**Technical appendix – Living well for longer: the economic argument for investing in the health and wellbeing of older people in Wales**

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# Section 1: Background: literature review

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Title** | **Date** | **Journal, website or source** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| Anglada-Martinez et al.  | Does Health increase adherence to medication? Results of a systematic review. | 2015 | International Journal of Clinical Practice | Barcelona, Catalonia,Spain | The evidence was mixed regarding the benefits of interventions due to the variety of the study designs and the results found. | Strong | Systematic review included RCTs, quasi-RCTs, cross-sectional studies, case-control studies, pre- and post-intervention studies, and literature reviews. |
| Barker et al.  | Assessment and prevention of falls in older people. | 2014 | Nursing Older People | United Kingdom  | There is a lack of awareness about falls risk across all care sectors. Patients receive inconsistent messages about their falls risk. Authors concluded that there is a significant risk that commissioners will not fund all the NICE (2013a) guideline recommendations. The NICE (2013b) costing statement concluded that the implementation of the guideline is unlikely to have a significant cost impact for the NHS.  | Moderate  | Interpretation of revised advice |
| Barnett et al.  | Epidemiology of multimorbidity and implications for health care, research, and medical education: A cross-sectional study. | 2012 | The Lancet | Scotland  | Authors recommended complementary strategy that supports generalist clinicians to provide personalised, comprehensive continuity of care, especially in socioeconomically deprived areas. | Strong | Cross-sectional study published in The Lancet  |
| Conn et al.  | Interventions to improve medication adherence among older adults: Meta-analysis of adherence outcomes among randomized controlled trials. | 2009 | Gerontologist | USA  | The results found that the interventions increased medication adherence among older adults; however, considerable heterogeneity in the magnitude of effects across studies were reported.  | Strong | Meta-analysis of RCTs  |
| Duerden et al.  | Polypharmacy and medicines optimisation Making it safe and sound. | 2013 | Kings Fund | England  | There is no clearly accepted definition for the word ‘polypharmacy’. Polypharmacy is a common and growing global issue, affecting primary and secondary health care settings. Encouraging patients to make informed choices about treatments is a significant challenge in the area of polypharmacy.  | Moderate  | Secondary source of information  |
| Gurwitz et al.  | The incidence of adverse drug events in two large academic long-term care facilities. | 2005 | American Journal of Medicine | USA and Canada | The findings reinforce the need for a special focus on the ordering and monitoring stages of pharmaceutical care for preventing adverse drug events in the long-term care setting. Patients taking antipsychotic agents, anticoagulants, diuretics, and anti-epileptics are at increased risk. | Strong | Big sample size over a long period of months. |
| Holley-Moore et al.  | Drink Wise, Age Well: Alcohol Use and the Over 50s in the UK. | 2016 | Drink Wise Age Well report www.drinkwiseagewell.org.uk | UK  | There is an urgent need for action to reduce alcohol-related harm in older adults across the UK. The new Drink Wise, Age Well programme will address the challenges of alcohol-related harm in older adults. The report is informed by a major new survey assessing alcohol use people aged 50 and above inkey UK study areas.  | Moderate  | Informed by National survey data  |
| NICE  | Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes. | 2015 | NICE Guidelines  | UK | Guidelines | Strong | NICE Guidelines |
| Nieuwlaat et al.  | Interventions for enhancing medication adherence. | 2014 | Cochrane Database of Systematic Reviews | Of the109 RCTs included in the review, 80 were from high-income countries(44 from USA), 17 from middle-income countries, fivefrom low-income countries, and seven from unknown geographiclocations. | The effects were inconsistent from study to study, and only a minority of lowest risk of bias RCTs improved both adherence and clinical outcomes. Authors state that there is an uncertainty on how to consistently improve medicine adherence so that the full health benefits of medicines can be achieved.  | Strong | High calibre Cochrane review of RCTs  |
| Office for National Statistics | 2011 Census data. | 2011 | ONS www.ons.gov.uk | United Kingdom  | A significantly large proportion of the population are elderly individuals. In mainly coastal and rural communities up to 44.1% of the population are 65-84 years old. This trend is set to continue if middle aged people remain living in their current homes.  | Strong | National statistics  |
| Office for National Statistics | Life Expectancy at Birth and at Age 65 by Local Areas in England and Wales: 2012 to 2014. | 2015 | ONS www.ons.gov.uk | England and Wales  | In Wales, men and women aged 65 years could expect to live to reach their 83rd and 85th birthday, respectively.  | Strong | National statistics  |
| Office for National Statistics | Health state life expectancies, UK: 2013 to 2015, (April), 1–17. | 2016 | ONS www.ons.gov.uk | United Kingdom  | In the UK, life expectancy is higher in 2013 to 2015, compared to 2009 to 2011 however, the proportion of life spent in good health is decreasing. This is because of the improvement in life expectancy exceeding that of healthy life expectancy. | Strong | National statistics |
| Older People’s Commissioner for Wales. | The Importance and Impact of Community Services within Wales. | 2014 | Older People’s Commissioner for Wales [www.olderpeoplewales.com](http://www.olderpeoplewales.com) | Wales  | Reductions in community services have a substantially detrimental effect on the health and wellbeing of older people. The Welsh Government and public bodies must continue to utilise the principle of wellbeing and consult with older people when making key decisions. | Low | <http://www.olderpeoplewales.com/en/news/news/14-02-25/The_Importance_and_Impact_of_Community_Services_within_Wales.aspx#.WibCwEpl-Uk> |
| Pirmohamed | Adverse drug reactions as cause of admission to hospital: prospective analysis of 18 820 patients | 2004  | British Medical Journal (BMJ)  | England  | Adverse drug reactions place a significant burden on the NHS and accounts for significant morbidity, mortality, and increased costs. The projected annual cost of hospital admissions (due to adverse drug reactions) to the NHS is £466m (€706m, $847m). | Strong | Prospective observational study published in the BMJ  |
| Public Health Wales Observatory | Public Health Wales Observatory - Demography Overview | 2016a | Public Health Wales Observatoryhttp://www.publichealthwalesobservatory.wales.nhs.uk | Wales  | In Wales, the population of people aged 85 years and above has increased by 27% between 2005 and 2014, (from approximately 62,000 to 79,000).  | Strong | National statistics  |
| Richards  | Economic Austerity and Older Volunteers – Wales Institute of Social &amp; Economic Research, Data &amp; Methods (WISERD) - Cardiff University. | 2015 | Cardiff University website http://blogs.cardiff.ac.uk | Wales  | The blog discusses the WISERD Civil Society, seminar on economic austerity on the lives of older volunteers. The author discusses the contribution of older people to the economy.  | Low  | Blog  |
| Statistics for Wales. | A Statistical Focus on Age in Wales. | 2009 | Her Majesty’s Stationery Office  | Wales  | Wales has the highest proportion of over-60s in the UK. In 2005/06, the proportion of people being treated for a range of illnesses increased (excluding mental illness). | Strong | National statistics  |
| The King’s Fund  | Ten priorities for commissioners: Transforming our health care system summary | 2015 | King’s Fund www.kingsfund.org.uk | United Kingdom  | Report discusses the ten priorities set out for commissioners to help transform the health care system: self-management; primary prevention; secondary prevention; ACS conditions; mental and physical health; coordinated care; end of life care; medicines management; referral quality; and activity.  | Moderate | Secondary source of information  |
| Watt & Roberts | The path to sustainability. | 2016 | The Health Foundation  | Wales  | In order to meet the financial pressures in the long term, sustained growth in efficiency, and additional funding at least in line with GDP growth is needed. The authors conclude that these assumptions can be met, based on previous trends.  | Low  | Funding projections for the NHS in Wales.  |
| Welsh Assembly Government | National Service Framework for Older People in Wales. | 2006 | Welsh Assembly Government | Wales  | Report presents the National Service Framework (NSF) for Older People in Wales. This framework aims to improve health and social care services and equity of access for the older population in Wales.  | Moderate  | Report sets national, evidence basedStandards.  |

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**Table of evidence**

# Section 2: Investing in older people as assets: literature review

| **Author** | **Title** | **Date** | **Name of journal/website** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Altogether Better. | Altogether Better Working Together to Create Healthier People and Communities. | 2016 | www.altogetherbetter.org.uk | United Kingdom  | In the ‘Altogether Better’ programme, 86% of champions and 94% of participants reported increased levels of confidence and well-being. 87% of champions and 94% of participants in the programme developed new knowledge relating to their health and well-being. 98% of champions and 99% of participants in the programme increased their involvement in social groups and activities. 95% of practice staff involved with recommended the programme and wanted to remain involved in the programme.  | Moderate  |  |
| ARUP & Partners | Seasonal health and resilience for ageing urban populations and environments. | 2016 | www.sd-research.org.uk | London, New York and Shanghai | The report highlights the significant risk of climate change to the elderly population in London. Elderly people living in urbanised areas are at a greater risk where heat is absorbed and released by buildings and paved surfaces.  | Moderate  |  |
| Bedell et al.  | The new old age: perspective on innovating our way to the good life for all. | 2009 |  |  |  | Weak |  |
| Bray et al. | Costs and outcomes of improving population health through better social housing: a cohort study and economic analysis. | 2017 | International Journal of Public Health | North East England  | Warmth-related housing improvements may be a cost-effective means of improving the health of social housing tenants and reducing health service expenditure, especially in older populations. | High  |  |
| Children in Wales  | Grandparents asked about their role.  | 2010 | www.childreninwales.org.uk | Wales  | The Children in Wales survey was conducted to determine how involved grandparents are in their children’s lives, and how they support their grandchildren in practical, financial or emotional terms.  | Weak  |  |
| Donald | Social Return on Investment Report (SROI) on Dial-A-Community Bus Shopping Service. | 2010 | Buchan Development Partnership www.dialabus.org.uk | Scotland | An evaluative Social Return on Investment (SROI) was undertaken for a Dial-A Community Bus’s (DACB) Shopping Service for the elderly and less-abled. The analysis found that for every £1 that was invested in the DACB Shopping Service, £3.03 was returned in social added value, during the timeframe that was studied. | Moderate  |  |
| Fonda et al.  | Changes in Driving Patterns and Worsening Depressive Symptoms Among Older Adults. | 2001 | The Journals of Gerontology | America  | The study explored whether changes in driving patterns result in negative outcomes for the depressive symptoms of older Americans and whether these negative consequences are moderated for individuals with a spouse that drives. Results found that changes in driving patterns can be detrimental for older people's depressive symptoms. Authors concluded that initiatives should focus on strategies that help older individuals retain their driving skills and that prepare them for the possibility of not driving.  | High |  |
| Hex & Tatlock  | Altogether Better Social Return on Investment Case Studies. | 2011 | www.altogetherbetter .org.uk | United Kingdom  | Social Return on Investment (SROI) was conducted of 15 case studies from 15 projects in the Altogether better programme. The analysis found that all demonstrated a positive social return on investment (SROI) of between £0.79 - £112.42 for every £1 pound invested.  | High |  |
| Hunter Lovins | Rethinking Production. In STATE OF THE WORLD 2008 Innovations for a Sustainable Economy Innovations for a Sustainable Economy. | 2008 | The Worldwatch Institute  |  | Chapter is entitled ‘Rethinking production’ and discusses the following topics: The Solid Foundation of Eco-efficiency, Cradle to Cradle: Extending a Product’s Life, Following Nature’s Lead, and Riding the New Wave of Innovation. | Weak  |  |
| ILC-UK | Grandparent Army Report. | 2017 | The International Longevity CentreUK (ILC-UK) | England | Grandparents provide an enormous amount of support to parents and grandchildren in the UK. As a result of increasing childcare costs and increased rates of working parents, the contribution that grandparents make in terms of financial aid, care-giving, and skills and hobbies, is fundamental.  | Moderate |  |
| Iparraguirre | Age UK Chief Economist’s Report Spring 2014. | 2014 | www.ageuk.org.uk | United Kingdom | Individuals aged 65 and aver make an annual contribution of approximately £61bn (approximately 5% of the GDP in the UK). This comes from their employment contribution (£37 bn); informal caring (£11.4 bn), childcare (£6.6 bn) and volunteering (£5.8 bn).  | High  |  |
| Jones  | Combining daycare for children and elderly people benefits all generations. | 2017 | The Conversation  | United Kingdom  | Article discusses the benefits of combining daycare of children and elderly people and gives examples from the UK, America, Australia and Japan. The research has found that interactions between older and younger populations can have significant benefits for each generation.  | Weak | Article published in the Conversation |
| Laverty & Millett | Potential impacts of subsidised bus travel for older people. | 2015 | Journal of Transport & Health | England | It is national policy in England for people aged 60 and above to travel of buses free of charge. Evidence suggests that this may be associated with a number of benefits for older people. However, the authors concluded that more research is needed to determine the cost-effectiveness of this scheme.  | Weak | Viewpoint article  |
| Laverty et al.  | Active Travel to Work and Cardiovascular Risk Factors in the United Kingdom. | 2013 | American Journal of Preventive Medicine | United Kingdom  | This study assessed sociodemographic correlates of active travel to work and associations between active travel and cardiovascular risk factors. Results found wide disparities in the mode of travel to work across regions and sociodemographic groups in the UK. The results of the survey found positive associations between active travel and cardiovascular risk.  | Moderate  |  |
| Mackett  | Has the policy of concessionary bus travel for older people in Britain been successful? | 2014 | Case studies on transport policy  | United Kingdom  | It is policy in Britain for older people to receive free bus travel. This has resulted in increased bus use by older individuals. Consequently, this has increased social inclusion and improved well-being among older people. As stated by the authors, although the scheme has been successful, it has not been as successful as some research suggests.  | Moderate |  |
| Mackett  | Improving accessibility for older people – Investing in a valuable asset. | 2015 | Journal of Transport & Health  | United Kingdom  | The older population makes a significant economic impact to society. The author discusses whether providing free travel to older people would increase their contribution to society.  | Moderate  |  |
| Musselwhite & Shergold | Examining the process of driving cessation in later life. | 2013  | European Journal of Ageing | England and Wales  | Stopping driving can be linked to poorer quality of life and depression among older people. The qualitative analysis found that although a similar pattern was found between the trigger for stopping driving, and life post-car, not all older people go through the stages of giving-up driving in the same way.  | Moderate |  |
| Office for National Statistics | 2011 Census data. | 2011 | ONS www.ons.gov.uk | United Kingdom  | A significantly large proportion of the population are elderly individuals. In mainly coastal and rural communities up to 44.1% of the population are 65-84 years old. This trend is set to continue if middle aged people remain living in their current homes.  | High  | National statistics  |
| Older People’s Commissioner for Wales | Ageing in Wales: An overview in a European perspective. | 2016 | Older People’s Commissioner for Wales www.olderpeoplewales.com | Wales and Europe  | Welsh Government has introduced free bus passes, free swimming and £50 maximum weekly charges for home care. This has made a significant impact to the lives of older people including benefits to physical and mental health and wellbeing. | Weak  | Some information sourced from news articles  |
| SCIE | Co-production. Retrieved 22 September 2017 | 2016 | Social Care Institute for Excellence www.scie.org.uk | United Kingdom | The Social Care Institute for Excellence (SCIE) offers resources to promote co-production, and builds upon the main co-production principles of equality, diversity, access and reciprocity. This includes promoting co-production among older people so they can inform service delivery and develop measures for effective participation.  | Weak  | Webpage for details of co-production training courses.  |
| Sinclair  | The Golden Economy - The Consumer Marketplace in an Ageing Society. | 2010 | Age UK  | United Kingdom  | In 2008, older people (65 years and above) spent approximately £97bn and the over 50s spent £276bn. This signifies44% of the total family spending in the UK. The report highlights that an ageing society means more older consumers.  | Weak  |  |
| Swift et al.  | Briefing paper (5): The perception of ageing and age discrimination. | 2016 | British Medical Association (BMA) www.bma.org.uk | United Kingdom  | Older people can be subject to patronising forms of prejudice which can be spoken in the language and tone some people use to communicate with older individuals. Health care practitioners should be aware that older populations may be vulnerable to age prejudice and stereotyping processes. | Moderate  |  |
| Titheridge et al.  | Transport and poverty: a review of the evidence | 2014 | UCL Transport Institute, University College London | United Kingdom | Authors conclude that most of the evidence exploring the impact of poverty on mobility and the relationship between transport and poverty is associated with disadvantaged groups and individuals vulnerable to social exclusion rather than individuals or households living in poverty as such.  | Moderate  |  |
| United Nations | The Sustainable Development Goals Report. | 2017 | United Nations www.unstats.un.org | USA  | The 2030 Agenda for sustainable development, comprises of 17 goals spanning poverty, equality, environment, education and health) links different dimensions of development (including health) to the environment, to prosperity and to all actions and policies that affect human wellbeing.  | Moderate  | United nations agenda for 2030  |
| WCVA | Volunteering in Wales 2015 Report on two Omnibus surveys March 2014 and 2015. | 2016 | Wales Council for Voluntary Action www.wcva.org.uk | Wales | Survey results found that individuals aged between 35 and 44 are more likely to volunteer than people aged 65 and over.  | Moderate  |  |
| Welsh Government  | The Strategy for Older People in Wales 2013-2023. | 2013 | Welsh Government chcymru.org.uk | Wales | Strategy for Older People in Wales (2013-2023) is informed by the views of 2,000 older people. The views of older individuals is summed up in three statements: 1. I have a sense of purpose and good relationships.2. I live in a community that is sensitive to my needs.3. I can afford a good quality of life. | Moderate  |  |
| Welsh Government  | Prosperity for All: The national strategy. | 2017 | Welsh Government<http://gov.wales>  | Wales |  | Moderate  |  |
| WHO  | A physically active life through everyday transport with a special focus on children and older people and examples and approaches from Europe. | 2002 | World Health Organization Regional Office for Europe http://www.euro.who.int | Europe  | The implementation of transport and land-use policies that produce suitable conditions for safe walking and cycling, while paying particular attention to the needs of vulnerable road users (including elderly people) is the single most essential means of increasing the amount of individuals who become or remain physically active. | Moderate  |  |
| Woodall et al.  | Community Health Champions and Older People: a Review of the Evidence. | 2012 | Altogether BetterLearning Networkwww.altogetherbetter.org.uk | England  | The evidence review demonstrates significant benefits of older people partaking in lay public health roles. Older people are delivering a wide range of health related programmes including art walks and gardening clubs. Consequently, the evidence implies that health benefits are not only seen in the wider community, but also for volunteers. | Moderate  |  |
| WRAP | WRAP and the circular economy. | 2017 | The Waste and Resources Action Programme (WRAP) | England and Wales  | A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible. In a circular economy, we extract the maximum value from products whilst in use, then recover and regenerate products and materials at the end of each service life | Weak | Webpage  |
| WRVS | Gold age pensioners, valuing the socio-economic contribution of older people in the UK. | 2011 | Social Care Institute for Excellence | United Kingdom  | The older population make significant contributions to the economy. A key finding of the report is that the overall value of the contribution made by older people significantly surpasses the costs to the state of providing services to older people.  | Moderate  | Report informed by national statistics  |
| WRVS | Loneliness amongst older people and the impact of family connections. | 2012 | Social Care Institute for Excellence  | United Kingdom  | Feelings of isolation and loneliness among older people are affected by how close they live to their children and how often they see them. Older Individuals who see their children once a month or less are twice as likely to feel lonely than those who see their children every day. Almost 75% of people aged 75 years and above that live alone feel lonely.  | Moderate  |  |

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**Table of evidence**

# Section 3: Investing in older people as assets: literature review

| **Author** | **Title** | **Date** | **Name of journal/website** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age UK.  | *Later Life in the United Kingdom*.  | 2017 | https://doi.org/10.1016/j.egypro.2016.11.209 | UK |  | Moderate evidence |  |
| Department for Work & Pensions.  | *Employment statistics for workers aged 50 and over , by 5-year age bands and gender*. | 2015 |  | UK |  | Moderate evidence |  |
| Hagger-Johnson, G., Carr, E., Murray, E., Stansfeld, S., Shelton, N., Stafford, M., & Head, J. (2017).  | Association between midlife health behaviours and transitions out of employment from midlife to early old age: Whitehall II cohort study.  | 2017 | *BMC Public Health*, *17*(1), 82. https://doi.org/10.1186/s12889-016-3970-4 | UK | Unhealthy behaviours in midlife are associated with transitions out of employment into old age. Promoting healthy behaviours at midlife might support current policy initiatives aimed at extending working life. Future research should consider possible mechanisms that link behaviours to transitions out of employment, and consider sex differences in larger cohorts. | Strong evidence |  |
| Harrop, A., & Jopling, K.  | *One voice: shaping our ageing society.*  | 2009 | https://doi.org/10.1037/e412532005-004 | UK |  | Moderate evidence |  |
| Hildon, Z., Smith, G., Netuveli, G., & Blane, D.  | Understanding adversity and resilience at older ages.  | 2008 | *Sociology of Health and Illness*, *30*(5), 726–740. https://doi.org/10.1111/j.1467-9566.2008.01087.x | UK | Participants with resilient outcomes drew upon social and individual resources in the face of adversity, in particular resources that stabilised life change by providing continuity. These included: constructing narratives that reinterpreted past adversity in light of recent ones; maintaining social roles and activities that had previously brought pleasure or a sense of mastery; relying on tried and tested coping strategies; support from close ongoing relationships. Participants with vulnerable outcomes, however, described more severe adversities, suggesting that resilience is also dependent on the degree and impact of this experience. | Strong evidence |  |
| Iparraguirre, J. (2014). Age UK Chief  | Economist’s Report Spring 2014, 1–26. | 2014 |  | UK |  | Moderate evidence |  |
| Mackett, R.  | Improving accessibility for older people – Investing in a valuable asset.  | 2015 | *Journal of Transport & Health*, *2*(1), 5–13. https://doi.org/10.1016/j.jth.2014.10.004 | UK | The contribution of older people to society in future is examined and how travel contributes to this. It is shown that changes in older people's mobility would affect their contribution to society. Ways in which the mobility of older people could be increased are identified. | Strong evidence |  |
| Marvell, R., & Cox, A.  | *Fulfilling work What do older workers value about work and why ?*  | (2016). | Retrieved from https://16881-presscdn-0-15-pagely.netdna-ssl.com/wp-content/uploads/2017/02/IES-Fulfilling-Work-Evidence-Briefing.pdf | UK |  | Moderate evidence |  |
| NICE.  | *Workplace health: management practices*. | 2015 |  | UK |  | Strong evidence |  |
| Office for National Statistics.  | *What Does the 2011 Census Tell Us About Older People?* | 2013 |  | UK |  | Strong evidence |  |
| PricewaterhouseCoopers LLP.  | *PwC Golden Age Index 2017*. | 2017 |  | UK |  | Strong evidence |  |
| Taskila, T., Shreeve, V., Laghini, M., & Bevan, S.  | About the Health at Work Policy Unit. | 2015 |  | UK |  | Moderate evidence |  |
| Tinsley, M.  | *Too Much to Lose*. Policy Exchange. | 2012 |  | UK |  | Moderate evidence |  |
| van der Noordt, M., IJzelenberg, H., Droomers, M., & Proper, K. I.  | Health effects of employment: a systematic review of prospective studies.  | 2014 | *Occupational and Environmental Medicine*, *71*(10), 730–6. https://doi.org/10.1136/oemed-2013-101891 | The Netherlands | This systematic review indicates that employment is beneficial for health, particularly for depression and general mental health. There is a need for more research on the effects of employment on specific physical health effects and mortality to fill the knowledge gaps. | Strong evidence |  |
| Williams, I., & Hatton-Yeo, A.  | Working with Older People Ageing Well in Wales: a national movement.  | 2015 | *Working with Older People*, *19*(4), 170–176. https://doi.org/10.1108/WWOP-07-2015-0013 |  | The programme is in its first year and works on several levels from high level national bodies to community groups on the group. The success of the programme is dependent on the commitment of organisations and individuals. | Strong evidence |  |
| WRVS.  | *Gold age pensioners, valuing the socio-economic contribution of older people in the UK*.  | 2011 | https://doi.org/10.1017/CBO9781107415324.004 |  |  | Moderate evidence |  |

**LHS**

**Table of evidence**

# Section 4: Housing and independent living in an age-friendly Wales: literature review

| **Author** | **Title** | **Date** | **Name of journal/ website** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A report by the Expert Group on Housing and Ageing Population in Wales.  | Our Housing AGEnda: meeting the aspirations of older people in Wales. Welsh Government. | 2017 |  | Wales, UK |  | Moderate evidence |  |
| Age Cymru.  | Save our public toilets. | 2011 |  | Wales, UK |  | Weak evidence |  |
| Age UK. Reducing fuel poverty - a scourge for older people. | Reducing fuel poverty - a scourge for older people. | 2014 | Age UK | UK |  | Weak evidence |  |
| Bergmo, T. S. (2014). Using QALYs in telehealth evaluations: a systematic review of methodology and transparency.  | Using QALYs in telehealth evaluations: a systematic review of methodology and transparency | 2014 | *BMC Health Services Research*, *14*(1), 332. https://doi.org/10.1186/1472-6963-14-332 | Norway | The use of QALYs in telehealth evaluations has increased over the last few years. Different methodologies and utility measures have been used to calculate QALYs. A more harmonised methodology and utility measure is needed to ensure comparability across telehealth evaluations. | Strong evidence |  |
| Bridges, E., & James, V.  | *Getting back on your feet: reablement in Wales*. | 2012 | WRVS | UK | The delivery of reablement varied, with some health boards having their own dedicated reablement teams, whilst others locate reablement within larger multi-discipline community resource teams. There was also evidence of some variation evident between health boards in their target groups for reablement. | Moderate evidence |  |
| Cabe. (2009).  | *Homes for our old age*.  | 2009 | Department of Health. | UK |  | Weak evidence |  |
| Carter-Davies, L., & Hillcoat-Nallétamby, S.  | Housing for Older People in Wales: An Evidence Review. | 2015 |  | Wales, UK |  | Moderate evidence |  |
| Community Housing Cymru Group.  | *The Future of the Energy Company Obligation Community Housing Cymru Group response*. | 2014 |  | Wales, UK |  | Moderate evidence |  |
| Croucher, K., & Lowson, K.  | *Handypersons Evaluation Interim key findings*.  | 2011 | Department for Communities and Local Government. | UK |  | Moderate evidence |  |
| Davies, A., & Newman, S.  | Evaluating telecare and telehealth interventions WSDAN briefing paper, 44. | 2011 | Kings Fund | UK | Evaluation studies need to be carefully planned out. | Weak evidence |  |
| Department of Health.  | Homecare Re-ablement, Efficiency Delivery: supporting sustainable transformation, (January). | 2007 | Department of Health | UK |  | Moderate evidence |  |
| Disability Wales. (2002).  | *An introduction to the Social Model of Disability*. | 2002 |  | Wales, UK |  | Weak evidence |  |
| Dixon, J., Winterbourne, S., Watters, S., Knapp, M., Joy, S., Corral, S., … Mcnulty, A.  | An Analysis of the Economic Impacts of the British Red Cross Support at Home Service, (January). | 2014 |  | UK |  | Moderate evidence |  |
| Francis, J., Fisher, M., & Rutter, D. | *Reablement: a cost-effective route to better outcomes*. | 2011 |  |  |  | Moderate evidence |  |
| Health Challenge Wales.  | Health Challenge Wales - Home safety for older people.  | 2017 | Retrieved 26 September 2017, from http://www.healthchallengewales.org/home-safety-for-older-people |  |  | Weak evidence |  |
| Help the Aged. (2007).  | *Nowhere to go: Public toilet provision in the UK*. | 2007 | Help the aged | UK |  | Moderate evidence |  |
| Henderson, C., Knapp, M., Fernandez, J.-L., Beecham, J., Hirani, S. P., Cartwright, M., … Whole System Demonstrator evaluation team.  | Cost effectiveness of telehealth for patients with long term conditions (Whole Systems Demonstrator telehealth questionnaire study): nested economic evaluation in a pragmatic, cluster randomised controlled trial.  | 2013 | *BMJ*, *346*(1), f1035. | UK | The QALY gain by patients using telehealth in addition to usual care was similar to that by patients receiving usual care only, and total costs associated with the telehealth intervention were higher. Telehealth does not seem to be a cost effective addition to standard support and treatment. | Strong evidence |  |
| Ho, Y.-L., Yu, J.-Y., Lin, Y.-H., Chen, Y.-H., Huang, C.-C., Hsu, T.-P., … Chen, M.-F.  | Assessment of the cost-effectiveness and clinical outcomes of a fourth-generation synchronous telehealth program for the management of chronic cardiovascular disease.  | 2014 | *Journal of Medical Internet Research*, *16*(6), e145. https://doi.org/10.2196/jmir.3346 | Taiwan | Better cost-effectiveness and clinical outcomes were noted with the use of a fourth-generation synchronous telehealth program in patients with chronic cardiovascular diseases. The intervention costs of this new generation of telehealth program do not increase the total costs for patient care. | Strong evidence |  |
| House of Commons.  | *The Provision of Public Toilets - Twelfth Report of Session 2007–08*. | 2008 | House of Commons | UK |  | Weak evidence |  |
| Hurstfield, J., Parashar, U., & Schofield, K.  | *The costs and benefits of independent living*. | 2007 | Office for Disability Issues, Department for Work and Pensions | UK |  | Weak evidence |  |
| KAFKA Brigade.  | *Supporting better health outcomes in Wales: A Report for Community Housing Cymru*. | 2011 | *Community Housing Cymru*. | Wales, UK | This report was written to aid the discussion surrounding supporting better health outcomes in Wales. | Weak evidence |  |
| Laing & Buisson. (2008).  | Press release: Private pay rate among older care home residents reaches 35%. | 2008 |  | UK |  | Weak evidence |  |
| Leng, G.  | *On the Pulse: Housing routes to better health outcomes for older people.*  | 2012 | National Housing Federation. |  |  | Weak evidence |  |
| Mid Wales Healthcare Collaborative.  | *A review of telehealth, telecare and telemedicine in Wales*. | 2016 | Mid Wales Healthcare Collaborative. | Wales, UK |  | Moderate evidence |  |
| National Assembly for Wales.  | *Inquiry into Poverty in Wales: Poverty and Inequality*. | 2015 | National Assembly for Wales | Wales, UK |  | Moderate evidence |  |
| National Assembly for Wales. (*Health, Social Care and Sport Committee*  | *Inquiry into loneliness and isolation Consultation responses*. | 2017 | National Assembly for Wales | Wales, UK |  | Moderate evidence |  |
| NICE.  | *Excess winter deaths and illness and the health risks associated with cold homes*.  | 2015 | Retrieved from https://www.nice.org.uk/guidance/ng6 | UK | NICE guidelines | Strong evidence |  |
| NICE.  | *Home care: delivering personal care and practical support to older people living in their own homes*. | 2015 | NICE | UK | NICE guidelines | Strong evidence |  |
| NICE.  | *Older people with social care needs and multiple long-term conditions*. *NICE Guidelines* (Vol. NG22). | 2015 | NICE | UK | NICE guidelines | Strong evidence |  |
| Office for National Statistics. Excess Winter Mortality in England and Wales: 2015/16 (Provisional) and 2014/15 (Final). *Statistical Bulletin*, *16*, 1–18. | Excess Winter Mortality in England and Wales: 2015/16 (Provisional) and 2014/15 (Final).  | 2016 | Statistical Bulletin, 16, 1–18. | UK | ONS data | Strong evidence |  |
| Palfreman, M., & Jepson, W. | *Efficiency and Innovation Board: New Models of Service Delivery*. Cardiff: Social Services Improvement Agency. | 2011 | Cardiff: Social Services Improvement Agency. | Wales, UK |  | Moderate evidence |  |
| Pevalin, D. J., Taylor, M. P., & Todd, J. (2008). The Dynamics of Unhealthy Housing in the UK: A panel data analysis. *Housing Studies*, *23*(5), 679–695. https://doi.org/10.1080/02673030802253848 | The Dynamics of Unhealthy Housing in the UK: A panel data analysis.  | 2008 | *Housing Studies*, *23*(5), 679–695. https://doi.org/10.1080/02673030802253848 | UK | The authors noted that improvements in housing conditions produce health benefits and the findings are important for proposed housing interventions to maximise health benefits and prioritise areas of housing investment. | Strong evidence |  |
| Polisena, J., Coyle, D., Coyle, K., & McGill, S.  | Home telehealth for chronic disease management: A systematic review and an analysis of economic evaluations. | 2009 | *Journal of Technology Assessment in Health Care*, *25*(3), 339–349. https://doi.org/10.1017/S0266462309990201 | Canada | Telehealth seems to be beneficial for health but in terms of societal costs, more high quality studies need to be conducted. | Strong evidence |  |
| RNIB. (2010). *Evidence-based review Older people*. Retrieved from <http://www.iihs.org/research/qanda/older_people.html> | *Evidence-based review Older people*. Retrieved from http://www.iihs.org/research/qanda/older\_people.html | 2010 | RNIB | UK |  | Weak evidence |  |
| Thokala, P., Baalbaki, H., Brennan, A., Pandor, A., Stevens, J. W., Gomersall, T., … Wong, R.  | Telemonitoring after discharge from hospital with heart failure: cost-effectiveness modelling of alternative service designs.  | 2013 | *BMJ Open*, *3*(9), e003250. https://doi.org/10.1136/bmjopen-2013-003250 | UK | Base case cost-effectiveness analyses suggest that telemonitoring during office hours (TM) is the most cost-effective strategy at a threshold of £20 000/QALY, albeit with uncertainty. | Strong evidence |  |
| van Leeuwen, K. M., Malley, J., Bosmans, J. E., Jansen, A. P. D., Ostelo, R. W., van der Horst, H. E., & Netten, A.  | What can local authorities do to improve the social care-related quality of life of older adults living at home?  | 2014 | Evidence from the Adult Social Care Survey. *Health and Place*, *29*, 104–113. https://doi.org/10.1016/j.healthplace.2014.06.004 | The Netherlands and UK | In seeking to find ways to maintain and improve the quality of life of social care users living at home, local authorities could look more broadly across their responsibilities. Further research is required to explore the cost-effectiveness of these options compared to standard social care services. | Moderate evidence |  |
| Van Woerden, H. Achieving prudent healthcare in NHS Wales. | Achieving prudent healthcare in NHS Wales. | 2014 |  | Wales, UK |  | Moderate evidence |  |
| Wales Audit Office.  | *Supporting the Independence of Older People: Are Councils Doing Enough?* | 2015 |  | Wales, UK |  | Moderate evidence |  |
| Wanless D, Appleby, J. Harrison, A . Patel, D. | Our Future Health Secured?, 1–279. | 2007 | Kings Fund | UK |  | Moderate evidence |  |
| Welsh Government.  | *Framework for Action on Independent Living*. | 2013 | Welsh Government | Wales, UK |  | Weak evidence |  |
| Welsh Government.  | *The Strategy for Older People in Wales 2013-2023*. Retrieved from http://www.cpa.org.uk/cpa-lga-evidence/Merthyr\_Tydfil\_County\_Borough\_Council/The\_Strategy\_for\_Older\_People\_in\_Wales\_2013-2023.pdf | 2013 | Welsh Government | Wales, UK |  | Weak evidence |  |
| Welsh Government.  | *Informed Health and Care A digital health and social care strategy for Wales*. | 2015 | Welsh Government | Wales, UK |  | Moderate evidence |  |
| Welsh Government.  | Welsh Government | ENABLE – Support for Independent Living.  | 2017 | Retrieved from http://gov.wales/topics/housing-and-regeneration/housing-quality/aids-and-adaptations/support-for-independent-living/?lang=en | Wales, UK |  | Moderate evidence |  |
| Westwood, S., & Daly, M.  | *Social Care and Older People in Home and Community Contexts: A Review of Existing Research and Evidence*. | 2016 | Department of Social Policy and Intervention and Green Templeton College, University of Oxford. | UK | There remains the pressing and unresolved issue of how to fund the growing care needs of older people, particularly during times of austerity. It may be that only a significant cultural shift, which supports systems and practices which prioritise, value and promote the provision of care (both formal and informal), will resolve the growing gap between care needs and available care support. Our society as a whole may need to become re-orientated so that care becomes central to its operating values and social norms, rather than merely adjunct to them. | Moderate evidence |  |
| WHO.  | *Global age-friendly cities : a guide.*  | 2007 | World Health Organization. | Worldwide, printed in France |  | Moderate evidence | This is a guide to age friendly cities |

**LHS**

# Section 5: Preventing loneliness and social isolation: Rapid review: cost-effectiveness of loneliness and social isolation interventions for older people

A rapid systematic search strategy was developed to undertake the literature review. A range of databases and grey literature sources across a diffuse evidence base were identified (see Figure 5.1) to encompass the relevant literature within public health, health economics and clinical fields.

A comprehensive set of inclusion and exclusion criteria consistent with the projects’ scope was applied to the titles and abstracts of all publication citations retrieved from the searches.

The rapid review on the cost-effectiveness of loneliness and social isolation questions and search strategy are outlined in Figure 5.1.

Keywords for the cost-effectiveness of loneliness and social isolation rapid review are shown in Table 5.1.

**Table 5.1 Keywords for the health economic evaluation rapid review: cost effectiveness of loneliness and social isolation intervention**

|  |  |  |  |
| --- | --- | --- | --- |
| **Population keywords** | **Condition** | **Interventions** | **Additional keywords** |
| aged [Mesh]ageingaging [Mesh]elder\*elderlygeriatric\*gerontology\*infirmold\*senior\*veteran\*retire\*Middle Aged | social isolationisolated alienat\*exclusionsocial contact\*social environment\*lonel\*LonelinessSocial AlienationSocial Distance | BefriendHome visitMentor\*PsychosocialNetworkPrevent\*Promot\*SupportSelf-helpSocial active\*Health promotionHealth statusCommunity networkSocial participant\*Social integrat\*FriendshipSelf-esteemExercise CreativePhysical active\*PeerSocio-medical | cost analys\*cost benefitcost consequencecost effective\*cost minimisationcost utilit\*cost\*costs and cost analysis (Mesh)economic analys\* economic\*health care cost\* health economic\* healthcare cost\*QALY quality adjusted life yearquality-adjusted life yearreturn on investmentROIsocial return of investmentSROI |

|  |
| --- |
| **Phase 1: Rapid review questions****Primary review questions:**1. What are the costs and benefits of interventions that prevent or alleviate loneliness and social isolation in Older People?

**Secondary review questions:**1. What type of economic evaluation methodology is used to evaluate the cost-effectiveness / return on investment / value for money of loneliness/social isolation interventions?
2. From what perspective is the analysis conducted?
	* 1. To whom do the costs fall and who receives the benefits (or savings)?
3. Are there any potential best or good buys in loneliness/social isolation interventions?
	* 1. Are the interventions scalable?
		2. Are the interventions highly cost-effective relative to a threshold?
4. What is the budget impact /opportunity cost of delivering different loneliness/social isolation interventions?
 |
|  |
| **Searching: Database and other search strategies**Database searches of Cochrane Collaboration Register and Library, DARE, HTA, NHS EED, PubMed.Grey literature searching. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 1 – title screening; Stage 2 – abstract screening; (Two reviewers independantly screen at both stages 1 and 2) |
|  |
| Inter-rater reliability checks between the two review authors. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 3 – full text screening(Second reviewer to conduct limited screening to confirm study eligibility before extraction) |
|  |
| **Data extraction** |
|  |
| **Narrative summary** |

**Figure 1: Rapid review design flowchart: economic evaluations of loneliness and social isolation interventions**

The rapid review literature search identified 51 abstracts. 51 selected titles and abstracts were double screened. In total 28 papers were selected for full text screening. Relevant data was extracted from 16 papers. An additional XX sources of grey literature was also found. The flow of the literature is presented in the PRISMA diagram (see Figure 2).

Full-text articles assessed for eligibility
(n = 28)

Records excluded
(n = 22)

Records screened
(n = 50)

Records after duplicates removed
(n =50)

Records identified through database searching
(n = 51)

#### Identification

#### Screening

#### Eligibility

12 full-text articles excluded, with reasons

* No economic evaluation
* Not older people

Studies included in narrative synthesis
(n = 16)

#### Included

**Figure 5.2 Cost-effectiveness of loneliness and social isolation PRISMA diagram**

**Table of evidence**

**Section 5: Preventing loneliness and social isolation**

| **Author** | **Title** | **Date** | **Name of journal/website** |  **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age Concern | Promoting mental health and well-being in later life. | 2006 | Age UK www.ageuk.org.uk | UK  | This booklet provides commissioners with a guide to services that promote good mental health and well-being in older people. It provides examples of low-cost, high-impact services that meet the needs and aspirations of older people.  | Weak  |  |
| Age UK | Loneliness among older men growing problem in our society. | 2016 | Age UK www.ageuk.org.uk | UK | Loneliness and isolation are not the same thing: the causes of loneliness are not just physical isolation and lack of companionship, but also sometimes the lack of a useful role in society. One of the most effective methods of preventing loneliness is to combat isolation.  | Weak |  |
| Antonucci et al.  | Social relations and depressive symptomatology in a sample of community-dwelling French older adults. | 1997 | Psychology and Aging  | France  | This study assessed the association between social relations and mental health among older people. The results found that social support variables account for more variance in depressive symptomatology than social network variables. | Moderate  |  |
| Burholt & Scharf | Poor Health and Loneliness in Later Life: The Role of Depressive Symptoms, Social Resources, and Rural Environments. | 2014 | Journals of Gerontology, Series B: Psychological Sciences and Social Sciences.  | Republic of Ireland | The results support cognitive discrepancy theory, in that depressive symptoms impact cognitive processes, and interferes with judgments about the adequacy of social interaction. The results also found that the environment can impact loneliness. | Moderate | National data  |
| Cacioppo et al.  | Loneliness as a Specific Risk Factor for Depressive Symptoms: Cross-Sectional and Longitudinal Analyses. | 2006 | Psychology and Aging  | USA  | The results found that loneliness and depressive symptomatology have a combined negative impact on well-being in middle-aged and older adults. | Moderate  |  |
| Carers UK | Prepared To Care  | 2013  | Carers Trust www.carers.org | UK  | Results of the report found that: 75% of carers were unprepared for their caring role; 81% of carers were not aware of the support available; 61% of carers experienced depression; 92% felt more stressed due to their caring role; and 35% felt they were given the wrong advice about the available support.  | Weak  |  |
| Cattan et al.  | The use of telephone befriending in low level support for socially isolated older people - an evaluation. | 2010 | Health & Social Care in the Community.  | UK  | The qualitative evidence demonstrates the impact of telephone befriending on older people's well-being. The authors conclude that befriending schemes offer low-cost means for socially isolated older individuals to become more confident and independent and develop a sense of self-respect that could potentially lead to increased participation and meaningful relationships. | Moderate  | Qualitative analysis of 40 in-depth interviews.  |
| Cattan et al.  | Preventing social isolation and loneliness among older people: a systematic review of health promotion interventions. | 2005 | Ageing and Society  | USA, Canada, UK, Sweden, Germany, the Netherlands, Denmark.  | This systematic review found that educational and social activity group interventions can lessen social isolation and loneliness among older people. However, the evidence on the effectiveness of home visiting and befriending schemes is unclear. | Moderate  | Systematic review, no meta-analysis  |
| Centre for Reviews and Dissemination. | Interventions for loneliness and social isolation. | 2014 | The University of York Centre for Reviews and Dissemination.www.york.ac.uk |  | The results found poor evidence for the effectiveness of interventions to improve loneliness and social isolation. Group-based interventions demonstrated some potential for reducing loneliness and social isolation. Further research is needed to determine the magnitude of the benefit, and the cost-effectiveness of interventions to alleviate loneliness and social isolation.  | Moderate  |  |
| Claxton et al.  | Methods for the Estimation of the NICE Cost Effectiveness Threshold. | 2013  | www.york.ac.uk | UK  |  | Weak  |  |
| Cohen et al.  | The impact of professionally conducted cultural programs on the physical health, mental health, and social functioning of older adults. | 2006 | The Gerontologist  | USA | The intervention group reported higher ratings physical health, fewer doctor visits, less medication use, less instances of falls, and fewer other health problems, compared to the control group. The intervention group also reported improved morale and less loneliness compared to the control group.  | Moderate  |  |
| Cotten et al.  | Impact of internet use on loneliness and contact with others among older adults: Cross-sectional analysis. | 2013 | Journal of Medical Internet Research | USA  | Internet use can potentially reduce loneliness and increase social contact among older adults in assisted and independent living communities. | Moderate  |  |
| Coulton et al.  | Effectiveness and cost-effectiveness of community singing on mental health-related quality of life of older people: Randomised controlled trial. | 2015 | British Journal of Psychiatry | England  | The results found that community group singing had a significant effect on mental health-related quality of life, anxiety and depression. Authors concluded that community signing could enhance the mental health of older people. | Strong | RCT  |
| Courtin & Knapp  | Social isolation, loneliness and health in old age: A scoping review. | 2015 | Health and Social Care in the Community. | USA, UK and the Netherlands.  | The results of the scoping review found that a recent development in the literature is the study of the comparative effects of social isolation and loneliness. Depression and cardiovascular health was the most often researched outcomes, followed by well-being. Almost all (apart from two) studies found a negative impact of isolation or loneliness on health.  | Moderate  | Scoping review – not a systematic review of the evidence  |
| Cutler  | Tackling Loneliness in Older Age - The role of the Arts. | 2012 | The Baring Foundation www.baringfoundation.org.uk | UK  | Report highlights the detrimental effect of loneliness among older people. Report affirms that over 1 million people over 65 are lonely and that loneliness is strongly associated with poor physical and mental health. The report recommends the arts as an effective method of combating loneliness but state it can be overlooked by older people’s services. | Weak  |  |
| Dayson et al.  | The Rotherham Social Prescribing Service for People with Long-Term Health Conditions: Annual Evaluation Report. | 2016 | Centre for Regional Economic and Social Research, Sheffield Hallam University www4.shu.ac.uk | England  | The report found that the intergenerational sessions of the ‘Active Regen’ programme (included in this report) had a positive impact on social isolation. The older participants benefitted from spending time with the younger coaches.  | Moderate  | Evaluation report  |
| Department of Health  | Making a strategic shift to prevention and early intervention A guide. | 2008 | Department of Health www.dorsetforyou.gov.uk | England  | This guide recommends a comprehensive range of wellbeing services for older people including activities to combat social isolation such as befriending and luncheon clubs.  | Moderate  |  |
| Findlay  | Interventions to reduce social isolation amongst older people: where is the evidence? | 2003a | Ageing and Society  | USA, Australia, Canada, the Netherlands, Italy, and Sweden.  | The results found that although there have been many interventions to reduce social isolation conducted worldwide, there is minimal evidence to show their effectiveness.  | Moderate | Literature review of empirical evidence.  |
| Frick at el.  | Modeled Cost-Effectiveness of the Experience Corps Baltimore Based on a Pilot Randomized Trial. | 2004 | Journal of Urban Health  | USA | The results found that when using conservative modelling assumptions and excluding benefits to teachers, principals, and the surrounding community, the Experience Corps Baltimore was costly for the older adults' health improvements, but only needs small long-term benefits to the target children to make the program cost-effective or cost-saving. | Moderate |  |
| Fulton & Jupp  | Investing to Tackle Loneliness: A Discussion Paper. | 2015a | Social Financewww.socialfinance.org.uk | UK  |  | Weak | Discussion paper |
| Glass et al.  | Population based study of social and productive activities as predictors of survival among elderly Americans. | 1999 | BMJ (Clinical Research Ed.) | USA  | Results found that social and productive activities that involve little or no improvement of fitness lower the risk of all-cause mortality, to the same extent as fitness activities do.  | Moderate  |  |
| Glymour et al.  | Social ties and cognitive recovery after stroke: Does social integration promote cognitive resilience? | 2008 | Neuroepidemiology | USA | The results suggest that emotional support can potentially increase cognitive resilience, and that social ties can provide cognitive reserves that defends against impaired cognition following a stroke. The authors noted that because social ties did not predict cognitive change, other possible explanations, e.g reverse causation, may explain the results.  | Moderate |  |
| Godfrey et al.  | Building a good life for older people in local communities: The experience of ageing in time and place. | 2004 | Community care  | England  | The research discussed in this article states that old age is not about decline, but about how to effectively deal with transition and loss, and that being part of a community where older people are respected and valued is fundamental.  | Weak  |  |
| Green et al.  | Risk factors for depression in elderly people: a prospective study. | 1992 | Acta Psychiatrica Scandinavica | UK | Results of the study found that there were three factors that were significantly related to the development of depression 3 years later; a lack of satisfaction with life; feelings of loneliness; and smoking. | Moderate |  |
| Health Quality Ontario. | Social isolation in community-dwelling seniors: an evidence-based analysis. | 2008 | Health Quality Ontario. | Canada | The results of the review unearthed some interventions that improved social isolation and loneliness among older people; however, they were directed at specifically targeted groups and involved only some of the many potential causes of social isolation. The authors conclude that further research is needed to determine the effectiveness of interventions to reduce social isolation among community-dwelling seniors.  | Moderate | Systematic review of the literature |
| Holt-Lunstad et al.  | Loneliness and Social Isolation as Risk Factors for Mortality: A Meta-Analytic Review. | 2015 | Perspectives on Psychological Science | Multi-national | The results found the influence of objective and subjective social isolation on risk for mortality is similar with well-established risk factors for mortality. | Moderate | Meta-analytic review  |
| Holt-Lunstad et al. | Social Relationships and Mortality Risk: A Meta-analytic Review. | 2010a | PLoS Medicine |  | The authors concluded that the impact of social relationships on mortality risk is comparable with well-established risk factors for mortality. | Moderate | Meta-analytic review |
| Holwerda et al.  | Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam Study of the Elderly (AMSTEL). | 2014 | Journal of Neurology, Neurosurgery & Psychiatry | The Netherlands | The results found that feelings of loneliness, rather than being alone, is related to an increased risk of clinical dementia in older people. The authors conclude that feelings of loneliness should be considered as a major clinical risk factor for dementia, that is independent from vascular disease, depression and other confounding factors, deserves clinical attention.  | Moderate  |  |
| Huckett  | Gloucestershire Village & Community Agents. Cost / Benefit Analysis. | 2014 |  | UK | Anyone over the age of 16 living in Gloucestershire, or registered with a Gloucestershire GP, can access Community Connectors. Referrals can be made by a health or social care professional, a Voluntary and Community Group, members of the community as well as self-referral. |  |  |
| James et al.  | Late-Life Social Activity and Cognitive Decline in Old Age. | 2011 | Journal of the International Neuropsychological Society | USA  | The results found that the rate of global cognitive decline was reduced by an average of 70% in people who were frequently socially active, compared to people who weren’t socially active (score = 1.83, 10th percentile). Consequently, the results of this study demonstrate that older people will experience less cognitive decline if they frequently partake in social activities | Strong |  |
| Jones et al.  | Social return on investment analysis of an art group for people with dementia. | 2014 | The Lancet  | UK  | In this six-step social return on investment analysis of an art group for people with dementia, three key stakeholders have been identified: participants, participants’ families, and staff at residential units where the project is taking place. The next step of this SROI is to assign a monetary value to non-physical outcomes such as increased wellbeing, increased confidence in participants, and increased staff morale. | Moderate  |  |
| Jones, C. H. | Combining daycare for children and elderly people benefits all generations. | 2017 | The Conversation  | UK | Article discusses the benefits of combining daycare of children and elderly people and gives examples from the UK, America, Australia and Japan. The research has found that interactions between older and younger populations can have significant benefits for each generation. | Weak  |  |
| Jones et al.  | Older people going online: its value and before-after evaluation of volunteer support. | 2015 | Journal of Medical Internet Research | UK  | The results of the study found that volunteer support to go online was associated with increased social contacts, reduced loneliness, and improved mental well-being in older people. Furthermore, the help to go online seemed to be highly valued among the participants.  | Moderate  |  |
| Jopling | Promising approaches to reducing loneliness and isolation in later life. | 2015 | Campaign to End Loneliness Age UKwww.campaigntoendloneliness.org | England | This guide highlights the necessity to reduce loneliness, the author states that action to do this should primarily be driven by local authorities who should ensure that adequate services and supports are in place.  | Weak  |  |
| King’s Fund  | Social prescribing: from rhetoric to reality | 2017 | The King’s Fund | England | Webpage provides details of a one-day workshop event where the benefits of social prescribing will be discussed, and how to measure and evaluate the impact and outcomes effectively. | Low | Webpage with details of a workshop event. |
| Kinsella  | Older people and social isolation evidence: a review of the evidence. | 2014 |  | UK | Group activities which have an arts, educational learning or social focus are particularly beneficial: A systematic review supported this finding that group interventions involving some form of educational, training, arts or social activity that target specific groups of people are the most effective. | Weak |  |
| Knapp et al.  | Building community capacity: making an economic case. PSSRU: Personal Social Services Research Unit. | 2011 | www.pssru.ac.uk/pdf/dp2772.pdf | England |  | Weak | Discussion paper  |
| Knapp et al.  | Building community capital in social care: Is there an economic case? | 2013 | Community Development Journal | England | This study used a cost-benefit approach and decision modelling techniques to show potential costs and economic consequences of building community capital in social care. The results suggest that there could be significant savings to society when investing in community capital-building initiatives at relatively low cost. | Moderate  |  |
| Knapp et al.  | Mental health promotion and mental illness prevention: The economic case. | 2011 | Department of Health  | UK  | This report discussed befriending among older people and concludes that befriending interventions are unlikely to result in cost savings to the public purse; however they can increase older people’s quality of life at a low cost. | Moderate  |  |
| Landeiro et al.  | The impact of social isolation on delayed hospital discharges of older hip fracture patients and associated costs. | 2016 | Osteoporosis International | Portugal | Results found that being isolated or at a high risk of social isolation, was significantly associated with delayed discharges. The total costs of delayed discharges were between 11.2% and 30.7 % of total costs.  | Moderate |  |
| Local Government Association  | Combating loneliness: A guide for local authorities. | 2016 | Campaign to End Lonelinesswww.campaigntoendloneliness.org | UK  | This guide is targeted at local authorities and is based on a three-tiered framework for combating loneliness; at a strategic level, in local communities and through one–to-one work with individuals. | Weak |  |
| Marsh  | Social value of Local Area Coordination in Derby: a forecast social return on investment analysis for Derby City Council.  | 2016 | Social Value of Local Area Coordination in DerbyKingfishers (Project Management) Ltd.  | England  | Report discusses the Local Area Coordination in Derby, and its intention to support residents in the local community to ‘get a life, not a service’, with the aim of encouraging people to find community-based solutions rather than depending on services. A forecast SROI analysis found that Local AreaCoordination is producing significant social value with approximately£4 of value for every £1 invested.  | Weak |  |
| McDaid et al.  | Reconnections Evaluation Interim Report. | 2016 | Personal Social Services Research Unit (PSSRU). | England  | Results found that ‘Reconnections’ intervention was valued by participants and provided a break from difficult isolated personal situations. All participants reported positive changes in their lives associated with Reconnections programme. Additionally, participation in Reconnections programme encouraged some participants to partake in additional social activities.  | Moderate  | Intervention evaluation  |
| Men’s Sheds Cymru | List of all Men’s Sheds in Wales updated 19 July 2017. | 2017 | www.mensshedscymru.co.uk | Wales  | Men’s Sheds Cymru set up social groups in local communities in order to benefit me, with the intention of reducing social isolation in the male population.  | Low  |  |
| Milligan et al.  | Older men and social activity: a scoping review of Men’s Sheds and other gendered interventions. | 2015 | Ageing and Society  | Australia, UK, Canada, and Norway  | The result found some limited evidence that Men’s Sheds and other gendered social activities effect the mental health and wellbeing of older men; however, results found little evidence that these types of activities effect physical health. | Moderate | Scoping review of 14 studies  |
| Morita & Kobayashi | Interactive programs with preschool children bring smiles and conversation to older adults: time-sampling study. | 2013 | BMC Geriatrics | Japan  | The authors conluded that interactive programs with young children seem to increase happiness and conversation in older people.  | Moderate | Only 25 participants in study  |
| Mountain et al.  | ‘Putting Life in Years’ (PLINY) telephone friendship groups research study: pilot randomised controlled trial. | 2014 | Trials  | UK  | The authors concluded that the recruitment and retention of participants to a definitive trial with a recruitment timeframe of 1 year is possible. In order to recruit a sufficient amount of volunteers to meet the request for telephone befriending intervention in this study, the trial would need to be carried out in more than one major population centre and/or would require the dedicated management of volunteers.  | Moderate | Pilot RCT  |
| National Assembly for Wales  | Health, Social Care and Sport Committee Inquiry into loneliness and isolation Consultation responses.  | 2017 | National Assembly for Wales www.senedd.assembly.wales | Wales |  | Weak |  |
| NICE  | Mental wellbeing in over 65s: occupational ther therapy and physical activity interventions. | 2008 | www.nice.org.uk | UK  | This guideline provides advice on how to foster mental wellbeing in people aged over 65. The guideline centres on providing practical support to older people for everyday activities that incorporate occupational therapy principles and methods. This is accomplished by working with older people and their carers to determine what type of support they need. | Moderate  | Public health guideline  |
| NICE  | Older people: independence and mental wellbeing. | 2015 | www.nice.org.uk | UK  | This report from NICE discusses the quality standards that need to be considered when commissioning or providing services to improve the independence and well-being among older people.  | Moderate  | Quality standard report  |
| O’Connell et al.  | Clinical review Recent developments: Suicide in older people Sources and selection criteria Dispelling the myths (Greek and otherwise). | 2004 | BMJ  | Republic of Ireland  | Due to the increased risk of suicide among older people, suicide screening, prevention, and management interventions should be more emphasised on the older population. The authors express the need for vigorous screening and treatment for depression and suicidal thoughts in the elderly population, and especially for elderly people with additional risk factors such as co-morbidities and those who are experiencing social isolation.  | Moderate  | Clinical review published in the BMJ  |
| Older People’s Commissioner for Wales. | Men’s Sheds Cymru. | 2015 | www.olderpeoplewales.com | Wales | The Commissioner highlights the growing issue of loneliness and isolation in Wales. The effect of loneliness and isolation on older people’s health is the same as smoking 15 cigarettes per day. Loneliness and isolation is more prevalent among men. Men’s Sheds is based on the notion that men don’t talk ‘face to face’ but ‘shoulder to shoulder’. The Commissioner hopes that the Men’s Sheds initiative will continue to grow across Wales in order to combat loneliness among older men in Wales.  | Low  | Opinion piece on webpage  |
| Older People’s Commissioner for Wales. | Response from the Older People’s Commissioner for Wales to the UK Government HM Treasury ‘Public Financial Guidance Review’ consultation. | 2016 |  |  |  |  |  |
| Older People’s Commissioner for Wales. | Response from the Older People’s Commissioner for Wales to the National Assembly for Wales Health, Social Care and Sport Committee Inquiry into loneliness and isolation. | 2017 | Health, Social Care and Sport Committee http://www.senedd.assembly.wales | Wales | In this paper, the Older People’s Commissioner for Wales responded to the National Assembly for Wales’ Health,Social Care and Sport Committee Inquiry into loneliness and isolation. She concludes, that Wales cannot afford to put older people at risk of the harmful, devastating and far-reaching effects of loneliness and isolation. | Low  | Response to the National Assembly for Wales enquiry  |
| Optimity Matrix | Independence and mental wellbeing (including social and emotional wellbeing) for older people Older people: Economic Analysis.  | 2015 | NICE (CPH) Internal Review Team | UK  | There is limited evidence regarding the base with respect to cost-effectiveness of interventions to improve and promote mental well-being of older people. There is significant heterogeneity in interventions and the studies have methodical limitations flaws. Consequently, the cost-effectiveness of interventions reduce loneliness and social isolation in the older population is unknown.  | Moderate |  |
| Owen et al.  | Cost-effectiveness of a befriending intervention to improve the wellbeing and reduce loneliness of older women. | 2016 | The Lancet  | UK  | The results of the study found the intervention to be effective and cost-effective. The findings suggest that befriending interventions can increase the health and well-being of older women and are a good use of public spending.  | Strong | 115 participants. Study published in The Lancet.  |
| Ozbay et al.  | Social support and resilience to stress: from neurobiology to clinical practice. | 2007 | Psychiatry | UK  | The literature shows that social support is essential for maintaining physical and psychological health. The negative impact of poor social support and the positive effects of good social support in mental health has been well established in the literature. The authors call for more research and development of specific interventions aiming to increase social support for psychiatrically ill and at-risk populations. | Low/moderate  | Literature review – not systematic  |
| Park  | The effects of intergenerational programmes on children and young people. | 2015 | International Journal of School and Cognitive Psychology | USA, Brazil and Canada  | Intergenerational programmes were found to benefit psychological outcomes including reduced anxiety and increased self-worth, and also positive changes in attitudes towards older people shown as better mutual understanding.  | Moderate | Literature review of RCTs, non-RCTs, and before and after observational studies. |
| Petitte et al.  | A Systematic Review of Loneliness and Common Chronic Physical Conditions in Adults. | 2015 | Open Psychol J. | Worldwide - USA, the Netherlands, UK, Israel, Turkey, Sweden, Norway, Malaysia, Ireland, Greece, Canada, Finland, New Mexico, South America.  | Review found loneliness to be a major significant biopsychosocial stressor that is prevalent in adults with heart disease, hypertension, stroke, and lung disease. The research suggests that loneliness is linked with obesity and with psychological stress in obese persons. Nevertheless, the authors state that limited interventions have shown the long-term effect of reducing loneliness in adults with these chronic illnesses.  | Moderate | Systematic literature review, following PRISMA guidelines, of 22 quantitative studies.  |
| Pitkala et al.  | Effects of Socially Stimulating Group Intervention on Lonely, Older People’s Cognition: A Randomized, Controlled Trial. | 2011 | The American Journal of Geriatric Psychiatry | Finland  | Within the 3 month period, a greater improvement in cognition was observed in the intervention group compared to the control group. At 12 months, mental function was significantly improved in the intervention group compared with the control group.  | Strong | RCT including 235 participants.  |
| Pitkala et al. | Effects of psychosocial group rehabilitation on health, use of health care services, and mortality of older persons suffering from loneliness: A randomized, controlled trial. | 2009 | Journals of Gerontology - Series A Biological Sciences and Medical Sciences | Finland  | At 2 year follow-up, survival rates were 97% and 90% for the intervention group and control group, respectively. The intervention group reported a significant improvement in subjective health, this in turn resulted in significantly lower health care costs at follow-up.  | Strong | RCT of 235 participants  |
| Roderick et al.  | Local Community Initiatives in Western Bay: Formative Evaluation Summary Report | 2016 | Swansea University  | Wales | Benefits of Local Area Coordination (LAC) and Local Community Coordination (LCC) in Neath Port Talbot and Swansea included improvements in areas such as community engagement, identifying community assets and individuals for support. In Swansea, LAC implementation produced cost benefits of £800k - £1.2m, and benefits are predicted to increase when LAC is fully rooted within communities.  | Moderate | Evaluation summary report  |
| Russell et al.  | Loneliness and nursing home admission among rural older adults. | 1997 | Psychology and Aging | USA | The results found that high levels of loneliness were associated with an increased probability of nursing home admission and decreased time until nursing home admission. The impact of very high levels of loneliness on nursing home admission stayed significantly significant after controlling for other variables including age, income, physical health and social contact. | Moderate  | 3000 participants studied over a 4 year time period. However, paper is dated – published in 1999.  |
| Social Exclusion Unit | A Sure Start to Later Life Ending Inequalities for Older People Improving Services, Improving Lives. | 2006 | Office of the Deputy Prime Minister | UK  | This report discusses the Sure Start to later life initiative that uses the same principles as the children’s model to improve access and bring together services around older people, with the intention of reducing inequalities for older people.  | Low/moderate  | Report of Sure Start to later life  |
| Social Value Lab | Craft Cafe. Creative Solutions to Isolation & Loneliness: Social Return on Investment Evaluation. | 2011 | Social Value Lab  | Scotland  | The SROI analysis found that the Craft Café pilot programme produced a social value of between £4.86 and £9.57 for every pound of invested. | Moderate  |  |
| Stickley & Hui | Social prescribing through arts on prescription in a UK city: Participants’ perspectives (Part 1). | 2012 | Public Health  | UK  | Individuals that took part in the Arts on prescription programme reported social, psychological and occupational benefits, participants also reported pride in their art work.  | Moderate | 16 qualitative interviews  |
| Teater  | Intergenerational Programs to Promote Active Aging: The Experiences and Perspectives of Older Adults. | 2016 | Activities, Adaptation & Aging | England  | The results from the survey found that partaking in the ‘Time after Time’ programme increased the confidence, self-esteem and social skills of older people. Their participation also positively impacted their emotional and overall health and well-being, and increased feelings of relatedness to their community.  | Moderate | Survey of 70 respondents.  |
| Tenovus Cancer Care | About Sing with Us | 2007 | https://tenovuscancercare.org.uk/how-we-can-help-you/sing-with-us/about-sing-with-us/ | UK  | Webpage provides information about the Sing with Us choirs and how people can get involved.  | Low  | Webpage |
| Valtorta et al.  | Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. | 2016 | Heart (British Cardiac Society) | Europe, North America, Asia and Australia  | The results found that a lack of social relationships are related to an increased risk of coronary heart disease (CHD) and stroke. The authors state that future research is needed to determine whether interventions to combat loneliness and isolation can reduce CHD and stoke in high income countries. | High | Systematic review and meta-analysis |
| Wenger et al.  | Social Isolation and Loneliness in Old Age: Review and Model Refinement. | 1996 | Ageing and Society  | Wales  | The results found that the key factors for isolation are: marital status, network type and social class; and, for loneliness: network type, household composition and health. | Moderate  |  |
| WHO  | Active Ageing: A Policy Framework (Vol. 5) | 2002 | https://doi.org/10.1080/713604647 |  |  |  |  |
| WHO | The case for investing in public health. | 2014 | World Health Organization Europe www.euro.who.int | Europe  | This report provides examples of interventions with early returns on investment and longer-term benefits. The report highlights the need for investing in cost-effective interventions in order to establish sustainable health systems and economies.  | Moderate  | Public health summary report  |
| Wilson et al.  | Loneliness and risk of Alzheimer disease. | 2007 | Archives of General Psychiatry |  | The results found that for lonely people the risk of Alzheimer’s disease was doubled compared with individuals who were not lonely. These findings were not changed after controlling for indicators of social isolation. Furthermore, loneliness was associated with lower cognition at baseline and a greater cognitive decline at the follow-up period.  | Moderate  |  |
| Windle et al.  | Public health interventions to promote mental well-being in people aged 65 and over: systematic review of effectiveness and cost-effectiveness. | 2007 |  | UK, Canada  | The authors highlight the lack of summary robust evidence for the effectiveness and cost-effectiveness of interventions to improve the mental well-being of older people. The review highlighted six positive evidence statements regarding exercise and physical activity(four statements), group-based health promotion and non-clinical psychologicalInterventions. | Strong |  |
| Windle et al.  | Dementia and Imagination: a mixed-methods protocol for arts and science research.  | 2016 | BMJ Open  | England and Wales  | This is a protocol for a mixed-methods study to determine if partaking in art can improve quality of life and well-being, and if so, how does it make a difference and why? The study also sets out to determine whether the intervention has wider social and community impacts.  | Low  | Study protocol – no results.  |
| Windle et al.  | Preventing loneliness and social isolation: interventions and outcomes. | 2011 | Social Care Institute for Excellence, Research Briefing 39. |  |  |  |  |
| WRVS | Loneliness amongst older people and the impact of family connections. | 2012 | Social Care Institute for Excellence | UK  | Feelings of isolation and loneliness among older people are affected by how close they live to their children and how often they see them. Older Individuals who see their children once a month or less are twice as likely to feel lonely than those who see their children every day. Almost 75% of people aged 75 years and above that live alone feel lonely.  | Moderate  |  |

# Section 6: Caring for older carers: Rapid review: cost-effectiveness of caring for older carers

A rapid systematic search strategy was developed to undertake the literature review. A range of databases and grey literature sources across a diffuse evidence base were identified (see Figure 6.1) to encompass the relevant literature within public health, health economics and clinical fields.

A comprehensive set of inclusion and exclusion criteria consistent with the projects’ scope was applied to the titles and abstracts of all publication citations retrieved from the searches.

The rapid review on the cost-effectiveness of caring for older carers questions and search strategy are outlined in Figure 6.1.

Keywords for the cost of caring for older carers rapid review are shown in Table 6.1.

**Table 6.1 Keywords for the health economic evaluation rapid review: cost of caring for older carers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Person keywords** | **Elderly keywords** | **Interventions** | **Additional keywords** |
| care givercaregivercaregivers [Mesh]care-giver\*carer\*caringhome nursing [Mesh]informal careinformal caringfamily carefamily caring | aged [Mesh]ageingaging [Mesh]cognitive impairmentelder\*elderlygeriatric\*gerontology\*infirmold\*senior\*veteran\* | breakburn outburn-outcarer clubscaringinformal respiteinterventionpreventionprogramprogrammepsychosocialpsychotherapyrespitesocial care | cost analys\*cost benefitcost consequencecost effective\*cost minimisationcost utilit\*cost\*costs and cost analysis (Mesh)economic analys\* economic\*health care cost\* health economic\* healthcare cost\*QALY quality adjusted life yearquality-adjusted life yearreturn on investmentROIsocial return of investmentSROI |

|  |
| --- |
| **Phase 1: Rapid review questions on the cost-effectiveness of caring for older carers****Primary review questions:**1. What do caring for carers interventions cost?
2. What are the direct and indirect healthcare costs and incremental resource consequences of providing care for carers in the UK?

**Secondary review questions:**1. What type of economic evaluation methodology is used to evaluate the cost-effectiveness / return on investment / value for money of caring for carer interventions?
2. From what perspective is the analysis conducted?
	* 1. To whom do the costs fall and who receives the benefits (or savings)?
3. Are there any potential best or good buys in caring for carer interventions?
	* 1. Are the interventions scalable?
		2. Are the interventions highly cost-effective relative to a threshold?
4. What is the budget impact /opportunity cost of delivering different caring for carer interventions?
 |
|  |
| **Searching: Database and other search strategies**Database searches of Cochrane Collaboration Register and Library, DARE, HTA, NHS EED, PubMed.Grey literature searching. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 1 – title screening; Stage 2 – abstract screening; (Two review authors independently screen at both stages 1 and 2) |
|  |
| Inter-rater reliability checks between the two review authors. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 3 – full text screening(Second review author to conduct limited screening to confirm study eligibility before extraction) |
|  |
| **Data extraction** |
|  |
| **Narrative summary** |

**Figure 6.1: Rapid review design flowchart: Cost of caring for carers**

**Keywords: Cost of caring for carers**

The rapid review literature search identified 335 abstracts. 335 selected titles and abstracts were double screened. In total 48 papers were selected for full text screening. Relevant data was extracted from 14 papers from the rapid review and from a further 41 additional sources (total n = 55 sources). The flow of the literature is presented in the PRISMA diagram (see Figure 2).

Records excluded
(n = 287)

Records screened
(n = 335)

Records identified through database searching
(n = 335)

#### Identification

Records after duplicates removed
(n =335)

#### Screening

#### Eligibility

Full-text articles excluded, with reasons (n= 5 not at all relevant after full screening; n = 29 = about patient costs and not about the cost of caring for carers)

 (n = 34)

Full-text articles assessed for eligibility
(n = 48)

Studies included in quantitative synthesis
(n = 14)

#### Included

**Figure 2 Cost of caring for older carers PRISMA diagram**

**Table of evidence**

**Section 6: Caring for older carers**

| **Author** | **Title** | **Date** | **Name of journal/website** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age UK.  | Briefing: Health and Care of Older People in England  | 2017 | Age UK | UK |  | Moderate evidence |  |
| Alzheimer’s Society.  | *Risk Factors for Dementia Factsheet 450*. | 2016 | Alzheimer’s Society | UK |  | Weak evidence |  |
| Alzheimer’s Society. | *What is dementia? Factsheet 400*. | 2017 | Alzheimer’s Society | UK |  | Weak evidence |  |
| Andrén, S., & Elmståhl, S.  | Effective psychosocial intervention for family caregivers lengthens time elapsed before nursing home placement of individuals with dementia: A five year follow-up study. | 2008 | *International Psychogeriatrics*, *20*(6), 1177–1192 https://doi.org/10.1017/S1041610208007503 | Sweden | The costs of home help services were lower in the subgroup of spouse caregivers in the intervention group and the cost of nursing home placement was lower in the intervention group. While the person with dementia lived at home, caregivers in the intervention group rated higher HRQoL (p<0.01). After the person with dementia had moved to nursing home, spouses in the control group rated a lower HRQoL (p<0.001). | Strong evidence |  |
| Artaso, I. B., Martin, C. M., & Cabases Hita, J. M.  | Cost-consequence analysis of a psychogeriatric day center. *Revista Espanola de Geriatria Y Gerontologia*, *37(6)*, 291–297. | 2002 | *Revista Espanola de Geriatria Y Gerontologia*, *37(6)*, 291–297. | Spain | Compared with community care, day centres do not appear to have had a positive impact on the patients' functional impairment, functional capacity and behavioural disorders. In addition, they did not improve the carers' quality of life and burden. However, satisfaction was significantly higher among carers of patients attending a day centre. | Strong evidence |  |
| Baumgarten, M., Lebel, P., Laprise, Hé., Leclerc, C., & Quinn, C.  | Adult Day Care for the Frail Elderly.  | 2002 | *Journal of Aging and Health*, *14*(2), 237–259. https://doi.org/10.1177/089826430201400204 | Canada | Participants’ and caregivers’ subjective perceptions of the day center’s effects were positive. However, using standard research instruments, there was no evidence of an effect of day center attendance on the client’s anxiety, depression, or functional status; on caregiver burden; or on the cost of health services. | Strong evidence |  |
| Bialystok, E., Craik, F. I. M., Binns, M. A., Ossher, L., & Freedman, M.  | Effects of bilingualism on the age of onset and progression of MCI and AD: Evidence from executive function tests.  | 2014 | *Neuropsychology*, *28*(2), 290–304. https://doi.org/10.1037/neu0000023 | Canada | Results replicated the finding that bilingual patients are several years older than comparable monolinguals at both age of symptom onset and date of first clinic visit. This result could not be attributed to language group differences in such lifestyle variables as diet, smoking, alcohol consumption, physical activity, or social activity | Strong evidence |  |
| Bialystok, E., Craik, F. I. M., & Freedman, M.  | Bilingualism as a protection against the onset of symptoms of dementia.  | 2007 | *Neuropsychologia*, *45*(2), 459–464. https://doi.org/10.1016/j.neuropsychologia.2006.10.009 | Canada | The bilinguals showed symptoms of dementia 4 years later than monolinguals, all other measures being equivalent. Additionally, the rate of decline in Mini-Mental State Examination (MMSE) scores over the 4 years subsequent to the diagnosis was the same for a subset of patients in the two groups, suggesting a shift in onset age with no change in rate of progression. | Strong evidence |  |
| Buckner, L., & Yeandle, S.  | Valuing Carers 2015. | 2015 |  | UK |  | Weak evidence |  |
| Carers Trust.  | Caring About Older Carers. | 2015 |  | UK |  | Weak evidence |  |
| Carers UK.  | *State of Caring 2014*.  | 2014 | Retrieved from https://www.carersuk.org/for-professionals/policy/policy-library/state-of-caring-2015 | UK |  | Weak evidence |  |
| Charlesworth, G., Shepstone, L., Wilson, E., Thalanany, M., Mugford, M., & Poland, F.  | Does befriending by trained lay workders improve psychological well-being and quality of life for carers of people with dementia.  | 2008 | *Health Technology Assessment*, *12*(4). https://doi.org/99/34/07 [pii] | UK | ‘Access to a befriender facilitator’ is neither an effective nor a cost-effective intervention in the support of carers of people with dementia, although there is a suggestion of cost-effectiveness for the care dyad (carer and care recipient). In common with many services for carers of people with dementia, uptake of befriending services was not high. However, the small number of carers who engaged with befrienders for 6 months or more reported a reduction in scores on HADS depression that approached statistical significance compared with controls (95% CI –0.09 to 2.84). While providing only weak evidence of any beneficial effect, further research into befriending interventions for carers is warranted.  | Strong evidence |  |
| Chatterton, M. Lou, Chambers, S., Occhipinti, S., Girgis, A., Dunn, J., Carter, R., … Mihalopoulos, C.  | Economic evaluation of a psychological intervention for high distress cancer patients and carers: costs and quality-adjusted life years.  | 2016 | *Psycho-Oncology*, *25*(7), 857–864. https://doi.org/10.1002/pon.4020 | Australia | The PI may be cost-effective compared with the nurse-led, minimal contact self-management condition for highly distressed cancer patients and carers. More intensive psychological intervention for patients with greater levels of distress appears warranted. | Strong evidence |  |
| Chien, L. Y., Chu, H., Guo, J. L., Liao, Y. M., Chang, L. I., Chen, C. H., & Chou, K. R.  | Caregiver support groups in patients with dementia: A meta-analysis.  | 2011 | *International Journal of Geriatric Psychiatry*, *26*(10), 1089–1098.https://doi.org/10.1002/gps.2660 | Taiwan | Support groups benefit caregivers and findings of this meta-analysis serve as immediate guidance for group facilitators. Future research should include additional outcome variables with our defined factors on effectiveness collected as demographic characteristic data for comparison. A more comprehensive understanding of the effectiveness of support groups is indicated to enhance outcomes for caregivers and patients. | Strong evidence |  |
| Clare, L., Whitaker, C. J., Craik, F. I. M., Bialystok, E., Martyr, A., Martin-Forbes, P. A., … Hindle, J. V.  | Bilingualism, executive control, and age at diagnosis among people with early-stage Alzheimer’s disease in Wales. | 2016 | *Journal of Neuropsychology*, *10*(2), 163–185. https://doi.org/10.1111/jnp.12061 | Wales, Canada and USA | There may be a delay inonset of AD in Welsh/English bilinguals, but if so, it is smaller than that found in some otherclinical populations. In this Welsh sample, bilinguals with AD came to the attention ofservices later than monolinguals, and reasons for this pattern could be explored further.There may be a delay inonset of AD in Welsh/English bilinguals, but if so, it is smaller than that found in some otherclinical populations. In this Welsh sample, bilinguals with AD came to the attention ofservices later than monolinguals, and reasons for this pattern could be explored further.There may be a delay inonset of AD in Welsh/English bilinguals, but if so, it is smaller than that found in some otherclinical populations. In this Welsh sample, bilinguals with AD came to the attention ofservices later than monolinguals, and reasons for this pattern could be explored further.There may be a delay in onset of AD in Welsh/English bilinguals, but if so, it is smaller than that found in some other clinical populations. In this Welsh sample, bilinguals with AD came to the attention of services later than monolinguals, and reasons for this pattern could be explored further. | Strong evidence |  |
| Dahlrup, B., Nordell, E., Steen Carlsson, K., & Elmståhl, S.  | Health economic analysis on a psychosocial intervention for family caregivers of persons with dementia.  | 2014 | *Dementia and Geriatric Cognitive Disorders*, *37*(3–4), 181–195. https://doi.org/10.1159/000355365 | Sweden | The costs of home help services were lower in the subgroup of spouse caregivers in the intervention group and the cost of nursing home placement was lower in the intervention group. While the person with dementia lived at home, caregivers in the intervention group reported a higher HRQoL (p < 0.01). After the person with dementia had moved to a nursing home, spouses in the control group had a lower HRQoL (p < 0.001). | Strong evidence |  |
| Dassel, K. B., Carr, D. C., Vitaliano, P., & Pruchno, R.  | Does Caring for a Spouse With Dementia Accelerate Cognitive Decline? Findings From the Health and Retirement Study.  | 2017 | *The Gerontologist*, *57*(2), 319–328. https://doi.org/10.1093/geront/gnv148 | USA | The findings from this study show that spousal caregivers of persons with dementia experience accelerated cognitive decline themselves compared to non-dementia caregivers. These results, along with our previous study findings, suggest that this vulnerable group could benefit from early cognitive screening and psychosocial interventions designed to help dementia caregivers better maintain their cognitive and physical health during and following their intensive caregiving responsibilities. | Strong evidence |  |
| Donaldson, C., & Gregson, B.  | Prolonging life at home: What is the cost?  | 1989 | *Journal of Public Health (United Kingdom)*, *11*(3), 200–209. https://doi.org/10.1093/oxfordjournals.pubmed.a042468 | UK | If life at home is preferable to long-term care, FSU care can be judged cost effective. However, regarding implementation of such schemes, cash-limited local authorities appear to be forced to take on schemes which, despite being cost effective when taking a broad range of resources into account, cost more than they save as far as the local authority itself is concerned. | Strong evidence |  |
| Forster, A., Dickerson, J., Young, J., Patel, A., Kalra, L., Nixon, J., … Farrin, A.  | A cluster randomised controlled trial and economic evaluation of a structured training programme for caregivers of inpatients after stroke: The TRACS trial.  | 2013a | *Health Technology Assessment*, *17*(46), 1–98. https://doi.org/10.3310/hta17460 | UK | The economic evaluation suggests that from a patient and caregiver perspective, health and social care costs, societal costs and outcomes are similar for the intervention and control groups at 6 months, 12 months and over 1 year. | Strong evidence |  |
| Forster, A., Dickerson, J., Young, J., Patel, A., Kalra, L., Nixon, J., … Farrin, A.  | A structured training programme for caregivers of inpatients after stroke (TRACS): A cluster randomised controlled trial and cost-effectiveness analysis.  | 2013b | *The Lancet*, *382*(9910), 2069–2076. https://doi.org/10.1016/S0140-6736(13)61603-7 | UK | In a large scale, robust evaluation, results from this study have shown no differences between the LSCTC and usual care on any of the assessed o | Strong evidence |  |
| Gaugler, J. E., Zarit, S. H., Townsend, A., Parris Stephens, M. -a., & Greene, R.  | Evaluating Community-Based Programs for Dementia Caregivers: The Cost Implications of Adult Day Services.  | 2003 | *Journal of Applied Gerontology*, *22*(1), 118–133. https://doi.org/10.1177/0733464802250049 | USA | The findings emphasize that adult day programs are most effective for dementia caregivers who use these services consistently and for longer periods of time. Moreover, practitioners must develop methods to encourage early utilization of adult day services during the caregiving career to increase the range of benefits | Strong evidence |  |
| Gilden, D. M., Kubisiak, J. M., Kahle-Wrobleski, K., Ball, D. E., & Bowman, L.  | Using U.S. Medicare records to evaluate the indirect health effects on spouses: a case study in Alzheimer’s disease patients.  | 2014 | *BMC Health Services Research*, *14*(1), 291. https://doi.org/10.1186/1472-6963-14-291 | USA | The study methodology provides a framework for comprehensively evaluating medical costs of both chronically ill patients and their spouses. This method also provides monthly data, which makes possible a longitudinal evaluation of the cost effects of specific health events. The observed correlations provide a coherent demonstration of the interdependence between AD patients’ and spouses’ health. Future research should examine caregiving burden and other possible factors contributing to the AD spouses’ health outcomes | Strong evidence |  |
| Gitlin, L. N., Hodgson, N., Jutkowitz, E., & Pizzi, L.  | The Cost-Effectiveness of a Nonpharmacologic Intervention for ... | 2010 | *The American Journal of Geriatric Psychiatry*, *18*(6), 510–519. | USA | Findings suggest that investment in TAP is cost-effective and afforded families an important, limited and highly valued resource, needed time off from caregiving. This non-pharmacologic approach should be considered part of the clinical management of dementia | Strong evidence |  |
| Gustavsson, A., Jonsson, L., Rapp, T., Reynish, E., Ousset, P. J., Andrieu, S., … ICTUS Study Group.  | Differences in resource use and costs of dementia care between European countries: baseline data from the ICTUS study.  | 2010 | *The Journal of Nutrition, Health & Aging*, *14*(8), 648–654. https://doi.org/10.1186/s13195-016-0215-9 | Sweden | Costs of Alzheimer’s Disease are high across European countries. Activities of daily living is an important determinant of care costs. Formal care service use is lower and informal care higher in Southern Europe compared to Western and Northern Europe. Differences in resource utilization patterns are important to consider in international studies of dementia care costs as well as in economic evaluations of new treatments for dementia. | Strong evidence |  |
| Health Challange Wales.  | *Dementia*. | 2012 | Health Challenge Wales | Wales, UK |  | Moderate evidence |  |
| Health Challenge Wales.  | *Stroke: don’t let it happen to you!* Welsh Assembly Government. | 2012 | Health Challenge Wales | Wales, UK |  | Moderate evidence |  |
| Hedrick, S. C., Rothman, M. L., Chapko, M., Ehreth, J., Inui, T. S., Connis, R. T., … Kelly, J. R.  | Summary and Discussion of Methods and Results of the Adult Day Health Care Evaluation Study Source :  | 1993 | Medical Care , Vol . 31 , No . 9 , Supplement : Adult Day Health Care Evaluation Study Published by : Lippincott Williams & Wilkins Stable URL : http://ww, *31*(9). | USA | The findings of the second phase of the study evaluating contract ADHC provide no support for choosing to provide either contract ADHC or VA-ADHC over the other. The nonrandomized design and smaller sample size suggest that inferences from the contract ADHC evaluation should be drawn with more caution than those from the VA-ADHC evaluation. | Moderate evidence |  |
| Hu, B., Wittenberg, R., & Knapp, M.  | *The hidden cost of dementia in Wales*. | 2015 |  | Wales, UK |  | Moderate evidence |  |
| Joling, K. J., Bosmans, J. E., van Marwijk, H. W., van der Horst, H. E., Scheltens, P., Vroomen, J. L., & van Hout, H. P.  | The cost-effectiveness of a family meetings intervention to prevent depression and anxiety in family caregivers of patients with dementia: a randomized trial. | 2013 | *Trials*, *14*(1), 305. https://doi.org/10.1186/1745-6215-14-305 | The Netherlands | The annual costs of caring for a person with dementia were substantial with informal care being by far the largest contributor to the total societal costs. Based on this study, family meetings cannot be considered a cost-effective intervention strategy in comparison with usual care | Strong evidence |  |
| Knapp, M., King, D., Romeo, R., Schehl, B., Barber, J., Griffin, M., … Livingston, G.  | Cost effectiveness of a manual based coping strategy programme in promoting the mental health of family carers of people with dementia (the START (STrAtegies for RelaTives) study): a pragmatic randomised controlled trial. | 2013 | *Bmj*, *347*(oct25 2), f6342–f6342. https://doi.org/10.1136/bmj.f6342 | UK | The manual based coping intervention START, when added to treatment as usual, was cost effective compared with treatment as usual alone by reference to both outcome measures (affective symptoms for family carers, and carer based QALYs). | Strong evidence |  |
| Livingston, G., Barber, J., Rapaport, P., Knapp, M., Griffin, M., Romeo, R., … Cooper, C.  | START (STrAtegies for RelaTives) study: a pragmatic randomised controlled trial to determine the clinical effectiveness and cost-effectiveness of a manual-based coping strategy programme in promoting the mental health of carers of people with dementia. | 2014 | *Health Technology Assessment*, *18*(61). https://doi.org/10.3310/hta18610 | UK | The START intervention was clinically effective and cost-effective in the short and longer term. The results are robust to the sensitivity analyses performed. Future work is needed to consider mechanism of action; the effects on people with dementia in clinical terms (cognition, neuropsychiatric symptoms, longer-term care home admission); and on health and social care costs. In addition, we will explore the effects of carer abusive behaviour on the care recipient’s care home admission and if this then reduces abusive behaviour. We would also like to implement START and evaluate this implementation in clinical practice | Strong evidence |  |
| Martindale-Adams, J., Nichols, L. O., Zuber, J., Burns, R., & Graney, M. J.  | Dementia caregivers’ use of services for themselves.  | 2016 | *Gerontologist*, *56*(6), 1053–1061. https://doi.org/10.1093/geront/gnv121 | USA | This study shows that caregiver service use is related to caregiver characteristics. Future work should examine the impact of caregiving on health care and social service use and costs. The societal costs of caregiving may be better understood when we account for additional service use by caregivers themselves. A significant clinical and policy issue is who should assess and support the caregiver. Possibilities include the care recipient’s health care practitioner, the caregiver’s health care practitioner, or a formal caregiver-focused program based in the health care system or the social service network. | Strong evidence |  |
| Mason, A., Weatherly, H., Spilsbury, K., Golder, S., Arksey, H., Adamson, J., & Drummond, M.  | The effectiveness and cost-effectiveness of respite for caregivers of frail older people.  | 2007 | *Journal of the American Geriatrics Society*, *55*(2), 290–299. https://doi.org/10.1111/j.1532-5415.2006.01037.x | UK | No reliable evidence was found that respite care either delays entry to residential care or adversely affects frail older people. The economic evaluations all assessed day care, which tended to be associated with similar or higher costs than usual care. Given the increasing numbers of frail elderly people and the lack of up-to-date, good-quality evidence for all types of respite care, better-quality evidence is urgently needed to inform current policy and practice. (250) | Strong evidence |  |
| NICE.  | *Dementia, disability and frailty in later life – mid-life approaches to delay or prevent onset*. | 2015 |  | UK | NICE guidance. | Strong evidence |  |
| Nichols, L. O., Chang, C., Lummus, A., Burns, R., Martindale-Adams, J., Graney, M. J., … Czaja, S.  | The cost-effectiveness of a behavior intervention with caregivers of patients with Alzheimer’s disease.  | 2008 | *Journal of the American Geriatrics Society*, *56*(3), 413–420. https://doi.org/10.1111/j.1532-5415.2007.01569.x | USA | The intervention provided that most scarce of caregiver commodities—time. The emotional and physical costs of dementia caregiving are enormous, and this intervention was able to alleviate some of that cost. | Strong evidence |  |
| Nichols, L. O., Martindale-Adams, J., Zhu, C. W., Kaplan, E. K., Zuber, J. K., & Waters, T. M.  | Impact of the REACH II and REACH VA Dementia Caregiver Interventions on Healthcare Costs.  | 2017 | *Journal of the American Geriatrics Society*, 931–936. https://doi.org/10.1111/jgs.14716 | USA | The intervention provided that mostThe emotional and physical costs of dementia caregiving are enormous, and this intervention was able to alleviate some of that cost.  | Strong evidence |  |
| Norton, S., Matthews, F. E., Barnes, D. E., Yaffe, K., & Brayne, C.  | Potential for primary prevention of Alzheimer’s disease: An analysis of population-based data.  | 2014 | *The Lancet Neurology*, *13*(8), 788–794. https://doi.org/10.1016/S1474-4422(14)70136-X | UK and USA | Even after accounting for non-independence between modifiable risk factors for AD, assuming a causal relationship, around one-third of AD cases in Europe and the UK may be attributable to the risk factors considered. This provides an indication for the potential size of reduction of AD through the improvements in education and deploying effective methods for population reduction of vascular risk. | Strong evidence |  |
| Office for National Statistics.  | 2011 Census data.  | 2011 | Retrieved from <https://www.ons.gov.uk/census/2011census/2011censusdata> | UK | ONS data | Strong evidence |  |
| Office for National Statistics.  | *Deaths Registered in England and Wales (Series DR), 2015 (Statistical Bulletin)*.  | 2016 | Retrieved from http://www.ons.gov.uk/ons/rel/vsob1/mortality-statistics--deaths-registered-in-england-and-wales--series-dr-/2014/stb-mortality-stats-2014.html | UK | ONS data | Strong evidence |  |
| Older People’s Commissioner for Wales.  | Carers Week - June 2009. | 2009 | Older People’s Commissioner for Wales. | Wales, UK |  | Moderate evidence |  |
| Older People’s Commissioner for Wales.  | Wellbeing Indicators for Older People Introduction Summary and main points, 1–38. | 2013 | Older People’s Commissioner for Wales. | Wales, UK |  | Moderate evidence |  |
| Public Health England.  | Health matters: midlife approaches to reduce dementia risk.  | 2016 | Retrieved from https://www.gov.uk/government/publications/health-matters-midlife-approaches-to-reduce-dementia-risk/health-matters-midlife-approaches-to-reduce-dementia-risk | England, UK |  | Moderate evidence |  |
| Reinhard, S. C., Given, B., Petlick, N. H., & Bemis, A.  | *Supporting Family Caregivers in Providing Care*. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Agency for Healthcare Research and Quality (US).  | 2008 | Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21328765 |  |  | Moderate evidence |  |
| Robinson, L., Hutchings, D., & Corner, L. (2006).  | A systematic literature review of the effectiveness of non-pharmacological interventions to prevent wandering in dementia and evaluation of the ethical.  | 2006 | *Health Technology Assessment (Winchester, England)*, *10*(26), iii-108. https://doi.org/10.3310/hta10260 | Systematic Review | Ten studies (n=492) were included: 7 RCTs and 3 non-randomised controlled studies. Ten studies (7 RCTs and 3 non-randomised controlled studies) met the inclusion criteria. The interventions evaluated were multi-sensory environment (3 studies), music therapy (1 study), exercise (1 study), special care units (2 studies), aromatherapy (2 studies) and a behavioural intervention (1 study). There was no robust evidence to recommend any of these non-pharmacological interventions to reduce wandering in dementia. There was some evidence, albeit of poor quality, for the effectiveness of exercise (1 small RCT) and multi-sensory environment on wandering (2 RCTs; mean difference 0.22, 95% CI: 0.02, 0.41). | Strong evidence |  |
| Semple, A., Willis, E., & de Waal, H.  | *Peer Support for people with Dementia A Social return on Investment (SROI) study*. | 2015 |  | UK | The benefits of participating in peer support groups included: reduced isolation and loneliness; increased stimulation, including mental stimulation; and increased wellbeing. Carers experienced a reduction in carer stress, carer burden and reduction in the feeling of loneliness. Volunteers had an increased sense of wellbeing through their engagement with the group, improved knowledge of dementia and gained transferrable skills. Overall the study found that for every pound (£) of investment the social value created by the three groups evaluated ranged from £1.17 to £5.18. | Strong evidence |  |
| Shaw, C., McNamara, R., Abrams, K., Cannings-John, R., Hood, K., Longo, M., … Williams, K. | Systematic review of respite care in the frail elderly. | 2009 | *Health Technology Assessment*, *13*(20), 1–246. https://doi.org/10.3310/hta13200 | UK | There was some evidence to support respite having a positive effect on carers but the evidence was limited and weak. It is difficult, therefore, to make recommendations as to the most appropriate form of delivery of respite, apart from the suggestion that a range of services is probably most appropriate, to provide flexibility of respite provision and responsiveness to carer and care recipient characteristics and needs and also changes in those needs over time. There is a need for further high-quality larger trials that include economic evaluations. | Strong evidence |  |
| Sposaro, F., Danielson, J., & Tyson, G.  | IWander: An Android application for dementia patients. | 2010 | *Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC’10*, 3875–3878 https://doi.org/10.1109/IEMBS.2010.5627669 | USA | The data collected from the device is evaluated using Bayesian network techniques which estimate the probability of wandering behaviour. Upon evaluation several courses of action can be taken based on the situation’s severity, dynamic settings and probability. These actions include issuing audible prompts to the patient, offering directions to navigate them home, sending notifications to the caregiver containing the location of the patient, establishing a line of communication between the patient-caregiver and performing a party call between the caregiver-patient and patient’s local 911. As patients use this monitoring system more, it will better learn and identify normal behavioural patterns which increases the accuracy of the Bayesian network for all patients. Normal behaviour classifications are also used to alert the caregiver or help patients navigate home if they begin to wander while driving allowing for functional independence. | Strong evidence |  |
| Statistics for Wales.  | 2011 Census : First Results on the Welsh Language Wales.  | 2012 | *National Statistics Statistical Bulletin*, *SB 118/201*, 1–13. | Wales, UK | Statistics for Wales | Strong evidence |  |
| van Baal, P. H. M., Hoogendoorn, M., & Fischer, A.  | Preventing dementia by promoting physical activity and the long-term impact on health and social care expenditures.  | 2016 | *Preventive Medicine*, *85*, 78–83. https://doi.org/10.1016/j.ypmed.2016.01.013 | The Netherlands and the UK | Preventing dementia by increasing PA increases life expectancy and can result in decreased spending overall on health and social care, even after additional spending during life years gained has been taken into account. If prevention is targeted at the physically inactive, savings in dementia-related costs outweigh the additional spending in life years gained. | Strong evidence |  |
| Welsh Government.  | National Survey for Wales, 2014-15 - Welsh Language. | 2015 |  | Wales, UK |  | Moderate evidence |  |
| Welsh Government.  | Physical activity and health.  | 2017 | Retrieved 22 September 2017, from http://gov.wales/topics/health/improvement/physical/?lang=en | Wales, UK |  | Moderate evidence |  |
| Woods, R. T., Orrell, M., Bruce, E., Edwards, R. T., Hoare, Z., Hounsome, B., … Russell, I.  | REMCARE: Pragmatic multi-centre randomised trial of reminiscence groups for people with dementia and their family carers: Effectiveness and economic analysis.  | 2016 | *PLoS ONE*, *11*(4), 1–19. https://doi.org/10.1371/journal.pone.0152843 | Wales, UK | This trial does not support the clinical effectiveness or cost-effectiveness of joint reminiscence groups. Possible beneficial effects for people with dementia who attend sessions as planned are offset by raised anxiety and stress in their carers. The reasons for these discrepant outcomes need to be explored further, and may necessitate reappraisal of the movement towards joint interventions | Strong evidence |  |
| Woods R, Brayne C, B. V.  | *Maintaining function and well-being in later life: a longitudinal cohort study (CFAS - WALES). Protocol*.  | 2010 | Retrieved from http://cfaswales.bangor.ac.uk/documents/PROTOCOLv1.pdf | Wales, UK | Protocol. | Moderate evidence |  |
| WRVS.  | *Gold age pensioners, valuing the socio-economic contribution of older people in the UK*.  | 2011 | https://doi.org/10.1017/CBO9781107415324.004 | UK |  | Weak evidence |  |
| Zarit, S. H., & Stephens, M. A. P.  | Stress reduction for family caregivers: Effects of adult day care use.  | 1998 | *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *53B*(5), S267. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=1102817&site=ehost-live | USA | Use of adult day care by caregivers of dementia patients results in lower levels of caregiving-related stress and better psychological well-being when compared to that of controls. | Strong evidence |  |

**LHS**

# Section 7: Caring for older carers: Rapid review: cost of preventing falls

A rapid systematic search strategy was developed to undertake the literature review. A range of databases and grey literature sources across a diffuse evidence base were identified (see Figure 7.1) to encompass the relevant literature within public health, health economics and clinical fields.

A comprehensive set of inclusion and exclusion criteria consistent with the projects’ scope was applied to the titles and abstracts of all publication citations retrieved from the searches.

The rapid review on the cost of preventing falls questions and search strategy are outlined in Figure 7.1.

Keywords for the cost of preventing falls rapid review are shown in Table 7.1.

**Table 1 Keywords for the health economic evaluation rapid review: The cost of preventing falls**

|  |  |  |  |
| --- | --- | --- | --- |
| **Elderly keywords** | **Falls keywords** | **Interventions** | **Additional keywords** |
| aged [Mesh]ageingaging [Mesh]cognitive impairmentelder\*elderlygeriatric\*gerontology\*infirmold\*senior\*veteran\* | breakdeathfall injuriesfall ratefall related injuriesfallersfallsinjuryprevention | interventionprogramprogramme | cost analys\*cost benefitcost consequencecost effective\*cost minimisationcost utilit\*cost\*costs and cost analysis (Mesh)economic analys\* economic\*health care cost\* health economic\* healthcare cost\*QALY quality adjusted life yearquality-adjusted life yearreturn on investmentROIsocial return of investmentSROI |

|  |
| --- |
| **Rapid review questions: The cost of preventing falls****Primary review questions:**1. What do prevention of falls interventions cost?
2. What are the direct and indirect healthcare costs and incremental resource consequences of providing interventions to prevent falls of older people in the UK.

**Secondary review questions:**1. What type of economic evaluation methodology is used to evaluate the cost-effectiveness / return on investment / value for money of preventing falls interventions?
2. From what perspective is the analysis conducted?
	* 1. To whom do the costs fall and who receives the benefits (or savings)?
3. Are there any potential best or good buys in preventing falls interventions?
	* 1. Are the interventions scalable?
		2. Are the interventions highly cost-effective relative to a threshold?
4. What is the budget impact /opportunity cost of delivering different prevention of falls interventions?
 |
|  |
| **Searching: Database and other search strategies**Database searches of Cochrane Collaboration Register and Library, DARE, HTA, NHS EED, PubMed.Grey literature searching. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 1 – title screening; Stage 2 – abstract screening; (Two review authors independantly screen at both stages 1 and 2) |
|  |
| Inter-rater reliability checks between the two review authors. |
|  |
| **Screening against inclusion / exclusion criteria:** Stage 3 – full text screening(Second review author to conduct limited screening to confirm study eligibility before extraction) |
|  |
| **Data extraction** |
|  |
| **Narrative summary** |

**Figure 7.1: Rapid review design flowchart: The cost of preventing falls**

The rapid review literature search identified 87 abstracts. 84 selected abstracts were double screened. In total 23 papers were selected for full text screening. Relevant data was extracted from 20 papers. The flow of the literature is presented in the PRISMA diagram (see Figure 7.2). In addition 52 sources of grey literature were found.

Full-text articles assessed for eligibility
(n = 23)

Records excluded
(n = 61)

Records screened
(n = 84)

Records after duplicates removed
(n =84)

Records identified through database searching
(n = 87)

#### Identification

#### Screening

#### Eligibility

Full-text articles excluded, with reasons (2 were study protocols and 1 was not a falls prevention intervention (n = 3)

Studies included in quantitative synthesis (meta-analysis)
(n = 20)

#### Included

**Figure 7.2 Cost of preventing falls PRISMA diagram**

**Table of evidence**

**Section 7: Preventing falls and reducing hospital stays**

| **Author** | **Title** | **Date** | **Name of journal/website** | **Country of origin** | **Main findings** | **Strength of evidence (weak, moderate, strong)** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Access Economics.  | *Future sight loss UK (1): The economic impact of partial sight and blindness in the UK adult population*. | 2009 | Access Economics. | UK |  | Weak |  |
| Ageing Well in Wales.  | Ageing Well Themes. | 2017a | Ageing Well in Wales.  | Wales, UK |  | Weak |  |
| Ageing Well in Wales.  | Falls Prevention. | 2017b | Ageing Well in Wales.  | Wales, UK |  | Weak |  |
| Alcock, D., Brook, C. D., Walker, D., & Hunt, C.  | Home care clients, providers and costs.  | 1998 | *Canadian Journal of Public Health*, *89*(5), 297–300. | Canada | The most frequent primary diagnoses (reason for admission to program) were arthritis, stroke, fractures and sepsis. Discipline experts determined the competencies required to provide the care. Variations in costs across the same diagnosis were related to the category of providers assigned and to the frequency of provision of care strategies. The constant dependency of the client was perceived as the greatest stressor for informal providers. | Strong |  |
| Alwan, M.  | Fall Prevention and Detection : How Can Technology Help?  | 2007 | *Alternate Care. Purchasing and Products*, *1*(3), 12–14. Retrieved from https://www.pppmag.com/documents/ACP&P/ACP&P\_07/V1N3/p12\_13\_14.pdf | USA | Older adult participants accepted monitoring. The results suggest that monitoring technologies could provide care coordination tools that are accepted by residents and may have a positive impact on their quality of life | Strong |  |
| Barker, W.  | Assessment and prevention of falls in older people | 2014 | *Nursing Older People*, *26*(6), 18–24. https://doi.org/10.7748/nop.26.6.18.e586 | UK |  | Moderate |  |
| Beard, J., Rowell, D., Scott, D., van Beurden, E., Barnett, L., Hughes, K., & Newman, B.  | Economic analysis of a community-based falls prevention program.  | 2006 | *Public Health*, *120*(8), 742–751. https://doi.org/10.1016/j.puhe.2006.04.011 | Australia | Findings suggest that well-designed community-based interventions targeting falls prevention among older people are highly cost effective and a wise investment for all levels of government. The models used are conservative and are likely to underestimate the real benefit of the intervention, which may have lasted for some time beyond the life of the program. | Strong |  |
| Bentley, T. G., Kuntz, K. M., & Ringel, J. S. (2010)  | Bias associated with failing to incorporate dependence on event history in Markov models.  | 2010 | *Medical Decision Making*, *30*(6), 651–660. https://doi.org/doi:10.1177/0272989X10363480 | USA | Failing to incorporate dependence on prior event history in subsequent relapse risk in Markov models can greatly affect model outcomes, overestimating the impact of prevention and treatment strategies by up to 85% and underestimating the impact in some treatment models by up to 20%. When at least 4 prior episodes are incorporated, bias does not exceed 26% in prevention or 11% in treatment. K | Strong |  |
| Busbee, B. G., Brown, M. M., Brown, G. C., & Sharma, S.  | Cost-Utility Analysis of Cataract Surgery in the Second Eye.  | 2003 | *Ophthalmology*, *110*(12), 2310–2317. https://doi.org/10.1016/S0161-6420(03)00796-6 | USA | Second-eye cataract surgery is an extremely cost-effective procedure when compared with other interventions across medical specialties. The cost-effectiveness of second-eye surgery diminishes only slightly from the $2023 per QALY gained from first-eye cataract surgery. This suggests that patients with good vision in one eye and visual loss from cataract in the fellow eye derive substantial benefit from cataract extraction. | Strong |  |
| Carande-Kulis, V., Stevens, J. A., Florence, C. S., Beattie, B. L., & Arias, I.  | A cost-benefit analysis of three older adult fall prevention interventions.  | 2015 | *Journal of Safety Research*, *52*, 65–70. <https://doi.org/10.1016/j.jsr.2014.12.007> | USA | For the Otago Exercise Program delivered to persons aged 65 and older, the net benefit was $121.85 per participant and the ROI was 36% for each dollar invested. For Otago delivered to persons aged 80 and older, the net benefit was $429.18 and the ROI was 127%. Tai chi: Moving for Better Balance had a net benefit of $529.86 and an ROI of 509% and Stepping On had a net benefit of $134.37 and an ROI of 64% | Strong |  |
| Cockayne, S., Rodgers, S., Green, L., Fairhurst, C., Adamson, J., Scantlebury, A., … Torgerson, D. J.  | Clinical effectiveness and cost-effectiveness of a multifaceted podiatry intervention for falls prevention in older people: A multicentre cohort randomised controlled trial (the reducing falls with orthoses and a multifaceted podiatry intervention trial).  | 2017a | *Health Technology Assessment*, *21*(24). https://doi.org/10.3310/hta21240 | UK | The multifaceted package of podiatry care was seen to be a safe, acceptable and potentially effective intervention in reducing the proportion of older adults who experience a fall over 12 months. Although the primary outcome (incidence rate of falls) did not reach statistical significance, the intervention appeared to be cost-effective in terms of QALYs gained, based on the HRQoL measure, the EQ-5D | Strong |  |
| Cooper, K., Shepherd, J., Frampton, G., Harris, P., & Lotery, A.  | The cost-effectiveness of second-eye cataract surgery in the UK.  | 2015 | *Age and Ageing*, *44*(6), 1026–1031. https://doi.org/10.1093/ageing/afv126 | England | Second-eye cataract surgery is generally cost-effective based on the best available data and under most assumptions. However, there are only a small number of clinical trials for second-eye cataract surgery, and these have not been conducted in recent years. | Strong |  |
| Croucher, K., & Lowson, K. (2011).  | *Handypersons Evaluation Interim key findings*.  | 2011 | Department for Communities and Local Government. |  |  | Weak |  |
| Cumming, R. G., Ivers, R., Clemson, L., Cullen, J., Hayes, M. F., Tanzer, M., & Mitchell, P. (2007 | Improving vision to prevent falls in frail older people: A randomized trial.  | 2007 | *Journal of the American Geriatrics Society*, *55*(2), 175–181. <https://doi.org/10.1111/j.1532-5415.2007.01046.x> | Australia | In frail older people, comprehensive vision and eye assessment, with appropriate treatment, does not reduce, and may even increase, the risk of falls and fractures. | Strong |  |
| Davis, J. C., Robertson, M. C., Ashe, M. C., Liu-Ambrose, T., Khan, K. M., & Marra, C. A.  | International comparison of cost of falls in older adults living in the community: A systematic review.  | 2010 | *Osteoporosis International*, *21*(8), 1295–1306. https://doi.org/10.1007/s00198-009-1162-0 | Canada | The economic cost of falls is likely greater than policy makers appreciate. The mean cost of falls was dependent on the denominator used and ranged from US $3,476 per faller to US $10,749 per injurious fall and US $26,483 per fall requiring hospitalization. A consensus on methodology for cost of falls studies would enable more accurate comparisons and subgroup-specific estimates among different countries. | Strong |  |
| Davis, J. C., Robertson, M. C., Comans, T., & Scuffham, P. A. (2011).  | Guidelines for conducting and reporting economic evaluation of fall prevention strategies.  | 2011 | *Osteoporosis International*, *22*(9), 2449–2459. https://doi.org/10. 1007/s00198-010-1482-0 |  |  | Weak |  |
| Durstine, J. L., Gordon, B., Wang, Z., & Luo, X.  | Chronic disease and the link to physical activity.  | 2013 | *Journal of Sport and Health Science*, *2*(1), 3–11. https://doi.org/10.1016/j.jshs.2012.07.009 |  |  | Moderate |  |
| Eldridge, S., Spencer, A., Cryer, C., Parsons, S., Underwood, M., & Feder, G.  | Why modelling a complex intervention is an important precursor to trial design: lessons from studying an intervention to reduce falls-related injuries in older people.  | 2005 | *Journal of Health Services Research & Policy*, *10*(3), 133–42. https://doi.org/10.1258/1355819054338942 | England | The model-building approach described in this paper is vital when designing complex trials and where a trial is not possible. Information from the modelling can be used to re-design the intervention. The effectiveness of our proposed intervention appears very small due to its inability to reach those at risk of falling. It is most likely not to be cost-effective. If inability to reach the target group is a weakness common to other similar interventions, this suggests an area for further research. | Strong |  |
| Farag, I., Howard, K., Ferreira, M. L., & Sherrington, C. (2015).  | Economic modelling of a public health programme for fall prevention.  | 2015 | *Age and Ageing*, *44*(3), 409–414. https://doi.org/10.1093/ageing/afu195 | Australia | Widespread rollout of a public health fall prevention programme could result in an incremental cost-effectiveness ratio (ICER) of $A28,931 per QALY gained, assuming a programme cost of $700 per person and at a fall prevention risk ratio of 0.75. This ICER would be considered cost-effective at a threshold value of $A50,000 per QALY gained. Sensitivity analyses for programme cost and effectiveness indicated that the public health programme produced greater health outcomes and was less costly than no programme when programme costs were $A500 or lower and risk ratio for falls was 0.70 or lower. At a cost of $A2,500, the public health falls prevention programme ceases to be a cost-effective option. | Strong |  |
| Farag, I., Sherrington, C., Hayes, A., Canning, C. G., Lord, S. R., Close, J. C. T. T., … Howard, K.  | Economic evaluation of a falls prevention exercise program among people With Parkinson’s disease. | 2016 | *Movement Disorders*, *31*(1), 53–61. https://doi.org/10.1002/mds.26420 | Australia | e average cost of the intervention was $A1,010 per participant. Incremental cost-effectiveness of the program relative to usual care was $A574 per fall prevented, $A9,570 per extra person avoiding mobility deterioration, and $A338,800 per quality-adjusted life year gained. The intervention had an 80% probability of being cost-effective, relative to the control, at a threshold of $A2,000 per fall prevented. Subgroup analyses for the low-disease-severity group indicate the program to be dominant, that is, less costly and more effective than usual care for all health outcomes. | Strong |  |
| Fletcher, E., Goodwin, V. A., Richards, S. H., Campbell, J. L., & Taylor, R. S. (2012).  | An exercise intervention to prevent falls in Parkinson’s: an economic evaluation. | 2012 | *BMC Health Services Research*, *12*(1), 426. https://doi.org/10.1186/1472-6963-12-426 | UK | The mean cost of the intervention was £76 per participant. Although in direction of favour of exercise intervention, there was no statistically significant differences between groups in total healthcare (−£128, 95% CI: -734 to 478), combined health and social care costs (£-35, 95% CI: -817 to 746) or QALYs (0.03, 95% CI: -0.02 to 0.03) at 20 weeks. Nevertheless, exploration of the uncertainty surrounding these estimates suggests there is more than 80% probability that the exercise intervention is a cost-effective strategy relative to usual care. | Strong |  |
| Foundations. (2013).  | *Handyperson Services Financial Benefits Toolkit Full Guidance 2013*. | 2013 |  | UK |  | Weak |  |
| Frampton, G., Harris, P., Cooper, K., Lotery, A., & Shepherd, J. (2014).  | The clinical effectiveness and cost-effectiveness of second-eye cataract surgery: a systematic review and economic evaluation.  | 2014 | *Health Technology Assessment*, *18*(68). https://doi.org/10.3310/hta18680 | UK | Three randomised controlled trials (RCTs) of clinical effectiveness, three studies of cost-effectiveness and 10 studies of health-related quality of life (HRQoL) met the inclusion criteria for the systematic reviews and, where possible, were used to inform the economic analysis. Heterogeneity of studies precluded meta-analyses, and instead data were synthesised narratively. The RCTs assessed visual acuity, contrast sensitivity, stereopsis and several measures of HRQoL. Improvements in binocular visual acuity and contrast sensitivity were small and unlikely to be of clinical significance, but stereopsis was improved to a clinically meaningful extent following second-eye surgery. Studies did not provide evidence that second-eye surgery significantly affected HRQoL, apart from an improvement in the mental health component of HRQoL in one RCT. In the model, second-eye surgery generated 0.68 incremental quality-adjusted life-years with an incremental cost-effectiveness ratio of £1964. Model results were most sensitive to changes in the utility gain associated with second-eye surgery, but otherwise robust to changes in parameter values. The probability that second-eye surgery is cost-effective at willingness-to-pay thresholds of £10,000 and £20,000 is 100%. | Strong |  |
| Frick, K. D., Kung, J. Y., Parrish, J. M., & Narrett, M. J.  | Evaluating the cost-effectiveness of fall prevention programs that reduce fall-related hip fractures in older adults. | 2010 | *Journal of the American Geriatrics Society*, *58*(1), 136–141. https://doi.org/10.1111/j.1532-5415.2009.02575.x | USA | Medical management of psychotropic and group tai chi were the least-costly, most-effective options, but they were also the least studied. Excluding these interventions, the least-expensive, most-effective options are vitamin D supplementation and home modifications. Vitamin D supplementation costs less than home modifications, but home modifications cost only $14,794/quality-adjusted life year (QALY) gained more than vitamin D. In probabilistic sensitivity analyses excluding management of psychotropic and tai chi, home modification is most likely to have the highest economic benefit when QALYs are valued at $50,000 or $100,000. | Strong |  |
| Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Lamb, S. E., Gates, S., Cumming, R. G., … Lamb, S. E. (2012).  | *Interventions for preventing falls in older people living in the community (Review)*. | 2012 | *Cochrane Database of Systematic Reviews* (Vol. 2). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/14651858.CD007146.pub3.www.cochranelibrary.com | New Zealand and Australia | Overall, vitamin D did not reduce rate of falls (RaR 1.00, 95% CI 0.90 to 1.11; seven trials; 9324 participants) or risk of falling (RR 0.96, 95% CI 0.89 to 1.03; 13 trials; 26,747 participants), but may do so in people with lower vitamin D levels before treatment. | Strong |  |
| Haines, T. P., Hill, A.-M., Hill, K. D., Brauer, S. G., Hoffmann, T., Etherton-Beer, C., & McPhail, S. M. (2013). | Cost effectiveness of patient education for the prevention of falls in hospital: economic evaluation from a randomized controlled trial. | 2013 | *BMC Medicine*, *11*(1), 135. https://doi.org/10.1186/1741-7015-11-135 | Australia | The short-term cost to a health service of one cognitively intact patient being a faller could be as high as A$14,591 (2008). The education program cost A$526 (2008) to prevent one cognitively intact patient becoming a faller and A$294 (2008) to prevent one fall based on primary trial data. These estimates were unstable due to high variability in the hospital costs accrued by individual patients involved in the trial. There was a 52% probability the complete program was both more effective and less costly (from the health service perspective) than providing usual care alone. Decision tree modelling sensitivity analyses identified that when provided in real life contexts, the program would be both more effective in preventing falls among cognitively intact inpatients and cost saving where the proportion of these patients who would otherwise fall under usual care conditions is at least 4.0%. | Strong |  |
| Hendriks, M. R. C., Evers, S. M. A. A., Bleijlevens, M. H. C., van Haastregt, J. C. M., Crebolder, H. F. J. M., & van Eijk, J. T. M.  | Cost-effectiveness of a multidisciplinary fall prevention program in community-dwelling elderly people: A randomized controlled trial (ISRCTN 64716113).  | 2008 | *International Journal of Technology Assessment in Health Care*, *24*(2), 193–202. https://doi.org/10.1017/S0266462308080276 | The Netherlands | The multidisciplinary intervention program to prevent falls was not cost-effective compared with usual care in the Netherlands. Notwithstanding our findings, however, falls still have an important impact on society and individuals in terms of costs and effects. Economic evaluations studying promising interventions to prevent falls, therefore, remain necessary. | Strong |  |
| Huckett, C.  | *Gloucestershire Village & Community Agents. Cost / Benefit Analysis*. | 2014 | *Gloucestershire Village & Community Agents.* | UK |  | Weak |  |
| Irvine, L., Conroy, S. P., Sach, T., Gladman, J. R. F., Harwood, R. H., Kendrick, D., … Masud, T.  | Cost-effectiveness of a day hospital falls prevention programme for screened community-dwelling older people at high risk of falls. | 2010 | *Age and Ageing*, *39*(6), 710–716. https://doi.org/10.1093/ageing/afq108 | UK | In the base-case analysis, the mean falls programme cost was £349 per person. This, coupled with higher screening and other health-care costs, resulted in a mean incremental cost of £578 for the intervention arm. The mean falls rate was lower in the intervention arm (2.07 per person/year), compared with the control arm (2.24). The estimated ICER was £3,320 per fall averted. | Strong |  |
| Jenkyn, K. B., Hoch, J. S., & Speechley, M.  | How Much Are We Willing to Pay to Prevent A Fall? Cost-Effectiveness of a Multifactorial Falls Prevention Program for Community-Dwelling Older Adults.  | 2012 | *Canadian Journal on Aging / La Revue Canadienne Du Vieillissement*, *31*(2), 121–137. https://doi.org/10.1017/S0714980812000074 | Canada | The results failed to provide evidence that a multifactorial falls prevention program was cost-effective. Participant adherence to recommendations ranged from low (41.3%), to moderate (21.1%), to high (37.6%). A future challenge is to understand more clearly the relationship between the community-dwelling older adult, potentially modifiable risks for falls, adherence to multifactorial risk factor recommendations, costs, and resulting effects of falls prevention practices. Future economic evaluations of falls prevention interventions remain necessary and should consider the NBRF so that regression tools can facilitate cost-effectiveness analysis. | Strong |  |
| Johansson, P., Sadigh, S., Tillgren, P., & Rehnberg, C.  | Non-pharmaceutical prevention of hip fractures – a cost-effectiveness analysis of a community-based elderly safety promotion program in Sweden.  | 2008 | *Cost Effectiveness and Resource Allocation*, *6*(1), 11. https://doi.org/10.1186/1478-7547-6-11 | Sweden | Total societal intervention costs amounted to 6.45 million SEK (in Swedish krona 2004; 1 Euro = 9.13 SEK). The number of avoided hip fractures during the six-year post-intervention period was estimated to 14 (0.44 per 1,000 person-years). The Markov model estimated a difference in societal costs between an individual that experiences a first year hip fracture and an individual that avoids a first year hip fracture ranging from 280,000 to 550,000 SEK, and between 1.1 and 3.2 QALYs (quality-adjusted life-years, discounted 3%), for males and females aged 65-79 years and 80+ years. The cost-effectiveness analysis resulted in zero net costs and a gain of 35 QALYs, and the do-nothing alternative was thus dominated. | Strong |  |
| Jones, S. J. (2011).  | *Injury Prevention Guidance 1 Falls Preventing falls in older people living in the community*. | 2011 | *Injury Prevention* |  |  | Weak |  |
| Kang, H. G., Mahoney, D. F., Hoenig, H., Hirth, V. A., Bonato, P., Hajjar, I., & Lipsitz, L. A. (2010b). In situ monitoring of health in older adults: Technologies and issues. *Journal of the American Geriatrics Society*. https://doi.org/10.1111/j.1532-5415.2010.02959.x | In situ monitoring of health in older adults: Technologies and issues. | 2010 | *Journal of the American Geriatrics Society*. https://doi.org/10.1111/j.1532-5415.2010.02959.x |  |  | Moderate |  |
| Landeiro, F., Leal, J., & Gray, A. M. | The impact of social isolation on delayed hospital discharges of older hip fracture patients and associated costs.  | 2016 | *Osteoporosis International*, *27*(2), 737–745. https://doi.org/10.1007/s00198-015-3293- | England | Mean age at admission was 85.5 years and mean length of stay was 13.1 days per patient. Sixty-two (22.3 %) patients had delayed discharges, resulting in 419 bed days lost (11.5 % of the total length of stay). Being isolated or at a high risk of social isolation, measured with the Lubben social network scale, was significantly associated with delayed discharges (odds ratio (OR) 3.5) as was being referred to a public-funded rehabilitation unit (OR 7.6). These two variables also increased the number of days of delayed discharges (2.6 and 4.9 extra days, respectively, holding all else constant). Patients who were admitted from an institution were less likely to have delayed discharges (OR 0.2) with 5.5 fewer days of delay. Total costs of delayed discharges were between 11.2 and 30.7 % of total costs (€2352 and €9317 per patient with delayed discharge) conditional on whether waiting costs for placement in public-funded rehabilitation unit were included. | Strong |  |
| Latimer, N., Dixon, S., Drahota, A. K., & Severs, M.  | Cost–utility analysis of a shock-absorbing floor intervention to prevent injuries from falls in hospital wards for older people. | 2013 | *Age and Ageing*, *42*(5), 641–645. https://doi.org/10.1093/ageing/aft076 | England | In the base case, the shock-absorbing flooring was cost saving, but generated QALY losses due to an increase in the faller rate reported in the intervention arm. Scenario analysis showed that if the shock-absorbing flooring does not increase the faller rate it is likely to represent a dominant economic strategy-generating cost savings and QALY gains. | Strong |  |
| Lee, R. H., Weber, T., & Colõn-Emeric, C.  | Comparison of cost-effectiveness of vitamin d screening with that of universal supplementation in preventing falls in community-dwelling older adults. | 2013 | *Journal of the American Geriatrics Society*. https://doi.org/10.1111/jgs.12213 | USA | In women aged 65 to 80, population screening was slightly more cost-effective than universal supplementation, with an incremental NMB of $224 compared with $189 (P < .001). Population screening in men was also more cost-effective than universal supplementation (incremental NMB $298 vs $260, P < .001). Results differed according to age group. In those aged 65, population screening had cost-effectiveness similar to that of universal supplementation in women ($59 vs $71) and men ($114 vs $120), whereas in those aged 80, population screening was substantially more cost-effective than universal supplementation in women ($563 vs $428) and men ($703 vs $571). | Strong |  |
| Legood, R., Scuffham, P., & Cryer, C. (2002).  | Are we blind to injuries in the visually impaired? A review of the literature.  | 2002 | *Injury Prevention*, *8*(2), 155–160. https://doi.org/10.1136/ip.8.2.155 | UK | Thirty one studies were selected. The majority of these studies (20) assessed falls (including eight on hip fracture and four on multiple falls), eight studies reported traffic related injuries, and three studies assessed occupational injury. The evidence on falls, which relate predominantly to older people, suggests that those with reduced visual acuity are 1.7 times more likely to have a fall and 1.9 times more likely to have multiple falls compared with fully sighted populations. The odds of a hip fracture are between 1.3 and 1.9 times greater for those with reduced visual acuity. Studies of less severe injuries and other causes of injury were either poorly designed, underpowered, or did not exist. | Strong |  |
| Li, F., & Harmer, P.  | Economic Evaluation of a Tai Ji Quan Intervention to Reduce Falls in People With Parkinson Disease, Oregon, 2008–2011.  | 2015 | *Preventing Chronic Disease*, *12*, 140413. https://doi.org/10.5888/pcd12.140413 | USA | ai Ji Quan was more effective than either Resistance training or Stretching; it had the lowest cost and was the most effective in improving primary and secondary outcomes. Compared with Stretching, Tai Ji Quan cost an average of $175 less for each additional fall prevented and produced a substantial improvement in QALY gained at a lower cost. Results from subgroup and sensitivity analyses showed no variation in cost-effectiveness estimates. However, sensitivity analyses demonstrated a much lower ICER ($27) when only intervention costs were considered. | Strong |  |
| Ling, C., Henderson, S., Henderson, R., Henderson, M., Pedro, T., & Pang, L. (2008).  | Cost benefit considerations of preventing elderly falls through environmental modifications to homes in Hana, Maui.. | 2008 | *Hawaii Medical Journal*, *67*(3), 65–68 | USA | The average cost of home modifications was $800. The average annual averted medical cost of falling was $1728. | Strong |  |
| Ling, S. J., Kleimeyer, C., Lynch, G., Burmeister, E., Kennedy, D., Bell, K., … Cooke, C.  | Can Geriatric Hip Fractures be Managed Effectively Within a Level 1 Trauma Center?  | 2015 | *Journal of Orthopaedic Trauma*, *29*(3), 160–164. https://doi.org/10.1097/bot.0000000000000257 | Australia | Since the hip fracture service, more patients underwent surgery within 48 hours (67% vs. 52%; P = 0.004), the length of stay significantly decreased from 26 to 22 days (P = 0.004), significantly more patients were admitted to the rehabilitation unit (58.7% vs. 3.5%; P < 0.001) and ultimately discharged to their own residence (51.6% vs. 40.5%; P = 0.034). Inpatient mortality rates did not change significantly (7.5% vs. 6.8%; P = 0.780). The estimated cost saving in 2011 was $981,040. | Strong |  |
| MacAuley, D., Bauman, A., & Frémont, P. (2015). Exercise: not a miracle cure, just good medicine. *BMJ (Clinical Research Ed.)*, *350*(4), h1416. https://doi.org/10.1136/bmj.h1416 | Exercise: not a miracle cure, just good medicine.  | 2015 | *BMJ (Clinical Research Ed.)*, *350*(4), h1416. https://doi.org/10.1136/bmj.h1416 | Northern Ireland, Australia, Canadas | Physical activity remains the best buy for public health. And, in support of the academy’s initiative, medicine and individual doctors do have a role. Indeed, academic sports medicine bodies in Canada, Ireland, and the United Kingdom already include “exercise” in their titles. But let’s stick to the evidence—otherwise, medicine risks finding itself taking on disproportionate responsibility for promoting health related physical activity when creating community behaviour change requires a multifaceted approach in which medicine can play only a limited part. | Strong |  |
| McLean, K., Day, L., & Dalton, A. (2015).  | Economic evaluation of a group-based exercise program for falls prevention among the older community-dwelling population.  | 2015 | *BMC Geriatrics*, *15*(1), 33. https://doi.org/10.1186/s12877-015-0028-x | Australia | The ICER of GBP£51,483 per QALY for the base case analysis was well above the accepted cost-effectiveness threshold of GBP£20,000 to £30,000 per QALY, but in a sensitivity analysis with minimised program implementation the incremental cost reached GBP£25,678 per QALY. The ICER value at 95% confidence in the base case analysis was GBP£99,664 per QALY and GBP£50,549 per QALY in the lower cost analysis. Males had a 44% lower injury rate if they fell, compared to females resulting in a more favourable ICER for the women only analysis. For women only the ICER was GBP£22,986 per QALY in the base case and was below the cost-effectiveness threshold for all other variations of program implementation. The ICER value at 95% confidence was GBP£48,212 in the women only base case analysis and GBP£23,645 in the lower cost analysis. The base case incremental cost per fall averted was GBP£652 (GBP£616 for women only). A threshold analysis indicates that this exercise program cannot realistically break even. | Strong |  |
| Müller, D., Borsi, L., Stracke, C., Stock, S., & Stollenwerk, B.  | Cost-effectiveness of a multifactorial fracture prevention program for elderly people admitted to nursing homes.  | 2014 | *European Journal of Health Economics*. https://doi.org/10.1007/s10198-014-0605-5 | Germany | Compared to no prevention a multifactorial prevention program for nursing home residents resulted in a cost-effectiveness ratio of 21,353 euro per quality-adjusted life-year. The total costs for SHI/LCI would result in 1.7 euro million per year. Results proved to be robust following deterministic and probabilistic sensitivity analyses. | Strong |  |
| Munro, J. F.  | Cost effectiveness of a community based exercise programme in over 65 year olds: cluster randomised trial.  | 2004 | *Journal of Epidemiology & Community Health*, *58*(12), 1004–1010. https://doi.org/10.1136/jech.2003.014225 | UK | Twenty six per cent of the eligible intervention practice population attended one or more exercise sessions. There were no significant differences in mortality rates, survival times, or admissions. After adjusting for baseline characteristics, patients in intervention practices had a lower decline in health status, although this reached significance only for the energy dimension and two composite scores (p<0.05). The incremental average QALY gain of 0.011 per person in the intervention population resulted in an incremental cost per QALY ratio of €17 174 (95% CI = €8300 to €87 120). | Strong |  |
| Murphy, S. M., Edwards, R. T., Williams, N., Raisanen, L., Moore, G., Linck, P., … Moore, L.  | An evaluation of the effectiveness and cost effectiveness of the National Exercise Referral Scheme in Wales, UK: a randomised controlled trial of a public health policy initiative...[corrected][published erratum appears in J EPIDEMIOL COMMUNITY HEALTH 201. | 2012 | *Journal of Epidemiology & Community Health*, *66*(8), 745–753 9p. https://doi.org/10.1136/jech-2011-200689 | Wales, UK | Ordinal regression identified increased physical activity among those randomised to NERS compared with those receiving normal care in all participants (OR 1.19, 95% CI 0.99 to 1.43), and among those referred for CHD only (OR 1.29, 95% CI 1.04 to 1.60). For those referred for mental health reason alone, or in combination with CHD, there were significantly lower levels of anxiety (-1.56, [corrected] 95% CI -2.75 to -0.38) and depression (-1.39, [corrected] 95% CI -2.60 to -0.18), but no effect on physical activity. The base-case incremental cost-effectiveness ratio was £12,111 per quality adjusted life year, falling to £9741 if participants were to contribute £2 per session. | Strong |  |
| NHS Choices.  | Falls. | 2015 | NHS Choices |  |  | Weak |  |
| NICE.  | *Mental wellbeing in over 65s: occupational ther therapy and physical activity interventions*. | 2008 | NICE | UK | NICE | Strong |  |
| NICE.  | *Falls: assessment and prevention of falls in older people - CG161 (Costing statement)*. *Nice*. | 2013a | NICE | UK | NICE | Strong |  |
| NICE.  | *NICE clinical guideline 161.*  | 2013b | *Falls: Assessment and prevention of falls in older people* (Vol. 161). https://doi.org/10.7748/nop.26.6.18.e586 | UK | NICE | Strong |  |
| Page, T. F., Batra, A., & Palmer, R.  | Cost Analysis of a Community-Based Fall Prevention Program Being Delivered in South Florida. | 2012 | *Family & Community Health*, *35*(3), 264–270. https://doi.org/10.1097/FCH.0b013e318250be2e | USA | The aim of this study was to measure the costs of delivering a fall prevention program by community agencies in South Florida. Cost data were collected from agencies participating in the delivery of Matter of Balance workshops in South Florida. Cost information included both initial implementation and ongoing workshop delivery costs. Average costs for implementation per program completer were $325 during the first year in which the program was offered and $176 during the second year of the program. Matter of Balance is a relatively inexpensive fall prevention program. This has implications for the further dissemination and sustainability of evidence-based programs for elderly individuals. | Strong |  |
| Profound.  | *Falls Prevention Intervention Factsheets*. | 2015 | Profound | UK |  | Weak |  |
| RNIB.  | *Evidence-based review Older people*. | 2010 |  | UK |  | Weak |  |
| RNIB. (2014). | *Sight loss advisers: social return on health and social care investment*. | 2014 | RNIB | UK |  | Weak |  |
| Sach, T. H., Foss, A. J. E., Gregson, Richard M Zaman, A., Osborn, F., Masud, T., Harwood, R. H., … Rowan H Harwood.  | Falls and health status in elderly women following first eye cataract surgery: a randomised controlled trial.  | 2007 | *British Journal of Ophthalmology*, *91*(1), 1675–1679. https://doi.org/10.1136/bjo.2007.118687 | UK | Visual function improved in the operated group (corrected binocular acuity improved by 0.25 logMAR units; 8% had acuity worse than 6/12 compared with 37% of controls). Over 12 months of follow up, 76 (49%) operated participants fell at least once, and 28 (18%) fell more than once. 69 (45%) un-operated participants fell at least once, 38 (25%) fell more than once. Rate of falling was reduced by 34% in the operated group (rate ratio 0.66, 95% confidence interval 0.45 to 0.96, p = 0.03). Activity, anxiety, depression, confidence, visual disability, and handicap all improved in the operated group compared with the control group. Four participants in the operated group had fractures (3%), compared with 12 (8%) in the control group (p = 0.04). | Strong |  |
| Scuffham, P. A., Legood, R., Wilson, E. C. F., & Kennedy-Martin, T. (2002).  | The incidence and cost of injurious falls associated with visual impairment in the UK.  | 2002 | *Visual Impairment Research*, *4*(1), 1–14. https://doi.org/10.1076/vimr.4.1.1.15635 | UK | There were over 2.35 million accidental falls in the UK that required hospital treatment in 1999. Of these falls, 189,000 occurred in individuals with visual impairment, of which 89,500 can be attributed to the visual impairment itself. The estimated medical costs of these falls were £269 m (range: £193 m–£360 m) and £128 m (range: £32 m–£240 m), respectively. Eighty-nine percent of these falls and the majority of costs occurred in those aged 75 years and over. Results were most sensitive to the relative risks of falls and the proportion of long-term care costs attributed to the fall.  | Strong |  |
| Sherrington, C., Whitney, J. C., Lord, S. R., Herbert, R. D., Cumming, R. G., & Close, J. C. T.  | Effective exercise for the prevention of falls: A systematic review and meta-analysis.  | 2008 | *Journal of the American Geriatrics Society*, *56*(12), 2234–2243. https://doi.org/10.1111/j.1532-5415.2008.02014. | Australia | Exercise can prevent falls in older people. Greater relative effects are seen in programs that include exercises that challenge balance, use a higher dose of exercise, and do not include a walking program. Service providers can use these findings to design and implement exercise programs for falls prevention. | Strong |  |
| Singh, P. S.  | *Economic Impact of an Eye Clinic Liaison Officer (ECLO) on Health, Social Care and Welfare Budgets: A Case Study*. | 2013 |  |  |  | Moderate |  |
| Spetz, J., Jacobs, J., & Hatler, C. (2007).  | Cost effectiveness of a medical vigilance system to reduce patient falls. | 2007 | *Nursing Economics*, *25*(6), 333–338,352. | USA | Patient falls are a serious problem in hospitals, resulting in substantial morbidity, mortality, length of stay, and costs. The results of a small trial of a patient vigilance system in a post-neurosurgery unit of a large acute care hospital are reported. The system includes two components: (a) passive sensor array placed under the patient in a hospital bed, and (b) a bedside unit that connects to the nurse call system already in place at the hospital. This trial demonstrated the overall effectiveness of the vigilance system in reducing the rate of patient falls. The cost-effectiveness analysis found that use of this system was associated with somewhat higher measured costs. It is likely that the system was cost-saving, due to unmeasured costs. | Strong |  |
| Spink, M. J., Menz, H. B., Fotoohabadi, M. R., Wee, E., Landorf, K. B., Hill, K. D., & Lord, S. R.  | Effectiveness of a multifaceted podiatry intervention to prevent falls in community dwelling older people with disabling foot pain: randomised controlled trial.  | 2011 | *Bmj*, *342*(jun16 3), d3411–d3411. https://doi.org/10.1136/bmj.d3411 | Australia | A multifaceted podiatry intervention reduced the rate of falls in community dwelling older people with disabling foot pain. The components of the intervention are inexpensive and relatively simple to implement, suggesting that the programme could be incorporated into routine podiatry practice or multidisciplinary falls prevention clinics. | Strong |  |
| Summary, E.  | Falls : Factsheet. *WHO*, *2010*(2005), 1921–1928. | 2005 | WHO |  |  | Weak |  |
| Tannenbaum, C., Diaby, V., Singh, D., Perreault, S., Luc, M., & Vasiliadis, H. M. (2015).  | Sedative-Hypnotic Medicines and Falls in Community-Dwelling Older Adults: A Cost-Effectiveness (Decision-Tree) Analysis from a US Medicare Perspective. | 2015 | *Drugs and Aging*, *32*(4), 305–314. https://doi.org/10.1007/s40266-015-0251-3 | Canada | On an annual basis, CBT showed a dominance (cost: US$19,442; QALYs: 0.594) over sedative hypnotics (cost: US$32,452; QALYs: 0.552) and no treatment (cost: US$33,853; QALYs: 0.517). Assuming a willingness to pay of US$50,000, the net monetary benefit was positive for CBT (US$10,287) and negative for sedative hypnotics (-US$4,851) and no treatment (-US$7,993). CBT had a 95% chance of being the dominant strategy, with results most sensitive to an older adult's baseline risk of falling. | Strong |  |
| The Chartered Society of Physiotherapy.  | The cost of falls. | 2016 | The Chartered Society of Physiotherapy. |  |  | Moderate |  |
| Thomas, E., Mottram, S., Peat, G., Wilkie, R., & Croft, P.  | The effect of age on the onset of pain interference in a general population of older adults: Prospective findings from the North Staffordshire Osteoarthritis Project (NorStOP).  | 2007 | *Pain*, *129*(1–2), 21–27. https://doi.org/10.1016/j.pain.2006.09.027 | UK | Pain that interferes with daily life appears to be strongly age-related in cross-sectional studies, although the nature of this relationship over time has not been established. We have investigated the onset and persistence of pain and pain interference over a 3-year period to determine their association with age in older people. A 3-year follow-up postal survey was conducted of adults aged 50 years and over (n=5366) who had previously been recruited as part of the North Staffordshire Osteoarthritis Project. Four thousand two-hundred and thirty-four completed questionnaires were received (adjusted response 84.7%). The occurrence of pain interference at 3 years was 19.7% in persons free of such pain at baseline, higher in females than males (6.0% difference; 95% CI: 2.6%, 9.3%), and showed a clear age-related trend with a more than twofold increase from 50 to 59 years (16.0%) to the 80+ years (35%). Any pain at follow-up was reported by 48% of those pain-free at recruitment, and this figure was similar for males and females, and across 10-year age-groups. Persistence of pain interference (72.1%) at 3 years was high. In adults aged 50 years and over, the onset of pain that interferes with life shows a clear gender difference and a consistent rise with age into the oldest age-group.  | Strong |  |
| Tian, Y., Thompson, J., Buck, D., & Sonola, L. | *Exploring the system-wide costs of falls in older people in Torbay.* | 2013 | *The King’s Fund*. | UK | One in three people aged over 65, and half of those aged over 80, fall at least once a year. Falls cost the NHS more than £2 billion per year. With the number of people aged 65 and over predicted to increase by 2 million by 2021, these costs are set to rise further. | Strong |  |
| Treml, J., Husk, J., Lowe, D., & Vasilakis, N.  | Falling standards, broken promises. Report of the national audit of falls and bone health in older people 2010.  | 2011 | *Royal Collge Of Physicians*. Retrieved from papers3://publication/uuid/8315A9D3-9D26-4A1E-B63C-6816B131B5F4 | UK | Neither emergency departments nor fracture clinics are assessing falls risk or bone health in most patients, which suggests that accident and trauma services are focused on treating the injury and not the cause of the injury or reducing the chances of further serious injury. | Strong |  |
| van Haastregt, J. C. M., Zijlstra, G. A. R., Hendriks, M. R. C., Goossens, M. E. J. B., van Eijk, J. T. M., & Kempen, G. I. J. M.  | Cost-Effectiveness of an Intervention To Reduce Fear of Falling.  | 2013 | *International Journal of Technology Assessment in Health Care*, *29*(3), 219–226. https://doi.org/10.1017/S0266462313000275 | The Netherlands | Participants were randomly allocated to intervention (n = 280) and control groups (n = 260). Costs for the intervention program were on average €276 per person. Total costs per person were comparable (€4,925 in intervention group and €4,828 in control group). Furthermore, favorable effects of the program were observed for fear of falling and activity avoidance. | Strong |  |
| Watson, W. L., Clapperton, A. J., & Mitchell, R. J.  | The cost of fall-related injuries among older people in NSW, 2006-07.  | 2011 | *New South Wales Public Health Bulletin*, *22*(3–4), 55–9. https://doi.org/10.1071/NB10002 |  |  | Weak |  |
| Welsh Government.  | *Welsh Health Survey 2015: Health status, illnesses, and other conditions.* | 2016 |  |  |  | Moderate |  |
| WHO Regional Office for Europe.  | The case for investing in public health. | 2015 | WHO |  |  | Moderate |  |
| Williams, N. H., Hawkes, C., Din, N. U., Roberts, J. L., Charles, J. M., Morrison, V. L., … Wilkinson, C.  | Fracture in the Elderly Multidisciplinary Rehabilitation (FEMuR): study protocol for a phase II randomised feasibility study of a multidisciplinary rehabilitation package following hip fracture [ISRCTN22464643].  | 2015 | *Pilot and Feasibility Studies*, *1*(1), 13. https://doi.org/10(2015.1186/s40814-015-0008-0 |  |  | Moderate |  |
| Winckler, V., & Donnelly, M.  | *Out of sight: Visual impairment and poverty in Wales*. | 2012 |  | Wales, UK |  | Weak  |  |
| Wu, S., Keeler, E. B., Rubenstein, L. Z., Maglione, M. A., & Shekelle, P. G.  | A cost-effectiveness analysis of a proposed national falls prevention program.  | 2010 | *Clinics in Geriatric Medicine*, *26*(4), 751–66. https://doi.org/10.1016/j.cger.2010.07.005 | USA | Falls are a major health concern for elderly people and cause substantial health care costs. The authors used meta-analytic findings on the effectiveness of fall prevention interventions to determine cost-effectiveness of a proposed Medicare fall prevention program for people who experience a recent fall. Using published clinical trial data, the authors constructed a population-based economic model and estimated that, in the base case, the program could prevent a half million people from falling again within a year. From the model, under most circumstances the cost-effectiveness ratio is less than $1500 per person prevented from experiencing a recurrent fall. Paying for a fall prevention program to increase the use of evidence-based interventions would be a cost-effective use of Medicare dollars. | Strong |  |
| Wylie, G., Menz, H. B., McFarlane, S., Ogston, S., Sullivan, F., Williams, B., … Morris, J. (2017a).  | Podiatry intervention versus usual care to prevent falls in care homes: pilot randomised controlled trial (the PIRFECT study). | 2017 | *BMC Geriatrics*, *17*(1), 143. https://doi.org/10.1186/s12877-017-0541-1 |  |  | Moderate |  |

**LHS**