp.	S8	TI "case stud*" OR AB "case stud*"	S8	DE "COMMUNITY-based participatory research" OR DE "ACTION research"
9	case stud*.mp.	S9	TI ethno* OR AB ethno*	S9	DE "PHENOMENOLOGY"
10	ethno*.mp.	S10	TI "grounded theory" OR AB "grounded theory"	S10	TI "phenomeno*" OR AB "phenomeno*"
11	grounded theory.mp.	S11	TI phenomeno* OR AB phenomeno*	S11	TI "Narrative*" OR AB "Narrative*"
12	phenomeno*.mp.	S12	(MH "Narratives+")	S12	DE "SOCIOLOGY -- Biographical methods"
13	Narration/	S13	TI narrative* OR AB narrative*	S13	TI "biograph*" OR AB "biograph*"
14	narrative*.mp.	S14	TI biograph* OR AB biograph*	S14	DE "AUTOETHNOGRAPHY"
15	biograph*.mp.	S15	(MH "Autobiographies")	S15	TI "Autobiograph*" OR AB "Autobiograph*"
16	Autobiography/	S16	TI Autobiograph* OR AB Autobiograph*	S16	TI "documentar*" OR AB "documentar*"
17	Autobiograph*.mp.	S17	TI documentar* OR AB documentar*	S17	TI ((Qualitative or quantitative) N2 (synthes* or data)) OR AB ((Qualitative or quantitative) N2 (synthes* or data))
18	documentar*.mp.	S18	TI "qualitative synthes*" OR AB "qualitative synthes*"	S18	TI "thematic" OR AB "thematic"
19	qualitative synthes*.mp.	S19	TI "active feedback" OR AB "active feedback"	S19	TI "key informant*" OR AB "key informant*"
20	active feedback.mp.	S20	TI conversation* OR AB conversation*	S20	DE "FOCUS groups"
21	conversation*.mp.	S21	TI discourse* OR AB discourse*	S21	TI "focus group*" OR AB "focus group*"

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
22	discourse*.mp.	S22	TI thematic OR AB thematic	S22	DE "INTERVIEWING"
23	thematic.mp.	S23	TI "qualitative data" OR AB "qualitative data"	S23	TI "interview*" OR AB "interview*"
24	qualitative data.mp.	S24	TI "key informant*" OR AB "key informant*"	S24	TI Q-methodology OR AB Q-methodology
25	key informant*.mp.	S25	(MH "Focus Groups")	S25	DE "PARTICIPANT observation"
26	Focus Groups/	S26	TI "focus group*" OR AB "focus group*"	S26	TI "visual data" OR AB "visual data"
27	focus group*.mp.	S27	TI "case report*" OR AB "case report*"	S27	DE "ANTHROPOLOGY"
28	case report*.mp.	S28	(MH "Interviews+")	S28	TI experience OR AB experience OR KW experience
29	Interview/ or interview*.mp.	S29	TI (interview*) OR AB (interview*)	S29	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28
30	Q-methodology.mp.	S30	(MH "Observational Methods+")	S30	DE "CLINICAL trials"
31	Observation/	S31	TI observer* OR AB observer*	S31	DE "BLIND experiment"
32	observer*.mp.	S32	TI "visual data" OR AB "visual data"	S32	DE "PLACEBOS (Medicine)"
33	visual data.mp.	S33	TI "audio record*" OR AB "audio record*"	S33	S30 OR S31 OR S32
34	(audio adj record*).mp.	S34	(MH "Anthropology+")	S34	TI (clinic* N25 trial*) OR AB (clinic* N25 trial*) OR KW (clinic* N25 trial*)
35	Anthropology, Cultural/	S35	TI experience* OR AB experience*	S35	TI (random) OR AB (random) OR KW (random)
36	experience*.mp.	S36	(S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35)	S36	TI ("latin square") OR AB ("latin square") OR KW ("latin square")
37	or/1-36	S37	(MH "Clinical Trials+")	S37	TI Placebo* OR AB Placebo* OR KW Placebo*
38	exp clinical trial/	S38	(MH "Study Design+")	S38	S34 OR S35 OR S36 OR S37
39	exp Research Design/	S39	(MH "Random Assignment")	S39	DE "SOCIAL sciences -- Comparative method"
40	random allocation/	S40	(MH "Double-Blind Studies+")	S40	TI "comparative stud*" OR AB "comparative stud*" OR KW "comparative stud*"
41	double-blind method/	S41	(MH "Single-Blind Studies")	S41	TI "evaluation stud*" OR AB "evaluation stud*" OR KW "evaluation stud*"

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
42	Single-Blind Method/	S42	(MH "Placebos")	S42	DE "EVALUATION research (Social action programs)"
43	Placebos/	S43	(MH "Crossover Design")	S43	TI "validation stud*" OR AB "validation stud*" OR KW "validation stud*"
44	Cross-Over Studies/	S44	S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43	S44	DE "FOLLOW-up studies (Medicine)"
45	or/38-44	S45	TI (clinic* N25 trial*) OR AB (clinic* N25 trial*)	S45	TI ((realist W2 (design or evaluation* or review* or research or approach)).) OR TI ((realist W2 (design or evaluation* or review* or research or approach)).) OR KW ((realist W2 (design or evaluation* or review* or research or approach)).)
46	(clinic* adj25 trial*).mp.	S46	TI random* OR AB random*	S46	TI ((followup stud* or follow-up stud*)) OR AB ((followup stud* or follow-up stud*)) OR KW ((followup stud* or follow-up stud*))
47	random*.mp.	S47	TI control* OR AB control*	S47	TI ("cross over" or crossover) OR AB ("cross over" or crossover) OR KW ("cross over" or crossover)
48	control*.mp.	S48	TI (latin N1 square) OR AB (latin N1 square)	S48	TI prospective* OR AB prospective* OR KW prospective*
49	(latin adj square).mp.	S49	TI placebo* OR AB placebo*	S49	TI volunteer* OR AB volunteer* OR KW volunteer*
50	placebo*.mp.	S50	S45 OR S46 OR S47 OR S48 OR S49	S50	S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49
51	or/46-50	S51	(MH "Comparative Studies")	S51	TI (singl* or doubl* or trebl* or tripl*) OR AB (singl* or doubl* or trebl* or tripl*) OR KW (singl* or doubl* or trebl* or tripl*)
52	Comparative Study/	S52	TI "comparative stud*" OR AB "comparative stud*"	S52	TI (mask* or blind*) OR AB (mask* or blind*) OR KW (mask* or blind*)
53	"comparative stud*"mp.	S53	(MH "Validation Studies")	S53	S51 AND S52
54	Validation Studies/	S54	TI "validation stud*" OR AB "validation stud*"	S54	((DE "COHORT analysis") OR (DE "CASE-control method")) OR (DE "CROSS-sectional method")) OR (DE "QUESTIONNAIRE design")
55	validation stud*.mp.	S55	(MH "Evaluation Research+")	S55	TI (survey* or questionnaire*) OR AB (survey* or questionnaire*) OR KW (survey* or questionnaire*)
56	evaluation studies/	S56	TI "evaluation stud*" OR AB "evaluation stud*"	S56	DE "MORTALITY"
57	evaluation stud*.mp.	S57	(MH "Prospective Studies+")	S57	TI cohort OR AB cohort OR KW cohort

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
58	Follow-Up Studies/	S58	TI (followup or follow-up) OR AB (followup or follow-up)	S58	TI (case-control or "case control") OR AB (case-control or "case control") OR KW (case-control or "case control")
59	(followup stud* or follow-up stud*).mp.	S59	(MH "Prospective Studies+")	S59	TI cross sectional OR AB cross sectional OR KW cross sectional
60	(realist adj (design or evaluation* or review* or research or approach)).mp.	S60	(MH "Crossover Design")	S60	TI longitudinal OR AB longitudinal OR KW longitudinal
61	Prospective Studies/	S61	TI ("cross over" or crossover) OR AB ("cross over" or crossover)	S61	TI (incidence or prevalence or mortality) OR AB (incidence or prevalence or mortality) OR KW (incidence or prevalence or mortality)
62	Cross-Over Studies/	S62	TI prospective* OR AB prospective*	S62	TI ("case series" or "time series") OR AB ("case series" or "time series") OR KW ("case series" or "time series")
63	cross over.mp.	S63	TI volunteer* OR AB volunteer*	S63	TI (before-and-after or prognos*) OR AB (before-and-after or prognos*) OR KW (before-and-after or prognos*)
64	crossover.mp.	S64	S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63	S64	TI (before-and-after or prognos* or predict*) OR AB (before-and-after or prognos* or predict*) OR KW (before-and-after or prognos* or predict*)
65	prospective*.mp.	S65	TI singl* OR AB singl*	S65	S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64
66	volunteer*.mp.	S66	TI doubl* OR AB doubl*	S66	TI ((mixed N5 method*) or multimethod or (multiple N5 method*)) OR AB ((mixed N5 method*) or multimethod or (multiple N5 method*))
67	or/52-66	S67	TI trebl* OR AB trebl*	S67	DE "QUALITATIVE research"
68	singl*.mp.	S68	TI tripl* OR AB tripl*	S68	TI qualitative OR AB qualitative OR KW qualitative
69	doubl*.mp.	S69	S65 OR S66 OR S67 OR S68	S69	TI quantitative OR AB quantitative OR KW quantitative
70	trebl*.mp.	S70	TI mask* OR AB mask*	S70	S67 OR S68
71	tripl*.mp.	S71	TI blind* OR AB blind*	S71	S69 AND S70
72	or/68-71	S72	S70 OR S71	S72	S66 OR S71
73	mask*.mp.	S73	S69 AND S72	S73	S29 OR S33 OR S38 OR S50 OR S53 OR S65 OR S72
74	blind*.mp.	S74	S44 OR S50 OR S64 OR S73	S74	TI ((Ageing-at-home or ageing-in-place)) OR AB ((Ageing-at-home or ageing-in-place))

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
75	73 or 74	S75	(MH "Prospective Studies+")	S75	TI ((Ageing-at-home or ageing-in-place)) OR AB ((Ageing-at-home or ageing-in-place))
76	72 and 75	S76	(MH "Case Control Studies+")	S76	TI (((assisted N2 living) or assisted-living)) OR AB (((assisted N2 living) or assisted-living))
77	45 or 51 or 67 or 76	S77	(MH "Cross Sectional Studies")	S77	TI (((stay-at-home or home-environment*) and (older or elderly))) OR AB (((stay-at-home or home-environment*) and (older or elderly)))
78	Cohort Studies/	S78	(MH "Surveys")	S78	TI (((Age-related N1 housing) or (age N1 related N1 housing))) OR AB (((Age-related N1 housing) or (age N1 related N1 housing)))
79	Case-Control Studies/	S79	(MH "Incidence")	S79	TI (((Ancillary N1 dwelling N1 units) or (ancillary N1 units))) OR AB (((Ancillary N1 dwelling N1 units) or (ancillary N1 units)))
80	Cross-Sectional Studies/	S80	(MH "Prevalence")	S80	TI apartment-for-life OR AB apartment-for-life
81	"Surveys and Questionnaires"/ or Longitudinal Studies/	S81	(MH "Mortality")	S81	TI ((Cohousing or co-housing)) OR AB ((Cohousing or co-housing))
82	(survey* or questionnaire*).mp.	S82	TI cohort* OR AB cohort*	S82	TI (Collective W1 ageing) OR AB (Collective W1 ageing)
83	Risk/	S83	TI case-control OR AB case-control	S83	TI (Congregate W1 housing) OR AB (Congregate W1 housing)
84	Incidence/	S84	TI "cross sectional" OR AB "cross sectional"	S84	TI ((Continuing W1 care W1 ((retirement W1 communit*) or strateg*))) OR AB ((Continuing W1 care W1 ((retirement W1 communit*) or strateg*)))
85	Prevalence/	S85	TI (health W1 survey*) OR AB (health W1 survey*)	S85	TI (((elder W1 cottage*) or (Granny W1 flat*))) OR AB (((elder W1 cottage*) or (Granny W1 flat*)))
86	Mortality/	S86	TI (longitudinal or risk or incidence or prevalence or mortality) OR AB (longitudinal or risk or incidence or prevalence or mortality)	S86	TI (((Extra W1 care W1 hous*) or (Extracare W1 hous*) or (Extra-care W1 hous*))) OR AB (((Extra W1 care W1 hous*) or (Extracare W1 hous*) or (Extra-care W1 hous*)))
87	cohort*.mp.	S87	TI "case series" OR AB "case series"	S87	TI (Family W1 home*) OR AB (Family W1 home*)
88	case-control.mp.	S88	TI "time series" OR AB "time series"	S88	TI (hous* W1 type*) OR AB (hous* W1 type*)
89	cross sectional.mp.	S89	TI ("before and after") OR AB ("before and after")	S89	TI (Green W1 House W1 model*) OR AB (Green W1 House W1 model*)

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
90	longitudinal.mp.	S90	TI prognos* OR AB prognos*	S90	TI (((home or home) W1 modification*)) OR AB (((home or home) W1 modification*))
91	risk.tw.	S91	TI predict* OR AB predict*	S91	TI (Hous* W1 adaptation*) OR AB (Hous* W1 adaptation*)
92	incidence.mp.	S92	S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85 OR S86 OR S87 OR S88 OR S89 OR S90 OR S91	S92	TI (Hous* W1 allowance*) OR AB (Hous* W1 allowance*)
93	prevalence.mp.	S93	TI (mixed W5 method*) OR AB (mixed W5 method*)	S93	TI (((Housing or house) W1 services)) OR AB (((Housing or house) W1 services))
94	mortality.tw.	S94	TI (mixed W5 method*) OR AB (mixed W5 method*)	S94	TI (Hous* W1 modification*) OR AB (Hous* W1 modification*)
95	case series.mp.	S95	TI multimethod* OR AB multimethod*	S95	TI ((Housing-plus-services or housing-plus)) OR AB ((Housing-plus-services or housing-plus))
96	time series.mp.	S96	TI (multiple W5 method*) OR AB (multiple W5 method*)	S96	TI Housing-support* OR AB Housing-support*
97	before-and-after.mp.	S97	S94 OR S95 OR S96	S97	TI ((housing-with-care or (housing W1 care))) OR AB ((housing-with-care or (housing W1 care)))
98	prognos*.mp.	S98	TI qualitative OR AB qualitative	S98	TI (((Independent W1 living) and (older or elderly or senior))) OR AB (((Independent W1 living) and (older or elderly or senior)))
99	predict*.mp.	S99	(MH "Qualitative Studies")	S99	TI (Life W1 care W1 communit*) OR AB (Life W1 care W1 communit*)
100	predict*.tw.	S100	TI quantitative OR AB quantitative	S100	TI ((living-at-home or live-at-home)) OR AB ((living-at-home or live-at-home))
101	or/78-100	S101	S98 OR S99	S101	TI ((LORC or LORCs)) OR AB ((LORC or LORCs))
102	(mixed adj5 method*).mp.	S102	S100 AND S101	S102	TI Medical-Foster-Home* OR AB Medical-Foster-Home*
103	multimethod*.mp.	S103	S36 OR S74 OR S92 OR S102	S103	TI Naturally-occurring-retirement-communit* OR AB Naturally-occurring-retirement-communit*
104	(multiple adj5 method*).mp.	S104	TI ((Ageing-at-home or ageing-in-place)) OR AB ((Ageing-at-home or ageing-in-place))	S104	TI New-Town* OR AB New-Town*
105	or/102-104	S105	TI ((Ageing-at-home or ageing-in-place)) OR AB ((Ageing-at-home or ageing-in-place))	S105	TI ((NORC or NORCS or (NORC-SSPs or NORC SP))) OR AB ((NORC or NORCS or (NORC-SSPs or NORC SP)))

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
106	qualitative.mp.	S106	TI (((assisted N2 living) or assisted-living)) OR AB (((assisted N2 living) or assisted-living))	S106	TI ((PERC or PERCs)) OR AB ((PERC or PERCs))
107	Qualitative Research/	S107	TI (((stay-at-home or home-environment*) and (older or elderly))) OR AB (((stay-at-home or home-environment*) and (older or elderly)))	S107	TI ((Retirement W1 (communit* or housing or subdivision* or village*))) OR AB ((Retirement W1 (communit* or housing or subdivision* or village*)))
108	quantitative.mp.	S108	TI (((Age-related N1 housing) or (age N1 related N1 housing))) OR AB (((Age-related N1 housing) or (age N1 related N1 housing)))	S108	TI (((Section 202 or Senior or Service integrated or Service-integrated or shared or sheltered) W1 housing)) OR AB (((Section 202 or Senior or Service integrated or Service-integrated or shared or sheltered) W1 housing))
109	106 or 107	S109	TI (((Ancillary N1 dwelling N1 units) or (ancillary N1 units))) OR AB (((Ancillary N1 dwelling N1 units) or (ancillary N1 units)))	S109	TI ((((Small* W1 house*) or Small-scale) W1 living W1 facilities)) OR AB ((((Small* W1 house*) or Small-scale) W1 living W1 facilities))
110	108 and 109	S110	TI apartment-for-life OR AB apartment-for-life	S110	TI ((Special W1 (Housing or Accommodation))) OR AB ((Special W1 (Housing or Accommodation)))
111	105 or 110	S111	TI ((Cohousing or co-housing)) OR AB ((Cohousing or co-housing))	S111	TI (support* W1 hous*) OR AB (support* W1 hous*)
112	37 or 77 or 101 or 111	S112	TI (Collective W1 ageing) OR AB (Collective W1 ageing)	S112	TI ((Village-model* or housing-village)) OR AB ((Village-model* or housing-village))
113	112 not (letter or comment or editorial or newspaper article).pt.	S113	TI (Congregate W1 housing) OR AB (Congregate W1 housing)	S113	(DE "LIFE care communities" OR DE "RETIREMENT communities") OR (DE "SENIOR housing")
114	113 not (exp animals/ not humans.sh.)	S114	TI ((Continuing W1 care W1 ((retirement W1 communit* or strateg*))) OR AB ((Continuing W1 care W1 ((retirement W1 communit* or strateg*)))	S114	DE "HOUSING "
115	(Ageing-at-home or ageing-in-place).tw,kf.	S115	TI (((elder W1 cottage*) or (Granny W1 flat*))) OR AB (((elder W1 cottage*) or (Granny W1 flat*)))	S115	S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85 OR S86 OR S87 OR S88 OR S89 OR S90 OR S91 OR S92 OR S93 OR S94 OR S95 OR S96 OR S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 OR S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114
116	(Ageing-at-home or ageing-in-place).tw,kf.	S116	TI (((Extra W1 care W1 hous*) or (Extracare W1 hous*) or (Extra-care W1 hous*))) OR AB (((Extra W1 care W1 hous*) or (Extracare W1 hous*) or (Extra-care W1 hous*)))	S116	TI ((((aged or ageing or ageing or elder* or senior* or old* or retired) W2 (adult* or people* or person* or individual* or wom#n or man or men or age)) or (senior* W2 citizen*) or retiree* or sexagenarian* or

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
					septuagenarian* or octagenarian* or nonagenarian* or centenarian* or supercentenarian*)) OR AB ((((aged or ageing or ageing or elder* or senior* or old* or retired) W2 (adult* or people* or person* or individual* or wom#n or man or men or age)) or (senior* W2 citizen*) or retiree* or sexagenarian* or septuagenarian* or octagenarian* or nonagenarian* or centenarian* or supercentenarian*)))
117	((assisted adj2 living) or assisted-living).tw,kf.	S117	TI (Family W1 home*) OR AB (Family W1 home*)	S117	TI (("65+ years" or "70+ years" or "80+ years" or "over 65 years" or "over 70 years" or "over 80 years" or "80 years and older" or "80 years and over" or "70 years and older" or "70 years and over" or "65 years and older" or "65 years and over")) OR AB (("65+ years" or "70+ years" or "80+ years" or "over 65 years" or "over 70 years" or "over 80 years" or "80 years and older" or "80 years and over" or "70 years and older" or "70 years and over" or "65 years and older" or "65 years and over"))
118	((stay-at-home or home-environment*) and (older or elderly)).tw,kf.	S118	TI (hous* W1 type*) OR AB (hous* W1 type*)	S118	TI (("55+ older" or "over 55 years" or "55 years and older" or "over 55 years") or ("50+ older" or "over 50 years" or "50 years and older" or "over 50 years")) OR AB (("55+ older" or "over 55 years" or "55 years and older" or "over 55 years") or ("50+ older" or "over 50 years" or "50 years and older" or "over 50 years"))
119	((Age-related adj housing) or (age adj related adj housing)).tw,kf.	S119	TI (Green W1 House W1 model*) OR AB (Green W1 House W1 model*)	S119	DE "OLDER people" OR DE "CHILDREN & older people" OR DE "ELDERLY poor" OR DE "INTERNET & older people" OR DE "MINORITY older people" OR DE "OLDER Christians" OR DE "OLDER LGBT people" OR DE "OLDER Native Americans" OR DE "OLDER blacks" OR DE "OLDER blind people" OR DE "OLDER couples" OR DE "OLDER men" OR DE "OLDER sexual minorities" OR DE "OLDER unemployed" OR DE "OLDER women" OR DE "PETS & older people" OR DE "POLICE services for older people" OR DE "RURAL elderly" OR DE "TECHNOLOGY & older people" OR DE "URBAN elderly" OR DE "ACTIVE ageing" OR DE "RETIRES"

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
120	((Ancillary adj dwelling adj units) or (ancillary adj units)).tw,kf.	S120	TI (((home or home) W1 modification*)) OR AB (((home or home) W1 modification*))	S120	S116 OR S117 OR S118 OR S119
121	apartment-for-life.tw,kf.	S121	TI (Hous* W1 adaptation*) OR AB (Hous* W1 adaptation*).	S121	S73 AND S115 AND S120
122	(Cohousing or co-housing).tw,kf.	S122	TI (Hous* W1 allowance*) OR AB (Hous* W1 allowance*)	S122	S73 AND S115 AND S120. Limiters - Document Type: Article
123	(Collective adj ageing).tw,kf.	S123	TI (((Housing or house) W1 services)) OR AB (((Housing or house) W1 services))	S123	S73 AND S115 AND S120. Limiters - Scholarly (Peer Reviewed) Journals; Document Type: Article
124	(Congregate adj housing).tw,kf.	S124	TI (Hous* W1 modification*) OR AB (Hous* W1 modification*)	S124	S73 AND S115 AND S120. Limiters - Scholarly (Peer Reviewed) Journals; Date of Publication: 20000101-20191231; Document Type: Article
125	(Continuing adj care adj ((retirement adj communit*) or strateg*)).tw,kf.	S125	TI ((Housing-plus-services or housing-plus)) OR AB ((Housing-plus-services or housing-plus))	S125	
126	((elder adj cottage*) or (Granny adj flat*)).tw,kf.	S126	TI Housing-support* OR AB Housing-support*	S126	
127	((Extra adj care adj hous*) or (Extracare adj hous*) or (Extra-care adj hous*)).tw,kf.	S127	TI ((housing-with-care or (housing W1 care))) OR AB ((housing-with-care or (housing W1 care)))	S127	
128	(Family adj home*).tw,kf.	S128	TI (((Independent W1 living) and (older or elderly or senior))) OR AB (((Independent W1 living) and (older or elderly or senior)))	S128	
129	(hous* adj type*).tw,kf.	S129	TI (Life W1 care W1 communit*) OR AB (Life W1 care W1 communit*)	S129	
130	(Green adj House adj model*).tw,kf.	S130	TI ((living-at-home or live-at-home)) OR AB ((living-at-home or live-at-home))	S130	
131	((home or home) adj modification*).tw,kf.	S131	TI ((LORC or LORCs)) OR AB ((LORC or LORCs))	S131	
132	((Hous* adj adaptation*) or (Hous* adj allowance*)).tw,kf.	S132	TI Medical-Foster-Home* OR AB Medical-Foster-Home*	S132	
133	(Hous* adj design*).tw,kf.	S133	TI Naturally-occurring-retirement-communit* OR AB Naturally-occurring-retirement-communit*	S133	
134	((Housing or house) adj services).tw,kf.	S134	TI New-Town* OR AB New-Town*	S134	

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
135	(Hous* adj modification*).tw,kf.	S135	TI ((NORC or NORCS or (NORC-SSPs or NORC SP))) OR AB ((NORC or NORCS or (NORC-SSPs or NORC SP)))	S135	
136	(Housing-plus-services or housing-plus).tw,kf.	S136	TI ((PERC or PERCs)) OR AB ((PERC or PERCs))	S136	
137	Housing-support*.tw,kf.	S137	TI ((Retirement W1 (communit* or housing or subdivision* or village*))) OR AB ((Retirement W1 (communit* or housing or subdivision* or village*)))	S137	
138	(housing-with-care or (housing adj1 care)).tw,kf.	S138	TI (((Section 202 or Senior or Service integrated or Service-integrated or shared or sheltered) W1 housing)) OR AB (((Section 202 or Senior or Service integrated or Service-integrated or shared or sheltered) W1 housing))	S138	
139	((Independent adj living) and (older or elderly or senior)).tw,kf.	S139	TI ((((Small* W1 house*) or Small-scale) W1 living W1 facilities)) OR AB ((((Small* W1 house*) or Small-scale) W1 living W1 facilities))	S139	
140	(Life adj care adj communit*).tw,kf.	S140	TI ((Special W1 (Housing or Accommodation))) OR AB ((Special W1 (Housing or Accommodation)))	S140	
141	(living-at-home or live-at-home).tw,kf.	S141	TI (support* W1 hous*) OR AB (support* W1 hous*)	S141	
142	(LORC or LORCs).tw,kf.	S142	TI (Supported W1 housing) OR AB (Supported W1 housing)	S142	
143	Medical-Foster-Home*.tw,kf.	S143	TI ((Village-model* or housing-village)) OR AB ((Village-model* or housing-village))	S143	
144	Naturally-occurring-retirement-communit*.tw,kf.	S144	(MM "Housing")	S144	
145	New-Town*.tw,kf.	S145	(MH "Housing for the Elderly")	S145	
146	(NORC or NORCS or (NORC-SSPs or NORC SP)).tw,kf.	S146	(MH "Assisted Living")	S146	
147	(PERC or PERCs).tw,kf.	S147	(MH "Community Living")	S147	
148	(Retirement adj (communit* or housing or subdivision* or village*)).tw,kf.	S148	(MM "Public Housing")	S148	
149	((Section 202 or Senior or Service integrated or Service-integrated or shared or sheltered) adj housing).tw,kf.	S149	(MM "Residence Characteristics")	S149	
150	((Small* adj house*) or Small-scale) adj living adj facilities).tw,kf.	S150	S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114 OR S115 OR	S150	

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
			S116 OR S117 OR S118 OR S119 OR S120 OR S121 OR S122 OR S123 OR S124 OR S125 OR S126 OR S127 OR S128 OR S129 OR S130 OR S131 OR S132 OR S133 OR S134 OR S135 OR S136 OR S137 OR S138 OR S139 OR S140 OR S141 OR S142 OR S143 OR S144 OR S145 OR S146 OR S147 OR S148 OR S149		
151	(Special* adj (Housing or Accommodation)).tw,kf.	S151	TI ((((aged or ageing or ageing or elder* or senior* or old* or retired) W2 (adult* or people* or person* or individual* or wom#n or man or men or age)) or (senior* W2 citizen*) or retiree* or sexagenarian* or septuagenarian* or octagenarian* or nonagenarian* or centenarian* or supercentenarian*)) OR AB ((((aged or ageing or ageing or elder* or senior* or old* or retired) W2 (adult* or people* or person* or individual* or wom#n or man or men or age)) or (senior* W2 citizen*) or retiree* or sexagenarian* or septuagenarian* or octagenarian* or nonagenarian* or centenarian* or supercentenarian*))	S151	
152	(support* adj hous*).tw,kf.	S152	TI (("65+ years" or "70+ years" or "80+ years" or "over 65 years" or "over 70 years" or "over 80 years" or "80 years and older" or "80 years and over" or "70 years and older" or "70 years and over" or "65 years and older" or "65 years and over")) OR AB (("65+ years" or "70+ years" or "80+ years" or "over 65 years" or "over 70 years" or "over 80 years" or "80 years and older" or "80 years and over" or "70 years and older" or "70 years and over" or "65 years and older" or "65 years and over"))	S152	
153	(Supported adj housing).tw,kf.	S153	TI (("55+ older" or "over 55 years" or "55 years and older" or "over 55 years")) OR AB (("55+ older" or "over 55 years" or "55 years and older" or "over 55 years"))	S153	
154	(Village-model* or housing-village).tw,kf.	S154	(MM "Age Factors")	S154	
155	*Housing/	S155	(MM "Ageing")	S155	
156	Housing for the Elderly/	S156	(MM "Aged")	S156	

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
157	Homes for the Aged/	S157	(MM "Aged, 80 and Over")	S157	
158	Independent Living/	S158	(MH "Frail Elderly")	S158	
159	*Public Housing/	S159	(MM "Retirement")	S159	
160	*Residence Characteristics/	S160	S150 OR S151 OR S152 OR S153 OR S154 OR S155 OR S156 OR S157 OR S158 OR S159	S160	
161	assisted living facilities/	S161	S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114 OR S115 OR S116 OR S117 OR S118 OR S119 OR S120 OR S121 OR S122 OR S123 OR S124 OR S125 OR S126 OR S127 OR S128 OR S129 OR S130 OR S131 OR S132 OR S133 OR S134 OR S135 OR S136 OR S137 OR S138 OR S139 OR S140 OR S141 OR S142 OR S143 OR S144 OR S145 OR S146 OR S147 OR S148 OR S149	S161	
162	((aged or ageing or ageing or elder* or senior* or old* or retired) adj2 (adult* or people* or person* or individual* or wom#n or man or men or age)) or (senior* adj2 citizen*) or retiree* or sexagenarian* or septuagenarian* or octagenarian* or nonagenarian* or centenarian* or supercentenarian*).tw,kf.	S162	S103 AND S160 AND S161	S162	
163	("65+ years" or "70+ years" or "80+ years" or "over 65 years" or "over 70 years" or "over 80 years" or "80 years and older" or "80 years and over" or "70 years and older" or "70 years and over" or "65 years and older" or "65 years and over").tw,kf.	S163	S103 AND S160 AND S161. Limiters - Exclude MEDLINE records	S163	
164	("55+ older" or "over 55 years" or "55 years and older" or "over 55 years").tw,kf.	S164	S103 AND S160 AND S161. Limiters - Exclude MEDLINE records; Publication Type: Clinical Trial, Journal Article, Meta Analysis, Meta Synthesis, Randomized Controlled Trial, Research, Review, Systematic Review	S164	
165	*Age Factors/	S165	S103 AND S160 AND S161. Exclude MEDLINE records; Publication Type: Clinical Trial, Journal Article, Meta Analysis, Meta Synthesis, Randomized Controlled Trial, Research, Review, Systematic Review; Age Groups: All Adult	S165	

Medline (OVID)		CINAHL Complete (EBSCO)		SOCIndex (EBSCO)	
166	*Ageing/	S166	S103 AND S160 AND S161. Limiters - Published Date: 20000101-20191231; Exclude MEDLINE records; Publication Type: Clinical Trial, Journal Article, Meta Analysis, Meta Synthesis, Randomized Controlled Trial, Research, Review, Systematic Review; Age Groups: All Adult	S166	
167	*Aged/	S167		S167	
168	"Aged, 80 and over"/	S168		S168	
169	Frail Elderly/	S169		S169	
170	*Retirement/	S170		S170	
171	Homebound Persons/	S171		S171	
172	or/115-161	S172		S172	
173	or/162-171	S173		S173	
174	114 and 172 and 173	S174		S174	
175	limit 174 to yr="2000 -Current"	S175		S175	

Social Policy & Practice	
N	Terms
1	(housing adj1 (support* or model)).mp.
2	(Extra-care hous* or retirement community or village model or special* hous* or age-friendly hous*).mp. [mp=abstract, title, publication type, heading word, accession number]
3	(elderly or older or ageing or ageing).mp. [mp=abstract, title, publication type, heading word, accession number]
4	(1 or 2) and 3
5	limit 4 to (government publication or research or "research review" or "systematic review")
6	limit 5 to (journal or journal article or online report or report)
7	limit 6 to yr="2000 -Current"

Appendix D: Systematic reviews and grey literature reviews used for forward citation searching and reference chasing for both systematic reviews

Boggatz T. Quality of Life in Long-Term Care Facilities. In: Boggatz T, editor. Quality of Life and Person-Centered Care for Older People. Switzerland: Springer International Publishing; 2020.
Boland L, Légaré F, Perez MMB, Menear M, Garvelink MM, McIsaac DI, <i>et al.</i> Impact of home care versus alternative locations of care on elder health outcomes: an overview of systematic reviews. BMC Geriatr. 2017;17(1):20.
Boland L, Slade A, Yarwood R, Bannigan K. Determinants of Tenancy Sustainment Following Homelessness: A Systematic Review. Am J Public Health. 2018;108(11):e1-e8.
Centre for Policy on Ageing Information Service. Selected Readings: Extra-care Housing. London: Centre for Policy on Ageing; 2019.
Centre for Policy on Ageing Information Service. Selected Readings: Housing with Care. London: Centre for Policy on Ageing; 2019.
Centre for Policy on Ageing Information Service. Selected Readings: Sheltered Housing. London: Centre for Policy on Ageing; 2019.
Coyle C, Cagney O, Buggy S, O’Nolan G, O’Brien D, Farragher, <i>et al.</i> HRB Evidence Brief - Housing with support for older people. Dublin: HRB; 2019.
Croucher K. Making the case for retirement villages. York: Joseph Rowntree Foundation; 2006.
Croucher K, Hicks L, Bevan M, Sanderson D. Comparative evaluation of models of housing with care for later life. York: Joseph Rowntree Foundation; 2007.
Croucher K, Hicks L, Jackson K. Housing with care for later life: A literature review. York: Joseph Rowntree Foundation; 2006.
Douma JG, Volkers KM, Engels G, Sonneveld MH, Goossens RHM, Scherder EJA. Setting-related influences on physical inactivity of older adults in residential care settings: a review. BMC Geriatr. 2017;17(1):97.
Dwyer R, Gabbe B, Stoelwinder JU, Lowthian J. A systematic review of outcomes following emergency transfer to hospital for residents of aged care facilities. Age Ageing. 2014;43(6):759-766.

Dwyer R, Stoelwinder J, Gabbe B, Lowthian J. Unplanned transfer to emergency departments for frail elderly residents of aged care facilities: A review of patient and organizational factors. *J Am Med Dir Assoc.* 2015;16(7):551-562.

Evans S, Vallely S. Best practice in promoting social well-being in extra care housing: A literature review. York: Joseph Rowntree Foundation; 2007.

Gaugler JE, Kane RL. Families and assisted living. *Gerontologist.* 2007;47(Suppl 1):83-99.

Pannell J, Blood I. Supported housing for older people in the UK: An evidence review. York: Joseph Rowntree Foundation; 2012.

Rosenwohl-Mack A, Schumacher K, Fang ML, Fukuoka Y. A new conceptual model of experiences of aging in place in the United States: Results of a systematic review and meta-ethnography of qualitative studies. *Int J Nurs Stud.* 2020;103:103496.

Roy N, Dubé R, Després C, Freitas A, Légaré F. Choosing between staying at home or moving: A systematic review of factors influencing housing decisions among frail older adults. *PLoS One.* 2018;13(1):e0189266.

Serrano-Gemes G, Rich-Ruiz M, Serrano-del-Rosal R. Systematic review of qualitative studies on participants in the decision-making process about the location of care of the elderly. *BMJ Open.* 2020;10(3):e036551-e51.

Underwood F, Burrows L, Gegg R, Latour JM, Kent B. The meaning of confidence for older people living with frailty: a qualitative systematic review. *JBI Database System Rev Implement Rep.* 2017;15(5):1316-1349.

Wu YT, Prina AM, Brayne C. The association between community environment and cognitive function: a systematic review. *Soc Psychiatry Psychiatr Epidemiol.* 2015;50(3):351-362.

Appendix E: List of organisations searched as part of the supplementary grey literature search

Organisation	Website address
Age UK	https://www.ageuk.org.uk/
Aston Research Centre for Healthy Ageing at Aston University, Birmingham	https://www2.aston.ac.uk/lhs/research/centres-facilities/archives/
Centre for Housing Policy (University of York)	https://www.york.ac.uk/chp/expertise/housing-later-life/publications/
Centre for Policy on Ageing	http://www.cpa.org.uk/
Institute of Public Care (Oxford Brookes University)	https://ipc.brookes.ac.uk/
Joseph Rowntree Foundation (UK)	https://www.jrf.org.uk/housing
National Institute on Aging (USA)	https://www.nia.nih.gov/research/resources
Personal Social Services Research Unit (University of Kent)	https://www.pssru.ac.uk/project-pages/extra-care-housing/

Appendix F: Priority screening in EPPI-Reviewer

Priority screening in EPPI-Reviewer was used to prioritise abstracts and improve efficiency for both systematic reviews. Figures 5 and 6 below display the priority screening curve, indicating where in the screening process included articles were identified.

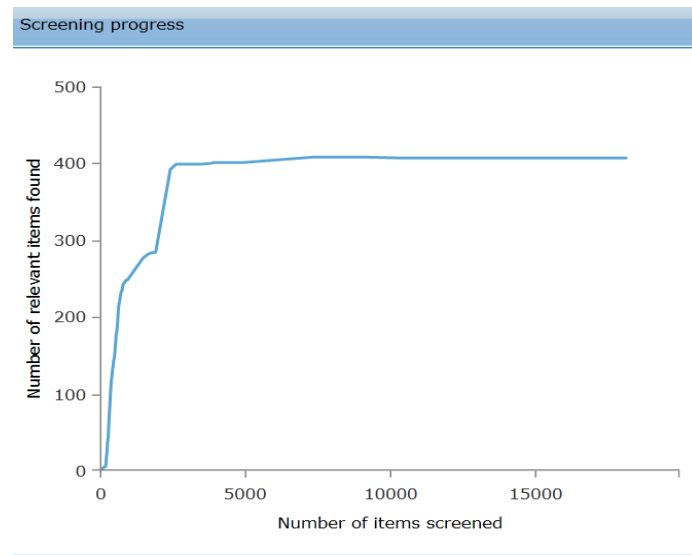


Figure 5: EPPI-Reviewer priority screening curve for the perceptions and experiences review

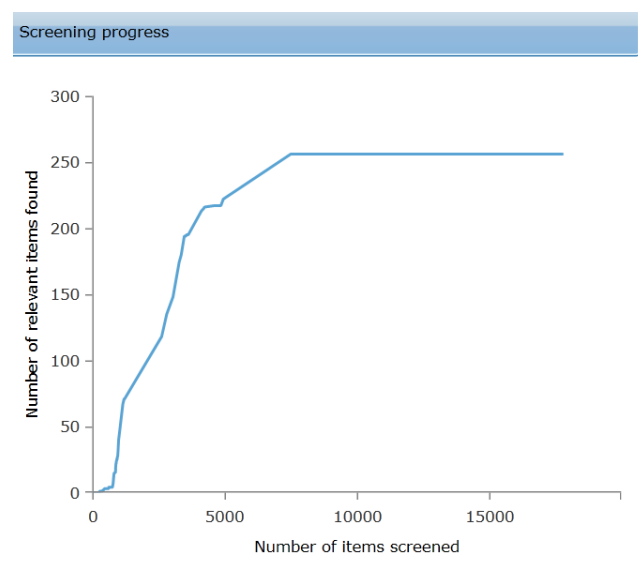


Figure 6: EPPI-Reviewer priority screening curve for the impact review

Appendix G: Quality assessment tool for the perceptions and experiences review

Joanna Briggs Institute's Critical Appraisal Checklist for Qualitative Research¹⁵

1. Is there congruity between the stated philosophical perspective and the research methodology?
2. Is there congruity between the research methodology and the research question or objectives?
3. Is there congruity between the research methodology and the methods used to collect data?
4. Is there congruity between the research methodology and the representation and analysis of data?
5. Is there congruity between the research methodology and the interpretation of results?
6. Is there a statement locating the researcher culturally or theoretically?
7. Is the influence of the researcher on the research, and vice-versa, addressed?
8. Are participants, and their voices, adequately represented?
9. Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?
10. Do the conclusions drawn flow from the analysis, or interpretation, of the data?

Appendix H: Quality assessment tool for the impact review

Adapted version of the National Institutes of Health National Heart, Lung, and Blood Institute's Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies¹⁷

1. Was the study question or objective clearly stated?
2. Were eligibility/selection criteria for the study population pre-specified and clearly described?
3. Were all eligible participants that met the pre-specified entry criteria enrolled?
4. Were the participants in the study representative of those who would be eligible for the test/service/intervention in the general or clinical population of interest?
5. Was the sample size sufficiently large to provide confidence in the findings?
6. Was the test/service/intervention clearly described and delivered consistently across the study populations?
7. Were the outcome measures pre-specified, clearly defined, valid, reliable, and assessed consistently across all study participants?
8. Was the loss to follow-up after baseline 20% or less? Were those lost to follow-up accounted for in the analysis?
9. Were the statistical methods employed to test changes over time appropriate?
10. Were the outcome measures of interest taken over multiple times (before and after or multiple times during)?
11. Did the statistical analysis account for confounding factors?

Appendix I: Quality assessment of studies in the perceptions and experiences review

Study ID	Philosophical perspective stated and aligned with research aim	Congruity between research methodology and research question	Congruity between the research methodology and methods used	Congruity between research methodology and analysis	Congruity between research methodology and interpretation	Researcher bias stated	Researcher influence stated	Participants and their voices adequately represented	Ethical approval*	Conclusions appropriate
Ball 2014	0	1	1	1	1	0	0	1	1	1
Bender 2020	0	1	1	1	1	0	0	1	1	1
Bjornsdottir 2012	1	1	1	1	1	1	1	1	1	1
Bjornsdottir 2019	1	1	1	1	1	0	0	1	1	1
Burns 2014	0	1	1	1	1	0	0	1	1	1
Chen 2008	0	1	1	1	1	0	0	1	1	1
Dong 2018	0	1	1	1	1	0	0	1	1	1
Dupuis-Blanchard 2007	1	1	1	1	1	0	0	1	1	1
Dupuis-Blanchard 2009	0	1	1	1	1	0	0	1	1	1
Evans 2009	0	1	1	1	1	0	0	1	1	1
Ewen 2013	0	1	1	1	1	0	0	1	1	1
Frankowski 2009	0	1	1	1	1	0	1	1	0	1
Funk 2019	0	1	1	1	1	0	0	1	1	1
Hrybyk 2012	0	1	1	1	1	0	0	1	0	1
Kemp 2012	0	1	1	1	1	0	0	1	1	1
Kemp 2016	0	1	1	1	1	0	0	1	1	1
Kennedy 2005	0	1	1	1	1	0	0	1	0	1
Lawrence 2002	0	1	1	1	1	0	0	1	0	1
Leith 2006	0	1	1	1	1	0	0	1	1	1

Study ID	Philosophy aligned with research aim	Congruity between research methodology and research question	Congruity between the research methodology and methods used	Congruity between research methodology and analysis	Congruity between research methodology and interpretation	Researcher bias stated	Researcher influence stated	Participants and their voices adequately represented	Ethical approval*	Conclusions appropriate
Mahoney 2009	0	1	1	1	1	0	0	1	1	1
McCaig 2012	1	1	1	1	1	0	0	1	1	1
Nielson 2019	0	1	1	1	1	0	0	1	1	1
Nord 2013	1	1	1	1	1	0	0	1	1	1
Nord 2018	0	1	1	1	1	0	0	1	1	1
Park 2012	0	1	1	1	1	0	0	1	1	1
Perry 2014	0	1	1	1	1	0	0	1	0	1
Portacolone 2016	0	1	1	1	1	0	0	1	0	1
Roth 2012	0	1	1	1	1	0	0	1	1	1
Roth 2016	0	1	1	1	1	0	0	1	1	1
Scott 2019	0	1	1	1	1	0	0	1	1	1
Shaw 2016	0	1	1	1	1	0	0	1	1	1
Shippee 2012	0	1	1	1	1	0	0	1	1	1
Spierings 2017	0	1	1	1	1	0	0	1	0	1
Svensson 2012	1	1	1	1	1	1	1	1	1	1
Sviden 2002	0	1	1	1	1	0	0	1	0	1
Tracy 2004	0	1	1	1	1	0	0	1	1	1
Tyvima 2011	0	1	1	1	1	0	0	1	0	1
Vasara 2015	0	1	1	1	1	0	0	1	1	1
Walker 2013	0	1	1	1	1	0	0	1	1	1

*Studies that did not disclose whether or not they sought ethical approval received a zero.

Appendix J: Study characteristics for the perceptions and experiences review

Study ID	Study title	Country	Housing model	Study design	Data collection method	Dates of data collection	Population age	Participants	Proportion of males and females
Ball 2014	This is our last stop: negotiating end of life transitions in assisted living	USA	Assisted living	Grounded theory	Interviews and observation	Not available	52-100	Not available	Not available
Bender 2020	Negotiating the lack of intimacy in assisted living: resident desires, barriers, and strategies	USA	Assisted living	Grounded theory	Interviews	2009-2011	55-94	n=23	Males: n=7 Females: n=16
Bjornsdottir 2012*	Facilitators of and barriers to physical activity in retirement communities: experiences of older women in urban areas	Iceland	Retirement community	Phenomenology	Interviews	2009	72-97	n=10	Females: 100%
Bjornsdottir 2019*	Physical activity of older women living in retirement communities: capturing the whole picture through an ecological approach	Iceland	Retirement community	Phenomenology	Interviews	Not available	72-97	10	Females: 100%
Burns 2014	The benefits of extra care housing on the quality of life of residents: the impact of living in Campbell Place, Fleet	UK	Extra care housing	Case study	Interviews	Not available	75-84	17	Males: n=7 Females: n=10
Chen 2008	Elders' decisions to enter assisted living facilities: a grounded theory study	USA	Assisted living	Grounded theory	Interviews	2001-2005	69-95	28	Males: n=6 Females: n=22
Dong 2018	Quality of life at an elder's collective dwelling community: a case study of a Toronto seniors' residence	Canada	Assisted living	Case study	Interviews	Not available	65-85	16	Males: n=7 Females: n=9

*Bjornsdottir 2012 and Bjornsdottir 2019 analysed the same data set, therefore they were counted as one study. As a result, we had a total of 39 included articles and 38 unique studies

Study ID	Study title	Country	Housing model	Study design	Data collection method	Dates of data collection	Population age	Participants (n)	Proportion of males and females
Dupuis-Blanchard 2007	Building a new nest: the experience of women relocating to a seniors-designated apartment building	Canada	Senior-designated apartment building	Grounded theory	Interviews and focus group discussions	Not available	65-85	16	Females: 100%
Dupuis-Blanchard 2009	The significance of social engagement in relocated older adults	Canada	Senior-designated apartment building	Ethnography	Interviews and focus group discussions	Not available	65-85	19	Males: n=4 Females: n=15
Evans 2009	That lot up there and us down here: social interaction and a sense of community in a mixed tenure UK retirement village	UK	Retirement village	Case study	Interviews and focus group discussions	2004-2006	65 and over	11	Not available
Ewen 2013	Influence of late life stressors on the decisions of older women to relocate into congregate senior housing	USA	Congregate senior housing	Phenomenology	Interviews	2004 and 2006	53-96	37	Females: 100%
Frankowski 2009	Sexuality and intimacy in assisted living: residents' perspectives and experiences	USA	Assisted living	Ethnography	Interviews	Not available	Average age: 78	26	Females: 100%
Funk 2019	More than petty squabbles: developing a contextual understanding of conflict and aggression among older women in low-income assisted living	Canada	Assisted living	Case study	Interviews and observation	Not available	Average age: 80	7	Females: 100%
Hrybyk 2012	The dark side: stigma in purpose-built senior environments	USA	Senior housing	Ethnography	Interviews and observation	Not available	Not available	Not available	Not available
Kemp 2012	Strangers and friends: residents' social careers in assisted living	USA	Assisted living	Grounded theory	Interviews and observation	2008-2011	Not available	28	Not available
Kemp 2016	Couples' social careers in assisted living: reconciling individual and shared situations	USA	Assisted living	Grounded theory	Interviews and observation	2008-2011	Not available	51	Not available
Kennedy 2005	Beyond the rhythm and routine adjusting to life in assisted living	USA	Assisted living	Case study	Interviews and observation	Not available	Not available	Not available	Not available

Study ID	Study title	Country	Housing model	Study design	Data collection method	Dates of data collection	Population age	Participants (n)	Proportion of males and females
Lawrence 2002	Reciprocity beyond dyadic relationships: ageing-related communal coping	USA	Continuing care retirement community	Grounded theory	Interviews, focus group discussions, and observation	Not available	82-95	11	Not available
Leith 2006	Home is where the heart is...or is it? a phenomenological exploration of the meaning of home for older women in congregate housing	USA	Congregate living facility	Phenomenology	Interviews	Not available	63-91	20	Females: 100%
Mahoney 2009	Tensions in independent living facilities for elders: a model of connected disconnection	USA	Independent living facilities	Grounded theory	Interviews	2005	Average age: 79	26	Not available
McCaig 2012	The lived experience of older people using assistive technology	UK	Supported housing for older people	Phenomenology	Interviews	Not available	Not available	6	Not available
Nielson 2019	Social exclusion and community in an urban retirement village	New Zealand	Retirement village	Ethnography	Interviews	Not available	70-87	12	Males: n=7 Females: n=5
Nord 2013	A day to be lived: elderly peoples' possessions for everyday life in assisted living	Sweden	Assisted living	Grounded theory	Interviews	Not available	60-99	13	Males: n=6 Females: n=7
Nord 2018	Resident-centered care and architecture of two different types of caring residences: a comparative study	Sweden	Assisted living and extra care housing	Case study	Interviews and observation	Not available	62-99	16	Not available
Park 2012	Social engagement in assisted living and implications for practice	USA	Assisted living	Grounded theory	Interviews	2007	74-96	29	Males: n=9 Females: n=20
Perry 2014	Make mine home: spatial modification with physical and social implications in older adulthood	USA	Senior housing	Ethnography	Interviews and observation	2009-2012	57-91	81	Males: n=22 Females: n=59

Study ID	Study title	Country	Housing model	Study design	Data collection method	Dates of data collection	Population age	Participants (n)	Proportion of males and females
Portacolone 2016	Move or suffer: is age-segregation the new norm for older Americans living alone?	USA	Senior housing	Ethnography	Interviews and observation	Not available	Not available	47	Males: n=16 Females: n=31
Roth 2012	Baby boomers in an active adult retirement community: comity interrupted	USA	Active adult retirement community	Ethnography	Interviews and observation	Not available	Not available	35	Not available
Roth 2016	Stigma and discontinuity in multilevel senior housing's continuum of care	USA	Senior housing	Ethnography	Interviews and observation	Not available	Not available	157	Not available
Scott 2019	Adjusting to the transition in to assisted living: opportunities for nurse practitioners	USA	Continuing care retirement community	Phenomenology	Interviews	Not available	84-94	17	Females: 100%
Shaw 2016	Living well to the end: a phenomenological analysis of life in extra care housing	UK	Extra care housing	Phenomenology	Interviews	Not available	71-90	6	Males: n=3 Females: n=3
Shippee 2012	On the edge: Balancing health, participation, and autonomy to maintain active independent living in two retirement facilities	USA	Continuing care retirement community	Ethnography	Interviews and observation	2003-2005	Not available	60	Males: n=22 Females: n=38
Spierings 2017	Assessing social quality of sheltered independent housing: challenges of scale and group mix	Netherlands	Sheltered independent housing	Case study	Interviews	2011	Not available	174	Not available
Svensson 2012	Well-being dialogue: elderly women's subjective sense of well-being from their course of life perspective	Sweden	Special housing accommodation	Narrative analysis	Interviews	2011	75-100	5	Females: 100%
Sviden 2002	Elderly persons' reflections on relocating to living at sheltered housing	Sweden	Sheltered housing	Phenomenology	Interviews	Not available	Not available	59	Males: n=18 Females: n=41

Study ID	Study title	Country	Housing model	Study design	Data collection method	Dates of data collection	Population age	Participants (n)	Proportion of males and females
Tracy 2004	Moving to an assisted living community: exploring the transitional experience of elderly individuals	USA	Assisted living	Phenomenology	Interviews	Not available	74-93	28	Male n=9 Female n=19
Tyvima 2011	Finnish seniors' move to a senior house: examining the push and pull factors	Finland	Senior housing	Case study	Interviews and open-ended survey questions	Not available	55 and over	120	Not available
Vasara 2015	Not ageing in place: negotiating meanings of residency in age-related housing	Finland	Senior housing	Narrative analysis	Interviews	2011-2015	78-88	14	Males: n=5 Females: n=9
Walker 2013	Relocating to retirement living: an occupational perspective on successful transitions	Australia	Retirement village	Grounded theory	Interviews	Not available	72-88	16	Males: n=4 Females: n=12

Appendix K: Structure of analytical themes from the perceptions and experiences review

First level themes	Second level themes	Third level themes
Deciding to move	Reasons for moving to housing with support	Loneliness and isolation Burden of maintaining a home Neighbourhood accessibility Accessing support Reducing burden on children
	Ownership of the decision	Influence of children Individual agency
Transition and adaptation	Moving to housing with support	Choosing a community The process of moving Personalising the new home Moving directly from hospital
	Nostalgia for previous life	(No third level themes)
	Adapting to housing with support	Autonomy and adaptation Routines and keeping busy Familiar neighbourhood Accepting ageing and death Letting go of the past Embracing change Challenges to adaptation Acceptance and appreciation

First level themes	Second level themes	Third level themes
Living independently	Asserting independence	(No third level themes)
	Balancing independence and dependence	Increasing dependency Satisfaction with support Relocation within the community
	Independent activities	Hobbies Shopping
Staying physically active	Individual preferences and habits	Former lifestyle Self-efficacy Structured daily life Motivation Sociability
	Access to physical activities	(No third level themes)
	Gyms	(No third level themes)
	Outdoor accessibility	(No third level themes)
	Care responsibilities	(No third level themes)
	Culture of physical activity	(No third level themes)

First level themes	Second level themes	Third level themes
Social engagement	Proximity to family and friends	(No third level themes)
	Opportunities to socialise	Organised activities Volunteering Communal spaces Mealtimes
	Engaging with peers	(No third level themes)
	Friendships	Familiarity with the social environment Proactively seeking friends Self-reliance Gradients of friendships Friendships with staff
	Romantic relationships	Dating Intimacy
	Challenges to socialising	Personal challenges Stigma against the less able Cliques Language barriers
	Mutual support	(No third level themes)

Appendix L: CERQual evidence profile for the perceptions and experiences review

Review finding	Contributing studies	Confidence in the evidence	Explanation of confidence in the evidence
Deciding to move: Older people described a variety of factors that motivated them to move to housing with support. These included loneliness and isolation, the burden of maintaining a home, the appeal of living in a more accessible neighbourhood, accessing support services, and not wanting to burden their children with their care. They also expressed varying degrees of ownership over the decision to move; some reported having been influenced by their children, whereas others conveyed a strong sense of agency.	Bjornsdottir <i>et al.</i> 2019; Burns 2014; Chen <i>et al.</i> 2008; Dong 2018; Dupuis-Blanchard 2007; Ewen & Chahal 2013; Kemp <i>et al.</i> 2016; Kennedy <i>et al.</i> 2005; Leith 2006; Nielson <i>et al.</i> 2019; Nord 2018; Scott & Mayo 2019; Svidén <i>et al.</i> 2002; Tracy & DeYoung 2004; Tyvima & Kemp 2011; Vasara 2015; Walker & McNamara 2013	Moderate confidence	17 studies with minor to serious methodological limitations. Minor: none of the studies stated researcher bias; none of the studies stated researcher influence; and only Bjornsdottir <i>et al.</i> 2019 and Dupuis-Blanchard 2007 stated philosophical perspective. Serious: unclear ethical considerations in Kennedy <i>et al.</i> 2005. Thick data from 8 countries: Australia, Canada, Finland, Iceland, New Zealand, Sweden, UK, and USA. High relevance. High coherence.
Transition and adaptation: The move to housing with support was often an emotionally wrought process for older people. Many described nostalgia for their previous home and previous life after moving in, yet they identified several important factors that enabled them to adapt to their new home. These included maintaining autonomy, keeping routines and staying busy, moving within the same neighbourhood, accepting the reality of ageing and death, letting go of the past, and embracing change. Many older people expressed acceptance of and appreciation for their new community and ultimately described feeling content and at home in housing with support.	Ball <i>et al.</i> 2014; Bjornsdottir <i>et al.</i> 2012; Burns 2014; Chen <i>et al.</i> 2008; Dong 2018; Dupuis-Blanchard 2007; Ewen & Chahal 2013; Kennedy <i>et al.</i> 2005; Leith 2006; Nielson <i>et al.</i> 2019; Nord 2013; Nord 2018; Perry 2015; Portacolone & Halpern 2016; Scott & Mayo 2019; Shaw <i>et al.</i> 2016; Shippee 2012; Spierings & Ache 2018; Svidén <i>et al.</i> 2002; Tracy & DeYoung 2004; Tyvima & Kemp 2011; Vasara 2015; Walker & McNamara 2013	Moderate confidence	23 studies with minor to serious methodological limitations. Minor: only Bjornsdottir <i>et al.</i> 2012 stated researcher bias; only Bjornsdottir <i>et al.</i> 2012 stated researcher influence; and only Bjornsdottir <i>et al.</i> 2012, Dupuis-Blanchard 2007, and Nord 2013 stated philosophical perspective. Serious: unclear ethical considerations in Kennedy <i>et al.</i> 2005. Thick data from 9 countries: Australia, Canada, Finland, Iceland, Netherlands, New Zealand, Sweden, UK, and USA. High relevance. High coherence.

Review finding	Contributing studies	Confidence in the evidence	Explanation of confidence in the evidence assessment
Living independently: Older people primarily conceptualised living independently in housing with support as asserting and maintaining their autonomy alongside increasing care needs. Additionally, they highlighted specific activities, including keeping up their own hobbies and shopping for themselves, that represent important aspects of living independently.	Bjornsdottir <i>et al.</i> 2012; Burns 2014; Chen <i>et al.</i> 2008; Dong 2018; Ewen & Chahal 2013; Hrybyk <i>et al.</i> 2012; Kemp <i>et al.</i> 2012; Kennedy <i>et al.</i> 2005; Leith 2006; Mahoney & Goc 2009; Nielson <i>et al.</i> 2019; Nord 2013; Roth <i>et al.</i> 2012; Scott & Mayo 2019; Shaw <i>et al.</i> 2016; Shippee 2012; Svidén <i>et al.</i> 2002; Tracy & DeYoung 2004; Tyvimaa & Kemp 2011; Walker & McNamara 2013	Moderate confidence	20 studies with minor to serious methodological limitations. Minor: only Bjornsdottir <i>et al.</i> 2012 stated researcher bias; only Bjornsdottir <i>et al.</i> 2012 stated researcher influence; and only Bjornsdottir <i>et al.</i> 2012 and Nord 2013 stated philosophical perspective. Serious: unclear ethical considerations in Kennedy <i>et al.</i> 2005. Thick data from 8 countries: Australia, Canada, Finland, Iceland, New Zealand, Sweden, UK, and USA High relevance. Moderate coherence.
Staying physically active: Older people described several factors that influenced their level of engagement in physical activity. These included: individual preferences and habits; access to physical activities and physical therapy; access to a gym on-site; outdoor accessibility; care responsibilities; and the culture of physical activity in the community.	Bjornsdottir <i>et al.</i> 2012;* Bjornsdottir <i>et al.</i> 2019;* Dong 2018; Svidén <i>et al.</i> 2002; Tyvimaa & Kemp 2011	Low confidence	4 studies with minor methodological limitations: only Bjornsdottir <i>et al.</i> 2012 stated researcher bias; only Bjornsdottir <i>et al.</i> 2012 stated researcher influence; and only Bjornsdottir <i>et al.</i> 2012 stated philosophical perspective. Thin data from 4 countries: Canada, Iceland, Finland, and Sweden. High relevance. High coherence.

*Bjornsdottir 2012 and Bjornsdottir 2019 analysed the same data set, therefore they were counted as one study.

Review finding	Contributing studies	Confidence in the evidence	Explanation of confidence in the evidence assessment
Social engagement: Older people provided rich descriptions of their social worlds in housing with support communities. They highlighted the importance of proximity to family and friends in their previous community, as well as the social opportunities in housing with support that allowed them to form new friendships. Some also said that romantic relationships had developed. Older people also identified several challenges to socialising in housing with support, including personal challenges, social cliques, stigma against the less able, and language barriers. However, despite these challenges, many described a strong sense of mutual support in their communities.	Bender <i>et al.</i> 2020; Burns 2014; Chen <i>et al.</i> 2008; Dong 2018; Dupuis-Blanchard 2007; Dupuis-Blanchard <i>et al.</i> 2009; Evans 2009; Ewen & Chahal 2013; Frankowski & Clark 2009; Funk <i>et al.</i> 2019; Hrybyk <i>et al.</i> 2012; Kemp <i>et al.</i> 2012; Kemp <i>et al.</i> 2016; Kennedy <i>et al.</i> 2005; Lawrence & Schigelone 2002; Leith 2006; McCaig <i>et al.</i> 2012; Nielson <i>et al.</i> 2019; Nord 2013; Nord, 2018; Park <i>et al.</i> 2012; Portacolone & Halpern 2016; Roth <i>et al.</i> 2012; Roth <i>et al.</i> 2016; Scott & Mayo 2019; Shaw <i>et al.</i> 2016; Shippee 2012; Spierings & Ache 2018; Svensson <i>et al.</i> 2012; Svidén <i>et al.</i> 2002; Tracy & DeYoung 2004; Tyvimaa & Kemp 2011; Walker & McNamara 2013	Moderate confidence	33 studies with minor to serious methodological limitations. Minor: only Svensson <i>et al.</i> 2012 stated researcher bias; only Frankowski & Clark 2009 and Svensson <i>et al.</i> 2012 stated researcher influence; and only Dupuis-Blanchard 2007, McCaig <i>et al.</i> 2012; Nord 2013; and Svensson <i>et al.</i> 2012 stated philosophical perspective. Serious: unclear ethical considerations in Frankowski & Clark 2009, Hrybyk <i>et al.</i> 2012, Kennedy <i>et al.</i> 2005, and Lawrence & Schigelone 2002. Thick data from 8 countries: Australia, Canada, Finland, Netherlands, New Zealand, Sweden, UK, and USA. High relevance overall. Only 1 study with partial relevance: McCaig <i>et al.</i> 2012. High coherence.

Appendix M: Quality assessment of studies in the impact review

Study ID	Objective stated	Eligibility criteria described	All eligible participants enrolled	Participants representative	Sample size	Intervention clearly described	Outcome measures described	Loss to follow-up <20%	Statistical methods appropriate	Outcomes measured multiple times	Confounding factors accounted for
Housing model: CCRC, USA and Israel											
Cutchin 2010	1	0	0	0	0	1	1	1	1	1	1
Gaines 2011	1	1	1	1	1	1	1	1	1	1	1
Heisler 2003	1	1	0	1	0	1	1	1	1	1	0
Moen 2001	1	1	0	0	0	1	0	1	1	1	1
Moen 2000	1	1	0	0	0	1	0	1	1	1	1
Roberts 2018	1	1	1	0	1	1	1	1	1	1	1
Roberts 2013	1	1	1	0	1	1	1	1	1	1	1
Young 2009	1	1	1	1	1	1	1	1	1	1	0
Ayalon 2019	1	1	1	0	0	1	1	0	1	1	1
Housing model: Independent living, USA											
Lutgendorf 2001	1	1	1	0	0	0	1	0	1	1	1
Rantz 2011	1	1	1	1	1	1	1	1	1	1	0
Rantz 2014	1	1	1	1	1	1	1	1	1	1	0
Rossen 2007	1	1	1	0	0	1	1	1	1	1	0
Housing model: Assisted living, USA											
Frytak 2001	1	1	1	1	1	1	1	1	1	1	1
Gaugler 2005	1	1	1	1	1	1	1	1	1	1	0
Pruchno 2000	1	1	1	0	0	1	1	0	1	1	1
Housing model: Planned retirement community, USA											
Waldron 2005a	1	0	1	1	0	1	1	0	1	1	0

Study ID	Objective stated	Eligibility criteria described	All eligible participants enrolled	Participants representative	Sample size	Intervention clearly described	Outcome measures described	Loss to follow-up <20%	Statistical methods appropriate	Outcomes measured multiple times	Confounding factors accounted for
Waldron 2005b	1	0	1	1	0	1	1	0	1	1	0
Housing model: Extra care, UK											
Bäumker 2010	1	1	1	0	1	1	1	0	1	1	1
Bäumker 2011	1	1	1	0	1	1	1	1	1	1	1
Callaghan 2009	1	1	1	0	1	1	1	0	0	1	0
Darton 2011a*	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Darton 2011b	1	1	1	0	1	1	1	0	0	1	0
Darton 2011c	1	1	1	0	1	1	1	0	0	1	0
Darton 2012*	1	1	1	0	1	1	1	N/a	N/a	N/a	N/a
Holland 2014	1	1	1	0	0	1	1	1	1	1	1
Holland 2015	1	1	1	0	0	1	1	1	1	1	1
Holland 2017	1	1	1	0	0	1	1	1	1	1	1
Holland 2019	1	1	1	0	0	1	1	1	1	1	1
Kingston 2001	1	1	1	1	1	1	1	0	1	1	0
Kneale 2011	1	1	1	1	1	1	1	1	1	1	1
Kneale 2013	1	1	1	1	1	1	1	1	1	1	1
Netten 2011	1	1	1	0	1	1	1	0	0	1	0
Housing model: Senior housing, Canada and Finland											
Lotvonen 2017	1	1	1	1	1	1	1	1	1	1	0
Lotvonen 2018	1	1	1	1	1	1	1	1	1	1	0
Smith 2008	1	1	0	0	0	1	1	1	1	1	1

*Darton 2011a was a technical report from the University of Kent's evaluation of extra care housing, therefore none of the quality appraisal questions were applicable. Darton 2012 reported limited information from the University of Kent's evaluation, therefore not all quality appraisal questions were applicable.

Appendix N: Study characteristics for the impact review

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
Housing model: CCRC, USA										
Cutchin 2010	Moving to a continuing care retirement community: occupations in the therapeutic landscape process	USA	CCRC	Case study	Before moving to CCRC, and 12 months later	167 residents	164 residents	0.02%	Mean 78.9	59% female
Gaines 2011	Health and medical services use: a matched case comparison between CCRC residents and national health and retirement study samples	USA	CCRC	Matched case control	Baseline and 2-year follow-up for both samples	229 dyads from Erickson Life Study sample and Health and Retirement Study sample	229 dyads	N/a	Mean 77.5 (range: 60 – 93)	66.8% female in the matched samples
Heisler 2003	Health and social outcomes of moving to a continuing care retirement community	USA	CCRC	Longitudinal study	Before and after moving	102 residents	92 residents	10%	Mean age 77	66% female
Moen 2000	Social role identities among older adults in a continuing care retirement community	USA	CCRC	Pre- and post-move	1995 and 1997 waves of the Pathways to Life Quality data	101 residents	92 residents	9%	Not stated	64% female
Moen 2001	Decision-making and satisfaction with a continuing care retirement community	USA	CCRC	Pre- and post-move	1995 and 1997 waves of the Pathways to Life Quality data	101 residents	92 residents	9%	Mean age 76.5 (range: 64-94)	63% female 37% male

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
Roberts 2013	A longitudinal study of the influence of social engagement on quality of life among older adults living in senior housing	USA	CCRC	Longitudinal	Five years	300 residents	175 residents	41.7%	Mean age 78	65.3% were female
Roberts 2018	Quality of life trajectories of older adults living in senior housing	USA	CCRC	Longitudinal	Five years	267 residents	184 residents	31%	Mean age 78.8	66% female
Young 2019	Factors associated with permanent transition from independent living to nursing home in a continuing care retirement community	USA	CCRC	Prospective cohort study	Three-year follow-up	298 residents	N/a	N/a	Mean age 83.4 (range: 75 – 94)	69.1% female
Housing model: CCRC, Israel										
Ayalon 2019	Subjective social status as a predictor of loneliness: the moderating effect of the type of long-term care setting	Israel	CCRC	Quantitative surveys based on interviews	Baseline and 12 months later	427 respondents (172 CCRC and 225-day centre residents)	245 respondents (104 CCRC and 141-day centre residents took part in both waves)	43%	Mean 84.95 for CCRC residents	80.7% females in CCRCs
Housing model: Independent living, USA										
Lutgendorf 2001	Effects of housing relocation on immunocompetence and psychosocial functioning in older adults	USA	Independent living within congregate living setting	Pre- and post-move	1-month pre-move, 2 weeks post-move, and 3 months post-move	30 movers and 28 non-moving control group	30 movers and 28 non-moving control group	0%	Movers: mean age 78.8	Movers: 40% male, 60% female
Rantz 2011	Evaluation of aging in place model with home care services and registered nurse care	USA	Aging in Place programme (Independent living)	Evaluation	2005 to 2008	161 residents	77 residents	52%	Median: 84	26% male 74% female

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
Rantz 2014	coordination in senior housing The continued success of registered nurse care coordination in a state evaluation of aging in place in senior housing	USA	Aging in Place programme	Evaluation	2009 to 2012	128 residents	64 residents	50%	Median: 84	34% male 66% female
Rossen 2007	Women's well-being after relocation to independent living communities	USA	Independent living	Pre- and post-test design	Within the month prior to the move, and 3-4 months after moving	32 residents	31 residents	3%	Mean age 78 (range: 61 - 91)	100% female
Housing model: Assisted living, USA										
Frytak 2010	Outcome trajectories for assisted living and nursing facility residents in Oregon	USA	Assisted living	Longitudinal, interviews with residents or their proxies	Baseline, 6 and 12 months later	1215 (605 in assisted living and 610 in nursing homes)	813 (441 in assisted living, 88 in nursing home)	33%	Not available	Not available
Gaugler 2005	Activity outcomes for assisted living residents compared to nursing home residents: findings from a longitudinal study	USA	Assisted living	Longitudinal, interviews with residents or their proxies	Baseline, 6 and 12 months later	1215 (605 in assisted living and 610 in nursing homes)	813 (441 in assisted living, 88 in nursing home)	33%	Mean age for assisted living residents: 84.91	83.8% female
Pruchno 2000	The effect of long-term care environments on health outcomes	USA	Assisted living	Longitudinal	Baseline, 3, 8, and 12 months later. Chart review up to 15 months later	158 (82 in assisted living, 76 in nursing home)	116 (63 in assisted living, 53 in nursing home)	26.5%	Range: 60 to 101	74% female

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
Housing model: Planned retirement community, USA										
Waldron 2005a	Losing and building supportive relationships in later life: a four-year study of migrants to a planned retirement community	USA	Planned retirement communities	Longitudinal survey	Baseline and four years later	453 residents	255 residents	44%	Mean age 66 years	53% female
Waldron 2005b	Gender differences in social adaptation to a retirement community: longitudinal changes and the role of mediated communication	USA	Planned retirement communities	Longitudinal survey	Baseline and four years later	453 residents	255 residents	44%	Mean age 66 years	53% female 47% male
Housing model: Extra care, UK										
Bäumker 2010	Costs and outcomes of an extra care housing scheme in England	UK	Extra care	Before and after study	Baseline and 6 months later	40 respondents	22 respondents	55%	Mean 76 (range: 59 – 90)	72.7% female
Bäumker 2011	Evaluating extra care housing for older people in England: a comparative cost and outcome analysis with residential care	UK	Extra care	Comparative cost analysis	Baseline and 6 months later	Extra care (408) 1995 care home(614)	N/a	N/a	Extra care 76.5 1995 care home 83.3	Extra care 66% female 1995 care home 74% female
Callaghan 2009	The development of social well-being in new extra care housing schemes	UK	Extra care	Longitudinal study – interviews and questionnaires	Baseline and 6 months later	Questionnaire 599 residents, follow-up interviews 166 resident	N/a	N/a	Mean age 76.3 for interviewees, 77.4 for questionnaires	Interviewees 62% female, surveys 64% female
Darton 2011a*	Evaluation of the extra care housing initiative: PSSRU technical report	UK	Extra care	Longitudinal evaluation	N/a	N/a	N/a	N/a	N/a	N/a
Darton 2011b	Improving housing with care choices for older people: the PSSRU	UK	Extra care	Longitudinal evaluation	Baseline and 6, 18,	Information was obtained from a resident	1,182 at baseline, 650 at 6 months, 599 at 12 months	45% at 6 months	Mean 77.0	34% male

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
	evaluation of extra care housing				and 30 months	questionnaire was obtained for 1,182 individuals and the care assessments records for 817 individuals	for self-completed survey For the care assessments 468 at baseline, 261 6 months later, 157 at 18 months, and 123 at 30 months			
Darton 2011c	Residents in extra care housing: changes in dependency over time, survival and destinations of leavers	UK	Extra care	Longitudinal evaluation	Baseline and 6, 18, and 30 months	Care assessments records for 817 individuals	For the care assessments 468 at baseline, 261 6 months later, 157 at 18 months, and 123 at 30 months	43% at first follow-up	Not available	Not available
Darton 2012	The characteristics of residents in extra care housing and care homes in England	UK	Extra care	Longitudinal evaluation	Baseline	Care assessments records for 817 individuals	609 extra care entrants 494 care home entrants	25%	77 85.2	33.8% males 66.2% females 26.8% males 73.2% females
Holland 2015	Collaborative Research between Aston Research Centre for Healthy Ageing (ARCHA) and the ExtraCare Charitable Trust	UK	Extra care	Longitudinal study	Baseline, 3, 12, and 18 months later	193 (162 in Extra Care and 31 in control)	128 (99 residents and 29 in control group)	34%	Baseline Extra care group mean age 75.2, Community - based control group mean age 71.8	Baseline 61.7 female and 38.3% male in the extra care sample 74.2% female 25.8% male in the community-based control sample
Holland 2014	A second-year update and portfolio of outputs	UK	Extra care	Longitudinal study	Baseline, 3, and 12 months	193 (162 in Extra Care and 31 in control)	160 (121 residents and 39 in control group)	17%	Baseline Extra care group mean age 75.2, Community - based control group mean age 71.8	Baseline 61.7 female and 38.3% male in the extra care sample 74.2% female 25.8% male in the community-based control sample

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
Holland 2016	Transition from community dwelling to retirement village in older adults: cognitive functioning and psychological health outcomes: the final report	UK	Extra care	Longitudinal study	Baseline and 3 months later	193 (162 in Extra Care and 31 in control)	178 (144 residents and 34 in control group)	8%	Baseline Extra care group mean age 75.2, Community - based control group mean age 71.8	Not available
Holland 2019	Integrated homes, care and support: measurable outcomes for healthy ageing	UK	Extra care	Longitudinal study	Baseline, 3, 12, 15/18, 24, 36, 48, and 60 months	193 (162 in Extra care and 31 in control)	96 (51 in Extra Care and 45 in control group) at 60 months 24 (22 in Extra Care and 2 in control group) at 60 months	50% 12%	Baseline Extra care group mean age 75.2, Community-based control group mean age 71.8	Baseline 61.7 female and 38.3% male in the extra care sample 74.2% female 25.8% male in the community-based control sample
Kingston 2001	Assessing the health impact of age-specific housing	UK	Retirement community with security (similar to extra care)	Longitudinal cohort with comparison group	Baseline and 12 months later	47 in retirement community, 98 in community	42 in retirement community, 74 in community	20% Retirement community 89% Control day centre attendees 76%	Mean 80.1 years for retirement community and 76.4 for the community	72% female and 28% male in retirement community 75% female and 25% male day centre attendees
Kneale 2011	Establishing the extra in extra care perspectives from three extra care housing providers	UK	Extra care	Combination of pooled longitudinal data and cross-sectional data	2002 – 2010	Pooled sample 2,610	N/a	N/a	Mean between 79.2 years at baseline	71% female, 29% male in pooled sample
Kneale 2013	Extra care housing in the UK: can it be a home for life?	UK	Extra care	Survival or time series analysis	1995 – 2010	1,188	N/a	N/a	Mid-70's	66% female 34% male
Netten 2011	Improving housing with care choices for older	UK	Extra care	Longitudinal evaluation	Baseline and 6, 18,	Resident questionnaire 1,182	1,182 at baseline, 650 at 6 months, 599 at 12 months	45% at 6 months	Mean 77.0	34% male

Study ID	Study title	Country	Housing model	Study design	Timepoints	Participants at baseline	Participants at follow-up	Loss to follow-up	Population age	Proportion of males and females
	people: an evaluation of extra care housing				and 30 months	individuals and care assessments records for 817 individuals	for self-completed survey. For the care assessments 468 at baseline, 261 6 months later, 157 at 18 months, and 123 at 30 months	43% at first follow-up		
Housing model: Senior housing, Canada and Finland										
Lotvonen 2017	Social environment of older people during the first year in senior housing and its association with physical performance	Finland	Senior housing	Longitudinal cohort	3 and 12 months after relocation	81	71	11%	Mean 81 (range: 59 – 93)	70% female 30% male
Lotvonen 2018	Mental well-being of older people in Finland during the first year in senior housing and its association with physical performance	Finland	Senior housing	Longitudinal cohort	3 and 12 months after relocation	81	71	11%	Mean 81 (range: 59 – 93)	70% female 30% male
Smith 2008	Effects of neighborhood and individual change on the personal outcomes of recent movers to low-income senior housing	Canada	Senior housing	Longitudinal study	Wave 1 1-12 months after moving to senior housing	230 residents	137 residents	40%	Not available	62% female 38% male

*Darton 2011a was a technical report from the University of Kent's evaluation of extra care housing that provided additional information regarding the evaluation, therefore it was not eligible for many of the study characteristics items.

Appendix O: Outcomes and their measures for the impact review

Continuing care retirement communities' outcomes and their measures

Pathways to Life Quality evaluation

Self-rated health

Heisler *et al.* (2004) measured self-perceived health status using data from the Pathways to Life Quality evaluation. Subjective and objective health measures were compared between local and distant movers. Individuals reported a subjective 'health rating' on a scale from 0 to 10, ranging from 'very serious problems' to 'the very best of health'. The survey asked respondents to report which conditions they had from a list of 24 health conditions in 1995 and 26 health conditions in 1997. For consistency, the list of 24 was the one analysed, as it was more comparable. However, this list is not reproduced in the article.⁶⁷

Mental well-being

Reasons for moving

In a previous study on the Pathways to Life Quality baseline dataset, residents' primary reasons for moving to the CCRC had been for long-term care, to avoid being a burden, and to avoid needing to perform maintenance on their original home. In this study they measured what other long-term care options residents had considered.⁶²

Social well-being

Satisfaction

Moen *et al.* (2001) measured satisfaction in five ways:⁶²

1. Satisfaction with continuing care
2. Satisfaction with retirement community
3. Satisfaction with investment
4. Satisfaction with home
5. Overall satisfaction

The first four measures of satisfaction are scored on a scale from 0 to 100. 'Overall satisfaction' is a composite item, indicating that respondents scored above the mean for all four of these satisfaction items. Thirty-seven per cent of respondents were satisfied overall.⁶²

Satisfaction with social relationships

Heisler *et al.* (2004) examined satisfaction with social relationships using the Social Provisions Scale emphasising the social integration and reliable alliance subscales. The Social Provisions Scale asks respondents to rate support received from various relationships, and is scored on a scale from 'strongly disagree' to 'strongly agree'. Social integration refers to "belonging to a group of people who share recreational activities and common activities",^{67 p14} while reliable alliance refers to people's confidence that they can ask others for help.⁶⁷

Social role identities

Moen *et al.* (2000) examined social role identities among CCRC residents at baseline (pre-move) and follow-up.⁶⁶ Participants were presented with 11 social role identities: son/daughter, spouse, parent, friend, citizen, church member, grandparent, volunteer, homemaker, worker, and student. The last three on that list were omitted, as they were rarely selected, leaving a list of eight social role

identities. At both baseline and follow-up participants chose which identity was most important to them at the time. At baseline, participants were also asked which was most important to them in the past (“when you were in your 50s”) and which would be most important to them in 2 years’ time.^{66 p564}

Erickson Life evaluation

Self-rated health

Using both the Erickson Life evaluation and Health and Retirement Study samples, responses to self-rated health were categorised into those who were in poor or fair health, and those who were in good to excellent health (‘good’, ‘very good’, and ‘excellent’ health).⁶⁸

Objective health outcomes

Comorbidity

Total comorbidity is dichotomised into a rating of either 0 or 1, with 0 representing no chronic conditions and 1 representing the presence of one or more of the six conditions recorded in both the Erickson Life evaluation and the Health and Retirement Study: hypertension, diabetes, heart condition, arthritis, cancer, and stroke.⁶⁸

Mental well-being

Quality of life

Quality of life was measured in the Erickson Life Study using the Perceived Quality of Life Scale.⁶⁹ The Perceived Quality of Life Scale is a 19-item scale, with items measuring “satisfaction with the social, physical and cognitive dimensions of quality of life”.^{69 p517} Questions are answered on an 11-point scale, from ‘extremely dissatisfied/unhappy’ to ‘extremely satisfied/happy’. Sample questions include ‘how dissatisfied or satisfied are you with how well you remember and think?’ and ‘how dissatisfied or satisfied are you with the kind and amount of leisure you have?’. Scores above 7.5 are generally accepted as indicating satisfaction with quality of life. Roberts and Adams (2018) used this measure to track trends in quality of life scores over the 5-year period during which data were collected, and to model how social engagement in the first year of residency influenced quality of life for the next 4 years in the CCRC.⁶⁹

Depression

Depressive symptoms were measured using two different measures in the Gaines *et al.* (2011) study; in the Erickson Life Study depression was measured using the Geriatric Depression Scale. A score of 5 or more indicated depression. In the Health and Retirement Study, the authors used the Center for Epidemiologic Studies Depression Scale. A score of 3 or more indicated depression. For each measure, respondents were categorised as either depressed or not depressed, based on the above cut-off scores.⁶⁸

Social well-being

Social engagement

Roberts and Adams (2018) measured the levels of social engagement and social support experienced by residents of four CCRCs that were part of the Erickson Life Study.⁶⁹

4.1.1.4.2.4.1.1 Activities

Social engagement is operationalised as participants engaging in formal activities which are organised by CCRC staff. The authors analysed a list of 17 group activities provided by the CCRCs. These activities included art groups, movie screenings, volunteer groups, and education. Frequency of attendance in the past year was recorded.⁶⁹

Social support

Roberts and Adams (2018) measured social support using the Inventory of Socially Supportive Behaviors. This measure examines the frequency of both giving and receiving a number of supportive behaviours, including emotional and informational support, over the past 2 weeks. There are 40 items, with 12 relating to emotional support, 8 relating to informational support, 7 relating to tangible support, and 13 relating to providing support. Higher scores on this measure indicate that people are engaged in giving and receiving more supportive behaviours.⁶⁹

Health and social care utilisation

In Gaines *et al.* (2011), use of home-based services was measured based on home-based or hospital service use in the past 2 years. Hospital service use was measured by whether and how many times people were admitted to hospital in the past 2 years.⁶⁸

Cutchin evaluation

Social well-being

Social engagement

Activities

The list of 20 activities used in the study by Cutchin *et al.* (2010) included both individual and social activities, as well as active and passive activities. The frequency of participation in these 20 activities was compared pre- and post-move.⁷⁰

Residential satisfaction

Cutchin *et al.* also explored residential satisfaction using a Likert scale in the post-move questionnaire, asking, "In general how satisfied are you with your current living situation?".^{70 p124}

Young evaluation

Objective health outcomes

Transfer to higher level of care

The outcome of interest in Young *et al.* (2009) was permanent transfer from the independent living units in the CCRC to the nursing home on the same campus.⁶⁴

Ayalon

Social well-being

Loneliness

The loneliness measure used is an abridged version of the University of California Los Angeles Loneliness Scale.⁷² It consists of three questions asking how often respondents felt they were lacking companionship, they were left out, or as 'others', and these items are measured along a three-point Likert scale.

Subjective social status

Ayalon also used the MacArthur Scale of Subjective Social Status,⁷² which measures people's perceived social standing in their community using socioeconomic indicators as a proxy for social standing. Respondents rated their self-perceived social status along a 10-rung ladder, with 10 (or the top of the ladder) representing high socioeconomic status and 1 (or the bottom of the ladder) representing low socioeconomic status.⁷²

Independent living outcomes and their measures

Lutgendorf evaluation

Objective health outcomes

Biophysical marker/immune measures

Researchers involved in the Lutgendorf *et al.*'s study (2001) used blood tests to assess immunologic responses to the move to independent living. Measures included:⁷⁷

- Antibodies for the Epstein Barr virus
- Natural killer cell cytotoxicity
- Interleukin-6

Mental well-being

Stress response

Lutgendorf *et al.* used an amended version of the Impact of Events Scale.⁷⁷ This self-report questionnaire measured intrusive thoughts related to a stressor. The questions relate to experiences over the past week and measure respondents' subjective response to a specific stressful event in the older adult population – in this case, their move to independent living. The tool is validated for use with older people. Higher scores represent higher levels of distress; however, there is no cut-off score to indicate the categorical presence of distress. The scale can be used to track an individual's response to a stressful event over time, and in this study it was completed by respondents before, during, and after their move, and was also completed by the control group in this study.⁷⁷

Emotional well-being

Lutgendorf *et al.* used the Profile of Mood States (short form) as a measure of emotional well-being.⁷⁷ The original version of this questionnaire has 65 items, while the short form used in this study had 37 items.⁷⁷ The study focused on results relating to two mood states: the first was vigour, and the second was a composite item for negative mood states comprising anxiety, depression, anger, fatigue, and confusion.⁷⁷ The authors did not define vigour, but we assume they meant a zest for life.

Rossen evaluation

Self-rated health

In Rossen and Knafl (2007), just before their move to independent living, 77.4% of the women surveyed perceived their self-rated health as good or excellent.⁷³

There were no uniform increases in self-rated health in the sample post-move; some participants (n=8) rated their health as better, some (n=4) reported it as worse, and most (n=19) reported no change. The authors suggest that this may relate to the residents continuing to have an active life within the independent living community, as they were provided with their main meal of the day in a communal dining room and various group activities were organised during the day.⁷³

Health satisfaction

When Rossen and Knafl (2007) assessed residents' health satisfaction, 87% of the sample said that they were "somewhat to completely satisfied with their health" prior to their move.^{73 p191} Post-move, 94% reported that they were somewhat to completely satisfied with their health. Nine women reported greater health satisfaction, 4 reported lower satisfaction with their health, and 18 reported no change in their health satisfaction.⁷³

Objective health outcomes

Respondents reported the number of chronic health conditions they had over the past 12 months.⁷³

Physical well-being

Rossen and Knafl (2007) enquired about exercise with the health habits question “Do you do physical exercise such as walking?”, which required a yes/no response.^{73 p188}

Mental well-being

Quality of life

Rossen and Knafl (2007) measured quality of life using the Quality of Life Index,⁷³ which measures people’s satisfaction with these subscales:

- Health and physical functioning
- Social and economic functioning
- Psychological and spiritual functioning
- Family functioning

Higher scores represent higher quality of life, and the measure had been previously validated for use with older women.⁷³

Depression

Rossen and Knafl (2007) measured depression using the Geriatric Depression Scale. The Geriatric Depression Scale is a 30-item questionnaire. Respondents answer yes or no to questions including ‘Do you feel happy most of the time?’ and ‘Do you think it’s wonderful to be alive right now?’ Scoring brackets are as follows:⁷³

- 0-10: no depression
- 11-20: mild depression
- 21-30: moderate to severe depression

7.1.1.1.1.1 Self-esteem

Self-esteem relates to one’s self-perception, self-acceptance and self-worth. Rossen and Knafl (2007) used the Rosenberg Self-Esteem Scale to measure self-esteem.⁷³ This is a 10-item questionnaire, including questions such as ‘I feel that I have a number of good qualities’ and ‘I certainly feel useless at times’. The responses range from ‘strongly disagree’ to ‘strongly agree’. Five items are reverse-scored, and higher scores represent greater self-esteem.⁷³

Social well-being

The ‘person-environment’ portion of Rossen and Knafl’s outcomes asked residents whether they had anyone to confide in.⁷³ The authors also measured the number of social activities residents engaged in per week in five domains:

1. Family visits
2. Friend visits
3. Attending groups
4. Total social activities attended
5. Total time spent attending activities

Aging in Place evaluation

Physical well-being

Activities of daily living

In the Aging in Place programme, the researchers created an activities of daily living measure from the Minimum Data Set within the evaluations that were performed with residents on a semi-annual (TigerPlace) or annual (CCRC) basis. The measure provided a summary score ranging from 0 to 28, which was made up of seven items (bed mobility, transfer, locomotion off unit, dressing, eating, toilet use, and person hygiene), each scored between 0 and 4, with 0 representing independence and 4 representing complete dependence. This evaluation also used the physical health subscale of the Short Form-12 Health Survey to measure physical well-being.^{75 76}

Continence

Bowel and bladder incontinence were measured in the Aging in Place programme using the Minimum Data Set.^{75 76}

Mental well-being

Cognitive function

The Mini-Mental State Examination was performed as part of routine analysis on admission to the Aging in Place programme.⁷⁵ If residents appeared to be experiencing cognitive decline, the Mini-Mental State Examination was performed again. The examination is a measure of cognitive functioning and requires participants to answer questions pertaining to orientation, memory, attention, and spatial skills.⁷⁵

Psychological well-being

The Aging in Place evaluation measured psychological well-being using the mental health subscale of the Short Form-12 Health Survey, with scores ranging from 0 to 100 (standardised to a mean of 50 and with a standard deviation of 10).^{75 76}

The Aging in Place evaluation also measured depression using the Geriatric Depression Scale. The range is 0–30 and higher scores represent the presence of more depressive symptoms.^{75 76} Rantz *et al.* also used the mental health component of the Short Form-12 Health Survey to measure depression.^{75 76}

Costs

Rantz *et al.* (2011; 2014) performed cost evaluations within the Aging in Place evaluation by comparing the cost of residency in both independent living units with the cost of residency in a nursing home. This cost projection was performed by measuring residents' cost of care and housing within the Aging in Place programme, combined with any extra care they may have received (e.g. hospitalisation, additional care services), against the monthly average nursing home cost. However, only those residents who received additional care services and who were eligible for nursing home care but were still living in independent living were included in the cost analysis in order to provide a fair comparison between the two costs. Those who were living fully independently were not included in the cost analysis in order not to skew the results.^{75 76}

Assisted living outcomes and their measures

Pruchno evaluation

Self-rated health

In Pruchno and Rose (2000), self-rated health scores were measured using the Multilevel Assessment Instrument.⁷⁹ The questions ask about a number of dimensions of health, including the respondent's current overall health, their current health compared with their health 3 years ago, the limitations they experienced due to their health, and their health compared with the health of their peers.⁷⁹

Objective health outcomes

Mortality and relocation

In order to track relocation and mortality, Pruchno and Rose used the facility's census reports up to 15 months after baseline.⁷⁹ When residents' health and functional abilities declined, they moved from the assisted living community to the nursing home on campus.⁷⁹

Physical well-being

Functional abilities (activities of daily living)

Pruchno and Rose (2000) also gathered information on functional ability using the Multilevel Assessment Instrument.⁷⁹ This scale measures seven activities of daily living:

1. Eating
2. Dressing
3. Grooming
4. Getting around the home
5. Getting in and out of bed
6. Bathing
7. Toileting

It also measures eight instrumental activities of daily living:

1. Housework
2. Laundry
3. Preparing meals
4. Grocery shopping
5. Getting to places that are beyond walking distance
6. Using the phone
7. Managing money
8. Taking medication

The scales were scored on people's capacity to perform these activities either with or without help, or their inability to perform the activities. Scores ranged from 15 to 45, with higher scores representing better functional ability.⁷⁹

Mental well-being

Cognitive functioning

Cognitive functioning was measured by Pruchno and Rose (2000) using the Mini-Mental State Examination. Scores ranged from 0 to 30, with higher scores representing better cognitive function.⁷⁹

Psychological well-being

Pruchno and Rose (2000) measured depression using the Center for Epidemiologic Studies Depression Scale.⁷⁹ Higher scores represent the presence of more depressive symptoms.⁷⁹

Costs

All assisted living residents in the Pruchno and Rose (2000) study were paying privately for their residence, but no data were provided on the costs of residence in the community.⁷⁹

Oregon evaluation

Physical well-being

Functional abilities (activities of daily living)

Frytak *et al.* (2001)⁷⁴ used an activities of daily living scale which measures:

- Continence
- Feeding
- Toileting
- Transferring
- Dressing

Bathing is normally included in this scale but was excluded for this study as nursing home residents do not bathe by themselves. Results were transformed to range from 0 to 100, with 0 representing no dysfunction and 100 representing total dependence.⁷⁴

Pain and discomfort

Frytak *et al.* (2001) used an adapted version of a pain and discomfort scale to measure the frequency of:⁷⁴

- Aches and pains in joints and muscles
- Chest pain
- Shortness of breath
- Dizziness
- Itching and burning
- Headaches
- Coughing

Mental well-being

Psychological well-being

Psychological well-being was measured using the mental health subscale of the Short Form-36 Health Survey. This measure contains items on depression, anxiety, loss of emotional or behavioural control, and psychological well-being. Higher scores indicate higher psychological well-being.⁷⁴

Social well-being

Gaugler *et al.* (2005) used data from the same dataset as Frytak *et al.* (2001) to examine activity levels in older people.⁷⁸ The study compared residents in assisted living with nursing home residents over a 12-month period.⁷⁸ The resident activity questions asked how often residents take part in nine social activities, e.g. how often they went to church, a senior center, club and how often they had done group activities such as bingo, cards, or exercise groups.⁷⁸ The respondents were asked questions about frequency of the following activities:

- Going to see a movie, play, going to a restaurant, etc.
- Going to church, senior centre, club, etc.
- Staying overnight elsewhere
- Having relatives or children visiting

- Having external friends visiting
- Having a conversation with other tenants
- Having telephone contact with family members or friends
- Doing activities such as reading books or newspapers
- Doing group activities such as bingo, cards, or exercise groups

Planned retirement communities' outcomes and their measures

Social well-being

Waldron's (2005a;2005b) evaluations measured perceived social support as well as gender differences in social support and email use.

Perceived social support

Respondents were asked about the number of their close friends who lived outside of the retirement community, and about the close friends they had made within the retirement community.⁸⁰ They were also asked how many people they felt they could rely on. The authors used the Quality of Relationships Inventory, which they adapted to be more relevant to the lives of older people. The authors performed a factor analysis on this amended survey which presented two themes: emotional resources and help with tasks related to adjusting to a new community. From these questions, the researchers were able to investigate retention of friends outside the community, making new close friends in the community, and changes in perceived sources of social support.⁸⁰

Gender differences in social support

Using the adapted Quality of Relationships Inventory to measure social support, the authors predicted that women would experience a reduction in supportive relationships in the new environment, and that the structured environment may facilitate men to form social bonds in the community and have enhanced supportive relationships as a result.⁸¹

Gender differences in email use

To examine how people communicated using email, the authors asked how many times the residents used email in the past 30 days to communicate with their friends, children, grandchildren, other family members. The authors predicted that women would use email more frequently than men would to keep in touch with friends, children and grandchildren, and other family members outside the retirement community.⁸¹

Appendix P: Descriptive analysis of primary studies outcomes for the impact review

Continuing care retirement communities' findings by outcomes

USA

Pathways to Life Quality evaluation

Self-rated health

Heisler *et al.* (2004) found that local and distant movers in the Pathways to Life Quality evaluation had similar self-perceived health at baseline. At 24-month follow-up, the people who had moved to the CCRC from the local area had better self-perceived health compared with people who had moved from farther away. The proportions are not clear, however.⁶⁷

Mental well-being

Reasons for moving

In one early study based on the Pathways to Life Quality dataset, at baseline, people's reasons for moving to the CCRC had been for long-term care, to avoid being a burden, and to avoid needing to perform maintenance on their original home.⁶² Cluster analysis in the Moen *et al.* (2001) study found that half (53%; *n*=49) of respondents considered only one move option – that is, moving to the CCRC.⁶² Another cluster (12%; *n*=11) considered multiple options for moving, and the third cluster (35%; *n*=32) explored options for staying in their original homes.⁶² People with a higher degree of 'planfulness' informing their move exhibited greater satisfaction with the CCRC.⁶²

Social well-being

Satisfaction

The majority of respondents in the Pathways to Life Quality evaluation stated that they were satisfied with the continuing care service, the retirement community itself, their financial investment in the CCRC, and their home.⁶² The mean score for satisfaction with continuing care was 90.5 (standard deviation: ± 11.0). The mean score for satisfaction with the retirement community was 90.2 (standard deviation: ± 11.4). The mean score for satisfaction with their investment was 88.1 (standard deviation: ± 12.0), and the mean score for satisfaction with their home was 91.7 (standard deviation: ± 7.6). Just over one-third (37%) of respondents rated their satisfaction with all four of these items above the mean scores. Women were more likely to be satisfied with the CCRC than men. Age was also a strong predictor of satisfaction with the CCRC, with those aged 77–94 years being 13.9 times more likely to be satisfied compared with the younger cohort, aged 64–76. Meanwhile, being in the lower salary bracket (that is, earning less than US\$50,000) predicted lower levels of satisfaction.⁶²

Satisfaction with social relationships

Heisler *et al.* (2004) examined social connectedness and the differences between local and distant movers, finding that those who moved from farther away experienced greater changes in their social relationships than those who moved locally.⁶⁴ The mean score on the social integrations subscale of the Social Provisions Scale for distant movers was 14.1 (standard deviation: ± 1.5) at baseline, whereas for local movers the mean score was 13.3 (standard deviation: ± 2.3) at baseline.⁶⁴ At follow-up, the mean score for distant movers was 13.2 (standard deviation: ± 1.5), and for local movers it was 13.3 (standard deviation: ± 2.0).⁶⁷

Social role identities

Moen *et al.* (2000) examined people's social role identities at two time points, enquiring about their past, present, and expected identities.⁶⁶ 'Friend', 'spouse', 'parent', and 'grandparent' were the most commonly reported identities both pre- and post-move. Women in the CCRC who were single and younger were most likely to see themselves primarily as friends. The authors suggest that as parenthood is assumed in people within that cohort, it is not perceived as a strong social role identity. However, the parents who gave regular assistance to their children were significantly more likely to identify with the parent role. Frequency of seeing one's children did not influence the likelihood of identifying as a parent. Parents in CCRCs may be more strongly influenced by other identities. Further cluster analysis on the Pathways to Life Quality data showed three clusters of social role identities within the CCRC: Cluster 1 (*n*=31) had many social role identities, with a mean score of 5.6 identities across domains. Cluster 2 (*n*=20) contained participants who were most likely to describe themselves as friends. Cluster 3 (*n*=31) comprised individuals who saw themselves as husbands and wives. The authors outline how people within these different clusters may have different experiences transitioning to CCRCs as a result of their held identities before the move.⁶⁶

Erickson Life evaluation

Self-rated health

For the Erickson Life evaluation cohort reported on in Gaines *et al.* (2011), 94.8% of the sample reported that they had good or excellent health at baseline. Two years later at follow-up, this

increased to 95.6%. This CCRC sample was significantly more likely to report being in good or excellent health than the Health and Retirement Study sample at the 2-year follow-up (95.6% compared with 73.4%).⁶⁸

Objective health outcomes

Comorbidity

Gaines *et al.* (2011) estimated that the prevalence of having one or more chronic conditions in the Erickson Life evaluation CCRC sample was 87.8% at baseline, increasing to 96.1% at follow-up.⁶⁸ This increase can be expected as the population ages. However, the matched sample from a nationally representative population had a smaller increase in the prevalence of chronic conditions, rising from 92.1% to 93.4% over the 24-month period. This difference was significant, with the CCRC sample being significantly more likely than the Health and Retirement Study sample to report experiencing at least one chronic condition at the 24-month time point.⁶⁸

Mental well-being

Quality of life

Roberts and Adams (2018) reported that there is a dearth of longitudinal analyses on quality of life among older people.⁶⁹ Using data from the Erickson Life evaluation, Roberts and Adams (2018) measured quality of life using the Perceived Quality of Life Scale.⁶⁹ Observing quality of life over 5 years, the dataset indicated that quality of life declined over this period for residents of the CCRCs studied. The mean score for quality of life in the first 12 months was 8.4 (standard deviation: ± 1.3), and this fell to 7.9 (standard deviation: ± 1.3) at the end of the 5-year study. More than three-quarters (78%) of residents scored above 7.5 (representing satisfaction with quality of life) in the first year, which declined to two-thirds (66%) in the fifth year. These results were corroborated by the results of the study's linear growth modelling. The models indicate that the rate of decline in quality of life scores was similar for all residents, whether or not they had scored highly on quality of life at baseline. Providing social support to others in the first 12 months of residency yielded a higher score on the quality of life measure and a slower decline in this score over 5 years. Similarly, participating in organised social activities with fellow residents in the first 12 months of residency resulted in significantly slower declines in quality of life by the end of the fifth year. The authors suggest that ensuring social activities are organised to help people settle into a community early on in their residency will have positive long-term effects on their quality of life.⁶⁹

Depression

Gaines, *et al.* (2011) found that 96.1% of CCRC residents reported no depressive symptoms at baseline, and 94.3% reported no depressive symptoms at the 2-year timepoint. By comparison, in the general population only 75.5% showed no depressive symptoms at baseline and follow-up.⁶⁸

Social well-being

Social engagement

Activities

Roberts and Adams performed analysis on the Erickson Life Study data and found that after 12 months, residents in the four CCRCs studied took part in an average of 5.6 (standard deviation: ± 2.5) activities per person in their first 12 months of residency.⁶⁹ The most popular activities were film screenings, concerts, and the theatre. Activities involving exercise, support groups, and spiritual development were less popular.⁶⁹

Social support

Based on the Erickson Life evaluation data, Roberts and Adams (2018) found that residents were receiving high levels of emotional support but low levels of informational and tangible support at study baseline. They were also providing support to their family, friends, and neighbours.⁶⁹

Health and social care utilisation

In Gaines *et al.*'s (2011) study, those in the CCRC sample were found to use a similar number of home-based and hospital services over a 24-month period when compared with the general sample who participated in the Health and Retirement Study.⁶⁸

Cutchin evaluation

Social well-being

Social engagement

Activities

Cutchin *et al.* (2010) found that many of the activities that were common pre-move reduced in frequency post-move, and vice versa. Some of the most popular activities both before and after the move included reading and watching TV. The greatest changes observed were a decrease in frequency of cooking/baking, housekeeping, eating out at restaurants, and grocery shopping post-move. Many of these services would be provided within the CCRC. Some activities increased in frequency: attending meetings, concerts, parties, and movies all increased in frequency post-move, which speaks to the activities on offer within the CCRC. There was no significant change in the frequency of entertaining friends and family, attending religious services, exercising, playing games, reading, watching TV, or gardening.⁷⁰

Residential satisfaction

Logistic regression results show that participants who engaged in more activities in the first year of living in the CCRC experienced statistically significant greater residential satisfaction.⁷⁰

Young evaluation

Objective health outcomes

Transfer to higher level of care

Young *et al.* (2009) reported that after 3 years of measurement, a total of 33 (11.1%) CCRC residents permanently transitioned to the nursing home facility on the same campus, and 265 remained in their independent living units within the CCRC.⁶⁴ Of the 33 who transferred to the nursing home, one-third (n=11) were aged between 75 and 84 years, while two-thirds (n=22) were aged 85 years or over. These transfers were significantly associated with declines in cognitive function, impairments in activities of daily living, incontinence, and depression. Results from the survival analysis showed that the relative risk of permanent transfer was 3.6 times more likely among those with cognitive impairment than among those without cognitive impairment. Those experiencing cognitive impairment had a mean time of transfer to the nursing home 34.5 months sooner than those without cognitive impairment. People who were incontinent were 12.7 times more likely to be transferred to the nursing home than those who were continent, and were transferred an average of 34.1 months sooner than those who were continent and had no cognitive impairment. Residents with all four risk factors had a mean transfer time of 32 months sooner, compared to residents experiencing none of the four risk factors.⁶⁴

Israel

The descriptive findings by outcome are presented in Appendix P.

Social well-being

Loneliness

Loneliness scores were consistent across the two time points of baseline and 12 months follow-up.⁷² The mean loneliness score for CCRCs at baseline was 1.51 (standard deviation: ± 0.64 ; range: 1–3). At follow-up, the mean loneliness score was 1.63 (standard deviation: ± 0.67 ; range: 1–3). Loneliness had

a significant negative correlation with perceived social status at both time points, and with gender at the second time point.⁷²

Subjective social status

The mean score for subjective social status at baseline was 7.5 (standard deviation: ± 1.71 ; range: 0–10), with 10 representing the top rung of the ladder or highest social status, and 1 representing the lowest social status.⁷²

Associations between loneliness and social standing

In the hierarchical regression models, higher perceived social standing was negatively associated with loneliness scores after 12 months of living in the CCRCs. These models controlled for sociocentric network, education, subjective financial status, age, and gender.⁷²

Independent living findings by outcomes

Lutgendorf *et al.*

Physical well-being

Biophysical markers/immune measures

Lutgendorf *et al.* (2001) found reduced levels of natural killer cell cytotoxicity in the blood tests of recent movers compared with those in the non-moving control group, which may be a result of the stress of the move.⁷⁷ Reduced levels of natural killer cell cytotoxicity puts people at greater risk of tumours and infectious diseases. At 3-month follow-up, natural killer cell cytotoxicity levels had risen to 75% of what they had been initially, and were almost at the same levels as the control group at the same time point.⁷⁷

There were no differences between the control group and the movers in terms of their levels of antibodies for Epstein–Barr virus viral capsid antigen, which is contrary to what the researchers expected. Epstein–Barr virus antibodies are a proxy for cellular immune competence.⁷⁷

Interleukin-6 levels rose over the course of the study, from 3.3 (standard deviation: ± 3.1) pre-move to 3.5 (standard deviation: ± 3.2) post-move and 3.9 (standard deviation: ± 3.1) at 3-month follow-up.⁷⁷

Mental well-being

Stress response

In Lutgendorf *et al.*'s (2001) study, measures of intrusive thoughts, negative mood, and vigour leading up to the move were recorded and compared with the control group of non-movers. The Impact of Events Scale measure of intrusive thoughts was 11.3 (standard deviation: ± 9.1) pre-move, which fell to 8.2 (standard deviation: ± 8.4) post-move and to 4.1 (standard deviation: ± 7.0) at 3-month follow-up.⁷⁷

Emotional well-being

On the vigour subscale of the Impact of Events Scale, the movers group showed a decrease from 9.1 (standard deviation: ± 5.7) pre-move to 8.6 (standard deviation: ± 5.3) post-move, and an increase to 11.0 (standard deviation: ± 5.3) at 3-month follow-up.⁷⁷

Participants' level of negative mood was 15.7 (standard deviation: ± 14.5) pre-move and 15.9 (standard deviation: ± 15.6) post-move, and decreased to 11.9 (standard deviation: ± 18.1) at 3-month follow-up.⁷⁷

Rossen evaluation

Self-rated health

In Rossen and Knafl (2007), just before their move to independent living, 77.4% of the women surveyed perceived their self-rated health as good or excellent.⁷³

There were no uniform increases in self-rated health in the sample post-move; some participants ($n=8$) rated their health as better, some ($n=4$) reported it as worse, and most ($n=19$) reported no change. The authors suggest that this may relate to the residents continuing to have an active life within the independent living community, as they were provided with their main meal of the day in a communal dining room and various group activities were organised during the day.⁷³

Health satisfaction

When Rossen and Knafl (2007) assessed residents' health satisfaction, 87% of the sample said that they were "somewhat to completely satisfied with their health" prior to their move.^{73 p191} Post-move, 94% reported that they were somewhat to completely satisfied with their health. Nine women

reported greater health satisfaction, 4 reported lower satisfaction with their health, and 18 reported no change in their health satisfaction.⁷³

Objective health outcomes

Eighty-seven per cent of the women reported at least one comorbidity. The conditions most frequently reported were arthritis, high blood pressure, and heart conditions. Rossen and Knafl (2007) stated that 48% of their sample had high blood pressure before their move to independent living, and that this decreased to 29% after their move.⁷³

Physical well-being

Rossen and Knafl (2007) measured exercise as a covariate, and the share of respondents reporting walking as a method of exercise increased from 51.6% pre-move to 77.4% post-move.⁷³

Mental well-being

Quality of life

Higher scores on the Quality of Life Index represent improvements in quality of life.⁷³ Rossen and Knafl (2007) reported that there was a small increase in overall quality of life between the pre- and post-move measures.⁷³ The majority (81%) of respondents reported greater overall life satisfaction, although 19% experienced less overall life satisfaction. The mean quality of life score was 23.8 (standard deviation: ± 3.6) pre-move, increasing to 25.5 (standard deviation: ± 2.3) post-move. Regarding the four Quality of Life Index subscales, respondents reported no improvement on the health and physical functioning or the family functioning subscales. However, the social and economic functioning subscale and the psychological and spiritual functioning subscale did show significant improvements after the move.⁷³

Depression

In Rossen and Knafl (2007), mean scores on the Geriatric Depression Scale were 6.5 (standard deviation: ± 5.1 ; range: 0–19) pre-move, and fell to 5.9 (standard deviation: ± 5.6 ; range: 0–22) post-move, with the highest possible score being 30. This represented a small decrease in mean depression scores, although this change was not statistically or clinically significant. Before the move, six participants were mildly depressed. After the move, three participants scored 11–20, indicating mild depression, and one scored 21–30, indicating moderate to severe depression.⁷³

Self-esteem

There were no significant changes in self-esteem scores after the move.⁷³ Mean pre-move scores for self-esteem were 31.5 (standard deviation: ± 0.5 ; range: 21–40), which rose marginally to 32.0 (standard deviation: ± 0.4) post-move.⁷³

Social well-being

Rossen and Knafl (2007) reported that having a confidant acts as a buffer from negative emotions.⁷³ The majority (87%) of residents in Rossen and Knafl's (2007) study said that they had a confidant both before and after the move.⁷³

There were no significant changes after the move in the number of social visits or social activities participants took part in, except for group social activities.⁷³ Rossen and Knafl (2007) reported that the women in their study attended more group social activities post-move. At baseline, the mean number of times per week that participants took part in social activities was 4.4 (standard deviation: ± 3.5), which increased to 8.2 (standard deviation: ± 5.0) after the move. The authors report that the increase was expected, as there were several social events organised for residents within the independent living communities studied.⁷³

Aging in Place evaluation

Physical well-being

Short Form-12 Physical Health Subscale

In their first evaluation, Rantz et al. (2011) measured the physical health of the TigerPlace (independent living) residents using the Short Form-12 Physical Health subscale. The mean score was 39.7 (standard deviation: ± 11.9) in 2005, which rose slightly to 42.8 (standard deviation: ± 10.2) in 2006, then decreased to 41.1 (standard deviation: ± 10.1) in 2007 and 38.8 (standard deviation: ± 10.9) in 2008, according to the cross-sectional analysis.⁷⁵ Meanwhile, the mean Short Form-12 Physical Health score for CCRC residents was 39.0 (standard deviation: ± 12.2) in 2005, 40.8 (standard deviation: ± 11.3) in 2006, 38.8 (standard deviation: ± 10.9) in 2007, and 41.2 (standard deviation: ± 11.1) in 2008. Although similar, the physical health scores were not exactly the same between the two locations. In both locations, there was a slight increase in the mean score in 2006, which eventually decreased by 2008 in TigerPlace, while in the CCRC the mean score remained higher in 2008 than at baseline.

In the second evaluation, which included TigerPlace residents only, mean scores on the Short Form-12 Physical Health subscale were 38.8 (standard deviation: ± 10.5) in 2009, 39.0 (standard deviation: ± 8.8) in 2010, 40.1 (standard deviation: ± 10.5) in 2011, and 39.8 (standard deviation: ± 11.7) in 2012.⁷⁶

Having both consecutive evaluations allows us to see the cross-sectional analysis of the TigerPlace cohort between 2005 and 2012. From these scales, we can see that the mean physical health rating stayed relatively consistent over that time period.

Activities of daily living

Rantz et al. (2011) reported that the mean scores for activities of daily living in TigerPlace were 0.1 (standard deviation: ± 0.3) in 2005 and 0.0 (standard deviation: ± 0.0) in 2008.⁷⁵ Likewise, the mean activities of daily living score in the CCRC was 0.1 (standard deviation: ± 0.3) in 2005 and 0.0 (standard deviation: ± 0.0) in 2008. A score of 0 represents no deficits in a resident's daily functioning.

In the later evaluation, Rantz et al. (2014) reported a mean activities of daily living score of 0.4 (standard deviation: ± 1.0) for TigerPlace in 2009, which rose to 2.6 (standard deviation: ± 4.7) in 2012.⁷⁶ As is expected, we can see an increase in the levels of dependency over the full evaluation period from 2005 to 2012.

Continence

Cross-sectional results from the Minimum Data Set showed that both bladder and bowel continence decreased for residents in both locations between 2005 and 2008.⁷⁵

In the later evaluation, most people living in TigerPlace between 2009 and 2012 were continent, although levels were decreasing, with 98% of respondents having bowel continence in 2009 compared with 95% in 2012, and 85% reporting bladder continence in 2009 compared with 65% in 2012.⁷⁶

Mental well-being

Cognitive functioning

Mini-Mental State Examinations were only available for residents who had at least one health assessment per year, and this subset would have higher health and social care needs than the remainder of the population. In the TigerPlace independent living community, the Mini-Mental State Examination mean score fell from 26.9 (standard deviation: ± 4.1) in 2005 to 22.7 (standard deviation: ± 6.7) in 2008.⁷⁵ Similarly, in the CCRC, the mean scores for the Mini-Mental State Examination were 28.0 (standard deviation: ± 2.8) in 2005 and 24.2 (standard deviation: ± 6.3) in 2008.⁷⁵

In the later evaluation of TigerPlace, the mean Mini-Mental State Examination score in 2009 was 26.2 (standard deviation: ± 4.7), and this remained similar in 2012, when the mean score was 25.2 (standard deviation: ± 5.9).⁷⁶ Overall, there was little change in the mean Mini-Mental State Examination scores between 2005 and 2012.

Psychological well-being

In the first Rantz *et al.* (2011) evaluation, mental health was measured using the Short Form-12 Mental Health subscale and the Geriatric Depression Scale.⁷⁵ Results were similar across the two locations studied. However, the number of people being measured decreased, as only those who required at least one health assessment per year were measured.

In the TigerPlace independent living community, mental health scores for residents using the Short Form-12 Mental Health subscale improved, while the mean Geriatric Depression Scale scores remained constant between 2005 and 2008.⁷⁵ Mean scores for the Short Form-12 Mental Health subscale were 51.5 (standard deviation: ± 8.7) in 2005, 52.4 (standard deviation: ± 9.9) in 2006, 54.3 (standard deviation: ± 8.7) in 2007, and 58.5 (standard deviation: ± 5.3) in 2008. Higher scores on the Short Form-12 Mental Health subscale indicate improved mental health. The mean Geriatric Depression Scale score was 3.7 (standard deviation: ± 2.5) in 2005 and 3.5 (standard deviation: ± 2.2) in 2008. Lower scores on the Geriatric Depression Scale indicate better mental health.⁷⁵

The CCRC's mean score for the Short Form-12 Mental Health subscale was 53.0 (standard deviation: ± 8.9) in 2005, increasing to 57.0 (standard deviation: ± 5.1) in 2008.⁷⁵ The mean score for the Geriatric Depression Scale in 2005 was 4.1 (standard deviation: ± 2.9), falling to 2.4 (standard deviation: ± 2.0) in 2008.⁷⁵

In the later evaluation of TigerPlace, the mean Geriatric Depression Scale score using cross-sectional analysis was 4.2 (standard deviation: ± 3.4 ; $n=51$) in 2009, and this fell to 2.6 (standard deviation: ± 2.2 ; $n=74$) in 2012, with a lower score representing reduced incidence of depressive symptoms.⁷⁶ The mean Short Form-12 Mental Health subscale score in 2009 was 52.7 (standard deviation: ± 11.7 ; $n=46$), which rose to 55.1 (standard deviation: ± 8.6 ; $n=72$) in 2012, indicating improved mental health.⁷⁶

In the longitudinal analysis of residents who had at least one health assessment per year, the mean score on the Geriatric Depression Scale was 4.1 (standard deviation: ± 3.4 ; $n=23$) in 2009, falling to 2.7 (standard deviation: ± 1.9 ; $n=28$) in 2012.⁷⁶ The longitudinal score on the Short Form-12 Mental Health subscale was 54.7 (standard deviation: ± 11.1 ; $n=21$) in 2009, which rose slightly to 56.4 (standard deviation: ± 6.4 ; $n=28$) in 2012.⁷⁶ A similar trend is reported in both the cross-sectional and longitudinal analyses, indicating that the incidence of depression decreased and that mental health improved marginally over the course of the evaluation.

Costs

In the first evaluation, for the sample of 25 residents who were both eligible for nursing home care and who received services exceeding that of independent living, the cost of independent living did not exceed the average cost of living in a nursing home.⁷⁵ This held true for both the independent living and CCRC facilities.

The average housing cost for TigerPlace increased from US\$2,871 per month (or US\$34,452 annually) in 2005 to US\$3,374 per month (or US\$40,488 annually) in 2008.⁷⁵ The average annual care and housing cost was US\$36,700 annually in 2005, rising to US\$47,819 annually in 2008.

The average housing cost for the CCRC in 2005 was US\$1,526 per month (or US\$18,312 annually), rising to US\$2,369 per month (or US\$28,428 annually) in 2008.⁷⁵ The cost of care plus housing was US\$18,312 annually in 2005, rising to US\$31,529 annually in 2008.

TigerPlace was the more expensive option, which the authors suggest was partly because it catered to a wealthier cohort.⁷⁵ The cost of care between 2005 and 2008 was also higher in TigerPlace compared with the CCRC because people stay in place for longer in TigerPlace, whereas in the CCRC they move to a higher care facility (either assisted living or a nursing home) when they need more care.

For comparison, the average nursing home cost was US\$64,240 per year in 2005, which increased incrementally to US\$69,715 per year in 2008.⁷⁵

In the second evaluation, the authors used the same grouping of people: those who were eligible for nursing home care and who received additional services on top of what was offered in TigerPlace.⁷⁶ The average annual care cost for TigerPlace residents in 2009 was US\$4,704, while the average annual housing cost was US\$46,725. The total annual cost of care and housing in 2009 was therefore

US\$51,429. In 2012, the average annual care cost was US\$9,096 and the average annual housing cost was US\$52,892, for a total annual housing and care cost of US\$61,988 on average.⁷⁶ As was the case in the first evaluation, additional care and housing costs were not as expensive as the average cost of a semi-private room in a nursing home, which was US\$72,270 in 2009 and US\$81,030 in 2012.⁷⁶

Assisted living findings by outcomes

Pruchno evaluation

Self-rated health

Pruchno and Rose (2000) reported that the mean self-rated health score at baseline was 8.6 (standard deviation: ± 2.2), rising to 9.5 (standard deviation: ± 1.7) after 12 months, with a higher score representing higher self-rated health. Residents' increase in their subjective rating of their health after 12 months in the assisted living community was statistically significant. There is some bias apparent in this outcome, as it does not account for the number of people who died, transferred from assisted living to another community, or declined to further participate in the study.⁷⁹

Objective health outcomes

Mortality and relocation

In Pruchno and Rose (2000), 10 residents died and 20 moved from the assisted living community to a nursing home between baseline and the 15-month follow-up.⁷⁹

The results of the modelling showed that the type of facility (assisted living or nursing home) has no effect on mortality rates or transfer to a higher level of care. The researchers used logistic regression modelling to estimate the impact of facility on relocation and mortality. The model controlled for education, length of stay, pay status (paying privately or through Medicaid), functional abilities, depression, self-rated health, age, and cognitive functioning. Relocating to a higher level of care was predicted by education, pay status, functional ability, and cognitive functioning, but not by facility of residence at baseline. Resident age was the only covariate that significantly predicted mortality.⁷⁹

Physical well-being

Functional abilities

The mean functional ability score at baseline was 40.7 for the assisted living sample (standard deviation: ± 3.6), falling slightly to 39.2 (standard deviation: ± 3.8) at 12 months.⁷⁹

Mental well-being

Cognitive functioning

Pruchno and Rose (2000) reported that the mean Mini-Mental State Examination score for cognitive status was 24.1 (standard deviation: ± 4.1) at baseline, and that this fell to 23.6 (standard deviation: ± 5.4) at 12 months. This represents a marginal decrease in cognitive status for assisted living residents over the course of 12 months.⁷⁹

Psychological well-being

Depression

Pruchno and Rose (2000) reported that depression scores based on the Center for Epidemiologic Studies Depression Scale were 13.7 (standard deviation: ± 10.6) at baseline and 13.1 (standard deviation: ± 10.3) at 12 months.⁷⁹

Oregon evaluation

Physical well-being

Functional abilities

In Frytak *et al.*'s (2001) study, the sample size for activities of daily living was 428 at the 6- and 12-month follow-up interviews.⁷⁴ The mean baseline score for activities of daily living was 16.9. At 6 months it was 20.2, and at 12 months it was 24.9. Standard deviations were not reported. Higher scores represent higher levels of dependence, and the level of dependence increased over the 12-month follow-up period.⁷⁴

Pain and discomfort

In Frytak *et al.*'s (2001) study, the sample size that completed the Pain and Discomfort Scale was 257 assisted living residents at 12 months. The mean pain and discomfort score remained stable over the time period: it was 12.6 at baseline, 12.4 at 6 months, and 12.6 at 12 months.⁷⁴

Mental well-being

Psychological well-being

At baseline in the Oregon study, the mean psychological well-being score for assisted living residents was 76.0. This increased to 77.7 at the 6-month follow-up and decreased to 75.7 at the 12-month follow-up. Higher scores on the mental health subscale of the Short Form-36 Health Survey represent higher levels of psychological well-being.⁷⁴

Social well-being

The adjusted mean number of activities at baseline was 3.4 for assisted living residents compared with 3.0 for nursing home residents. At 6 months, the mean activity score was 3.5 for assisted living residents compared with 3.0 for nursing home residents, and at 12 months it was 3.5 for assisted living residents and 3.1 for nursing home residents.⁷⁸

Planned retirement communities' findings by outcomes

Social well-being

Perceived social support

In Waldron *et al.* (2005a), respondents who moved to the retirement community reported experiencing changes in their supportive relationships.⁸⁰ While these included reduced relationships with those outside the community, they also included making new close friends within the retirement community. The average number of friends outside the community was found to be larger before moving (mean: 11.4) than it was 48 months after moving (mean: 9.5). Residents had made an overall average of 8.8 new friends within the community after 48 months.

Differences between long-distance and local movers

People who make a long-distance move to these communities may experience a loss in old friendships as a result of the distance, and as such, a balance must be struck to determine whether a long-distance move to such a community is right for the individual.⁸⁰ That said, the data suggest that those people moving from farther away make more new close friends than those moving locally. While local movers reported making an average of 6.2 new friends after 48 months, long-distance movers reported making a mean of 9.9 new friends in the same time period.⁸⁰

Those moving locally experienced an increase in supportive relationships over the 48-month period studied, while those moving long distance experienced a reduction.⁸⁰ Using statistical tests to examine changes in supportive relationships, the authors determined that long-distance movers reported a significant reduction in supportive relationships over 48 months (mean at baseline: 3.4; mean at 48 months: 2.7), while local movers reported a significantly greater number of supportive relationships at 48 months than at baseline (mean at baseline: 1.7; mean at 48 months: 2.7).⁸⁰

Gender differences in social support

Despite women scoring higher on all domains of social support at baseline, some experienced reductions in social support after 48 months. Men consistently improved their experience of social support over 48 months.⁸¹

Gender differences in email use

At 48 months, women were found to email their friends more regularly than men did. Women had sent an average of 8.3 (standard deviation: ± 7.4) emails to friends in the past 30 days, whereas men had sent an average of 6.2 emails to friends (standard deviation: ± 6.0).⁸¹ This difference was statistically significant.

Women had also emailed their children slightly more often in the past 30 days (mean: 7.5; standard deviation: ± 7.7) compared to men (mean: 5.8; standard deviation: ± 6.5), but this difference was not statistically significant.⁸¹

Extra care housing findings by outcomes

Keele University evaluation

Kingston *et al.* (2001) evaluated self-perceived health status, physical well-being, mental well-being, and social well-being outcomes of residents living in extra care housing at baseline and at 12 months, and compared their outcomes with those of counterparts attending day centres in the same geographical region.⁸³ Objective health outcomes and costs were not measured in this study. The previously validated Short Form-36 was used to measure self-perceived health status, physical well-being, mental well-being, and social well-being outcomes at baseline and 12 months.⁸³ The Short Form-36 assessed eight domains: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. Mental health was also assessed using the validated Life Satisfaction Index and the Semantic Differentials assessment.⁸³

Self-rated health

At baseline, respondents from the extra care community rated their general health higher than the day centre participants.⁸³ When longitudinal analysis was conducted, there were no significant changes in the extra care participants' average ratings for this domain of the Short Form-36 between baseline and 12 months. However, the day centre participants' average general health score increased by 7.6 points.⁸³

Physical well-being

When cross-sectional comparisons between the extra care participants' and day centre participants' Short Form-36 results at baseline were analysed, significant differences were noted in the role-physical and bodily pain domains.⁸³ However, the average ratings for the physical functioning and vitality domains were similar in both groups. When longitudinal analysis was conducted, there were no significant changes in the extra care participants' average ratings for physical domains between baseline and 12 months. Conversely, there were statistically significant declines in the day centre participants' ratings in two physical domains of the Short Form-36: a decrease of almost 21 points in the average role-physical domain score, and a decrease of 10.5 points in the average bodily pain score.⁸³

Mental well-being

At baseline, respondents from the extra care community rated their mental health higher than the day centre participants using the Short Form-36.⁸³ The average rating for the role-emotional dimension was similar in both groups at baseline. When longitudinal analysis was conducted, there were no significant changes in either group's average ratings for the Short Form-36 mental health domain or role-emotional domain between baseline and 12 months.⁸³

Analysis of the Life Satisfaction Index found statistically significant differences in only 2 of the 12 statements at baseline.⁸³ The extra care participants were significantly more likely to agree with the statement "I have made plans for the things I'll be doing in a month or year from now" (28.3%,

compared with 19.4% of day centre participants). Conversely, the day centre participants were significantly more likely to agree with the statement “In spite of what people say, the lot of the average person is getting worse, not better” (55.1% compared with 32.6% of extra care participants).^{83 p231}

At 12 months, analysis of the Life Satisfaction Index found that the proportions agreeing with 4 of the 12 statements were statistically significantly different from baseline.⁸³ The day centre participants were more likely to agree with the statement “I have made plans for the things I’ll be doing in a month or year from now” (25.7% compared with 7.1% of extra care participants). The extra care participants, meanwhile, were significantly more likely to agree with the statement “I’ve had pretty much what I expected out of life” (92.9% compared with 70.3% of day centre participants) and the statement “I have had more of the breaks in life than most people I know” (64.3% compared with 36.5% of day centre participants). And in response to the statement “When I think back over my life, I didn’t get most of the important things I wanted”, only 28.6% of the extra care participants agreed with this statement compared with 71.4% of the day centre participants.^{83 p231}

Kingston *et al.*’s (2001) participants rated 18 semantic differentials to ascertain their attitude towards the named object, event, or concept as applied to their current living situation.⁸³ The rating scale was 1 to 5, with 1 being the most positive semantic and 5 being the most negative semantic; the average score is presented as a mean. At baseline, there was a statistically significant difference between the two groups in only one semantic differential, with the extra care participants being more likely than the day centre participants to respond to the positive semantic of comfortable/uncomfortable (1.4 versus 1.9).⁸³

At 12 months, three semantic differentials were significantly different between the two groups: interesting/disinteresting, organised/disorganised, and successful/unsuccessful.⁸³ In each case, the extra care participants were statistically significantly more likely to relate to the positive semantic differential: for ‘interesting’, extra care participants scored 1.4 versus 1.8 for day centre participants; for ‘organised’, extra care participants scored 1.3 versus 1.8 for day centre participants; and for ‘successful’, extra care participants scored 1.6 versus 2.2 for day centre participants.⁸³

Social well-being

When cross-sectional comparisons between baseline data for the extra care participants and day centre participants were analysed, significant differences were noted in the domain of social functioning.⁸³ At baseline, the day centre participants rated their health as significantly better than the extra care participants in the domain of social functioning.⁸³

When longitudinal analysis was conducted, there were no significant changes in the extra care participants’ average Short Form-36 ratings for the social functioning domain between baseline and 12 months.⁸³ However, there was a statistically significant change in the day centre participants’ average Short Form-36 social functioning domain score, which decreased by 18.2 points.⁸³

Health and social care utilisation

All respondents were asked about contact with a variety of health and social care professionals; it is not clear whether this question was asked at baseline or at 12 months.⁸³ The data suggest that participants living in the extra care community were significantly less likely to see a health visitor or a social worker compared with the participants attending day centres. One person in the extra care community reported regular contact with a health visitor, whereas a significantly higher number (19; 19.4%) of day centre attendees reported regular contact with a health visitor. Four (8.5%) extra care community residents reported regular contact with a social worker compared with 38 (38.7%) people attending day centres. There was no statistically significant difference between the two groups in the proportions attending the GP or being visited by the district nurse, a community psychiatric nurse, or a physiotherapist.⁸³

University of Kent evaluation

Netten *et al.* (2011) reported that there were a number of dimensions in which the outcomes of extra care housing could be defined: people’s quality of life; whether they stay in extra care housing until death or have to move on from the setting to institutional care; the degree to which they are enabled

to live independently; and whether better outcomes in terms of functional ability and quality of life delay death.⁹³ The authors went on to state that outcomes were difficult to measure, as most extra care residents moved into extra care accommodation with, or in anticipation of, deteriorating health. The authors reported that in an ideal situation, a community-based comparator group would be required.⁹³ The longitudinal follow-up of residents was up to 30 months after they had moved in, with other follow-ups at 6, 12 (by Callaghan *et al.*, 2009), and 18 months. Netten *et al.* (2011) stated that the data were particularly complex to analyse because the schemes opened at different times, people moved in and out of the schemes and joined or dropped out of the study, and the follow-ups were not always completed at the intended time points.⁹³ However, both Netten *et al.* (2011)⁹³ and Darton *et al.* (2011c)⁹² acknowledged that it was possible to track whether people stayed or moved on, and how long they survived.^{92 93} It was also possible to examine changes in physical and cognitive functioning over time.

Self-rated health

There was no difference in self-perceived health during the 6-month period, with an average score of 2.9 at both baseline and 6 months.⁸⁹

Objective health outcomes

Morbidity

In terms of residents' medical histories, more than 80% were assessed as having an underlying long-term condition at 6 months.⁸⁴

Institutionalisation and death

Of the 1,182 residents who did the self-completed questionnaire at baseline, by the 30-month follow-up, 739 (63%) were still living in extra care accommodation, 163 (14%) had moved, and 280 (24%) had died (63% in an institution and 37% in their extra care residence).^{90 93} Those who died elsewhere did so in a hospital, hospice, care home, or nursing home.^{90 93}

At least some information was obtained about the destination for 686 (84%) of the 817 residents for whom care assessment information was collected.⁹² Of these, two-thirds (456; 56%) were still living in the scheme at 30 months. Just 9% (64) had moved on to a care or nursing home. Almost one-quarter (166; 24%) had died. Of the 166 who died, 62 (37%) died in their extra care home and 104 (63%) died elsewhere. The vast majority of those who died elsewhere died in a hospital or hospice. For the 166 residents who died, the average time between moving into extra care and death was about 18 months.⁹²

Table O1 Number of cases at each data collection timepoint based on care assessment records in Netten 2011 and Darton 2011c

Group	Number of schemes used in denominator	Baseline	6 months	18 months	30 months	Cumulative
Extra care	19 schemes	817	627	453	241/248 (total/plus 7 new entrants)	817 (total/plus 7 new entrants)
Moved		31	23	8	2	64
Died		81	58	17	10	166
Lost to follow-up		78	38	12	3	131
Refused but had care assessment		0	55	175	103	333
Alive and available to participate		627	453	241	130/123 (total/minus 7 new entrants)	130/ 123 (minus 7 new entrants)
Other refusals		308	235	84	0	
Final participation at this point		319	218	157	123	
Extra care	11 schemes	496	378	243	146	123
Moved (cumulative)		21	18	7	2	48
Died (cumulative)		56	50	16	10	132
Lost to follow-up (cumulative)		41	23	9	3	76
Refused but had care assessment		0	44	65	8	117
Alive, available and participated		378	243	146	123	123
Final participation at this point		163	155	55	123	

Darton *et al.* (2011c) reported that the information collected in the care assessment questionnaire was designed to be compatible with that collected in the previous University of Kent longitudinal survey of care homes, so that the results of an analysis of survival of care home residents in the previous study were comparable to an analysis of survival of extra care residents.⁹² A survival model of the factors associated with death rates was estimated for the care home data based on the following covariates: age, sex, source of admission, health (cardiovascular, respiratory, malignancy), physical frailty (Barthel Index for Activities of Daily Living), cognitive impairment (Minimum Data Set Cognitive Performance Scale), and bed type. Applying the same model to the extra care data resulted in a median estimated life expectancy of 32 months for residents aged 65 years or over. By comparison, application of the same model to data collected in the survey of admissions to care homes in 2005 produced a median estimated life expectancy of 21 months for residents of care homes providing personal care, and 10 months for residents of care homes providing nursing care.⁹² Netten *et al.* (2011) reported that when compared with predictions of survival using a model of the factors associated with death rates of people who moved into care homes, levels of mortality were much lower in extra care housing than those predicted.⁹³ The model predicted that 50% of the residents aged 65 years or over would die within 32 months. Among the residents aged 65 years or

over who were followed up on over the full 30-month period, 34% had died – that is, around 70% of the predicted proportion.⁹³

Physical well-being

Physical functioning was measured using the Barthel Index for Activities of Daily Living, with scores ranging from 0 (maximum disability) to 20 (no disability).⁹² Information collected about residents included the ability to undertake activities of daily living (relating to personal care) and instrumental activities of daily living (relating to domestic tasks). At baseline, 45.6% of residents had very low or no physical dependency levels, scoring 17 or more on the index.⁹² This decreased to 42% at 6 months, and to 40% at both 18 months and 30 months. The proportion of residents whose score indicated total dependence decreased steadily over the time period: it was 3.2% at baseline, 2.7% at 6 months, 2.3% at 18 months, and 1.7% at 30 months. However, it should be noted that a proportion of residents died or moved to institutional care during the study period. The mean Barthel Index for Activities of Daily Living score at baseline was 15.2 for extra care residents who were still in the scheme at 30 months, 13.2 for those who moved out of the scheme during the 30 months, 12.8 for those who died in the extra care scheme, and 14 for those who died in an institution.⁹²

Changes in physical dependency by 4 points or more over time, using the Barthel Index for Activities of Daily Living, were observed in a decreasing number of residents living in 11 schemes and who had regular care assessments.⁹² A small proportion of extra care residents had a 4-point or more improvement in physical dependency scores: 12% at 6 months, 11% at 18 months, and 8% at 30 months. An increasing proportion over time had a 4-point or more reduction in physical dependency scores: 9% at 6 months, 14% at 18 months, and 22% at 30 months. Almost 70% had no major change in their physical dependency score between baseline and the 30-month follow-up.⁹²

Mental well-being

Quality of life

Callaghan *et al.* (2009) measured quality of life in two ways. In the self-completed longitudinal questionnaire, the authors included Bowling's Older People's Quality of Life Questionnaire, while in the 12-month once-off face-to-face interview, the authors used the CASP-19 scale, which is summed to give an overall score from 0 to 57.⁹¹

At 12 months, 69% of the 591 residents in the self-completed questionnaire sample who rated their quality of life (using Bowling's questionnaire) as either 'good' or 'very good', with an average composite score of 5.0 (out of 7).⁹¹ Eight respondents did not answer the quality of life question. A further 25% considered their quality of life to be 'alright', with a minority (6%) responding at the negative end of the scale. On average, village residents rated their quality of life as slightly better (average 5.2) than those living in smaller schemes (average 4.7). The main difference was that more people in the villages than in the smaller schemes rated their quality of life as 'very good', while more people in the smaller schemes than in the villages felt their quality of life to be 'alright'.

The CASP-19 scale was also used to measure quality of life, with the maximum score on the scale (57) indicating the best quality of life. Results using the CASP-19 (only available for the sample of 166 interviewees) followed a similar pattern, with residents in the villages on average having slightly higher levels of quality of life (42.3 out of 57) than people living in the smaller schemes (37.4) at 12 months.⁹¹

Callaghan *et al.* (2009) reported that the frequency with which individuals met up with or heard from relatives was not significantly associated with quality of life. The remaining six social indicators were related to quality of life.⁹¹ More positive social outcomes were related to an increased quality of life. The associations between indicators of social well-being and overall quality of life were found in both the smaller schemes and the villages.

Cognitive impairment

Cognitive impairment was measured using the Minimum Data Set Cognitive Performance Scale, with scores ranging from 0 (intact) to 6 (very severe impairment). An additional question was added concerning the frequency of problem behaviour, such as wandering and physical and/or verbal abuse.

The Minimum Data Set Cognitive Performance Scale scores indicate that 3.5% of those who moved into extra care suffered from moderate to severe cognitive impairment at baseline, and that challenging behaviour was infrequent.⁹²

The proportions of residents whose score indicated intact cognitive abilities increased steadily over the time period: 66% at baseline, 68% at 6 months, 75% at 18 months, and 79% at 30 months.⁹² At baseline, 4% of residents had severe levels of cognitive impairment, scoring 4 or more on the scale. This proportion decreased to 3% at 6 months and to 1% at 18 months, although it increased to just under 2% at 30 months. The average cognitive score at baseline was 0.61 for extra care residents who were still in the scheme at 30 months, 1.23 for those who moved from the scheme during the 30 months, 0.97 for those who died in the extra care scheme, and 0.52 for those who died in an institution.⁹²

Changes in cognitive impairment by 2 points or more over time, using the Minimum Data Set Cognitive Performance Scale, were observed in a decreasing proportion of residents who had regular care assessments and lived in 11 participating schemes.⁹² An increasing proportion of extra care residents had a 2-point or greater improvement in cognitive impairment scores over time: 6% at 6 months, 9% at 18 months, and 14% at 30 months.⁹² However, this result must be interpreted with caution, as those with deteriorating cognitive functioning were more likely to leave extra care during the research period. The proportion of residents who had a 2-point or greater reduction in cognitive impairment scores was 8% at 6 months and decreased to 6% at 18 months and 30 months. Four-fifths (80%) had no major change in their cognitive score between baseline and the 30-month follow-up.⁹²

Social well-being

Index of social well-being

Callaghan *et al.* (2009) used several indicators of social well-being, including social participation; scheme-based friendships; contact with scheme-based friends and other friends or relatives; participation in activities; level of choice of, and fulfilment through, activities; and level of social support.⁹¹ The first six indicators were included in the self-completed questionnaire given to all participating residents at baseline, 6 months, and 12 months, while questions designed to indicate levels of social support were asked in the face-to-face interview at 12 months only.⁹¹

Friends and social life

Callaghan *et al.* (2009) found that, for most residents in their sample, levels of social well-being were high. Around 41% reported that they had a 'good' social life, while a further 42% reported that it was 'as good as it can be'.⁹¹ More than half felt that their social life had changed for the better following their move to extra care housing, and 90% had made new friends at their scheme.⁹¹

Social participation

Residents were asked to describe their current social life. Responses from people living in the villages and those living in the smaller schemes were different.⁹¹ Almost half (48%) of the people living in the villages stated that they had a 'good social life', whereas almost half (48%) of the people in the smaller schemes rated their social life to be 'as good as it can be'. A higher percentage of people (25%) in the smaller schemes than in the villages (13%) said they were 'sometimes lonely' or 'often lonely'.⁹¹

Social activities

Callaghan *et al.* (2009) found that residents' ratings of their social life were related to how often they took part in a social activity or attended a social group; people who felt more positive about their social life took part in an activity or group more frequently. A higher proportion of people living in the villages (37%) than in the smaller schemes (20%) took part in a social activity on most days, although similar proportions took part once or twice a week (44% in the villages compared with 40% in the smaller schemes).⁹¹ Fifteen per cent of people living in the smaller schemes never participated in social activities, compared with 7% in the villages. Most residents in the villages and smaller schemes indicated that their time was fully occupied in 'activities of their choice', including social/leisure activities and formal, voluntary, or unpaid work. Eighty-three per cent of village residents were fully

occupied in activities of their choice, compared with 68% of people living in smaller schemes. Of people living in the smaller schemes, 13% said that they did not have enough to keep them occupied, while 9% said they were often bored. This compares with 6% and 3%, respectively, of village residents.⁹¹

In the smaller schemes, the most popular social activities were social gatherings (38%), games (34%), attending entertainment and events (22%), informal socialising with friends (18%), and exercise (16%).⁹¹ In the villages, exercise was the most popular social activity (38%), followed by games (23%), arts and crafts (21%), sports (20%), and voluntary work within the village (17%).⁹¹

Social climate

Callaghan *et al.* (2009) assessed the social climate using measures of cohesion, conflict, and independence.⁹¹ As part of the follow-up interview at 12 months, the authors asked residents questions from the three relevant subscales of the Social Care Environment Scale (these questions were not asked at baseline):⁹¹

1. Cohesion: How helpful and supportive staff members are towards residents? How involved and supportive residents are with each other? Cohesion scores ranged from 37 to 91 (out of 100), with an average score of 60.
2. Conflict: The extent to which residents express anger and are critical of each other and of the facility. Conflict scores ranged from seven to 57 (out of 100), with an average score of 37.
3. Independence: How self-sufficient residents are encouraged to be in their personal affairs? How much responsibility and self-direction did they exercise? Independence scores ranged from 30 to 80 (out of 100), with an average score of 59.

The results varied across the schemes.⁹¹ Only 3 of the 13 schemes (11 of which were smaller schemes and 2 of which were villages) included in the study had the 'ideal' pattern of social climate scores, with high levels of cohesion and independence alongside low levels of conflict; all of these were smaller schemes. Social climate in the villages was different from that in the smaller schemes. The two villages had slightly lower cohesion scores on average (52 versus 62), and higher conflict (48 versus 31) and independence (72 versus 50) scores, than smaller schemes. More than half of the people in 7 of the 11 smaller schemes felt that their scheme was a part of the local community. There was no consensus in the two villages as to whether residents felt that their village was part of the local community. Residents were also asked how they felt about people from the local community coming into the scheme to use the facilities or take part in social activities. A small minority (between 0% and 18%) of the residents disliked people from the local community using their facilities or taking part in social activities; between 12% and 55% neither liked nor disliked people from the local community using their facilities; and between 12% and 88% liked people from the local community using their facilities.⁹¹

Costs

Costs in Bradford

Bäumker *et al.* (2010) investigated the cost and outcome consequences for a sample of people who moved into an extra care housing scheme in Bradford, England.⁸⁹ As part of this costs evaluation, the authors collected information from residents after they had moved into the scheme. Information collected about residents included the ability to undertake activities of daily living and instrumental activities of daily living. Two summary measures of physical and cognitive function, the Barthel Index for Activities of Daily Living and the Minimum Data Set Cognitive Performance Scale, were estimated from the information. Other outcome measures used in the study included Bowling's Older People's Quality of Life Questionnaire using a 7-point scale, the Adult Social Care Outcomes Toolkit, the CASP-19 scale, and an indicator of self-perceived health. For the CASP-19 and the indicator of self-perceived health, the authors asked people how they felt at the time of the interview, because recall was likely to be unreliable. In the follow-up interviews at 6 months, all the questions reflected residents' current perceptions of their life at the scheme.⁸⁹

The methodology for costing informal care calculated the cost of opportunities foregone as a result of caring using direct financial expenditure on goods and services, as well as waged and non-waged time

spent caring.⁸⁹ Data were also collected from care staff and from relatives when they were identified as providing informal care, and by drawing on assessment records.

At the scheme level, information on local costs and funding contracts in place was obtained from social services, and capital cost and operating cost data were supplied by the housing and care provider.⁸⁹ Charges to residents that are directly payable to the housing and care provider include the rent; the service charge; and a flat-rate well-being charge that pays for the presence of staff 24 hours per day, provision of social activities, and support in administrative tasks.

The main finding of this case study was that the overall cost per person increased after a move to extra care housing, but that this increase was associated with improved social care outcomes and improvements in quality of life.⁸⁹

The average cost per resident was GB£380 per week (median: GB£320; range: GB£200–GB£850) before moving in, compared with an average of GB£470 per week (median: GB£466; range: GB£300–GB£870) 6 months after moving into the extra care scheme. This translated to an average difference of GB£90 per person per week.⁸⁹ The cost calculations comprised healthcare (which decreased after the move), social care (home and personal care), social and well-being amenities (which increased after the move), accommodation, living expenses, and personal expenses.⁸⁹

It was estimated that approximately GB£385 (81.9%) of the GB£470 per week per extra care resident was the average cost of extra care housing funded by the public sector (median: GB£375; range: GB£233–GB£585).⁸⁹ This figure includes the estimates of subsidised costs including capital, rent, service charge, social care package, health services costs, and the average amount of benefits/allowances received.⁸⁹

Costs and cost-effectiveness

Bäumker *et al.* (2011) completed a cost-effectiveness evaluation of extra care compared with care homes.⁸⁴ The extra care evaluation was purposefully designed to record costs and outcomes information in a way that was equivalent to the information collected in the 1995–1999 and 2005 University of Kent studies of publicly funded admissions to care homes. Both settings (extra care and care homes) support a broad range of care needs, and thus it was thought that care needs would overlap between settings. The statistical propensity score matching methodology aimed to identify a group of individuals who could be equally well served in either setting.⁸⁴ The authors tested different models to determine the most appropriate variables for predicting the probability of being allocated to residential care. The matching variables used included demographic characteristics, physical functioning, cognitive function, and previous living arrangements (living alone). The final sample included 240 matched pairs between extra care (2006) and residential care (1995–1999). Individuals admitted to care homes in 2005 were more dependent than they were in the 1990s, and so the size of the ‘overlap’ group between extra care and care home residents was smaller. The authors noted that their matched sample of 1995 care home residents could all be living in private households in 2005. Therefore, in a second exercise, they applied the same propensity score approach to a 2005 University of Kent survey of admissions to care homes in 16 local authorities in England in order to explore the proportion of the 2005 sample that could be matched to their extra care evaluation dataset. This 2005 study was conducted just one year before the first extra care scheme opened. The 2005 dataset consisted of 469 comparable admissions; 136 (29%) were matched to the 240 matched extra care residents (2006) cum care home admissions (1995). There were no statistically significant differences between the 240 extra care and 1995 care homes matched pairs and the 136 care home admissions (2005) group.⁸⁴

The mean score on the Barthel Index for Activities of Daily Living was practically the same for the 240 matched extra care residents (13.94) and the care home residents (13.89) at baseline.⁸⁴ At the 6-month follow-up interview, the scores for the extra care residents were significantly higher (14.22) than for the care home residents (13.51). There had been a marginal improvement in extra care residents’ abilities and a decline among those in care homes, which resulted in a statistically significant difference. A ratio of cost difference to outcome difference – the incremental cost-effectiveness ratio – was computed on an outcome measure of physical functioning, as measured by the Barthel Index for Activities of Daily Living.⁸⁴

The best proxy for cost for the 1995–1999 National Longitudinal Survey of Publicly-Funded Admissions to care homes was the gross weekly placement fee. The weekly placement fee was the contracted price and represented the total cost to social services for the care provided.⁸⁴ The cost of care in a care home is packaged with the accommodation. This proxy for costs excludes primary healthcare, hospital, and social security costs.⁸⁴ The costs obtained from the 1995–1999 study were converted to 2008 prices using the relevant inflation calculators specifically pay and prices. The 2008 adjusted average weekly cost per care home resident was GB£409 (standard deviation: \pm GB£65; 95% confidence interval (CI): GB£400–GB£417). The minimum 2008 adjusted cost per care home resident was GB£310, while the maximum adjusted cost was GB£610.⁸⁴

The final extra care costs include capital (building and land), household management, supports, activities, social care, and living expenses.⁸⁴ In order to ensure a valid comparison, it was necessary to exclude primary healthcare and hospital costs from the extra care cost estimations. The average weekly extra care costs (excluding healthcare) were GB£374 (standard deviation: \pm GB£131; 95% CI: GB£357–GB£391). The minimum cost per extra care resident was GB£172, while the maximum cost was GB£892. Over the 6-month follow-up period, extra care housing on average saved more money (GB£902; 95% CI: GB£421–GB£1,383) than a placement in a care home in 1995. The 240 matched cases distribution was simulated using a bootstrapping exercise and estimated that incremental cost-effectiveness ratios for extra care housing compared to care homes was that extra care was “less costly and more effective”.^{84 p533}

For the 136 matched pairs, the cost of extra care per person per week increased from GB£374 to GB£403 (standard deviation: \pm GB£138) and the cost for the care homes group increased from GB£409 to GB£413 (standard deviation: \pm GB£66.64).⁸⁴ The minimum 2008 adjusted cost per care home resident was GB£310, while the maximum adjusted cost was GB£663. The 136 matched cases distribution was simulated using a bootstrapping exercise and estimated that incremental cost-effectiveness ratios for extra care housing compared to care homes was that extra care was equal cost but more effective.⁸⁴

International Longevity Centre evaluation

In this section, we present findings for objective health outcomes, physical well-being, and health and social care utilisation. Self-perceived health status, mental well-being, social well-being, and costs were not measured in this study.

Objective health outcomes

Using Kaplan-Meier survival curves to examine exits from extra care housing for any reason (such as death, transfer to a nursing or care home, transfer to hospice, or move to a family member’s home), the median length of stay for those in extra care housing based on their pooled histories was 6.5 years.⁹⁴ The reason for exit varies by resident characteristics. Extra care residents who were older or who had higher care needs had shorter median lengths of stay in extra care housing. For example, residents who required no support package on entry to extra care housing had a longer median length of stay (8.9 years) than residents who required a level 4 or 5 package of care (3 years). There are 5 levels of home care employed by extra care housing schemes in the UK, and these comprise level 1 supports people with very low care needs, level 2 supports people with low level care needs, level 3 supports people with intermediate care needs, level 4 supports people with high level care needs and level 5 supports people with very high level care needs. Residents who moved into extra care initially as a couple had longer median lengths of stay (9.3 years) than those who moved as a single person (5.7 years). Residents in village-style developments had longer median lengths of stay in extra care housing (6.8 years) than those in courtyard-style developments (5.7 years). Courtyard-style developments are sometimes reserved for people with higher levels of care needs. There were no significant differences when examining the median length of stay by the year in which the resident moved in, providing justification for pooling the data.⁹⁴ The authors examined the effect of the year in which a person moved to extra care, age, gender, living as a couple or a singleton, level of care needs, and scheme type simultaneously in two competing risks regression models: one to predict who was more likely to move to institutional accommodation at 5 years (proxy for failure of ageing in place) and the other to predict who was more likely to die in their extra care home at 5 years (proxy for success of ageing in place).⁹⁴

Incidence of institutionalisation

At 5 years, the cumulative incidence of extra care housing residents who moved into institutional accommodation was 8.2% (95% CI: 6.7–9.9%).⁹⁴

Those in receipt of a level 1 or 2 (very low or low support) care package on entry to extra care were two or three times (level 1: 2.5; standard error: ± 0.85 ; and level 2: 3.2; standard error: ± 0.88) more likely to have moved to institutional accommodation in the first 5 years of residence than those who were not in receipt of a care package.⁹⁴ After accounting for other factors, those in village-type schemes were also twice as likely (2.0; standard error: ± 0.54) to move into institutional accommodation compared with those in courtyard-style developments. Residents who moved into extra care housing between 1999 and 2002 were almost twice as likely (1.9; standard error: ± 0.55) to move to institutional accommodation than those who moved into extra care between 1995 and 1998. Age and gender were not significant predictors of having moved into institutional accommodation once other factors had been included in the model. Overall, the results suggest that the care package, the year a person entered extra care, and the type of development were the most influential factors in predicting movement from extra care to institutional accommodation.⁹⁴

When using the full matched British Household Panel Survey sample of all individuals living in the community aged 65 years and over as a comparison group, those aged 65 years and over in extra care housing were twice as likely (2.1; standard error: ± 0.46) to move into institutional accommodation over the first 5 years in extra care than those in the community survey.⁹⁴ Those aged 75 years or over were equally likely to move into institutional accommodation as their community survey counterparts. When the authors restricted the comparison sample to those in receipt of domiciliary care in the community, they found no statistically significant difference in transition rates to institutional accommodation in those aged 65 years and over during the first 5 years compared with their counterparts in extra care housing. However, when the authors restricted the domiciliary matched sample to those aged 75 years and over, the likelihood of experiencing a move to institutional care was more than 35% lower among the extra care housing group (0.64; standard error: ± 0.12) than among the matched community setting sample in receipt of domiciliary care. Among the population aged 80 years and over, those in extra care housing were 44% less likely to move into institutional accommodation (0.56; standard error: ± 0.13) compared with those in the community in receipt of domiciliary care after 5 years of observation.⁹⁴

Incidence of death

The proportion of individuals who died while in extra care housing (25.0%; 95% CI: 22.5–27.5%) was approximately three times higher than the proportion who moved to institutional accommodation.⁹⁴

The care package received on entry to extra care housing was a significant predictor of the risk of death, with those receiving the most substantial care packages approximately four times more likely (4.0; standard error: ± 0.74) to die in their extra care accommodation within 5 years of their move compared with those receiving no additional care package.⁹⁴ Women were half as likely (0.5; standard error: ± 0.07) to die in their extra care home than men. Every year of additional age was associated with a 6% (standard error: ± 0.01) greater risk of dying in extra care. The type of extra care scheme was also a predictor of dying in an extra care home, with those living in courtyard schemes more likely to achieve ageing in place.⁹⁴

The authors compared the experience of dying in the extra care group and the matched community survey population receiving domiciliary care.⁹⁴ They found that the risk of dying was equal in the extra care group and in the community group for those aged 65 years and over and for those aged 75 years and over.⁹⁴

Physical functioning

Kneale (2011) estimated falls among 63 residents in one extra care housing scheme compared with matched controls living in the community, and reported that extra care residents were significantly less likely to experience a fall in 2008 than those in receipt of care at home (31% and 44%, respectively).⁹⁵ Of extra care residents who experienced a fall in 2008, more than half fell once, with the remainder falling between two and nine times. Those who fell were more likely to be older and male. Concentration, dizziness, and alcohol were triggers for falls.⁹⁵

Health and social care utilisation

Kneale (2011) reported that 15% (95% CI: 11.7–19.0) of all extra care participants living in ExtraCare Charitable Trust housing reported a decrease in care needs (proxy for an improvement in health status) in their first 5 years in extra care housing, and that 33% (95% CI: 28.1–37.9) experienced an increase in care needs (proxy for a change in health status).⁹⁵ Kneale (2011) reported that among those who enter extra care housing with additional care needs and those who later develop additional care needs, 24% experience a decrease in care requirements over the first 5 years.⁹⁵

Kneale (2011) found that extra care residents were in hospital for an average of 5.4 nights per year per resident. In a typical year, 20% of residents spent at least 1 night in hospital. For those aged 80 years or over, the estimated annual hospital bed occupancy was 4.8 nights per year per person, compared with 5.8 nights for matched controls living in the community.⁹⁵

Aston University evaluation

In this section, we present findings for self-perceived health status, objective health outcomes, physical well-being, mental well-being, social well-being, health and social care utilisation, and costs.^{88 96-98} We concentrate on reporting the results presented in the 36- and 60-month report⁹⁸ and those results included the 3-, 12-, and 18-month reports, where necessary.^{88 96 97} In some instances, the results presented in the 12- and 18-month evaluations are revised because of additional data or the effect of new questions included at 24 months, which are detailed in Table 14.⁹⁸ The 3-month peer-reviewed paper and 12-month report provided numbers, proportions, means, and standard deviations for the main outcomes.^{88 96} The peer-reviewed paper demonstrates that people settle into extra care housing in a short time period, with an initial increase in physical, intellectual, and social activity scores, but the findings of the 18-month report show that although the initial increases level off by 18 months, the levels continue to be higher than at baseline.⁹⁷ There are no numerical data on outcomes presented in two of the published reports.^{97 98} Some of the main results are presented in bar or trend line graphs, so the proportions presented in this text are as exact as possible.^{97 98} Although the authors mention that some measures have wide variance at follow-up,^{97 98} there are no measures of variance provided in the published reports after the 3-month time period. Some of the main results are presented in text only, without supporting proportional data. When presenting the results, we have provided actual or approximate proportions where they were available. The descriptive results for quality of life or age friendliness of the environment were not presented in the 2019 report; however, quality of life is a variable in the frailty index.⁹⁸

In order to determine if the differences in key well-being variables at baseline persisted at 36 months, the Aston University team compared the baseline and 36-month data for extra care participants with community-based control participants.⁹⁸ The data controlled for age differences, effects of attrition, and ceiling effects related to some measures (such as a high proportion of healthy people reporting no problems on some measures).^{88 96-98} Holland *et al.* (2014; 2015; 2016; 2019) used growth curve modelling to examine effects over time.^{88 96-98} Of note, some extra care participants and community-based control participants joined the study at each of the time points up to 36 months. The 36-month time point was chosen for final comparison time between cases and controls, because, after this point, there was a high attrition rate among the community-based control participants.^{88 96-98}

Self-rated health

Holland *et al.* (2015; 2019) reported that individuals' perception of their own health status is a very good indicator of their actual physical and psychological well-being, and that this perceptiveness occurs even in the absence of a clear diagnosis.^{97 98} Perceived health is measured using a single question: 'How would you rate your health at the present?' The rating is selected from a five-point Likert scale, where 5 is excellent, 4 is very good, 3 is good, 2 is fair, and 1 is poor.^{97 98} For the 36-month analysis, average perceived health ratings improved significantly over time for extra care participants, from 2.7 out of 5 (standard deviation: ± 1.02) at baseline to 3.1 at 12 months, 3.2 at 24 months, and 3.1 at 36 months.^{96 98} Perceived health ratings fluctuated over time for community-based control participants, from an average rating of 4.2 (standard deviation: ± 0.8) at baseline to 3.7 at 12 months, 3.6 at 18 months, and 3.8 at 36 months.⁹⁸ Average perceived health ratings remained lower at each time point in the extra care participants compared with average ratings for the control participants.⁹⁸

Objective health outcomes

Comorbidity

Kingston *et al.* (2018), cited by Holland *et al.* (2019), reported that in the general English population, 54% of people aged over 65 years have two or more chronic diseases, and this figure increases to 69% of people aged over 85 years.⁹⁸ Just under 45% of extra care participants aged over 65 years, and 50% of the 18 participants aged over 85 years, had two or more chronic diseases at baseline; both measures are below the national average.⁹⁸ At 36 months, just under 55% of the 11 extra care participants aged over 85 years (which was below the national average), and 61% of those aged over 65 years (which was above the national average), had two or more chronic diseases. When comparing the extra care participants with the community-based control participants and controlling for age, there is no difference in the average number of chronic diseases experienced at each of the measurement time points between baseline and 36 months. The average number of comorbidities increased between baseline and 36 months for both groups, but only the increase for the control group was significant.⁹⁸

Prescribed medication

Controlling for age, extra care participants took more prescribed medications on average than control participants, but the differences were not statistically significant.⁹⁸

Physical well-being

Indices of independence

The Lawton Instrumental Activities of Daily Living Scale comprises household management measures and assesses a person's ability to live independently. At baseline, the average basic instrumental activities of daily living (household management measures) scores were 6.4 (standard deviation: ± 2.3) for extra care participants and 8 (standard deviation: ± 0.2) for controls.^{96 98} At 18 months, there were significant decreases in instrumental activities of daily living scores in the community-based control sample but not in the extra care sample.^{97 98} At 36 months, no further significant change was observed for household management measures in either the extra care or control participants.⁹⁸ At baseline, the average basic activities of daily living (personal care measures) scores were 5.2 (standard deviation: ± 1.6) for extra care participants and 6 (standard deviation: ± 0) for controls.^{96 98} At 18 and 36 months, few extra care or control participants had issues with basic activities of daily living.^{97 98}

Another measure used in assessment of independence is that of the Functional Limitations Profile, which is a measure that assesses the impact of any health issues on everyday functions. It consists of 97 items designed to measure functional limitations under eight subcategories: ambulation, mobility, household management, recreation, social, alertness, sleep, and communication. People are asked to agree or disagree with a list of 97 statements and to confirm that their comment is due to the state of their health rather than another issue. The authors assessed the total limitations, which consists of the summed limitations in each of the eight subcategories. At baseline, the extra care participants had higher average functional limitations scores (299.4; standard deviation: ± 231.9) than the community-based control participants (59.2; standard deviation: ± 120.8), and this difference between extra care and control participants' scores was maintained throughout the study period.^{96 98} The general trend in scores was very slightly downwards for all participants, indicating that functional limitations were decreasing over time, but this trend was not statistically significant.⁹⁸

Average walking speed in metres per second was higher for community-based control participants than for extra care participants at each measurement time point between baseline (0.7 metres per second for extra care participants compared with 1.13 for controls) and 36 months (1.1 metres per second for extra care participants compared with 1.3 for controls).⁹⁸ Walking speed increased in both groups up to the 36-month time point.⁹⁸

Falls

In spite of their higher levels of frailty and older age, extra care participants did not experience a statistically significantly higher rate of falls.⁹⁸ There was a significant reduction in the average number

of falls per year for extra care participants from baseline (0.65) to 3 months (0.4).⁹⁸ This reduction was not sustained at 18 (0.8), 24 (0.8), or 36 months (1.1). The annual average fall rate for control participants was generally lower (between 0.1 and 0.2), except for the 12-month time point, when the rate rose to 0.58.⁹⁸

Weekly exercise

Holland *et al.* (2019) stated that one of the main lifestyle changes recommended to prevent or reduce frailty is physical activity through exercise and an active lifestyle.⁹⁸ Over the 36-month period, both the extra care and control participants significantly increased the weekly number of times they exercised for 30 minutes. Extra care participants increased weekly exercise from an average of 2 times per week at baseline to an average of 3.9 times per week at 36 months, while control participants increased weekly exercise from an average of 3 times per week at baseline to an average of 5 times per week at 36 months.⁹⁸ Overall, control participants exercised more frequently than extra care participants.⁹⁸

Mental well-being

Quality of life

Quality of life was measured using the CASP-12 measure at 24 and 36 months; however, the descriptive results are not reported in Holland *et al.* (2019).⁹⁸

Cognitive functioning

In the well-being assessment, Holland *et al.*'s reports took two general measures of general cognition: the Mini-Mental State Examination and the Addenbrooke's Cognitive Examination III measure. The Mini-Mental State Examination is a well-known cognitive screening tool and is used to determine if further investigation is warranted. The Addenbrooke's Cognitive Examination III provides a more comprehensive assessment examining five areas: memory, attention, fluency, language, and visuospatial processing.^{88 96-98} The researchers controlled for age in these analyses.

Holland *et al.*'s reports found that the overall average Mini-Mental State Examination scores for the extra care participants was stable over time.^{88 96-98} However, the authors reported that there was a significant decline in average Mini-Mental State Examination scores in the community-based control group. Exact scores were not provided for the 36- or 60-month periods.

There was a steady but non-significant increase over time in the average overall Addenbrooke's Cognitive Examination III scores for extra care participants, from 84 (standard deviation: ± 13.6) at baseline to 89 at 36 months, and the initial difference between extra care participants (84) and community-based control participants (93; standard deviation: ± 5.1) was no longer significant at the 36-month time point, when average scores were 89 and 92, respectively.^{88 96 98} At 12 months, the average Addenbrooke's Cognitive Examination III scores were 86 for extra care participants and 95 for controls.⁹⁸ The authors reported that the lack of statistical significance may be related to the large variance in the extra care group, where many people who were not showing a decline were mixed with some people with significant impairment, up to and including dementia.⁹⁸

Memory is measured as one part of the Addenbrooke's Cognitive Examination III. People are asked to recall three words that they have previously heard; a name and address with multiple components, both immediately and at a delayed point; and four facts about world leaders.^{88 97} A significant increase in extra care participants' average memory scores was observed between baseline (average: 20 out of 26; standard deviation: ± 5.1), 12 months (22), 18 months (22), and 60 months (23.5).^{96 98} The authors reported that the average score from baseline to 60 months increased by almost 17%.⁹⁸ The control participants had an average memory score of 24 (standard deviation: ± 1.9) at baseline and sustained this average score throughout the study period.^{96 98}

Holland *et al.*'s reports stated that 'autobiographical memory' refers to a person's recall of details relating to events from across their lifespan and is an indicator of effective functioning in social relationships.^{97 98} In the memory test, respondents recalled memories in response to 10 positive or negative emotional cue words. Positive and negative words were presented in turn.⁹⁸ Over the first 36 months, community-based control participants possessed higher levels of autobiographical memory

specificity on average compared with extra care participants at each measurement time point.⁹⁸ The average autobiographical memory specificity score was significantly higher for control participants at baseline (7.5; standard deviation: ± 1.7) compared with extra care participants (5.3; standard deviation: ± 2.7), at 3 months (7.0 compared with 5.5), at 12 months (6.4 compared with 6.2), and at 18 months (7.1 compared with 6.0).^{96 98} A 24% increase in average autobiographical memory specificity scores was observed for extra care participants over the 36-month period, from 5.3 at baseline to 6.7 at 36 months, while a decrease was observed for control participants, from 7.5 at baseline to 6.8 at 36 months.⁹⁸

Verbal fluency is a useful measure of executive functioning. It is measured within the Addenbrooke's Cognitive Examination III overall assessment, and consists of two tasks: category fluency and letter fluency.^{88 97} In the category fluency task, respondents are given 60 seconds to recall as many words as possible within a given category; in the letter fluency task, they have 60 seconds to recall as many words beginning with a certain letter as they can.

Executive functioning, the final measure in the Addenbrooke's Cognitive Examination III, did not show any significant improvements in extra care participants when compared with community-based control participants over the 36-month period.⁹⁸ The difference at baseline between extra care participants and control participants had reduced to no difference by the 36-month time point.⁹⁸ This means that there was a continued non-significant improvement in extra care participants' executive functioning over the period, whereas the control group's executive functioning decreased or remained the same.⁹⁸

Psychological well-being

Psychological well-being was measured through the presence of depression and anxiety. Depression and anxiety in this study were assessed using the Hospital Anxiety and Depression Scale, which scores anxiety and depression separately on a scale from 0 to 21. For both scales, scores between 0 and 7 suggest no clinical depression or anxiety; scores between 8 and 10 suggest a mild clinical issue; scores between 11 and 14 suggest a moderate clinical issue; and scores between 15 and 21 suggest a severe clinical issue.⁹⁸

At baseline, the average anxiety score was significantly higher in extra care participants (5.8) compared with control participants (3.8).^{96 98} There was a reduced difference between the two groups' average anxiety scores at 12 months, with extra care participants scoring an average of 4.7 and control participants scoring an average of 3.5, and again at 18 months, when the scores were 4.4 for extra care participants and 3.7 for control participants.^{96 98} By 36 months, extra care participants had lower average anxiety scores (3.4) than control participants (3.8), but this difference was not statistically significant.⁹⁸ By 60 months after moving into extra care housing, the average anxiety score for these participants had reduced by 23% when compared with their baseline scores.⁹⁸

At baseline, 9.2% of the extra care population had a depression score above 7, which may indicate a clinical issue; this proportion was 10.7% at 12 months, 9.0% at 18 months, 5.9% at 36 months, and 9.1% at 60 months. These data are not reported for control participants.⁹⁸ The trends were examined over a 36-month period in order to assess any change between participant groups.⁹⁸ The average depression score at baseline was 3.6 for extra care participants compared with 1.6 for controls; 3.0 for extra care participants (compared with 1.5 for controls) at 12 months; 2.8 for extra care participants (compared with 1.7 for controls) at 18 months; 2.7 for extra care participants (compared with 1.7 for controls) at 36 months; and 3.7 for extra care participants at 60 months (no scores reported for the control group at 60 months).^{96 98} Holland *et al.* (2019) reported that average depression scores for extra care participants were 24% lower at 36 months than at baseline, and said that the wide variance means that this effect is not statistically reliable.⁹⁸ Regression analyses were conducted to examine some potential predictors of depression. The effects of frailty, mobility, and walking speed on depression were significant; however, the effect of mobility was more significant for the community-based controls.

Social well-being

Holland *et al.* (2019) defined social isolation as⁹⁸ "the number of friends and family one feels close to combined with how often one sees or communicates with them".^{98 p23}

The authors defined loneliness as the difference between “perceived and desired companionship”.^{98 p23} Loneliness is known to be a significant risk factor for older adults, as it is associated with depression, poorer quality of life, dementia, frailty, and comorbidity.⁹⁸

Holland *et al.* (2019) introduced new variables at 24 months and continued to measure these variables at 36, 48, and 60 months.⁹⁸ Two of these variables measured loneliness and the impact of social interaction (numbers of close family and friends, and connectedness to family and friends). The authors constructed a total social connectedness/isolation score from these measures. Holland *et al.* (2019) assessed social frailty in extra care participants between 24 and 60 months, but not in control participants, due to high attrition among community-based control participants after 36 months.⁹⁸

The average score for loneliness among extra care participants varied between 10 and 11 out of a maximum of 12 between 24 and 60 months, indicating that they were not lonely and showing little variation in perceived loneliness scores over time.⁹⁸ The majority of participants (87%) rated themselves as ‘hardly ever or never’ lonely (scores higher than 9), only 13% rated themselves as lonely ‘some of the time’, and less than 1% reported that they were ‘often’ lonely (scores lower than 4).⁹⁸

The average score for social interaction decreased steadily over the study period, from 42 at 24 months to 35 at 60 months, indicating reduced social interaction with family and/or friends. However, according to the authors, the averages remained high, indicating that the extra care participants were not classified as socially isolated at 60 months.⁹⁸

Frailty measured combining physical, mental and social well-being outcomes

Holland *et al.* (2015; 2019) stated that when older people are exposed to a stressor and have little resilience, they are vulnerable to adverse health outcomes that lead to frailty.^{97 98} Frailty is related to disease and risk of death, and to increased and unplanned use of healthcare services. Holland *et al.* was the only longitudinal study that measured frailty and presented five important facts about measuring frailty:^{97 98}

1. People can be frail without having any diagnosed diseases.
2. Once frailty level is considered, chronological age has little influence on negative outcomes.
3. On average, deficits accrue, and so frailty increases at a stable rate in the population.
4. Women accumulate more deficits over time than men but live longer with frailty, and men have a higher mortality rate.
5. Frailty is highly related to age in community samples, but less so in institutional or clinical cohorts, which have some degree of selection.

Holland *et al.* (2019) report that frailty, especially pre-frail states, can be reversed.⁹⁸ Holland *et al.* measured frailty using a combination of the physical, mental and social well-being outcomes available to them. The authors developed two iterations of a frailty index: the first was a 49-item measure used in the 18-month report, and the second was a 34-item measure used to reanalyse the annual data from baseline to 36 months.⁹⁸ When age was controlled for, there was significantly higher frailty in extra care participants compared with community-based control participants at each annual time point between baseline and 36 months. However, there was an overall reduction in frailty over time in both extra care participants and community-based control participants. When extra care participants were examined separately, there was a significant reduction in frailty over the first 36 months, but frailty increased again between 36 and 60 months.⁹⁸

Frailty and falls

The relationship between age, gender, frailty, and time living in extra care as predictors of falls was assessed in a multiple regression model.⁹⁸ Age, gender, frailty, and time living in extra care were entered in a stepwise sequence, enabling control for variance predicted by age before the variable ‘time living in extra care’ was entered in the model. The final model results indicated that after controlling for age and gender, the independent predictors of falls were increasing frailty and time living in extra care.⁹⁸

Frailty and weekly exercise

Holland *et al.* (2019) examined the relationship between frailty and number of times an extra care participant said they did at least 30 minutes of exercise per week.⁹⁸ They found that increased frailty predicted lower exercise frequency.

Social frailty

Frailty is not just related to people's physical and psychological health, but also to their connections with their social environment.⁹⁸ For the period between the 24- and 60-month time points, the authors examined what autobiographical memory specificity scores, depression, functional limitations, and social networking measures added to the model predicting loneliness (feelings of connectedness).⁹⁸ When combined together, social networking measures accounted for a statistically significant 13.2% of the variance in the model on loneliness, confirming that relationships with family and friends are vital. Autobiographical memory specificity added a further 6.5%. Functional limitations and depression did not add anything to the variance predicted, once the model on loneliness had accounted for social networking and autobiographical memory specificity. Mediation analysis showed that once variance due to autobiographical memory specificity was controlled for, there was a stronger relationship between social networking measures and loneliness.⁹⁸

Health and social care utilisation

GP and practice nurse visits

Unplanned visits by extra care participants to practice nurses were rare, with the average number of visits per extra care participant being 0.04 at baseline, 0.2 at 36 months, and 0.1 at 60 months.⁹⁸ There were no significant changes in unplanned GP visits by extra care over time, with the average number of visits being 0.6 at baseline, 1.3 at 36 months, and 0.2 at 60 months. There was a significant increase in the average number of planned visits to practice nurses, from 0.9 at baseline to 1.6 at 36 months, and 1.3 at 60 months. There was a marginally significant reduction in planned GP visits, from 3.1 at baseline to 2.3 at 36 months and 2.3 at 60 months. Planned nurse visits increased by approximately 1 visit per year, whereas planned GP visits decreased by almost 1 visit per year. When frailty was controlled for, there was no significant change over the 36-month period in planned and unplanned GP or practice nurse visits in either the extra care or the control participants.⁹⁸

Outpatient appointments or hospital visits

After controlling for age, there was no significant difference between extra care and control participants in relation to the number of outpatient appointments or hospital visits over the 36-month assessment period.⁹⁸ There was also no change in the number of outpatient appointments for the extra care participants over the 60-month period.

Hospital admissions

After controlling for age, there was no significant difference between extra care and control participants in the number of planned or unplanned admissions to hospital over the 36-month assessment period.⁹⁸ Older age was a highly significant predictor of unplanned admissions for both groups. There was no significant change in the number of planned or unplanned admissions for the extra care participants over the 60-month period.⁹⁸

Length of stay in hospital

In order to examine length of stay in hospital, Holland *et al.* (2019) added length of stay in hospital (in days) for planned and unplanned hospital admissions, with people getting a score of 0 if they had no hospital admissions.⁹⁸ There was no significant difference in total length of stay between extra care and control participants during the 36-month period. Older age was a significant predictor of longer length of stay for both groups. There was a significant (31%) reduction in length of stay for extra care participants during the 60-month period. Summing the mean lengths of stay after baseline, the authors reported that extra care participants spent an average of 1.4 days per year in hospital between 12 and 60 months after moving compared with 4.4 days in the 12 months prior to moving, suggesting an average of 3 fewer days spent in hospital per year per participating resident over 5

years.⁹⁸ Frailty among participants increased length of stay in hospital.⁹⁸ however, the increase in length of stay was reduced for extra care participants by 60 months.

Costs

Healthcare costs

In the 2019 report by Holland *et al.*, healthcare costs were assessed for change over a 36-month period, with costs determined by the National Health Service (NHS) in the United Kingdom's National Tariff for 2017/18 and Unit Costs of Health and Social Care 2016 report.⁹⁸ The total costs were added together for GP visits (GB£36 per visit), practice nurse visits (GB£7 per visit), number of prescribed medications (GB£28 per medication), hospital admissions (GB£163 on admission), hospital overnight stays (GB£222 per day), and average outpatient visit cost (GB£166 per visit). Over the first 36 months, there was no overall reduction in healthcare costs for extra care participants.⁹⁸ For extra care participants over the full 60-month study period, there was a reduction in costs over time, but this was not a significant linear effect. Using average costs per person at baseline, the expected annual cost (GB£1,626.90), accumulated over 5 years living in extra care, was saving the NHS an average of GB£1,991.94 per person over the 60-month period. The difference between the expected 5-year cost and the actual cost was statistically significant, despite annual fluctuations.⁹⁸

Frailty and costs

At baseline, there was an association between level of frailty and NHS costs, indicating that the frailer a person is, the higher their NHS costs.⁹⁸ This association was no longer significant for extra care participants at the 12-month or 60-month time points. In order to identify the factors that predict costs at 36 months, a multiple regression analysis was conducted using the covariates of age, frailty, time living in extra care, and perceived health as potential predictors. Both age and frailty, but not time living in extra care, were predictors of total annual NHS cost.⁹⁸ A 0.1-point increase/decrease in score on the frailty index was related to a GB£550 (95% CI: GB£397–GB£703) increase/decrease in annual NHS costs, indicating the potential average impact on costs of interventions that reduce frailty up to 36 months.

Social care costs

Social care costs were reported up until the 18-month time point by Holland *et al.* (2015).⁹⁷ On average, based on baseline figures, extra care across the care levels cost GB£428 less per annum for the study participants than it would have done outside of extra care in the wider community.⁹⁷ This difference is greater at higher levels of care, and varies according to local authority costs in each location.⁹⁷

Senior housing findings by outcomes

Canada

Self-rated health

The self-perceived health status model included a block of 13 independent variables relating to four antecedent change constructs.⁹⁹ The results of the stepwise logistic regression analysis to predict self-perceived health indicated that the variables entered into the model were able to correctly classify 34.8% of cases. Seven of the change variables were statistically significant predictors of self-perceived health at the 0.05 level. The two positive and statistically significant relationships registered by variables concerning change in personal resources indicated that the log odds of rating health as either 'excellent' or 'good' increased if the resident experienced stability in either the number of instrumental activities of daily living limitations or the number of chronic conditions. The results found that residents whose use of automobiles for food shopping purposes was stable or had decreased were more likely to rate their health positively compared with residents whose use of automobile transportation had increased. The results also found that residents expressing decreased satisfaction with proximity to grocery stores were more likely to rate their health positively. On the other hand, continued dissatisfaction with access to family members reduced the likelihood of positive self-ratings of health.⁹⁹

Mental well-being

Self-esteem

The stepwise model predicting self-esteem included a block of 11 independent change variables relating to three antecedent change constructs.⁹⁹ The variables in the regression model predicted 23% of the overall explanation of the outcome self-esteem. The model indicated that 6 of the 11 independent change variables entered the model predicted self-esteem at the 0.05 level of significance. Four of these variables concerned residents' appraisals of change in the content of either the service environment or the physical environment. The negative and statistically significant standardised regression coefficient of satisfaction with global proximity to services indicates that older persons who remained dissatisfied with proximity to services after their move to senior citizen apartments were more likely to report lower self-esteem. The statistically significant relationships registered by two of the dummy variables concerning satisfaction with proximity to a physician's office somewhat surprisingly revealed that decreased or stable levels of satisfaction were associated with higher levels of self-esteem. However, lower levels of self-esteem were significantly related to decreased satisfaction with snow removal at the senior apartment complex. Respondents who maintained a stable number of chronic conditions also reported significantly higher levels of self-esteem.⁹⁹

Morale

The stepwise model predicting morale included a block of 11 independent variables relating to four antecedent change constructs.⁹⁹ The results of the regression model reveal that it was able to correctly classify 18% of cases. The three change variables that were significant predictors of morale at the 0.05 level each related to residents' appraisals of environmental change. First, the negative and statistically significant standardised regression coefficient for satisfaction with security indicates that respondents were more likely to have lower morale if they perceived that their security had declined after the move. Second, the positive and statistically significant relationship between morale and satisfaction with proximity to a pharmacy is indicative of higher morale among residents who remained satisfied with their proximity to a pharmacy after the move. The third statistically significant finding was change in global proximity to services, which indicated that lower morale was associated with continued dissatisfaction with overall service provision.⁹⁹

Depression

The stepwise model predicting depression included a block of 12 independent variables relating to three antecedent change constructs.⁹⁹ The results of the model showed that the model correctly predicted 21% of depression cases. Of the four statistically significant predictors of depression at the 0.05 level, three were concerned with residents' appraisals of change in the context of either the service environment or the physical environment, while the fourth was related to the social environment. Specifically, the positive and significant relationship recorded in relation to satisfaction with global proximity to services implies that older persons who were dissatisfied with their overall proximity to services at both their past residence and the new senior apartment were more likely to report greater depression. In addition, respondents who remained satisfied with their proximity to pharmacies or family members after the move reported significantly lower levels of depression, while higher levels of depression were significantly related to perceived declines in crime-related security.⁹⁹

Combined results

The regression models' results indicate that the change variables provided only moderate levels of explanation of the variations in the four personal state outcomes (self-perceived health status, depression, self-esteem, and morale) over time.⁹⁹ For the four models, however, it is notable that the change variables plus the sociodemographic control variables consistently improved each of the models' explanatory levels. These results reveal that key changes in the residential setting, individual resources, and behaviours of a mover do ultimately contribute to his or her residential adjustment.⁹⁹

It is noteworthy that the results show that change variables constituting five of the antecedent change constructs are significant predictors of at least one of the personal state outcomes.⁹⁹ Three of these constructs concern resident appraisals of change in various aspects of the local service, social,

and physical environment. In contrast, none of the change variables related to the two observer-defined environmental context constructs qualified for inclusion in the regression models. It is particularly notable that variables concerning satisfaction with proximity were found to have greater predictive capability than those involving physical measures of distance separation. These findings indicated that the older person's subjective interpretations of a new setting may contribute more to their outcomes than objective measures.⁹⁹

Finland

Physical well-being

Physical well-being was measured as physical performance. During the first year living in senior housing, participants' instrumental activities of daily living scores, dominant hand grip strength, and walking speed decreased significantly.¹⁰⁰ Average instrumental activities of daily living scores decreased by 6%, and mean grip strength of right and left hands decreased by 8% and 2%, respectively.

Dominant hand grip strength decreased with increasing age; the average decrease was 12% in participants aged 55–74 years, 21% in participants aged 75–84 years, and 23% in participants aged 85–94 years. Instrumental activities of daily living scores also decreased, but the average decrease was not linear: it was 10% in participants aged 55–74 years, 21% in participants aged 75–84 years, and 10% in participants aged 85–94 years.¹⁰⁰

Mental well-being

Self-reported mental capability

After 12 months, mental capability (ability to think clearly and memory) was very good or quite good in 36% of participants.¹⁰⁰ Almost one-quarter (23%) reported that their mental capability had decreased, 17% reported an increase, and 61% reported no change at 12 months. However, the change in self-reported mental capability was not statistically significant during the first year in senior housing. Reports of not forgetting appointments or losing items decreased significantly, from 69% to 58%, during the first year in senior housing. On the negative side, after 12 months, 25% of older people reported increased difficulties in concentrating on an issue, 13% reported a decrease, and 62% reported no change. In addition, reports of no difficulty in learning new things and skills decreased significantly, from 31% at baseline to 21% after 12 months. At the 12-month data collection time point, almost all participants (96%) said that they followed current affairs and events (through TV, radio, newspaper, or the Internet) and most of them (63%) had no difficulty concentrating.¹⁰⁰

Self-reported mood

After 12 months, 22% of participants reported that they felt depressive symptoms daily or weekly and 59% rarely or never felt depressive symptoms.¹⁰⁰ There was no statistically significant change in depressive symptoms during the first year in senior housing. Reports of having opportunities to make decisions about life decreased statistically significantly during the first year in senior housing, falling from 82% after 3 months to 69% after 12 months. After 12 months, respondents reported no change in controlling negative feelings or aggression, no change in levels of distress or anxiety, no change in self-worth, and no change in sleeping patterns. In addition, a significant minority (44%) remained positive about the future.¹⁰⁰

Self-reported safety

The feeling that life is safe significantly increased while living in senior housing.¹⁰⁰ The percentage of respondents perceiving life to be very safe rose from 20% after 3 months to 42% after 12 months. Being afraid of sudden illness while at home statistically significantly decreased. Being 'very much' or 'quite a lot' afraid of sudden illness while at home decreased from 13% after 3 months to 3% after 12 months. There were no statistically significant changes in fear of violence.¹⁰⁰

Social well-being

Interpersonal relationships and support

Lotvonen *et al.* (2017) examined interpersonal relationships and levels of support from family and friends.¹⁰¹ At 12 months, most residents agreed that they had adequate contact with close family and friends by phone or Skype (87%), and that their family and friends cared about them (76%). Contact by phone or Skype significantly increased from 65% at 3 months to 87% at 12 months after the move. The participants reported that experiences of meeting an adequate number of their family and friends increased significantly, from 45% after 3 months to 53% after 12 months. The participants were also asked about the frequency of meeting family and friends, and 39% of older people reported that the frequency of meetings had increased, 18% reported that the frequency had decreased, and 42% reported no change. The proportion who fully disagreed with the statement that they could not easily move outside the home increased significantly, from 22% at 3 months to 39% at 12 months. Moreover, 15% of the older people reported that problems moving outside had decreased, 35% reported that they had increased, and 49% reported no change during their first year in senior housing.¹⁰¹

Self-reported loneliness

After 12 months, 47% of participants reported that they never suffered from loneliness, 60% reported feeling some or a little loneliness; Of those who ever felt lonely, 39% reported feeling lonely weekly/daily, and 14% reported feeling lonely monthly.¹⁰⁰ However, The results showed that feeling lonely increased somewhat by 12 months. Thirty per cent of older people reported feeling lonely more often, 20% less often, and half reported no change. Forty-two per cent of respondents said that they had a key person who they could discuss their personal affairs with, while 58% reported that they frequently lacked a confidant with whom to discuss their personal affairs. The changes in self-reported loneliness during the first year in senior housing were not statistically significant.¹⁰⁰

Self-reported social environment

Lotvonen *et al.* (2017) asked residents about the pleasantness of their social environment and feelings of social restrictiveness.¹⁰¹ At 12 months after their move, 87% of participants strongly agreed that they had freedom to do what they liked in the senior housing community. At 12 months, 58% of the participants agreed that the senior housing community was pleasant, which was a significant increase from the 32% who agreed with this statement at 3 months. At 3 months, 63% of participants agreed that changes in their physical condition limited social interaction, and this proportion increased to 70% at 12 months.¹⁰¹

Mental and social well-being by physical well-being

Mean instrumental activities of daily living scores decreased more among participants who reported decreases in opportunities to make decisions about their life than among those who reported that such opportunities increased or remained the same.¹⁰⁰ Mean instrumental activities of daily living scores also decreased more among participants who reported more negative thoughts about the future than among those who reported more positive or neutral thoughts about the future. Participants who reported feeling less or equally safe also saw a greater decrease in mean instrumental activities of daily living scores than participants who reported increased feelings of safety. Mean instrumental activities of daily living scores decreased significantly more among those who reported increases in meetings with close family and friends, compared to participants who reported that the number of such meetings declined or remained the same.¹⁰¹

Mean walking speed decreased more among older people who reported more or unchanged loneliness than among those who reported less loneliness, and it decreased more among older people who reported more or unchanged sleeping problems than among those with reduced sleeping problems. Participants who reported that the pleasantness of their residential community had decreased saw their mean walking speed decline significantly more than those reporting that the residential community's pleasantness had increased or remained the same.¹⁰¹ Mean walking speed also declined significantly more among participants who reported that peer support had decreased or remained the same than among those reporting that peer support had increased; walking speed also

declined significantly more among participants who reported that physical limitations of social interaction decreased or remained the same than among those reporting reductions in physical limitations.¹⁰¹

Dominant hand grip strength decreased significantly more among participants who reported that peer support increased or remained the same than among those reporting that levels of peer support had decreased.¹⁰¹ Dominant hand grip strength also decreased significantly more among participants who reported an increase in meaningful activity at home than among those reporting that amounts of such activities declined or remained the same.¹⁰¹ Right hand grip strength decreased more among participants who reported more fear or an unchanged fear of falling or experiencing some other accident while moving outdoors than among those who reported reduced fear while moving outdoors.¹⁰⁰