Public Health England

Protecting and improving the nation's health

An evidence summary of health inequalities in older populations in coastal and rural areas

Annexe: included studies

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Included Studies: UK and Ireland

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
1. Active Norfolk (2017) Dance to Health[88] https://www.activenorfolk.org/uploads/project-profile.pdf	Innovative falls prevention approach / intervention	Adults aged 65+. Sample size not clear	Participant feedback	Norfolk, England (Rural and Coastal)	Participant enjoyment overwhelmingly positive. Opportunity to socialise. Increased confidence in movements and independence. Some initial increase in pain although the majority of participants identified a reduction in pain. Demand for the sustainability of the programme.	3/10	Lack of formal evaluation	High	Health and care interventions
2. Age UK (2018) Helping people to enjoy later life in Allerdale	A review of annual activities	Age UK target adults aged 50+	Review of activities	Allerdale and Copeland, England (Rural and Coastal)	Interventions were focused on: information, advice and support to assist people in making informed choices and assist	3/10	Lack of formal evaluation	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
and Copeland[91] Not available online					support planning; promote and provide opportunities for safe, independent living; to provide targeted support and supported activities to promote social and digital inclusion and healthy living in active communities. Effectiveness of interventions were not formally evaluated. Examples provided.				
3. Allan, R et al (2018) Gendered mortality differentials over the rural-urban continuum: The analysis of census linked	Urban-rural mortality variation and causes	465,646 adults aged 20 and older in 2001 (Age groups 2 0 to 64 and 65+)	Survival analysis of the Office for National Statistics Longitudinal Study	England and Wales (Rural v Urban)	Demonstrated a clear urban-rural mortality gradient, with the risk of dying increasing with each level of urbanisation. The exceptions were those living in areas adjacent to London, who consistently	14/14	Individual's place of residence is taken from just 1 time point	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
longitudinal data from England and Wales[9] https://www.sciencedirect.com/science/article/pii/S0277953618305719?via%3Dihub					exhibited lower mortality than anticipated. Once the models were adjusted to individuals' socio-economic characteristics, the variation across the urban-rural continuum reduced substantially, although the gradient persisted suggesting contextual effects. Females were found to be influenced more by their surrounding environment and males by their socio-economic position, although both experienced lower mortality in rural compared to urban areas.				
4. All-Party Parliamentary Group for Rural	An inquiry into the funding formulae	General population	Written and oral evidence presented	England (Rural)	Concluded that achieving equitable outcomes costs	Not able to assess	Methods of data	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Services (2010) The implications of national funding formulae for rural health and education provision[54] http://www.f40.org.uk/wp-content/uploads/2015/12/appgfunding-full-260310.pdf	used to allocate resources for health		to the inquiry		more in rural areas, for a variety of reasons relating to remoteness and limited economies of scale. In addition, the older age profile in rural areas increases the cost of providing adequate healthcare for rural populations. The funding formula at the time actually provided less money per patient for those who happen to live in a rural rather than an urban area.		collection not clear		
5. Alzheimer's Society (2018) Dementia Friendly Communities[93]	Explains the work each dementia friendly community is undertaking in East Durham	People affected by dementia	Reports main activities	East Durham (Rural and Coastal)	A dementia friendly community is; 'A city, town or village where people with dementia are understood, respected and supported, and continue to live in the way they want	Not able to assess	Lack of formal evaluation	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Not available online					to and in the community they choose.' Since Autumn 2017, people of all ages from communities across East Durham have been working together with people affected by dementia towards making their communities' dementia friendly. Facilitated by the Alzheimer's Society Dementia Friendly Communities Coordinator for East Durham working with the Senior Dementia Friendly Communities Officer, North East, the project has identified local community leads, established Dementia Friendly				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					Community Steering Groups and actively involved people living with dementia and carers in working together to become recognised Dementia Friendly Communities that are each unique and sustainable.				
6. Appleton et al (2009) Fruit and vegetable consumption in older individuals in Northern Ireland: levels and patterns[48] https://www.cambridge.org/core/journals/british-journal-of-nutrition/arti	Fruit and vegetable consumption patterns	A representative sample of 426 adults over the age of 65 years	Telephone survey	Northern Ireland (Rural v Urban)	No rural or urban differences in patterns of fruit and vegetable consumption with older individuals consuming about 4 portions of fruit and vegetables per day. This may be a reflection of the availability of fruit and vegetables in rural areas of Northern Ireland as a result of home-grown produce, local	6/12	fruit and vegetable consumption was assessed using self report, which may be more susceptible to inflation	Medium	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
cle/fruit-and-vegetable-consumption-in-older-individuals-in-northern-ireland-levels-and-patterns/D88481AB348B640B3E1E2D78DB40449F					sellers and local markets.				
7. Asthana et al (2004) The pursuit of equity in NHS resource allocation: should morbidity replace utilisation as the basis for setting health care capitations? [96] https://www.sciencedirec	NHS resource allocation	36,663 adults aged 16+ from 34 PCTs in 7 Health Authorities	A critical review ofNHS resource allocation	England (Rural v Urban)	Proposed that a morbidity-based model would result in a significant shift in hospital resources away from deprived areas, towards areas with older demographic profiles and towards rural areas. Because epidemiological estimates yield direct measures of health status, there are strong grounds for proposing that	12/14	Model not evaluated	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
t.com/science/article/pii/S027795360300217X?via%3Dihub					a morbidity-based model provides a more legitimate basis for allocating health resources than the use of indirect proxies such as health service utilisation or deprivation				
8. Asthana & Halliday (2004) What can rural agencies do to address the additional costs of rural services? A typology of rural service innovation [98] https://onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2524.2004.0	Projects developed within a rural Health Action Zone	General population	Literature review	Cornwall and Isles of Scilly (Rural and Coastal)	Describes a range of innovative approaches to service delivery which explicitly attempt to address the particular challenges posed by a rural context.	6/10	Lack of formal evaluation	High	Whole systems approaches

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
0518.x?sid=nlm%3Apubmed									
9. Atterton (2006) Ageing and Coastal Communities: Final Report for the Coastal Action Zone Partnership[95] https://www.ncl.ac.uk/media/wwwnclacuk/centreforruraleconomy/files/coastal-communities.pdf	Models to maximise ageing trend	General population	Analysis of 2001 census data	England, Scotland and Wales (Rural and Coastal)	Models were proposed – the pre-retirement model and the retirement industry model – which represent progressive and pro-active strategies to maximise the benefits of demographic ageing trend along Britain's coast were identified	10/14	Model not evaluated	High	Whole systems approaches
10. Barrett et al (2016) Location and deprivation are important influencers	Physical activity of adults	Adults between the ages of 18 to 69 years presenting for their	Questionnaire survey	Republic of Ireland (Rural v Urban)	Adults living in rural locations were less physically active than those located in urban areas. The difference in activity levels	9/12	Self-report physical activity measure open to bias from overestimation and	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
of physical activity in primary care populations[47] https://www.sciencedirect.com/science/article/pii/S0033350616000779?via%3Dihub		primary care appointment			between the locations was accounted for by differences in walking. The median walking time of rural participants was less than 10 minutes walking per day. This compares with a median of 30 minutes of walking per day for the most active, urban deprived sample		problems with recall		
11. Basu & Steven (2009) A Comparison of Rural and Urban Rheumatoid Arthritis Populations [55] https://journals.sagepub.com/doi/ab	Disparities in the management of patients with rheumatoid arthritis	1314 patients aged 22 to 105 years with rheumatoid arthritis	A retrospective observational study	Raigmore Hospital, Inverness, Highlands of Scotland (Rural v urban)	Rural dwellers, with rheumatoid arthritis in the Highlands of Scotland, do not appear to be disadvantaged in regards to their disease management in comparison to the urban population.	12/14	There may be a number of undiagnosed rheumatoids, patients who have chosen not to present to their primary care practitioner, or to have refused the	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
s/10.1258/rsmsmj.54.1.7							invitation to specialist review		
12. Bonar et al (2000) Hypothyroidism and ageing: The Rosses' Study[29] https://www.liebertpub.com/doi/abs/10.1089/thy.2000.10.821	Prevalence of hypothyroidism	544 females aged 50+ years and 1000 females aged 18 to 49	Observation of patient records and case control blood samples	A general practice in the Rosses, Northwest of Ireland (Rural and Coastal)	A high prevalence of hypothyroidism in women in the Rosses was confirmed compared to the Irish National. The reason for this is unclear but may reflect high levels of opportunisitic screening	10/12	Age of onset of hypothyroidism not avaiable for all participants	Low	Nature of inequalities
13. Campbell et al (2002) Impact of deprivation and rural residence on treatment of colorectal and lung cancer[56] https://www.ncbi.nlm.nih.gov/pmc/art	Differences in treatment of colorectal and lung cancer for deprived and outlying, rural patients	1,314 patients diagnosed with lung or colorectal cancer	Case note review (Cohort study)	North and northeast Scotland (Rural v Urban)	Rurality may have a minor impact on modalities of treatment for colorectal cancer with less radiotherapy among outlying patients, but does not lead to delays between referral and treatment with colorectal cancer treatment actually	14/14	Levels of deprivation are more difficult to assess in rural areas where affluence and poverty can coexist in close proximity.	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
icles/PMC2364239/					quicker for outlying patients.				
14. Cassarino (2016) Environment and Cognitive Aging: A Cross-Sectional Study of Place of Residence and Cognitive Performance in the Irish Longitudinal Study on Aging[39] https://psycnet.apa.org/record/2015-52770-001	Urban/rural differences in cognition	3,765 healthy community-dwelling people aged 50+ years	Wave 1 of The Irish Longitudinal Study on Aging	Ireland (Rural v Urban)	Urban residents showed better performance than rural or other settlement residence groups for global cognition and executive functions after controlling for covariates. Childhood urban residence was associated with a cognitive advantage especially for currently rural participants.	14/14	Self-rated childhood health	Medium	Nature of inequalities
15. CCRI et al (2013) Alternative Service Delivery Models in	Examines how innovative approaches have developed,	Rural communities	Policy, literature and technical reviews. A survey of	England (Rural)	The study suggests that the 'Big Society' approach, to give communities and authorities the	5/10	Lack of formal evaluation	High	Whole systems approaches

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Rural Areas – Final Report[97] https://www.rsnonline.org.uk/images/stories/publications/11696_FinalDefraASDReport.pdf	how they operate in practice, and what the main successes and barriers are to their implementation in rural areas		LAs and CVS groups and 12 in-depth case studies		wherewithal to tailor their services to local circumstances through a broad base of action, does offer a number of benefits, particularly through the use of common local assets by a number of services co-terminously. Good examples of these are for example, sustaining the pub, shop, library, social care, health, broadband and transport. Motivated individuals and personal commitment are critical to these developments and can be part of a virtuous circle: initial motivations can be infectious.				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
16. Christie & Fone (2003) Equity of access to tertiary hospitals in Wales: a travel time analysis[57] https://academic.oup.com/jpubhealth/article/25/4/344/1523467	Geographical access in configuration of National Health Service tertiary hospital service provision located in Wales	Residents aged 75 or more years	Travel time road length analysis from hypothetical scenarios	Wales (Rural)	Centralisation of services reduces geographical access for rural older people.	12/14	No allowance for time for parking, or for rest breaks. Real journey times depend on the amount of traffic congestion.	Low	Health and care interventions Whole systems approaches
17. Connolly et al (2011) Area of residence and alcohol-related mortality risk: a 5-year follow-up study[19] https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1360-	To examine differences in alcohol-related mortality risk between areas	720 627 people aged 25 to 74, from the Northern Ireland 2001 Census, not living in communal establishments	A 5-year longitudinal study	Northern Ireland (Rural v Urban)	Risk of alcohol-related mortality is lower in rural than urban areas, but the cause is unknown.	14/14	Difficulty in unravelling individuals from areas, and areas from individuals Cross sectional	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
0443.2010.03103.x									
18. Corcoran (2018) House of Lords Select Committee on Regenerating Seaside Towns and Communities[35] https://www.parliament.uk/documents/lords-committees/Regenerating-Seaside-Towns/Seaside-Written_Evidence_Volume.pdf	Understanding the Issues Facing UK Coastal Towns	General population	Applied research, implementation and practice	England (Coastal)	Coastal towns tend to be characterised by an ageing population of long-term residents or incoming retirees and a transient younger, marginalised group. Living in coastal towns can effect individuals' healthy life expectancy, with particularly high levels of both common and serious mental health difficulties. Evidence focused on community wellbeing and health inequalities suggests that a combination of the following would most likely lead to positive change in the prospects of UK coastal towns:	Not able to assess	Lack of information regarding study design	High	Nature of inequalities Whole systems approaches

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					1) National legislation aimed at halting the drift of vulnerable and transient populations to UK coastal towns. 2) National legislation addressing the longstanding issues of the quality and type of homes and accommodation associated with isolation, loneliness, poor mental and physical health that can back up and support context-sensitive local initiatives such as the Blackpool Housing Strategy. 3) Inclusive approaches to physical regeneration such as community co-				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					design focussed on community wellbeing and informed by evidence of their wellbeing efficacy. 4) Community wealth building approaches to social and economic regeneration that involves anchor institutions and public authorities procuring services from locally-based practices that know and rely on the town for their business.				
19. Corfe (2017) Living on the edge: Britain's coastal communitie s[31] : http://www.s	To understand the extent to which coastal communities are among the worst ranked parts of the country in terms of earnings,	General population	Quantitativ e analysis of economic and social data at a local authority level	Coastal	Of the 20 local authorities in England and Wales with the highest proportion of individuals in poor health, 10 were in coastal communities	Not able to assess	Methods not reported	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
mf.co.uk/wp-content/uploads/2017/09/Living-on-the-edge.pdf	employment, health and education								
20. Cullum et al (2007) Effectiveness of liaison psychiatric nursing in older medical inpatients with depression: a randomised controlled trial[85] https://academic.oup.com/ageing/article/36/4/436/40688	To compare liaison psychiatric nursing with usual medical care in the management ofolder medical inpatients who screen positive for depression	121 medical inpatients aged 65+ out of 138 screen positives on the 15-item geriatric depression scale entered the trial (58/121 fulfilled criteria for depressive disorder at baseline)	Pragmatic Randomised Controlled Trial	Medical wards of UK district general hospital in rural East Anglia (Rural)	Participants in the intervention group (A liaison psychiatric nurse assessed participants, formulated a care plan for treatment of their depression, ensured its implementation through liaison with appropriate agencies, and monitored participants' mood and response to treatment for up to 12 weeks) were more satisfied with their care, but no significant differences in depressive disorder,	11/11	Low sample size Dropout	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					depression rating or quality adjusted life weeks gained were found between groups. However, there was a trend towards improvement in the intervention group and effect sizes were higher in the subgroup with depressive disorder.				
21. De Koning et al (2015) Similarities and differences in the determinants of trips outdoors performed by UK urban- and rural- living older adults[75]	Compared and contrasted determinants of trips outdoors	Rural- (n=13) and urban-living (n=15) people aged 65 and older	Qualitative interview study	South West England (Rural V Urban)	Some personal-level determinants (age-related barriers) and environment-level factors (car dependence, bus services) were shared across samples. The main differences were seen in how a community-based social network instigated trips outdoors for rural participants while	9/10	All white, English older adults	High	Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
https://journals.humankinetics.com/doi/abs/10.1123/japa.2014-0141					family ties mostly led to trips outdoors for urban-living participants. Having social contacts in the community may lead to a larger overall social network than if an older person relies only on family contact alone.				
22. de Lusignan (2018) Conurbation, Urban, and Rural Living as Determinants of Allergies and Infectious Diseases: Royal College of General Practitioners Research and	To assess differences in general practice presentations of allergic and infectious disease in those exposed to conurbation or urban living compared with rural environments	175 English general practices covering a population of 1,602,366 patients of any age	Multivariate logistic regression of disease surveillance data	England (Rural v Urban)	Those living in conurbations or urban areas were more likely to consult a general practice for allergic rhinitis and upper respiratory tract infection. Both conurbation and rural living were associated with an increased risk of urinary tract infection. Living in rural areas was associated with an increased risk of asthma and lower	14/14	Not everyone who has infectious or allergic diseases will go to their GP, meaning that actual rates of illness may have been higher in the general population	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Surveillance Centre Annual Report 2016-2017[24] https://publichealth.jmir.org/2018/4/e11354/					respiratory tract infections.				
23. Defra (2009) Inequalities in health outcomes in rural areas[12] http://randd.defra.gov.uk/Document.aspx?Document=Healthinequalities-Finalreport.pdf	To examine certain health advantages and disadvantages in different types of rural areas	General population	Investigating a number of health indicators (including access to services for 2008, mortality for 2001 to 2007 and life expectancy for 2006 to 208)	England (Rural v Urban)	The results showed that at Census 2001 the age profile of those living in rural areas was generally older when compared to urban areas. While mortality rates were higher in urban areas compared to rural areas, within rural areas those living in the town and fringe settlement types had higher mortality rates than those living in village and	14/14	Susceptible to the ecological fallacy	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					dispersed areas. There were no conclusive difference in urban and rural areas between the rates of mortality and fatality from acute myocardial infarction and access to emergency medical services. Overall, life expectancy was higher in rural areas than urban areas for both males and females. Within rural settlement types, life expectancy was higher in village and dispersed areas than town and fringe areas.				
24. Docking et al (2015) The epidemiology of regional	To examine whether the prevalence of regional and chronic	Participants, aged ≥55 years, from participating general	Postal questionnaire survey	Scotland (Rural v Urban)	There was some evidence to suggest that the prevalence of widespread	8/12	Only investigated the aetiology of those pain	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
and widespread musculoskeletal pain in rural versus urban settings in those ≥55 years[25] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4616965/	widespread pain (CWP) varies with rurality	practices in 7 different geographical locations			musculoskeletal pain increased with increasing rurality, although the magnitude of this was slight. No large or significant differences were observed with any regional musculoskeletal pain conditions. Risk factors for widespread musculoskeletal pain are similar to those seen in the urban setting, including markers of general health, mental health and also aspects of social contact. It may be, however, that social networks are more difficult to maintain in rural settings, and clinicians should be aware of the negative effect of perceived social		conditions which were found to increase significantly with increasing rurality		

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					isolation on pain in rural areas.				
25. Doebler (2016) Access to a Car and the Self-Reported Health and Mental Health of People Aged 65 and Older in Northern Ireland[76] https://journals.sagepub.com/doi/abs/10.1177/0164027515590424?rfr_dat=cr_pub%3Dpubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&journalCode=roaa	Relationships between access to a car and the self reported health and mental health of older people	N = 65,601 individuals aged 65 years and older	Longitudinal Study	Northern Ireland (Rural v Urban)	Having no access to a car is related to a considerable health and mental health disadvantage particularly for older people who live alone. Rural–urban health and mental health differences are mediated by access to a car. The findings support approaches that emphasize the importance of autonomy and independence for the well-being of older people and indicate that not having access to a car can be a problem for older people not only in rural but also in intermediate and	14/14	For multi-person households, we cannot know whether the older person living in the household is the driver nor does the measure indicate the actual car usage	Medium	Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					urban areas, if no sufficient alternative forms of mobility are provided.				
26. Dorset area of outstanding natural beauty (2016) Stepping into Nature Pilot Evaluation [72] https://www.dorsetaonb.org.uk/resource/stepping-into-nature/	To investigate opportunities/ barriers for older people living in their own homes, including those living with dementia (PLWD) or a mild cognitive impairment (MCI), and their carers that encourages the interaction with or connection to the natural & cultural environment and experience its	293 people comprising of 11% PLWD, 12% caring for someone with dementia, 10% volunteers or knew someone with dementia, 19% older people and representatives of organisations, 48% unkown	Questionnaires	Dorset, England (Rural and Coastal)	Information and opportunities for engaging in the natural environment for older people are fragmented and limited. There are number of barriers/enablers to accessing the natural environment including accessibility; seasonality and weather; information; cost; health; those related to dementia and perception of others. We highlighted that the language used to promote inclusive activities is	4/12	Lack of details of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
	restorative effects				important and can greatly influence the number of people taking part				
27. Dwyer & Hardill (2011) Promoting social inclusion? The impact of village services on the lives of older people living in rural England[86] https://www.cambridge.org/core/journals/ageing-and-society/article/promoting-social-inclusion-the-impact-of-village-services-on-the-lives-of-	The impact of 'village services' on the lives of older people	44 older rural residents and users of 1 of the 6 village services (32 women and 12 men) (age range 58 to 93 years) 25 key informants involved in the management, day-today delivery, or financing of the services	A qualitative study	Three rural regions of England (Rural)	'Village services' refers to 6 community-based services and activities provided to help meet the needs of older rural residents, namely lunch clubs, welfare rights information and advice services, befriending schemes and community warden support. Village services promote social inclusion by enhancing older rural residents' access to the resources, rights, goods and services that encourage social interaction and meaningful	8/10	Small sample Not a RCT	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
older-people-living-in-rural-england/FBEBFF756D94461C731552FB4D267338					participation in community life. It is clear, however, that the overwhelming majority of users of village services are female, that older men are often reluctant to engage with the services on offer, and that the providers of village services need to find new and innovative ways of engaging with older men in rural areas.				
28. Elliot et al (2015) Examining the role of Scotland's telephone advice service (NHS 24) for managing health in the	To examine the type, duration and outcome of the symptoms and health problems Scotland's nurse-led telephone advice	Any users of NHS 24	Analysis of routinely collected NHS 24 data.	Scotland (Rural v Urban)	NHS 24 is a nurse-led telephone advice service to provide an accessible, high-quality, consistent and sensitive healthcare service to the people of Scotland via a network of contact centres accessible	12/14	16% data excluded from analyses due to missing data	Medium	Digital technology

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
community: analysis of routinely collected NHS 24 data[99] https://bmjopen.bmj.com/content/5/8/e007293	service (NHS 24) is contacted about and explore whether these vary by time of contact and patient characteristics				through a single telephone number and is available 24 hours a day, 7 days a week. Compared with in-hours users, a significantly higher proportion of out-of-hours users were female, younger or older, living in less affluent areas and living in remote and rural areas. There were no clear differences in the problems presented by different urban/rural groups. A smaller proportion of older users than younger users used the service. This may reflect an unfamiliarity among older people with this type of service or				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					an unwillingness to use telephone advice lines.				
29. Erskine et al (2010) Socioeconomic deprivation, urban-rural location and alcohol-related mortality in England and Wales[18] https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-10-99	To investigate variation in alcohol-related mortality in relation to socioeconomic deprivation, urban-rural location and age	28,839 deaths (age <15-80+)	An ecological study design	England and Wales (Rural v Urban)	Alcohol-related mortality rates were higher in men and increased with increasing age, generally reaching peak levels in middle-aged adults. The 45 to 64 year age group contained a quarter of the total population but accounted for half of all alcohol-related deaths. People living in urban areas experienced higher alcohol-related mortality relative to those living in rural areas, with differences remaining after adjustment for socioeconomic deprivation.	12/14	All deaths from liver fibrosis and cirrhosis, were included but not all of these deaths will have been caused by alcohol	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
30. Fenge & Jones (2012) Gay and Pleasant Land? Exploring Sexuality, Ageing and Rurality in a Multi-Method, Performative Project[46] https://academic.oup.com/bjsw/article-abstract/42/2/300/1680785	Perspectives of living in rural areas	22 older lesbian and gay men living in rural areas	Qualitive participatory action research study including visual ethnography, focus groups and interviews	South-west of England and Wales (Rural)	Some older lesbians and gay men in rural areas prefer to remain hidden due to concerns over intolerance where they live. As a consequence, it is important to recognise that the issues and perspectives of those who do come forward to participate in research may not reflect those who remain hidden and marginalised in rural communities. In other words, as suggested by the authors, research findings among this group could potentially underestimate or underemphasise the extent to which rural residence among sexual	8/10	Small sample	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					minorities impacts on their social connections.				
31. Finnerty et al (2009) A postal survey of data in general practice on the prevalence of Acquired Brain Injury (ABI) in patients aged 18 to 65 in 1 county in the west of Ireland[38] https://bmcfampract.biomedcentral.com/articles/10.1186/1471-2296-10-36	The prevalence of ABI in County Mayo	Patients aged 18 to 65 years old with ABI	Postal Survey of all general practices in County Mayo	West of Ireland (Rural v Urban)	There were found to be significantly more patients with ABI in rural areas than urban areas. Traumatic brain injuries and tumours were more common in rural areas whilst haemorrhage and infection were noted more in urban settings.	6/12	Low response rate	Low	Nature of inequalities
32. Frewen et al (2013) Factors that	To investigate the	A population sample (n= 4890) of	Longitudinal study	Republic of Ireland	Lack of awareness of Atrial Fibrilliation was associated	14/14	Exclusion of persons in residential	Low	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
influence awareness and treatment of atrial fibrillation in older adults[67] https://www.ncbi.nlm.nih.gov/pubmed/23504411	prevalence of atrial fibrillation (AF), treatment rates of AF and the factors underlying awareness and treatment	people aged 50+		(Rural v Urban)	with lower education (P= 0.01), lower cognition (P= 0.04), rural location (OR= 3.67; P= 0.02) and number of general practitioner visits (P= 0.01).		care and/or with significant cognitive impairment/ dementia means that findings cannot be generalised to the entire population		
33. Gray et al (2013) Explaining the social patterning of lung function in adulthood at different ages: the roles of childhood precursors, health behaviours and environmental factors[20]	To determine the extent to which the socioeconomic patterning of lung function varies with age	24 500 participants aged ≥18 years	Cross sectional cohort study	Scotland (Rural v Urban)	Urban/rural residence had some impact on lung function among older adults (65+). With rural older adults having better lung function.	13/14	Analyses are based on cross-sectional survey data prohibiting ability to assess lung function reductions over age within individuals	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3812876/									
34. Green & Bramley (2018) Rural Workforce Issues in Health and Care[58] https://www.ncrhc.org/news/rural-workforce-issues-in-health-and-care	To apply a rural lens to the workforce challenges facing the NHS and social care in England	Delivery agencies (including local authorities in the context of social care), professional associations, stakeholders etc.	Spatial framework, analyses of economic and labour market data, evidence review, interviews and workshops with stakeholders	England (Rural)	There is systemic lack of 'thinking rurally' in workforce planning in health and care. Sparser and smaller populations, higher employment rates, lower unemployment rates, an older population and relatively fewer younger people pose challenges for recruitment, retention and workforce development in rural areas. Rural areas are diverse. The importance of sensitivity to local circumstances also	5/10	Lack of detailed methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					needs to be taken into account in workforce planning in rural areas. Establishing consensus on what health and care service delivery should look like in rural areas and what staffing models are most appropriate to achieve this lies at the heart of workforce supply and development issues. Urban bias is apparent in the application of the universal service and standards approach of the NHS. This tends to further disadvantage rural areas which can face enhanced challenges relative to urban areas in				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					meeting nationally imposed minimum threshold standards associated with health-related and non-health-related aspects of service delivery.				
35. Hall et al (2016) Technology Enabled Care (TEC) provision for the care home sector in the Scottish Highlands: video conferencing in care homes[100] https://www.ijic.org/articles/abstract/10.5334/ijic.2898/	Nurse led Technology Enabled Care older adult psychiatry clinics were introduced in 3 rural care homes in NHS Highland with the aim of providing improved access to psychiatric care services, reducing unnecessary admissions, reducing antipsychotic use for	Unclear	Unclear	Scotland (Scottish Highlands) (Rural)	The direct impact on residents has been quicker assessment, treatment review and regular monitoring. Residents and family members believe that it is more responsive to their needs. In addition to direct impacts on residents, the development of greater knowledge and understanding by care home staff through access to specialist knowledge,	Not able to assess	Lack of detailed information	Medium	Digital technology

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
	people with dementia and improving the management of behavioural and psychiatric symptoms of dementia				experience and advice has led to increased confidence and skills, enabling staff to feel more confident and be more actively involved in care. Care homes have become more able to manage complex cases and challenging behaviours locally and are less likely to admit patients to hospital. Prevention of hospital admissions has allowed residents to remain within their local care setting. Where hospital admission has been necessary, sooner and more frequent follow up has been possible after discharge back to				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					the care home. Frequent reviews have enabled more rapid adjustment in medication, with some residents becoming managed through behavioural plans only. Overall, participation in the clinics has led to staff feeling more valued in their role.				
36. Hamilton (2016) Changing service provision in rural areas and the possible impact on older people: A case example of compulsory post office closures	Impacts of basic service change on older people in rural areas	15 older people (65 years and over)	Secondary analysis of survey data and case study (interviews and focus groups)	England (Rural)	Changes to the provision of Post Office services in rural areas of England – that is, branch closures with a mobile replacement – indirectly impact on older people (65 years and over) by creating a perceived loss of a social meeting place. This restructuring consequently has	9/10	The Freedom of Information response only covered enforced closures and change by the Post Office (meaning it does not include closures for other reasons).	High	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
and outreach services in England[52] https://www.cambridge.org/core/journals/social-policy-and-society/article/changing-service-provision-in-rural-areas-and-the-possible-impact-on-older-people-a-case-example-of-compulsory-post-office-closures-and-outreach-services-in-england/2C42D1A2B781387AE77F					an indirect negative impact on older rural residents' access to social contacts as well as on their engagement in activities out in public		This means that the findings could underestimate the number of closures during the years of the Network Change Programme		

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
676A6D43F87F									
37. Harriss & Hawton (2011) Deliberate self-harm in rural and urban regions: A comparative study of prevalence and patient characteristics[32] https://www.sciencedirect.com/science/article/abs/pii/S0277953611002863?via%3Dihub	Rates of deliberate self-harm (DSH) in urban and rural districts	4,054 persons aged 15 years and over presenting to the local general hospital for episodes of DSH	Cohort study	Oxfordshire, England (Rural v Urban)	Urban DSH rates were substantially higher than rural rates amongst both males and females aged between 15 and 64 years. There was little difference between urban and rural rates for patients aged 65 years and over.	14/14	Definitions of rural and urban are not consistent across studies, and the use of different measures may result in differences in classification of an area	Medium	Nature of inequalities
38. Hobson et al (2005) Cross-sectional survey of Parkinson's disease and	To estimate the crude and standardized age/sex-adjusted prevalence rates of	77,388 general population	Cohort study	North Wales (Rural)	Prevalence rates adjusted to an index UK population show lower rates of parkinsonism and Parkinson's	13/14	Method of case ascertainme xcluded cases of parkinsonism not due to	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
parkinsonism in a rural area of the United Kingdom [42] https://onlinelibrary.wiley.com/doi/abs/10.1002/mds.20489	parkinsonism and Parkinson's disease (PD)				disease for a rural compared to an urban population.		PD and subjects with isolated tremor.		
39. Hughes (2018) Delivering Physical Activity in Norse Care Residential Settings[84] Not available online	Mobile Me was a free 10-week sport intervention delivered between October 2015 and December 2017. The primary intended outcome of Mobile Me was a reduction in inactivity. Secondary outcomes	Residents aged sixty-five years and over	A pragmatic, mix-methods evaluation, with qualitative and quantitative data and a waiting-list control group	Fifty-one sheltered housing and care home sites in Norfolk (Rural and coastal)	Sedentary behaviour in the intervention group reduced. Physical activity and sport also increased. Arm curl improved in the intervention group. Self-reported fear of falling reduced. Qualitative feedback from professional stakeholders and residents suggest that residents felt less socially isolated due to Mobile Me,	3/11	Lack of detailed methods	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
	were to improve functional status, well-being and social interaction, and to reduce sitting time, fall-risk and loneliness				although scores on a loneliness scale did not improve. Scores on a wellbeing scale did improve. Mobile Me was cost effective in 3 out of 4 scenarios tested using the Sport England MOVES model. Mobile Me differs from many other physical activity programmes described in the literature as it is unstructured and low-intensity. Mobile Me provides an example of a different approach to engaging older people in physical activity.				
40. Iliffe et al (2017) Health and well-being promotion	To explore and map the extent to which such 'hard to	Hard to reach groups were defined as older people	Document analysis of current health and well-being	10 localities in England	Strategies to counter rural deprivation included recruitment of	Not able to assess	Relied on public documents	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
strategies for 'hard to reach' older people in England: a mapping exercise[92] http://discovery.ucl.ac.uk/1567522/1/Iliffe_Health_well-being_promotion.pdf	reach' groups of older people, are the focus of local health and well-being strategies in England	from deprived areas, the oldest old and those from ethnic minorities	promotion strategies in a purposive sample of areas with high proportions of some or all of the 3 hard to reach groups	(Rural v Urban)	village 'agents' who would signpost (mostly older) residents with unmet needs to services and community resources, and also promote volunteering, commissioning housing providers to provide energy advice and to deliver an outreach service for older people, other initiatives aimed at reducing fuel poverty were specifically targeted towards older people living in rural areas.		Unable to access internal documents Quantitative data not scrutinised for its contribution to the policy analysis		
41. Iversen et al (2005) Is living in a rural area good for your respiratory health?	To investigate the epidemiology of self-reported chronic respiratory	4,560 adults registered (aged 16 to 75+) with 1 of 57 family practices (22 rural and 35	Cross sectional study	Scotland (Rural v Urban)	Living in a rural area was associated with a lower prevalence of asthma but not other chronic respiratory disorders, and a	10/12	Rurality based on current residency only	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Results from a cross-sectional study in Scotland[21] https://journal.chestnet.org/article/S0012-3692(15)52603-2/fulltext	disease throughout Scotland, and to explore the relationship between quality of life and geographic location in those reporting disease	urban) throughout Scotland			lower prevalence of some respiratory symptoms (including wheeze) in adults. Although the prevalence of COPD or emphysema did not differ between rural and urban areas, rural residency appeared to be associated with better health status among subjects with these conditions.				
42. Jefferson et al (2018) Home care in England: Views from commissioners and providers [59] https://www.kingsfund.or	To understand the key trends and challenges facing the home care sector	53 participants – commissioners and providers from 20 national social care organisations	Interviews	England (Rural v Urban)	Rurality was identified as 1 of 5 predictors of problems relating to home care supply. Rural areas generally have lower rates of unemployment and lower rates of income deprivation affecting older people. We found	5/10	Lack of detail of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
g.uk/sites/default/files/2018-12/Home-care-in-England-report.pdf					that home care providers in rural areas were smaller, but provided better quality care (a higher proportion were rated good or outstanding by the CQC). They received higher fee rates from local authorities and paid higher hourly rates to their workers (both of which may reflect supply challenges). The rurality of a provider's location created financial pressure on domiciliary care companies because of the additional travel time that needed to be paid to care workers. In some instances, home care providers had				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					deliberately moved out of rural locations due to the unsustainable costs associated with paying staff travel time, which were not sufficiently reimbursed by local authority contracts. In some rural areas or areas of high employment, the challenge was to recruit enough workers in competition with other sectors paying higher wages, offering more stable employment or easier working conditions.				
43. Jivraj et al (2016) Short- and long-term determinants of social	The effect of short-term changes in marital, employment and health	5,315 people living in private households	English Longitudinal Study of Ageing	England (Rural v Urban)	Older adults living in a rural area had a greater risk of being socially detached than those living in	14/14	1000 cases were lost due to respondents not completing	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
detachment in later life[50] https://www.cambridge.org/core/journals/ageing-and-society/article/short-and-longterm-determinants-of-social-detachment-in-later-life/3AEA98F842BCB085ADC79A651CC21D09	status on the dynamics of social detachment over the following 4 years	aged 50 and over			urban areas. This is likely to reflect the fact that fewer social opportunities are available in rural areas, because there are fewer people and places to visit, which also means people are more vulnerable to becoming socially detached. Access to facilities will also be more difficult for those living in rural areas and may deter people from engaging socially even when they have means of transport.		the ELSA self-completion questionnaire in its entirety or in particular items that comprised the social detachment index		
44. Jones & Lake (2013) The combined impact of rural residence and socio-economic	Whether the benefit of living in rural areas is felt by individuals in all levels of deprivation	Age 50 to retirement	Cohort study	England and Wales (Rural v Urban)	Male premature mortality rates in England and Wales (age 50 to 64) fell with increasing rurality for individuals in all socioeconomic status	12/14	Only representative of the levels of rurality and socio-economic conditions present in	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
status on premature mortality[10] https://www.sciencedirect.com/science/article/abs/pii/S1353829213001159?via%3Dihub					classifications. The most deprived individuals benefitted most from residence in increasingly rural areas. Similar trends were observed when premature mortality was subdivided by the major causes of death. Female premature mortality rates (age 50–59) demonstrated similar trends but the differences between urban and rural areas were less marked.		England and Wales		
45. Jordan et al (2004) Distance, rurality and the need for care: access to health services in	The geographical accessibility of health services in urban and rural areas	General population	Compare 2 measures of geographical access: straight-line distance and	South West England (Rural v Urban)	Access to primary and secondary care were most difficult in rural and coastal areas. In these areas straight-line distances underestimate true	Not able to assess	Only 1 region of England, a relatively affluent area with a very small ethnic minority population	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
South West England[68] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC524184/			modelled drive-time along the road network to primary and secondary care throughout South West England		travel distance, reflecting sparse road networks and geographical barriers such as hills, rivers and coastline. The proportion of over 65 year olds increased slightly with straight-line distance from hospitals: more remote wards had a slightly higher proportion of residents over the age of 65, but there was considerable variation within deciles of remoteness, and the observed difference was small.		and an unusual 'peninsular' geography		
46. Judge et al (2010) Equity in access to total joint replacement	To explore geographical and sociodemographic factors associated	Patients (aged 50+) throughout England who needed total hip or	Cross Sectional Study	England (Rural v Urban)	In terms of age, an ‘n’-shaped curve is identified, with people aged 50 to 59 years and those aged 85 and over	14/14	Lack of individual data Information on social	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
of the hip and knee in England: Cross sectional study[23] https://www.bmj.com/content/341/bmj.c4092	with variation in equity in access to total hip and knee replacement surgery.	knee replacement and numbers who received surgery			receiving less total hip replacement and less total knee replacement surgery than people aged 60 to 84 years. For total knee replacement in patients, those in urban areas got higher provision relative to need, but for total hip replacement it was highest in villages/isolated areas.		class or obesity were unavailable Ethnicity is incompletely recorded		
47. Kee et al (2007) Are Gatekeepers to Renal Services Referring Patients Equitably? [66] https://journals.sagepub.com/doi/abs/10.1258/1	To investigate access to and timeliness of referral to renal specialists relatively early in the course ofthe disease	16,856 adult patients aged 20 to 80+ years	Cohort	Northern Ireland (Rural v Urban)	Diabetic patients, older patients and those living in deprived areas were significantly more likely to have serum creatinine testing, compared with non-diabetic, younger and those living in more affluent areas. Delays in referral to renal specialists for patients with	14/14	25% of patients in the cohort had only a single creatinine test No detailed clinical information on why patients had renal function	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
3558190777 9497530					raised serum creatinine levels (a marker of kidney disease) were significantly shorter among diabetic patients, women, younger individuals, those living in rural areas.		tested or why they were referred		
48. Lehtinen et al (2003) Urban-rural differences in the occurrence of female depressive disorder in Europe--evidence from the ODIN study[34] https://link.springer.com/article/10.1007/s00127-003-0631-6	Urban-rural differences in the occurrence of female depressive disorder	12,702 people aged between 18 and 64	Cohort	Four European countries (Finland, Ireland, Norway and the UK) (Rural v Urban)	A large between-country variation was found in female urban prevalence of depressive disorder, with Ireland (Dublin) and the UK (Liverpool) having a remarkably high rate compared to Finalnd and Norway. The women in these same countries showed a significant urban/rural difference, whereas in men	12/14	In the UK there were different interviewers for urban and rural sites, which was not the case in the other countries	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					and in the total sample this difference was non-significant. There was a remarkable urban preponderance in comparison to the corresponding rural site in the female prevalence of depressive disorder in the UK and Ireland compared to Finland and Norway.				
49. Levin & Leyland (2006) A comparison of health inequalities in urban and rural Scotland[13] https://www.sciencedirect.com/science/article/abs/pii/S027795	To examine health inequalities between deprived and affluent areas of Scotland for differing ruralities	General population	Cohort	Scotland (Rural v Urban)	Health inequalities (using all cause mortality) amongst the elderly (age 65+) were greater in remote rural Scotland than urban areas for both males and females.	14/14	Carstairs Indicator is considered to be biased towards urban areas	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
360500434X									
50. Levin & Leyland (2006) Urban-Rural Inequalities in Ischemic Heart Disease in Scotland, 1981-1999[17] https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2004.051193	To describe the pattern and magnitude of urban-rural variation in ischemic heart disease (IHD) in Scotland	Population aged 40 to 74 years	Cohort	Scotland (Rural v Urban)	The relative risk of Ischemic Heart Disease mortality in remote rural areas of Scotland was similar to that of urban areas in patients aged 40 to 74 years. The relative risk of a continuous hospital stay was significantly lower and the relative risk of mortality was higher in remote rural areas. Low standardized ratios of IHD continuous hospital stays and mortality in remote rural areas mask health problems among rural populations.	14/14	Interpretation of findings	Medium	Nature of inequalities
51. Lindsay et al (2006) Geography,	Examines the relationship between	Men aged 65 to 74 (n = 8,292)	Questionnaire	Highlands and Western	Uptake of screening for abdominal aortic	6/12	Unable to link home postcodes	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
private costs and uptake of screening for abdominal aortic aneurysm in a remote rural area[70] https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-6-80	geographical location, private costs, health provider costs and uptake of health screening in a screening programme for abdominal aortic aneurysm			Isles of Scotland (Rural v Urban)	aneurysm for men aged 65 to 74 in the Highland and Western Isles of Scotland, a remote and rural setting, was high in comparison with previous studies, and this applied across all settlement types (Urban – Very Remote Rural). Geographical location did not affect uptake, most likely due to the outreach approach adopted. Private and NHS costs were highest in very remote settings.		to deprivation scores for 8% of subjects Not designed to assess cost-effectiveness		
52. Public Health England & Local Government Association (2017) Health and	Health issues of people living in remote farming areas, in the small market towns and in	General Population	Case Studies	England (Rural and Coastal)	Rural communities are increasingly older. Older people experience worse health and have greater need of health and care services. Financial	Unable to assess	Lack of detail of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
wellbeing in rural areas[8] https://www.local.gov.uk/health-and-wellbeing-rural-areas	the coastal villages that make up much of what we think of as 'the countryside'				poverty in rural areas is highly concentrated amongst older people. Reductions in resources to care for the older population, issues of access to health and care services, travelling and transport issues and lack of community support in some areas contribute to pressures on local government and the NHS to take a place-based approach to health needs.				
53. Mak et al (2008) The epidemiology and treatment of mesothelioma in South	To describe trends in the incidence of mesothelioma for men and women	5,753 cases from the Thames Cancer Registry database (aged 0 to 80+)	Cohort	Thames and estuary, England (Coastal)	Mesothelioma (a type of cancer) incidence has increased in South East England, particularly for men aged over 70 years. The highest	12/14	Residential areas of high incidence do not necessarily indicate areas where	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
East England 1985 to 2002[30] https://thorax.bmj.com/content/63/2/160.long					incidence occurs along the Thames and its estuary, reflecting areas of asbestos use in shipbuilding and industry in the past.		exposure occurred		
54. Manthorpe & Stevens (2010) Increasing Care Options in the Countryside: Developing an Understanding of the Potential Impact of Personalization for Social Work with Rural Older People[89] https://academic.oup.co	The impact of the personalization of social care services (personal budgets) on older people living in rural areas and those supporting them in formal and informal roles	33 participants from professional, community and voluntary organisations	Interviews	England (Rural)	Personal budgets (a means of giving people more control over the public resources allocated for social care services) give potential flexibility arising from choice and control which might be much appreciated by some older people in rural areas; however there were concerns that local variations would affect the capacity to tailor support and to sustain developments.	8/10	Partial picture Small sample	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
m/bjsw/article-abstract/40/5/1452/1715456									
55. McCann et al (2014) Urban and rural differences in risk of admission to a care home: A census-based follow-up study[77] https://www.sciencedirect.com/science/article/abs/pii/S1353829214001397	Considers rural–urban differences in household composition and admission rates	51,619 people aged 65 years or older	Data linkage (Cohort) study	Northern Ireland (Rural v Urban)	In Northern Ireland living alone was less common in rural areas. Care home admission was more common in urban and intermediate areas than in rural areas. People in rural areas experience better family support by living as part of 2 or 3 generation households. Even after accounting for this difference, older rural dwellers are less likely to enter care homes; suggesting that neighbours and relatives in rural areas provide more informal care; or that there	14/14	Use of self-reported measures of ill-health	Medium	Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					may be differential deployment of formal home care services.				
56. Middleton et al (2008) An atlas of suicide mortality: England and Wales, 1988-1994[36] https://www.sciencedirect.com/science/article/abs/pii/S135382920700086X	The magnitude and spatial patterning of suicide mortality	General population aged 15 to 64+ across 9,265 wards in England and Wales	Cohort	England and Wales (Rural / Coastal v Urban)	Although the geography of suicide differed across age/sex groups, some common patterns emerged e.g. high rates in (a) central parts of cities and (b) remote and coastal areas.	12/14	Suicide data in the years following the 2001 census were not available	High	Nature of inequalities
57. Miller et al (2011) Urban and Rural Issues for the Health Sector in Scotland[61]	To examine the ways in which the Scottish Territorial Health Boards have addressed the challenges of	Representatives from the 14 territorial Health Boards and NHS Education for Scotland	Analysis of literature, interviews, 2 case studies of innovative practice	Scotland (Rural v Urban)	Health Boards in the more remote and rural locations in particular pointed to challenges in provision of accommodation for staff and sub-optimal transport.	7/10	Detail of analysis methods are missing	Medium	Nature of inequalities Digital technology

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
https://www.employment-studies.co.uk/resource/urban-and-rural-issues-health-sector-scotland	serving an aging, rural and remote population				Transport costs and time spent in travel for work compound difficulties. There is evidence that national problems in recruitment of some specialist staff are more keenly felt in rural areas. In rural areas it can be difficult for people to gain experience and access continuing professional development, meaning that Health Boards are all the more dependent upon recruitment to obtain specialist staff. Health Board representatives pointed to the potential of ICT to assist with diagnosis and decision making,				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					minimise patient and staff travel and improve training and CPD options. However technology infrastructure at present limits the potential solutions available to some Health Boards, with some (large) parts of the more remote areas being effectively still without broadband coverage.				
58. Munoz (2013) Co-producing care services in rural areas [90] https://www.emeraldinsight.com/doi/abs/10.1108/JICA-05-2013-0014	The implications of co-produced health and care services for remote and rural community members – particularly those with	Community members, health care providers and commissioners in a remote and rural community in Scotland	Qualitative action research	Scotland (Rural)	Community members in a remote and rural community in Scotland identified some positive aspects of being involved in a home care service co-production relating to sense of community, empowerment and personal	8/10	Tensions heightened through the co-production process	Medium	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
	ageing populations				satisfaction. However, negative impacts included increased feelings of pressure, strain and frustration among those who took part in the co-production process. Overall, the community was reluctant to engage with "transformative" co-production and traditional provider-user dynamics were maintained.				
59. Nichols et al (2012) Campylobacter epidemiology: a descriptive study reviewing 1 million cases in England and Wales	To review Campylobacter cases in England and Wales over 2 decades and examine the main factors/mechanisms driving the	1,109,406 cases in patients from general practice, hospital and environmental health investigations through primary diagnostic	Cohort	England and Wales (Rural v Urban)	Campylobacter, the most common bacterial cause of gastroenteritis, is increasing in older people, particularly men, with the largest increase in people over 50 years. There were higher prevalences	14/14	The disease burden may be underestimated due to low reporting in deprived areas that may reflect poor access to healthcare	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
between 1989 and 2011[26] https://bmjopen.bmj.com/content/2/4/e001179.long	changing epidemiology	laboratories across England and Wales			in rural communities.		or prior infection		
60. Nuffield Trust (2018) Rapid review of the impact of rurality on the costs of delivering health care[62] https://www.nuffieldtrust.org.uk/research/rural-health-care	The impact of rurality on the costs of providing health services	General population	Rapid Review	England (Rural)	Unavoidable costs of providing health care in rural and remote areas suggests possible issues related to: Difficulties in staff recruitment, retention and overall staff costs; higher travel costs and unproductive staff time; the scale of fixed costs associated with providing services within, for example, safe staffing level guidelines; difficulties in realising economies of	Not able to assess	No detail of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					scale while adequately serving sparsely populated areas. NHS Improvement approved an additional £20 to 25 million a year uplift in funding to 1 trust (Morecambe Bay) it deemed to have unavoidable costs in delivering care to a dispersed population.				
61. O'Reilly et al (2001) General practice out-of-hours service, variations in use and equality in access to a doctor: a cross-sectional study[65]	To examine geographical variation in the rates of out-of-hours calls and to see if there is any systematic variation in how the co-operative that covers the area	110 357 calls to an out-of-hours co-operative with 4 centres	Secondary data analysis (Cohort)	One mostly rural Health Board in Northern Ireland (Rural)	While older patients were more likely to be seen by the GP, each kilometre from the centres reduced the likelihood of seeing the GP.	14/14	While it is probable that the distance and sex inequalities represent inequity, the data in this paper cannot provide a definitive answer.	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
https://bjgp.org/content/51/469/625.short	responds to calls								
62. O'Reilly et al (2007) Urban and rural variations in morbidity and mortality in Northern Ireland[11] https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-123	Examines the variations in morbidity and mortality between urban and rural areas	General population	Cohort study	Northern Ireland (Rural v Urban)	There was an increasing gradient of poorer health from rural to urban areas. Differences in death rates between rural and city areas were evident for most of the major causes of death but were greatest for respiratory disease and lung cancer. Urban areas appear less healthy than the more rural areas and the association with respiratory disease and lung cancer suggests that pollution may be a factor.	14/14	Not possible to conclude that cities are inherently detrimental to health as their higher morbidity and mortality levels could be due to higher levels of deprivation which cannot be adequately adjusted for in the current datasets	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
63. Pearce & Boyle (2005) Is the urban excess in lung cancer in Scotland explained by patterns of smoking?[22] https://www.sciencedirect.com/science/article/abs/pii/S0277953604005544	Considers whether there is an urban excess in lung cancer incidence and whether any urban excess in lung cancer incidence remained once smoking behaviour was controlled for	18,632 lung cancer patients of all ages (>30 to 101 years)	Cohort	Scotland (Rural v Urban)	Rates of lung cancer were higher in urban compared to rural areas and all the significant clusters of cases of lung cancer were located in the large urban centres of Scotland. Smoking behaviour did account for much of this urban excess in lung cancer, although it did not explain the entire effect. These results suggest that there are urban effects that influence the incidence of lung cancer that are not explained entirelybysmoking behaviour. Possible explanations include the variations in exposure to air	14/14	There is likelyto be a long latency period between carcinogenic exposure and diagnosis with lung cancer and the use of 1991 smoking data may be inappropriate if there have been dramatic variations in smoking patterns during the latencyperiod.	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					pollution, occupational differences and the legacyof selective migration between urban and rural areas.				
64. Reed & Lewis (2017) The Findings of the First Online Rural Opinion Panel[64] https://rsnonline.org.uk/images/publications/joint%20publications/RSN_Report_Draft_CCRI_.pdf	Information about the experience of people living in rural England	2500 people (age 15-90+ years)	Online survey	England (Rural)	Those responding to an survey (aged 15-90+ years) in rural England were more likely to be older. Respondents' primary concern was for healthcare provision. Dependent on private transport, questions of accessibility were pertinent. The respondents reported that they lived in communities that are marked by mutuality and cooperation, neighbours trust one another and trust is a common	4/12	Lack of detail of methods	High	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					currency. Fear of crime was not widespread, and people feel safe not just in their own homes but the villages and towns in which they live.				
65. Rigby et al (2017) Towards a geography of health inequalities in Ireland[15] http://irishgeography.ie/index.php/irishgeography/article/view/1263	Geographical structure of Ireland's mortality	27,681 deaths	Cohort	Ireland (Rural / Coastal v Urban)	Persistent inequalities exist in Ireland, with higher rates of mortality in the major cities and in isolated rural areas, particularly in more coastal, peripheral, and border areas.	12/14	Other interpretations of the same data are possible	Low	Nature of inequalities
66. Riva et al (2011) Residential mobility within England and urban-rural inequalities	To assess the role of residential mobility in explaining geographic inequalities in all-cause mortality	780,772 individuals from the Office for National Statistics Longitudinal Study	Longitudinal (Cohort) Study	England (Rural v Urban)	Residential mobility accounts for about 30% of the overall health advantage of rural areas compared to urban locations in England. Individuals who	14/14	The 10-year gap between censuses restricts the assessment of migration, as people might have	High	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
in mortality[44] https://www.sciencedirect.com/science/article/abs/pii/S0277953611006022?via%3Dihub	between urban and rural LA districts				were residentially mobile between urban and rural areas were relatively healthier than long-term urban residents, with better mortality outcomes among rural in-migrants. In age-stratified analysis, individuals of working age (2 0 to 64 years) moving out of rural areas, and individuals of retirement age (65 years and older) moving into rural areas, were shown to be healthier.		moved more than once and to different types of urban-rural locations over the 10-year period without this being recorded in the data		
67. Roberts et al (2015) Striking a balance between in-person care and the use of eHealth to support the older	Examines interactions between older people and their health/social care providers and considers how eHealth	6 adults aged 60 to 79 who experienced chronic pain, received regular (weekly/daily) home	Qualitative observations of health/social care home visits to chronic pain patients and	An island off the west coast of Scotland (Very Remote Rural / Coastal)	Older patients and care professionals An island off the west coast of Scotland (Very Remote Rural/Coastal) believed in-person care (home visits) promoted the	9/10	All patient participants were female Participants lived in an area where no formal eHealth	Medium	Strengths, assets and resilience Digital technology

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
rural population with chronic pain[79] https://www.tandfonline.com/doi/full/10.3402/qhw.v10.27536	could play a part in enhancing the life experiences of older people with chronic pain, who live in remote/rural areas.	visits from health and/or social care staff, lived in a remote rural location, and did not use any form of health-related technology to manage their pain. All were female. 5 professionals (3 community nurses/2 social care providers)	interviews with patients and health/social care providers		general well-being of older patients with pain. Older patients, their spouses and carers valued the sociability of the home visit. For some of the patients the physical presence of a health professional was essential: for example, patients who required clinical activities that cannot be carried out remotely using an eHealth application (eHealth is a very broad concept which encompasses both telehealth and telecare technologies). Others could, potentially, have some of their needs met through		initiative was running		

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					eHealth applications and were positive about the potential use ofeHealth technologies to manage chronic pain. A balance where digital interaction could enhance rather than replace face-to-face care may be most appropriate.				
68. Rodriguez-Ferrera et al (2004) Older people with schizophrenia: a community study in a rural catchment area[51] https://onlinelibrary.wiley.com/doi/a	To establish patterns of psychopathology, cognitive impairment and social functioning in a community sample of elderly people with symptoms of schizophrenia and to examine whether there are	72 patients over the age of 60 years with a primary diagnosis of a non-affective psychotic disorder who were known to health services in a rural area	Interviewed cohort with the Present State Examination and other standardised interview instrument	East England (Rural)	Older rural patients (aged over 60) with schizophrenia whether of very late or early onset are a vulnerable group with high levels of psychopathology. Older rural patients with schizophrenia, especially of very late onset, have high levels of hearing impairment. Older rural people with	12/14	No acknowldgement of confounding factors	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
bs/10.1002/gps.1237	differences between elderly people with early onset schizophrenia and those with late onset of illness				schizophrenia are socially isolated. Although numbers of these patients may not be large in any 1 rural catchment area their complex needs support the idea of specialist services to care for them.				
69. Royal Mail (2018) Safe and Connected Trial[87] http://www.cwu.org/wp-content/uploads/2018/10/LTB-580.18-RM_CWU-National-Terms-of-Reference-Safe-and-Connected-Trial-1.pdf	Royal Mail are supporting a trial of a new community service using postmen and women to help tackle loneliness	100 people aged 65 and over	Trial	Whitby (Coastal)	Postmen/women visit pre-selected volunteers while they are out delivering the mail. They will ask participants 5 questions on the doorstep to check on the individual's safety and well-being. This information will be passed on to the North Yorkshire County Council to organise further assistance if required. The service aims to	Not able to assess	Lack of details of methods	High	Health and care interventions

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					help individuals access assistance at the earliest opportunity if necessary. This might include offering support to help them make simple changes to stay healthy or putting them in touch with an activity or group in their area.				
70. Rural England (2017) State of rural services 2016[53] https://ruralengland.org/the-state-of-rural-services-2016-report/	To inform policy debate and to assist policy making for the benefit of rural residents and businesses	9,206,500 population of rural England, 22.9% aged 65+	Review of existing sources of evidence	England (Rural)	The third sector or community volunteers are playing a growing role in service delivery and they are more likely to be found in rural than in urban areas. By contrast, those services which are delivered by the public and private sectors are less likely to be found in rural than in urban areas, and	Not able to assess	Lack of detail of methods	HIgh	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					many of them have been contracting. Community action is playing a growing part in rural service provision, especially where there is declining provision as a result of public sector austerity or competitive market pressures. Whilst a number of services are struggling to maintain levels of provision in rural areas, 2 services currently at particular risk are rural bus services and rural bank branches. The demography of rural areas and, in particular, the growing number of older people has implications for the future of services. On one hand it				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					places considerable extra pressures on public services such as GP surgeries and adult social care, especially if funding for them is tight. On the other hand older age groups are more likely to be users of locally based commercial services in rural areas, such as convenience stores, thus helping them to survive. Retired people who remain in good health are also likely to make up a good proportion of the volunteers engaged with providing community-run services.				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
71. Rural England (2017) Issues Facing Providers of Social Care at Home to Older Residents in Rural England[60] https://ruralengland.org/wp-content/uploads/2018/01/Launch-Report-Issues-Facing-Providers-Social-Care-in-Rural-England.pdf	To examine the issues facing providers of domiciliary care to older people in rural areas	Older residents	Review of existing literature and case studies	England (Rural)	Rural areas are facing some specific, or particularly acute, challenges related to demographics, service provision and costs in relation to social care at home. Older people make up a significantly higher percentage of the total population in rural areas. The percentage of the population aged over 85, the group most likely to need care, is also markedly higher in rural areas than in urban. Lower population density impedes economies of scale resulting in higher per unit costs for service delivery. The distance from	Not able to assess	Lack of detail of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					providers to rural service users involves higher travel costs, opportunity costs and unproductive time for staff. In rural areas businesses providing domiciliary social care reported issues relating to staff recruitment and/or retention.				
72. Rural Services Network (2010) Understanding the real depth and impact of fuel poverty in rural England[69] https://www.cse.org.uk/downloads/file/fuel_pover	To investigate the real depth and impact of fuel poverty in rural England and its effect on consumers, service providers and the local economy	A good proportion of older people	Desk Research / Stakeholder Consultation / Study Area Activity	England (Rural)	In 2 of the 3 rural study areas in England (with a good proportion of older people) the survey confirmed expectations that fuel disadvantage was having a deep impact affecting more than 70% of rural households and in the third area affecting 1 in 3 rural households. Fuel disadvantaged	Not able to assess	Lack of detail of methods	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
ty_in_rural_england.pdf					households in the study areas were more likely to have a household member with health problems than those households not living with fuel disadvantage.				
73. Sarma & Kola (2010) Firearm suicide decedents in the Republic of Ireland, 1980-2005[33] https://www.sciencedirect.com/science/article/pii/S0033350610000569?via%3Dihub	To compare the socio-demographic characteristics of firearms suicide decedents and other suicide decedents in the Republic of Ireland between 1980 and the December 2005	9,674 suicides (aged 10 to 79)	A cross sectional (cohort) study	Republic of Ireland (Rural v Urban)	For both firearm assisted suicide (FAS) and non firearm assisted suicide (n-FAS) in the Republic of Ireland the deceased (aged 10 to 79) were predominantly male, living in a rural setting and not-married. However, this profile was more salient in the FAS group. In comparison to the n-FAS group, a greater proportion of the FAS victims were male from a	12/14	No opportunity to include potential mediators or moderators of 'suicide method choice' in the analyses	Low	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					rural setting and agri-employed (farmers, relatives assisting farmers, farm labourers, farm managers or fishermen).				
74. Schomerus et al (2007) Residential area and social contacts in schizophrenia : Results from the European Schizophrenia Cohort (EuroSC) [78] https://link.springer.com/article/10.1007%2Fs00127-007-0220-1	To determine the effect of rural or urban residence on frequency of social and family contacts.	1,208 patients in Britain, France and Germany. 302 from Britain aged between 18 and 64 years	Cohort	Britain (Rural v Urban)	Social isolation is associated with poor prognosis in schizophrenia. Rural living was associated with greater frequency of social contacts in patients suffering from schizophrenia in Britain.	14/14	Models report associations and do not formally permit conclusions about causality	HIgh	Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
75. Sherwood & Lewis (2000) Accessing health care in a rural area: an evaluation of a voluntary medical transport scheme in the English Midlands [80] https://www.sciencedirect.com/science/article/abs/pii/S1353829200000150?via%3Dihub	Exploring the notions of self-help and voluntarism by reference to `Rural Wheels', a voluntary medical transport scheme introduced to overcome the closure of branch surgeries and to provide access to a new medical centre	Unclear	Case study	Rural Northamptonshire, England (Rural)	`Rural Wheels', a voluntary medical transport scheme introduced to overcome the closure of branch surgeries and to provide access to a new medical centre was run almost entirely by the elderly who are now deep into their retirement however it plays an important role in the welfare of rural residents, particularly elderly women	Not able to assess	No formal evaluation presented	High	Strengths, assets and resilience Health and care interventions
76. Sinnott et al (2015) Centenarians in Ireland[14]	The prevalence of centenarians in Ireland and whether the distribution	People aged 100 or more	Cohort	Ireland (Rural v Urban)	Analyses show a concentration of centenarians in rural counties in the west of Ireland. This is consistent	12/14	Data were limited by their aggregate nature	Low	Nature of inequalities Strengths, assets and resilience

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
https://jech.bmj.com/content/69/Suppl_1/A64.2	was concentrated in areas with common lifestyle and environmental factors				with prior research locating "pockets" of centenarians in isolated areas where agriculture is dominant, food is sourced locally and a sense of community prevails.				
77. Somerset's Health and Wellbeing Board (2015) Somerset: Our County: Joint Strategic Needs Assessment for Somerset: Summary 2014/15[74] http://www.somersetintelligence.org.uk/files/JSNA_Summary	The key issues facing the rural population	545 adults (aged 18+) adult social care service users	Adult Social Care Survey and case studies	Somerset (48% rural v urban) also coastal	For older women living in rural villages, there was a marked difference in their ability to spend their time as they liked, possibly linked to a lack of personal transport if their husbands or partners had passed away or no longer drove. The older population in rural areas had more emergency and elective hospital treatment – possibly as a result of risk	Not able to assess	The observed differences might not reflect any real underlying differences because the rates are based on small numbers and the population structure of rural and urban areas is different	High	Determinants and drivers

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
_2014_15.pdf					aversion behaviour of GPs.				
78. Stewart et al (2018) A qualitative study of the perspectives of older people in remote Scotland on accessibility to healthcare, medicines and medicines-taking[71] https://openair.rgu.ac.uk/handle/10059/2999	To understand the perspectives of older people in the most remote areas of the Scottish Highlands on issues of accessibility to healthcare, medicines and medicines-taking	13 residents aged 65 years and over in the most remote and rural areas of the Scottish Highlands	Qualitative, semi-structured one-to-one interviews	Remote Scotland (Rural)	Healthcare was considered convenient, and positive relationships with providers being important in remote Scotland. Review of medicines was perceived to be the remit of the doctor, with pharmacists seen as valuable suppliers of medicines. There may be an unmet educational need, amongst residents, with regard to awareness of the role of pharmacists, the services they can provide and the benefits which may be experienced as a consequence of engagement.	9/10	Those agreeing to be interviewed may not have been representative of all older people residing in remote areas	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
79. Stewart & Stewart (2012) Home visits: why do rates vary so much?[82] https://www.lenus.ie/handle/10147/233616	To determine both the rate and factors associated with the variation in home visiting	603 home visits from a population of 24,720 GMS patients	Cohort	Ireland - rural teaching practices (Rural)	When high home visiting practices in rural Irelandwere compared to low visiting rate practices, patients tended to be older and calls were 12 times more likely to be doctor initiated or classified as routine. Home visits are not only appreciated by patients but are also a valuable tool in primary care, allowing general practitioners to gain useful insights into a patient s living conditions including their family and social supports. Home visits also provide an important service for the elderly and the house bound	12/14	Confined to a relatively small number of calls over a short time frame, within a rural setting and without taking into account seasonal variations or out of hour s workload	Low	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
80. Stewart and Hanley (2017) Donegal going against the flow: Irish differences in long-term urinary catheterisation (LTC) rates in men with Benign Prostatic Hypertrophy (BPH)[27] https://ijic.ubiquitypress.com/articles/abstract/10.5334/ijic.3574/	To assess whether male catheterisation rates were similarly disproportionate in a rural v an urban area.	Male patients greater than 65 years of age	A retrospective analysis of Primary Care Reimbursement Service (PCRS) data	Ireland (Rural v Urban)	There was a higher proportion of older men (65+) in a rural area of Ireland compared to an urban are of Ireland with long-term urinary catheters. This anomaly in long term urinary catheters rates may be a proxy for lack of access to basic Urology services.	12/14	Limited study detail available	Low	Nature of inequalities
81. Teckle et al (2012) Is the health of people living in rural areas different from those	To examine the association between rurality and health in Scotland	n = 7,932 adults aged 16 to 64 in 1995; and n = 9,047 adults aged 16 to 74 and children	Two cross sectional health surveys	Scotland (Rural v Urban)	Older age and lower social class were strongly associated with an increased risk of each of the 4 health outcomes measured	12/14	Small number of health indicators available for analysis	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
in cities? Evidence from routine data linked with the Scottish Health Survey[16] https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-12-43		aged 2 to 15 in 1998			(Hypertension, all-cause premature mortality, total hospital stays and admissions due to coronary heart disease (CHD)) in rural Scotland. After adjustment for individual and practice characteristics, no consistent pattern of better or poorer health in people living in rural areas was found, compared to primary cities. However, individuals living in remote small towns had a lower risk of a hospital admission for CHD and those in very remote rural had lower mortality, both compared with those living in primary cities.				

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
82. Tommis et al (2007) Rural-urban differences in the effects on mental well-being of caring for people with stroke or dementia [37] https://www.tandfonline.com/doi/abs/10.1080/13607860701365972	Rural and urban differences in the effects of care-giving	122 carers (aged 19 to 88 years) for people with stroke or dementia	Postal questionnaire	Wales (Rural v Urban)	Male carers living in urban areas of Wales reported better mental health than male carers in rural areas and female carers in both settings. Sitting service provision in rural and urban locations was linked to better carer mental health, while support from friends and family was linked to better mental health for urban carers only.	9/12	Limited control over which carers received the questionnaire	High	Nature of inequalities
83. Ward et al (2013) 'Now without my car I don't know what I'd do': The transportation needs of older people in rural	Describe and report on the challenges faced by older people in rural Lincolnshire when trying to maintain	People aged 60 or over who were not regular users of public or community transport	Focus groups	Rural Lincolnshire, England (Rural / Coastal)	While community transport services in England play a vital role in rural communities, many older people are confused or unclear about what these services do, how they can be used, and how to	7/10	Lack of detail regarding method of analysis	High	Determinants and drivers

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
Lincolnshire [63] https://journals.sagepub.com/doi/abs/10.1177/026909421349 5232	active lifestyles				access them. This suggests that these services are often poorly publicised and underused in some areas of the county and therefore those most likely to benefit from them may be the ones least likely to use them.				
84. Watkins & Jacoby (2007) Is the rural idyll bad for your health? Stigma and exclusion in the English countryside [45] https://www.sciencedirect.com/science/article/abs/pii/S135382920700024X	To challenge assumptions that life in the English countryside is a healthy existence	30 villagers of which 17% were aged over 60	Ethnographic research involving participant observation and a series of unstructured interviews.	A village in South East England (Rural)	Older women feel stigmatised when they could not be identified as wives or mothers, leading to various levels of social exclusion and marginalisation. Similar feelings are present among men who identified as gay or who were divorced. For both men and women, such characteristics are seen to deviate from normative	9/10	Intgerviews are limited in that people may try to present themselves in particular ways	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					ideas of what constitutes the rural idyll. The perceived benefits of rural living could not compensate for the negative impact on health and wellbeing from the stress stemming from such exclusion and marginalisation.				
85. Willis et al (2000) Urban-rural differences in total hip replacements: the next stage[28] https://academic.oup.com/jpubhealth/article/22/3/435/1572417	To explore the differences in the incidence of primary elective total hip replacements between urban and rural communities	All cases of primary elective total hip replacement (age 20 to 90+)	A retrospective case review	Northern Ireland (Rural v Urban)	The incidence of primary elective total hip replacement was significantly greater in rural populations than in urban ones.	12/14	It is not known what proportion of the observed difference is due to a true increased incidence of disease in rural populations	Medium	Nature of inequalities
86. Willis et al (2016) Swimming upstream:	Examines the ways in which older people's	Older lesbian, gay and bisexual	Qualitative – 5 focus groups with care	Wales (Rural & Urban)	Residential care environments (both rural and urban in Wales)	9/10	Missing from the interview sample are	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
the provision of inclusive care to older lesbian, gay and bisexual (LGB) adults in residential and nursing environments in Wales[73] https://www.cambridge.org/core/journals/ageing-and-society/article/swimming-upstream-the-provision-of-inclusive-care-to-older-lesbian-gay-and-bisexual-lgb-adults-in-	residential and nursing homes can constitute heteronormative environments – social spaces in which the same-sex attractions and desires of residents are disregarded in the provision of everyday care.	(LGB) adults' (50 to 76 years) residing in urban and rural locations across Wales.	and nursing staff and managers; and 29 semi-structured interviews with older LGB adults		can constitute heterosexualised spaces in which LGB identities are neglected in comparison to the needs and preferences of other residents in adults aged 50 to 76 years. Care staff and managers could be more attentive and responsive to the sexual biographies of all residents.		the voices of older adults who identify as bisexual and the views of older people from ethnically diverse backgrounds		

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
residential-and-nursing-environments-in-wales/74C155CC8C4D3E6A3464B892B6B8B9AE									
87. Willis et al (2018) “It’s a nice country but it’s not mine”: Exploring the meanings attached to home, rurality and place for older lesbian, gay and bisexual adults[49] https://onlinelibrary.wiley.com/doi/a	To examine the meanings attached to home and place for older LGB adults living independently across 3 dimensions: rural places as “home,” connections to LGB communities, and social care provision in the home.	Twenty-nine LGB-identifying self-selected adults (50 to 76 years)	Semi-structured qualitative interviews	Wales (rural)	Findings indicate older lesbian, gay and bisexual (LGB) adults experience points of social connection and disconnection across rural communities and encounter barriers to connecting with LGB social networks. These experiences represent a form of social exclusion in which heterosexual normalcy is reinforced. We identify concerns	9/10	A small sample of white, mostly lesbian and gay, adults, weighted towards a “younger-older” cohort	Medium	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
bs/10.1111/hsc.12616					expressed by older LGB adults towards the receipt of care services in the home				
88. Wilson et al (2016) Knowledge of palliative care and attitudes towards nursing the dying patient[83] https://www.magonlinelibrary.com/doi/abs/10.12968/bjon.2016.25.11.600	Examines the palliative care knowledge and attitudes towards caring for the dying patient of nurses working in care of older people settings in 1 rural region in Ireland	61 nurses working in care of older people settings	A cross-sectional survey	One rural region in Ireland (Rural)	As nurses' level of palliative care knowledge increased, attitudes become more positive. Nurses who completed the European Certificate in Essential Palliative Care (ECEPC) had better knowledge of palliative care when compared with nurses who had not undertaken the programme. Furthermore, increasing years as a registered nurse improved palliative care knowledge and attitudes towards	8/12	The sample size of nurses (n=61) is relatively small and from a rural setting only	Low	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					caring for the dying.				
89. Wu et al (2014) Age-friendly cities and environments: an investigation of the living environment of older people in England based on the MRC Cognitive Function and Ageing Study II[81] https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)62215-7/fulltext	To describe the living environment of older people at small area level using data from the Cognitive Function and Ageing Study II (CFAS II)	A representative sample of 7505 people aged 65 years and over	Cohort	England (Rural v Urban)	Two-thirds (n=4905) of the older population in England lived in an urban conurbation. More of the younger old (aged 65 to 79 years) than older old (≥80 years) lived in rural areas (1158 vs 396). Communities in urban conurbations generally had high crime, shorter distance to services, high heterogeneity of land use, and low proportion of green space with worse quality of street level conditions than did communities in rural areas.	12/14	Lack of study details	HIgh	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
90. Wu et al (2017) Micro-scale environment and mental health in later life: Results from the Cognitive Function and Ageing Study II (CFAS II)[43] https://www.sciencedirect.com/science/article/pii/S0165032716313982	To investigate the association between micro-scale environment and mental health problems in later life, including cognitive (cognitive impairment and dementia) and common mental disorders (depressive and anxiety symptoms)	3590 participants in the Cognitive Function and Ageing Study II, of people aged 65 or above	Cohort	England (Rural v Urban)	Poor quality of micro-scale environment in England (such as graffiti and broken windows) was associated with nearly 20% increased odds of depressive and anxiety symptoms in people aged 65 or above while the direction of association for cognitive disorders differed across urban and rural settings. Although higher odds of cognitive disorders were found in rural settings, living in a poor quality environment was associated with nearly twice higher odds of cognitive impairment in urban conurbations but	14/14	The causal direction could not be fully determined due to the cross-sectional nature of the data	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
					lower odds in rural areas.				
91. Wu et al (2017) The Built Environment and Cognitive Disorders: Results From the Cognitive Function and Ageing Study II[40] https://www.sciencedirect.com/science/article/pii/S0749379716306213	Investigated cross-sectional associations between features of land use and cognitive impairment and dementia, and also explored urban and rural differences in these associations	7,505 community-based participants (aged ≥65 years)	Cohort	England (Rural v Urban)	Higher prevalence of cognitive impairment was found in those living in rural areas, but these differences were not observed for dementia.	12/14	Given the cross-sectional nature of the data, the ability to determine causality is limited and reverse causality is possible	High	Nature of inequalities
92. Wu et al (2018) Inequalities in living well with dementia – The impact of deprivation on well-	To investigate the potential impact of deprivation and urban/rural areas on capability to live well with	1547 community dwelling people (aged 43 to 98 years) with dementia	Cohort	Great Britain (Rural v Urban)	The findings suggest inequalities in living well with dementia according to levels of deprivation but there was no urban/rural difference. 1547	14/14	Relatively large number of participants from least deprived areas	High	Nature of inequalities

Reference	Subject	Population	Method	Location	Outcomes	Quality*	Limitations	Applicability	Objectives
being, quality of life and life satisfaction: Results from the improving the experience of dementia and enhancing active life study[41] https://onlinelibrary.wiley.com/doi/abs/10.1002/gps.4998	dementia and to examine whether availability of informal carers modified the associations.				communitydwelling people (aged 43 to 98 years) with dementia				

* Quality rating is based on the total number of positive responses, out of the total number of questions, on the relevant quality assessment tool

Included Studies: International

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
1. Barnason et al (2019) Weight Management Telehealth Intervention for Overweight and Obese Rural Cardiac Rehabilitation Participants: A	To determine whether a 12-week telehealth weight management intervention (WMI) plus cardiac rehabilitation (CR) compared to CR alone improves outcomes for	43 adults (aged 47 to 81 years) who had undergone either coronary artery bypass surgery (CABS) or percutaneous coronary intervention (PCI) and	A clinical randomised controlled trial with measurements at baseline, 4 and 6 months. The primary outcome was weight loss.	Midwestern tertiary hospitals, Nebraska, USA (rural – not defined)	The WMI group had significantly more weight loss compared to the control group. There were no significant differences in physical activity. The WMI group had significantly higher levels of patient activation. They	8/11	Sample size was small (N = 43) and was not ethnically or economically diverse. Physical activity and weight were the only objectively measured outcome variables; all	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
Randomised Trial[101] https://onlinelibrary.wiley.com/doi/abs/10.1111/jocn.14784	overweight and obese cardiac revascularisation patients	participated in a rural CR programme	Secondary outcomes included physical activity, patient activation, perceived self-efficacy and use of weight management behaviours		also had significantly higher total scores on the Diet and Exercise Self-Management survey. Findings demonstrated the usefulness and feasibility of using telehealth delivery of the WMI for cardiac rehabilitation participants in rural communities to improve weight management outcomes.		other measures were based on participants' self-report		
2. Becker et al (2017) Effects of supportive telephone counseling in the metabolic control of	To evaluate the effi cacy of telephone-based support over 4 months, through 16 telephone contacts with	98 adults with type 2 diabetes mellitus, older than 60 years of age	Randomised controlled trial	A health unit from the countryside of São Paulo, Brazil (rural – not defined)	Telephone support was effective to deliver patient education to the diabetic elderly, leading to the reduction of	8/11	Unable to include all patients on diabetes register as not all had a telephone	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
elderly people with diabetes mellitus [110] http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672017000400704&lng=en&nrm=iso&tlng=en	educational material versus educational material mailed for the metabolic control of elderly patients with diabetes mellitus				fasting blood glucose				
3. Blair et al (2018) The "Golden Angels": effects of trained volunteers on specialling and readmission rates for people with dementia	To evaluate the clinical outcomes for patients with dementia, delirium, or at risk for delirium supported by the person-centered volunteer programme in rural acute	458 older adult patients >65 years with a diagnosis of dementia or delirium or had risk factors for delirium	A non-Randomised, controlled trial. Medical record audits provided data on volunteer visits, diagnoses, length of	Seven acute rural hospitals located in Southern New South Wales Local Health District, Australia (rural - serves a population of 200,000	There was a significant reduction in rates of 1:1 specialling and 28 day readmission for patients receiving the volunteer intervention. LOS was significantly shorter for the	8/12	No data on nutrition and hydration, no randomisation, no blinding, chance of a type 1 error	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
and delirium in rural hospitals [111] https://www.cambridge.org/core/journals/international-psychogeriatrics/article/golden-angels-effects-of-trained-volunteers-on-specialling-and-readmission-rates-for-people-with-dementia-and-delirium-in-rural-hospitals/33B7AC563A31783B135A	hospitals. Trained volunteers provided 1:1 person-centered care with a focus on nutrition and hydration support, hearing and visual aids, activities, and orientation		stay (LOS), behavioral incidents, readmission, specialling, mortality, admission to residential care, falls, pressure ulcers, and medication use	people over an area of 45,000 square kilometres)	control group. There were no differences in other patient outcomes for the intervention and control groups. The volunteer intervention is a safe, effective, and replicable way to support older acute patients with dementia, delirium, or risk factors for delirium in rural hospitals				

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
190CF5AEC87A									
4. Brenes (2017) Long-Term Effects of Telephone-Delivered Psychotherapy for Late-Life GAD[102] https://www.sciencedirect.com/science/article/pii/S1064748117303342?via%3Dihub	To examine the long-term effects of telephone-delivered cognitive-behavioral therapy (CBT-T) compared with nondirective supportive therapy (NST-T) in rural older adults with generalized anxiety disorder (GAD)	141 adults aged 60 years and older with a principal/co-principal diagnosis of GAD	A randomised controlled trial. Primary outcomes included interviewer-rated anxiety severity and self-report worry severity measured at 9 months and 15 months after randomisation. Mood-specific secondary outcomes	41 rural North Carolina counties, USA (rural – not defined)	There was a significantly greater decline in general anxiety symptoms and worry among participants in CBT-T compared with those in the NST-T group. There were no significant differences between the conditions in terms of depressive symptoms and GAD symptoms	9/11	The sample consisted predominantly of white women	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
			included self-report GAD symptoms and depressive symptoms						
5. Briant et al (2018) Using a Culturally Tailored Intervention to Increase Colorectal Cancer Knowledge and Screening among Hispanics in a Rural Community[103] http://cebp.aacrjournals.org/content/27/11/1283.long	Interventions to improve colorectal cancer screening behaviours among those living in rural areas in the United States. Intervention was home-based promotor-led "home health parties" in which participants were taught about colorectal cancer	101 participants aged 50 and older from a rural community of Hispanics	A pre- and post test design	Washington State, USA (rural – not defined)	Findings indicate that culturally tailored colorectal cancer education facilitated by promotores in a rural environment, coupled with free stool-based test for colorectal cancer screening, is an effective way to increase colorectal cancer screening awareness,	10/14	No control Short follow up Small sample size	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
	screening and were given a free fecal occult blood test kit to complete on their own				knowledge, and screening among Hispanics living in a rural area in Washington State				
6. Dye (2018) Improving Chronic Disease Self-Management by Older Home Health Patients through Community Health Coaching[104] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5923702/	To pilot test a model to reduce hospital readmissions and emergency department use of rural, older adults with chronic diseases discharged from home health services (HHS) through the use of volunteers. The volunteer community members	69 patients enrolled in HHS (aged 60 or older) with a diagnosis of congestive heart failure (CHF), diabetes Type II (DM) or cardiovascular diseases (CVD) such as hypertension	A quasi-experimental design	Oconee County, South Carolina, USA (rural – no definition)	Programme participants increased their ability to monitor and track their chronic health conditions, make positive lifestyle changes, and reduce incidents of falls, pneumonia and flu. Although differences in the ED and hospital admission rates after discharge from HHS between the treatment and comparison	6/12	Self-selection bias and small sample size	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
	were trained as Health Coaches to mentor discharged home health services (HHS) patients in following the self-care plan developed by their HHS RN; improving chronic disease self-management behaviours; reducing risk of falls, pneumonia, and flu; and accessing community resources				group were not statistically significant, the treatment group's rate was less than the comparison group thus suggesting a promising impact of the HC programme				
7. Farmer (2018) Exploring the role of	To explore, from the dental hygiene	16 dental hygienists who had experience	Qualitative semi structured one- on-	Across 10 provinces, Canada	Strategies proposed by participants to address oral	9/10	framework is strictly related to the	Low	Health and care intervention s

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
the dental hygienist in reducing oral health disparities in Canada: A qualitative study[112] https://onlinelibrary.wiley.com/doi/abs/10.1111/idh.12276	perspective, the role of dental hygienists in reducing oral health disparities in Canada for Aboriginal people, the elderly, rural and remote residents, and newcomers	working with vulnerable populations	one in-depth telephone interviews	(rural – not defined)	health disparities; included alternate delivery models of dental care delivery through non- traditional practice environments by integrating themselves within other healthcare settings in advisory or consulting roles or the use of technology, interprofessional collaboration , and increased scope of practice		accounts of the participants and therefore may not be generalizable to all dental hygienists across Canada.		Digital Technology
8. Gerlach et al (2018) Improving Access to Collaborative Behavioral	To examine whether a telephone delivered collaborative care	8,621 older adults (65+ years) participating in the SUSTAIN	Cohort study examining rural versus urban-	Pennsylvania, USA (rural v urban – no definition)	Participants in rural counties were more likely than those in urban-suburban counties to	12/14	Individual's address may have changed from urban-suburban or	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
Health Care for Rural-Dwelling Older Adults[105] https://ps.psychiatryonline.org/doi/full/10.1176/appi.ps.201700026?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed&	intervention (SUpporting Seniors Receiving Treatment And INtervention [SUSTAIN]) improved access to mental health services similarly among older adults in rural areas and those in urban-suburban areas	program, a clinical service provided to older adults newly prescribed a psychotropic medication by a primary care or non–mental health provider	suburban differences in rates of initial clinical interview completion, patient clinical characteristics, and program penetration		complete the initial clinical interview. Programme penetration was significantly higher in rural than in urban-suburban counties. Telephone-based care management programmes such as SUSTAIN may be an effective strategy to facilitate access to collaborative mental health care regardless of patients' geographic location		rural status during the study period		
9. Hicken et al (2017) Supporting Caregivers of Rural	To examine internet-based and telephone-based	231 older caregivers of rural veterans	Randomised trial. Caregiver outcome measures	Salt Lake Veterans Affairs Medical Center,	The majority of comparative effectiveness outcomes were not different	7/11	Statistically significant differences in the study may have	Low	Digital technologies

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
Veterans Electronically (SCORE) [106] https://onlinelibrary.wiley.com/doi/abs/10.1111/jrh.12195	caregiver support for access to effective support	with dementia	included burden, anticipatory grief, depression, family conflict, and a desire to institutionalize the care recipient.	Loma Linda Veterans Affairs Medical Center, North Florida/Southern Georgia Veterans Affairs Medical Center, USA Rural (urban = anyone located in a Census-defined urbanised area; rural = anyone not designated as urban or highly rural; highly rural = anyone residing in counties with < 7	between caregivers receiving technology interventions versus those receiving telephone-delivered support. This study demonstrates the feasibility and acceptability of using a variety of modalities to deliver caregiver support to a group of largely older, rural, spousal caregivers of veterans with dementia. The potential for reducing isolation for caregivers capable of		been due to chance based on multiple comparisons across groups and outcomes		

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
				persons/square mile)	receiving this intervention through the Internet is a promising finding				
10. Jang et al (2018) A multicomponent frailty intervention for socioeconomically vulnerable older adults: a designed-delay study[115] https://www.dovepress.com/a-multicomponent-frailty-intervention-for-socioeconomically-vulnerable-	To evaluate the effectiveness of a 6-month multicomponent intervention on physical function in socioeconomically vulnerable older adults in rural communities. A 24-week multicomponent programme that consisted of group exercise, nutritional supplementat	187 adults aged ≥65 years who were living alone or on a low income	Designed-delay study. The primary outcome was physical functionat 6 months. Secondary outcomes included frailty phenotype, sarcopenia, nutritional assessment, depression, and falls	Pyeongchang rural area, Korea (rural – not defined)	This 24-week multicomponent programme had sustained beneficial effects up to 1 year on physical function, frailty, sarcopenia, depressive symptoms, and nutritional status in socioeconomically vulnerable older adults in rural communities	Not able to assess	Adherence to individual components of the intervention was not perfect. Concurrent interventions outside the study may have influenced outcomes. Unable to examine long-term clinical outcomes. Higher surveillance frequency during the intervention	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
peer-reviewed-article-CIA	ion, depression management, deprescribing medications, and home hazard reduction was implemented with a planned 6-month interval						period may have resulted in larger numbers outcomes at 6 months		
11. Jang et al (2018) Impact of a Wearable Device-Based Walking Programs in Rural Older Adults on Physical Activity and Health Outcomes: Cohort Study[116]	To evaluate whether a wearable device and mobile-based intermittent coaching or self-management could increase physical activity and health outcomes of small groups of older	22 ambulatory older adults aged ≥65 years living at home (11 robust and 11 prefrail)	Cross sectional cohort study	Pyeongchang rural area, Korea (rural – not defined)	The “Smart Walk” programme improved physical fitness, anthropometric measurements, and geriatric assessment categories in a small group of older adults in rural areas with limited resources for monitoring	11/14	Small sample	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
https://mhealth.jmir.org/2018/11/e11335/	adults in rural areas								
12. Jin et al (2019) Internet Access and Hypertension Management Among the Elderly Population: A Nationally Representative Cross-Sectional Survey in China[117] https://www.jmir.org/2019/1/e11280/	To examine the association between internet access and hypertension awareness, treatment, and control among elderly Chinese adults and to investigate whether the association between internet access and hypertension management differed between those living in	5135 hypertensive respondents aged ≥45 years	Nationally representative survey	China (rural – not defined)	Despite the low rate of internet access among the elderly population, the internet shows its potential as a platform for achieving better hypertension management in China. Urban-rural disparities were moderated by internet access improving management in rural areas. Strategies for reducing the disparities in hypertension management and overall	10/12	Observational rather than causal.	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
	urban and rural areas				disease burden of hypertension among the elderly population might consider the internet as a platform				
13. Johnson et al (2018) Impact of a home-based nutrition and exercise intervention in improving functional capacity associated with falls among rural seniors in Canada [113] https://www.emeraldinsight.com/doi/abs/10.1108	To examine the impact of a home-based nutrition and exercise intervention on functional capacity to prevent falls among rural seniors	Men and women (n=134) aged 60 and older	Randomised controlled trial	Nova Scotia (a rural health authority), Canada (rural – Nova Scotia accounts for 3% of the Canadian population and has a population density of approximately 17.2 persons/km²)	Improvement of functional health among rural seniors is achievable through the delivery of a home-based intervention focusing on exercise and nutrition	9/11	Compliance Drop out Lack of blinding Findings may not generalise to non-Caucasian older adults	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
/QAOA-11-2017-0044									
14. Marrone et al (2017) Interventional Audiology to Address Hearing Health Care Disparities: Oyendo Bien Pilot Study[107] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5435479/	To investigate the needs of families affected by hearing loss in a rural Arizona community on the U.S.–Mexico border; and evaluate an outreach programme on hearing health. An outreach programme, Oyendo Bien (hearing wellness), a 5-week, Spanish-language health education	Older adults aged 50+ years (n = 21)	Community-based participatory research methods (interviews /focus groups)	Arizona, USA (rural – not defined)	Post programme focus groups revealed increased self-efficacy and decreased stigma. After 1 year, 7 of 9 participants with hearing loss contacted for follow-up had sought some form of hearing-related health care	9/10	Small sample	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
	program for older adults incorporated communication strategies and behavioral change techniques								
15. Rebello et al (2017) The Rural PILL Program: A Postdischarge Telepharmacy Intervention for Rural Veterans[108] https://onlinelibrary.wiley.com/doi/abs/10.1111/jrh.12212	To evaluate the efficacy of the Rural Pharmacological Intervention in Late Life (PILL) program, a quality improvement initiative in which a Boston-based pharmacist provided postdischarge telepharmacy care to veterans from	100 veterans aged 65 and older at risk of problems with medication management	Secondary, retrospective analysis of a clinical demonstration with case matched control	VA medical centers in Boston or Maine, USA (rural and highly rural – 1,000 people/sq. mile = rural and <7 people/sq. mile = highly rural)	Veterans who received the intervention were 70% less likely than controls to have an acute care visit at 30 days postdischarge. There was no difference in rates of hospital readmission or mortality. The pharmacist-led phone-based programme was effective in decreasing acute care utilisation within	12/14	Not a randomised controlled trial Small sample size	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
	rural Maine. The PILL pharmacist called patients the week after hospital discharge to reconcile medications, assess adherence, and identify potentially inappropriate drugs. The pharmacist worked with each veteran's family and providers to resolve problems and increase support.				30 days after hospital discharge				
16. Rush et al (2018) Planning Telehealth	To examine patients' and providers' views on	8 patients aged 65+ with Atrial Fibrilation,	Qualitative semi structured	7 rural communitie s with population	The overriding theme was variability in patient and	9/10	Small sample size	Low	Digital technology

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
for Older Adults With Atrial Fibrillation in Rural Communities: Understanding Stakeholder Perspectives[114] https://journals.sagepub.com/doi/abs/10.1177/10547738187 58170?rfr_dat=cr_pub%3Dpubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&journalCode=cnra	telehealth's potential to support rural patients with Atrial Fibrilation	along with 1 partner, from rural communities. 5 providers	telephone interviews	sizes ranging from 600 to 7,600, and distances from the urban-based AF clinic ranging from 111 to 760 km, Canada (rural)	provider receptiveness to telehealth. Receptiveness reflected differences in past experience with telehealth, in perceived adequacy of rural health services, and in perceived gaps in AF care. These are important considerations in planning effective and sustainable telehealth in rural communities				

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
17. Sayfian et al (2018) The effect of an educational intervention on injury prevention among 60 to 75 year old people in rural areas of Hamadan County, based on precede model[119] https://injuryprevention.bmj.com/content/24/Suppl_2/A238.3	To determine the effect of educational intervention on injury prevention among 60 to 75 year old people in rural areas of Hamadan County, based on PRECEDE model	110 participants aged 60 to 75 year old	Quasi-experimental study	Hamadan County, Iran (rural – not defined)	Educational intervention in the field of injury prevention, based on PRECEDE model, can be effective on promoting preventive behaviours among rural old people	4/11	Lack of study detials	Low	Health and care interventions
18. Schepens Niemiec et al (2018) Evaluation of ¡Vivir Mi Vida! to	To determine the feasibility and efficacy of a culturally tailored lifestyle intervention,	37 Latino, Spanish-speaking adults aged 50 to 64-years-old	Before and after study with interviews and focus groups	A rural health clinic in the Antelope Valley of California,	Participants demonstrated improvements in blood pressure, sodium and saturated fat intake, well-	10/14	No control group No long term follow up Small sample	Low	Health and care interventions

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
improve health and wellness of rural-dwelling, late middleaged Latino adults: results of a feasibility and pilot study of a lifestyle intervention[109] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6177291/	¡VivirMi Vida! (Live My Life!). This intervention was designed to improve the health and well-being of high risk late middle-aged Latino adults and to be implemented in a rural primary care system			USA (rural – not defined)	being and reduced stress		Self reported data		

Reference	Subject	Population	Method	Location & Definition of rural / coastal	Outcomes	Quality*	Limitations	Applicability	Objectives
19. Xie et al (2017) A Randomised study on the effect of modified behavioral activation treatment for depressive symptoms in rural left-behind elderly[118] https://www.ncbi.nlm.nih.gov/pubmed/28838290	To evaluate the effectiveness of a modified behavioral activation treatment (MBAT) intervention on reducing depressive symptoms in rural left-behind elderly	73 rural left-behind elderly people who had a Geriatric Depression Scale (GDS) score between 11 and 25. Left-behind is where young couples have moved to the cities to work, and their parents are typically left-behind without care	Randomised Controlled Trial	Yankou Town, a representative town of Lengshuijiang City of Hunan Province, China (rural – not defined)	MBAT produced a significantly greater reduction in depressive symptoms than regular care in rural left-behind elderly	8/11	Small sample size	Low	Health and care interventions

* Quality rating is based on the total number of positive responses, out of the total number of questions, on the relevant quality assessment tool