

Scottish Health and Inequality Impact Assessment Network (SHIAN)

Report

50,000 Affordable Homes: A Health Impact Assessment

June 2017

Contents

Foreword	4
1 Executive Summary.....	5
2 Introduction	8
3 Methods	9
4 Policy Context.....	11
4.1 Estimating Housing Need	12
4.2 Affordable Housing.....	13
4.3 Delivery of the 50,000 affordable homes	14
5 Key Informant Interviews	17
6 Affected Populations.....	21
7 Health impacts and pathways.....	28
7.1 Homelessness.....	28
7.2 Housing characteristics and health	29
7.2.1 Energy efficiency.....	33
7.2.2 Hazards and home safety	34
7.3 Specialist Housing: homes for older people and people needing care	36
7.4 Neighbourhoods, Public Realm and Communities.....	37
7.4.1 Overall environmental quality.....	37
7.4.2 Housing mix.....	38
7.4.3 Neighbourhood design and density.....	39
7.4.4 Greenspace and play facilities	40
7.4.5 Communities	41
7.5 Reoffending	42
7.6 Housing and Education	43
7.6.1 Domestic housing factors and education: overcrowding, noise, toxins and pollutants	43
7.6.2 Ownership, tenure mix and housing stability.....	43
7.7 Economic impacts	44
7.8 Construction.....	46
8 Matrix of health impacts.....	47
9.1 National policy	52
9.2 Community Planning policy.....	54
9.3 Placemaking and communities	55
References.....	58

Members of the steering group

Tony Cain: Association of Local Authority Chief Housing Officers

Margaret Douglas, Martin Higgins: NHS Lothian/Scottish Health and Inequalities impact assessment Network

Matt Lowther: NHS Health Scotland

Phil Mackie, Emma Scarlett: Scottish Public Health Network

Acknowledgements

We would like to thank our key informants. Their input has been vital and we are grateful for their time and effort. We would also like to thank Joe Jobling from Scottish Government for advice about housing statistics and Caroline Johnston from CoSLA for advice about housing policy.

Suggested citation

Higgins, M., Cain, T., Lowther, M., Mackie, P., Scarlett, E., Douglas M.J. 50,000 Affordable Homes: A Health Impact Assessment. Edinburgh: Scottish Health and Inequalities Impact Assessment Network and Scottish Public Health Network (ScotPHN), 2017.

Foreword

Good quality housing is essential for health and wellbeing. The Scottish Government has committed to deliver 50,000 affordable homes in the current parliament. This health impact assessment follows, and builds on, the Scottish Public Health Network report *Foundations for wellbeing: reconnecting public health and housing*. The assessment uses evidence from published literature, routine data and interviews with key informants to outline the range of likely impacts on health, and the populations with the highest potential to benefit. It makes recommendations to achieve the best health and wellbeing outcomes from this investment.

I welcome this assessment and its recognition of the broad range of health impacts likely to result from the 50,000 affordable homes programme. Scottish Government, Housing Providers and their partners could use this report positively, to inform policy implementation. As its first recommendations, the report highlights the benefits to be gained from a longer term commitment to affordable housing in Scotland. This an urgent priority for all Governments and capital programmes, so that we can see a continued increase in the availability of good quality, affordable, well located homes in Scotland.

This health impact assessment has been completed by members of the Scottish Health and Inequalities Impact Assessment Network, ably supported and directed by a steering group with membership from Health Scotland, ScotPHN and the Association of Local Authority Chief Housing Officers (ALACHO). The steering group also had the benefit of advice from CoSLA and Scottish Government on policy and data sources. I am grateful to them, and to all the key informants who gave their time to contribute to this work.

This report shows the value of using structured health impact assessment to identify ways to get the best value for health and wellbeing from public policy. In our current time of constrained public sector resources, this is ever more important. We should look to similar assessments on other policy areas, in order to make the best we can of public and private wealth for the wellbeing of Scotland.



Andrew Fraser

Director of Public Health Science, NHS Health Scotland

1 Executive Summary

The Scottish Government has made a commitment to deliver 50,000 new affordable homes over the next five years and has identified a budget of £3 billion to support this. There is growing awareness of the importance of good quality housing to support good health. This health impact assessment (HIA) aimed to identify and assess the likely health impacts of the commitment to 50,000 affordable homes in order to make recommendations to enhance these impacts.

Overall, the assessment identified many potential health benefits arising from the delivery of 50,000 affordable homes. Characteristics of high quality housing that benefit health include high levels of energy efficiency, thermal comfort, ventilation, appropriate space for the household, and provision of safety features. Social housing should meet the Scottish Housing Quality Standard and Energy Efficiency Standard for Social Housing. Other affordable housing should also meet high standards for quality and energy efficiency.

Most of these benefits will be experienced by the people who will be able to access new affordable homes as a result of the programme. We identified several populations with the highest potential to benefit, including people living on low incomes, people who are homeless and people with specialist housing needs. There is an opportunity to ensure the programme provides the affordable homes in high quality, well connected places with good community facilities. There are also economic benefits, which would have positive impacts on health, particularly for people who gain employment as a result of the programme.

We identified some adverse impacts, mostly short term that would arise during the construction phase. There were also some concerns raised about displacement effects if some existing social housing becomes less desirable with clustering of more vulnerable residents. The assessment highlighted several issues to consider in order to achieve the highest level of benefit from the investment.

These are the recommendations from the HIA:

National policy

- Scottish Government should seek cross party support to commit to a longer term programme of investment in affordable homes, of at least 20 years, to sustain the benefits of the programme, continue to increase availability of affordable homes and replace stock that is no longer fit for purpose.
- Scottish Government should aim to ensure that the distribution of grant funding for delivery of affordable housing is based on housing need.
- Scottish Government should publish an analysis of the previous and current programme that includes data on the number of affordable homes delivered in each local authority area, tenures, house types, and first lets. This should

present progress in delivery of affordable housing with reference to the needs defined in current Housing Need and Demand Assessments and Strategic Housing Investment Programmes.

- Scottish Government and its partners should consider how to monitor and evaluate the health and wellbeing outcomes of the programme, as well as the number of homes delivered.
- Scottish Government should work with colleges, industry and other partners to increase provision of training and apprenticeships to develop skills for construction and ensure young people are able to gain from the employment opportunities provided by the programme.
- Scottish Government should encourage employers to ensure high standards of health and safety, and to follow principles for high quality work.
- Scottish Government should quantify the impact of welfare reform on rent arrears and consider appropriate mitigation.

Community Planning policy

- Local authorities and their partners should use the evidence within this HIA as a resource to inform the development of future Local Housing Strategies and Strategic Housing Investment Programmes.
- Community Planning Partnerships should develop plans for their communities that enable affordable housing to be delivered as part of a holistic vision for each area.
- Local Authorities and their partners should continue to provide and enhance both preventative and support services for people who are homeless or at risk of homelessness.
- Health and Social Care Partnerships and Housing Authorities should work together to ensure that Housing Contribution Statements identify projected need for, and current provision of, specialist, supported, and adapted housing, and the range of support needed for these client groups.
- Housing providers should ensure affordable homes are built to varying needs standards with necessary infrastructure to support future needs such as telecare and technology enabled care.

Placemaking and communities

- Housing providers should aim to provide affordable homes within high quality neighbourhoods, with well laid out, walkable environments, using tools such as the Place Standard to identify priority neighbourhood improvements.
- Housing providers should work with partners to attract other investment to developments, ensure public transport links and ensure provision of other services is available for residents of the affordable homes.
- Affordable homes should avoid locations that would be dependent on private motor transport.

- Larger developments should include within them amenities such as playspace, greenspace and community venues.
- Housing providers should learn from examples of good practice in the creation of tenure blind developments.
- Housing providers should ensure meaningful involvement of communities in planning, design and delivery of new developments and opportunities for tenant participation.
- Contractors should ensure the highest standards of safety performance and workforce development and support, minimise disruption and risk to adjacent communities and minimise their environmental impacts.

2 Introduction

The Scottish Government has made a commitment to deliver 50,000 new affordable homes over the next five years. Of these, 35,000 will be social rented, the other 15,000 may be a mix of mid market rent, shared equity, low cost home ownership or other models. Both Local Authorities and Registered Social Landlords may be funded to build these homes through grant funding. The Scottish Government has identified a budget of £3 billion to support this programme over the lifetime of this parliament.

There is growing awareness of the importance of good quality housing to support good health. Several recent publications highlight the many ways that housing can contribute to health and wellbeing outcomes (1-3). The Scottish Public Health Network recently published Foundations for wellbeing: reconnecting public health and housing, which is a best practice resource for joint work between public health and housing colleagues (4). As part of its development, the Health and Housing Advisory Group ran a scoping exercise to identify the potential health impacts of the Scottish Government affordable homes commitment. ScotPHN then commissioned members of the Scottish Health and Inequalities Impact Assessment to complete this fuller health impact assessment of these impacts.

Health Impact Assessment (HIA) provides an internationally recognised, structured approach to identifying and assessing the health impacts of policies or proposals in order to inform changes. It aims to identify and assess impacts on a wide range of determinants of health. An HIA should also identify how impacts will affect different populations and therefore how a proposal may affect health inequalities.

This health impact assessment aims to identify and assess the likely health impacts of the commitment to 50,000 affordable homes and make recommendations to enhance these impacts.

3 Methods

This health impact assessment draws on the following sources of evidence to identify and assess the potential impact on health of the 50,000 affordable homes commitment.

Scoping

We held a scoping exercise in October 2016 with members of the ScotPHN Health and Housing Advisory Group. The group used a health impact checklist to identify the populations likely to be affected by the 50,000 affordable homes target and the potential areas of health impact. The group also suggested some provisional recommendations to enhance the health impacts of the policy. A report of the findings was circulated to participants for comments before being finalised.

For each of the impacts identified by the scoping exercise we identified research questions to help assess the impacts. We then used the evidence sources below to address the questions.

Steering group

A steering group was established to lead the Health Impact Assessment.

The steering group was responsible for agreeing the work to be done and evidence to be collated, discussing the findings and agreeing recommendations.

Routine data

We gathered routinely available, published data on housing and homelessness in Scotland in order to understand the context to the 50,000 affordable homes target.

Interviews with key informants

We held a small number of interviews with key informants in order to better understand how the target will be implemented and to seek wider views about its likely impacts. Key informants were selected to be individuals with knowledge of the policy and its implementation, and/or of the links between housing and health. The steering group identified an initial list of potential key informants and others were suggested during the interviews.

Interviews were either face to face or by telephone. A summary of the findings of the scoping exercise was shared with informants in advance. Interviews were semi-structured, based on the following questions, adapted to each key informant's individual area of expertise.

- What do you think are the most significant likely health issues in relation to 50,000 AH pledge that we should consider in our HIA?

- In practice, how do you think the 50,000 AH pledge will be implemented?
- Who will be the beneficiaries of 50,000 AHs?
- What are the obstacles/barriers/opportunities in realising the benefits?
- What levers or opportunities are there, or might there be, to influence the 50,000 AHs – national/regional/local? (Particularly in relation to realising benefits for health?)
- Are there one (or two) key things about maximising potential health benefits of 50,000 AHs that we should include in the report? (Could be positive or negative)

Handwritten notes were taken during the interviews and written up afterwards. A summary of findings from the interviews is given in section 5. Findings are also reflected where relevant in the sections on Policy Context and Impacts and Pathways.

Literature review: impacts and pathways

The literature review is a synthesis of key findings relating to the health impacts of housing. For evidence about housing conditions and health we used the review of housing and health contained in the SHIAN guidance on HIA of Housing Improvement (5), which is based on a systematic review conducted by the Medical Research Council Social and Public Health Sciences Unit. We searched for articles using this review and updated and added additional comments to the literature review, drawing where possible on systematic reviews or otherwise well-conducted research studies. For other areas of impact we searched for literature that addressed the specific questions, notably about educational outcomes and housing. Where possible we focused on research about low cost or affordable housing. The vast majority of research in the field of housing and health is observational rather than experimental. With a handful of exceptions, this means that it is inappropriate to make comment about or interpret research in terms of cause and effect.

Recommendations

The HIA Steering Group discussed the provisional recommendations identified during the scoping exercise and further recommendations suggested by key informants or during appraisal of the evidence. The final recommendations were debated and agreed by consensus.

4 Policy Context

Dwellings in Scotland

There are almost 2.6 million dwellings in Scotland (see Table 1). There are more dwellings than households. Table 1 shows wide variation in the proportion of social rented housing in each Local Authority.

Table 1: Social housing stock and total dwellings in Scotland, 2015 (6)

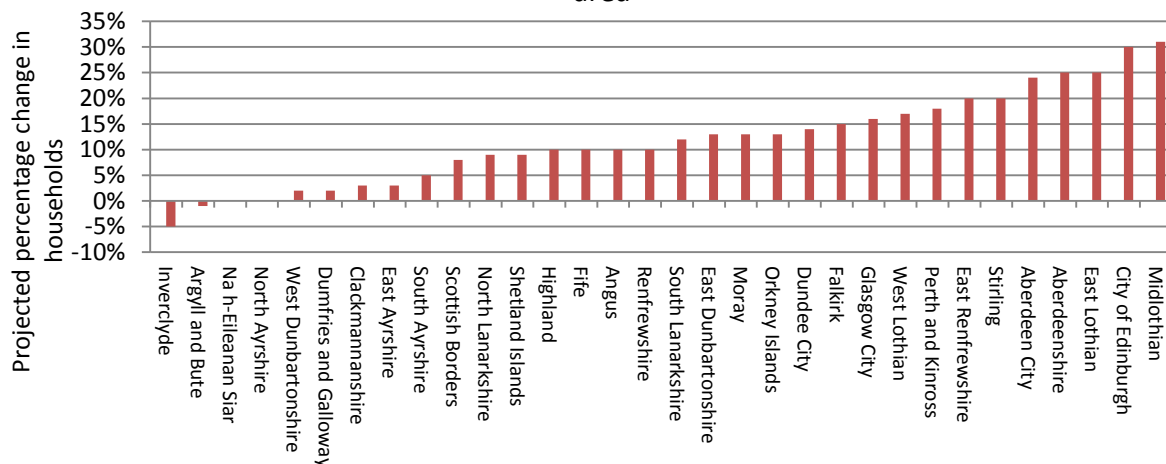
Local Authority Area	Total number of dwellings	Social stock as a proportion of all dwellings
Aberdeen City	113,871	24%
Aberdeenshire	114,655	15%
Angus	55,443	20%
Argyll and Bute	47,606	17%
Clackmannanshire	24,055	29%
Dumfries and Galloway	74,043	19%
Dundee City	73,632	29%
East Ayrshire	57,489	28%
East Dunbartonshire	45,480	12%
East Lothian	46,150	23%
East Renfrewshire	37,957	12%
Edinburgh, City of	240,479	16%
Falkirk	72,957	27%
Fife	172,896	22%
Glasgow City	302,952	35%
Highland	115,071	18%
Inverclyde	38,743	26%
Midlothian	38,417	26%
Moray	43,942	19%
Na h-Eileanan Siar	14,549	16%
North Ayrshire	67,397	27%
North Lanarkshire	151,859	30%
Orkney Islands	10,870	15%
Perth and Kinross	70,570	16%
Renfrewshire	84,720	24%
Scottish Borders	57,451	20%
Shetland Islands	10,986	21%
South Ayrshire	54,562	19%
South Lanarkshire	147,387	22%
Stirling	40,483	19%
West Dunbartonshire	44,895	37%
West Lothian	77,510	27%
Scotland	2,549,072	23%

4.1 Estimating Housing Need

Household projections provide an indication of the number of dwellings that will be required in future. The number of households is expected to increase from 2,418,336 in 2014 to 2,763,773 in 2039, which is an overall increase in households of 14%. Over this time period, National Records of Scotland estimate that average household size will decline from 2.17 to 2.01 persons per household. This means that more dwellings will be required that are suitable for single person households which will represent 41% of all households by 2039 (7).

The projected increase in household numbers of 14% masks considerable variation across the country. The increase in households is greatest in Stirling, Perth, East Renfrewshire, Lothian and Grampian (7).

Figure 1: Projected household percentage change 2014-2039 by council area



Recent research about housing aspirations commissioned by the Scottish Government highlighted the importance of housing being built in the right location. In this report, location was defined in terms of:

- Access to labour markets;
- Access to services;
- Good transport links;
- Perceived quality of schools;
- Access to leisure and shopping;
- Neighbours and the Neighbourhood;
- Green spaces; and
- Social dimensions -- family and community networks. (8)

Housing Need and Demand Assessments (HNDAs) are completed to estimate current and future need for new housing, of all tenures. They are used to inform Housing Supply Targets, Local Housing Strategies and Local Development Plans for each local authority (9).

Local authorities that form part of a Strategic Development Plan area work together on a HNDA for their region. The regional Housing Need and Demand Assessments across Scotland work to slightly different timescales and methodologies so comparison across areas is challenging. In Glasgow and Clyde Valley, the default housing need estimates represents a 10-11% increase in housing stock. In the South East Scotland plan area, housing need estimates represent a 22-23% increase in housing stock. In Aberdeen and Aberdeenshire, the increase is 25%.

Table 2: Housing need estimates by Strategic Development Plan area

Plan Area	Total Population ¹	Total Dwellings	Housing need ²	Private Sector ²	Social & Below Market Rent Sector ²	Preferred scenario housing need
Aberdeen & Aberdeenshire	457,320	217,261	54,730	n/a	n/a	n/a
Glasgow & Clyde Valley	1,789,000	847,758	91,853	52,533	39,320	95,139
SESplan	1,250,886	585,633	126,141	56,261	69,880	136,807
Tayplan	485,960	232,857	49,634	24,429	25,205	44,093

4.2 Affordable Housing

Scottish Planning Policy defines affordable housing as ‘housing of a reasonable quality that is affordable to people on modest incomes. Affordable housing may be provided in the form of social rented accommodation, mid-market rented accommodation, shared ownership housing, shared equity housing, housing sold at a discount (including plots for self-build), and low cost housing without subsidy’ (10).

Social rented properties account for just under a quarter of all housing in Scotland although there is significant variation across the country as demonstrated in Table 1.

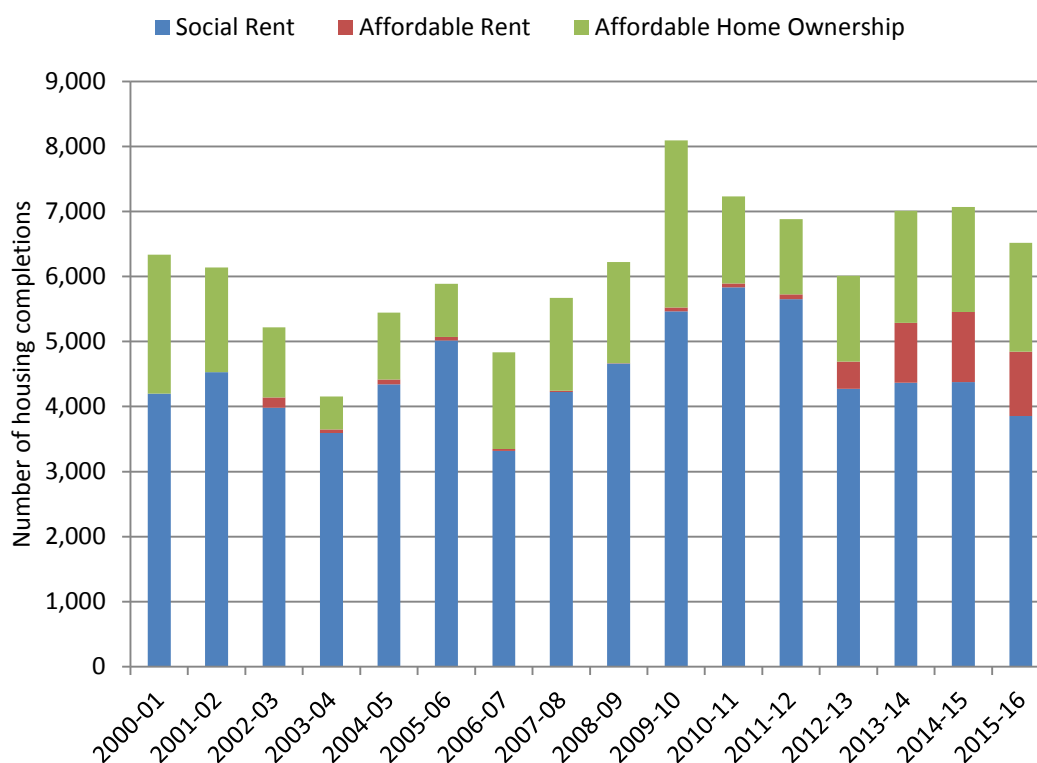
¹ Total population when plan prepared

² Default scenario

As of March 2015, 595,092 of the 2.5 million houses in Scotland were designated as social housing.

Delivery of 10,000 new affordable homes per year for the next five years will be an increase in the number of completions seen in recent years. Over the last fifteen years, affordable housing supply numbers have fluctuated around 6,000 new completions annually (see Figure 2). Research commissioned by Shelter Scotland, the Chartered Institute of Housing Scotland and the Scottish Federation of Housing Associations estimated a requirement of 12,014 new affordable homes per year for the next five years, with an range of 10,435 to 14,678 dwellings (1). Rural Housing Scotland has suggested that ‘A fair share for rural communities from this commitment would see 9,200 new affordable houses built of which 6,400 would be social rented homes, and over £552,000,000 committed’ (11).

Figure 2: New Affordable Housing Supply Programme completions in Scotland (13)



4.3 Delivery of the 50,000 affordable homes

The commitment to deliver 50,000 Affordable Homes in the current parliamentary session was introduced as a manifesto pledge by Nicola Sturgeon at the SNP annual conference in 2015 (12). This commitment followed a successful programme to deliver 30,000 new affordable homes during the 2011-2016 parliamentary session.

The government commitment is to deliver at least 50,000 affordable homes by 2021, of which 35,000 will be for social rent. There is funding of £3billion to support this (13). The funding is provided through the Affordable Housing Supply Programme, which funds schemes to help supply of social rented housing, mid market rent properties and low cost home ownership. This is part of an overarching government housing approach known as More Homes Scotland, which incorporates housing finance, public and private housing supply, housing partnerships between public and private sector and the impact of planning reform on housing (14).

Each Local Authority develops a Local Housing Strategy, based on the Housing Need and Demand Assessment which also informs housing land supply designations in the local authority's Local Development Plan. These are then developed into Strategic Housing Investment Programmes (SHIP) which detail strategic housing investment priorities (15). In practice, the SHIP is a dynamic document which is now updated annually and reflects both local housing demand and the availability of house building land.

Scottish Government then drafts a Strategic Local Programme Agreement (SLPA) for each area, which sets out how local affordable housing commitments will be delivered by the local authority and RSLs. Local Authorities and Registered Social Landlords receive an annual Resource Planning Assumption which sets out the affordable housing finance available from Scottish Government as grant aid. This also then enables them to borrow the additional funding needed to deliver new housing. Local authorities in Glasgow and Edinburgh receive a block grant, known as Transfer of Management of Development Funding (TMDF) and manage grants and loans to Registered Social Landlords (RSLs) on behalf of Scottish Government.

The 2017-18 Affordable Housing Supply settlement is £591 million, of which £422 million will be disbursed to local authorities (16). Subsidy for council house building is generally lower per unit than RSL subsidy (17).

Table 3: Affordable Housing Supply

Programme Budget	2016-17 £ millions	2017-18 £ millions
Housing Supply Grant	365	375
Transfer or Management of Development Funding (TMDF) Grant	95	96
Financial Transactions (estimate)	224	119.5
Resource	4	
Total AHSP	690	590.5

Although a number of local authorities have embarked on significant house building programmes in recent years, housing experts in Scotland suggest that most of the 35,000 new homes for social rent will be built in relatively small developments. Some social rented homes may be constructed within larger private developments.

The remainder of the money will be spent on other forms of affordable housing, particularly on Help to Buy schemes. Applicants can receive up to 15% of the cost of a new home up to a maximum value of £175,000 from 2017-18. It is hoped 7,500 Affordable Home purchases will be supported this way over three years (17).

The policy to deliver 50,000 affordable homes is being implemented against a background of austerity, which has implications both for individuals and for the ability of services to respond. There is some evidence of an increase in need for low cost housing in Scotland. Owner occupancy levels have decreased since the mid-2000s. The incidence of rent arrears has increased in recent years and homelessness continues to be a problem. The financial crisis, subsequent restrictions on mortgage lending and the impacts of UK government policies have a number of housing and income related impacts for lower income groups of the population. The Welfare Reform Act (2012) included a series of measures that impacted directly on housing costs along with other reforms that reduce income levels for those people not working: removal of the spare room subsidy (bedroom tax); introduction of a housing benefit cap and removal of housing benefits for people aged under 25 years ; non-dependent deductions. The supply of new housing has fallen since 2007 and while the number of completed affordable homes has increased in the last five years, the number of these being built is still about 40% fewer than in the mid 2000s. More people are therefore renting in the private sector; private sector rents have increased significantly in recent years. At the same time as these impacts for low income populations, funding pressures on local authorities and other public sector bodies may limit the ability of services to respond to an increase in needs.

5 Key Informant Interviews

We interviewed 16 people with a range of perspectives including: Scottish Government policy makers responsible for implementing the target and for wider housing policy; academics with expertise in housing and/or public health; Housing Association representatives; Local Authority Heads of Housing; CoSLA; Chartered Institute of Housing, Homes for Scotland.

This section contains a brief summary of key points raised in the interviews. Relevant information from key informants is also included in the sections on Policy Context and Impacts and Pathways.

All the informants supported the ambition to deliver more affordable homes and identified many benefits to health and wellbeing. Several noted that although the target is challenging and ‘focuses minds’ on delivery, 50,000 homes is still a small proportion of the overall housing stock, and still falls short of the need estimated in the Shelter report which was 60,000 affordable homes over 5 years (1). So we should be realistic about the impact we would expect to see, especially the impact on homelessness presentations which have many other drivers and require support packages as well as housing provision. This was a concern given current reductions in other services funded or delivered by local government.

Some informants noted that the 50,000 affordable homes will not all be additional to current stock as there may be some demolitions. The target is to deliver 35,000 social rented units; the remaining 15,000 may be a mix of tenures including low cost home ownership and mid market rent properties. The social rented properties include purchases and rehabilitated properties as well as new builds. One informant noted that social housing is an intervention that addresses market failure, rather than a social welfare intervention.

Informants broadly agreed with the areas of impact identified in the scoping exercise, and noted that there were strong links between housing and health. Some reported that they could already see the benefits of their own building programmes. They identified that impacts would depend on the needs and characteristics of the people who move into the affordable homes and the condition of their previous accommodation. They particularly highlighted the potential for improved energy efficiency and reduced fuel poverty, though several also raised concern about appropriate ventilation in well insulated homes. Many people with housing needs also have poor health and more appropriate housing may improve this. Informants made reference to the ‘dementia timebomb’ and stressed the preventative role that housing design can have. One informant stressed that good quality housing should also be seen as a preventative measure that will prevent future ill health, and noted the long timescales that may be needed to realise all the benefits. Informants noted there were potential negative impacts of construction but these were short term. Economic

benefits on the other hand were both short, through direct and indirect employment, and long term – one informant reported that better housing could lead to a more productive workforce well into the future.

Informants identified different groups who could be beneficiaries of the 50,000 homes: people on housing waiting lists, homeless people, people who are overcrowded or in poor quality housing, people who require specialist or adapted housing, people on low incomes especially those who are in relatively expensive private rented accommodation including key workers and young people. One informant expressed an aspiration for social housing to be seen as a realistic tenure for more people. People who do not need social housing but cannot get into the private housing market may benefit from other forms of affordable housing.

Several informants noted demographic changes, the aging population (the ‘dementia timebomb’) and rising numbers of people with mobility needs. They raised the need for more accessible housing and to build to Varying Needs standards to meet changing needs over time. Some also commented on the high levels of care need of people with mental health, learning disabilities or substance misuse issues. They reported on the difficulty of managing care packages for these groups, which required input from multiple agencies. Some discussed the difficulty of estimating need for specialist or adapted housing and managing this stock. Interviewees noted that while housing, social work and NHS staff have worked together in the past, the Public Bodies (Joint Working) (Scotland) Act 2014 presented opportunities to improve services particularly for people with specialist housing needs. Suitable housing could allow some people to be discharged from hospital and receive better care at home, which would benefit them and also reduce NHS costs. There was a strong desire for greater understanding of this and support for housing among Health and Social Care colleagues, for example through the Housing Contribution Statements.

Informants reported that the commitment is not simply to deliver houses but to create sustainable places, which includes consideration of placemaking, local services, good connections etc. It was also important to have the right mix of types and sizes of property. There is flexibility in the available subsidy if required to meet specific needs. Informants noted that it is possible to specify, and monitor, standards for the housing but less easy to control locations which depended more on land availability. There may be potential to learn from the Healthy New Towns programme in England.

Informants reported that although there have been concerns that building homes would cause pressures on education and health services, the people moving into new homes were mostly people who already lived locally in unsuitable or overcrowded housing, so there was little impact on overall population size.

Informants explained the process by which the target is being implemented, and the role of Housing Need and Demands Assessments, Local Housing Strategies and Strategic Housing Investment Plans to identify needs and inform resource allocation

within each Local Authority. The process is essentially already in place and was used to meet the previous target of 30,000 affordable homes in the last parliament. Registered Social Landlords need some certainty about allocations to be able to borrow and start planning. The Joint Housing Delivery and Policy Group is supporting Scottish Government, by identifying blockages and advising on ways to address them.

Informants stressed that decisions about site locations, housing allocations policies etc. should all be based on these local strategies to meet local needs and circumstances. Many decisions about location and infrastructure depended on policies within the Local Development Plans. Conversely, some informants thought there should be greater ministerial direction concerning allocations policies, ensuring developments are tenure blind, and regarding house type – specifically they reported a lack of one bedroom properties.

Several informants noted that the current distribution of social housing does not necessarily reflect the distribution of housing need. They reported that some areas have vacant stock but others have long waiting lists. Even within one local authority area this could be the case. Some questioned whether the new social housing would reflect need and were concerned that they would be based more on other factors including land availability. There were concerns that new housing could displace people from less desirable stock and increase voids with greater clustering of vulnerable people in less desirable areas. It was reported that Edinburgh and Aberdeen had high levels of need but a shortage of land.

Several informants noted that there were differences around the country in the relative proportions of local authority and Registered Social Landlord stock. Some informants were concerned about differences in the level of subsidy for local authorities and Registered Social Landlords. There was also concern about the balance between small and larger Registered Social Landlords. One respondent noted that some Registered Social Landlords seem focused on development led construction rather than needs led construction, which can lead to housing being built in the wrong place. Some reported on the potential for small Registered Social Landlords to provide broader support services, be community anchor organisations and bring wider benefits to local communities.

Informants also raised the possible impact on future rents and/or maintenance budgets to fund the borrowing requirement to deliver the homes. People who move to new housing may pay increased rents but these should be offset by reduced fuel costs in more energy efficient housing. However there were still significant concerns about housing affordability for people affected by benefit changes. The adverse impacts of welfare reform for individuals were already apparent, and there were risks to social landlords facing loss of income due to increased arrears.

Several informants commented that having a target for a five year period, which is a relatively short time to deliver homes on the ground, means that building will 'ramp up'

over that period as it takes time to plan, gain all the required approvals and develop sites, and to train people in all the required skills. This is inherently inflationary as shortages of skills and materials increase construction costs. There is also a risk that a focus on housing numbers will detract from the opportunity to create good places. Informants also noted that housing stock will continue to deteriorate and some will need replaced on an ongoing basis so we should plan for that. The 50,000 target was welcomed but recognised as the 'tip of the iceberg' of what is needed just to stand still, as for the last decade, too few houses have been built every year to meet the need. It was noted that the affordable homes target should be considered as part of a more holistic all tenure approach. Informants suggested that Scottish Government should consider setting a longer term target to replace and extend affordable housing stock.

Many barriers were identified. Availability of land and delays in being able to realise potential sites were significant concerns. These were caused by the lack of available land, the price of land, the cost of remediating brownfield sites, delays caused by the planning system, delays in realising Section 75 agreements and opposition from local communities who do not want building near them. There were also infrastructure issues which could add further delays. A variety of skills and capacity issues could restrict the programme including skills gaps in the construction industry (potentially exacerbated by Brexit), capacity among some RSLs and reduced capacity among planners and other professionals in local authorities. Financial barriers included uncertainty about interest rates, uncertainty about some materials costs, and the risks posed by reclassification of Registered Social Landlords. Many of these have been recognised and are being discussed at national level. Some informants discussed the potential to reach a national agreement that would allow more public sector land to be made available.

There were also many opportunities identified, which the affordable homes target could help support. These included: opportunities for more joint work with health and social care partnerships, sharing of good practice between RSLs, imaginative involvement of a range of other partners, employment and economic opportunities, better involvement of communities in creating high quality environments that meet their needs, and the overall opportunity not just to meet the target number of housing units but to create great places for people to live.

6 Affected Populations

This section provides background on the potentially affected populations.

At the health impact scoping the group identified the following potentially affected population groups:

- People who move to new homes – either new build or moving into vacated existing stock. Groups with particular needs to consider include;
 - People who are currently homeless or in insecure housing;
 - ‘Generation Rent’ – people in private rented accommodation who would prefer other tenures;
 - People living in areas with high levels of poverty;
 - People with a disability, frail older people and their carers;
 - Key workers;
- Communities in areas of house-building;
- People who are displaced; and
- People who gain employment.

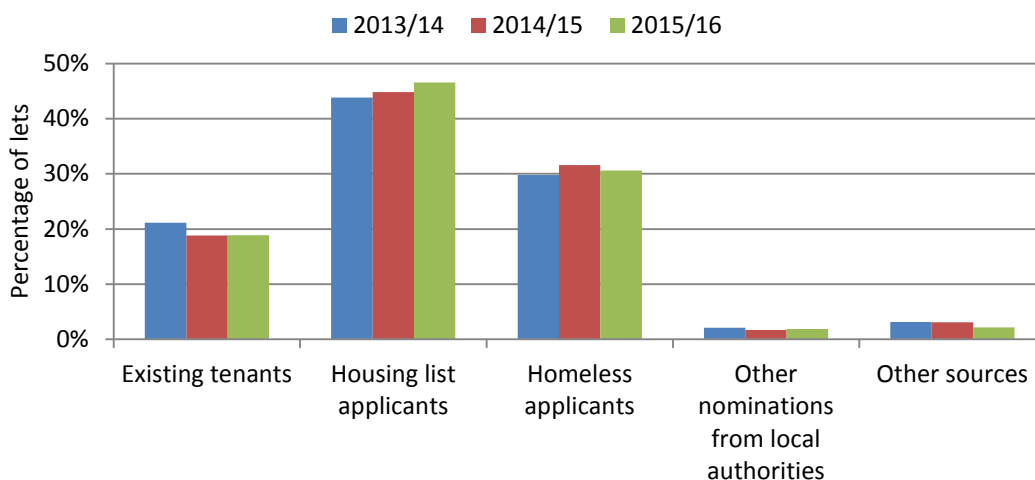
Key informants identified that rural populations may also have particular needs to consider.

People who move into new homes

This includes people moving into newly built or refurbished homes and the ‘vacancy chain’ - people may move from an existing social rented property to a new build, leaving a vacant property that a new tenant can occupy.

In each of the last three years, there have been between 50,000 and 55,000 new lets in social rented accommodation in Scotland (6). Homeless applicants account for about 30% of these and about 20% are people moving between social housing tenancies. Most of the others are people on the housing waiting list (Figure 3).

Figure 3: Percentage of social housing lets during the reporting year by source of let (6)



Homeless people

There were more than 34,000 applications for homelessness to local authorities in 2015. More than 28,000 of these applications resulted in a designation of homelessness and these people were then housed by local authorities. Homeless legislation in Scotland means that councils ‘must offer a minimum of advice, assistance and temporary accommodation’ to all homeless households and those at risk of homelessness. 30% of all social housing lets are made to homeless people. However, the homeless population is made up of varied sub-populations (18).

A ‘severe and multiply disadvantaged’ cohort of homeless people which experiences the most adverse health impacts has been identified by Fitzpatrick and colleagues (19). This group is often homeless on repeat occasions. Other people may become homeless due to domestic abuse or family and relationship breakdown. This means there is a cohort of repeat, multiply excluded homeless people and other cohorts which are perhaps more circumstantial such as victims of abuse, single parents and young men leaving the family home. Sometimes these populations cross over.

As of September 2016, approximately 10,500 households designated as homeless were not resettled immediately (18). In such instances, people are placed in temporary accommodation which ranges from council accommodation to bed and breakfast and refuges. About 25% of households living in temporary accommodation contain children or pregnant women.

Table 4: Pregnant women and households with children in temporary accommodation (18)

	30 Sep 2014	30 Sep 2015	30 Sep 2016
Local authority furnished	1,679	1,673	1,832
Local authority other	58	54	58
Housing association	676	773	849
Hostel: Local authority	34	31	51
Hostel: Other	20	12	16
Bed & Breakfast	16	14	35
Women's refuge	57	66	78
Other	182	196	255
Total	2,722	2,819	3,174

'Generation rent'

The health of people renting homes is generally worse than owner occupiers although this may be attributable to socioeconomic position rather than housing status. A number of housing factors may influence the health of renters. These include rental costs, relationship with landlords and quality of housing. Private rented properties are less likely to meet the Scottish Housing Quality Standard than social rented properties (6). Housing tenure patterns have shifted over the last fifteen years so that there are fewer people living in social rented accommodation than in 2001 and more in private rented accommodation.

Table 5: Housing Tenure (percentages) in Scotland 2001-2015 (selected years) (20)

Tenure	2001	2003	2005	2007	2009	2011	2013	2015
Owner occupier	64	65	66	66	66	64	61	61
Social rent	28	26	25	23	22	23	23	23
Private rent	6	6	8	9	10	11	13	14
Other	2	2	2	2	2	2	2	1

The increase in private sector renting is noticeable in younger ages, particularly people aged 16-34 years, but is also apparent in people over 35 years. The proportion of owner occupied households has increased in people over 60 years but declined in younger age groups. This supports the concept of a growing 'generation rent' living in private rented properties (21). Although many of this group may aspire to home ownership, there appears to be a group for whom social renting represents a more secure housing status (22).

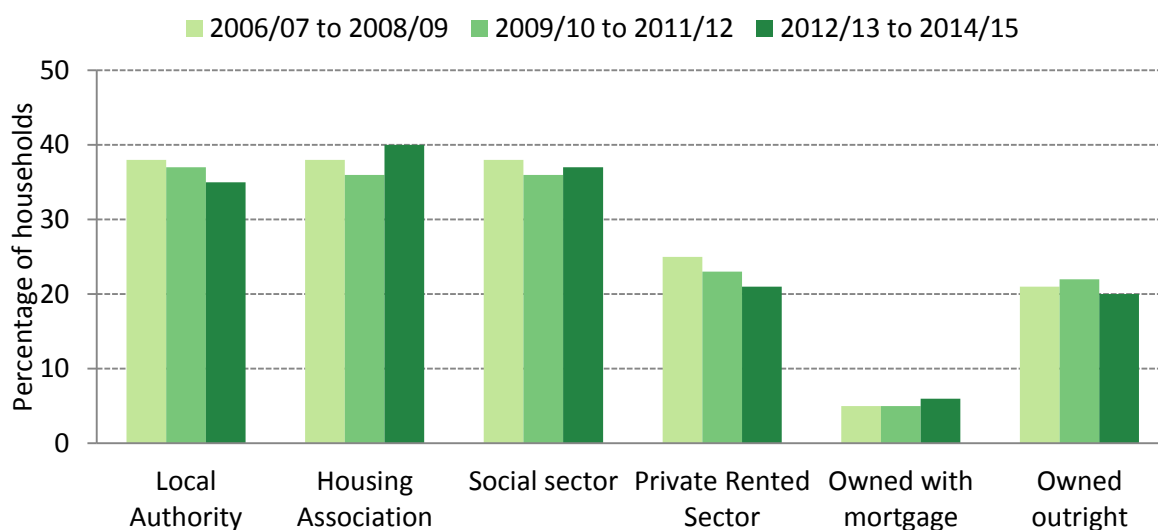
Table 6: Housing Tenure (percentages) by age group in Scotland 2001, 2007, 2015 (20)

	2001	2007	2015	2001	2007	2015	2001	2007	2015
Tenure	16-34 years			35-59 years			60 years plus		
Owner occupier	53	46	32	70	70	64	62	70	73
Social rent	28	25	25	24	22	24	34	24	22
Private rent	17	27	41	4	6	11	2	3	4
Other	2	2	2	1	1	1	2	3	2

People on low incomes

It seems self-evident that people who have low incomes should benefit most from new affordable housing. Between 35 and 40% of people who live in socially rented properties are in the lowest income quintile in Scotland (see Figure 4) (6). There is a strong link between income and health, so these populations also have high levels of health need.

Figure 4: Percentage of households in lowest income quintile, Scotland (6)



There is evidence that over time socially rented accommodation has become a less common type of tenure for less deprived people (23), which means there may be concentrations of people in more deprived circumstances living in local authority and RSL properties. For some of these tenants, housing and associated living costs are a significant problem. Low income can make it challenging to sustain tenancies and cause financial strain with negative impacts on health. This residualisation of social rented housing also presents challenges for landlords seeking to maintain rent levels. Recent changes to housing related social security payments have increased financial challenges for both tenants and landlords.

Older people

Older people form an increasing proportion of the Scottish population. In 2015, 397,000 people in Scotland were aged over 75 years (24). This is projected to increase to 803,000 people, 14 per cent of the total population, by 2039 (25). Older people are more likely to require housing adaptations, specialist housing or housing that enables care and support. They may also spend more of their time in their homes than working age people and are more vulnerable to the negative effects of cold, damp homes.

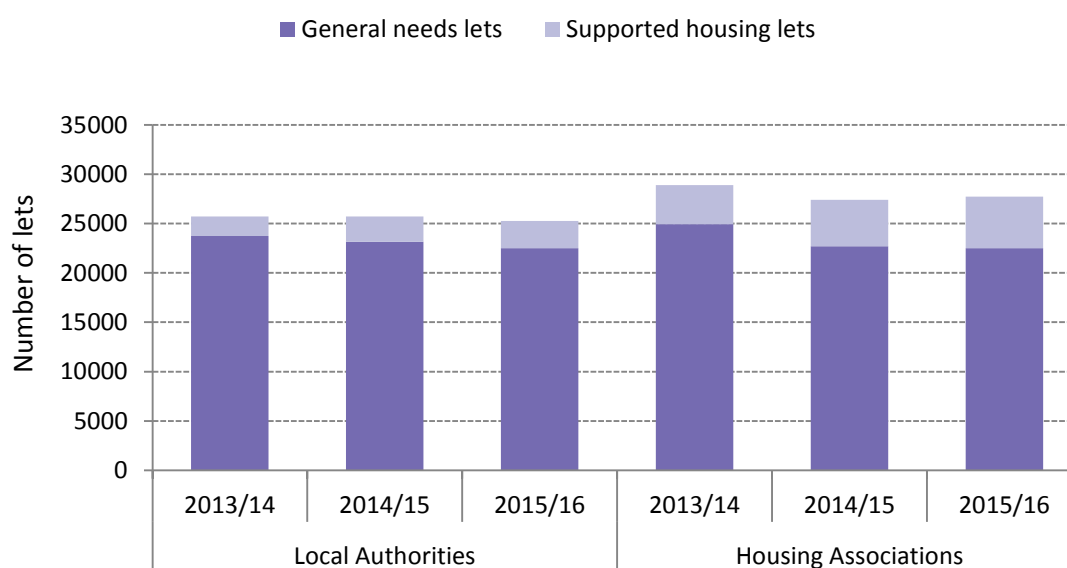
People with a disability

Between a fifth and a quarter of adults living in Scotland have a disability or limiting long-term condition (26). The Scottish Household Survey found that 40% of households have someone with a long term physical or mental health condition. This varied by tenure: 59% of social rented properties, 36% of owner occupied properties and 24% of private rented properties housed someone with a long term condition. Of all households with a person with a physical or mental health condition, 87 per cent stated that nothing about the home limited their activities, but 7% identified problems

being able to get upstairs and 4% identified difficulties accessing or using the bath or shower (20).

There were an estimated 32,282 socially rented dwellings adapted for older people or people with physical disabilities, from a total of 2.5 million dwellings of all tenures, in Scotland in 2012 (27). Adapted properties have accounted for between 10% and 15% of all lets in the social rented sector in the last three years (6).

Figure 5: Number of lets during reporting year, by general needs and supported housing, 2013/14 to 2015/16 (6)



Key workers

In some local housing markets, some employers find it difficult to recruit and retain staff because people cannot afford rents or house prices within the private housing market. Recruitment and retention of staff is also influenced by factors such as transport costs and remote locations as well as housing affordability. There is a particular concern about housing for key workers, who can be public sector staff or people with low paying jobs in the private sector. COSLA investigated key worker housing in 2015 and concluded that 'Finding affordable housing for key workers is a localised issue, most notably in the North East and most remote areas of Scotland' (28).

People living in rural areas

More than a million people live in rural parts of Scotland, about a fifth of the total Scottish population. In the most recent decades the rural population has been rising at a faster rate than the Scottish population overall. Young adults tend to migrate out of rural areas whereas the people moving into rural areas tend to be older. This results

in older average age in rural areas. The average median age in rural local authority small settlements is 44.5 years compared to the Scottish average of 41 years (29).

There are a range of housing challenges for people living in rural areas many of which are amplified by migration patterns and second home ownership influencing the housing economy in some parts of rural Scotland (30). Particular challenges include the supply of affordable housing for key workers and young people who have grown up in rural communities; provision of adaptable housing which enables older people to stay in communities where they live; higher per unit costs for building affordable housing in rural areas (1). However the proportion of houses meeting the Scottish Housing Quality Standard does not differ between rural and urban properties. At present, the proportion of social rented properties is lower in rural areas than urban areas (Table 7) (6). There is some evidence that public sector funding for housing was lower in rural areas than urban areas in the early 2010s. It should be noted that housing need in rural areas across varies across the country with greatest demand in Aberdeenshire, East Lothian, Perth and Kinross, Stirling, Highland, Orkney and Shetland (29).

Table 7: Households in 2015: Urban Rural classification by Tenure (percentage) (20)

Tenure	Large	Other	Accessible	Remote	Accessible	Remote
	urban	urban	small	small		
	areas	areas	towns	towns	rural	rural
Owner Occupier	54.5	59.9	68.7	61.8	74.6	68.3
Social Sector	25.7	25.5	19.8	27.4	13.6	17.2
Private Rented	18.8	13.0	10.5	8.3	9.9	13.2
Other (rent-free)	1.0	1.6	1.0	2.5	1.9	1.3

People living in house building areas or who are displaced

People who live in areas where new houses are being built may also be affected by the programme. In some instances, homes may be demolished before new construction starts. Some people may be displaced altogether while others live through a period of disruption characterised by noise, dust and increased heavy goods vehicle movements in an area.

People who gain employment

The Scottish Government estimates 14,000 jobs annually will be supported by its Affordable Housing investment. Many of these will be in the construction industry and its supply chain.

7 Health impacts and pathways

This section presents a summary of evidence on the main areas of health impact and the pathways through which these impacts arise. It draws on the findings of the literature review and also insights from key informants.

The potential areas of impact were identified by the scoping exercise. They are discussed below under the following headings:

- Homelessness;
- Physical characteristics of housing;
- Specialist housing provision;
- Neighbourhoods and communities;
- Reoffending;
- Educational impacts;
- Economic impacts; and
- Construction impacts.

7.1 Homelessness

The scoping exercise identified the potential for an increase in the availability of affordable homes to reduce homelessness.

At the most fundamental level, having a home is a crucial determinant of health. There are very significant negative health impacts associated with homelessness (31-36). Mental health problems are a particular concern (37). Families who are housed in temporary accommodation start to suffer a range of adverse health outcomes after approximately two weeks (37). Mental health problems and substance misuse increase the risk of homelessness as well as being caused or exacerbated by homelessness. Recent research has highlighted the extent to which long-term homeless populations experience a range of chronic health conditions, with mental illness and substance misuse often co-morbidities (19).

In the six month period April to September 2016, there were 17,107 applications to Scottish Local Authorities for homelessness assistance. This is a fall of 3% from the same period in 2015. The reduction is thought to be because of increased use of local authority Housing Options services to prevent homelessness. Of the 10,312 households assessed as unintentionally homeless, 73% were settled in social rented

housing. About a third of social rented lets are to homeless applicants, which demonstrates the need for available social housing as part of the response to homelessness (6).

The technical reason for homelessness in 31% of cases was loss of accommodation – for example through arrears, end of tenancy, landlord action or other reasons. In 69% of cases the technical reasons were leaving accommodation, for example due to family breakdown, conflict or domestic abuse (18).

The causes of homelessness are complex. Fazel and colleagues summarise this as ‘an interaction between individual and structural factors, including the presence or absence of a safety net.’

Individual factors include poverty, early childhood adverse experiences, mental health and substance misuse problems, personal history of violence, and criminal justice system association. Evidence suggests that drug and alcohol misuse have strong associations with both the initiation and persistence of homelessness. Primary individual risk factors for homelessness in young people (unaccompanied individuals aged 12–25 years) are family conflict and victimisation, non-heterosexual sexual identity, and having been in the child welfare system.

Structural factors that promote homelessness include the absence of low-cost housing, employment opportunities for low-skilled workers, and income support. Findings from ecological studies show that when structural support is not available, individuals with fewer individual vulnerabilities become homeless and rates of homelessness rise. Income inequality itself might be a structural factor that promotes homelessness: countries with greater levels of income inequality have higher rates of homelessness. (32)

This suggests that provision of affordable housing, especially social rented homes, is very important but is only one of the interventions needed to reduce homelessness. The provision of housing and health support is also essential to address the other factors noted above. It would be difficult to isolate the impact of providing affordable homes from other components (38). In addition to delivering 50,000 affordable homes, it is important that resources for homelessness services are maintained (31, 39) (40) (41, 42).

7.2 Housing characteristics and health

The scoping exercise identified that greater availability of affordable homes should enable more people to access housing that is built to high standards, suitable for their needs, and has security of tenure. This would have positive impacts on their health and wellbeing.

There are a number of ways in which the internal and external fabric of a house can affect human health. Most of the evidence to underpin these effects comes from studies of housing improvement. A recent review article suggested that the most notable health benefits of housing improvements arose from improvements in:

- size and usable space;
- design;
- thermal comfort;
- costs (including fuel and rent);
- housing satisfaction and control over living environment;
- relationship with housing provider; and
- neighbourhood environment.

The review found that changes in these housing outcomes affected socio-economic determinants of health including income and relationships within the household. Where residents felt more able to use the kitchen there were some reports of changes in diet and eating patterns (43). A summary of the pathways linking house conditions and home improvements to health outcomes is given in Table 8 and the logic model in Figure 6 below.

Figure 6: Overall logic model mapping reported health and socio-economic impacts, and potential pathways to health following housing improvement (43)

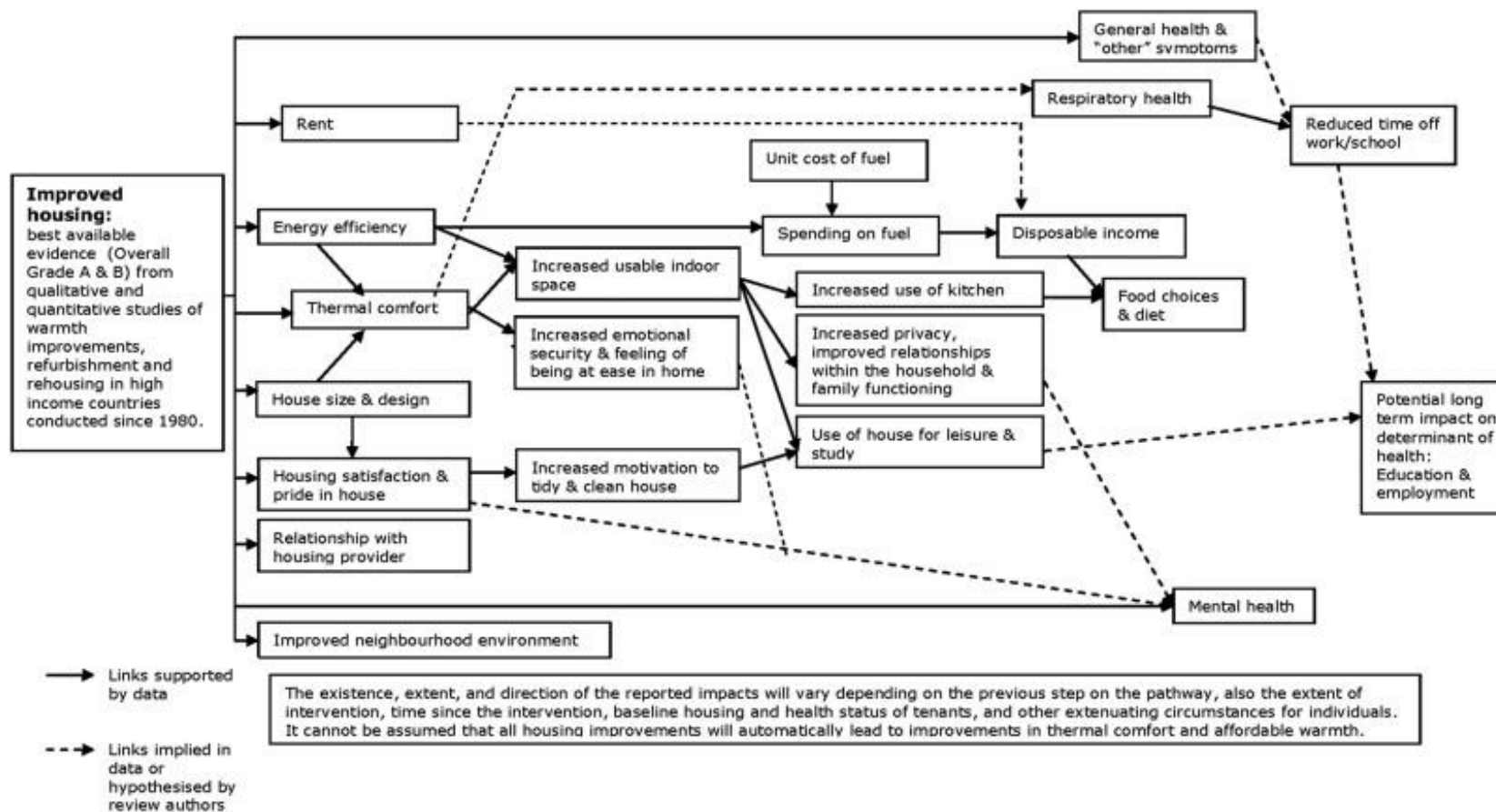


Table 8: Links between housing conditions and health conditions

Housing conditions →	Risk factors →	Health conditions
<ul style="list-style-type: none"> • Thermal efficiency • Weatherproofing • Heating affordability • Ventilation • Space • Food storage, preparation and cooking facilities • Quality of work and floor surfaces • Soft furnishings • External appearance • Neighbourhood environment 	<ul style="list-style-type: none"> • Damp, mould, cold, humidity • Fuel poverty • Dust mites and infestations • Cleanliness • Overcrowding • Concerns about crime and antisocial behaviour 	<ul style="list-style-type: none"> • Cardio-respiratory disease • Digestive health • Allergies and skin conditions • Headaches, migraine • Stress, anxiety • Depression and mental ill-health

Source: adapted from Curl A, Kearns A. Can housing improvements cure or prevent the onset of health conditions over time in deprived areas? BMC Public Health. 2015;15(1):1191.

The impacts depend on the characteristics of the residents. Different populations vary in their need for space or adaptations and in how they use the home – for example older people and young babies typically spend more time in the home than other age groups and may be more susceptible to cold or hazards in the home. Thomson and Thomas outline some of the ways in which housing needs vary and how this impacts on residents' wellbeing:

- For example, a move to a smaller house was reported to be beneficial for elderly residents. While for those with families, an increase in space was reported to be beneficial. This suggests that increased space is not a universal benefit, rather changes to household space should be tailored to meet household needs. The changes in usable space were facilitated partly by physical changes to space, but also by installation of heating systems which provided affordable warmth. Residents reported being able to heat more of the home and being able to use more of the house following the improvement. This was linked to

subsequent improvements in domestic relationships, as well as increased opportunities for privacy, studying, and leisure in the home. (43)

The benefits of good quality housing are especially evident for people with pre-existing health conditions. Earlier research has suggested that moving to new housing resulted in improved health, particularly mental health, for people whose previous housing situation was poor (44, 45). Moving from overcrowded accommodation also has health benefits. Overcrowded housing has negative health impacts, for example there is evidence of increased childhood risk of infection by helicobacter pylori and potential later incidence of gastric illnesses (46, 47).

For the wider population, good quality housing is a preventative measure, part of the suite of determinants such as income, employment and education that shape health.

The GoWell study of health related outcomes associated with a substantive housing investment and regeneration programme in Glasgow researched the impact of both housing improvement and moving to new build homes. The study identified benefits to health and wellbeing that were associated with a range of specific housing improvements:

- roofing, insulation and cladding led to short term (one to two years) physical and mental health improvements;
- improved security of front doors resulted in a one year mental health improvement; and
- new kitchens and bathrooms, chosen by tenants, had positive associations with mental health (48).

These findings add to the evidence that high quality housing that meets residents' needs is likely to benefit their health.

7.2.1 Energy efficiency

The scoping exercise specifically identified benefits from creating homes with high levels of energy efficiency, with potential direct impacts on residents' health and also indirect impacts through reduced fuel poverty.

There is good evidence of the health benefits of improved home energy efficiency and heating, particularly for particular population groups including frail older people, very young children and people with respiratory disease (49, 50). A systematic review for the National Institute for Health and Care Excellence (NICE) (51) aimed to determine the extent to which home energy efficiency and heating interventions could reduce the health risks associated with cold. It found that most evidence supports increased energy efficiency and heating improvement to reduce excess winter deaths.

Although older people receive a Winter Fuel Payment to assist with fuel costs, there is still evidence of excess winter mortality which is most often attributable to failure to keep homes warm enough. In Scotland in 2015/16 there were over 2,400 'additional'

deaths in winter, a figure consistent with the average number over the previous ten years (52). Excess winter mortality is associated with the difference between indoor and outdoor temperature and can be exacerbated by poor housing insulation. Older people with low incomes are most at risk as they may be less likely to heat their houses adequately as a result of concern about expensive heating bills (53).

People in fuel poverty may not only suffer directly from living in cold, damp houses but also may restrict the use of the rooms in their homes as they cannot afford to heat them. This is a particular issue for older people and young children, as these are the groups that spend most time in the home.

The Scottish House Condition Survey reports that 74% of homes in the social sector and 67% in the private sector met the Scottish Housing Quality Standard for energy efficiency in 2015 (6).

However there may also be adverse effects arising from highly insulated homes. In particular, high levels of insulation with inadequate ventilation may decrease indoor air quality (tobacco smoke, allergens) leading to negative health impacts (54, 55). There is evidence that respiratory illnesses, notably asthma, may be linked to indoor allergens (56, 57). Some research also finds that upgrading central heating in homes may not improve physical health. In part, this may be because in this case the upgrade did not represent a significant environmental improvement to the home, but also the costs of central heating may be a barrier to experiencing its full health benefits (45, 48, 58). Key informants reiterated the need for landlords to ensure tenants knew how to make best use of heating systems, the need for adequate ventilation and appropriate furnishings.

7.2.2 Hazards and home safety

The house condition and materials used in its construction may have direct impacts on health through exposure to specific hazards such as lead, toxins in paints, asbestos, unsafe electrical fittings, trip hazards, allergens etc. Meeting building standards relating to construction materials and methods is important to identify and prevent these.

Safety devices such as smoke alarms and lockable cupboards may reduce unintentional injury especially if targeted at parents of children at greater risk of injury (59, 60) (61).

Modern building standards should ensure that people have access to a clean water supply and safe sanitation. Waste management is also a key sustainability issue. Ensuring that there are well-designed waste management and recycling facilities – especially for flats – is important.

The Scottish Housing Quality Standard (SHQS) has 5 elements:

- Meet the legal tolerable Standard;
- Be free from serious disrepair;

- Be energy efficient;
- Have modern facilities and services; and
- Be healthy safe and secure.

Social rented homes were required to meet this standard by April 2015, and a higher proportion of socially rented homes meet the standard than other tenures. There have been improvements in the proportion meeting the SHQS in all tenures since 2012, with a lower proportion consistently in private rented properties (see Table 9).

Table 9: Scottish Housing Quality Standard (SHQS) criteria failure rates by tenure, 2012 to 2015 (6)

	2012	2013	2014	2015
All tenures:				
SHQS Overall	54%	49%	47%	44%
Below Tolerable Standard	4%	3%	2%	2%
Serious Disrepair	0%	0%	0%	0%
Not Energy Efficient	42%	36%	35%	32%
Lacking Modern Facilities/Services	12%	11%	11%	9%
Not Healthy, Safe or Secure	16%	14%	14%	13%
Social:				
SHQS Overall	52%	43%	45%	38%
Below Tolerable Standard	3%	3%	1%	1%
Serious Disrepair	0%	0%	0%	0%
Not Energy Efficient	39%	28%	30%	26%
Lacking Modern Facilities/Services	15%	12%	12%	8%
Not Healthy, Safe or Secure	13%	13%	14%	10%
Private:				
SHQS Overall	55%	51%	48%	46%
Below Tolerable Standard	4%	3%	2%	2%
Serious Disrepair	0%	0%	0%	0%
Not Energy Efficient	43%	39%	37%	33%
Lacking Modern Facilities/Services	11%	11%	11%	9%
Not Healthy, Safe or Secure	17%	14%	14%	14%

Source: Scottish House Condition Survey Key Findings. Note that figures in 2014 and 2015 are not fully comparable with previous years

7.3 Specialist Housing: homes for older people and people needing care

The scoping exercise identified potential benefits for people needing specialist or adapted housing if the affordable homes include some that are specialist or suitable for adaptation. Key informants highlighted the potential for more accessible homes, but also noted the difficulty of prioritising between different needs, managing adapted stock and securing revenue to sustain the support element of supported housing.

Providing homes that can be adapted or are suitable for people with mobility impairment is a central concern of housing and health policy. Numerous policy documents reiterate the need to provide care at home in suitably adapted properties (62-64). For the purpose of this review, we are not considering the care and supports needs component but focus on the property needs.

There is a need for both specialist housing – for example for people in wheelchairs and bariatric provision - and also to ensure that mainstream housing can be adapted when people's needs change. Lifetime Homes and Housing for Varying Needs standards have been used as benchmarks for accessible new homes and many of the standards have been incorporated into Scotland's Building Control standards. Different standards apply for new and extended homes. Varying needs housing 'recognises the needs of people as they grow older and less able and for those of all ages whose mobility, dexterity, cognitive function, hearing or sight is impaired. The design of a house or flat should not hinder a person's ability to live as independently as possible' (65). Key informants reported that the varying needs standards may need to be updated.

Older people and people with mobility or sensory impairment are at greater risk of falls (66). There is evidence that home modifications to reduce falls can help reduce injuries among older people at high risk (67, 68). This may reduce the costs to health services associated with falls as well as the morbidity and distress to individuals. Designing homes or adapting homes with appropriate aids has potential health benefits.

The need for specialist and adapted housing is likely to increase as the population ages, and people are looked after for longer at home. Key stakeholders expressed particular concerns about homes for people with dementia and housing that enables telecare and telemedicine. It has been noted that, 'Social housing providers face a heightened challenge as they experience a higher portion of the problem given the strong correlation between their tenants and higher instances of poor health and quality of life in old age often a number of years earlier than those in other housing sectors' (69). Furthermore, many people sell their homes in later life and seek to move to socially rented, adapted properties.

Boyle and Thomson highlight the challenge of managing adapted housing stock efficiently and coordinating housing and care needs. Housing Need and Demand Assessments provide guidance but it is very difficult to estimate the number of people

who will require specialist or adapted housing in future. Boyle and Thomson suggest that a housing stock register is needed to help housing and health policymakers assess what might be required (69). Some local authorities in Scotland have done work to assess adaptable housing stock provision.

7.4 Neighbourhoods, Public Realm and Communities

The scoping exercise identified that the health impacts of delivering 50,000 new affordable homes will relate not only to the availability and characteristics of the homes themselves but also the neighbourhoods where they are located. This includes the housing mix, the physical neighbourhood and the community in which they are located.

Key informants reported that some of the affordable homes will be 'off the shelf' purchases or refurbishments and that new builds will mostly be located in fairly small developments within existing residential areas. They reported that the average size of new developments built as part of the programme is expected to be 30 units. This limits the potential to influence the wider neighbourhood. Key informants also noted that the location of the homes will depend mainly on land availability. But despite these constraints it may still be possible to achieve neighbourhood improvements as part of the programme. This may provide benefits for both new and existing tenants. All the informants agreed that the target was not just to increase the number of affordable homes but to provide them in high quality, well located places.

The Place Standard is a framework that provides a way to invite views on both physical and social characteristics of a place. It identifies assets and areas for improvement. The Place Standard could be used as a tool to assess and improve the neighbourhoods where the affordable homes are located (70).

7.4.1 Overall environmental quality

The overall quality of the environment where people live can have wide impacts on health and health inequalities. Exposure to poor quality environments results in a range of negative health outcomes. These environments may be characterised by poor air quality and air pollution, noise pollution, heavy traffic, undesirable land uses such as waste facilities, and crime (71-75). Negative health impacts can be seen in higher rates of all cause mortality, respiratory disease, limiting long-term health conditions, stress and general mental health problems. There is evidence that people from more deprived backgrounds are at greater risk of exposure to environmental harms (72, 76). Pearce et al identify a 'triple jeopardy' of social, health and environmental inequalities' (77). This concentration of poor health among residents of areas with worse physical and social environments does not appear to be due to selective migration (78, 79).

7.4.2 Housing mix

There is an observable gap between the health outcomes of people living in different housing tenures but the reasons for this are unclear (80, 81). The British Cohort Studies suggest a small correlation between social housing and poorer health with outcomes for people in social housing worsening over time (23). Although owner occupiers have better health than people who rent their homes, it seems likely that income rather than housing may be the most important factor in this relationship. Home ownership is associated with higher income, and with security and control, all of which contribute to wellbeing (5) (82-84).

Recent housing policy has sought to mix tenures to achieve a more economically and socially viable neighbourhood (85). Mixed tenure is posited to be beneficial for health on the basis that it 'encourages population stability, rising aspirations, better self-image and increased social capital' (86). It appears that a mix with lower than 30% socially rented housing in a community may confer some benefits when measured in terms of health and determinants of health (86, 87). There is no strong evidence about optimal tenure mix at smaller population levels (81, 88-90).

Pepper-potting housing tenure to avoid segregation is often recommended as a way to avoid explicit differentiation of households by tenure. Key informants noted that creating 'tenure blind' development is difficult, though not impossible, to achieve. While it is possible to develop private and public sector residences side by side, evidence suggests that achieving interaction or cohesion between different communities is not just a matter of location, design and architecture. While owner occupiers may have resources to regenerate an area more effectively than renters, they can be 'critical of the neighbourhood environment and socially distanced from the tenants of social housing nearby' (91). In some instances, it is reported that existing residents can feel marginalised by processes that entice new residents to an area (92). Some research suggests that close physical proximity of tenures can create social tensions (quoted in (87)) while other research has suggested that mixed tenure does not necessarily lead to neighbourhood interaction or integration (91). Research suggests that effective community capacity building that engages all sections of the community is essential if neighbourhood integration is to be achieved (93). A recent UK study of neighbourhood social mixing and household resources reiterated the lack of strong evidence which prompted the study and concluded that 'this evidence does not provide a compelling argument to pursue social mix policies nor to halt them' (94).

Some research suggests that provision of a range of housing types to suit households of different types and ages is an important determinant of 'mixed, balanced or sustainable communities' (95).

7.4.3 Neighbourhood design and density

The association between built environments and health is increasingly well researched. The layout of neighbourhoods is influenced by wider land-use patterns, housing and transport (96). Obesogenic environments discourage physical activity and encourage the consumption of energy-dense foods, high in fat, salt and sugar (97). Recent urban development has reduced possibilities to walk, cycle or use public transport effectively, something recognised by the Scottish Government (98) (99, 100). Suburban sprawl creates an environment that constrains the amount of physical activity that people routinely exert on a daily basis (101).

Neighbourhood design can either encourage or discourage walking and cycling; however, evidence of effective interventions is lacking (102-107). The evidence base appears to be strongest for interventions to improve neighbourhood walkability (108). Street connectivity and an avoidance of culs-de sac and crescent type structures is viewed as good practice with regard to encouraging movement, neighbourliness, and also reducing reliance on private cars and enabling public transport provision. Areas that are deemed most 'walkable' are those with varied, higher density land use mix including local shops and services, good connectivity, safety and that are aesthetically attractive (109-111). There should also be good quality footpaths and clearly marked cycle paths. In essence, these are design solutions that shape or determine lifestyles and behaviour. There is limited evidence of causality of such associations (104) and it should be noted that, for example, culs-de-sac may increase children's physical activity levels and parents' feelings of security.

National Institute for Health and Care Excellence guidance recommends that: planning applications should encourage physical activity as part of daily life by including accessible local facilities and play space for children; pedestrians and cyclists should be given highest priority when developing or maintaining roads; a comprehensive network of walking and cycling routes should be provided; public open spaces and paths should be well maintained and accessible on foot and bicycle; workplaces and public buildings should be linked by and to walking and cycling routes; staircases should be designed and positioned to encourage their use; schools should be designed to facilitate active play (112).

Research from Glasgow suggests that 'the effects of [environmental] interventions are likely to vary between populations and between socioeconomic groups within populations' (113). It suggested that close access to shops and safe cycle paths influenced active travel in a positive way. The research suggests that residents' social and economic motivations and circumstances are also important determinants of travel. Addressing these issues is also an important aspect of effecting active travel. This research reiterates the sequence whereby fundamental determinants of health such as income and employment need to be in place for behaviour and lifestyle change to be possible (114, 115).

Density is another feature that can affect health related behaviour and access to services. UK government guidance in recent years recommends a density of approximately 50 dwellings per hectare in order to provide sufficient population numbers to sustain facilities and services in urban and suburban settings. Much of the recent design guidance in the UK and Scotland is an attempt to curb low density, car dependent suburbs. But some research highlights the contradictions and complexity around density:

- Firstly, outcomes relating to neighbourhood pride and attachment, stability, safety, environmental quality, and home satisfaction all display a negative, nonlinear relationship with density. Secondly, outcomes relating to social interaction and group participation tend to improve as density rises up to a medium level, and then fall off at higher levels. Thirdly, outcomes relating to the use of local services are broadly positively related to density. This third group represents the 'equity' aspect of social sustainability, whereas the previous two groups represent the 'community' aspect. ... ; and
- An exclusive emphasis on high density, particularly if this takes the form of apartment accommodation with little provision of gardens, is unlikely to produce happy, well-functioning communities. Compromises between the arguments (particularly from the sustainable transport perspective) for high density and the social and quality of life considerations will be needed (116) (see also (117)).

Public transport generally requires 40 dwellings per hectare over sustained distances so that demand exists (118). However, housing density is also linked to neighbourhood type. Suburbs have varying densities dependent on the type of housing provided. A further complication when considering density is the interests and perceptions of developers. Further research is required on housing density, its relationship to neighbourhood cohesion and effectiveness and the impacts on population health.

Density, layout and design can either encourage sustainable transport or contribute to car dominant modes of travel and high levels of traffic. Traffic has a number of adverse impacts on health. It produces air and noise pollution, increases the risk of pedestrian road traffic injury and can act as a barrier to movement and community contact. These impacts are not evenly distributed. Air pollution is more harmful to people with pre-existing heart or lung problems. People, especially children, living in more deprived areas are at greater risk of being hit by cars. Severance will impact people without cars who rely on walking to move around but community contact appears to be reduced for all residents living in close proximity to roads (119).

7.4.4 Greenspace and play facilities

The scoping exercise identified some concern that some of the 50,000 homes may be built on greenfield sites leading to loss of greenspace. Conversely, some key informants were concerned that brownfield sites would be developed in locations with poor connections to amenities (including greenspace). There was general agreement

about the need for residents of the 50,000 homes to have access to high quality greenspace including play facilities.

There is good observational evidence linking access to greenspace with improved mental health (120, 121) and physical health (122, 123), although the pathways and processes that create these benefits are not always straightforward (124). Benefits may vary across the lifecourse (125) and area deprivation may be an important contextual factor (126). Quality, quantity and proximity to greenspace interact in varying ways to mediate health benefits (127). The benefits may arise from the direct positive impact of experiencing greenspace on mental health, and also because greenspace may encourage physical activity which in turn has beneficial impacts on mental and physical health and overall mortality risk.

Supportive environments are particularly important for children to facilitate healthy development. Positive parenting is important in building resilience that is important for mental wellbeing in children's later life (128). This is supported by provision of adequate playspace to allow structured and unstructured play, as well as space for services that provide support for parents. Practice guidelines have highlighted the importance of shade as a design feature to minimise exposure to the sun.

Replacing greenspace with hard landscaping can increase flood risk. Flooding has negative impacts on both physical and mental health (129-134). Projections for future climate change suggest that there will be more rainfall in Scotland with more instances of thunderstorms. Sustainable Urban Drainage System and broader consideration of a green infrastructure approaches are important ways of managing the risk of flash flooding (135).

7.4.5 Communities

The scoping exercise identified several distinct, but inter-related, ways in which the social environment of the communities where the 50,000 homes are located could impact on health: firstly, impacts relating to the strength of social cohesion and social networks within the communities; secondly, the potential impacts of perceptions of an area and, in particular, any stigma associated with an area; and thirdly, impacts relating to the sense of control (or otherwise) that residents feel over their environment. The literature review found evidence of health impacts relating to all of these.

There is good evidence from observational studies of a positive association between social capital and health (136). However, the available literature on how to achieve the integration of communities, in the context of new housing developments being added to existing communities, is quite small. Design features that encourage interaction include proximate positioning of entrances and provision of focal points.

Social support may be encouraged by provision of community amenities that permit social gatherings for a range of groups (119). There are some clear messages about community facilities and health. The association of community facilities with healthier populations is well established (109). The uptake, quality and maintenance of facilities

are also important (137). Appropriate facilities can contribute to better mental health outcomes, more physical activity and improved social cohesion.

The review also confirmed that perceptions of an area can influence health of residents. There is good evidence to show that health outcomes are poorer in areas defined by residents as suffering from neighbourhood incivilities, vandalism and poor maintenance (138-140). A recent Glasgow study finds that people who live in areas rated as better neighbourhood environments experience less loneliness than people living in areas with lower quality neighbourhood resources (141). The authors of this study suggest that their research provides evidence to support investment in neighbourhood improvement but add the caveat that housing regeneration cannot be undertaken in isolation from other public policies:

- Our findings also support the notion that social regeneration, in the form of community support and development interventions, should comprise a more integral and better specified element of regeneration strategy and programs than at present, because a lack of familiarity and trust in others who live nearby is an issue underlying feelings of loneliness for people living in deprived areas (141).

Opportunities for participation, for social interaction, and sense of perceived control are all important determinants of mental wellbeing (142). Recent research from Glasgow shows that residents who felt most empowered during housing regeneration were most likely to report improvements in mental wellbeing (143). Perceived control can be enhanced by community consultation that is perceived to be meaningful and supported over time.

7.5 Reoffending

The scoping exercise identified the potential for reduced recidivism if the 50,000 homes help ensure that prisoners can access stable accommodation on their release.

Recent work for the Scottish Government highlighted that 35% of prisoners did not know where they would be living on release. Of all prisoners released in 2011-12 (the year for which most recent figures are available), approximately 11% were classified as homeless by local authorities (144). There is evidence that securing and maintaining homes is a problem for people released from prison. The extent to which housing supply is part of the problem is less clear. As well as appropriate housing, support to address substance misuse and other issues needs to be considered as part of the suite of things that help people to avoid re-offending. It would appear that maintaining housing through a custodial sentence reduces risk of reoffending (145).

7.6 Housing and Education

The scoping exercise identified the potential for educational benefits to children if their families are able to access more appropriate accommodation for their needs. Given the strong links between higher attainment and better health, this would also be likely to have lifelong benefits for their health. Key informants reported some anecdotal evidence of positive educational impacts for children and noted that there could be similar educational benefits for adults in education or training.

The pathways that link housing and education have been summarised as: toxins, pollutants, noise, crowding, chaos, housing, school and neighbourhood quality, ownership (tenure), and housing costs and affordability (146-148). Much of the research on this subject comes from the United States which means that there are some concerns about transferability. There are some well conducted studies of large cohorts from the United Kingdom. But, like the vast majority of the literature, these studies are observational which means it is impossible to attribute causality. There is ongoing interest in how children from more deprived backgrounds, whether classified by housing or neighbourhood measures, fare at school.

7.6.1 Domestic housing factors and education: overcrowding, noise, toxins and pollutants

Many reviews highlight the negative impacts of overcrowding on children and educational attainment (147, 148). The main explanations for this outcome appear to be the lack of space within a home to do school work; impaired parent child interaction; child withdrawal in busy households. It may also be linked to noise. Ambient noise may present a greater risk to children at home by affecting cognitive function, especially reading and memory, and behaviour (147, 149).

Gascon et al's review also highlights the potential impacts of toxins and pollutants and the greater susceptibility of children to the impacts of environmental exposures (149). Lead, mercury and volatile organic compounds are well known health risks and have all been associated with negative health and cognitive outcomes. In developed countries, exposure to air pollution is more associated with external pollutants rather than household fuels. Evidence is mixed on whether NO₂ and other pollutants definitively impair child cognition (150). Although there is a growing body of research documenting health problems associated with air pollution in urban areas, linking this to housing and then educational outcomes has not been done.

7.6.2 Ownership, tenure mix and housing stability

Owner occupation is associated with better performance in primary and secondary schools in many European and North American contexts. UK studies have found a similar pattern in primary (151) and secondary (152-154) schools. But reviews of this topic in recent years have stressed the limitations of observational studies. Holupka and Newman explain that the association of home ownership with child educational

outcomes is prone to selection bias with some research having ‘mistaken selection differences in who becomes a homeowner with the effect of home ownership itself (155). Tunstall et al suggest that ‘at least part of what might appear to be a “rented tenure” effect on test scores was potentially a “neighbourhood deprivation effect” (151).

Recent UK research suggests that there may be some educational advantage for children living in socially rented houses rather than social rented flats (151, 156). Nasim suggests that the poorer housing quality of privately rented flats may account for some of this difference in outcomes.

There is mixed evidence about whether mixed tenure improves educational outcomes (88). Although some research suggests that higher levels of owner occupation among parents and carers in a school population may have beneficial impacts on attainment (153, 154), these observational studies cannot rule out a selection effect. It also appears that there may be a threshold over which higher owner occupation rates in a neighbourhood does not confer additional educational improvement (157).

The Moving to Opportunity intervention randomised participants so that some people were given vouchers to move from high poverty neighbourhoods to low poverty neighbourhoods in New York City. Evaluations show no beneficial impact on school attainment for children who moved to low poverty areas. In fact, children from low income families living in the low poverty neighbourhoods appear to have fared worse than their counterparts in high poverty neighbourhoods (158). This (counterintuitive) finding from a robust study of housing and educational outcomes yet again reinforces the complexity of the relationship between housing, neighbourhoods and education (157).

A number of the UK cohort studies have focused on the impact of moving house. There is a well established evidence base that multiple moves, especially for young children and children from low income households, is bad for educational attainment (148, 159). Recent studies have investigated secondary school age children who move to more deprived communities and children who live in communities with high rates of population turnover. Weinhardt reports that the educational attainment of teenagers moving to areas with high levels of social housing does not worsen (160). However, a separate analysis of the same dataset suggests a negative educational impact for children who stay in areas of high social housing with high population turnover (161).

7.7 Economic impacts

The scoping exercise identified potential economic benefits to the individuals who access more affordable homes, and also more widely through the economic impact of

the construction. It also identified that the location of housing relative to employment opportunities could have positive or negative impacts for residents.

Poverty is a key determinant of poor health and there is a well established link between affordability of housing and health. Net household income is lower among social renters than people in other tenures. In 2015, only 26% of social rented households had a net income over £20,000 per year compared with 51% of private renters, 83% of households with a mortgage and 51% of households that owned their homes outright. Average rents in the social rented sector are significantly lower than rents in the private rented sector. In 2015/16 the average weekly rent for a social rented 3 apartment house in Scotland was £72, whereas the average weekly rent for a privately rented 2 bedroom property was £142. So there will be a clear benefit for households that, as a result of the increased stock, are able to move from private rented into social rented housing (6).

Fuel poverty is a significant contributor to financial strain linked to housing. Although most social rented properties meet Scottish Housing Quality Standards in terms of provision of central heating and adequacy of insulation, many people do not have enough money to pay for heating. Heating costs are a particular problem in areas that are off the gas grid.

Social landlords already invest in tenant sustainability initiatives as a way of preventing rent defaults but many social landlords have a number of tenants with rent arrears. Future changes to universal credit and the introduction of personal independence payments mean people who are already living on low incomes are likely to find it more difficult to meet housing costs. Changes to social security in recent years have already been disproportionately felt by social renters (see Table 10).

Table 10: Anticipated loss in 2021 arising from post 2015 welfare reforms, by tenure (162)

	Number of households (GB) millions, 2011	Average loss per household £ per annum	Average loss per working age household £ per annum
Social rented sector	4.7	1,330	1,690
Private rented sector	4.5	710	730
Owner occupied	16.3	230	290

For existing social renters, there may be an increase in rents to support the cost of building, refurbishing or purchasing new affordable homes. Rents for new build social rented properties tend to be higher than rents for older stock, and there are also short

term moving costs. On the other hand, new build properties are likely to be more energy efficient and cost less to heat. The overall impact on housing costs is unclear.

The 50,000 affordable homes are scheduled to be constructed by 2020-21. This represents a modest increase in the annual rate of housebuilding in Scotland. During construction there will be significant employment opportunities. These will include not only the jobs directly related to construction of homes but also the wider supply chain. The Scottish Government estimates that 14,000 jobs will be supported on and off site (16). There is good evidence of the characteristics of work that is good for health (163).

Key informants suggested that there may be a need to increase training opportunities that will allow young people to benefit from the employment opportunities, but also noted that there was an inherent delay in training up workers. They thought that relatively short term targets led to 'bursts' of activity with high demand but skills shortages, which was inflationary. Key informants highlighted that, over the long term, the economic impact will be felt in terms of increased opportunity for services and trades working at people's homes.

7.8 Construction

The scoping exercise identified some short term adverse health impacts associated with construction. There are potential health impacts associated with on-site construction risks; noise, nuisance and exposure to pollutants for people living near construction sites; and impacts associated with construction vehicle movement.

There is evidence of a health disadvantage for construction workers in comparison to other industries (164) and construction injuries are common (165-167). There is no compelling evidence about effective interventions promoting construction safety (168). A particular concern relates to exploitation of migrant workers who may end up on site (169). There is evidence that some migrant employees may be unaware of their basic employment and health and safety rights. The non-unionised nature of construction workforces (13% compared to 26% in UK workforce overall) (170) appears to limit the opportunity for both training about and enforcement of site safety rules.

Good standards of health and safety are important to mitigate these construction risks. Where the affordable homes are refurbishments or where new build is contingent on demolition of old buildings, it is very important that appropriate precautions are implemented to deal with any asbestos in old buildings. There also needs to be adequate security to ensure children are unable to trespass on site. Careful traffic management is important, particularly to reduce risks associated with HGV traffic.

8 Matrix of health impacts

Issue	Pathways	Affected populations	Potential impacts	Type of impact	Probability
Homelessness	Increased availability of affordable housing may reduce homelessness and reduce time spent in temporary accommodation before people are resettled.	<p>People who present as homeless</p> <p>Including families with children</p> <p>People liberated from prison</p>	<p>Reduction in adverse mental and physical health effects of homelessness</p> <p>Improved educational attainment – with long term beneficial impact on mental and physical health</p> <p>Reduced re-offending– with long term beneficial impact on mental and physical health</p>	Positive	<p>Probable</p> <p>Possible</p> <p>Possible</p>
Housing affordability	<p>More people will be able to access affordable housing.</p> <p>New/rehab social homes will meet EESSH and have appropriate ventilation.</p>	People who move into new homes – scale of impacts depend on costs of previous accommodation	Increased disposable income with beneficial impacts on physical and mental health	Positive	Probable

Issue	Pathways	Affected populations	Potential impacts	Type of impact	Probability
Housing condition	<p>The affordable homes will meet SHQS, have appropriate space and storage for residents' needs, be well designed and attractive.</p> <p>Reduced overcrowding, increased housing satisfaction, better facilities for food storage and preparation.</p>	<p>People who move into new homes – scale of impacts depend on condition of previous accommodation</p>	<p>Improved physical and mental health</p> <p>Improved educational attainment – with long term beneficial impact on mental and physical health</p>	Positive	<p>Probable</p> <p>Possible</p>
Energy efficiency	<p>New/rehab social homes will meet EESSH and have appropriate ventilation.</p> <p>Reduced fuel poverty, increased use of home for studying and leisure.</p>	<p>People who move into new homes -scale of impacts depend on condition of previous accommodation</p>	<p>Reduction in cardio-respiratory disease, allergic conditions, mental health conditions</p> <p>Reduced winter mortality</p>	Positive	<p>Probable</p> <p>Possible</p>

Issue	Pathways	Affected populations	Potential impacts	Type of impact	Probability
			Improved educational attainment – with long term beneficial impact on mental and physical health		
Specialist /adapted/ supported housing	The affordable homes will meet Lifetime Homes/Varying Needs standards. Some will be accessible or designed to provide supported accommodation.	People with care needs who move into new homes	Increased independence Improved care and support Reduced falls	Positive	Probable Probable Possible
Neighbourhood environment	The quality of environment, design and location of neighbourhoods where the affordable homes are delivered will affect walkability; exposure to traffic and pollution; access to	People moving into new homes	Impacts on physical activity, physical health, mental health, access to services	Positive/negative	Probable

Issue	Pathways	Affected populations	Potential impacts	Type of impact	Probability
	greenspace; access to services, amenities and employment.				
Communities	<p>Social networks may take time to develop after moving home</p> <p>There may be stigma related to affordable housing, but perceptions of an area may be improved by neighbourhood improvements</p> <p>People's sense of control may be affected by the quality of consultation on proposed development and by tenant participation activity.</p>	<p>People moving into new homes</p> <p>People living in communities near new affordable homes</p>	Impacts on mental health	Positive/negative	Probable

Issue	Pathways	Affected populations	Potential impacts	Type of impact	Probability
Employment and economic impacts	Many of the affordable homes will be new builds, which will bring employment in construction and through the supply chain. There will also be longer term jobs in services and trades serving new developments.	People who gain employment, directly or indirectly	Increased income with beneficial impacts on physical and mental health	Positive	Probable
Construction	There are risks associated with construction work. Construction is also associated with noise, dust, pollution and vehicle movements, particularly HGVs.	Construction workers People living near construction	Injuries Exposure to noise, pollution, HGV traffic	Negative	Probable Probable

9 Discussion and recommendations

Summary

Overall, this assessment has identified many potential health benefits arising from the delivery of 50,000 affordable homes. Characteristics of high quality housing that benefits health include high levels of energy efficiency, thermal comfort, ventilation, appropriate space for the household, and provision of safety features. Social housing should meet the Scottish Housing Quality Standard and Energy Efficiency Standard for Social Housing. Other affordable housing should also meet high standards for quality and energy efficiency.

Most of these benefits will be experienced by the people who will be able to access new affordable homes as a result of the programme. We identified several populations with the highest potential to benefit, including people living on low incomes, people who are homeless and people with specialist housing needs. There is an opportunity to ensure the programme provides the affordable homes in high quality, well connected places with good community facilities. There are also economic benefits, which would have positive impacts on health, particularly for people who gain employment as a result of the programme.

We identified some adverse impacts, mostly short term that would arise during the construction phase. There were also some concerns raised about displacement effects if some existing social housing becomes less desirable with clustering of more vulnerable residents. The assessment highlighted several issues to consider in order to achieve the highest level of benefit from the investment.

Our findings are in line with recent reviews including the Healthier and Happier at Home report that identifies the contribution that housing makes to national health and wellbeing outcomes (2); and the report of the Commission on Housing and Wellbeing (3).

Recommendations

9.1 National policy

Population numbers are projected to increase over the next 25 years while average household size is projected to decrease. It is clear that housing needs will continue to increase over a period longer than the current 5 year commitment.

- **Scottish Government should seek cross party support to commit to a longer term programme of investment in affordable homes, of at least 20 years, to sustain the benefits of the programme, continue to increase**

availability of affordable homes and replace stock that is no longer fit for purpose.

The assessment highlighted that housing need, including need for affordable housing, varies across Scotland both between and within local authority areas. The areas with the highest needs for affordable housing may not necessarily all be the areas that currently have the highest numbers or proportion of social housing stock. Some areas with high levels of housing need have land shortages which may limit their ability to develop new build affordable housing. The interaction between the planning system and housing need does not always enable housing to be delivered where it is needed most. It is important that the allocation of grant funding is based on housing need.

- **Scottish Government should aim to ensure that the distribution of grant funding for delivery of affordable housing is based on housing need; and**
- **Scottish Government should publish an analysis of the previous and current programme that includes data on the number of affordable homes delivered in each local authority area, tenures, house types, and first lets. This should present progress in delivery of affordable housing with reference to the needs defined in current Housing Need and Demand Assessments and Strategic Housing Investment Programmes.**

This assessment, and other recent reviews (2) have highlighted the range of outcomes that the Affordable Homes programme can contribute to, and the pathways through which these arise. Monitoring these co-benefits could inform implementation of the programme and help ensure the programme achieves the best outcomes. The kinds of evidence available to monitor these will vary depending on the nature of the outcome. For high level health outcomes with many contributory factors it may be more meaningful to monitor changes at earlier stages in the pathways.

- **Scottish Government and its partners should consider how to monitor and evaluate the health and wellbeing outcomes of the programme, as well as the number of homes delivered.**

There are strong links between poverty and ill-health and between good work and good health. The programme should have a positive economic impact through direct employment and wider economic effects. Key informants were concerned about skills gaps and identified a need for training and apprenticeships, which could also help ensure that young people are able to benefit from the employment opportunities. However they also noted that it takes time to train workers and it is important to ensure their skills will be relevant beyond the lifetime of the current programme. There are risks associated with construction work, which should be mitigated through best practice in health and safety procedures.

- **Scottish Government should work with colleges, industry and other partners to increase provision of training and apprenticeships to develop**

skills for construction and ensure young people are able to gain from the employment opportunities provided by the programme; and

- **Scottish Government should encourage employers to ensure high standards of health and safety, and to follow principles for high quality work.**

Although social rented properties and other forms of affordable housing have significantly lower costs than other tenures, there are still concerns about affordability - a third of social renters spend more than 30% of their income on housing costs. As well as the obvious impacts for tenants, there are risks to housing providers if a large number of tenants fall into arrears. Several aspects of welfare reform may exacerbate the risk of arrears. These include the benefit cap which mainly affects larger families; restriction to Local Housing Allowance affecting single people aged under 35 years who will only get the shared accommodation rate; the removal of eligibility for housing benefit for people aged under 21; and direct payment of housing benefit to claimants rather than landlords. Benefits changes, as well as local authority funding cuts, may also affect people with care needs in supported accommodation.

- **Scottish Government should quantify the impact of welfare reform on rent arrears and consider appropriate mitigation.**

9.2 Community Planning policy

Many of the decisions about delivery of the affordable housing will be made at local level based on the Local Housing Strategies and Strategic Housing Investment Plans. Local partners are better placed to understand local needs as well as opportunities to deliver affordable housing in high quality, well located places. It is important that decisions about the location of affordable homes are made in the context of a holistic vision for each place that considers employment, housing, services and communities together.

- **Local authorities and their partners should use the evidence within this HIA as a resource to inform the development of future Local Housing Strategies and Strategic Housing Investment Programmes; and**
- **Community Planning Partnerships should develop plans for their communities that enable affordable housing to be delivered as part of a holistic vision for each area.**

There is potential for increased availability of affordable homes to contribute to reducing homelessness. However, evidence from the literature and from key informants highlighted that the causes of homelessness are complex and the response from housing and other services needs to be flexible. Available affordable housing is certainly needed to allow local authorities to respond to homelessness but it is

insufficient by itself to prevent homelessness. It is important that Housing Options and other support services are also maintained and enhanced.

- **Local Authorities and their partners should continue to provide and enhance both preventative and support services for people who are homeless or at risk of homelessness.**

The aging population and policy of supporting more people to be cared for at home mean that requirements for specialist, supported and adapted housing are likely to increase. Dementia friendly and bariatric housing were highlighted as growing needs, which may not be fully addressed in the current standards for housing of varying needs. The assessment identified a lack of data on current and projected needs for specialist and supported housing, and the need to ensure housing would enable new models of care such as telecare and technology enabled care. Informants also highlighted the complexity of managing supported housing when different agencies were involved but identified opportunities with the establishment of Integrated Joint Boards.

- **Health and Social Care Partnerships and Housing Authorities should work together to ensure that Housing Contribution Statements identify projected need for, and current provision of, specialist, supported, and adapted housing, and the range of support needed for these client groups; and**
- **Housing providers should ensure affordable homes are built to varying needs standards with necessary infrastructure to support future needs such as telecare and technology enabled care.**

9.3 Placemaking and communities

The characteristics of the places where houses are located have wide ranging impacts on health. The location of the 50,000 affordable homes is likely to be limited by land availability and most new builds will be in relatively small developments. But it is important to ensure homes are provided within high quality neighbourhoods with good connections. The evidence highlights the many characteristics of neighbourhoods that can impact on residents' health. These include physical features such as pollution, traffic, walkability, greenspace; housing mix; access to employment, services and amenities; community cohesion and perceptions of the area. All of these need to be considered holistically to create high quality neighbourhoods. The Place Standard can be used to assess a neighbourhood and identify priorities for improvement.

- **Housing providers should aim to provide affordable homes within high quality neighbourhoods, with well laid out, walkable environments, using tools such as the Place Standard to identify priority neighbourhood improvements;**

- **Housing providers should work with partners to attract other investment to developments, ensure public transport links and ensure provision of other services is available for residents of the affordable homes;**
- **Affordable homes should avoid locations that would be dependent on private motor transport; and**
- **Larger developments should include within them amenities such as playspace, greenspace and community venues.**

The evidence also highlighted the health impacts of the social environment and perceptions of an area. Social housing may be stigmatised, and this adversely affects residents' health directly and indirectly. Tenure blind development can help reduce stigma but is difficult to achieve. Meaningful involvement of existing local communities in the planning stages, and opportunities for tenant participation once the homes are occupied, may help improve perceptions of an area and increase the sense of control that people feel over their environment.

- **Housing providers should learn from examples of good practice in the creation of tenure blind developments; and**
- **Housing providers should ensure meaningful involvement of communities in planning, design and delivery of new developments and opportunities for tenant participation.**

Construction has some of the highest morbidity and mortality rates of any occupation. There are also direct risks to nearby communities from construction related transport, air and noise pollution. Children are also at risk of accidents on building sites.

- **Contractors should ensure the highest standards of safety performance and workforce development and support, minimise disruption and risk to adjacent communities and minimise their environmental impacts.**

10 Glossary

Amenities: Standard features in a house e.g. toilets, bath, water supply etc.

Energy Efficiency Standard for Social Housing: The Energy Efficiency Standard for Social Housing categorises the property and fuel types by which housing stock should be apportioned, and sets out the ratings to be achieved by each property. Full details on the property types, fuel types and ratings which make up the EESSH are available on the Scottish Government's website at www.energyefficientsocialhousing.org

Fuel poverty: A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use.

Housing Associations: Housing Associations are independent, not-for-profit organisations that provide homes for people in housing need.

Registered Social Landlords: Registered Social Landlords are not-for-profit housing providers approved and regulated by Government. Most Registered Social Landlords are Housing Associations.

Scottish Housing Quality Standard: The Scottish Housing Quality Standard (SHQS) is the Scottish Government's principal measure of housing quality in Scotland. The purpose of the minimum housing standard in Scotland is to provide a 'floor' below which a property should ideally not fall. The SHQS is a set of five broad housing criteria which must all be met if the property is to pass SHQS:

- Must be compliant with the current Tolerable Standard;
- Must be Free from Serious Disrepair;
- Must be Energy Efficient;
- Must have Modern Facilities and Services; and
- Must be Healthy, Safe and Secure.

These criteria comprise 55 elements and nine sub-elements against which properties need to be measured. For more information see <http://www.gov.scot/Topics/Built-Environment/Housing/16342/shqs>

References

1. Powell R, Dunning R, Ferrari E, McKee K. Affordable Housing Need in Scotland. Edinburgh: Shelter Scotland; 2015.
2. Young G, Britain A. Healthier and Happier at Home. Livingston: iHub; 2017.
3. Wellbeing CoHa. A blueprint for Scotland's future. 2015.
4. Tweed E, McCann A, Arnot J. Foundations for wellbeing: reconnecting public health and housing. A Practical Guide to Improving Health and Reducing Inequalities. Glasgow: ScotPHN; 2017.
5. Thomson H, Macdonald C, Higgins M, Palmer S, Douglas M. Health Impact Assessment of Housing Improvements: a guide. Glasgow: ScotPHN; NHS Health Scotland; 2012.
6. Scottish Government. Social Tenants in Scotland, 2015 - Tables and Charts. In: People CaP, editor. Edinburgh: National Statistics, Scottish Government; 2017.
7. National Records of Scotland. Household Projections for Scotland (2014-based) -- Detailed Tables, Principal Projection. Edinburgh: National Statistics; 2017.
8. McKee K, Moore T, Crawford J. Understanding the Housing Aspirations of People in Scotland. In: People CaP, editor. Edinburgh: Scottish Government; 2015.
9. Scottish Government. Housing Need and Demand Assessment (HNDA): A Manager's Guide. Edinburgh: Scottish Government; 2014.
10. Government S. Scottish Planning Policy. Edinburgh: Scottish Government; 2014.
11. Skerratt S, Atterton J, McCracken D, McMorran R, Thomson S. Rural Scotland in Focus 2016. Edinburgh: Scotland's Rural College; 2016.
12. Stone J. Nicola Sturgeon pledges 50,000 affordable homes for Scotland. The Independent. 2015 15 October.
13. Scottish Government. Affordable Housing Supply Programme Edinburgh: Scottish Government 2017 [Available from: <https://beta.gov.scot/policies/more-homes/affordable-housing-supply/>]
14. Scottish Government. More Homes Scotland Edinburgh: Scottish Government; 2017 [Available from: <http://www.gov.scot/Topics/Built-Environment/Housing/reform/more-homes-scotland>]

15. Scottish Government. Guidance on the Preparation of Strategic Housing Investment Programmes. In: Division MH, editor. Edinburgh: Scottish Government; 2016.
16. Scottish Government. Increased Funding for Affordable Housing 2017 [Available from: <https://news.gov.scot/news/increased-funding-for-affordable-housing>]
17. Berry K. Housing Supply Budget. In: Centre SPI, editor. Edinburgh: SPICE; 2016.
18. Scottish Government. Homelessness in Scotland: Bi-annual update: 1 April to 30 September 2016. In: People CaP, editor. Edinburgh: National Statistics, Scottish Government; 2017.
19. Fitzpatrick S, Bramley G, Johnsen S. Pathways into Multiple Exclusion Homelessness in Seven UK Cities. *Urban Studies*. 2013;50(1):148-68.
20. Scottish Government. Scotland's People: Results from the 2015 Scottish Household Survey. In: Services CA, editor. Edinburgh: Scottish Government; 2016.
21. McKee K, Hoolachan J. Housing Generation Rent: what are the challenges for housing policy in Scotland? St Andrews: Centre for Housing Research, University of St Andrews; 2015.
22. Hoolachan J, McKee K, Moore T, Soaita AM. 'Generation rent' and the ability to 'settle down': economic and geographical variation in young people's housing transitions. *Journal of Youth Studies*. 2017;20(1):63-78.
23. Lupton R, Tunstall R, Sigle-Rushton W, Obolenskaya P, Sabates R, Meschi E, et al. Growing up in social housing in Britain: A profile of four generations from 1946 to the present day. 2009.
24. National Records of Scotland. Mid-2015 Population Estimates Scotland: population estimates by sex, age and administrative area. In: Scotland NRo, editor. Edinburgh: Scottish Government; 2016.
25. National Records of Scotland. Population Projections for Scottish areas (2014-based): Principal and variant population projections by age and sex for council, NHS Health Board, Strategic Development Plan and National Park areas. In: Scotland NRo, editor. Edinburgh: Scottish Government; 2016.
26. Scottish Government. Disability Evidence Finder page 2017 [Available from: <http://www.gov.scot/Topics/People/Equality/Equalities/DataGrid/Disability>]
27. Sandford N. SESplan Housing Need and Demand Assessment 2. Livingston: SESplan; 2015.

28. Johnston C. Affordable Housing for Key Workers. Edinburgh: COSLA; 2015.
29. Skerratt S, Atterton J, Brodie E, Carson DJ, Heggie R, McCracken D, et al. Rural Scotland in Focus 2014. Edinburgh: Rural Policy Centre, SRUC, Scotland's Rural College; 2014.
30. Skerratt S, Atterton J, Hall C, McCracken D, Renwick A, Revoredo-Giha C, et al. Rural Scotland in Focus 2012. Edinburgh: Scotland's Rural College; 2012.
31. Hetherington K, Hamlet N. Restoring the Public Health response to Homelessness in Scotland. Glasgow: Scottish Public Health Network; 2015.
32. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. *The Lancet*. 2014;384(9953):1529-40.
33. Wright J. Health needs of the homeless. *InnovAiT*. 2012.
34. Rabiner MMD, Weiner AMPH. Health Care for Homeless and Unstably Housed: Overcoming Barriers. *Mount Sinai Journal of Medicine: A Journal of Personalized & Translational Medicine* September/October. 2012;79(5):586-92.
35. Morrison DS. Homelessness as an independent risk factor for mortality: results from a retrospective cohort study. *International Journal of Epidemiology*. 2009;38(3):877-83.
36. Fazel S, Khosla V, Doll H, Geddes J. The Prevalence of Mental Disorders among the Homeless in Western Countries: Systematic Review and Meta-Regression Analysis. *PLoS Med*. 2008;5(12):e225.
37. Vostanis P. Mental health of homeless children and their families. *Advances in Psychiatric Treatment*. 2002;8(6):463-9.
38. Parsell C, Marston G. Beyond the 'At Risk' Individual: Housing and the Eradication of Poverty to Prevent Homelessness. *Australian Journal of Public Administration*. 2012;71(1):33-44.
39. Quilgars D, Pleace N. Housing First and Social Integration: A Realistic Aim? *Social Inclusion*. 2016;4(4).
40. Hwang SW, Burns T. Health interventions for people who are homeless. *The Lancet*. 2014;384(9953):1541-7.
41. Pawson H, Davidson E. Radically Divergent? Homelessness Policy and Practice in Post-devolution Scotland. *International Journal of Housing Policy*. 2008;8(1):39-60.

42. Balda MM. Complex needs or simplistic approaches? Homelessness services and people with complex needs in Edinburgh. *Social Inclusion*. 2016;4(4).
43. Thomson H, Thomas S. Developing empirically supported theories of change for housing investment and health. *Social Science & Medicine*. 2015;124:205-14.
44. Kearns A, Whitley E, Mason P, Petticrew M, Hoy C. Material and meaningful homes: mental health impacts and psychosocial benefits of rehousing to new dwellings. *International Journal of Public Health*. 2011;56(6):597-607.
45. Thomson H, Thomas S, Sellstrom E, Petticrew M. Housing improvements for health and associated socio-economic outcomes. *Cochrane Database Syst Rev*. 2013;2:CD008657.
46. Webb PM, Knight T, Greaves S, Wilson A, Newell DG, Elder J, et al. Relation between infection with *Helicobacter pylori* and living conditions in childhood: evidence for person to person transmission in early life. *BMJ*. 1994;308(6931):750-3.
47. Ford AC, Forman D, Bailey AG, Goodman KJ, Axon ATR, Moayyedi P. Effect of sibling number in the household and birth order on prevalence of *Helicobacter pylori*: a cross-sectional study. *Int J Epidemiol*. 2007;36(6):1327-33.
48. Curl A, Kearns A, Mason P, Egan M, Tannahill C, Ellaway A. Physical and mental health outcomes following housing improvements: evidence from the GoWell study. *Journal of Epidemiology and Community Health*. 2015;69(1):12-9.
49. Howden-Chapman P, Matheson A, Crane J, Viggers H, Cunningham M, Blakely T, et al. Effect of insulating existing houses on health inequality: cluster randomised study in the community. *BMJ*. 2007;334(7591):460-.
50. Howden-Chapman P, Pierse N, Nicholls S, Gillespie-Bennett J, Viggers H, Cunningham M, et al. Effects of improved home heating on asthma in community dwelling children: randomised controlled trial. *BMJ*. 2008;337(sep23_1):a1411-.
51. National Institute for Health and Care Excellence. Excess Winter Deaths and Illness and the Health Risks Associated with Cold Homes. . London: National Institute for Health and Care Excellence (NICE); 2015.
52. National Records of Scotland. Winter Mortality in Scotland 2015/16 Edinburgh: NRS; 2017 [Available from: <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths/winter-mortality/winter-mortality-in-scotland-201516/tables-and-figures>

53. Thomson H, Thomas S, Sellstrom E, Petticrew M. The Health Impacts of Housing Improvement: A Systematic Review of Intervention Studies From 1887 to 2007. *Am J Public Health*. 2009;99(S3):S681-92.
54. Sharpe T, Farren P, Howieson S, Tuohy P, McQuillan J. Occupant Interactions and Effectiveness of Natural Ventilation Strategies in Contemporary New Housing in Scotland, UK. *International Journal of Environmental Research and Public Health*. 2015;12(7):8480.
55. Sharpe RA, Thornton CR, Nikolaou V, Osborne NJ. Higher energy efficient homes are associated with increased risk of doctor diagnosed asthma in a UK subpopulation. *Environment international*. 2015;75:234-44.
56. Takaro TK, Krieger J, Song L, Sharify D, Beaudet N. The Breathe-Easy Home: The Impact of Asthma-Friendly Home Construction on Clinical Outcomes and Trigger Exposure. *American Journal of Public Health*. 2011;101(1):55-62.
57. Wright GR, Howieson S, McSharry C, McMahon AD, Chaudhuri R, Thompson J, et al. Effect of improved home ventilation on asthma control and house dust mite allergen levels. *Allergy*. 2009;64(11):1671.
58. Curl A, Kearns A. Housing improvements, fuel payment difficulties and mental health in deprived communities. *International Journal of Housing Policy*. 2016:1-27.
59. Kendrick D, Barlow J, Hampshire A, Polnay L, Stewart-Brown S. Parenting interventions for the prevention of unintentional injuries in childhood. [Systematic Review]. *Cochrane Database of Systematic Reviews* 2009(4).
60. Kendrick D, Coupland C, Mulvaney C, Simpson J, Smith S, Sutton A, et al. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2009(1).
61. Edwards P, Green J, Lachowycz K, Grundy C, Roberts I. Serious injuries in children: variation by area deprivation and settlement type. *Arch Dis Child*. 2008;93(6):485-9.
62. Scottish Government. Reshaping Care for Older People -- Getting On. In: Wellbeing Ha, editor. Edinburgh: Scottish Government, COSLA; 2013.
63. Scottish Government. Reshaping Care for Older People: A Programme for Change, 2011-2021. In: Wellbeing Ha, editor. Edinburgh: Scottish Government, COSLA; 2011.
64. Scottish Government. Age, Home and Community: a strategy for housing for Scotland's Older People 2012-2021. Edinburgh Scottish Government; 2011.

65. Pickles J. Housing for Varying Needs: A Design Guide. Edinburgh: The Stationery Office; 1998.
66. National Institute for Health and Care Excellence. Falls in older people: assessing risk and prevention Manchester: National Institute for Health and Care Excellence; 2013.
67. Gillespie LD, Robertson MC, Gillespie WJ, Lamb SE, Gates S, Cumming RG, et al. Interventions for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews. 2009(2):CD007146.
68. Keall MD, Piers N, Howden-Chapman P, Guria J, Cunningham CW, Baker MG. Cost-benefit analysis of fall injuries prevented by a programme of home modifications: a cluster randomised controlled trial. Injury Prevention. 2017.
69. Boyle F, Thomson C. Establishing an evidence base for adapting social housing for an ageing population. Journal of Financial Management of Property and Construction. 2016;21(2):137-59.
70. Architecture and Design Scotland, Scottish Government, NHS Health Scotland. The Place Standard Edinburgh 2016 [Available from: <https://placestandard.scot/#/home>]
71. Gordon M, Paul N, Karen M. Who benefits from environmental policy? An environmental justice analysis of air quality change in Britain, 2001–2011. Environmental Research Letters. 2015;10(10):105009.
72. Richardson EA, Pearce J, Mitchell R, Shortt NK. A Regional Measure of Neighborhood Multiple Environmental Deprivation: Relationships with Health and Health Inequalities. The Professional Geographer. 2012;65(1):153-70.
73. Bamba C, Cairns JM, Kasim A, Smith J, Robertson S, Copeland A, et al. This divided land: An examination of regional inequalities in exposure to brownfield land and the association with morbidity and mortality in England. Health & Place. 2015;34:257-69.
74. Bamba C, Robertson S, Kasim A, Smith J, Cairns-Nagi JM, Copeland A, et al. Healthy Land? An Examination of the Area-Level Association between Brownfield Land and Morbidity and Mortality in England. Environment and Planning A. 2014;46(2):433-54.
75. Lee D, Ferguson C, Mitchell R. Air pollution and health in Scotland: a multicity study. Biostat. 2009;10(3):409-23.
76. Richardson EA, Shortt NK, Mitchell RJ. The mechanism behind environmental inequality in Scotland: which came first, the deprivation or the landfill? Environment and Planning A. 2010;42(1):223.

77. Pearce J, Richardson E, Mitchell R, Shortt N. Environmental justice and health: the implications of the socio-spatial distribution of multiple environmental deprivation for health inequalities in the United Kingdom. . *Transactions of the Institute of British Geographers* 2010 34(4).
78. Tunstall H, Pearce JR, Shortt NK, Mitchell RJ. Residential mobility and the association between physical environment disadvantage and general and mental health. *Journal of Public Health*. 2015;37(4).
79. Tunstall H, Mitchell R, Pearce J, Shortt N. The general and mental health of movers to more- and less-disadvantaged socio-economic and physical environments within the UK. *Social Science & Medicine*. 2014;118(0):97-107.
80. Macintyre S, Ellaway A, Hiscock R, Kearns A, Der G, McKay L. What features of the home and the area might help to explain observed relationships between housing tenure and health? Evidence from the west of Scotland. *Health & Place*. 2003;9(3):207-18.
81. Lawder R, Walsh D, Kearns A, Livingston M. Healthy Mixing? Investigating the Associations between Neighbourhood Housing Tenure Mix and Health Outcomes for Urban Residents. *Urban Studies*. 2014;51(2):264-83.
82. Hiscock R, Macintyre S, Kearns A, Ellaway A. Residents and residence: factors predicting the health disadvantage of social renters compared to owner-occupiers. *Journal of Social Issues*. 2003;59(3).
83. Ellaway A, Macdonald L, Kearns A. Are housing tenure and car access still associated with health? A repeat cross-sectional study of UK adults over a 13-year period. *BMJ Open*. 2016;6(11).
84. Popham F, Williamson L, Whitley E. Is changing status through housing tenure associated with changes in mental health? Results from the British Household Panel Survey. *Journal of Epidemiology and Community Health*. 2015;69(1):6-11.
85. Galster GC, Friedrichs J. The Dialectic of Neighborhood Social Mix: Editors' Introduction to the Special Issue. *Housing Studies*. 2015;30(2):175-91.
86. Graham E, Manley D, Hiscock R, Boyle P, Doherty J. Mixing Housing Tenures: Is it Good for Social Well-being? *Urban Stud*. 2009;46(1):139-65.
87. Kearns A, Mason P. Mixed tenure communities and neighbourhood quality. *Housing Studies* 2007;22(Sep).
88. Sautkina E, Bond L, Kearns A. Mixed Evidence on Mixed Tenure Effects: Findings from a Systematic Review of UK Studies, 1995–2009. *Housing Studies*. 2012;27(6):748-82.

89. Bond L, Sautkina E, Kearns A. Mixed Messages about Mixed Tenure: Do Reviews Tell the Real Story? *Housing Studies*. 2011;26(1):69 - 94.
90. Arbaci S, Rae I. Mixed-Tenure Neighbourhoods in London: Policy Myth or Effective Device to Alleviate Deprivation? *International Journal of Urban and Regional Research*. 2013;37(2):451-79.
91. Green G, Grimsley M, Stafford B. The dynamics of neighbourhood sustainability. Report. 2005.
92. Douglas M, Thomson H, M G. Health Impact of Housing Proposals: A guide. . Glasgow: Public Health Institute of Scotland; 2003.
93. Forrest R, Kearns A. Social Cohesion, Social Capital and the Neighbourhood. *Urban Studies*. 2001;38(12):2125-43.
94. Bailey N, Besemer K, Bramley G, Livingston M. How Neighbourhood Social Mix Shapes Access to Resources from Social Networks and from Services. *Housing Studies*. 2015;30(2):295-314.
95. Bailey N, Livingston M. Population turnover and area deprivation. Report. Joseph Rowntree, Foundation; 2007.
96. Frumkin H. Urban vision and public health: designing and Building Wholesome Places. . GCPH Seminar Series 2 (Summary paper 5; Glasgow2006.
97. Egger G, Swinburn B. An "ecological" approach to the obesity pandemic. *BMJ*. 1997;315(7106):477-80.
98. The Scottish Executive. Promoting Active Lifestyles: good ideas for transport and health practitioners. Scottish Executive; 2006.
99. Ogilvie D, Hamlet N. Obesity: the elephant in the corner. *BMJ*. 2005;331(7531):1545-8.
100. Douglas MJ, Watkins SJ, Gorman DR, Higgins M. Are cars the new tobacco? *Journal of Public Health*. 2011;33(2):160-9.
101. Sturm R, Cohen DA. Suburban sprawl and physical and mental health. *Public Health*. 2004;118(7):488-96.
102. Sallis J, Spoon C, Cavill N, Engelberg J, Gebel K, Parker M, et al. Co-benefits of designing communities for active living: an exploration of literature. *International Journal of Behavioral Nutrition and Physical Activity*. 2015;12(1):30.
103. Panter J, Ogilvie D. Theorising and testing environmental pathways to behaviour change: natural experimental study of the perception and use of new

- infrastructure to promote walking and cycling in local communities. *BMJ Open*. 2015;5(9).
104. McCormack G, Shiell A. In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. *International Journal of Behavioral Nutrition and Physical Activity*. 2011;8(1):125.
 105. Audrey S, Batista-Ferrer H. Healthy urban environments for children and young people: A systematic review of intervention studies. *Health & Place*. 2015;36:97-117.
 106. Saunders LE, Green JM, Petticrew MP, Steinbach R, Roberts H. What are the health benefits of active travel? A systematic review of trials and cohort studies. *PLoS ONE*. 2013;8(8):e69912.
 107. Grasser G, Van Dyck D, Titze S, Stronegger W. Objectively measured walkability and active transport and weight-related outcomes in adults: a systematic review. *International Journal of Public Health*. 2013;58(4):615-25.
 108. Diez Roux AV. Neighborhoods and Health: What Do We Know? What Should We Do? *American Journal of Public Health*. 2016;106(3):430-1.
 109. Humphel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity: a review *American Journal of Preventive Medicine*. 2002;22(3):188-99.
 110. Frank LD, Schmid TL, Sallis JF, Chapman J, Saelens BE. Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ. *American Journal of Preventive Medicine*. 2005;28(2, Supplement 2):117-25.
 111. McCormack G, Giles-Corti B, Lange A, Smith T, Martin K, Pikora TJ. An update of recent evidence of the relationship between objective and self-report measures of the physical environment and physical activity behaviours. *Journal of Science and Medicine in Sport*. 2004;7(1, Supplement 1):81-92.
 112. National Institute for Health and Care Excellence. PH8: Promoting or creating built or natural environments that encourage and support physical activity. . 2008.
 113. Ogilvie D, Mitchell R, Mutrie N, Petticrew M, Platt S. Personal and environmental correlates of active travel and physical activity in a deprived urban population. *Int*. 2008;5:43.
 114. Chaufan C, Yeh J, Ross L, Fox P. You can't walk or bike yourself out of the health effects of poverty: active school transport, child obesity, and blind spots in the public health literature. *Critical Public Health*. 2015;25(1):32-47.

115. Rind E, Shortt N, Mitchell R, Richardson EA, Pearce J. Are income-related differences in active travel associated with physical environmental characteristics? A multi-level ecological approach. *The international journal of behavioral nutrition and physical activity*. 2015;12:73.
116. Bramley G, Dempsey N, Power S, Brown C, Watkins D. Social sustainability and urban form: evidence from five British cities. *Environment and Planning A*. 2009;41:2125-42.
117. Macintyre S, Macdonald L, Ellaway A. Do poorer people have poorer access to local resources and facilities? The distribution of local resources by area deprivation in Glasgow, Scotland. *Social Science & Medicine*. 2008;Vol.67(6):pp.
118. Office of the Deputy Prime Minister. *Better Places to Live: a companion guide to PP3*. In: Minister OotDP, editor.: The Stationery Office, London; 2004
119. Douglas M, Thomson H, Jepson R, Hurley F, Higgins M, Muirie J, et al. *Health Impact Assessment of Transport Initiatives: A Guide*. M D, editor. Edinburgh: NHS Health Scotland; 2007.
120. Croucher K, Myers L, Bretherton J. *The links between greenspace and health: a critical literature review*. Report. 2007.
121. Hartig T, Mitchell R, Vries Sd, Frumkin H. *Nature and Health*. *Annual Review of Public Health*. 2014;35(1):207-28.
122. Gascon M, Triguero-Mas M, Martínez D, Dadvand P, Rojas-Rueda D, Plasència A, et al. Residential green spaces and mortality: A systematic review. *Environment international*. 2016;86:60-7.
123. van den Berg M, Wendel-Vos W, van Poppel M, Kemper H, van Mechelen W, Maas J. Health benefits of green spaces in the living environment: A systematic review of epidemiological studies. *Urban Forestry & Urban Greening*. 2015;14(4):806-16.
124. Mytton OT, Townsend N, Rutter H, Foster C. Green space and physical activity: An observational study using Health Survey for England data. *Health & Place*. 2012;18(5):1034-41.
125. Astell-Burt T, Mitchell R, Hartig T. The association between green space and mental health varies across the lifecourse. A longitudinal study. *Journal of Epidemiology and Community Health*. 2014.
126. Ward Thompson C, Roe J, Aspinall P, Mitchell R, Clow A, Miller D. More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning*. 2012;105(3):221-9.

127. Lee ACK, Maheswaran R. The health benefits of urban green spaces: a review of the evidence. *Journal of Public Health*. 2011;33(3):212-22.
128. The Scottish Government. *Early Years Framework*. . 2009.
129. Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global Health Impacts of Floods: Epidemiologic Evidence. *Epidemiol Rev*. 2005;27(1):36-46.
130. Walker G, Burningham K. Flood risk, vulnerability and environmental justice: Evidence and evaluation of inequality in a UK context. *Critical Social Policy*. 2011;31(2):216-40.
131. Carroll B, Morbey H, Balogh R, Araoz G. Flooded homes, broken bonds, the meaning of home, psychological processes and their impact on psychological health in a disaster. *Health & Place*. 2009;15(2):540.
132. Convery I, Bailey C. After the flood: the health and social consequences of the 2005 Carlisle flood event. *Journal of Flood Risk Management*. 2008;1(2):100.
133. Tapsell SM, Tunstall SM. "I wish I'd never heard of Banbury": The relationship between 'place' and the health impacts from flooding. *Health & Place*. 2008;14(2):133.
134. Werritty A, Houston D, Ball T, Tavendale A, Black A. Exploring the Social Impacts of Flood Risk and Flooding in Scotland. In: Research S, editor.: *Scottish Executive*; 2007.
135. Berland A, Shiflett SA, Shuster WD, Garmestani AS, Goddard HC, Herrmann DL, et al. The role of trees in urban stormwater management. *Landscape and Urban Planning*. 2017;162:167-77.
136. Kawachi I, Berkman L. Social cohesion, social capital, and health. In: Berkman L, Kawachi I, editors. *Social epidemiology*. New York: Oxford University Press; 2000. p. 174-90.
137. Ellaway A, Kirk A, Macintyre S, Mutrie N. Nowhere to play? The relationship between the location of outdoor play areas and deprivation in Glasgow. *Health & Place*. 2007;13(2):557-61.
138. Warr D, Feldman P, Tacticos T, Kelaher M. Sources of stress in impoverished neighbourhoods: insights into links between neighbourhood environments and health. *Aust N Z J Public Health*. 2009;33(1):25-33.
139. Ellaway A, Macintyre S, Kearns A. Perceptions of Place and Health in Socially Contrasting Neighbourhoods. *Urban Studies*. 2001;38(12):2299-316.
140. Chappell N, Funk L. Lay perceptions of neighbourhood health. *Health Soc Care Community*. 2004;12(3):243-53.

141. Kearns A, Whitley E, Tannahill C, Ellaway A. 'Lonesome Town'? Is Loneliness Associated with the Residential Environment, including Housing and Neighbourhood Factors? *Journal of Community Psychology*. 2015;43(7):849-67.
142. Friedli L. *Mental health, resilience and inequalities*. Geneva: WHO; 2009.
143. Baba C, Kearns A, McIntosh E, Tannahill C, Lewsey J. Is empowerment a route to improving mental health and wellbeing in an urban regeneration (UR) context? *Urban Studies*. 2016;0(0):0042098016632435.
144. Scottish Government. *The Report of the Ministerial Group on Offender Reintegration*. In: Directorate J, editor. Edinburgh: Scottish Government; 2015.
145. Sapouna M, Bisset C, Conlong A-M, Matthews B. *What Works to Reduce Reoffending: A Summary of the Evidence*. In: Services JA, editor. Edinburgh: Scottish Government; 2015.
146. Leventhal T, Newman S. Housing and child development. *Children and Youth Services Review*. 2010;32(9):1165-74.
147. Ferguson KT, Cassells RC, MacAllister JW, Evans GW. The physical environment and child development: An international review. *International Journal of Psychology*. 2013;48(4):437-68.
148. Wiltshire S, Scottish Government. *A Thematic Review of Literature on the Relationship between Housing, Neighbourhoods and Schools*. In: Services CA, editor. Edinburgh: Scottish Government; 2010.
149. Gascon M, Vrijheid M, Nieuwenhuijsen MJ. *The Built Environment and Child Health: An Overview of Current Evidence*. *Current Environmental Health Reports*. 2016;3(3):250-7.
150. Asaria M, Ali S, Doran T, Ferguson B, Fleetcroft R, Goddard M, et al. How a universal health system reduces inequalities: lessons from England. *Journal of Epidemiology and Community Health*. 2016.
151. Tunstall B, Lupton R, Kneale D, Jenkins A. *Growing up in social housing in the new millennium*. Working Paper. London: York; 2011.
152. Nasim B. *Changes in the relationship between social housing tenure and child outcomes over time: Comparing the Millennium and British Cohort Studies*. London: Institute of Education 2015. Contract No.: 06.
153. Robison O, Kearns A, Gray L, Bond L, Henderson M. Mixed tenure communities as a policy instrument for educational outcomes in a deprived urban context? *Urban Research & Practice*. 2016;9(2):131-57.

154. Bramley G, Kofi Karley N. Homeownership, Poverty and Educational Achievement: School Effects as Neighbourhood Effects. *Housing Studies*. 2007;22(5):693-721.
155. Holupka S, Newman SJ. The Effects of Homeownership on Children's Outcomes: Real Effects or Self-Selection? *Real Estate Economics*. 2012;40(3):566-602.
156. Nasim B. The association between social housing type and children's developmental outcomes. London: Institute of Education; 2015. Contract No.: 07.
157. Dupere V, Leventhal T, Crosnoe R, Dion E. Understanding the positive role of neighborhood socioeconomic advantage in achievement: The contribution of the home, child care, and school environments. *Developmental Psychology*. 2010;46(5):1227-44.
158. Leventhal T, Fauth RC, Brooks-Gunn J. Neighborhood poverty and public policy: A 5-year follow-up of children's educational outcomes in the New York City moving to opportunity demonstration. *Developmental Psychology*. 2005;41(6):933-52.
159. Ziol-Guest KM, McKenna CC. Early Childhood Housing Instability and School Readiness. *Child Development*. 2014;85(1):103-13.
160. Weinhardt F. Social housing, neighborhood quality and student performance. *Journal of Urban Economics*. 2014;82:12-31.
161. Gibbons S, Silva O, Weinhardt F. Neighbourhood turnover and teenage attainment. IZA Discussion Paper2014.
162. Beatty C, Fothergill S. The Uneven Impact of Welfare Reform: The financial losses to places and people. Sheffield: Centre for Regional Economic and Social Research; 2016.
163. NHS Health Scotland. Good work for all Edinburgh: NHS Health Scotland; 2016 [Available from:http://www.healthscotland.scot/media/1256/inequality-briefing-2-good-work-for-all_sept2016_english.pdf]
164. Taulbut M, McCartney G. Health outcomes and determinants by occupation and industry in Scotland, 2008–2011. Edinburgh: NHS Health Scotland; 2017.
165. Dong WEI, Vaughan P, Sullivan K, Fletcher T. Mortality Study of Construction Workers in the UK. *Int J Epidemiol*. 1995;24(4):750-7.
166. Stocks SJ, Turner S, McNamee R, Carder M, Hussey L, Agius RM. Occupation and work-related ill-health in UK construction workers. *Occupational Medicine*. 2011.

167. Stocks SJ, McNamee R, Carder M, Agius RM. The incidence of medically reported work-related ill health in the UK construction industry. *Occupational and Environmental Medicine*. 2010;67(8):574-6.
168. van der Molen HF, Lehtola MM, Lappalainen J, Hoonakker PL, Hsiao H, Haslam R, et al. Interventions to prevent injuries in construction workers. *Cochrane Database Syst Rev*. 2012;12:CD006251.
169. Arndt V, Rothenbacher D, Daniel U, Zschenderlein B, Schuberth S, Brenner H. All-cause and cause specific mortality in a cohort of 20 000 construction workers; results from a 10 year follow up. *Occupational and Environmental Medicine*. 2004;61(5):419-25.
170. National Statistics. Trade Union Statistics, 2015. In: Business IaS, editor. London: National Statistics; 2016.

