The Annual Report of the **Director of Public Health**

NHS Highland

2019

Past, Present and Future Trends in Health and Wellbeing

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Preface

This year's annual report focuses on important trends in populations, health and social inequity that have profound implications for the delivery of health and social care services.

Planning for the future of our health and social care services requires a clear understanding of the factors facing our populations' health and wellbeing. The health and healthcare needs of a population cannot be measured or met without knowledge of its characteristics. Demography is concerned with this and with understanding population dynamics - how populations change in response to birth, migration, aging and death[1]. This report recognises that information about population dynamics is of fundamental importance for policy-making and planning, at both local and national level.

Analysis of the population has a long history. There is evidence of census data from over 3000 years ago, by Hammurabi, Moses and others[2]. However, analysis of births and deaths arose in medieval Europe, for example in the Bills of Mortality in Barcelona from 1457[3]. These were designed to provide objective facts during outbreaks of the plague and to reduce rumours and undue fear in the population. The objectivity and independence of such data from political influence has been an enduring principle.

Public health should be based on facts and figures and this year's report is based upon detailed analyses of population health in Highland and Argyll & Bute. More extensive analyses are included in a series of working papers, available in the appendices to this report.

The report provides an overview of the population of NHS Highland and considers key demographic trends for populations and households, as well as analysis of life expectancy, deaths and changes in health and disease. The report then provides continuing evidence of health inequalities and discusses the impact on dependency and care. Throughout the report are examples of current actions to improve health and wellbeing in Highland and Argyll & Bute, including an update on a previous report on Realistic Medicine.

Finally, I want to thank the Public Health Intelligence and Health Improvement teams that have contributed to the development of this report, which is the culmination of a lot of analysis, discussion and collaborative working. I hope you enjoy reading the report.

Professor Hugo van Woerden

Director of Public Health and Health Policy, NHS Highland
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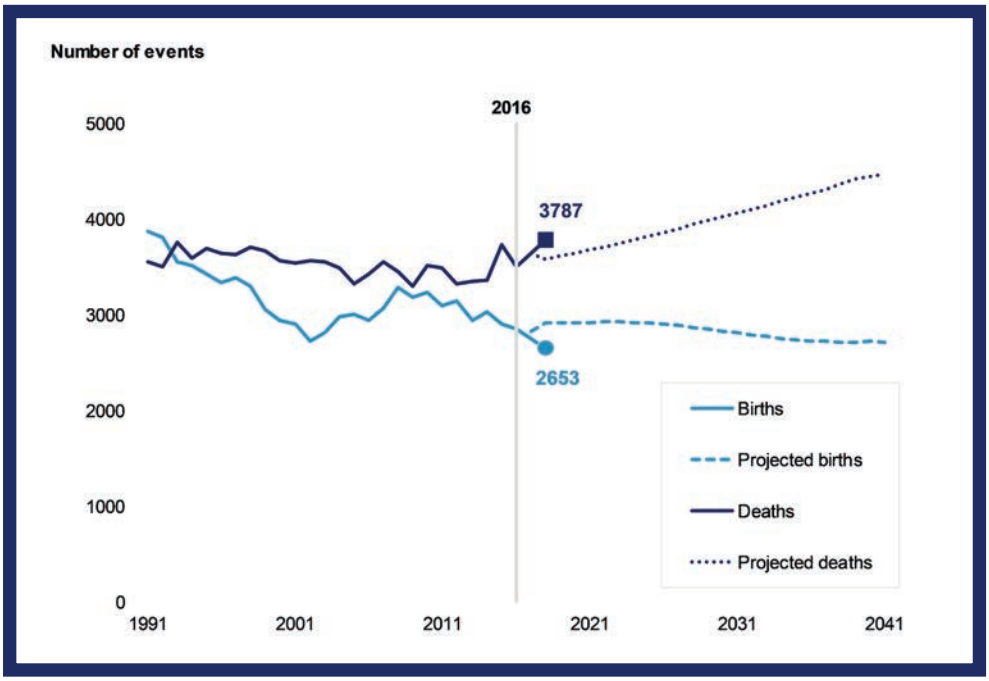
Chapter One - Population

This section of the report discusses the projected population for the NHS Highland area along with the age structure of the population, household changes, and the implications for care requirements.

Population Changes

Since the early 1990's, deaths in the NHS Highland area have exceeded births, and the gap between births and deaths is expected to widen further (Figure 1.1).

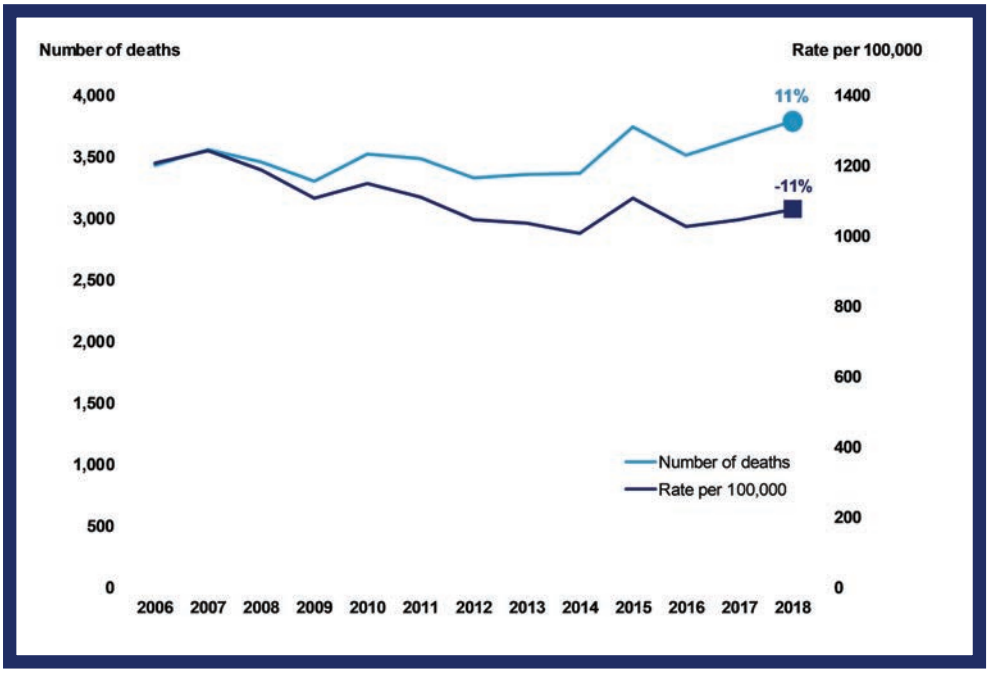
Figure 1.1 - Actual and projected number of births and deaths in NHS Highland, 1991 -2041



Source: National Records of Scotland[1,2]

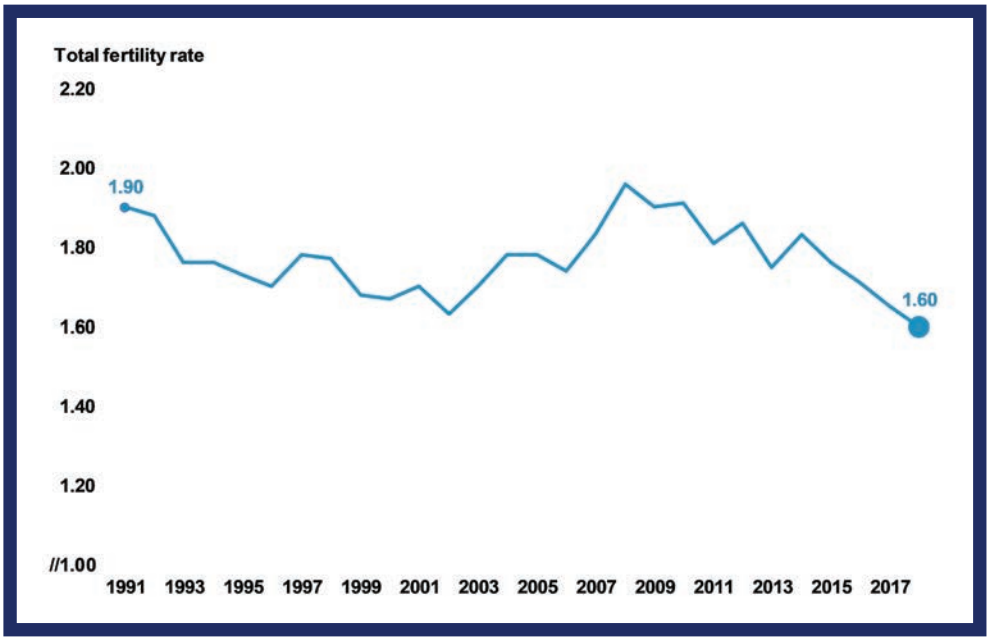
This is caused by an increase in the number of deaths each year as the resident population in Highland ages (Figure 1.2), and families choosing to have fewer children on average (Figure 1.3).

Figure 1.2 - NHS Highland – number of deaths from all causes (all ages) and directly age standardised rates per 100,000 population, 2006-2018



Source: National Records of Scotland[3]

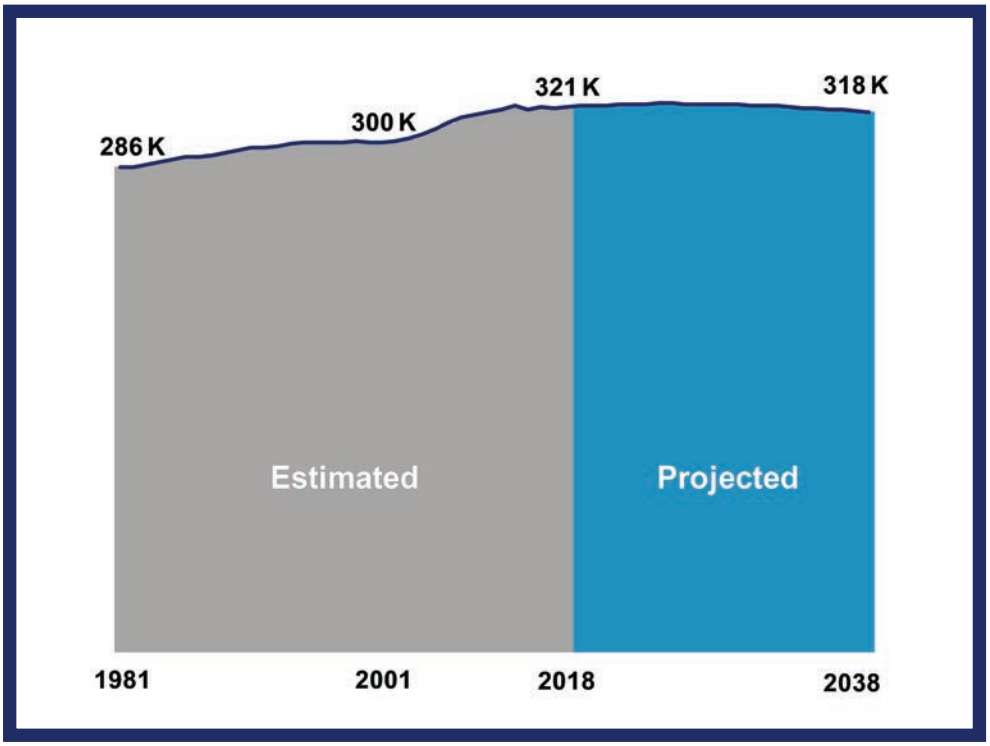
Figure 1.3 - NHS Highland total fertility rate, 1991 – 2018



Source: National Records of Scotland[4]

Despite this, inward migration to Highland has resulted in an overall population increase over the last four decades (Figure 1.4). The widening gap between deaths and births is expected to exceed migration over the next 30 years, so a modest decrease in the total population is likely.

Figure 1.4 - Estimated and projected change in the size of the NHS Highland population

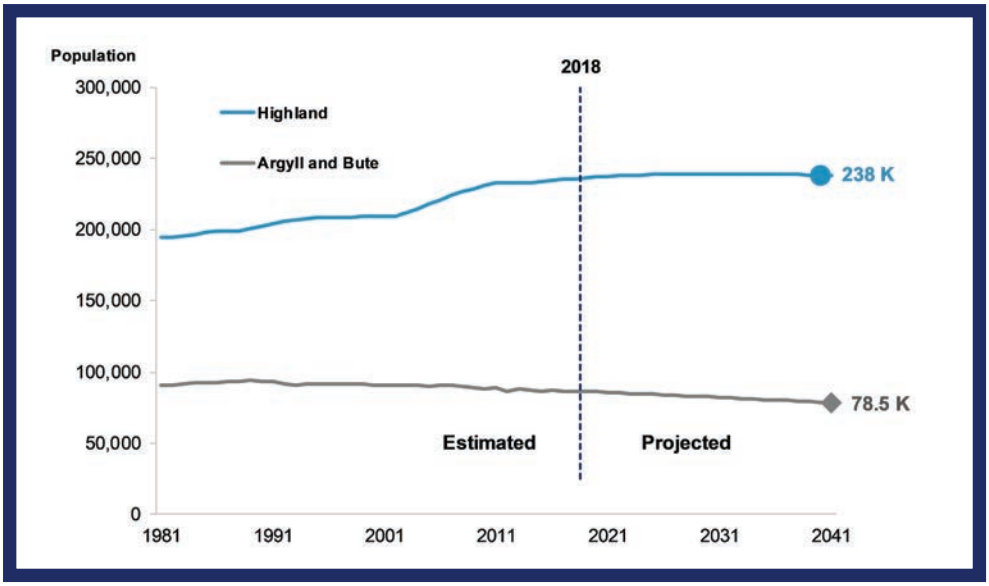


Source: National Records of Scotland[1,2]

Area Differences

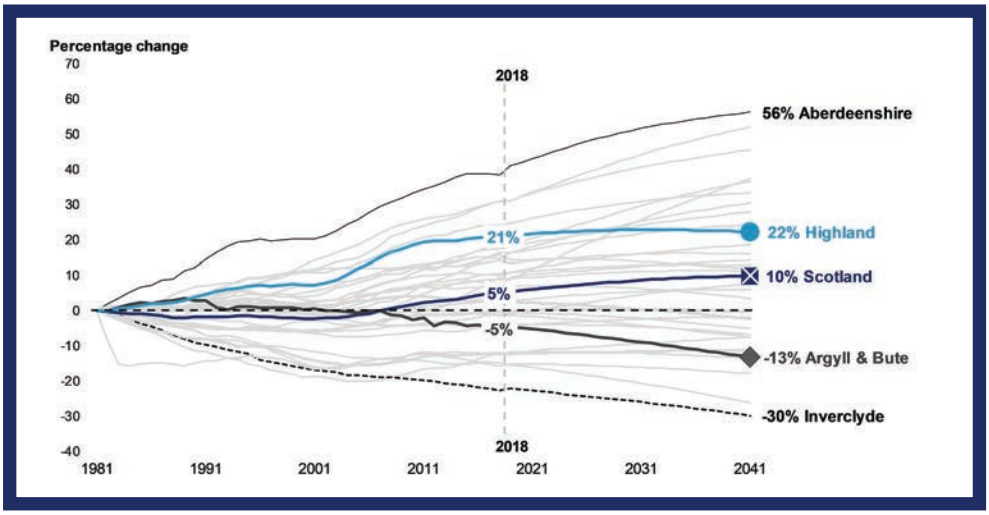
These overall figures conceal major differences by area. The number of people in the Highland Council area has increased, while the population of the Argyll and Bute area has declined (Figure 1.5). National Records of Scotland, who produce Scotland's population projections, expect the population increase in the Highland Council area to level off, and the population numbers in Argyll and Bute to decrease further. The predicted population decrease in Argyll and Bute is one of the largest in Scotland (Figure 1.6).

Figure 1.5 - Estimated and projected change in the size of the populations of Argyll & Bute and Highland



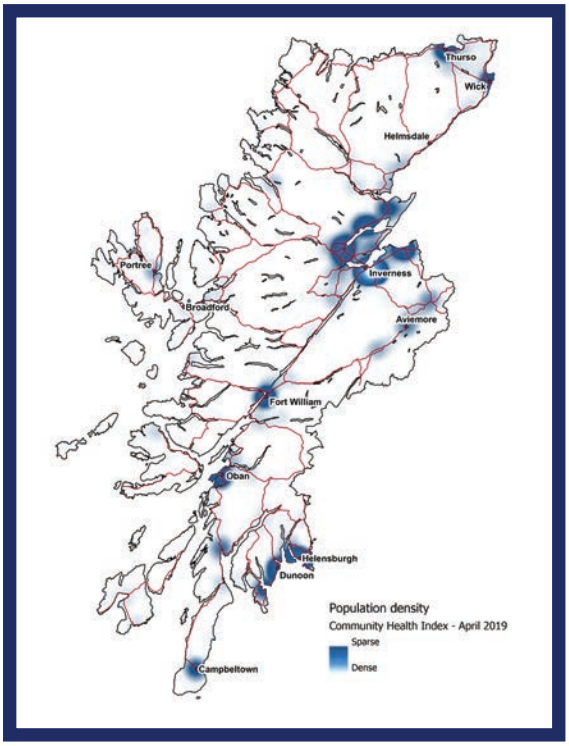
Source: National Records of Scotland[1,2]

Figure 1.6 - Actual, estimated and projected percentage change in the populations of the Council Areas of Scotland, 1981-2041



Source: National Records of Scotland[1,2]

Figure 1.7 - Population distribution in NHS Highland 2019

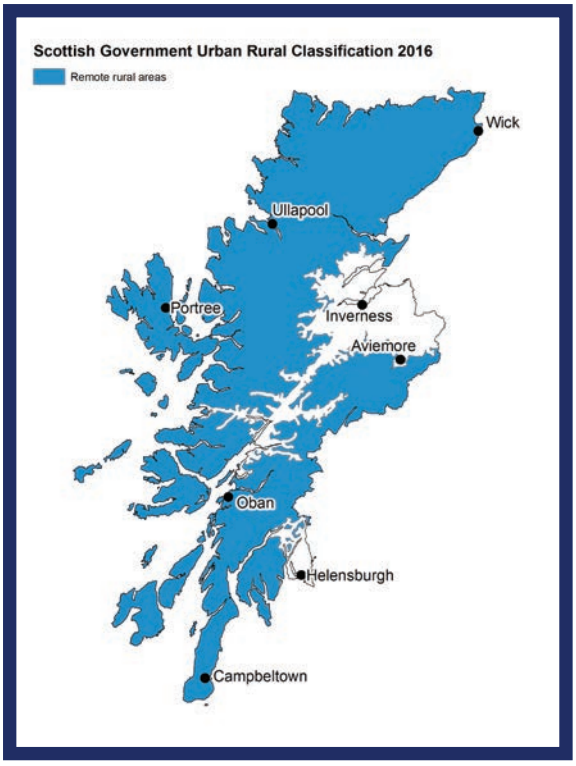


Source: NHS National Services Scotland - Practitioner Services[5]

About 60% of the NHS Highland population live in areas that the Scottish Government class as 'Remote', defining these as settlements that are more than 30 minutes drive time from a town of 10,000 people or more (Figure 1.7 and Figure 1.8). Many of these areas are also described as 'Fragile' by Highlands and Islands Enterprise (Figure 1.9).

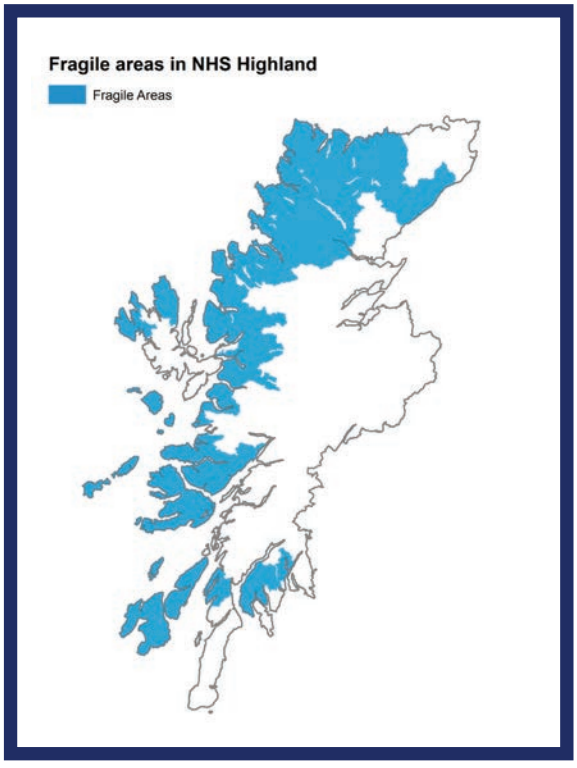
Actual and projected population changes by smaller area are very varied (Figure 1.10). The Scottish Government estimates that very remote rural areas in Highland, and very remote small towns†, have lost nearly 3000 residents in 2011 - 17, while rural areas and small towns close to population centres in Highland have gained over 2,700 residents (see appendix 'Working Paper 1: Population' for more details).

Figure 1.8 - Remote rural areas in NHS Highland



Source: Scottish Government[6]

Figure 1.9 - Highland and Islands Enterprise Fragile Areas

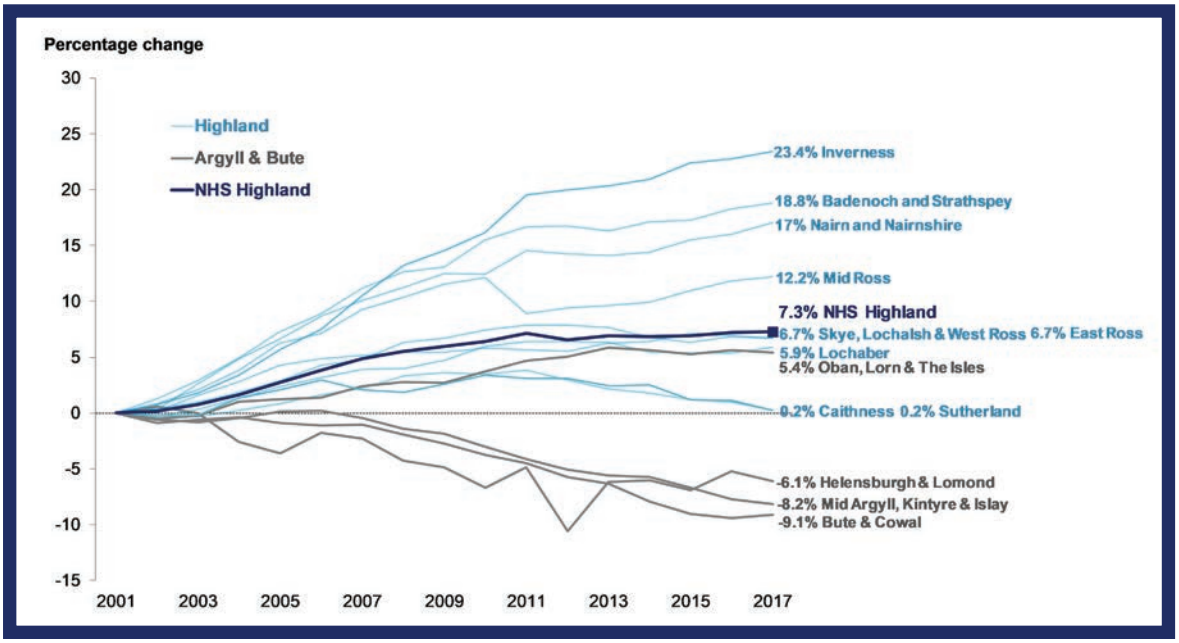


Source: Highlands and Islands Enterprise[7]

*Fragile areas are characterised by declining population, under-representation of young people within the population, lack of economic opportunities, below average income levels, problems with transport, and other issues reflecting their geographic location[7].

†Very remote areas are defined by the Scottish Government's Urban Rural classification as being over 60 minutes drive time from a settlement of 10,000 people or more.

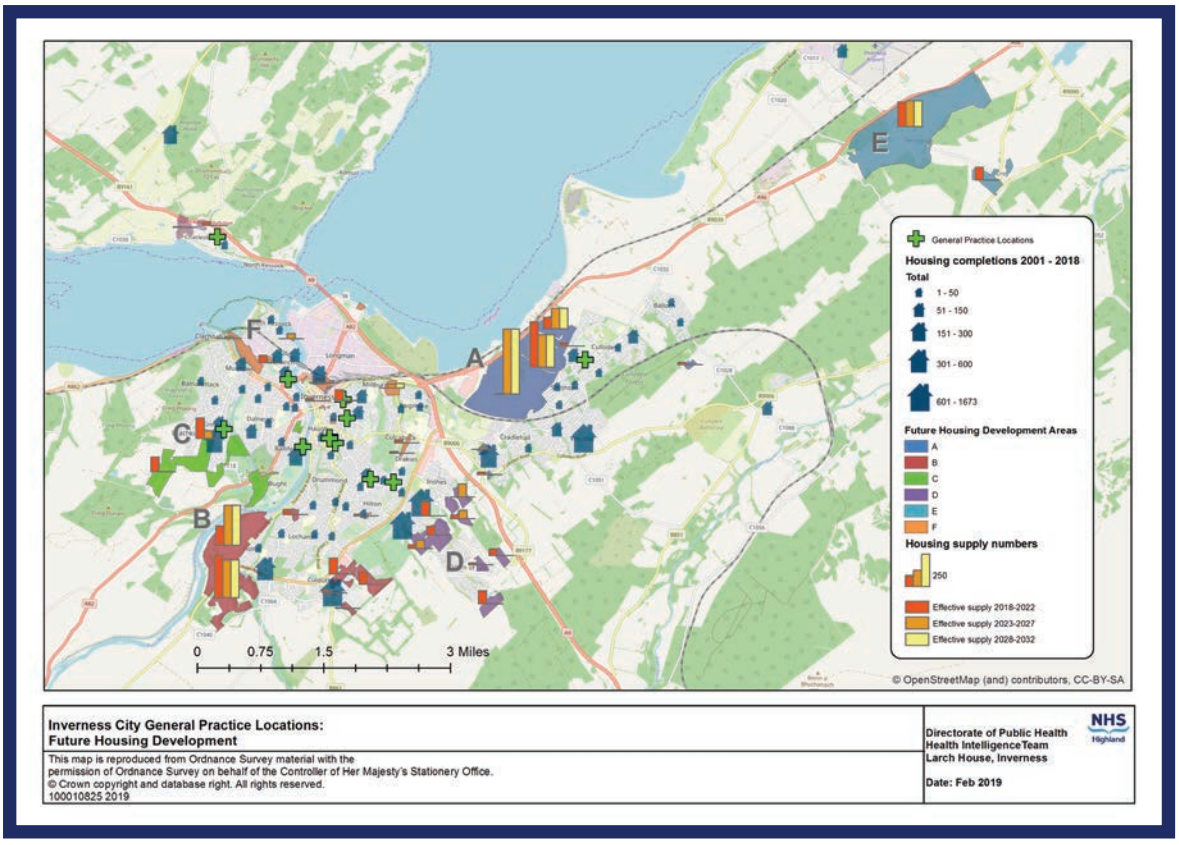
Figure 1.10 - Actual and estimated percentage change in the populations of areas within NHS Highland, 2001 - 2017



Source: National Records of Scotland[8]

As Figure 1.10 shows, Inverness has experienced a particularly large population increase. This is likely to continue, with an increase of a further 13,000 residents anticipated by 2032[9]. New house building is expected to be largely in two areas of the city (Figure 1.11). This will place major demands on primary care services, with General Practices not located in the same areas of the city as the expected expansions.

Figure 1.11 - Inverness City General Practice Locations showing completed and future housing development areas

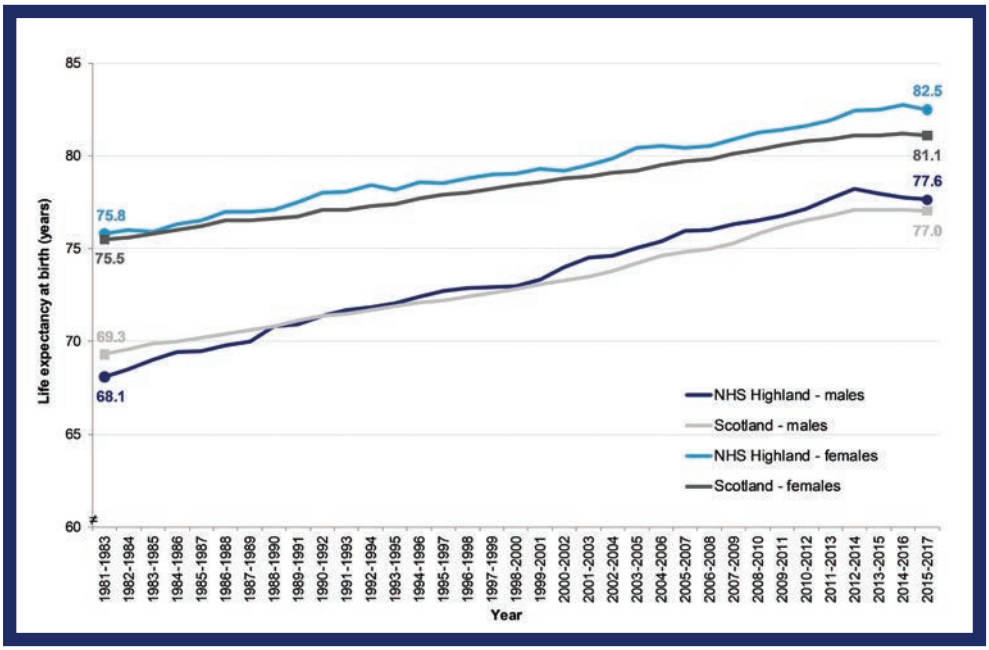


Source: NHS Highland Directorate of Public Health[9] and Highland Council[10]

Changes to Population Age Structure, and to Household Composition

Life expectancy increased dramatically in Scotland in the 20th and early 21st centuries. This increase has stalled and even begun to reverse since 2011. This end to the previously inexorable improvement in life expectancy, which may be due to economic 'austerity' and its impact on vulnerable people[11], has also begun to be visible in Highland (Figure 1.12). This is discussed further in the section on social inequity.

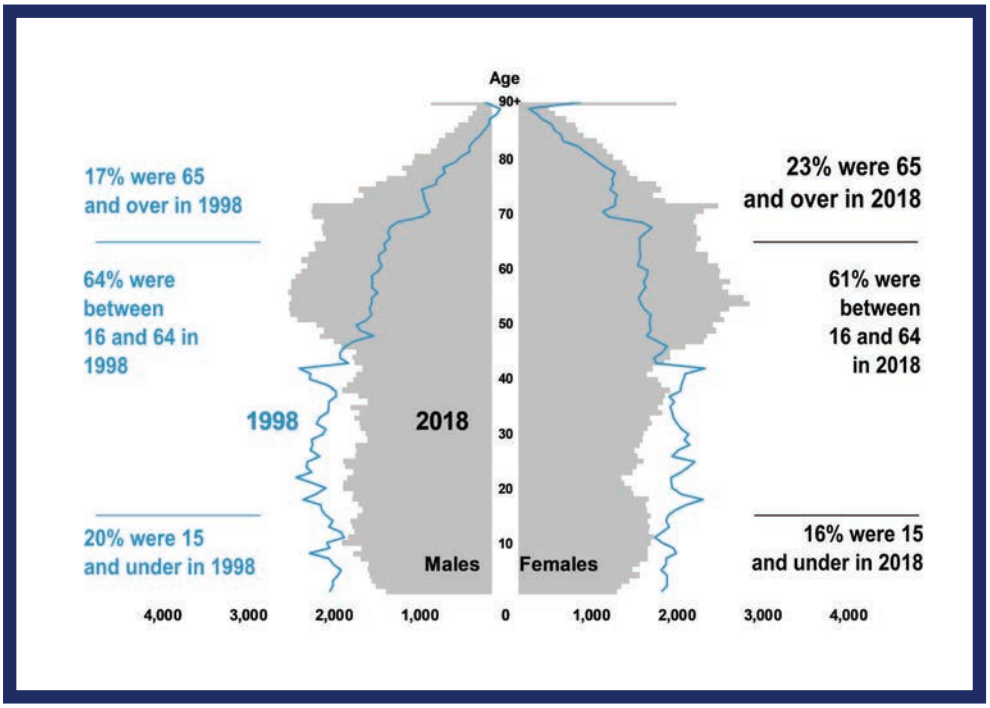
Figure 1.12 - Life expectancy at birth, NHS Highland and Scotland, 1981-83 to 2015-17



Source: National Records of Scotland[12]

Despite this recent setback, the combination of the lower birth rates seen in Figure 1.3 and the increased Life Expectancy demonstrated in Figure 1.12, have resulted in substantial changes to the age structure of the population. In only twenty years, the population of the NHS Highland area has changed dramatically (Figure 1.13). Inward and outwards migration has contributed to the changes as well as changes to birth rates and life expectancy. In 1998, 17% of people were 65 years old or over: this figure is now 23%.

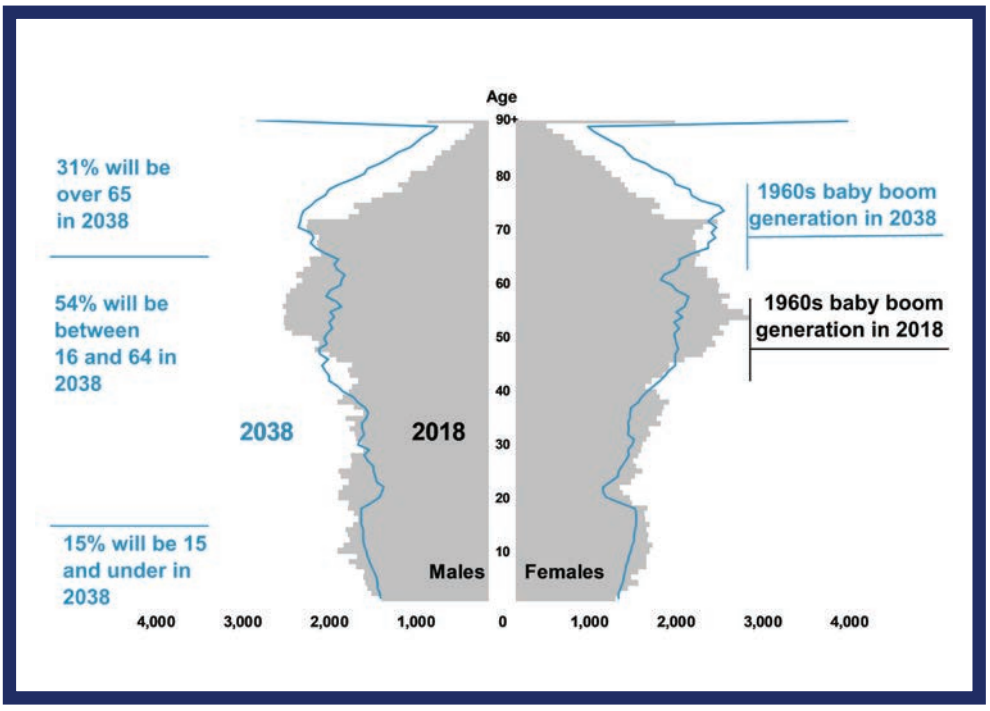
Figure 1.13 - NHS Highland population in 1998 and 2018



Source: National Records of Scotland[1,2]

The National Records of Scotland estimate that, in another 20 years, 31% of people in Highland will be aged 65 years or over, a very important change from the 17% of people only 40 years earlier (Figure 1.14).

Figure 1.14 - NHS Highland population in 2018 and 2038

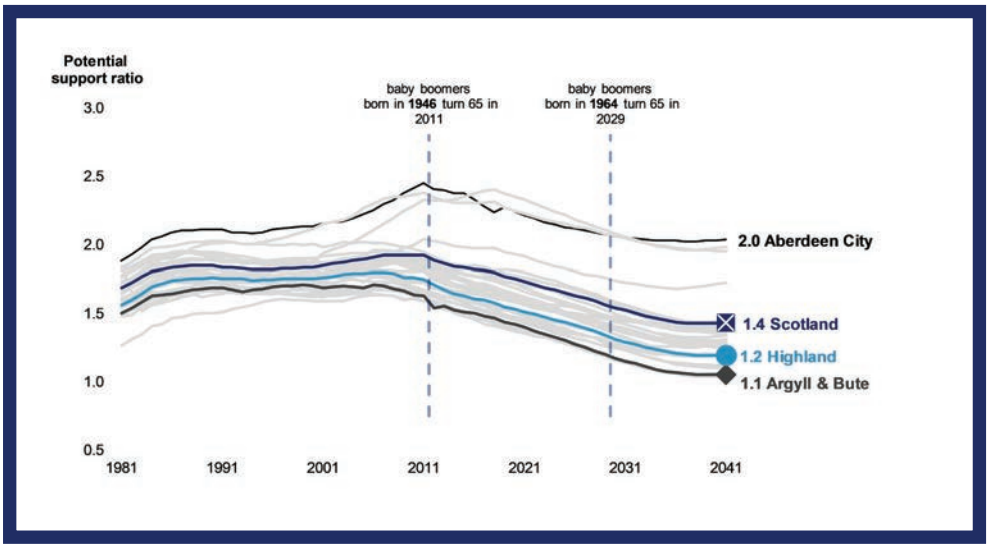


Source: National Records of Scotland[1,2]

While many older people are not dependent on others, it is common to compare the number of people aged 16 – 65 years – previously thought of as working age – to the number of people aged 65 years and over, to identify the pool of people potentially available to offer support if required. Although this is outdated, and many people aged 65 years and over now work, or care for others, this metric – known as the Potential Population Support Ratio – does allow comparison of the proportion of older people over time, and is helpful in visualising changes. Figure 1.15 shows this

ratio for Scottish Council areas over time, and projects it forward using population estimates. The Highland and Argyll and Bute Council areas will, if the projections prove accurate, have particularly low Potential Population Support Ratios.

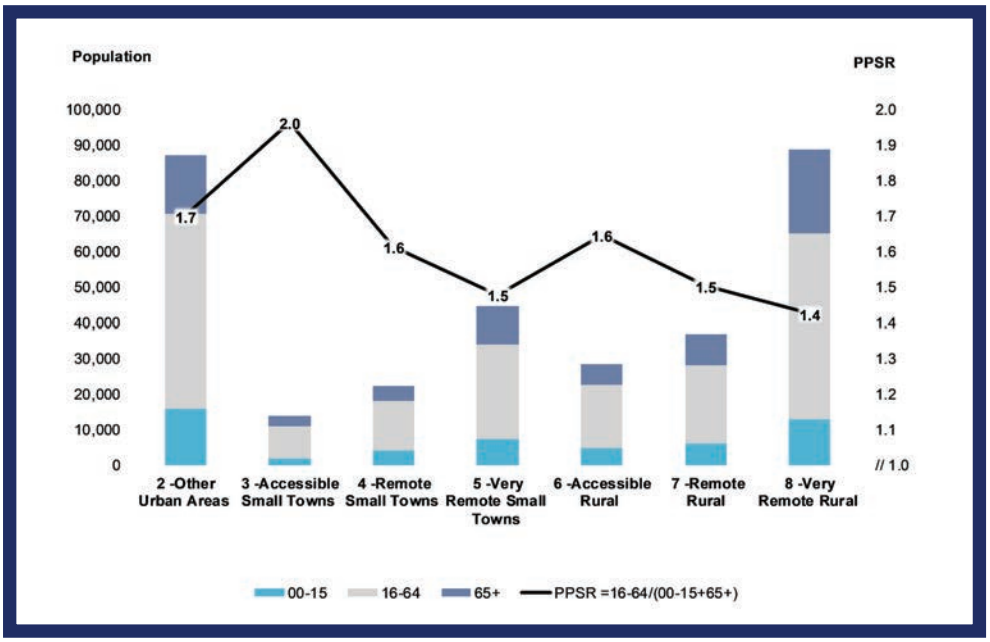
Figure 1.15 - Actual, estimated and projected potential population support ratios of Scottish Councils, 1981 to 2041



Source: National Records of Scotland[1,2]

The population trends in rural areas have already combined to produce lower Population Support Ratios in more rural areas of Highland (Figure 1.16). If this trend continues, as anticipated in Figure 1.15, then identifying potential care staff in rural areas of Highland may be a particularly difficult task.

Figure 1.16 - Population of NHS Highland by Scottish Government Urban Rural Classification in 2017 by broad age group highlighting potential population support ratios



Source: Scottish Government[6] and National Records of Scotland[13]

The ratio of 2.0 in 'Accessible Small Towns' indicates a larger number of people of working age, compared to children and older people. Recruiting staff in such contexts should generally be easier. In contrast, the ratio of 1.4 in 'Very Remote Rural' areas indicates fewer individuals of working age in these areas, potentially leading to greater staff recruitment problems.

Socially responsible recruitment

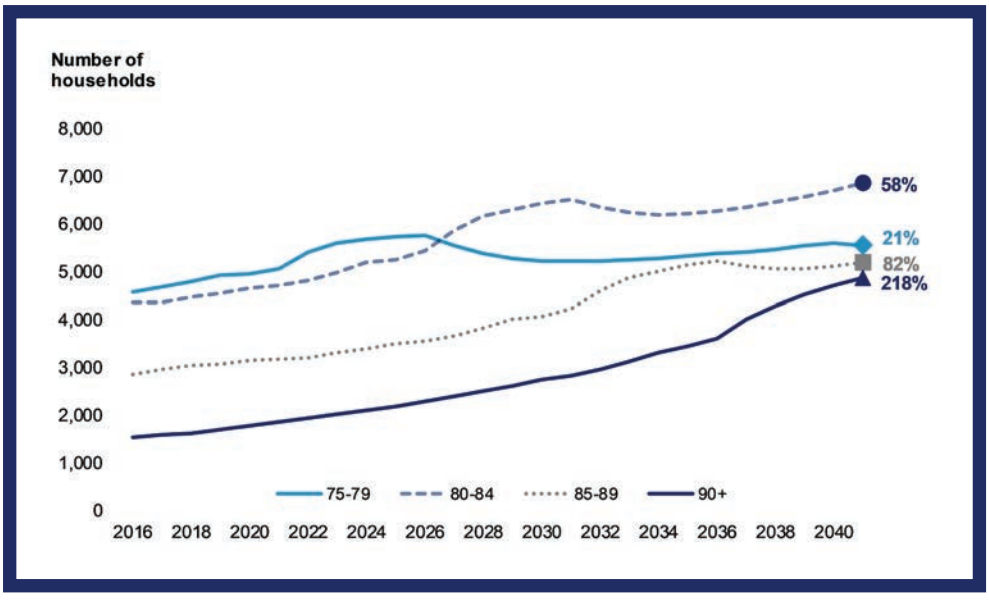
Having a workforce that is sustainable and resilient for the future is important for improving the outcomes of all people needing care. NHS Highland recognises that this can only happen with a committed, supported workforce that has the right skills, flexibility and support. Everyone Matters 2020 Workforce Vision is the Scottish Governments workforce policy for those involved in the delivery of healthcare in Scotland[14]. The policy promotes having shared values across NHS Scotland; care and compassion, dignity and respect, openness, honesty and responsibility and quality and teamwork.

While Highland has lower than national unemployment levels, there are issues relating to under-employment, low pay, seasonal employment and in some areas low skills in employment. This can present unique challenges for employers in terms of recruitment and retention, especially where there are unemployed individuals who are under skilled for the roles on offer.

In order to tackle some of these issues, NHS Highland is exploring how a model of socially responsible recruitment could be initiated. Socially responsible recruitment is about identifying the employment gaps within the organisation and working with local employment services to support individuals increase their skills for these roles. Employment services continue to support the individual after employment in order to achieve the best outcome for both the employer and employee.

These changes in the proportion of older people in the population are a success story: the combined efforts of society, until the recent adverse movement, have allowed many more people to live into older age. At the same time, housing patterns have changed. More people live alone than in the past, and this is expected to increase, particularly among older people (Figure 1.17).

Figure 1.17 - Estimated and projected numbers of single person households by older age group in NHS Highland, 2016-2041



Source: National Records of Scotland[15]

The growth in single person households is particularly marked in those aged 90 years and older. The absence of other people in these households who would contribute to caring roles is likely to increase demands on health and social services.

Loneliness and social isolation

A growing body of evidence reveals that in addition to being distressing, social isolation and loneliness puts people at greater risk of health issues such as depression, heart disease, high blood pressure and dementia[16]. By contrast, meaningful friendships and social networks can have a protective effect on health and wellbeing[17].

> **"The most terrible poverty is loneliness, and the feeling of being unloved."**
>
> Mother Teresa

Studies have suggested that loneliness increases with age, with one study suggesting that over 50% of those aged over 80 years experienced some loneliness[18]. This is particularly significant for NHS Highland given it is anticipated that a greater proportion of the population over 75 years of age will live alone in the future with very large increases projected in the numbers living alone in their eighties and nineties.

In response to this growing societal issue, NHS Highland's Director of Public Health's Annual Report in 2016 was called "Loneliness and Health". This followed the launch of the organisation's Reach Out campaign, which aimed to encourage citizens to "reach out" to those around them to counter the effects of isolation and loneliness.

Implications for Communities and Services

- Population growth will produce increased demand for services in some locations, particularly in and near to urban centres such as Inverness.
- Some rural areas are expected to see substantial population reductions, which will mean that some fixed costs of services are spread over smaller numbers of people, increasing the cost per person.
- The proportion of older people in the population will increase again. If the number of working age people decreases as anticipated, then the pool of potential staff in traditional working age groups will be lower, at the same time as the number of older people increases.
- The number of people living alone, particularly in older age groups, is expected to increase, which is likely to increase support needs.

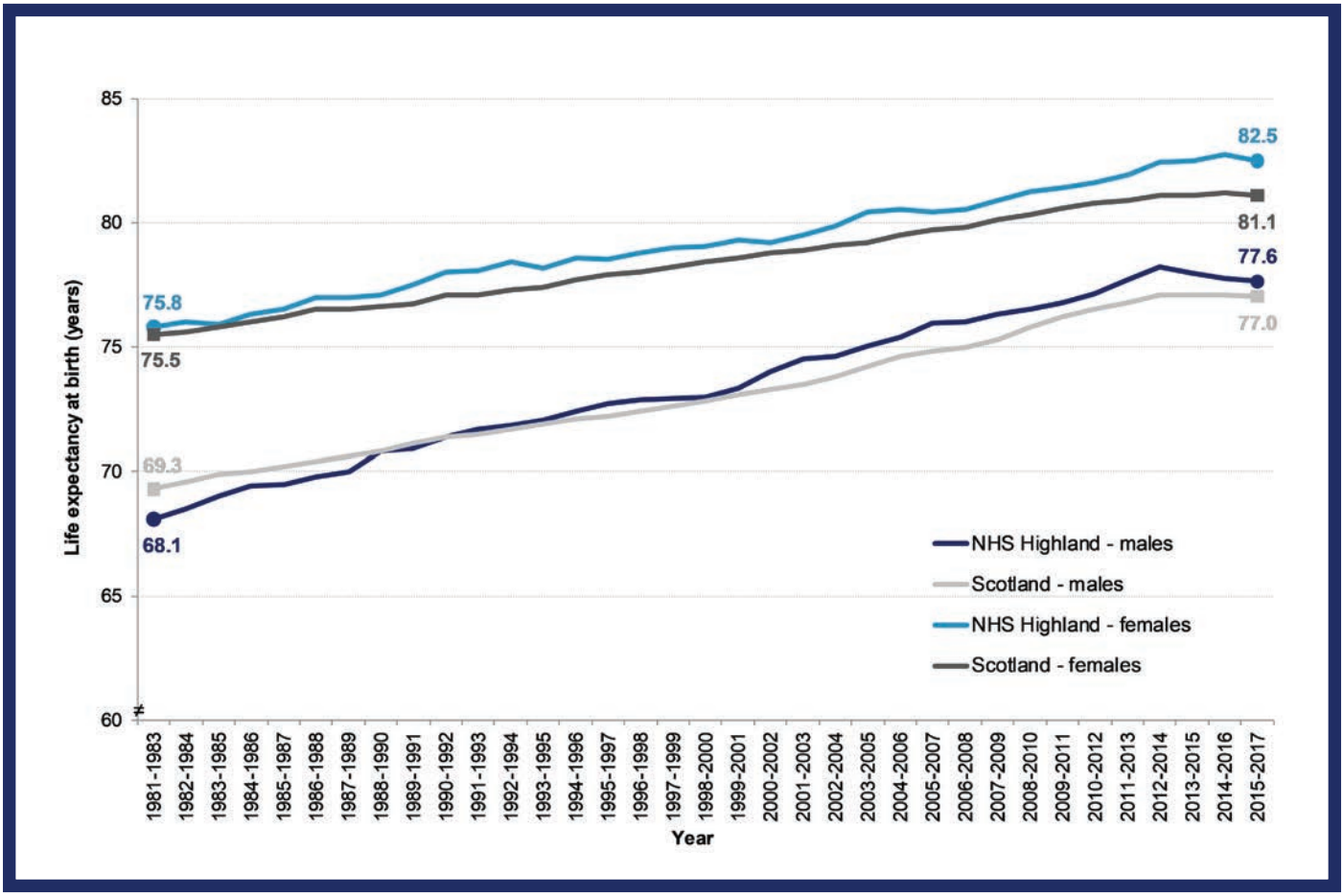
Chapter Two - Health

Understanding the health and wellbeing of the population of NHS Highland is valuable in informing longer term planning and the changing needs of health and social care services. This section of the report provides an overview of the main mortality and morbidity trends, and outlines some of the key health issues faced now and in the future.

Life Expectancy

Although lagging behind comparable European countries, life expectancy has increased steadily in both men and women in Scotland[1]. This previously continuous increase has stalled in recent years, and Highland, as Scotland, has experienced a decrease in both male and female life expectancy (Figure 2.1).

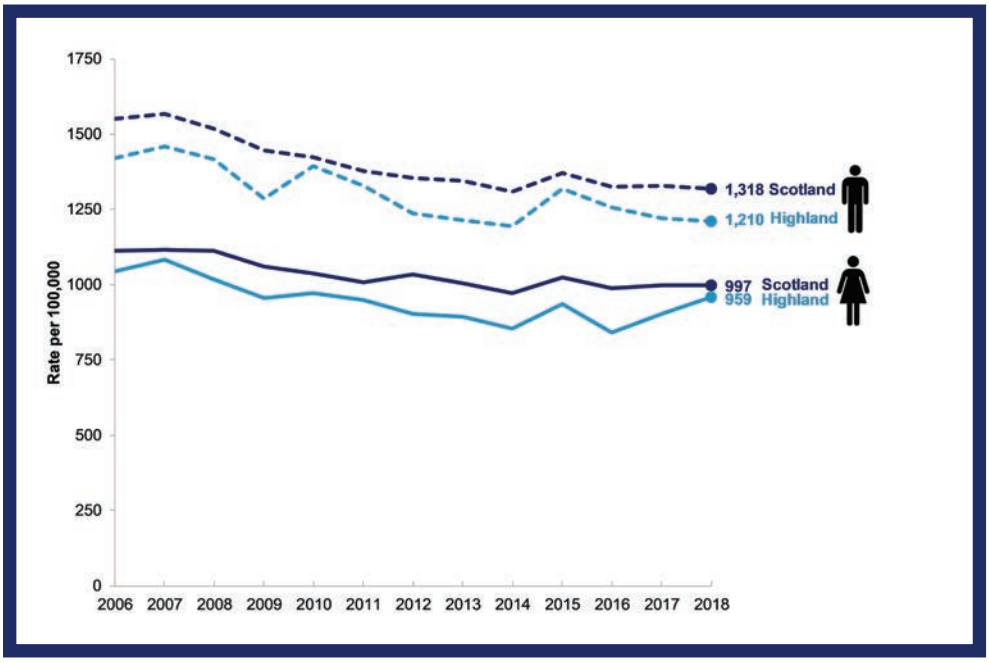
Figure 2.1 - Life expectancy at birth, NHS Highland and Scotland, 1981-83 to 2015-17



Source: National Records of Scotland[2]

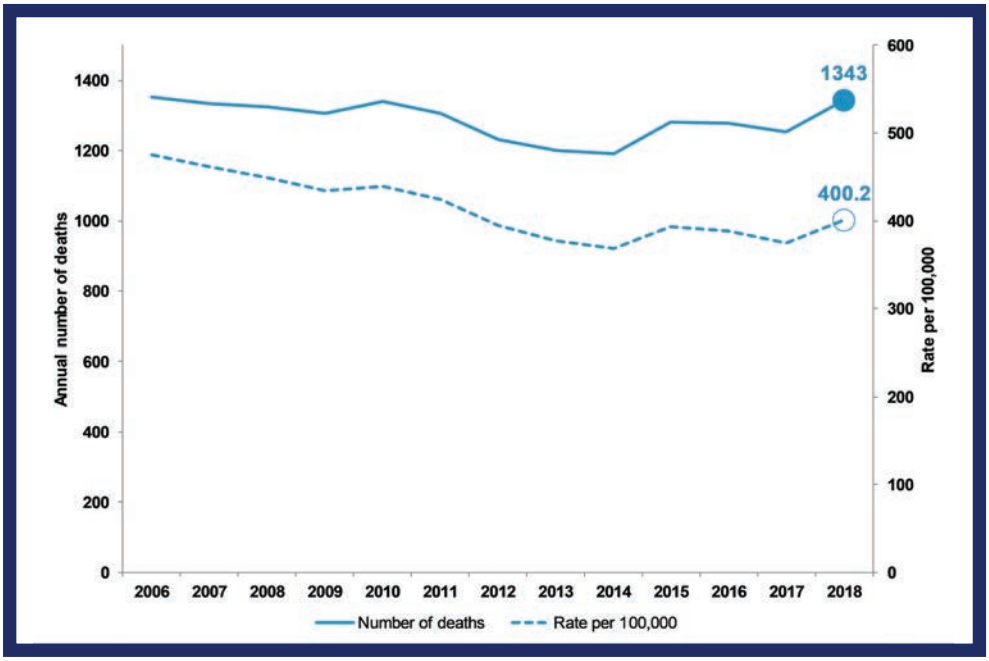
Age-Standardised death rates, which take into account changes in the age distribution of the population, also show levelling off compared to previous trends (Figure 2.2). This change has been visible in the number and rate of deaths in people aged under 75 years (Figure 2.3).

Figure 2.2 - Deaths from all causes (all ages) by gender, directly age standardised rates per 100,000 population for NHS Highland and Scotland



Source: National Records of Scotland[3]

Figure 2.3 - NHS Highland under 75 years of age and age-standardised all-cause mortality rate per 100,000 population and number of deaths



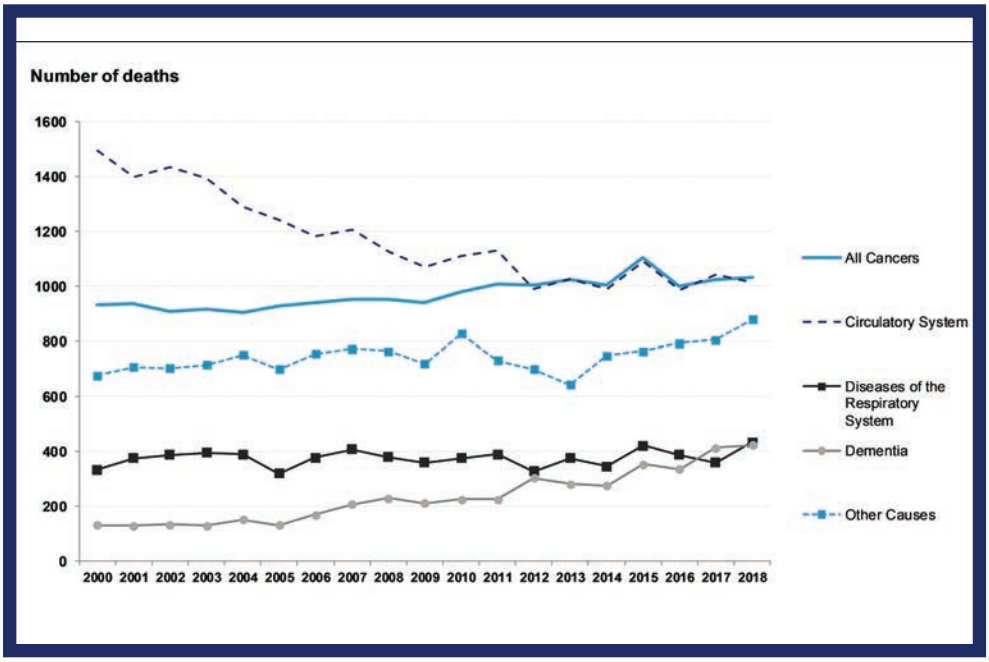
Source: National Records of Scotland[3,4]

NHS Scotland's national Public Health Observatory, ScotPHO, has proposed that this recent adverse trend may be due to the impact of economic 'austerity' on service provision, and on the effects of austerity on health. 'Austerity' refers to a situation in which people's living standards are reduced because of economic difficulties. The evidence for this is discussed in detail on the ScotPHO website[5]. The impact on societal inequity is discussed in the next chapter.

Causes of Death

There were 3,787 deaths registered in the NHS Highland area in 2018[3]. As in the rest of Scotland, the largest causes of death in the NHS Highland area are cancers, circulatory system diseases (a grouping that includes ischaemic heart diseases and cerebrovascular diseases) and diseases of the respiratory system. Dementia is increasingly recorded as a primary cause of death[6] (Figure 2.4).

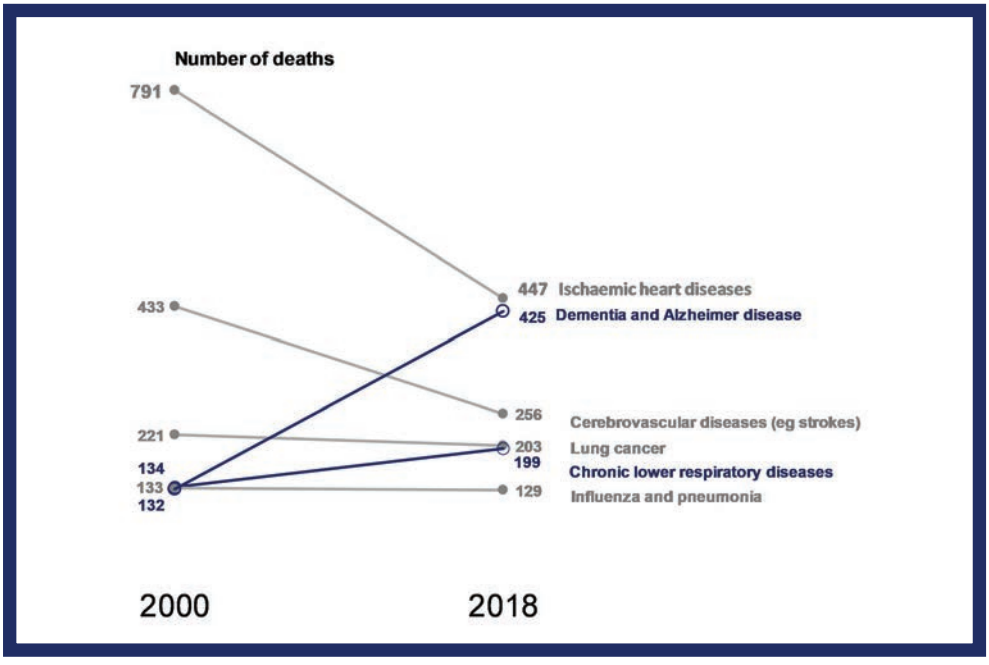
Figure 2.4 - NHS Highland - number of deaths for select causes by year of registration, 2001-2018



Source: National Records of Scotland[7]

Looking at the leading causes of death, much of the previous reduction in death rates happened because of a decrease in deaths from circulatory disorders, particularly ischaemic heart disease and stroke (Figure 2.5). National work suggests that a slowing of improvement in circulatory disorder deaths is an important contributor to the recent adverse trends in life expectancy[6,8].

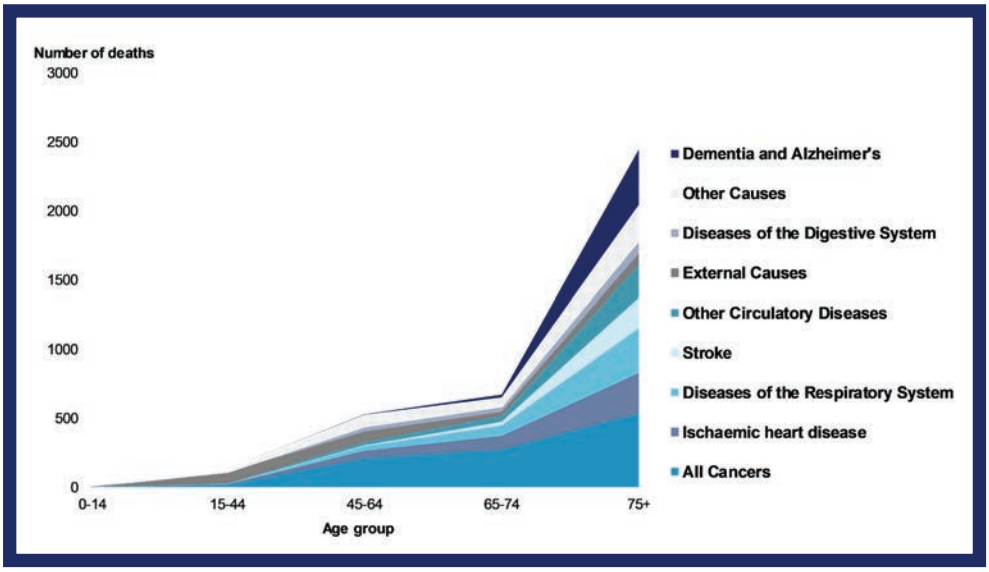
Figure 2.5 - NHS Highland - change in the leading causes of death, 2000-2018



Source: National Records of Scotland[7]

Dementia has increased as a cause of death, reflecting the higher proportion of older people in the population, described in Chapter 1* (Figure 2.6).

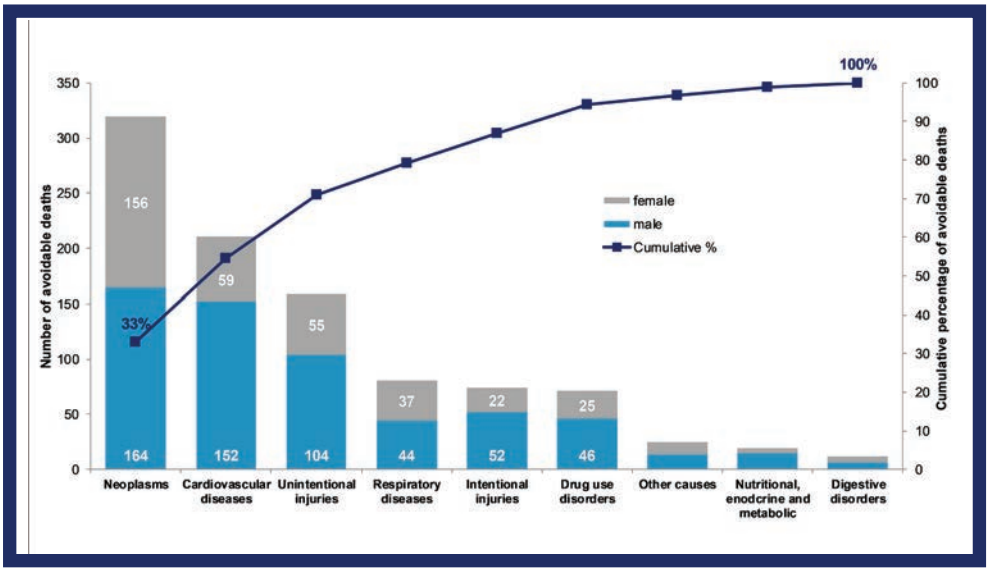
Figure 2.6 - NHS Highland - number of deaths by age group, 2018



Source: National Records of Scotland[7]

Some causes of death are regarded as preventable, in whole or in part (Figure 2.7). Some cancers and cardiovascular deaths make up the majority of these deaths, and prevention is discussed further in Chapter 4. There has also been a recent increase in winter deaths[9], and we intend to report on this in more detail during 2020.

Figure 2.7 - Number and cumulative percentage of avoidable deaths of residents of NHS Highland by sex and broad category of cause, 2018

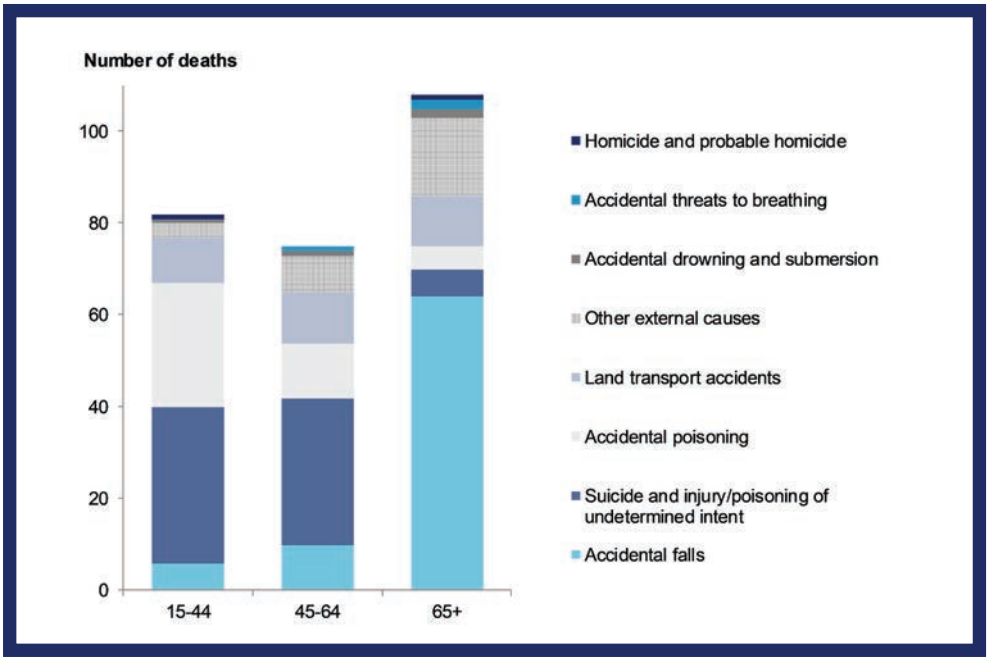


Source: National Records of Scotland[7]

External causes of death, such as accidents, suicide and drug-related deaths, are also important, and differences by age group are shown in Figure 2.8. suicide is a significant cause of death, particularly in younger people. Road traffic collisions and falls also feature as significant causes of death.

*Dementia can occur in younger people, but the most important population risk factor is age, so higher number of older people result in an increased number of people living – and dying – with dementia.

Figure 2.8 - Number of deaths in NHS Highland from external causes in NHS Highland by broad age group, 2018



Source: National Records of Scotland[7]

Suicide prevention in Highland

The Highland Community Planning Partnership has focussed on a 'breakthrough achievement' for the partnership during 2018/19; to raise awareness of suicide and tackle the stigma associated with suicide.

NHS Highland's Public Health Department co-ordinates delivery of the Suicide Intervention and Prevention Programme (SIPP) for the partnership.

This is a half day training programme which helps to raise awareness of suicide and support people to feel more confident when dealing with someone they think may be at risk of suicide. The training has been rolled out to more than 500 staff across the partnership. There are plans to develop delivery to community and staff groups in the third and private sector, to increase awareness and develop knowledge and skills in suicide prevention.

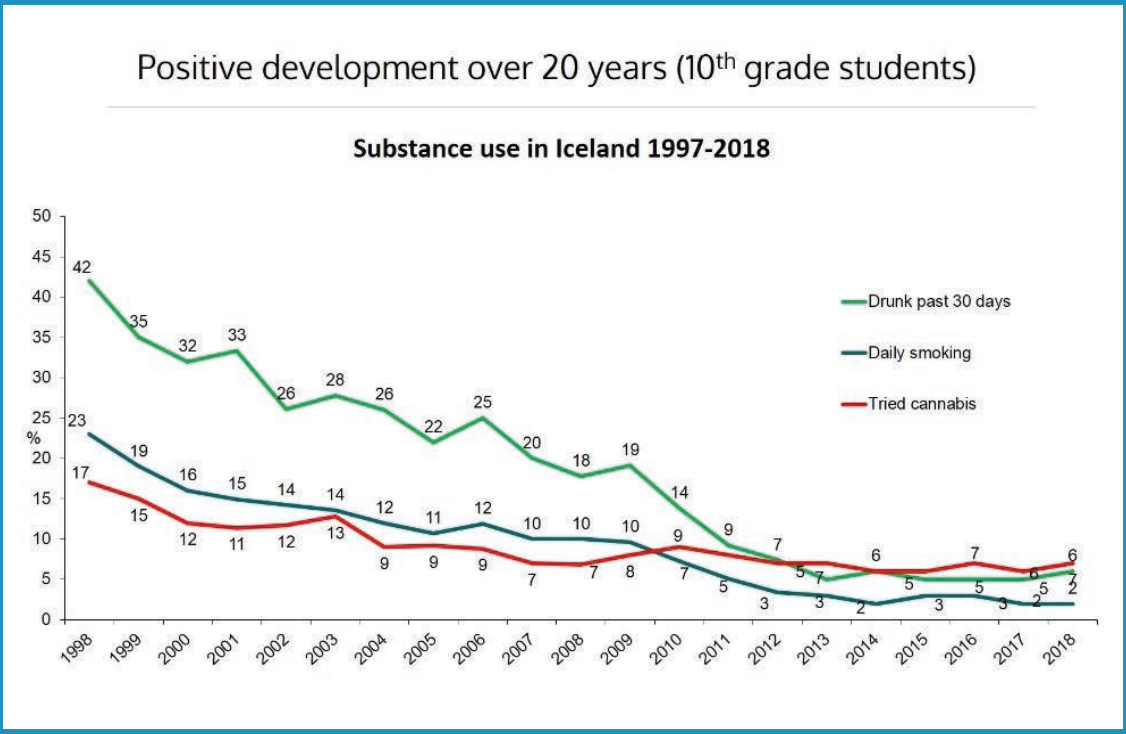
To accompany the SIPP training, a suicide prevention app has been developed for Highland which provides advice, information and support through provision of a 'prevent suicide' safety plan. The app also includes telephone numbers for local and national helplines which can offer support in some situations where people are feeling distressed or suicidal. There is also guidance on what members of the public can do to help someone they suspect is feeling suicidal.

Reducing drug-related harm and the Youth in Iceland Model

Drug related harm and in particular drug related deaths is now considered to be a major public health problem. To prevent the unrelenting rise in drug related deaths, (45 for 2018, an increase of 13 from 2017[10]), and other associated harms in NHS Highland it is clear that current policies need to be reviewed. Preventing the use of problematic drug use is complex and a system wide approach encompassing community based approaches are required to bring about societal change.

A move away from short term, single issue programmes towards longer term integrated approaches that places individuals, families and communities at the heart of any action taken is likely to be advantageous. Key elements of a prevention programme should include shared outcomes achieved through partnerships and the acknowledgement that a range of interventions is necessary. In Highland, the Alcohol and Drugs Partnerships, Health and Social Care Partnerships, Community Planning Partnerships, Integrated Children Services and Justice Partnerships all have an important role to play in early intervention and prevention through building the resilience of individuals and communities.

Currently in NHS Highland we are exploring the guiding principles of the 'Youth in Iceland Model' such as enhancing the social environment, community schools as the natural hub for learning and the importance of data driving decisions[11]. The model identifies risk and protective factors and in Iceland this has translated into working with communities to enforce night time curfews (ages 13-16 years) and to provide all young people with free leisure cards. The model has contributed towards successful reductions in drinking, smoking and cannabis use among Icelandic adolescents over the last 20 years[12].



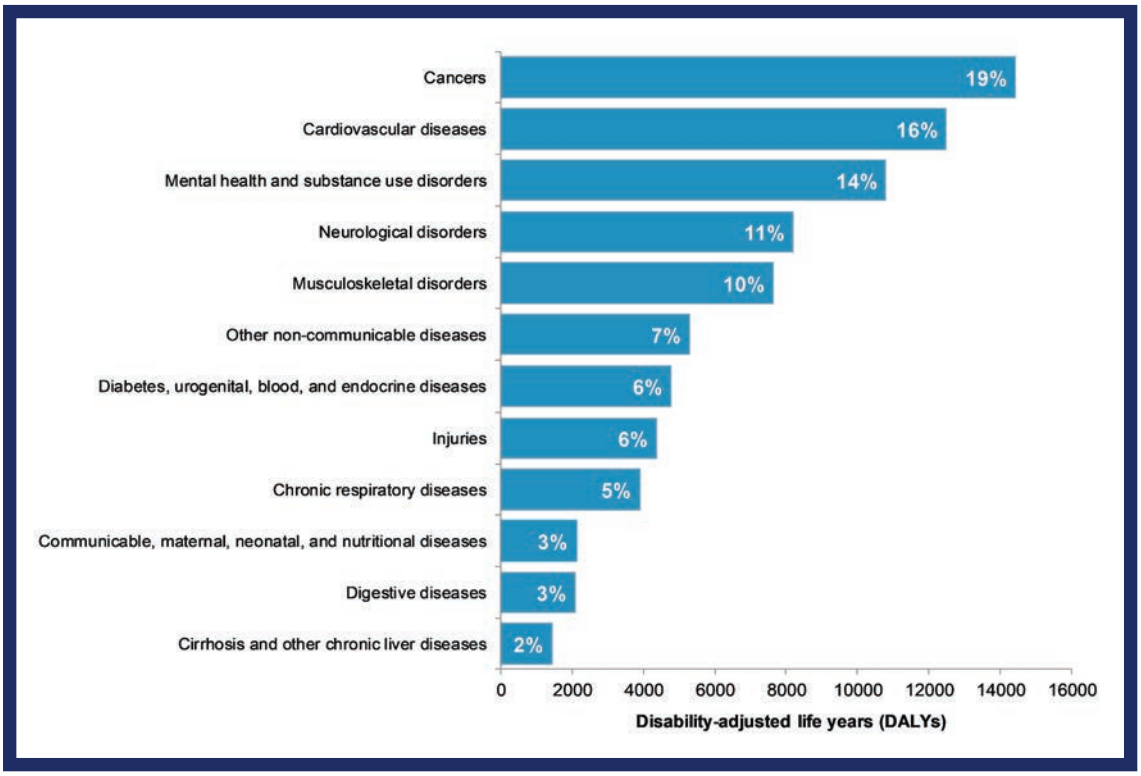
Source: Reproduced with kind permission Planet Youth[11]

Trends in individual causes of death, including trends by age and gender in cancer, heart disease and stroke, and deaths in children, are presented in the supporting appendices.

Ill-Health

Many people live with ill-health, sometimes for many years. The causes of ill-health are distinct from causes of death, as some conditions cause reduced quality of life, without necessarily resulting in death. Figure 2.9 shows the main causes of morbidity in Highland, using the figures from the Scottish Burden of Disease Study (see the supporting appendices for information on the method). The top five causes of morbidity are cancers, cardiovascular disease, mental health and substance use problems, neurological disorders, and musculoskeletal conditions.

Figure 2.9 - Estimates of the leading causes of morbidity by broad condition group, NHS Highland, 2016



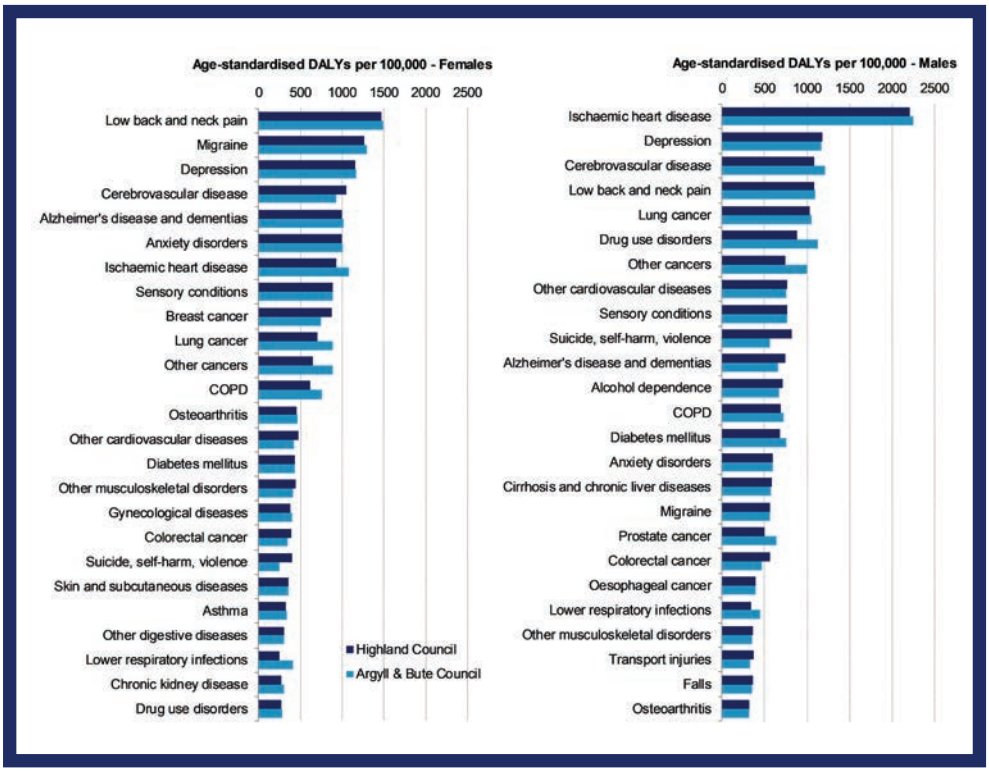
Source: Scottish Public Health Observatory[13]
Percentages shown represent proportion of all Disability Adjusted Life Years

The disability adjusted life year (DALY) is a measure used to quantify the difference between living to old age in good health, and the situation where healthy life is shortened by illness, injury, disability and early death. In any given year, the DALY counts up the number of years lost due to people dying early in that year (years of life lost) and the proportion of that year lost due to living in less than ideal health (years lived with disability or disease). The latter is calculated based on duration, severity and the level of disability attributed to that illness[13].

For some conditions, such as mental health disorders and musculoskeletal disorders, almost the entire total burden results from a large number of people spending many years living in less than ideal health with that disorder. For other conditions, such as cancers, the majority of DALYs come from early death.

Figure 2.10 shows individual conditions by gender, demonstrating important differences. Low back and neck pain, depression and cerebrovascular disease feature in the top four individual causes of morbidity in both genders.

Figure 2.10 - Top 25 leading causes of DALYs by specific causes for males and females, Argyll and Bute and Highland, 2016



Source: Scottish Public Health Observatory[13]
Age-standardised DALYs (using the 2013 European Standard Population) per 100,000 population
COPD: Chronic obstructive pulmonary disease

Social prescribing and Community Link Workers

The role of general practice is crucial to sustaining high quality universal healthcare and improving population health[14]. GP services are increasingly seeing people with multiple conditions, including mental health problems. The increased reliance on GP services has been recognised nationally under the Primary Care modernisation programme. The programme aims to reduce pressure on general practice through the redesign of six key services, one of which is the introduction of a Community Link Worker (CLW) service. Work is underway to develop CLW services in NHS Highland.

CLWs aim to address socio-economic and personal circumstances that affect health and wellbeing to improve the outcomes for patients and reduce pressure on GP's time. They are embedded in GP practices and follow a social prescribing model. Social prescribing is a means of linking individuals to non-medical support or services available in their communities, which may help address health and social issues.

Social prescribing services reduced GP attendance by 28% in one study[15]. This reduction is estimated to give a £83 saving per person per year[16] as well as ensuring that individuals are supported to access a range of services and opportunities that meet their needs. If 1,000 patients access social prescribing support over a year this would give an estimated saving of £83,000.

Think Health Think Nature: A Green Health Partnership for Highland

The Highland Green Health Partnership aims to develop opportunities and build on existing resources to support individuals and communities to improve their health and wellbeing, and build resilience through engaging with and appreciating the natural environment. It is one of four area wide partnerships developed in Scotland as part of the national "Our Natural Health Service" Programme. It brings together a range of partners to promote the natural environment.

Green Health covers a spectrum of engagement and activities. For some people it may be about looking out on natural environments or bringing natural materials inside. For others, it might be about supporting people to be accompanied to go outside, or to go outside independently; or to build up to regular or daily varied experiences in the outdoor environment. Having green space is about supporting people along this journey, wherever their starting point might be, and as far as is appropriate for individuals.

There is evidence of benefits to health from engaging with the natural environment. A report by the University of Exeter, "A Dose of Nature", reviewed evidence around the use of nature in the treatment of chronic health conditions[17]. It found that green space experiences can protect against cardiovascular disease, help to lower blood pressure, prevent and manage diabetes, bring relief from acute stress / depression / anxiety, speed up recovery from illness, improve immune function, tackle loneliness, promote physical activity, and reduce mortality.

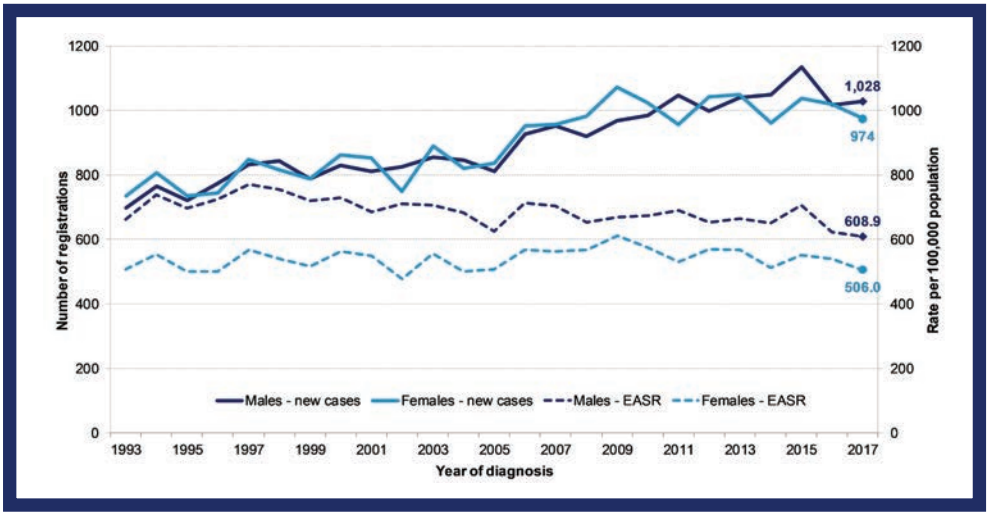
NHS Highland area is renowned for its natural environment and the wide range of opportunities it provides for people to be physically active and experience nature and the outdoors. Nature, and the benefits it provides, is also easily accessible in our parks, gardens and urban green spaces. Our natural assets have the potential to contribute to improving a range of health outcomes, helping tackle health inequalities, addressing issues of social isolation, and supporting the general transformation needed to keep people healthier for longer.

Cancers

Cancers were the largest cause of overall morbidity in Figure 2.9. Scottish estimates suggest that 3% of men and 4% of women are living with cancer, and that over 40% of people will develop cancer during their lifetimes.

The rate of new cases of cancer has decreased by 5% over the last decade, but the number of people diagnosed with cancer for the first time continues to grow. This is because rates of cancer are higher in older people, so as more people live in to older age, more people overall develop cancer (Figure 2.11).

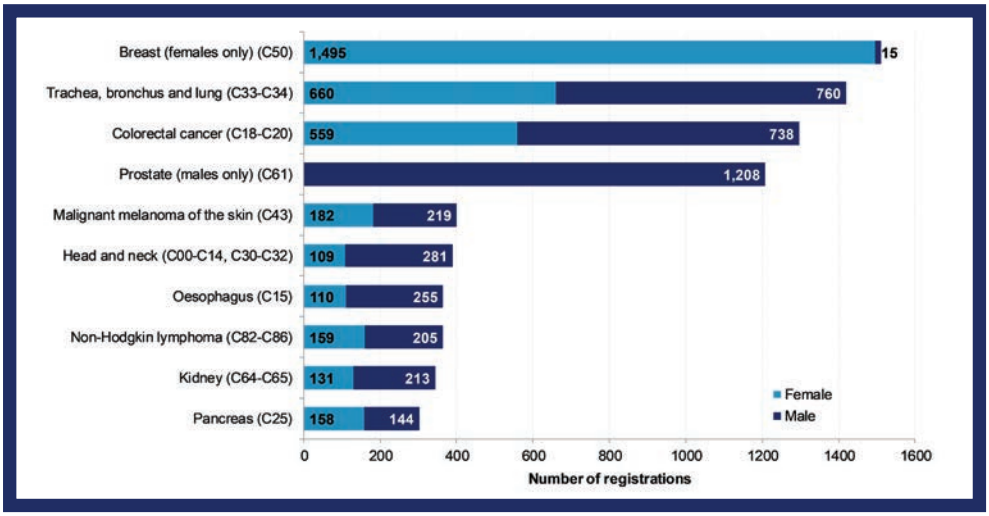
Figure 2.11 - All cancers excluding non-melanoma skin cancers by sex, number of new cases and directly age-standardised rates per 100,000 population; NHS Highland, 1993 to 2017



Source: Information Services Division
All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excluding C44)
EASR: European Age-Sex Standardised Rate (using the 2013 European Standard Population) per 100,000 person-years at risk

The commonest cancers in the NHS Highland area are breast, lung, colorectal and prostate, as in Scotland as a whole (Figure 2.12).

Figure 2.12 - Most common cancers in NHS Highland by sex, 2013 – 2017



Source: Information Services Division[18]
All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl. C44)

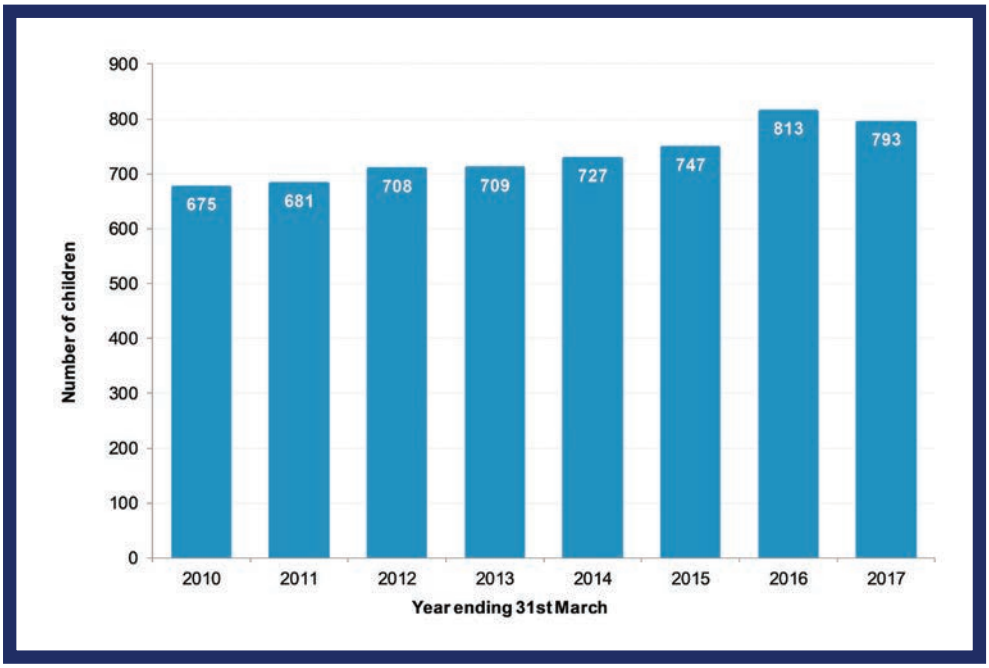
With larger numbers of people living in to older age, the NHS Highland area can expect 2,800 new cases of cancer a year in 2023 – 2027[19], an increase of 40%. Overall five year survival in 2011 compared to 1987 increased in men from 29% to 48%, and in women from 40% to 54%[19]. Larger numbers of people will need facilities to diagnose and treat cancer, and a higher number of people diagnosed will have pre-existing health problems and social care needs at the time of diagnosis. As a result of more people being diagnosed, and people diagnosed living longer on average, the total number of people living with cancer will increase.

Babies, children and young people with life-limiting conditions

The largest contributors to morbidity in babies and children under the age of 15 include congenital birth disorders and neonatal disorders. These conditions are often life-shortening, where there is little hope of a cure and from which children will ultimately die young. These children, and their families, have particularly complex care and support needs.

The numbers of babies, children and young people with life-limiting conditions is increasing. Estimates suggest that almost 800 children in the NHS Highland area are affected by conditions which are likely to shorten their lives. There was a 17% increase between 2010 and 2017 (Figure 2.13). There is a strong correlation between poverty and being a child with a life-shortening condition.

Figure 2.13 - Number of babies, children and young people with life-limiting conditions, NHS Highland, 2010 – 2017



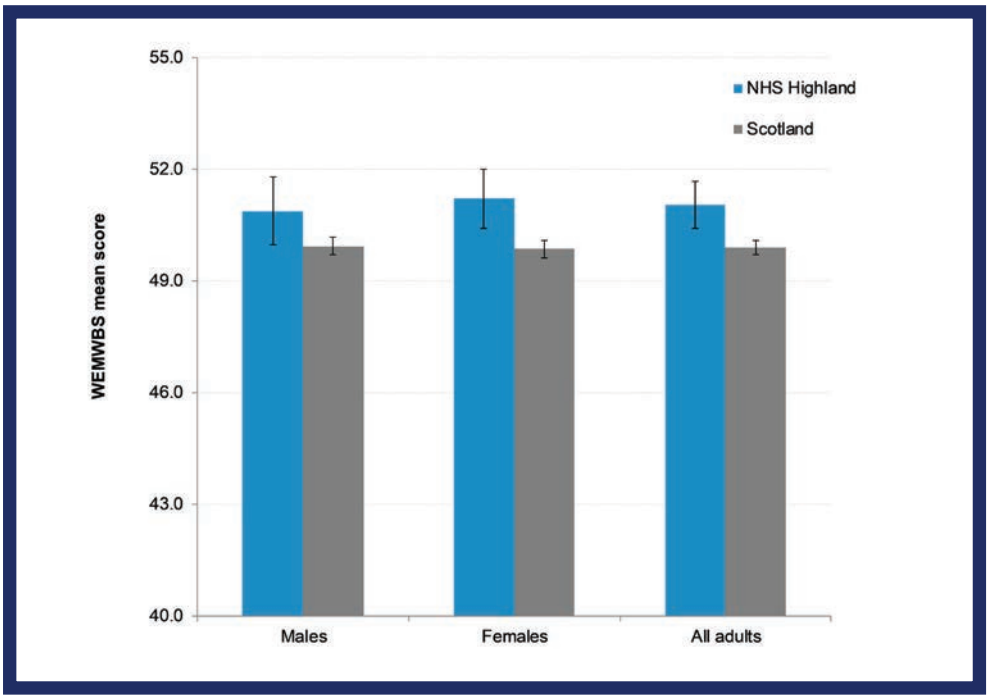
Source: Information Services Division and Children's Hospices Across Scotland[20]
Age 0-21 years, based on Scottish Birth Record (SBR), inpatient (SMR01) and community prescribing data

Mental Health and Wellbeing

The Figures 2.9 and 2.10 above demonstrate the importance of mental ill-health in overall levels of morbidity. Mental wellbeing and mental ill-health are two aspects of this. Mental wellbeing is often viewed as positive aspects of mental health, such as positive relationships, social capital, and life satisfaction. Good mental health allows people the resilience to cope with the normal stresses of life. Mental ill-health reflects the presence of a spectrum of disorders, from common conditions such as anxiety and depression, to less common illnesses such as schizophrenia and affective psychoses.

Nationally, mental well-being is measured using a questionnaire known as 'WEMWBS', where possible scores range from 14 to 70, with higher scores reflecting greater wellbeing. Highland scores for both men and women are generally higher than the Scottish average, although the male difference is not statistically significant (Figure 2.14).

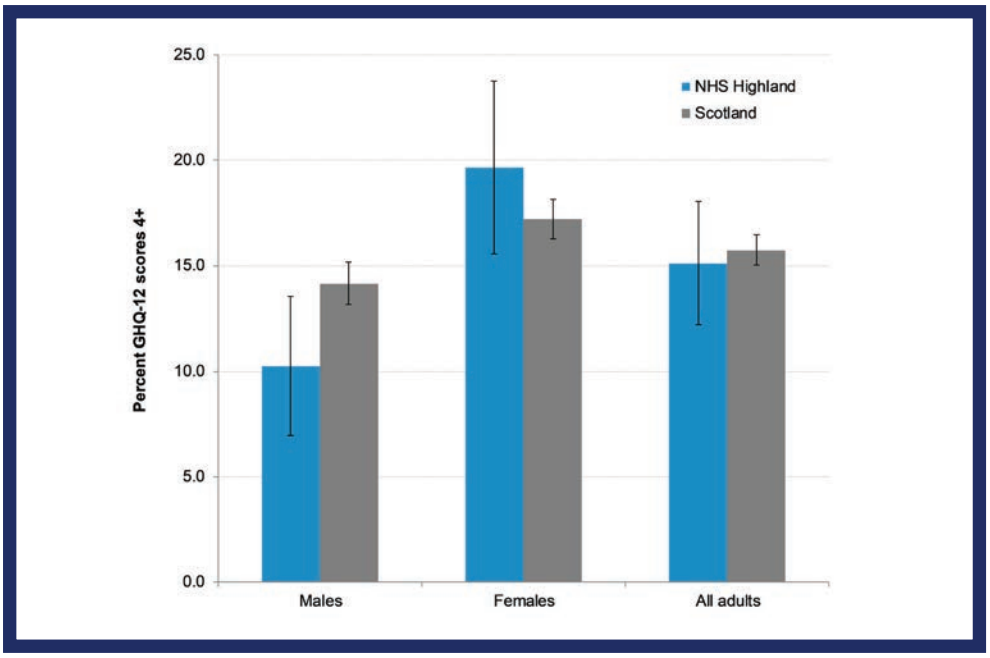
Figure 2.14 - Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) score by sex, NHS Highland and Scotland, 2014-2017 combined



Source: Scottish Government[21]

The likely presence of a mental health problem can be estimated using a questionnaire known as the GHQ-12. In 2014 – 17, 10% of men and 20% of women screened in Highland had results suggesting the presence of an illness (Figure 2.15), reflecting the high impact on health shown in Figures 2.9 and 2.10.

Figure 2.15 - General Health Questionnaire 12 (GHQ-12) score by sex, NHS Highland and Scotland, 2014-2017 combined



Source: Scottish Government[21]

Workplace mental health promotion

Good mental health is fundamental to our general wellbeing, and it affects our ability to work effectively. We also know that employment is the single most influential factor in terms of social inclusion. Mentally healthy workplaces and an inclusive approach to employment result in improved recruitment and retention practices, as well as more effective working relationships.

Employers have an important role to play in helping create a healthier and more motivated workforce by ensuring that their workplace is safe and healthy, not only for the wellbeing of staff, but also for the future success of their business. More than a third of absences from work are mental health related with 1 in 4 people in Scotland experiencing a mental health problem at some point in their lives. Employers should expect that at any one time, nearly 1 in 6 of their employees are affected by mental health problems such as anxiety and depression and 77% of those who completed suicide in Scotland in the last 6 years were in employment[22]. Whatever people want to do for a living, and wherever they are located in Highland, our population should be given the opportunity to work in ways that allow them not only to sustain but also to improve their health and wellbeing.

The Mentally Healthy Workplace training programme has been developed by the Scottish Centre for Healthy Working Lives and delivered by local advisers throughout NHS Highland. It is designed to encourage good practice in promoting positive mental health and wellbeing, thereby contributing to a more open culture that puts mental health on the agenda alongside physical health, social inclusion and productivity.

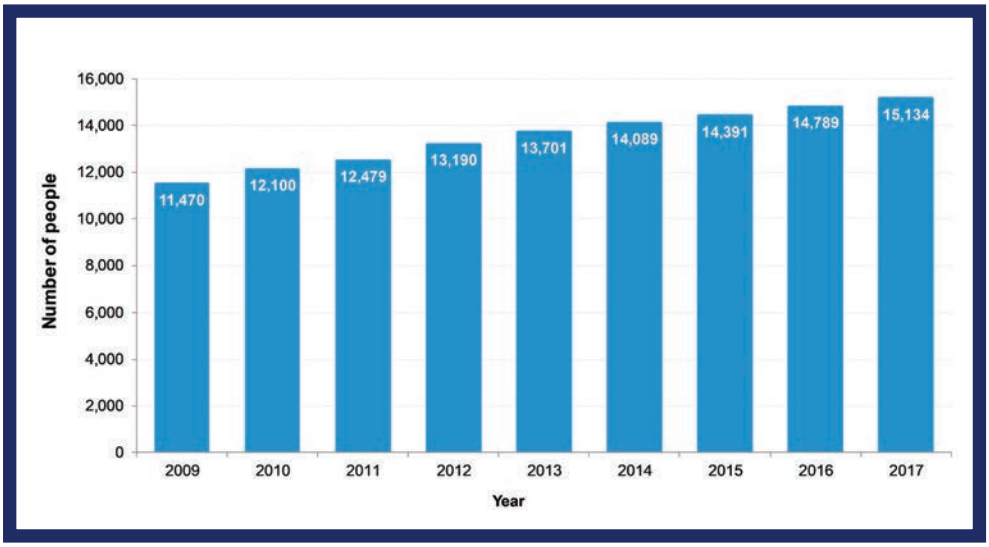
Type 2 Diabetes

Each year, around 1,000 new people in NHS Highland are diagnosed as having type 2 diabetes. Just over 15,000 people in the NHS Highland area have the condition at present. There was a 32% increase between 2009 and 2017 (Figure 2.16). At least 10% of people with type 2 diabetes are estimated to be undiagnosed, suggesting the true number of affected people will be even higher.

Type 2 diabetes is a condition where the body either does not produce enough insulin, or becomes resistant to the effects of the insulin produced. It tends to be progressive, and increases the risk of heart disease, stroke, kidney failure, peripheral vascular disease, nerve damage and eye problems[23].

The main risk factors for type 2 diabetes are increasing age, and being overweight or obese[24,25]. The increasing number of affected people reflects the older age distribution of the population discussed in detail in Chapter 1, and increases in obesity. The next section discusses risk factors for disease in the NHS Highland area in more detail.

Figure 2.16 - Number of people recorded with type 2 diabetes; NHS Highland, 2009 – 2017



Source: Scottish Diabetes Data Group[26]

Type 2 Diabetes Framework

Across Scotland, the incidence of type 2 diabetes is increasing and one in five people are living with or at risk of diabetes. The NHS spends around 9% of its total health expenditure treating type 2 diabetes. Increasing numbers of people with diabetes mean that if no changes are made to the way type 2 diabetes is prevented and treated then costs will rise to 17% of NHS expenditure by 2035.

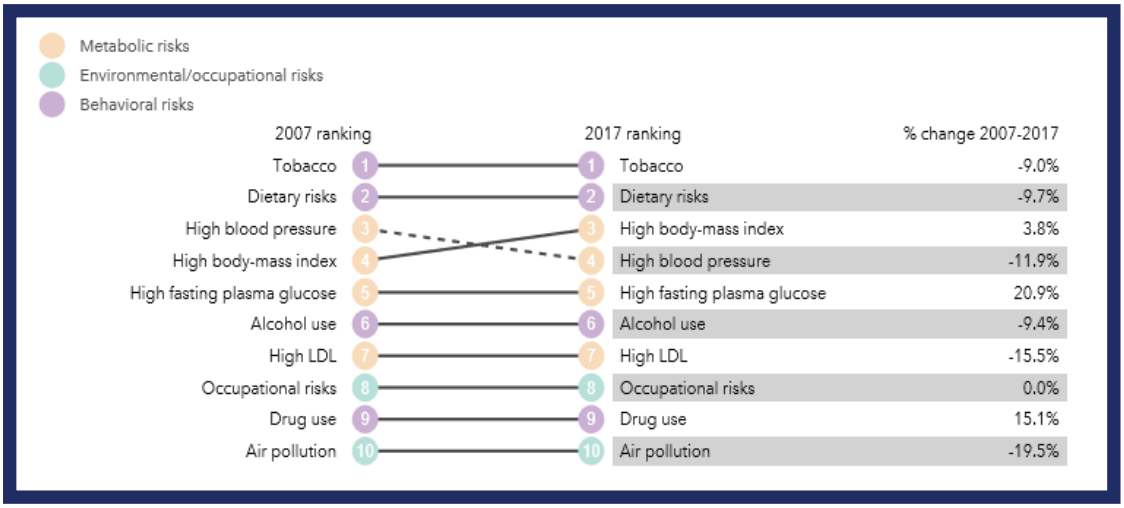
The Scottish Government published 'A Healthier Future - Framework for the Prevention, Early Detection and Early Intervention of type 2 diabetes' in July 2018[27]. The framework provides guidance for delivery partners to tackle the growing prevalence of type 2 diabetes. It sets out how individuals can be empowered to mitigate their risk of developing type 2 diabetes and, for those recently diagnosed, to improve management of their condition to delay and avoid complications.

In preparation for delivery of the framework, a needs assessment has been undertaken in NHS Highland and has informed implementation plans for Argyll and Bute and Highland Health and Social Care Partnerships. A Public Health led oversight group has been convened and priority actions for 2019/20 identified. These include enhancing capacity within the tiered healthy weight pathways to increase access and availability of community-based healthy weight interventions and support early detection and intervention for type 2 diabetes. This programme of work will be extremely important in helping to prevent type 2 diabetes, reduce complications from diabetes and reduce costs to the NHS.

Disease Risk Factors

Deprivation is an important risk factor, and is considered in detail in Chapter Three. The other main risk factors for disease in Scotland, other than age and genetic risk, are shown in Figure 2.17.

Figure 2.17 - Top 10 risks contributing to DALYs in 2017 and percent change, 2007-2017, Scotland



Source: Institute for Health Metrics and Evaluation[28]

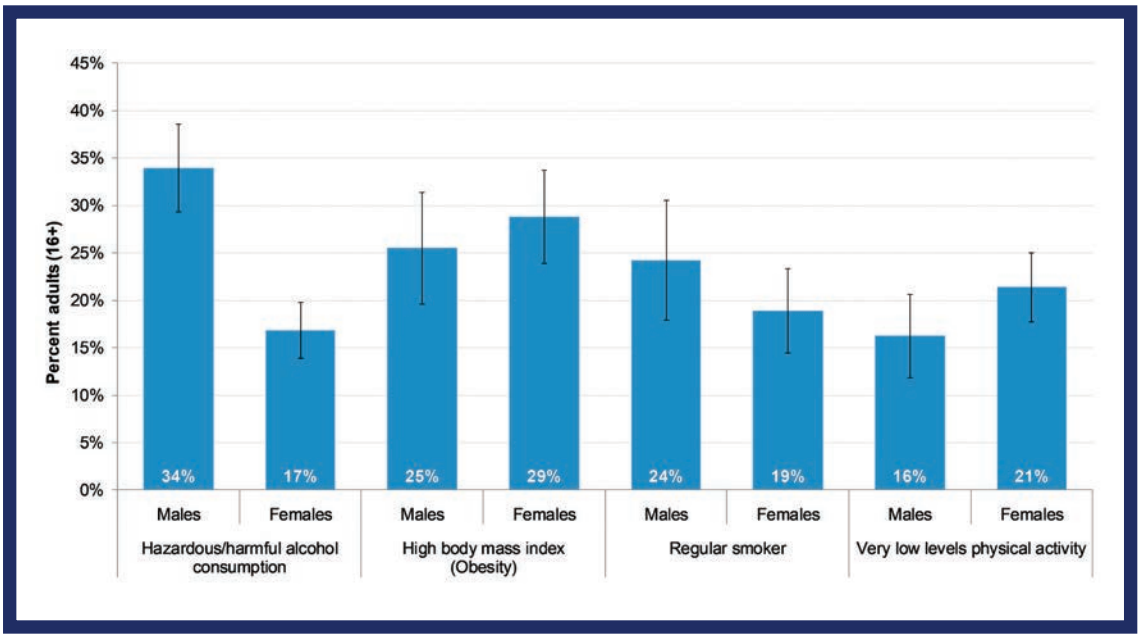
Smoking cessation, prevention and protection

NHS Highland developed a multi-agency tobacco strategy in 2018. This sets out the collective aim in Highland to reduce the harm from tobacco through smoking prevention, protection and cessation, with an under pinning principle of reducing health inequalities and working towards the end goal of reducing smoking prevalence. This work is important because smoking is the leading preventable cause of ill-health and premature death[29], and has an estimated annual cost to NHS Highland of between £19 million and £30 million each year[30]. The strategy and action plan can be found here.

ASH Scotland's #notafavour proxy purchase campaign is one initiative to help prevent young people from starting to smoke. NHS Highland worked with Highland Council trading standards staff and Inverness College UHI to encourage adults not to buy tobacco for young people. To support the campaign in Highland, students at Inverness College, UHI wrote and starred in a series of short films to promote #notafavour. The videos were released and promoted on social media and viewed almost 11,000 times during a two week campaign. This work won an award of excellence from ASH Scotland's Tobacco Free Charter.

The use of tobacco continues to be a leading cause of preventable disease[31]. In the NHS Highland area in 2014-2017, 21% of adults smoked regularly. Men were more likely to be regular smokers (24%) than women (19%). Figure 2.18 shows other common risk factors and their frequency amongst people in Highland.

Figure 2.18 - Prevalence of key risk factors in adults aged 16 years and over, by sex, NHS Highland, 2014-2017 combined



Source: Scottish Government[21]
Alcohol consumption: Exceeds 2016 CMO recommendations of 14 units per week
High body mass index: ≥ 30 kg/m^2
Very low levels of physical activity: < 30 minutes of moderate activity or < 15 minutes of vigorous activity a week

Recent analyses of data on alcohol has confirmed a clear link between alcohol use and cancer, and suggests that alcohol use increases the risk of cancer[32]. The current UK guidance is that men and women do not regularly exceed 14 units of alcohol a week[33]. At present, 51,000 adults in the Highland Council area are thought to exceed these limits (34% of men, and 17% of women).

Reducing the use of and harm from alcohol in Highland

Reducing the harm caused by alcohol will make a positive and sustainable change to the health of our population. Substance use is a complex issue and an individual's use of substances will vary over their life course. Collectively the harm from alcohol use contributes to a significant proportion of preventable ill health in our population. The impact of substance use is not equitable across our population and the harm that arises from this is significant and disproportionally affects those living in deprived communities.

Minimum Unit Pricing

In recent years there have been a number of key actions taken to help reduce alcohol related harms through price and availability, for example, the introduction of minimum unit pricing[34] (MUP) on May 1st 2018 and the ban on 'buy one get one free' alcohol promotions[35]. MUP had an immediate impact on the availability of cheap alcohol such as cheap cider and vodka that literally disappeared overnight. NHS Health Scotland carried out research to see if off-trade alcohol businesses were compliant with MUP[36]. The study found that licensed premises were largely compliant with MUP legislation.

Licensing

In Highland, joint work has been undertaken between the Directorate of Public Health and the Highland Alcohol and Drugs Partnership to gather and present evidence about the harms caused by alcohol to the Highland Licensing Board with the purpose of developing an overprovision statement.

This work involved gathering data from a number of partners: Scottish Ambulance Service, Fire and Rescue, NHS Highland and Police. Health data included alcohol related deaths and alcohol related hospital admissions. This evidence was considered by the Licensing Board in 2018 and an alcohol overprovision statement was agreed for off-sales setting a limit of no more than 40 square meter capacity[37].

Currently the Scottish Government are consulting about the role of licensing with a view to what other actions that may be taken by Licensing Boards, for example, the banning of alcohol at public events that are predominately for families, children and young people and how to tackle the regulation of internet sales because these are not regulated locally.

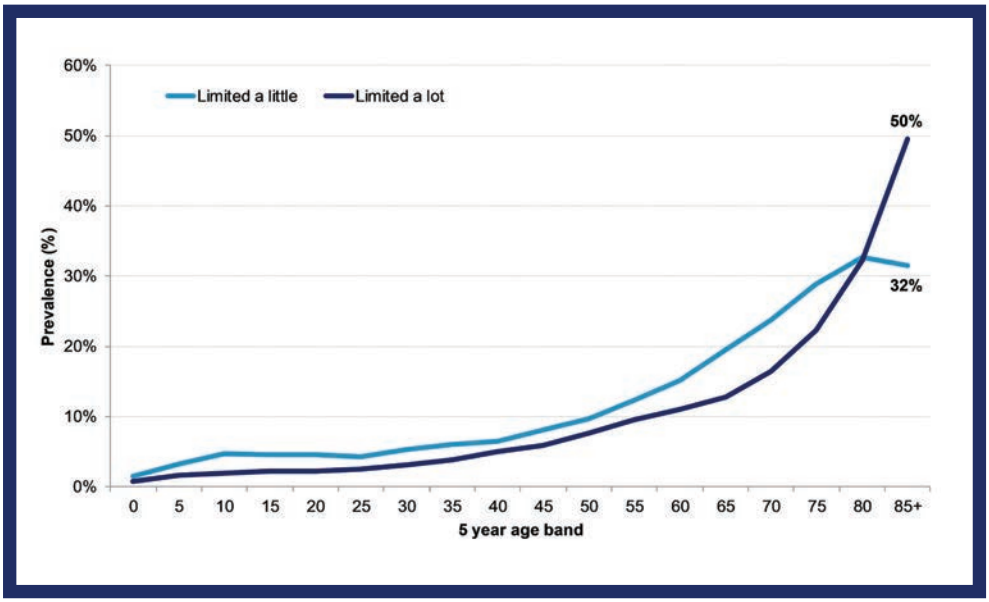
Alcohol Brief Interventions

Alcohol Brief Interventions (ABIs) aim to help people make informed choices about alcohol to reduce alcohol related harm and are an evidenced based intervention to reduce population alcohol related harm[38]. Online and face-to-face training is available for staff of any organisation who might come in contact with people who would benefit from an ABI. A public health training for trainer session was recently taken up by local Police Scotland colleagues who are keen to use ABIs when dealing with incidences of drink-driving.

Frailty, Multi-morbidity and Dementia

The prevalence of morbidity increases markedly with age and by the time people are aged 85 years and over, 50% of people report that their activities are 'limited a lot' by long term conditions (Figure 2.19).

Figure 2.19 - Prevalence of limiting and non-limiting long-term conditions by age; NHS Highland



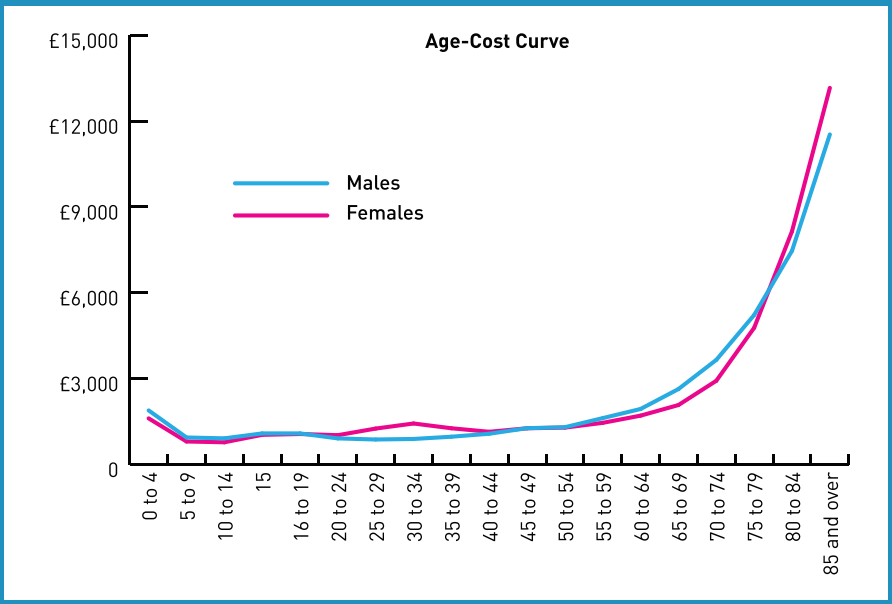
Source: National Records of Scotland[39]
Census 2011 Tables QS303SC, DC3101SC

The high prevalence of long-term conditions in older people is also reflected in the prevalence of frailty by age group. Frailty refers to an ageing process in which multiple body systems gradually lose their inbuilt reserves[40], resulting in greater vulnerability to ill-health, and a greater impact of illness, and more difficulty in recovering from illness, when it occurs.

Cost by Age

NHS Highland, in line with a number of Scottish health boards, is under intense financial pressure, with a large savings target. The graph indicates that across the life course costs per person are greatest at the two ends of life.

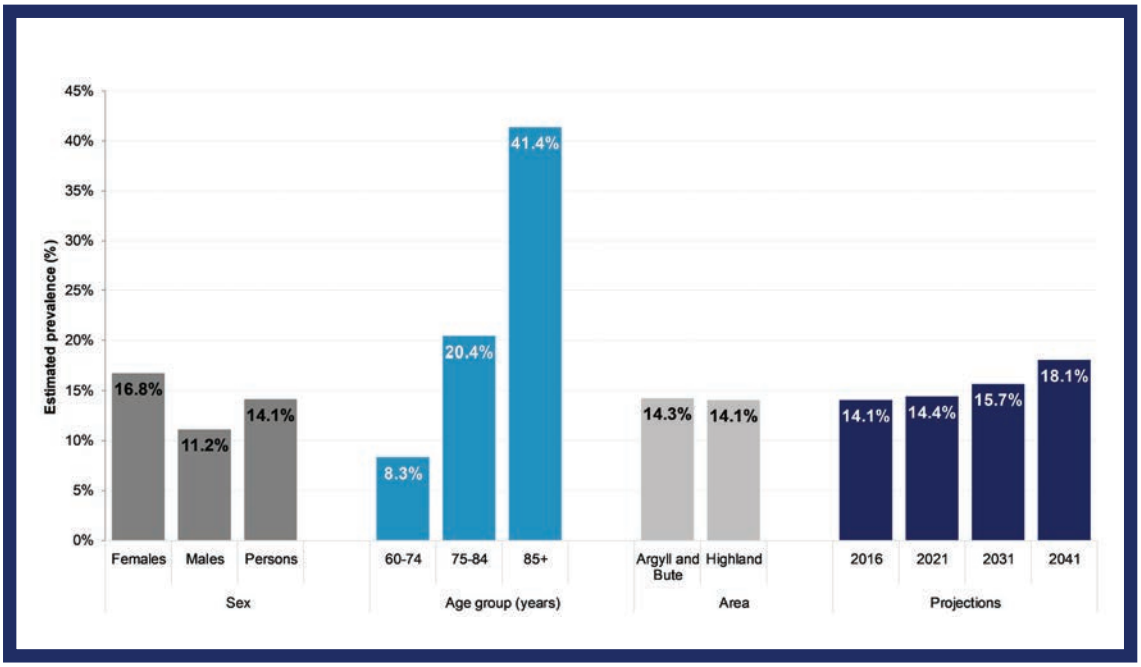
Planning of health and social care will need to incorporate the impact of this pattern over the coming decade, particularly given the demographic shift towards an aging population that is outlined elsewhere in this report.



Source: Department of Health (Northern Ireland)[41]

The proportion of frail people is expected to increase from 14.1% in 2016, to 18.1% in 2041. These averages conceal major differences by age group, with over 40% of people aged 85 years and over being frail (Figure 2.20).

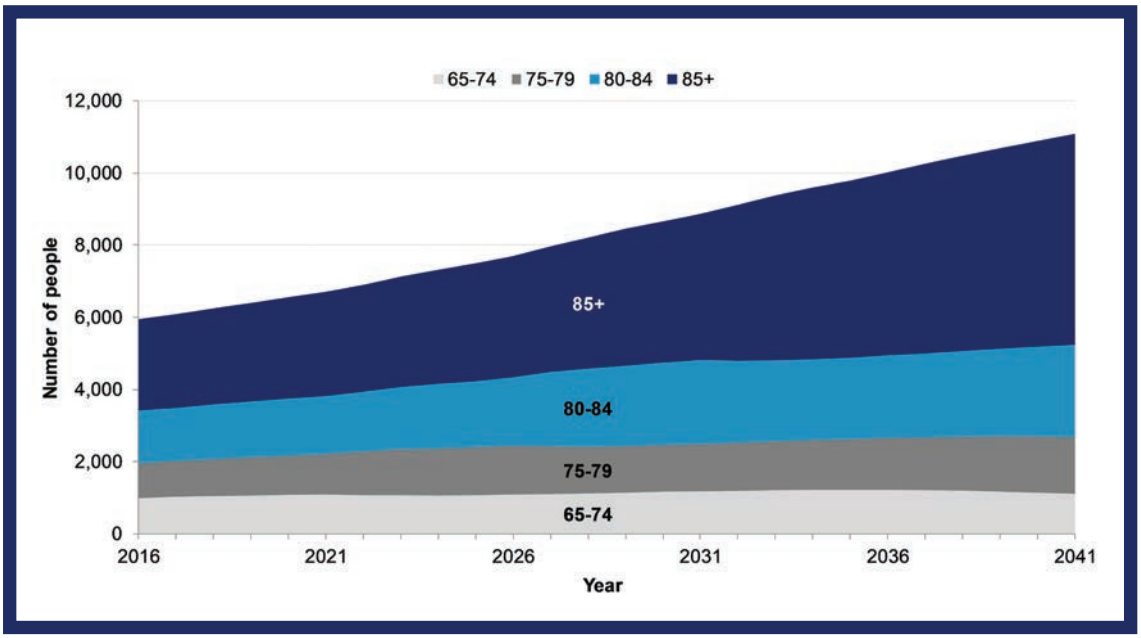
Figure 2.20 - Estimated percentage of people aged 60 years and over with frailty by sex, age group, area and year, NHS Highland



Source: Gale et al.[42] and National Records of Scotland[43,44]

Dementia is another important consideration in older age. The prevalence of dementia increases markedly with age[45]. The result of an older population is that, on average, more people can be expected to have dementia. In the NHS Highland area, around 6,600 people are currently affected by dementia[46], and this is likely to increase to around 8,000 people by 2026, and over 10,000 people by 2036 (Figure 2.21).

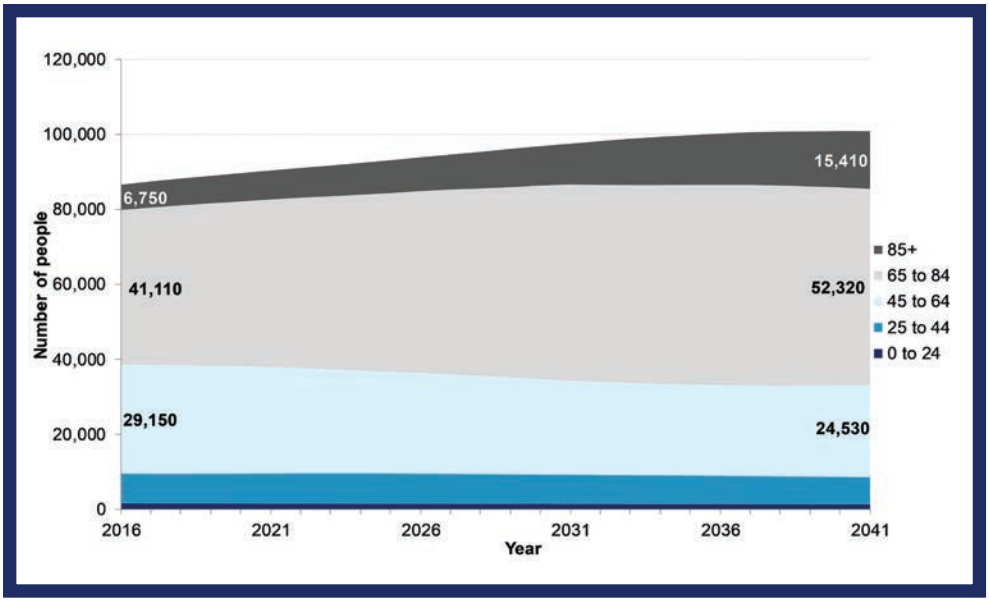
Figure 2.21 - Projected number of people aged 65 and over with dementia by age group, NHS Highland, 2016 to 2041



Source: Alzheimer Europe[47], Harvey[48] and National Records of Scotland[44]

The number of people with multiple health problems also increases with age so, as with dementia and frailty: 81% of people aged 85 years and over have more than one long-term health condition, compared to 30% of people aged 45 – 64 years[49]. The increase in the number of older people is expected to result in a doubling of the number of older people with multimorbidity by 2041 (Figure 2.22).

Figure 2.22 - Estimated and Projected number of people with multimorbidity by age group, NHS Highland, 2016 to 2041



Source: Barnett et al.[48] and National Records of Scotland[44]

Developing a NHS Highland dementia strategy

In NHS Highland our aspiration for people affected by dementia is to access timely, skilled and well-co-ordinated support from diagnosis to end of life. To achieve this aspiration a working group has been convened drawing on the expertise and interest from those with dementia, carers, organisations that provide care, Highland Council, Argyll and Bute COuncil, the NHS, Public Health and those delivering Education.

We estimate that in NHS Highland there are at least 6,600 people living with dementia and that there is potentially many more that have not sought or received a diagnosis. Age is the most important risk factor and it is estimated that the risk of dementia doubles every five years after the age of 30. By 2026 it is predicted the number of people with dementia in NHS Highland will be an estimated 8,000. We also know that the population is projected to age considerably as the numbers of older individuals make up proportionality larger shares of the population over time[45]. Simply put this means for each year there are increasing numbers of people who are dependent on a smaller working age population.

Services must continue to adapt in response to the increasing number of people with dementia and the shifting culture of care towards home and the community. The third national dementia strategy published by the Scottish Government in 2017[50] provides a framework to help progress this shift in culture.

The working group has developed a draft strategy[51] based on the national outcomes and is currently working on gathering information about the current situation. Once this information has been compiled there will be a series of workshops to encourage other partners to contribute.

Summary

- After decades of improvement in life expectancy, improvements have stalled and even reversed.
- The number of deaths attributed to dementia has increased to be the third largest cause of death in the NHS Highland area, after cancer and cardiovascular disease, and ahead of stroke. The number of people with dementia will increase by almost two-thirds by 2041, with a major impact on service requirements.
- Rates of cancer have decreased slightly, but because there are a greater number of older people, the number of people diagnosed will increase. Many of the people diagnosed can expect to live for years after diagnosis. This means services will need greater diagnostic and treatment capacity, and that increased methods of support will be required over the next decade.
- Type 2 diabetes has increased, and is predicted to continue to increase, if existing risk factors remain unchanged, placing an additional load on NHS services.
- There are likely to be substantial increases in the number of frail people, people with dementia and in older people with multiple conditions. This is likely to result in a substantial increase in the number of people who will be very dependent on care.

Chapter Three -
Societal Inequity in Health

There has been significant progress made in improving the health of our population in recent years and people are living longer. However, the difference between those groups with the best and worst health in Highland, like the rest of Scotland, persist and may be worsening. This section of the report provides an overview of societal inequities in health in NHS Highland, and highlights examples of work that targets action across a broad range of determinants of health.

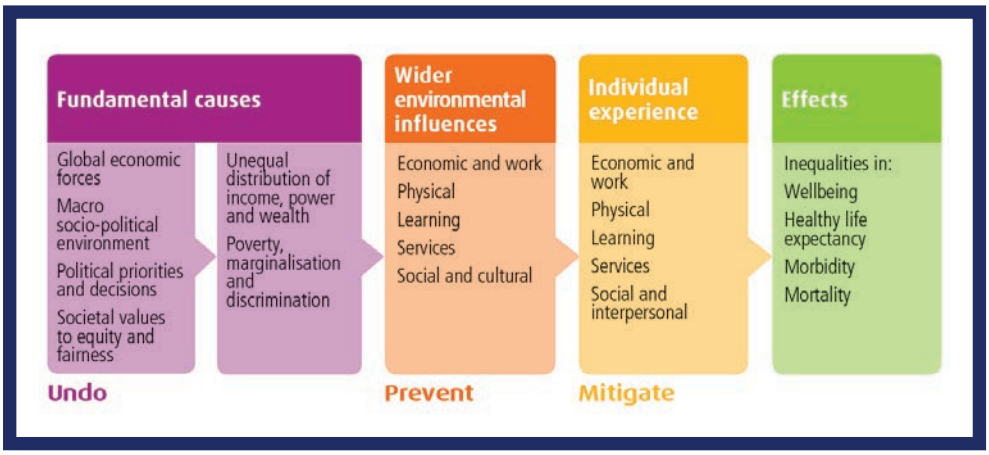
What are societal inequities in health?

There is a debate in public health over the use of two overlapping terms - societal inequities in health, which approach the issue from the perspective of justice, and health inequalities, which perhaps has greater emphasis on variation. The latter is open to the critique that mathematical variation is intrinsic to the distribution of any measurable phenomenon.

NHS Health Scotland define health inequalities as the "unjust and avoidable differences in people's health across the population and between specific population groups"[1]. Societal inequities can occur by gender, income, deprivation, ethnicity, disability, and geography and other factors[2]. Societal inequities are not caused by one single issue, but the result of a complex mix of factors which play out in local areas and generate a social gradient[3].

NHS Health Scotland highlights a cause of societal inequities as an unequal distribution of income, power and wealth. This can lead to poverty and marginalisation of individuals and groups, and affects the distribution of wider environmental influences, such as good housing, work and education. In turn, these influences can shape individual experiences, for example of poverty, discrimination, poor housing, and access to services. The effects are systematic differences in health outcomes across the life course (Figure 3.1).

Figure 3.1 - Health inequalities: theory of causation



Source: Reproduced with kind permission from NHS Health Scotland

Societal inequities have been documented across different population groups in a number of inter-related dimensions: socio-economic status and deprivation, geography and place, and vulnerable and disadvantaged groups, for example, homeless people and people living in prison. Examples of population groups who are known to experience health inequalities are shown in the following content.

Population groups considered for health inequalities

Protected characteristics	Socio-economic deprivation	Geography and Place	High-risk individuals
e.g. age, sex, disability, gender reassignment, race, pregnancy & maternity, religion or belief, sexual orientation	e.g. poverty, unemployment, low income, multiple deprivation	e.g. urban, rural and island communities and neighbourhoods	e.g. homeless people, people living in prison, people with problem substance use, people with mental health problems

It is important to recognise that a range of factors determine people's health, including genetic inheritance, social circumstances, behavioural patterns and the health care individuals receive[4]. The risk factors reflect not only the choices that people make in life but also the ways in which choices are shaped by people's social circumstances such as employment, education, housing, income, relationships and communities. It is clear that 'lifestyle' or 'behavioural' risk factors need to be seen within the context of where people live and the opportunities they have for health and well-being.

Actions to reduce societal inequities and improve everyone's health and wellbeing by promoting and supporting healthier lives from the earliest years are central to the Scottish Government's Health and Social Care Delivery Plan[5]. The Delivery Plan shaped the Public Health priorities for Scotland, published by the Scottish Government in 2018[6].

Public Health Priorities for Scotland

Source: Scottish Government[6]

The NHS Highland public health team have aligned inequalities work to five key drivers for action:

- Assess the impact of all our work on identified target groups and communities
- Take action to reduce inequalities by undoing the root causes and preventing environmental consequences in life circumstances
- Support communities to identify what is important to them and to develop solutions
- Challenge inequity and discrimination and support people to have their voice heard
- Identify those most at risk and target our work and services accordingly.

Equality Impact Assessment (EQIA) process

Under the Equality Act 2010 public sector organisations must assess their policies and practice, proportionately, to reduce inequality. The Fairer Scotland Duty 2018 introduced a new duty on organisations to produce written assessments showing how they have shown 'due regard' to reducing inequality caused by socio-economic disadvantage.

Equality impact assessment is a practical tool used by many public sector organisations to analyse policy and practice to identify any adverse impacts that might occur as a result of changes or decisions.

Using this framework helps organisations consider who might be impacted and whether any groups of people might be impacted disproportionately both positively and negatively. It also encourages organisations to engage with stakeholders and provides an opportunity to address any potential consequences.

Partnership work to reduce poverty

Welfare Support

Increasing uptake of welfare benefits can make a big difference to individuals and families who are struggling to make ends meet and can make a difference to their capacity to engage in healthy behaviours and play an active part in their community. Work is underway with local authorities to facilitate the roll-out of welfare advice within primary care settings. As of July 2019, this has resulted in providing advice sessions in six GP practices. These sessions provide a method for patients and their families to be signposted to advice and support around benefit eligibility and access to income maximisation services. An event is also planned in Raigmore hospital for staff to receive the same access to Citizens Advice Bureau, Home Energy Scotland and the Welfare Support Team. If this proves successful the intention is to make it more widely available to staff elsewhere in the organisation.

Department of Work and Pensions

Work is underway with job centres to develop an initiative that aims to increase the number of opportunities for health conversations through developing the role of work coaches. Work coaches support clients, and move them forwards towards employment with the recognition that this might not be a feasible outcome for some. A health and wellbeing questionnaire is being piloted to give work coaches a structure to have a conversation and advise on support services clients can assess. As work coaches have on-going conversations with individuals, there is an opportunity for a follow-up conversation and support.

To date, the pilot has identified anxiety/stress and loneliness/isolation as the top concerns for clients. Through developing robust pathways and engaging with support agencies, this initiative provides opportunities to access vulnerable groups who are disproportionately at risk of poor health outcomes[7].

Highland Affordable Warmth Partnership

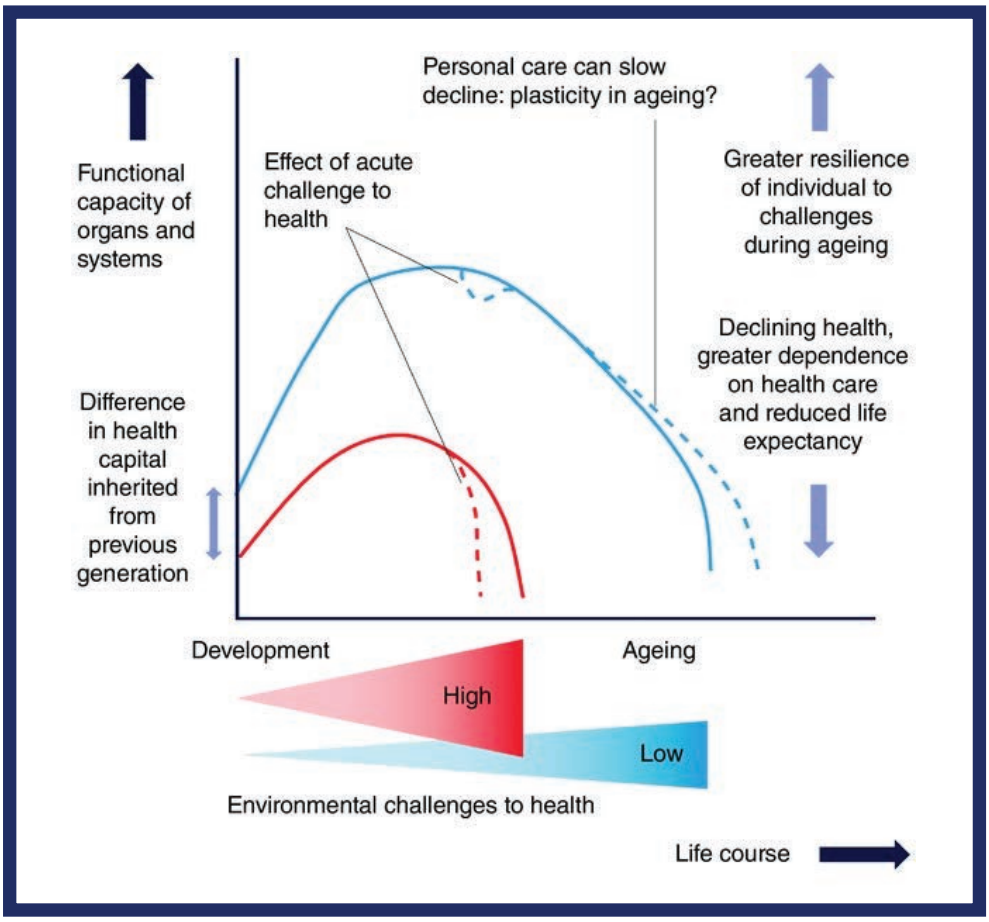
Living in fuel poverty and cold housing impacts directly and indirectly upon physical and mental health and wellbeing[7] and housing is an important determinant of health. The Highland Affordable Warmth Partnership undertakes work to support fuel poor households. A recent pilot project is underway in Sutherland where NHS Highland staff make referrals to Home Energy Scotland. This initiative is now being considered in other areas. It is an important example of where NHS services can work with partners to mitigate the impact on health and wellbeing of the wider determinants of health.

Life course perspective to societal inequity

Societal inequities begin before birth, can adversely impact health throughout adult life, and can persist across generations[8,9].

In the model below income impacts on two average hypothetical trajectories by comparing the functional capacity of organs and systems (such as the circulatory or respiratory systems) in individuals from low (red) and high (blue) income settings (Figure 3.2)[10].

Figure 3.2 - Developmental model of a life course for people from low (red) and high income settings (blue)



Source: Reproduced with kind permission from Hanson M, Cooper C, Sayer A et al.[10]

The next section of this chapter provides examples of health inequalities in NHS Highland. There is a lack of comprehensive data for many aspects of health inequalities[11]. The examples mainly concentrate on socio-economic deprivation using the Scottish Index of Multiple Deprivation.

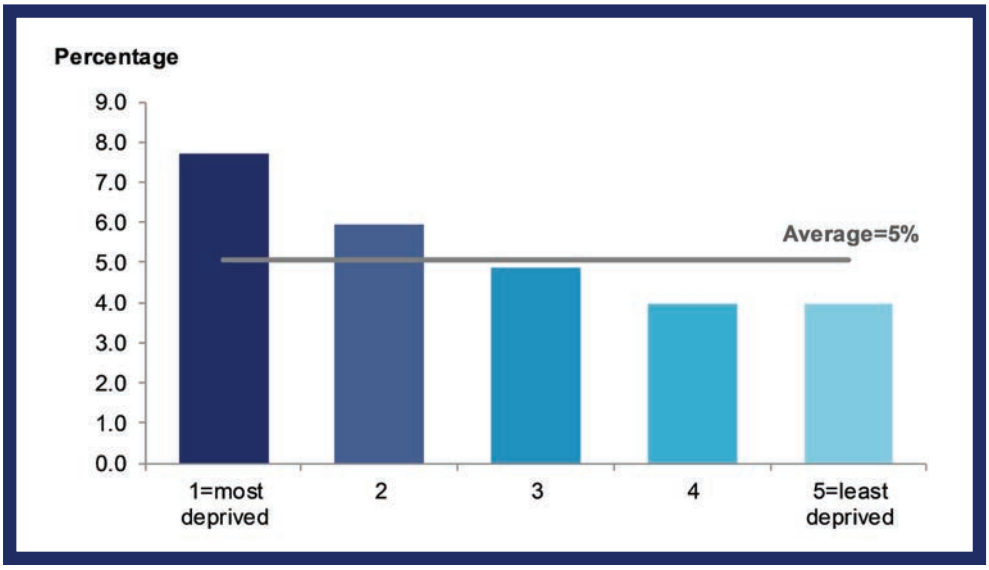
Social stratification in healthy early childhood development

The adverse circumstances that lead to increased risk of chronic disease and early mortality can begin during gestation and continue throughout childhood and onwards. The social circumstances in which parents live can be a barrier to healthy choices and behaviours that result in less optimal child development[12]. Importantly the literature does not suggest that inequalities in outcomes are inevitable, but rather that for the majority, outcomes can be improved[13].

Poor maternal nutrition and health behaviours such as smoking, drinking and substance misuse can impact on the likelihood of having a baby whose weight is outside either ends of the ideal birth weight range. Both low and high birth weights are associated with an increased risk of childhood obesity, diabetes and cardiovascular disease later in life[12].

As in the rest of Scotland, low birth weights are more prevalent in more disadvantaged socio-economic groups than in more advantaged groups in NHS Highland (Figure 3.3).

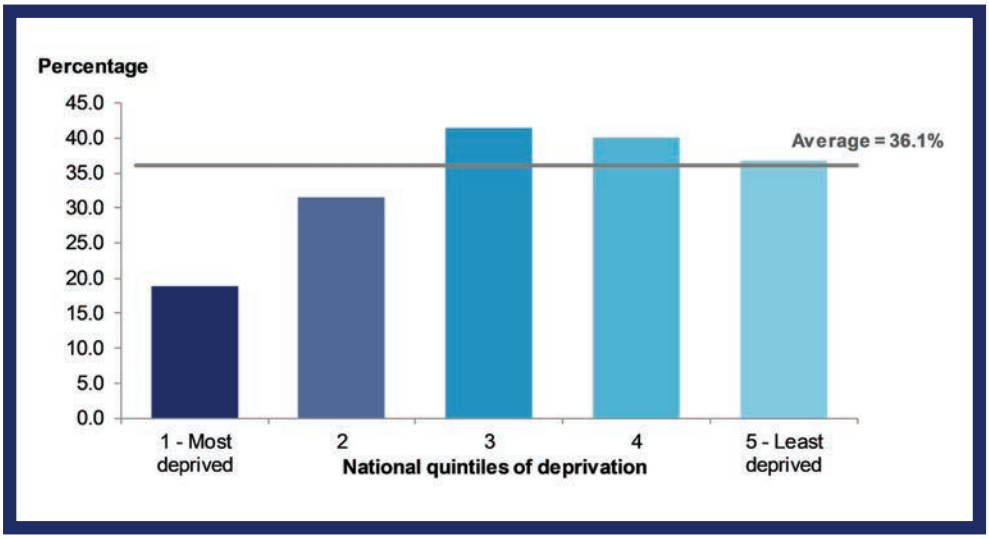
Figure 3.3 - Percentage of low birth weight births (<2,500g) of singleton births by national quintiles of deprivation in NHS Highland, 2016/17 – 2018/19



Source: Scottish Morbidity Recording (SMR02) and Scottish Index of Multiple Deprivation 2016

Breast feeding has a positive impact on later health outcomes, but is less common in more deprived areas (Figure 3.4).

Figure 3.4 - Children born in NHS Highland between April 2018 and March 2019 exclusively breastfed at time of 6-8 week review



Source: Child Health Systems Programme Pre-School and Scottish Index of Multiple Deprivation 2016

Breastfeeding

Breastfeeding saves lives, improves health and cuts costs. There is strong evidence that breastfeeding protects children from a range of illnesses including infections, diabetes, asthma, heart disease and obesity as well as sudden infant death syndrome (cot death)[14,15]. It has also been shown to have a positive impact on the brain development of babies. In addition, prolonged breastfeeding protects mothers from breast and ovarian cancers and lowers postmenopausal risk for heart disease[14,16]. Breastfeeding also supports the mother-baby relationship and the mental health of both baby and mother.

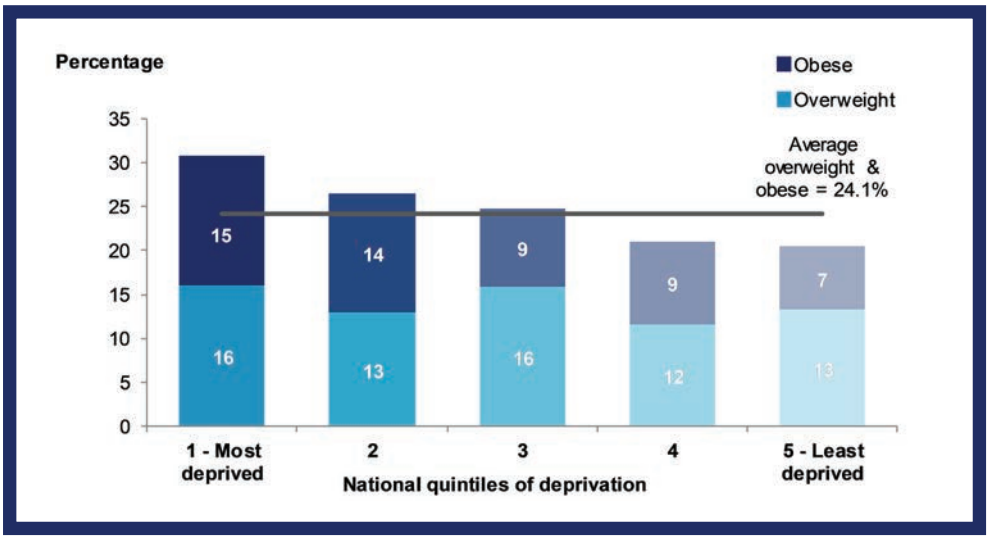
The benefits are seen in both high and low income countries. A 2016 study found that increasing breastfeeding rates around the world to near universal levels could prevent an estimated 823,000 deaths in children younger than five years and 20,000 maternal deaths from breast cancer every year[14].

Eight out of ten women stop breastfeeding before they want to, which is having a serious impact on the future health and wellbeing of babies and their mothers.

NHS Highland is working to embed the UNICEF Baby Friendly Initiative Standards to protect and support women in Highland to make a fully informed choice and when they choose to breastfeed, support them to do so. The standards also help to create an environment that supports staff to help women make informed choices and deliver a high standard of support for breastfeeding through provision of training, resources and other tools.

By the time children start primary school one in four are overweight or obese[17]. The prevalence of obesity in primary 1 children is higher in deprived areas of NHS Highland (Figure 3.5). This highlights how early in a child's life differences in obesity can result in greater risk of cardiovascular disease and diabetes in later life.

Figure 3.5 - Percentage of NHS Highland children in primary 1 epidemiologically classed as overweight or obese by national quintile of deprivation, school year 2017/18



Source: Information Services Division (ISD). Body mass index of primary 1 children in Scotland. School Year 2017/18.

Child Healthy Weight

The target set by Scottish Government is to halve childhood obesity by 2030 and to significantly reduce diet-related inequalities. This requires a strong focus on prevention, including approaches to influence and shape the food environment where children live, learn and play. This includes not just their home but also early years and childcare settings, schools, shops and retail premises.

The early years is a critical time for establishing good nutrition and healthy eating habits to reduce the likelihood of children becoming overweight or experiencing obesity in later life. Like adult healthy weight services, a tiered approach is advocated. The interventions promote best practice in relation to child healthy weight including body confidence and eating well for children aged one to five years. A range of resources has been developed, including online training modules, professional guidance, and resources for families and professionals working with families.

Poverty and child health

There is good evidence that babies, children and young people living and growing up in low-income households experience many disadvantages which can have negative consequences throughout their life.

Poverty is defined in either relative or absolute terms[18]. Absolute poverty is when someone does not have enough money to meet basic needs such as food, shelter and clothing. In recent years it has been widely accepted that poverty is relative to the place and time you live in. Most official definitions of poverty use relative income to measure who is in poverty. An income threshold is set and those who fall below it are viewed as being 'in poverty'. The key UK government measures take 60 per cent of median income as the 'poverty line'.

The mathematical weakness of this approach is that it is more influenced by the income of the wealthiest than by initiatives to bring up the income of the poorest in society.

NHS Highland along with local authority partners in Highland and Argyll and Bute are tasked with developing a child poverty action report that sets out activities that have been undertaken during the previous year to reduce child poverty and contribute to the delivery of national child poverty targets and outline planned future activities. Public sector agencies need to ensure that families are sufficiently supported financially, emotionally and in terms of employment and benefits rights to promote good health in the early years that will have a positive impact later in life.

Child poverty, health impact and health inequalities

Poverty has negative impacts on children's health, social, emotional and cognitive development, behaviour and educational outcomes.

Poverty puts an additional strain on families, which can lead to parental mental health and relationship problems, financial problems and substance misuse. This can have a negative impact on parenting behaviours, which in turn impact on children's outcomes. Disadvantaged adults may have an increased risk of their own children experiencing poverty.

Children born into poverty are more likely to experience a wide range of health problems – including poor nutrition, chronic disease and mental health problems – than those born into more affluent families.

Inequalities in screening uptake

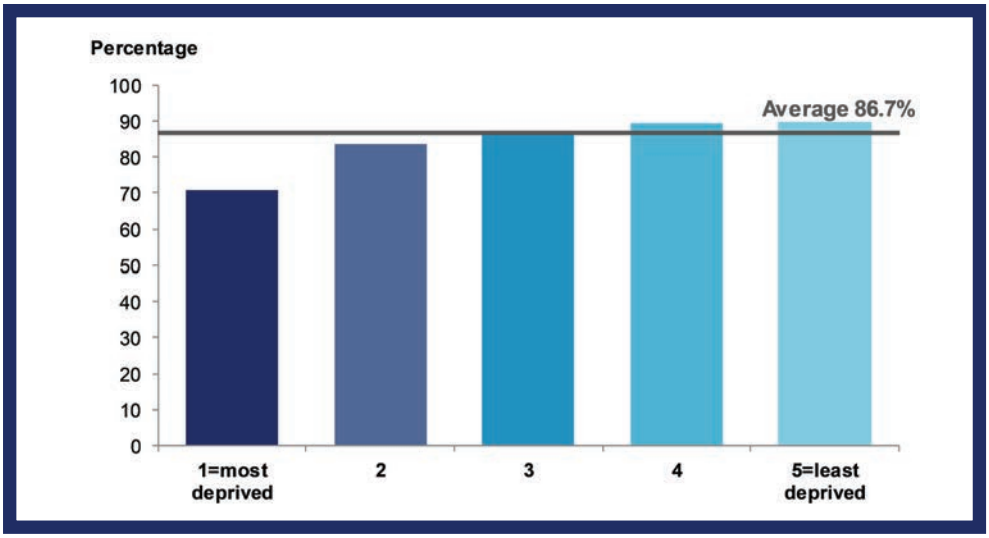
Screening programmes identify apparently healthy people who may be at increased risk of a disease or condition, enabling earlier referral, diagnosis, treatment and informed decisions about care[19].

Some of the conditions targeted by population screening disproportionately affect individuals from deprived backgrounds[20,21]. Screening programmes therefore have an important role to play in reducing health inequalities.

Overall participation in national screening programmes across NHS Highland is relatively high, but significant variation exists, with people living in the most deprived communities least likely to take part in screening. Reducing variation in screening participation therefore has an important role to play in reducing societal inequity in incidence and outcomes associated with the conditions being screened for.

The Scottish abdominal aortic aneurysm (AAA) screening programme aims to reduce deaths associated with aneurysm rupture among men aged 65 and over by identifying aneurysms early so that they can be monitored or treated. The screening test is a simple ultrasound scan of the abdomen which takes around 10 minutes. Analysis by deprivation category (SIMD 2016) shows that men experiencing social deprivation are less likely to attend and participate in screening (Figure 3.6).

Figure 3.6 - Percentage of NHS Highland men offered AAA Screening who are tested before age 66 years and 3 months of age; by national quintile of deprivation measured by the Scottish Index of Multiple Deprivation 2016 (SIMD 2016) (Year ending 31 March 2018)



Source: Information Services Division[22]

Actions to reduce undue variation in AAA screening

Researchers from the Scottish AAA Inequalities Project Group published a systematic review of factors influencing attendance at screening and interventions to reduce inequalities that recommended[23]:

Once men have been invited for screening it may be useful to provide extra support and personal reminders to those less likely to attend. Services should give increased consideration to travel time to clinics, particularly for men less likely to attend, and public transport use.

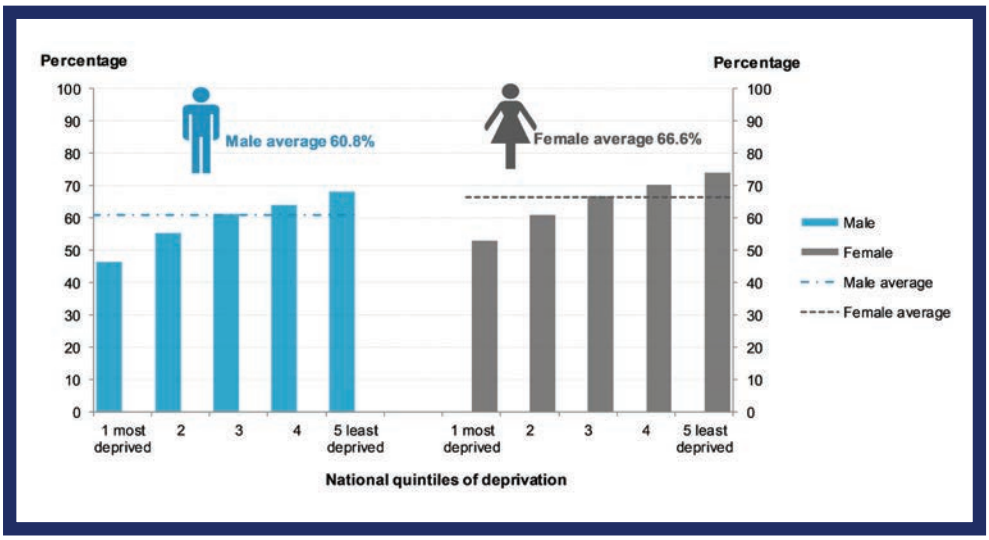
It may help to work alongside colleagues who share an interest in improving men's engagement with healthcare. For example, services may be able to use times when men attend other health or social care services, such as GP or acute hospital services, to discuss screening.

Interventions to reduce inequalities implemented locally should be evaluated and the results widely disseminated, so effective interventions can be implemented elsewhere and ineffective ones can be stopped.

Bowel (colorectal) cancer is the third most commonly diagnosed cancer in both men and women in Scotland with the majority (95%) of cases occurring in people over 50 years of age. It is the second most common cause of cancer death for men and women[24].

Bowel screening can help pick up early stage bowel cancer in men and women who have no symptoms. Treatment at this stage is usually very effective. In the most recent two year period of report the overall uptake in men and women in NHS Highland was 63.7% (men 60.8% and women 66.6%). The greater uptake in females is consistent across Scotland. Analysis by deprivation category (SIMD 2016) shows a clear deprivation gradient with greatest uptake of screening in the least deprived quintile to the lowest in the most deprived quintile for both males and females (Figure 3.7)[25].

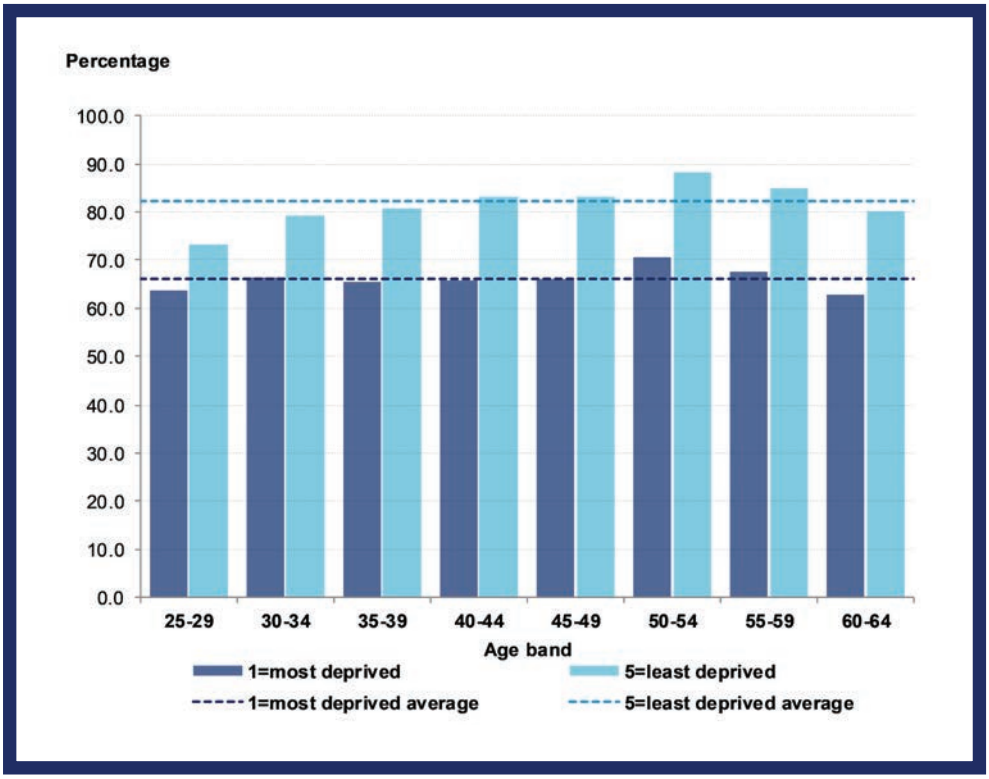
Figure 3.7 - Overall uptake of bowel screening by national quintile of deprivation (SIMD 2016) in NHS Highland



Source: Information Service Division27
Percentage of people with a final outright screening test result for which a valid postcode is available (invitations between the 1st of November 2016 and 31st of October 2018)

A similar social gradient is observable in the uptake of cervical screening (Figure 3.8). In the latest NHS Highland data for 2018-19 the uptake was 82.2% for women aged 25 to 64 years in the least deprived areas compared with 66.1% in the most deprived. The uptake is poorest in the youngest and oldest who live in the most deprived areas[26].

Figure 3.8 - Percentage uptake* of cervical screening in the most and least deprived quintiles of national deprivation in NHS Highland (SIMD 2016) by five year age band, 1 April 2018 to 31 March 2019



Source: Information Service Division[28]
*Uptake is age-appropriate based on being screened within the specified period (within the last 3.5 or 5.5 years for women aged 25-49 and 50-64 respectively)

The NHS Highland Public Health team plays a role in the organisation and oversight of local screening services and in engaging with communities to address barriers to participation that may further increase societal inequity. Factors shown to act as barriers to screening participation include low perception of risk, embarrassment, lack of knowledge and understanding about the process and benefits of screening, fear of screening test or diagnosis, and levels of trust in the service provider[27].

The Public Health team has worked to integrate these approaches into a number of targeted interventions and have been successful in implementing a number of projects aimed at reducing variation in screening participation.

Targeted interventions to reduce variation in screening participation in NHS Highland

Bowel - Implementation of a GP endorsement and reminder project aimed at increasing participation among individuals who have not taken up the opportunity to be screened after receiving their invitation. The initial findings have been encouraging.

Bowel – Development and delivery of a Peer Led Bowel Health and Screening awareness session designed for people with a learning disability.

Cervical - Successful implementation of pilot project to increase the accessibility of cervical screening for NHS staff.

All Screening – Development of a community "screening awareness volunteer" role and screening champion programme, with 7 volunteers trained to deliver key screening messages in the community.

This work, combined with targeted interventions to address the modifiable barriers to screening, supports NHS Highland in implementing Scottish Government strategy:

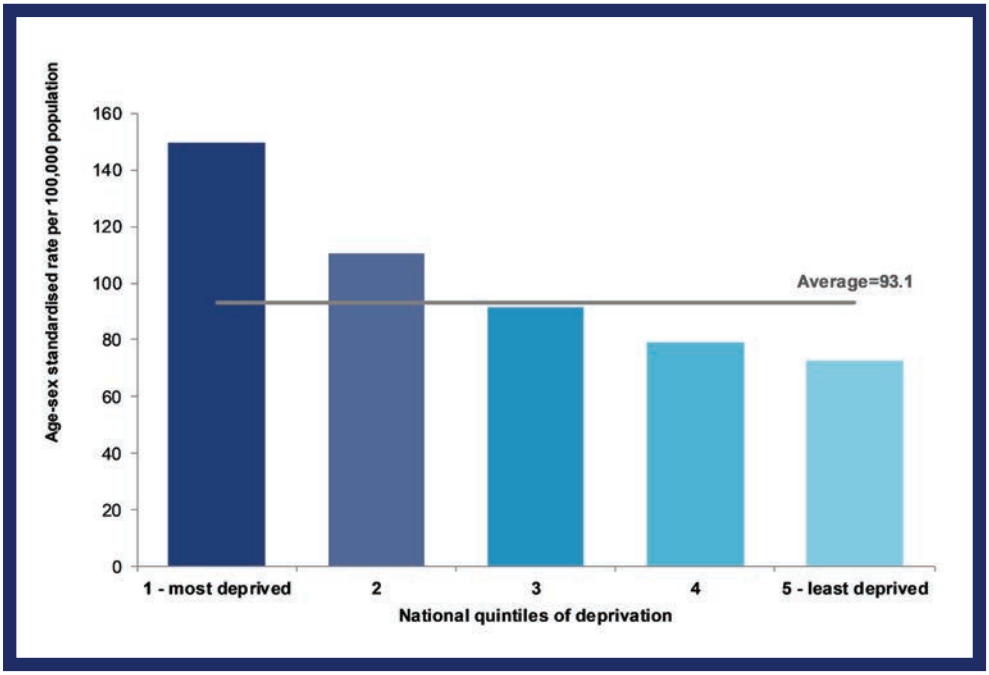
Beating Cancer: Ambition and Action[28] which outlines a commitment to act on inequalities in cancer outcomes by tackling equalities in access to screening.

The **Detect Cancer Early** programme[29] including "To improve informed consent and participation in national cancer screening programmes".

Deprivation and ill-health

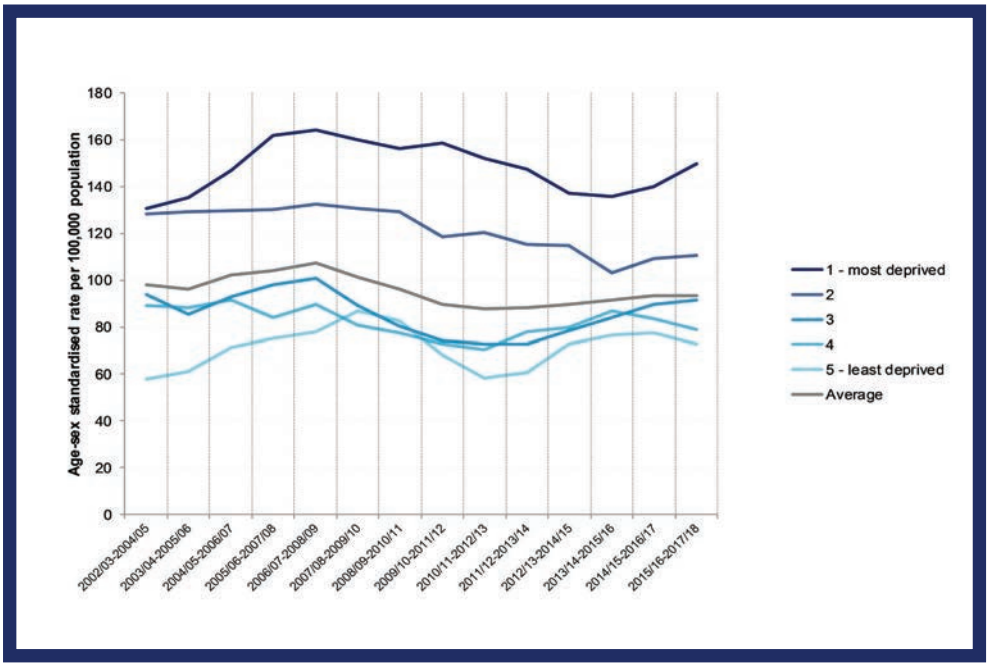
There are substantial gradients in emergency admission rates for asthma (Figure 3.9 and Figure 3.10) and Chronic Obstructive Pulmonary Disease (COPD) (Figure 3.11 and Figure 3.12). The trends suggest that the gap between deprived and more affluent areas in Highland has not narrowed.

Figure 3.9 - Patients hospitalised with asthma: NHS Highland, 2015/16 – 2017/18



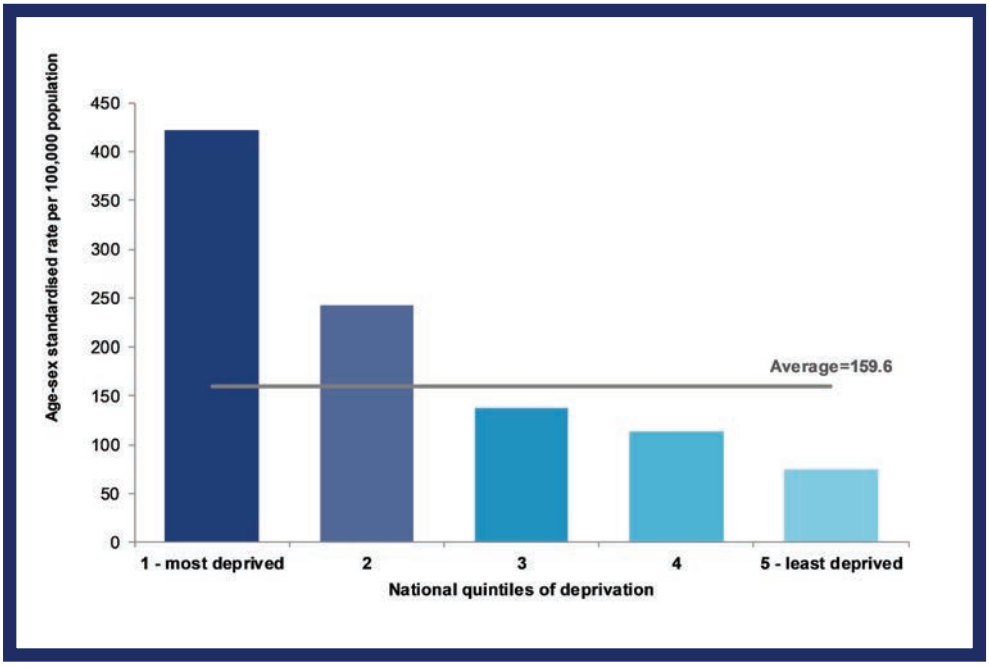
Source: Scottish Public Health Observatory[30]

Figure 3.10 - Patients hospitalised with asthma: change over time by deprivation group in NHS Highland



Source: Scottish Public Health Observatory[30]

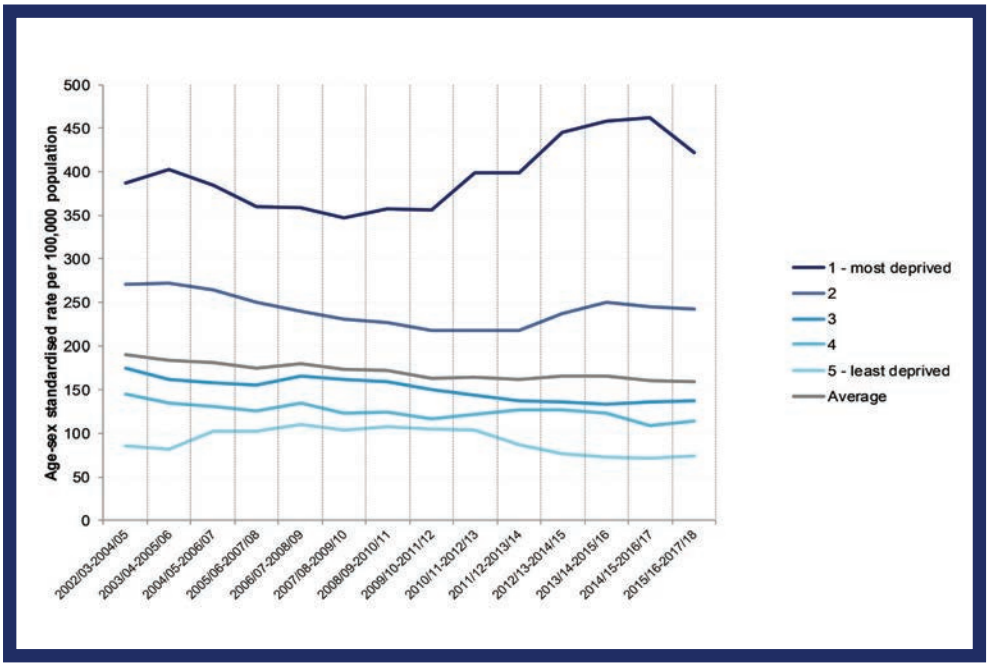
Figure 3.11 - Patients hospitalised with COPD: NHS Highland, 2015/16 – 2017/18



Source: Scottish Public Health Observatory[30]

Figures 3.10 and 3.11 show a marked social gradient for COPD.

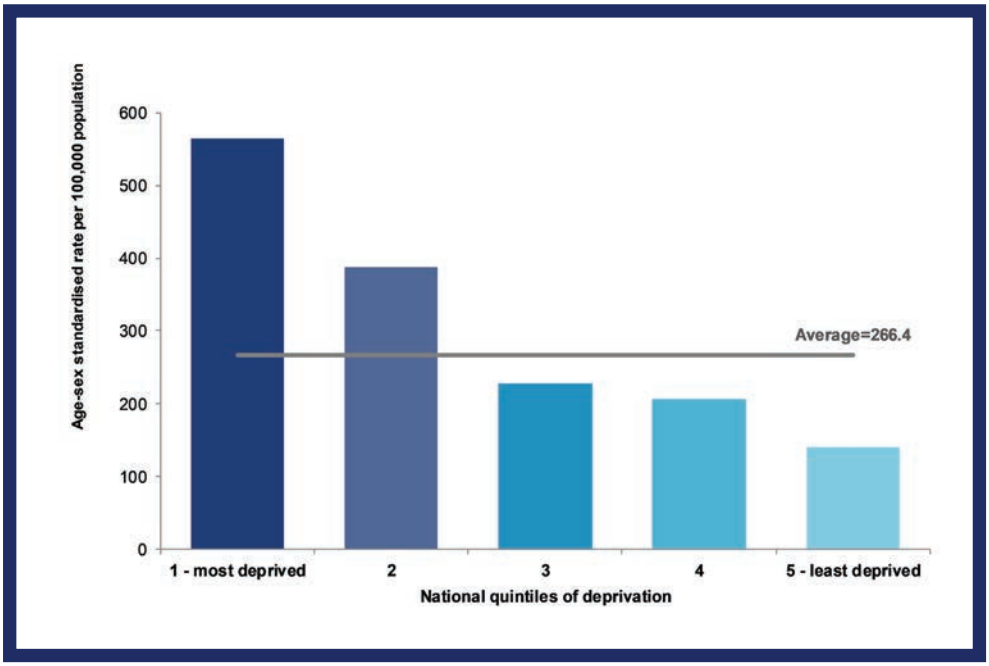
Figure 3.12 - Patients hospitalised with COPD: change over time by deprivation group in NHS Highland



Source: Scottish Public Health Observatory[30]

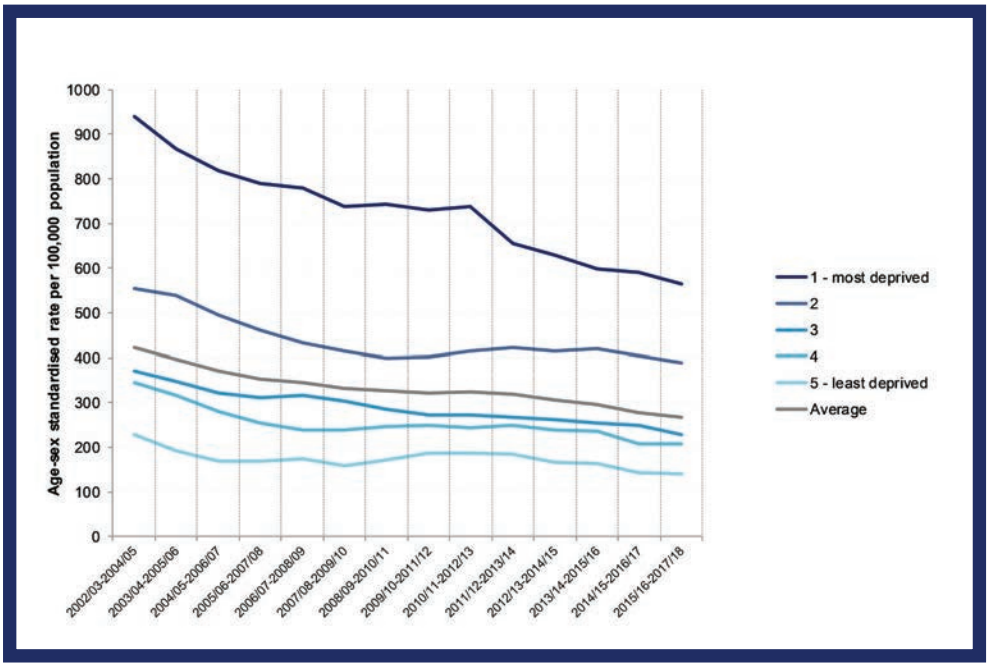
Mental health admissions show a similar social pattern (Figure 3.13 and Figure 3.14).

Figure 3.13 - Patients with a psychiatric admission: NHS Highland, 2015/16 – 2017/18



Source: Scottish Public Health Observatory[30]

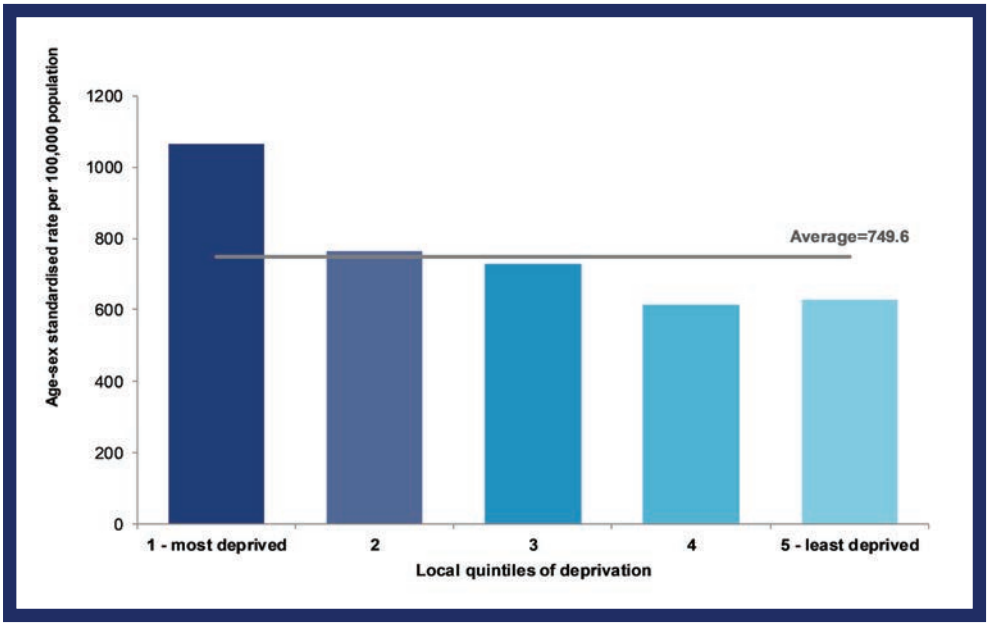
Figure 3.14 - Patients with a psychiatric admission: change over time by deprivation group in NHS Highland



Source: Scottish Public Health Observatory[30]

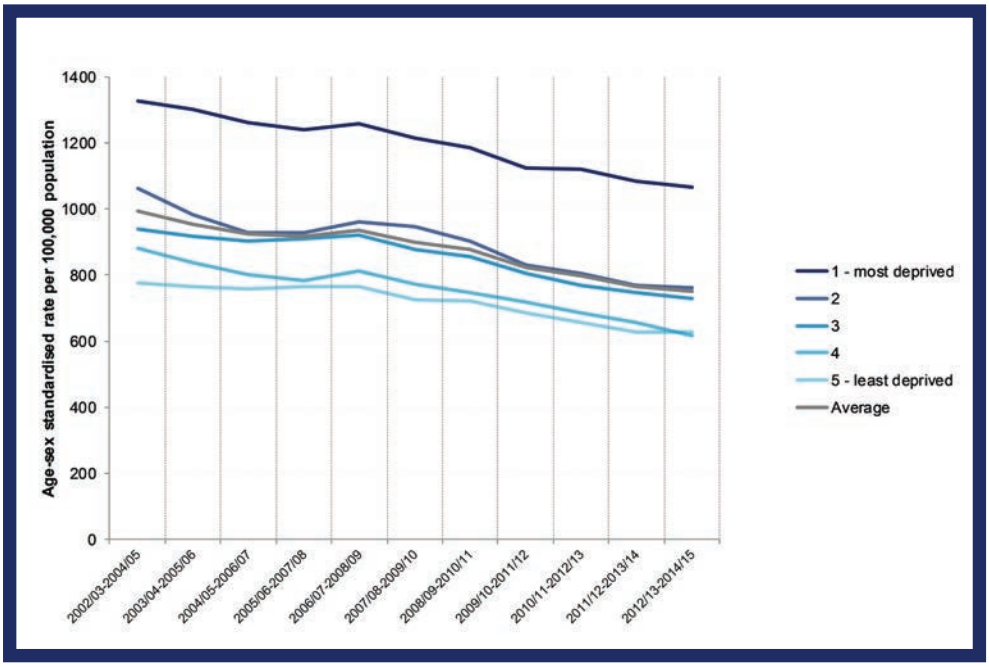
There are also substantial gradients in acute admissions for long term conditions which are identified, using a national classification, as potentially preventable (Figure 3.15 and Figure 3.16).

Figure 3.15 - Patients with a preventable emergency admission for a chronic condition, NHS Highland, 2015/16 – 2017/18



Source: Scottish Public Health Observatory[30]

Figure 3.16 - Patients with a preventable emergency admission for a chronic condition, change over time by deprivation group in NHS Highland

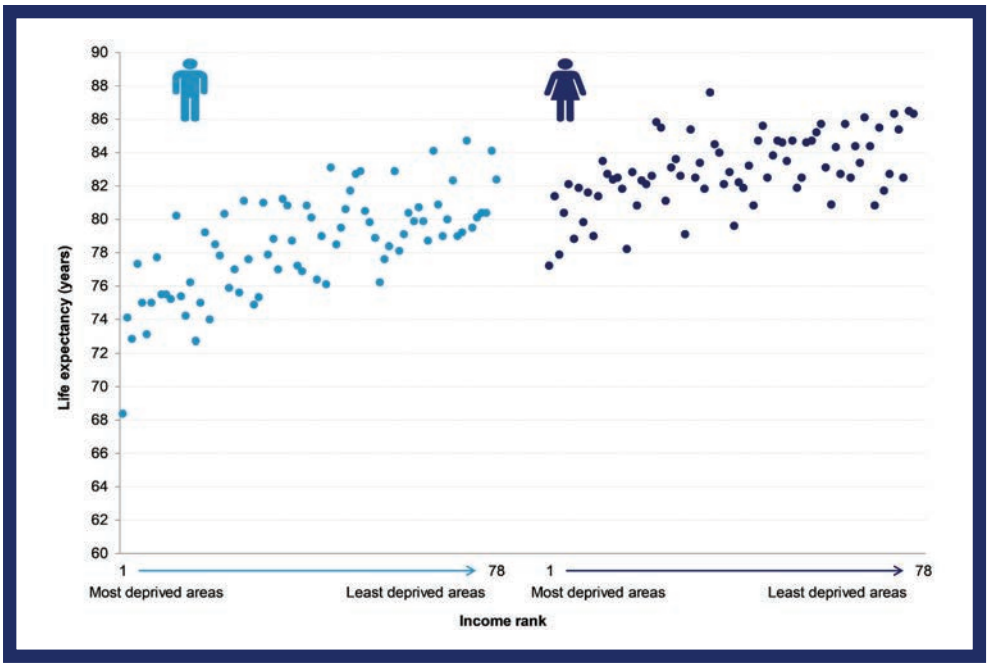


Source: Scottish Public Health Observatory[30]

Inequalities in life expectancy and mortality

Life expectancy varies markedly according to the deprivation levels in the areas people live. There are differences in life expectancy between the least and most deprived areas in Highland. The difference in average female life expectancy between areas with the best and the worst health is 10.4 years, and for men it is 16.3 years (Figure 3.17).

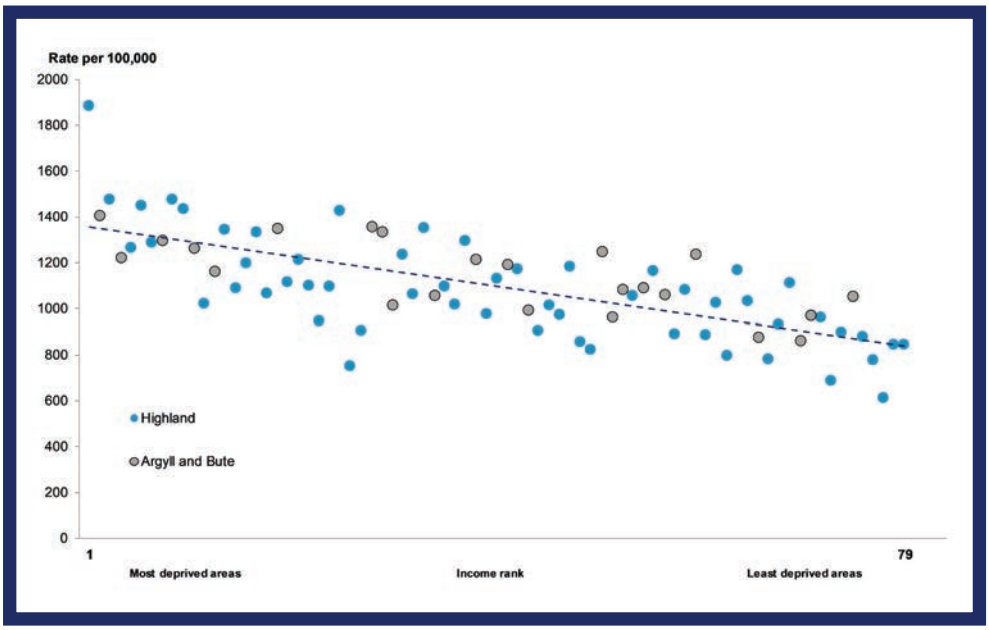
Figure 3.17 - Variation in life expectancy at birth (years) in the period 2013-2017 across NHS Highland intermediate geographies associated with income deprivation, for men and women



Source: Scottish Public Health Observatory[31] and Scottish Index of Multiple Deprivation 2016
Ranked in descending order of income deprivation, most deprived to least deprived (female values for Inverness Inshes and Inverness Drakies not shown due to small number of events in the five year period)

This reflects a clear gradient in death rates, adjusted for age and gender differences between areas (Figure 3.18).

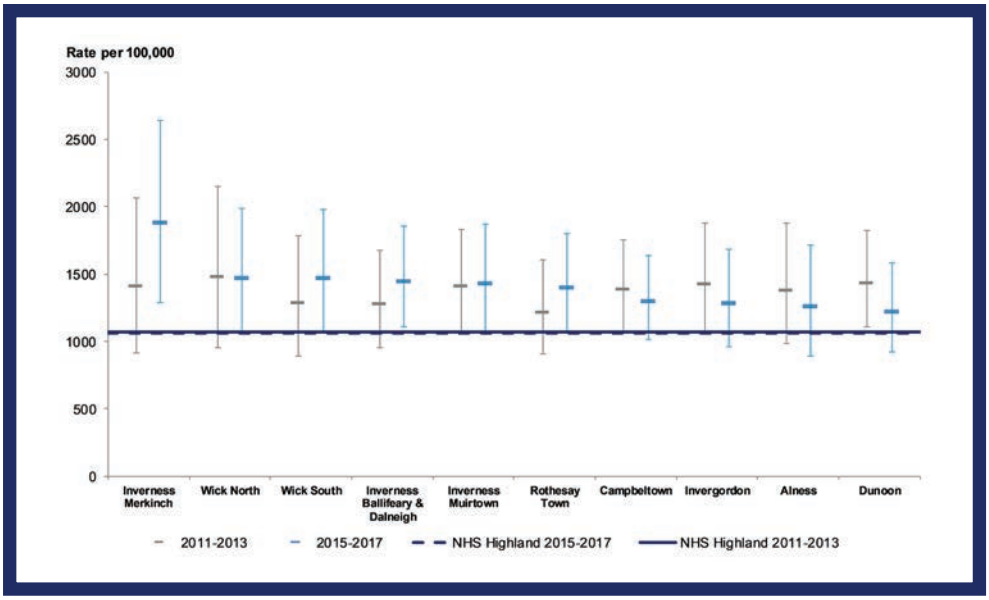
Figure 3.18 - Variation in age and sex adjusted all-cause (all ages) mortality rates per 100,000 population in the period 2015-2017 across NHS Highland intermediate geographies associated with income deprivation



Source: Scottish Public Health Observatory[31] and Scottish Index of Multiple Deprivation 2016

The death rates in the most deprived areas of Highland have been consistently high (Figure 3.19). The error bars in the chart represent the 95% confidence intervals, or the range which will contain the 'true' value of the indicator 95% of the time. Where the lower end of the confidence interval does not contain the overall NHS Highland rate, the difference between the two rates is considered to be statistically significant.

Figure 3.19 - Age and sex adjusted all-cause (all ages) mortality rates per 100,000 population in the periods 2011-2013 and 2015-2017 across the 10 most income deprived NHS Highland intermediate geographies



Source: Scottish Public Health Observatory[31] and Scottish Index of Multiple Deprivation 2016
The largest change is an increase in the mortality rate in Merkinch, Inverness between 2011-13 and 2015-17

Other Inequalities

This section provides some other examples of the impact of inequality on the health of population groups who are known to experience disadvantage.

- Scottish research examining differences in the health of ethnic groups in Scotland found that Gypsy/Travellers in Scotland had by far the worst health, reporting over three and a half times higher rates of 'poor general health' than their 'White: Scottish' counterparts[32].
- Existing evidence shows that health outcomes are generally worse for those who identify as lesbian, gay, bisexual and transgender (LGBTQI+) people compared to the rest of the population, with one in seven LGBTQI+ people (14%) in Scotland avoiding seeking healthcare for fear of discrimination from staff[33].
- The Institute for Health Equity highlights that some of the most vulnerable people in society - people with learning disabilities - die 15 to 20 years sooner on average than the general population, and are more likely to experience low incomes, poor housing, social isolation and loneliness, bullying and abuse[34].

Examples of initiatives to reduce inequalities

Languge interpretation and communication support

Communication difficulties can be a barrier for people whose first language is not English or for people who require communication support, for instance people who are deaf, hard of hearing, blind or deafblind. Reducing barriers to accessing services is an important aspect of improving population health. Between April 2017 to December 2018 NHS Highland provided interpretation for almost 8,000 health, care and support appointments. This includes the following commissioned services:

- Face to face interpretation of foreign language
- Telephone interpretation of foreign language
- Communication support – British Sign Language/English interpreters, lip speakers, note takers

Gender identity and orientation

NHS Highland's Public Health team have undertaken work to ensure that people who identify as LGBTQI+ feel valued and respected and have easy access to health services.

Supporting transgender staff in the workplace

NHS Highland has a protocol and guidance document which defines the term transgender and gender reassignment and clearly sets out NHS Highland's responsibilities as an employer of trans people and people who are undergoing a transitioning journey.

Gender based violence

Gender based violence is both a cause and a consequence of gender inequality and includes various forms of abuse such as sexual violence, domestic abuse, child sexual abuse, commercial sexual exploitation. Factors such as age, financial dependence, poverty, disability, homelessness, and insecure immigration status can heighten women's vulnerability to abuse or entrap them further in it. Experiencing abuse or violence as an adult or when a child can have a wide ranging effect on an individual's life. The impacts may be physical, psychological, sexual or a combination of these. Other impacts may include financial difficulties, becoming homeless or roofless[35].

NHS Highland introduced a Gender Based Violence Policy in 2017 which aims to support staff experiencing gender based violence, guide managers to respond and guides staff to use confidential contacts. Two training sessions have been held with the Human Resources Team to raise their awareness of gender inequality, its' impact and how to provide support and advice to managers who are supporting staff.

Tackling societal inequity and health inequality needs partnership work and actions across public policy areas alongside actions to specifically target disadvantaged groups and areas. An overview of work currently being undertaken to improve the health of people involved in the justice system is shown in the box on people in the care of the prison.

People in the care of the prison

Those living within a prison setting, in general, have poor health for a number of reasons such as socio economic disadvantage and lifestyle, and behavioural factors, for example, problematic substance use, smoking and poor nutrition[36]. There is evidence to show that many living in the Prison setting have been in the care system, have experience physical, emotional or sexual abuse and have difficulties forming and maintaining relationships. Levels of educational attainment are low and unemployment high. Furthermore, homelessness is common. In general this population group engage less with care services in the community but once in the Prison setting the demand can be high.

The recent 'Hard Edges Scotland' report described a five-dimensional profile of severe and multiple disadvantages (SMD) in Scotland[37]. The disadvantages are: domestic violence and abuse, homelessness, mental health, offending and substance dependency. The report highlights that people who are engaged in offending are also likely to experience overlapping experiences of problem substance use and homelessness.

Within NHS Highland, men in the care of the prison service are most likely to be incarcerated either in Inverness Prison or for men in Argyll and Bute they may be sent to Her Majesty's Prison (HMP) Barlinnie in Glasgow or HMP Greenock. HMP Inverness and HMP Barlinnie take men on remand or short term sentence's. HMP Greenock is a mixed Prison environment, and women and Young Offenders usually go to HMP & Young Offenders Institution Cornton Vale, in Stirling[38].

For those in the care of the prison the time spent can be an opportunity to improve their health and wellbeing, for example, engaging with services, and maintaining contact with families. These actions are important to support those in the care of the prison, particularly where there are multiple sentences, to break the cycle of offending[39].

Given the poor health of those in the prison setting, the Public Health Directorate is supporting a partnership to conduct a health and healthcare needs assessment. This work will be important for the ongoing improvement of health and health care services as well as contribute to developing services in the new prison due 2023. The Health Needs Assessment will be available from Spring 2020.

Key facts[40]:

- Scotland has one of the highest imprisonment rates in Western Europe although the prison population has fallen by 8% since 2011/12.

Those in the care of the prison service[40]:

- are predominately young, male, white and from disadvantaged backgrounds
- 76% tested positive for illegal drugs on admission to prison and 30% tested positive on release
- two in five reported being drunk at the time of their offence (41%), a decrease of 4% since 2013
- 72% smoke regularly
- 1 in 5 are estimated to be Hepatitis C positive

Figure 3.20 - HMP Inverness

Source: Reproduced with kind permission Scottish Prison Service[41]

Living Well

Argyll and Bute Health and Social Care Partnership's Living Well Strategy was launched in October 2019 and highlights the importance of self management, enablement and prevention. The strategy sets out our intentions to support people to live healthy and well lives in Argyll and Bute. The development process involved engagement activity with people, communities and our workforce. In total over 450 people were involved in the engagement process that then fed into the strategy and 5 year action plan. The 5 year action plan will link to several other current and relevant work streams to ensure more effective and joined up planning and delivery.

Four outcomes were identified from this engagement activity are the areas of focus for a 5 year action plan: "People" - people in Argyll and Bute have the tools and support they need to help them to Live Well; "Communities" - there are a wide range of local services to support people to Live Well; "Our Workforce" - staff are able and motivated to support the people they see to Live Well; "Leadership" - effective leadership to support delivery of Living Well Strategy.

Health and Wellbeing Networks

Health and Wellbeing Networks work to improving health outcomes of people living in Argyll and Bute. The eight networks enable:

- An opportunity for people to come together, network and share experiences and plans for health and wellbeing.
- Joint action planning for activity to make their local community better.
- Support local activity with the devolved health and wellbeing small grant funding.
- Partnership working between Community Planning partners and community members.

The past year saw the Networks exploring a new approach to investing grant funding by trialling a method called Participatory Budgeting (PB). This allows locals community members to score projects and to prioritise investment in activities that they value the most. Projects bid for funding in a short "Dragon's Den" style pitch and the audience votes for their top initiatives.

Summary

- There are important differences in rates of low birth weight babies, breastfeeding and childhood obesity between deprived and more affluent areas in Highland.
- The uptake of national screening programmes, such as abdominal aortic aneurysm, bowel, and cervical screening is lower in people from deprived areas in Highland.
- There are pronounced differences in admission rates for conditions such as asthma, COPD, and admissions to a psychiatric hospital.
- Higher rates of people from deprived areas in Highland are admitted to hospital with potentially avoidable exacerbations of long term conditions.
- There are substantial differences in life expectancy and death rates between deprived and more affluent areas in Highland. The life expectancy gap between areas of the Highlands is 16 years for men and 10 years for women.
- Tackling societal inequity and health inequality is not just down to Public Health staff or NHS Highland alone. It needs partnership work and actions across public policy areas alongside actions to specifically target disadvantaged groups and areas.

Chapter Four - Impact on Dependency and Care

Two key concepts affect the impact of the population changes presented in the earlier chapters: Compression of Mortality, and Compression of Morbidity[1].

Compression of Mortality

Some people die very young, while other people live into extreme old age. Average life expectancy can increase without markedly affecting this variation in mortality[2]. The aspiration for more people to live to older ages, and for the marked variance in life expectancy to decrease[3], is termed 'compression of mortality'. The alternative, whereby everyone, on average, lives longer, but with a continuation of the existing large spread in ages at death, is termed 'shifting mortality'.

Average age at death increased markedly in many countries in the twentieth century. For many years, this was driven by a decline in deaths at younger ages. This produced a reduction in the average variation in death rates, supporting the compression of mortality. After infant and child mortality improved, however, further improvements began to depend on improvements in survival in older age groups[4].

Figure 2.1 in Chapter 2 demonstrated that average life expectancy increased steadily for decades until recently. The differences in average life expectancy between different socio-economic groups have been tenacious (Figure 3.17 Chapter 3). Compression of mortality has not happened as much as was expected, a finding replicated in other countries[5].

Compression of Morbidity

Compression of morbidity is as aspiration for people to spend less time in a state of ill-health[6], whether or not as part of an increased lifespan. Increased lifespans, of themselves, do not necessarily result in compression of morbidity[7]. If people live longer, but disease onset happens at the same age as in the past, or the rate of improvement does not keep pace with improvements in life expectancy, then the period of life spent in ill-health can increase (known as 'extension of morbidity'). Alternatively, the period spent in ill-health could occur later in life, but be no shorter. This would result in people living longer, but spending the same length of time in poor health (known as the 'dynamic equilibrium' model)[8].

For compression of morbidity to occur, the population needs to have either or both:

- Lower rates of onset of disease.
- Increased recovery rates.

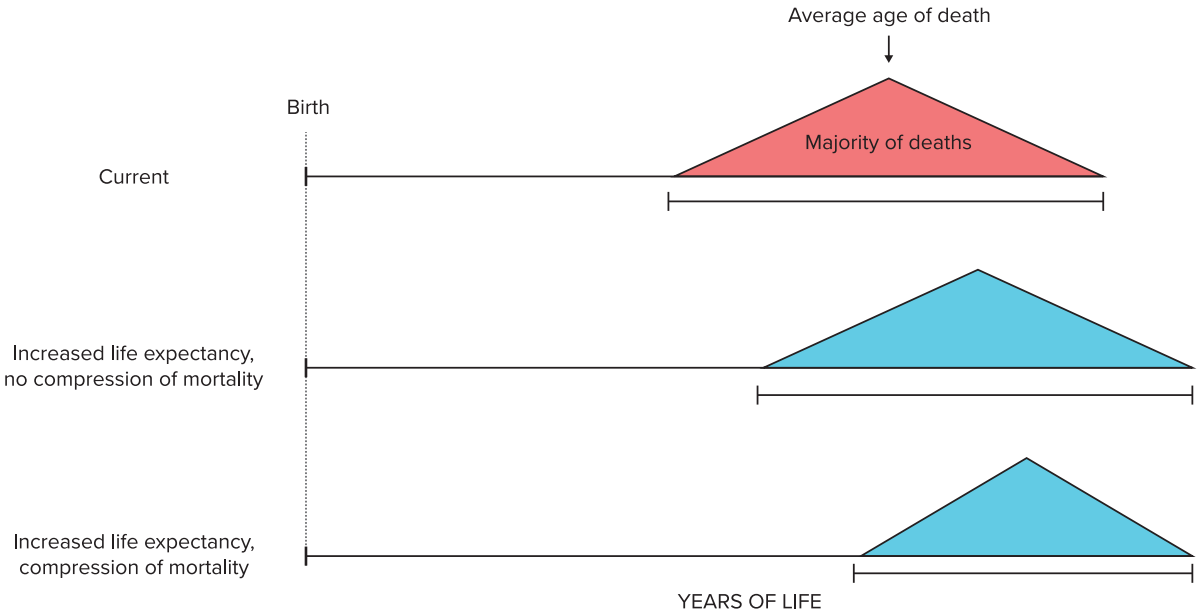
These changes then need to happen at a faster rate than increased lifespan, to avoid longer period being spent in a state of ill-health (termed 'extension of morbidity').

There is considerable debate about how these factors come together in different populations. Many international studies have not found convincing evidence of compression of morbidity[9,10,11,12] although findings vary between countries[13], and between study methods[14]. Analysis of data from Scotland by the Scottish Public Health Observatory (ScotPHO) found no persuasive evidence of compression of morbidity in either gender[15]. Overall, the time spent in a healthy state has tended to increase, but the percentage of life spent in ill-health has changed little or may even have increased in men in Scotland. There are uncertainties over estimates, and these are discussed in a detailed methods paper[16].

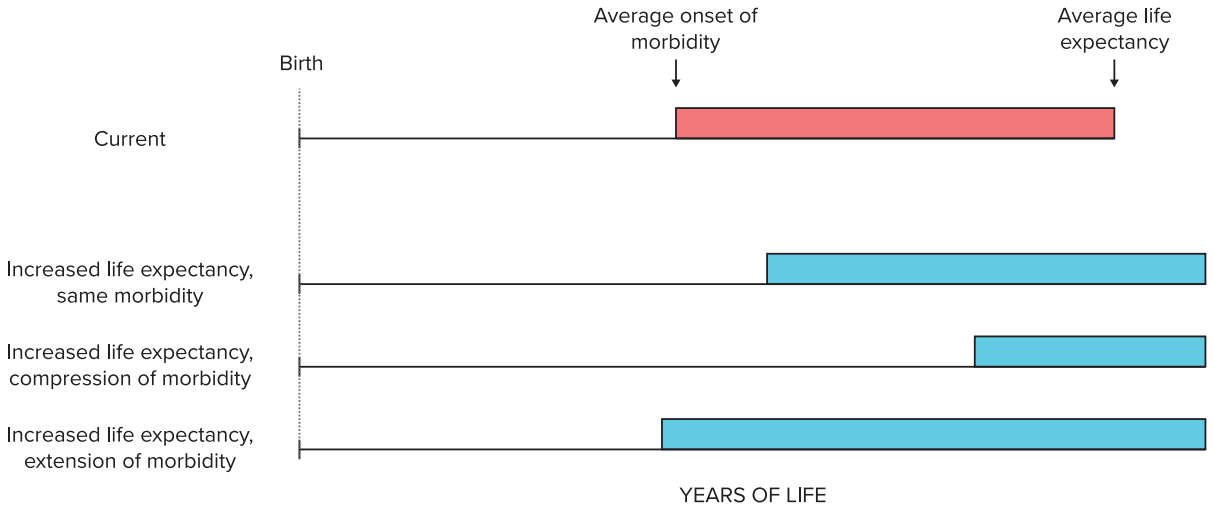
There are very substantial differences by deprivation status, with people in the most deprived areas, on average, both dying earlier and spending longer in a state of ill-health[17] before their death. In summary, there is some suggestion that fewer people live with very severe morbidity than in the past, but that more people live with moderate levels of disability, for longer periods[18,19]. Mental ill-health and distress may also be increasing[20].

Diagramatic representations of possible changes to morbidity and mortality

Diagramatic representation of possible changes to mortality



Diagramatic representation of possible changes to morbidity



Impact on Service Requirements

The effect of these competing trends – longer life but limited compression of morbidity, and the increase in the number of older people described earlier in the report, has important effects on service requirements. The reason the possible scenarios for morbidity described above matter in practice is that they produce different estimates of future service requirements.

The ScotPHO work cited above suggests limited evidence of compression of morbidity in Scotland, so it seems likely that many people will continue to live with long term non-communicable conditions[21] such as cancer, heart disease and the effects of stroke and dementia[22]. A considerable proportion of the cost of care for older people is associated with care around the time of death, and closer proximity to death is associated with higher care costs[23]. Multi-morbidity[24], dementia[25] and frailty[26] are also associated with higher costs of care, particularly in deprived communities[27,28]. There are, however, important opportunities to intervene, both to prevent illness, and to mitigate its effects on health, and on functional decline[29].

The Public Health implications of these trends are that the Highlands, like all parts of Scotland, needs to work to:

- Reduce the rate at which long-term health problems manifest, particularly in deprived areas.
- Reflect the greater requirements, and greater opportunities for health improvement, in deprived communities[30].
- Mitigate the impact of health problems through early detection and intervention.
- Create services and systems which adapt to long-term conditions, and allow people to function as well as possible, for as long as possible, promoting resilience and resilient systems[31,32].
- Ensure that health and social care systems are designed to support older people, who will often have multiple long-term conditions rather than one single illness[33].
- Communicate clearly to professionals and the public on the opportunities for managing functional decline[34].
- Consider how to best integrate end of life care[35].

Eco mapping

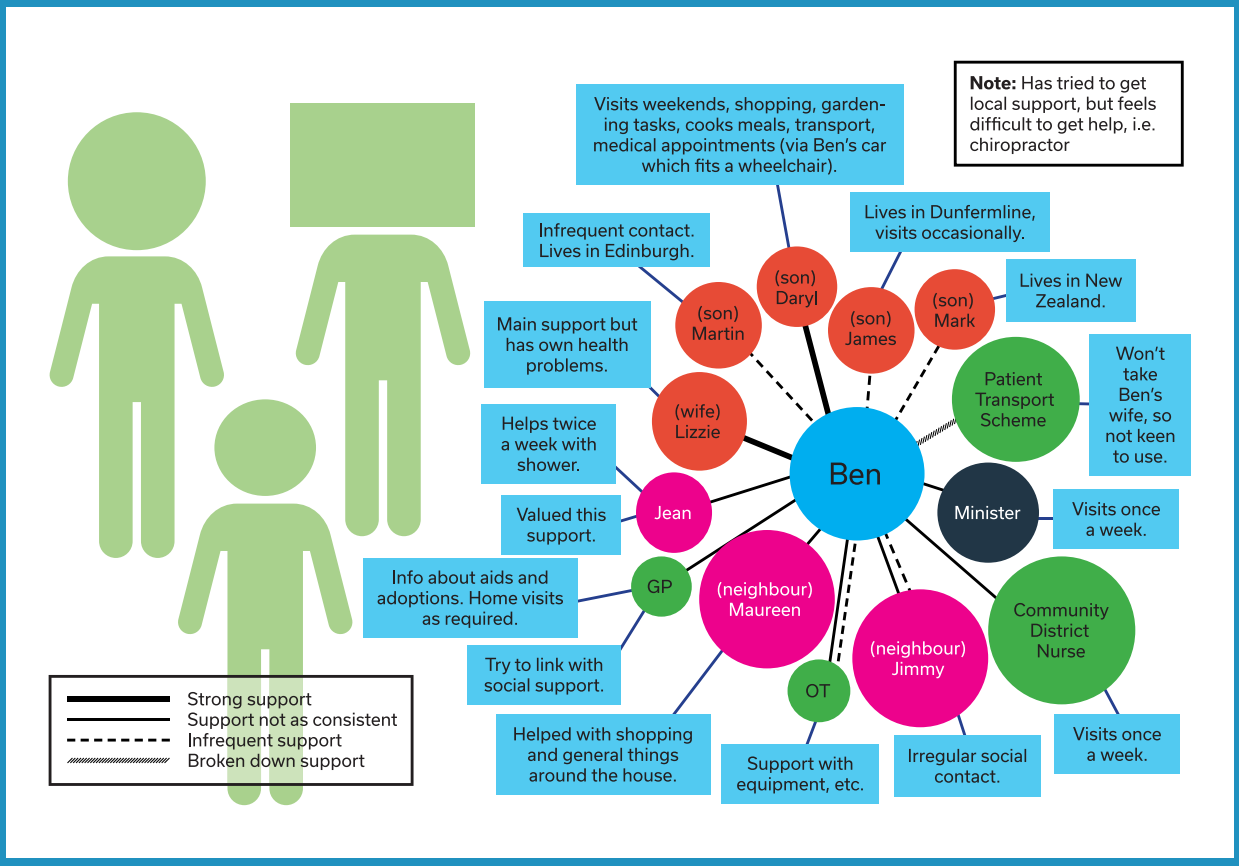
Our aging population and rural landscape puts ever increasing challenges on the adequate provision of health and social care services. People often have a network of support which when understood by practitioners can help to plan and co-ordinate efforts to ensure that patients have the right support to improve their health, manage their condition and maintain independence[36,37].

Eco-mapping is a tool that can help practitioners plan what support patients might need by addressing the person's whole network of support and therefore enhancing the practitioners understanding of the care giving context[38].

Eco mapping has been used mainly in social work addressing family networks in order to provide support to children and their families[39]. An ecomap is a visual mapping tool to record a person's social and personal connections to their environments. It also depicts to quality of these connections and what is meaningful to the person.

Through the Health Promoting Health Service initiative, the eco mapping tool is being piloted in a number of settings throughout NHS Highland. Although it is early days, practitioners are already reporting benefits in identifying connections to community, connections to support, strength of relationships, availability of services and duplication of services.

Community teams also report that eco mapping can help with care planning, discharge planning and service planning. Staff using the tool report that an ecomap reaffirms the support networks available to an individual and highlights areas of additional support that may be required. It encourages relationship building between the patient and the practitioner and identifies what is important to the individual, bringing information together on a visual display.



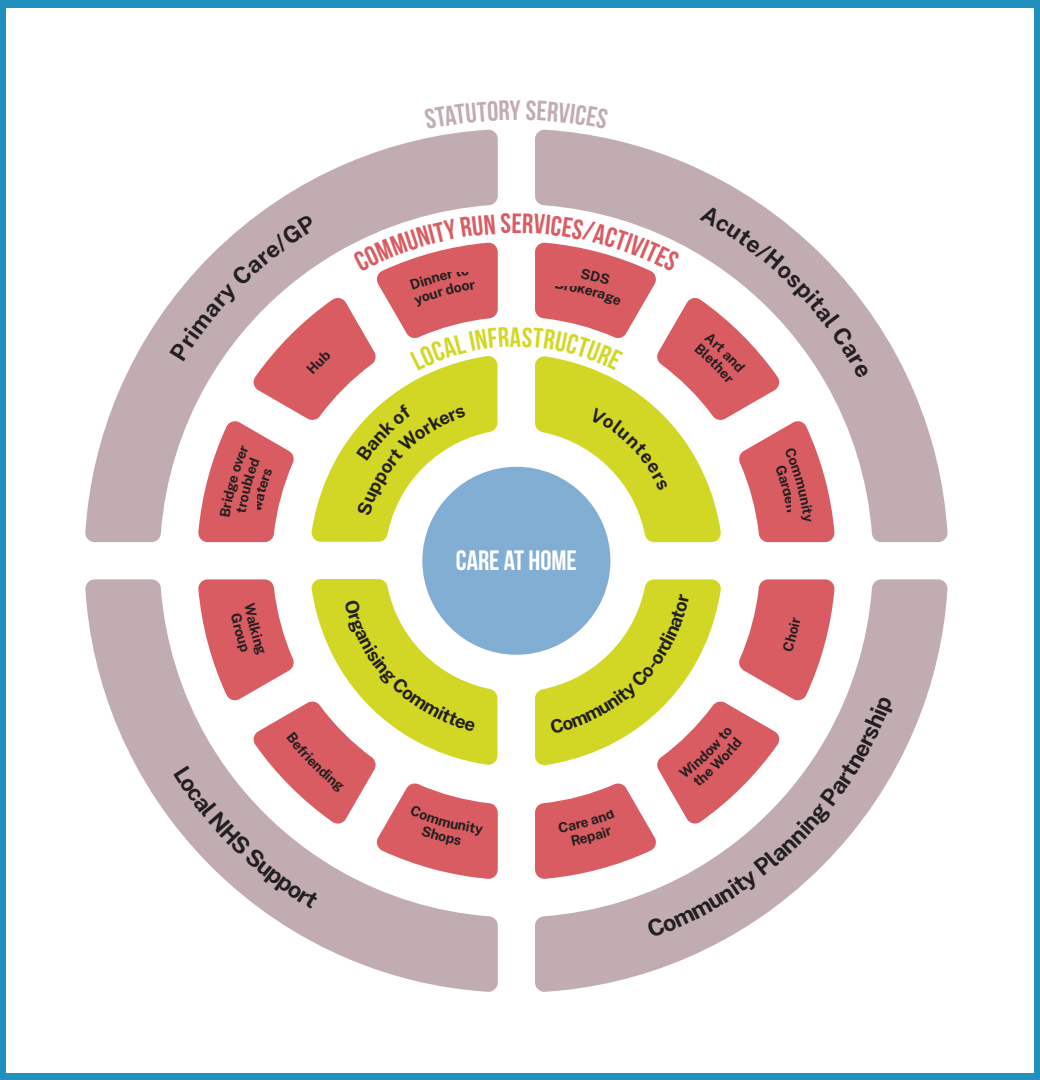
Source: NHS Highland Public Health

Highland Compassionate Communities

Supporting people to stay well as long as possible, and to manage with disabilities, is an essential action. In 2017 the Highland Compassionate Communities initiative was developed to support the roll out of the community led *'Circle of Support'* model that was developed in Helmsdale to four rural communities in Highland.

The model supports development of a range of activities and services for vulnerable people in rural communities when they need it. The model is community led and allows people to dip in and out of the *'Circle of Support'* as necessary, supporting people to stay at home and lead a life of quality for as long as possible. It is supported by a framework and guidance that has been developed from learning to date.

Harnessing the assets, skills and enthusiasm of communities and their capacity to deliver services and support that are tailored to local need can make a huge difference to an individual's health and wellbeing, allowing them to stay in their community for as long as possible, as well as supporting communities to be resilient and responsive to local needs.



Source: NHS Highland Public Health

Estimating Dependency

As the introduction above illustrates, there are uncertainties on the true level of future need. Several published studies use UK research to estimate the number of people living with different levels of dependency by age group, and to then project future numbers of people by levels of dependency. These projections are uncertain, because they require estimates of life expectancy, dementia, and prevalence of risk factors such as obesity, extended into the future.

Local classification of dependency used in NHS Highland[40]

NHS Highland has piloted the following categorisation of dependency.

High dependency (24 hour care)

At least one of the following: unable to get to or use the toilet (self-report), bed bound or chair bound (interviewer observed), needs help feeding (self-report or proxy rated), be often incontinent and need help dressing (self-report or proxy rated), or have severe cognitive impairment (mini-mental state examination score <10).

Medium dependency (care at regular times each day)

Either needs help preparing a meal (self-report) or putting on shoes and socks (self-report).

Low dependency (care less than daily)

At least one of the following: needs help to wash all over or bath (self-report), cut toenails (self-report), shop (self-report), or do light or heavy housework (self-report), or have considerable difficulty with household tasks, for example making a cup of tea (informant report).

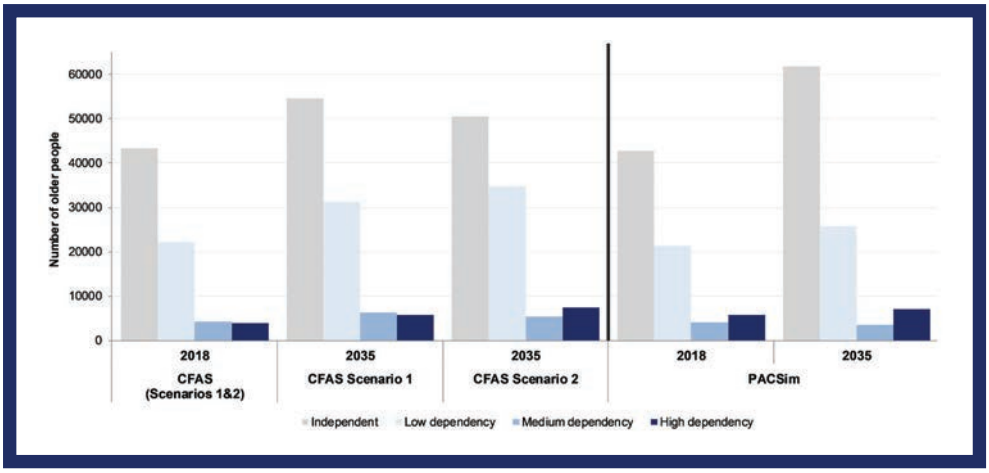
Independent

Not classified as high, medium, or low dependency.

Previously, NHS Highland Public Health team applied estimates from a study by Kingston et al.[41] to the Highland population[42]. More recent work[43] uses a larger pool of information, across a wider range of settings. The effect of applying different models, and different assumptions, to the projections obtained are compared in an appendix.

All models predict that the majority of older people will continue to live independently. Figure 4.1 shows the estimated changes by 2035 under the different models. All the models predict increases in the number of the people most dependent on care, ranging from 21% to 86% increases. Two of three models also predict an increase in the number of people with moderate care needs. The differences between the models relate to the underlying assumptions. For a detailed discussion of the models, please see the appendix.

Figure 4.1 - Comparison of estimated and projected dependency states of older people living in the NHS Highland area

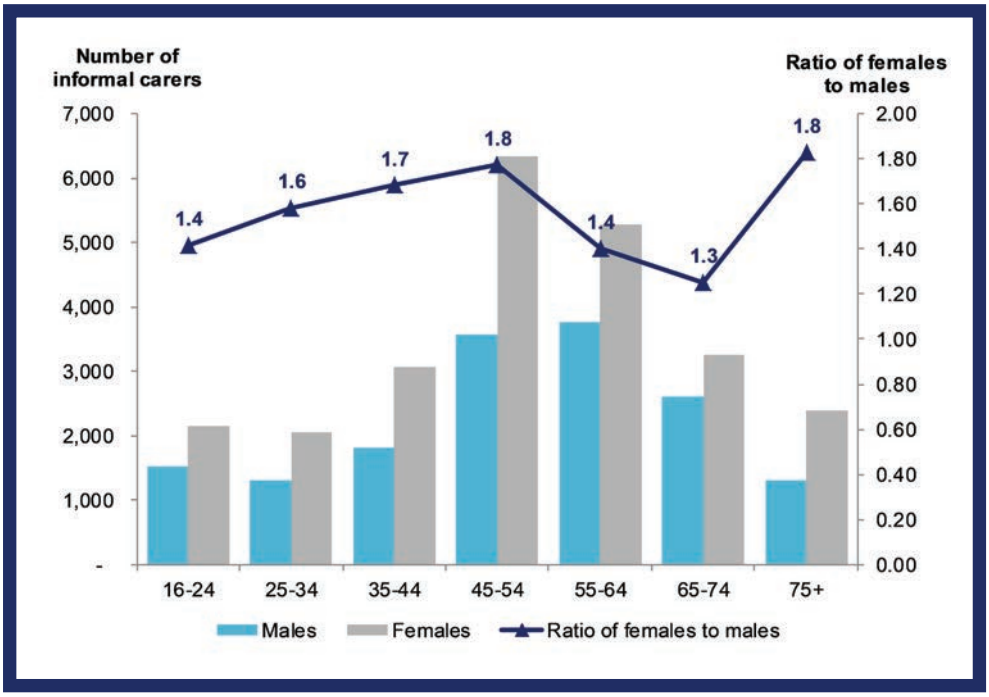


Source: Kingston et al.[42,44] and National Records of Scotland[44,45]

Carers

As the total number of people in poor health has increased, the number of people providing informal care for relatives and friends also increases. Estimates suggest that in 2018 over 40,000 people in Highland provided informal care. Much of this care is provided by women, with the highest number of carers being in people aged 45 – 64 years of age (Figure 4.2).

Figure 4.2 - Estimated caring prevalence by age and gender in NHS Highland



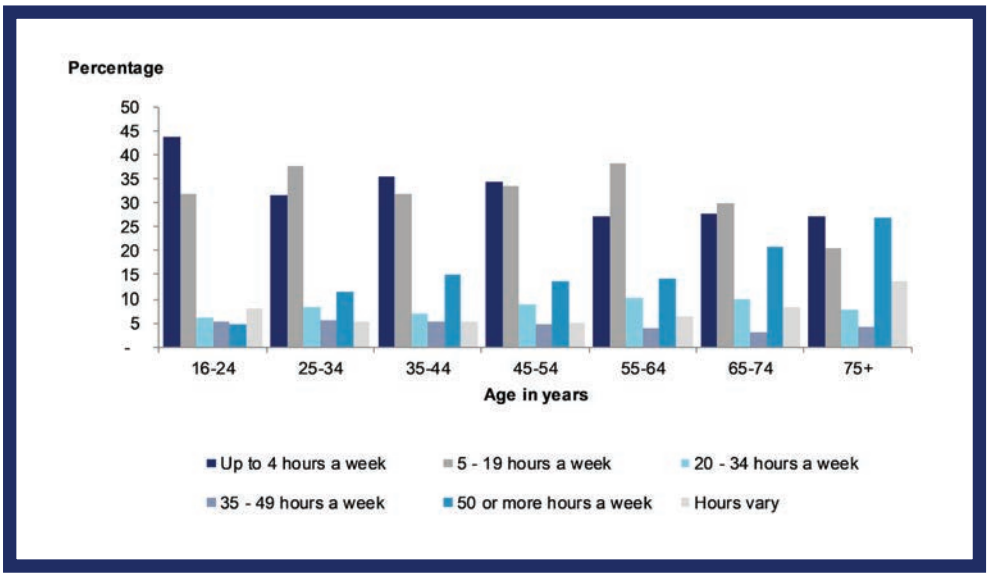
Source: Scottish Government[46] and National Records of Scotland[45]

The Carers (Scotland) Act 2016

The Carers (Scotland) Act 2016 that came into force in April 2018 sets out a range of measures intended to improve the support given to carers. It gives carers the right to a plan that identifies their needs and provides them with information about support available, and puts a duty on local authorities to support carers whose identified needs meet local eligibility criteria. Local authorities and health boards are required to jointly prepare a local carers strategy[47,48,49,50]. Work is underway across the NHS Highland population to seek to consider the needs of carers.

Based on the 2017 Scottish Health Survey[47], in NHS Highland, around a third of informal unpaid carers (approximately 13,000) will be providing regular care for up to 4 hours a week and another third for between 5 and 19 hours a week. 15% of all carers (approximately 6,000) indicate that they provide more than 50 hours per week; this proportion reaches around a quarter of the population for carers aged 65 years and over (Figure 4.3).

Figure 4.3 - Hours spent each week providing help or unpaid care by age



Source: Scottish Government[47]

The expected change to the ratio of younger to older people, and the dependence of the Highland population on inward migration, suggests that informal care may be less available in the future, and will result in an increased need for service support.

End of Life Care

Approximately 3,700 people die in NHS Highland each year. Many deaths follow a period, sometimes prolonged, of illness and/or frailty, which has implications for the type of care that may be required. Population ageing, and the growing numbers of people in the older age groups, means that the number of deaths are anticipated to increase. There is a growing recognition that there will be a rising demand for palliative and end of life care needs in the future[51], a theme reflected in the 2017 report from the NHS Highland Director of Public Health[52].

The World Health Organisation (WHO) have defined palliative care as an approach to treatment, care and support that improves the quality of life of people with a life-limiting illness, and their caregivers[53]. End of life care is an important part of palliative care and involves the care and support of people who are likely to die within the next 12 months[54]. This includes people whose death is imminent (expected within a few hours or days), people with advanced, progressive, incurable conditions and people with life-threatening acute conditions.

The Scottish Action Plan for palliative and end of life care identified three trajectories to death, apart from sudden deaths[55]. These are a short period of decline (e.g. some cases of cancer), a long term illness with intermittent serious episodes (e.g. heart or other organ failure), and a prolonged dwindling (e.g. physical or cognitive frailty). This suggests that many deaths can be anticipated, enabling a planned approach to end of life care in ways which reflect, as far as possible, the needs and wishes of patients, carers and their families.

A recent study defines a set of diagnoses where people are likely to benefit from palliative care[56]. These include cancers, heart disease, renal disease, liver disease, respiratory disease, neurodegenerative disease, and dementia. The authors estimated that between 69% and 82% of people who die have palliative care needs.

Estimates of the number of people who had potential palliative care needs in NHS Highland, based on analysis of local death registration data, are shown in Table 4.1. Between 2013 and 2017 there were over 13,000 deaths where people were likely to benefit from palliative care. This is equivalent to 2,660 people each year, or three in every four deaths (76.2%) in the health board area. The trend in the proportion of deaths likely to require palliative care has remained fairly constant over the last two decades.

Table 4.1 - Estimated number of people with potential palliative care needs, 2013-2017

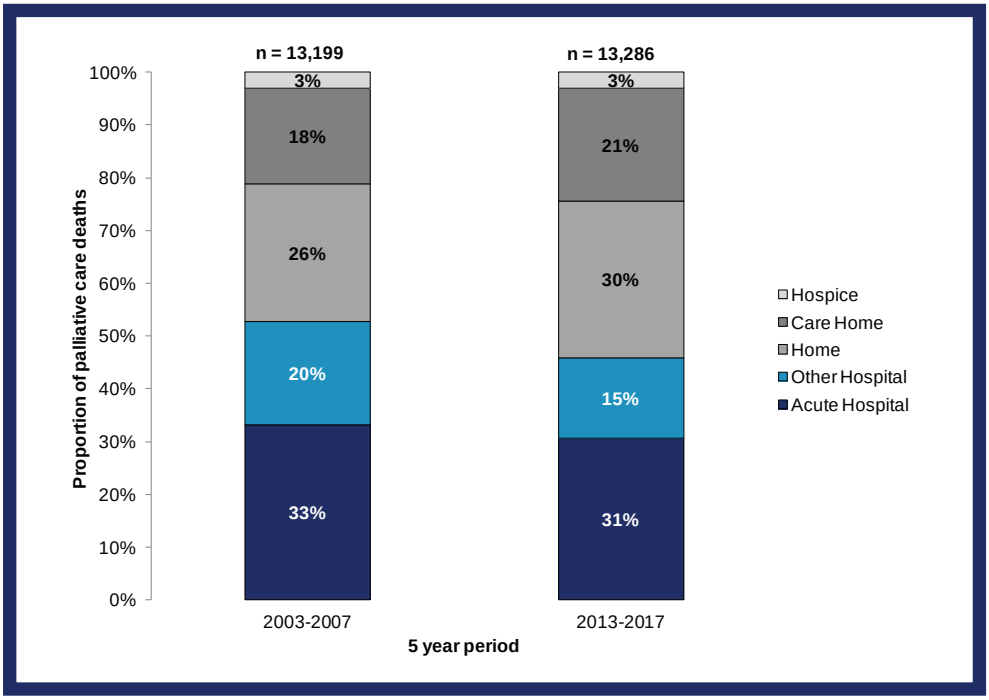
Area	Number of deaths (5 year total)	Number of deaths (annual)	Percent of all deaths	95% Confidence Intervals
Argyll and Bute	4,070	810	75.9%	73.9%, 77.9%
Highland	9,220	1,840	76.3%	74.9%, 77.6%
NHS Highland	13,290	2,660	76.2%	75.0%, 77.3%

Source: Murtagh et al.[57]
Selected International classification of Diseases 10th revision (ICD-10) diagnosis codes applied to National Records of Scotland (NRS) mortality records, rounded to nearest 10

For most people the majority of care at the end of life is delivered by family members and informal carers at home or in community settings. Published data shows that, of the 3,473 residents of NHS Highland who died in 2017-18, 90.1% of their last six months of life was spent either at home or in the community and 8.9% was spent in hospital. This is equivalent to each person spending an average of 19 days in hospital and 164 days at home in the six months prior to their death[57]. These data highlight the importance of a public health approach to palliative and end of life care that begins with people and communities[58].

The place of death for people with potential palliative care needs is shown in Figure 4.4. In the five year period 2013 to 2017, 46% of people estimated to have palliative care needs died in hospital, 21% in a care home and 30% at home. Over the last decade the proportion of people dying at home has increased and the number of people dying in hospital has fallen. However, 31% of palliative care deaths still occurred in an acute hospital in 2013-17.

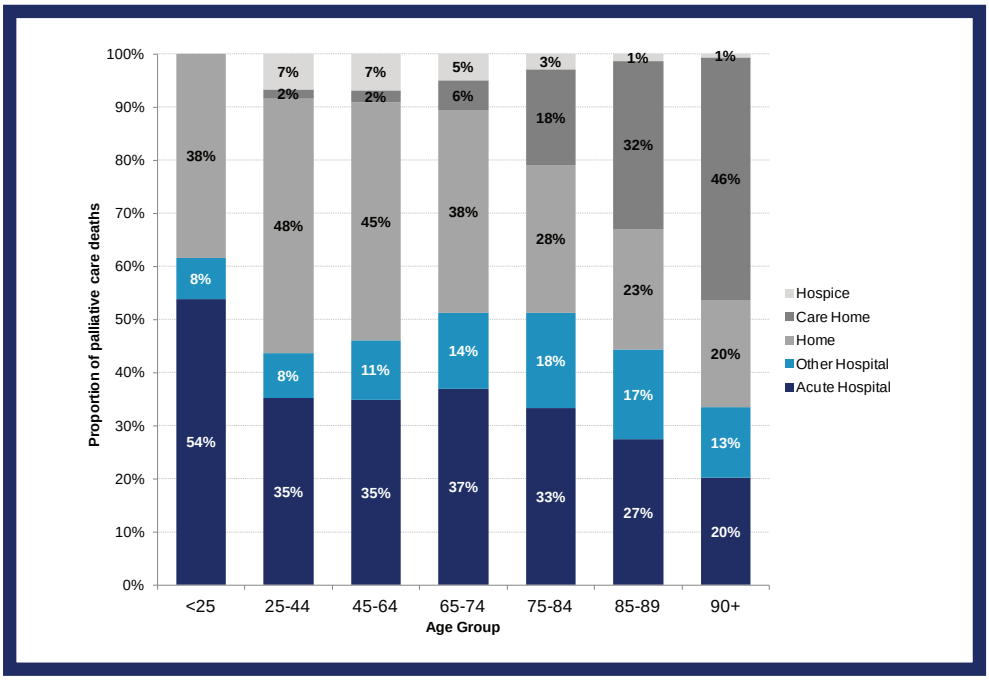
Figure 4.4 - Proportion of potential palliative care deaths occurring in different care settings, NHS Highland, 2003-2007 and 2013- 2017



Source: Murtagh et al.[57]
Place of death for selected International classification of Diseases 10th revision (ICD-10) diagnosis codes applied to National Records of Scotland (NRS) mortality records

The 'place of death' for people likely to benefit from palliative care varies with age. Figure 4.5 shows that among children and young people under the age of 25, 62% died in hospital and 38% died at home. The number and proportion of people with palliative care needs who died in a care home increased with age. One third (32%) of people aged 85 to 89 years likely to benefit from palliative care died in this setting, increasing to almost half (46%) of people aged 90 years and over.

Figure 4.5 - Proportion of potential palliative care deaths occurring in each care setting by age, NHS Highland, 2013-2017

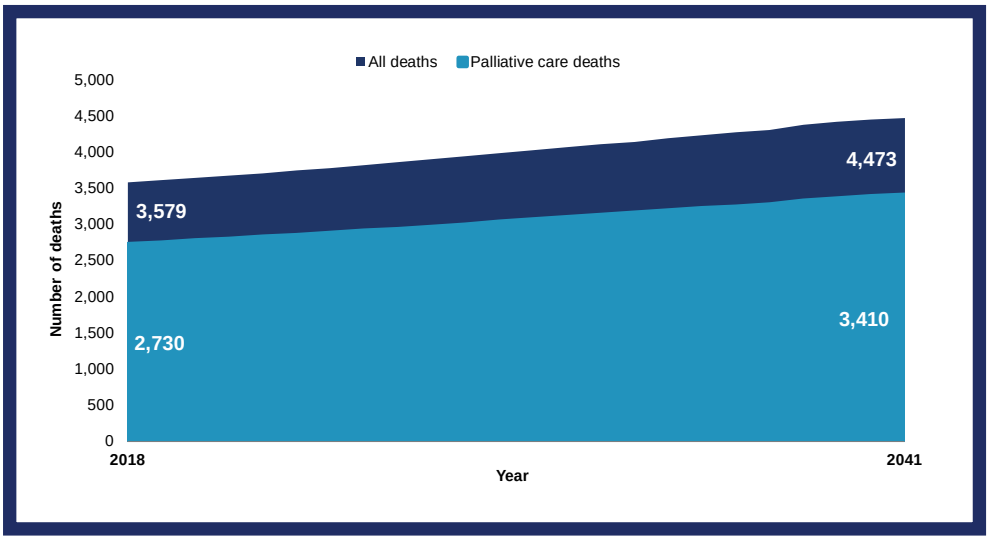


Source: Murtagh et al.[57]
Place of death for selected International classification of Diseases 10th revision (ICD-10) diagnosis codes applied to National Records of Scotland (NRS) mortality records

Projections of palliative care need

The future numbers of people likely to benefit from palliative care are estimated from the projected number of deaths for NHS Highland residents developed by the National Records of Scotland. Overall, the number of deaths is projected to increase by 25% from 3,579 in 2018 to 4,473 in 2041. Assuming that the current proportion of all deaths likely to benefit from palliative care remains constant, the number of people needing palliative care is projected to increase from 2,730 in 2018 to 3,410 in 2041. These projections of the absolute numbers of deaths do not reflect the recent mortality and life expectancy trends highlighted earlier in this report.

Figure 4.6 - Projected number of deaths (total deaths and deaths with palliative care needs), NHS Highland, 2018 to 2041



Source: Murtagh et al.[57] and National Records of Scotland[59]

Last Aid Course

In the field of palliative care and in recognising the value of adopting a Compassionate Communities approach[60], NHS Highland's Public Health team is currently supporting the Highland Hospice to evaluate a Last Aid Course.

Based on the assumption that everyone should have basic knowledge of palliative care, Last Aid is a programme, derived from the concept of First Aid, for educating the general public about death and dying[61]. Its aim is to support individuals, whether that be family, friends, or the wider community to support those who are coming towards the end of their lives or those who have experienced bereavement[62]. Last Aid courses are held on a single day and comprise four modules covering themes relating to: care at the end of life, advance care planning and decision making, symptom management, and cultural aspects of death and bereavement.

The original Last Aid Course was developed in German and hence revision of Course material is required to optimise the Course's relevance within an English-language, local (NHS Highland) and national (Scotland and UK) context.

Summary

- Compression of mortality and compression of morbidity are important concepts because they influence future estimates of service requirements. This is particularly apparent when considering the cost of care for older people associated with functional decline and end of life.
- Predictions of future levels of dependency suggest that the majority of older people will continue to live independently but that there will be substantial increases in the number of people most dependent on care.
- Large numbers of people currently provide informal care, but changes in the ratio of younger to older people, and dependence on inward migration, suggest that the availability of informal care will decrease in future. This will mean an increased need for service support.
- There will be substantial increases in the number of people requiring end of life care, with major impacts on care demands.
- The public health implications of these trends are that NHS Highland, like all parts of Scotland, needs to work to:
  - Reduce the rate at which long-term health conditions manifest, with a focus on prevention, early detection and early intervention, particularly in deprived communities.
  - Develop systems and services which can adapt to the changing profile of multiple long-term health conditions and functional decline.
  - Develop methods of identifying those who need intensive input towards the end of their lives and plan service provision around these needs.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Chapter Five - Realistic Medicine: a personal and population approach to value and equity

This chapter provides an update to the NHS Highland Director of Public Health Annual Report 2017 on the theme of Realistic Medicine[1]. Realistic Medicine offers a person focussed approach to providing healthcare where as an organisation and as individuals we aim to provide care of the best possible value, both to individuals and to the whole population we serve.

Creating and encouraging practice influenced by Realistic Medicine to flourish NHS Highland should allow individual patients the benefit of better value care appropriate for them, and enable clinicians to become more people focussed. At a population level it should allow us to manage our limited resources as appropriately as possible by reducing waste in our systems, encouraging ownership and improvement and raising awareness of inequities and variation which prevents high quality care being accessible to all our population.

Over the last few years the approach Realistic Medicine advocates is spreading throughout NHS Highland and we are using its principles to guide us in individual interactions with patients but also in the development of our clinical strategy.

Figure 5.1 - Practising Realistic Medicine

Source: Reproduced from Scottish Government[2]

Personalising Realistic Medicine

In 2019-2020 the Chief Medical Officer (CMO) has asked health boards to concentrate on Personalising Realistic Medicine[3]. The focus on best care for each individual recognises the need to take into account best clinical practice, people as individuals and clinicians as professionals.

Personalised planning requires staff to use shared decision making- improved decision making bringing professional knowledge and the individual's needs and priorities together. Staff in NHS Highland are being supported to develop skills in shared decision making and people using services are being encouraged to get involved.

It's OK to Ask Week in Lochgilphead

One example of promoting shared decision making in NHS Highland this year was "It's OK to Ask" week in Lochgilphead. Staff and patients tested three simple questions enabling better patient centred communication during consultations in a variety of clinical settings in Mid Argyll Community Hospital. 163 service users and 21 staff gave us feedback on their experience. This clearly showed that the vast majority of patients want to be involved with decisions about their care, about a third used the questions to help in their consultation, and overall the attitude of openness was a positive influence for professionals and patients alike.

A major project across NHS Highland in 2019-20 is to encourage the practice of writing clinic letters to patients from outpatient clinics. There is good evidence that this practice increases person focussed consulting and communication, improved patient understanding and does not detract from the clinic letter being a useful professional communication[4].

We also need to try to make the way we strive to deliver services "kinder" to those using the services. "Near Me" video consulting services have reduced the personal cost of visits and greatly improved access to outpatient clinics. The spread and improvement of these services shows great promise in the coming year, extending clinic coverage and in primary care, enabling more patients to benefit. The efficiencies this system introduces also have the potential to reduce travel time for clinicians, thus reducing waste of valuable clinical time.

NHS Highland Personalising Realistic Medicine plan for 2019-20

Source: Reproduced from Scottish Government[2]

Focus on creating the conditions for Personalising Realistic Medicine to thrive....

Engaged Patients	Supported workforce	Compassionate Leaders	Culture of Stewardship
"OK to Ask" spread Progress NHSH wide plan to copy outpatient letters to patients. Spread Near Me and similar tech solutions share learning - example of "kind care". Champion co-production in service design and decision making. House of Care models and how they might apply here.	Consent work in Obstetrics Raigmore Shared decision making training for different staff groups. Projects using our different skills and expertise to better support individual plans - oncology workshop and new Project ECHO 'communities of practice' developments	Contribute to organisational work under the 'Culture Fit for Future' programme. Raise awareness amongst leaders – GP Cluster Quality Leads, Board, department leads, etc of Realistic Medicine concepts and ethos- presentations etc to spread	Supporting the development of the NHSH clinical strategy with Realistic Medicine values. Encourage development of more supportive forums for all staff - Schwartz round/ Values Based Reflective Practice, etc. Link with existing work about the whole patient experience e.g. booking/ access/ appointments/ to help 'kind care' be the norm.

Personalised care is where healthcare professionals work with their patients to provide care based on what matters most to them. Care of high personal value is not solely "value" based on cost, measurable outcomes, and efficiency metrics.

Healthcare professionals are the stewards of healthcare resources. Demand for health and care services is increasing and in order to meet that demand the health and social care service must consider how to make optimal use of the resources it has to ensure the best possible care for the individuals who need help and also the population of NHS Highland we serve. The quality and safety, effectiveness and cost effectiveness of care remain vitally important.

Value based healthcare: the triple value tool

Triple value is an emerging tool Realistic Medicine brings in order to help decide where our efforts achieve best value. Clinical teams across NHS Highland are being introduced to the concept of triple value to help address planning, and as we progress towards the development of a clinical strategy its ethos will be right at the centre of what we do.

The value of an intervention can be assessed in three ways: personal, technical and allocative.

Personal Value must be defined around the person receiving care. Care should include the patient's personal goals and what matters to them. With high-quality care for advanced illness, these goals may diverge from simple treatment of disease, which may begin to feel less relevant. Instead, a more complex set of objectives, including comfort, quality of life, and family support, may take precedence. There is a risk of providing interventions of high quality and which are safe, effective and cost effective, but if provided to the 'wrong' patients at the 'wrong time' they will be of low value.

We know that both overuse and underuse of investigation and treatment can result in harm to patients. By talking to people to find out what matters to them, we can seek out and eliminate 'harm' and 'waste' and provide care that is in tune with what people value.

Technical value: improve the quality and safety of healthcare to increase the value derived from resources allocated to particular services. This may involve reducing the 'waste' or inefficient processes associated with a particular service, or improving safety and unintended harms. It also means ensuring that the people most likely to benefit are given some priority. Too often the people seen are not those who would benefit most, compared with people who have not sought help or been referred, and often this mismatch is associated with deprivation, so technical value includes the need to mitigate inequity as well as increase efficiency.

Allocative value: allocate resources to different groups equitably and in a way that maximises value for the whole population. For example, is the balance of resources allocated for people with cancer, for people with mental health problems or for people living with heart disease optimal? This is a complex decision and clinicians need to act as the stewards of those resources and decide whether the balance is right between different services for their population. For example, is the balance of resources within the cardiovascular population the right balance spread across heart failure, rhythm disorders and coronary heart disease?

We need to ensure the prevention of harm and 'waste' from overuse and overtreatment (unwarranted medical interventions), freeing up resources currently used with little or no benefit to clinical outcomes, in order to address under-provision of appropriate care elsewhere.

Identifying and tackling unwarranted variation

Variation in healthcare exists for all sorts of understandable reasons; health systems are complex and the population has differing needs. Some variation can be explained by the characteristics of the people being treated, or by their geographical setting.

Unwarranted variation is variation in healthcare that cannot be explained by need, or by explicit patient or population preferences. Identifying and tackling unwarranted variation is essential to improving outcomes derived from healthcare across Scotland and practicing Realistic Medicine.

Exploring unwarranted variation might lead us to identify areas where there is:

- Underuse of higher value interventions i.e. under-treatment;
- Overuse of lower value interventions; and
- Overuse of interventions which may result in increasing risk of 'harm'.

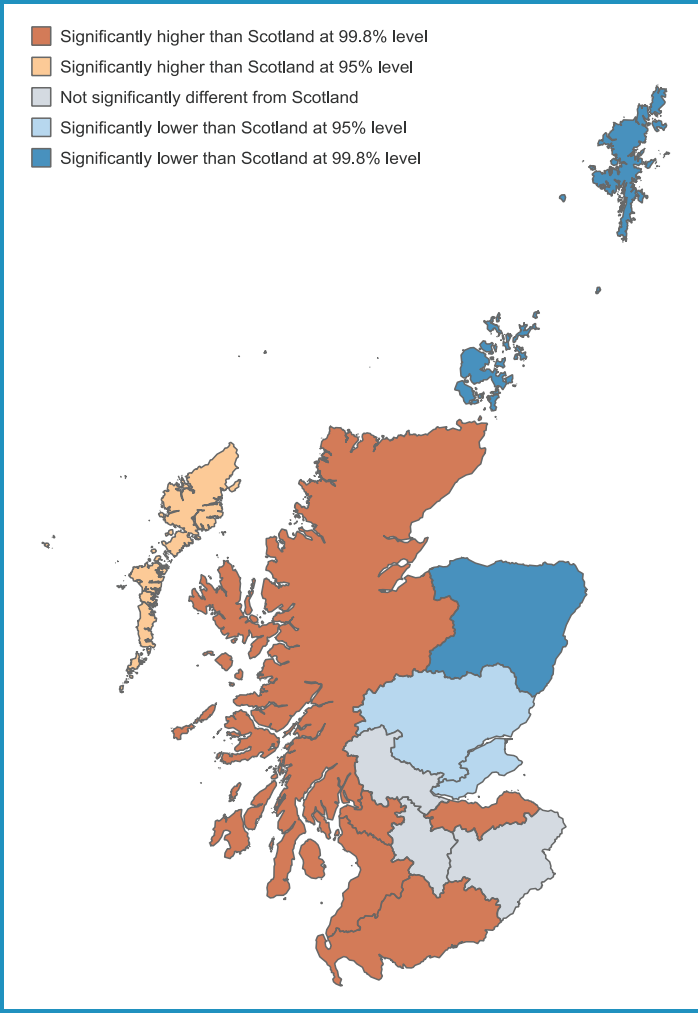
There may be a need to shift resources to areas which provide the greatest benefit. By engaging multidisciplinary teams in quality improvement and directing strategic decisions we can improve equity and access for all people. There is some evidence that a shift of resources to primary care from specialist high cost secondary care would provide better care overall.

Understanding variation (random, warranted or unwarranted), through the engagement of clinicians, users and service providers, is key to providing value based healthcare within NHS Scotland. In 2018, online maps providing a data source on particular procedures were published by the Scottish Atlas of Healthcare variation team. In NHS Highland these maps have started to provide us with a means of engaging clinicians and management in identification of areas of unwarranted variation in order to drive service development and change.

Example of the Scottish Atlas of Variation

Maps highlight each NHS Board in a colour indicating how significantly different the standardised rate is from the Scotland value, and in which direction.

Significance is based on whether the Scotland value falls within the confidence interval of the value for the NHS Board, at two confidence levels: 95% and 99.8%.



Summary

Two major themes in Chief Medical Officers reports have been taken forward in NHS Highland: valuing people (personalised plans, shared decision making, supporting innovation and valuing staff) and secondly getting better value (reducing harm and waste, reducing risk, reducing variation). These guiding principles have started to influence conversations, drive improvements and will form the underpinning for our developing Clinical and Care Strategy. We hope to continue to thread the Realistic healthcare message throughout health and social care to guide us towards better value for the population of NHS Highland.

Chapter Six - Conclusion

This report has drawn together a range of published and local evidence on important demographic trends, population health and social inequalities that have profound implications for the planning and delivery of health and social care services.

National population projections predict that the population of the Highland Council area will increase slightly, and then remain level. The same projections anticipate that the Argyll and Bute Council area will experience population decline. Deaths have outpaced births in both areas for many years, and populations are sustained and increased by inward migration. Population change is not evenly distributed, and the Inverness region in the Highland Council area has had the largest population increases.

The evidence presented in this report has highlighted that people are living longer on average, and people tend to have longer periods of their life free of disability than would have been expected in the past. The expansion in disease free life is probably less than the expansion in life expectancy, so paradoxically, people may also spend more time with health problems than in the past.

The combination of a larger number of older people – a good news story – but with more diseases associated with ageing for longer periods of their life will have significant impacts on service needs. Palliative care needs can be also expected to increase because of the large cohort of people born in the 'baby boom' who are entering older age. This will have implications for hospital, community, social care, and hospice care.

Much of the care currently provided to people is informal care from families and friends. Workforce and migration trends mean that fewer people may be able to offer support in the future, particularly when the children themselves may be over 60 years of age. These secular trends, combined with trends in one-person households, are likely to increase service care requirements, which will be challenging to meet, particularly in some of the Highland areas with declining populations.

All health and social care systems in Scotland are confronted with the same challenge: improve health and decrease morbidity while at the same time delivering care to an increasing number of people who may be experiencing frailty, dementia and multi-morbidity.

There are important partnership issues on supporting migration to Highland, and encouraging settlement in areas further from Inverness. NHS Highland and its partner agencies, particularly Local Authorities, also need to work to:

- Minimise the health inequity caused by poverty
- Reduce risk factors and increase community resilience to improve the health of people as they age
- Ensure that health and social care systems are responsive to the needs of people with multiple conditions, frailty and often cognitive impairment, as well as to people with acute one-system illnesses
- Make it as easy as possible for communities to offer support to their members, and for families to provide 'informal' care

Rising to these challenges will be essential to improve the sustainability of services for the future and sustaining communities across NHS Highland.

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Images

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Notes

Notes

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PUBLIC HEALTH

NHS Highland

The Annual Report of the **Director of Public Health 2019**

NHS Highland

Past Present and Future Trends in Health and Wellbeing – Appendices 1-7

The appendices to this report contain a series of papers written by the Public Health Intelligence team. The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland and provide an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

The series of papers contain more detailed information about the analyses that have contributed to the development of the NHS Highland Director of Public Health Annual Report 2019.

Supplementary paper 1: Population changes in NHS Highland

Supplementary paper 2: Changes in how we live in NHS Highland

Supplementary paper 3: Mortality in NHS Highland

Supplementary paper 4: Life Expectancy in NHS Highland

Supplementary paper 5: Health Status in NHS Highland

Supplementary paper 6: Care dependency in the older population of NHS Highland

Supplementary paper 7: Informal care provision in NHS Highland

Population changes in NHS Highland

Supplementary paper 1 to the Director of Public Health Annual Report 2019

Public Health Intelligence

Directorate of Public Health

NHS Highland

October 2019

The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland. The team provides an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

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Contents

Director of Public Health Annual Report 2019

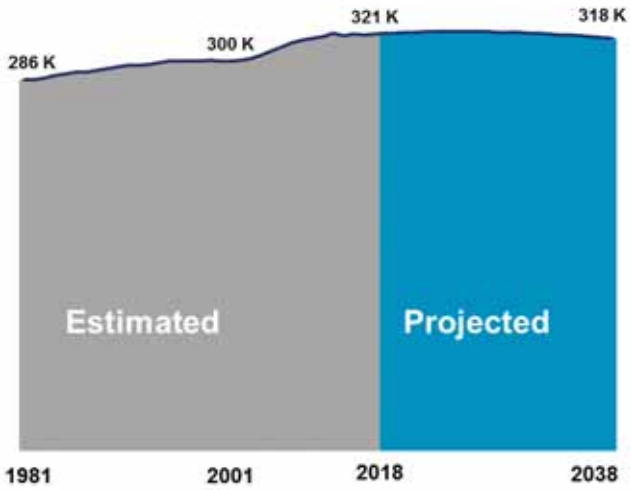
This is the first paper in a series that will contribute to the NHS Highland Director of Public Health Annual Report 2019.

A subsequent series of supporting papers are planned that will look at, generational change, mortality, life expectancy, morbidity, dependency and informal care.

Population change

Demographic changes in the population of NHS Highland are having a significant and increasing impact on the provision of health and social care services in the area as the size and age structure of the population changes. Many remote, rural and island communities are experiencing acute service challenges with ageing populations and decreasing numbers of people of working age. In more urban and accessible areas, particularly those of the Inner Moray Firth, services that were designed or evolved historically to look after smaller populations with younger age profiles are experiencing increasing demand from population growth that is compounded by population ageing.

Figure 1: Estimated and projected change in the size of the NHS Highland population

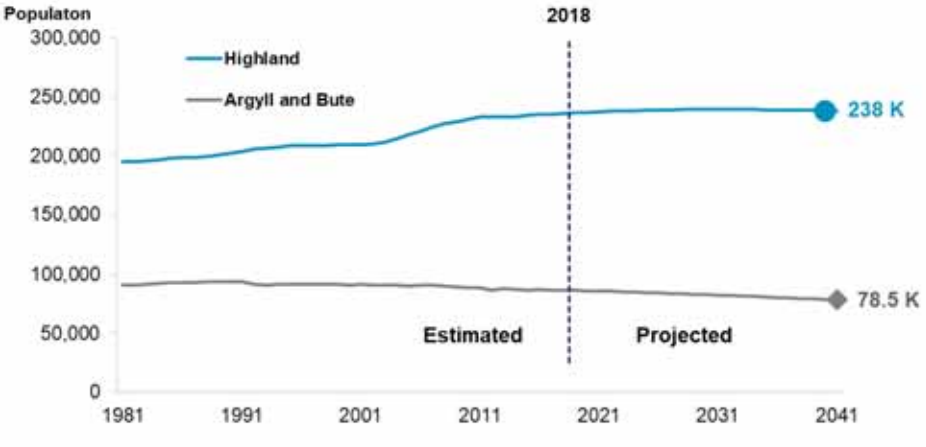


The latest available population projection for NHS Highland suggests that the total population of 321 thousand will decrease by 1.3 percent to around 318 thousand over the next 20 years with net migration numbers not sufficient to replace natural population loss as deaths increasingly exceed births over the period[1,2].

Data source: National Records of Scotland[1,2]

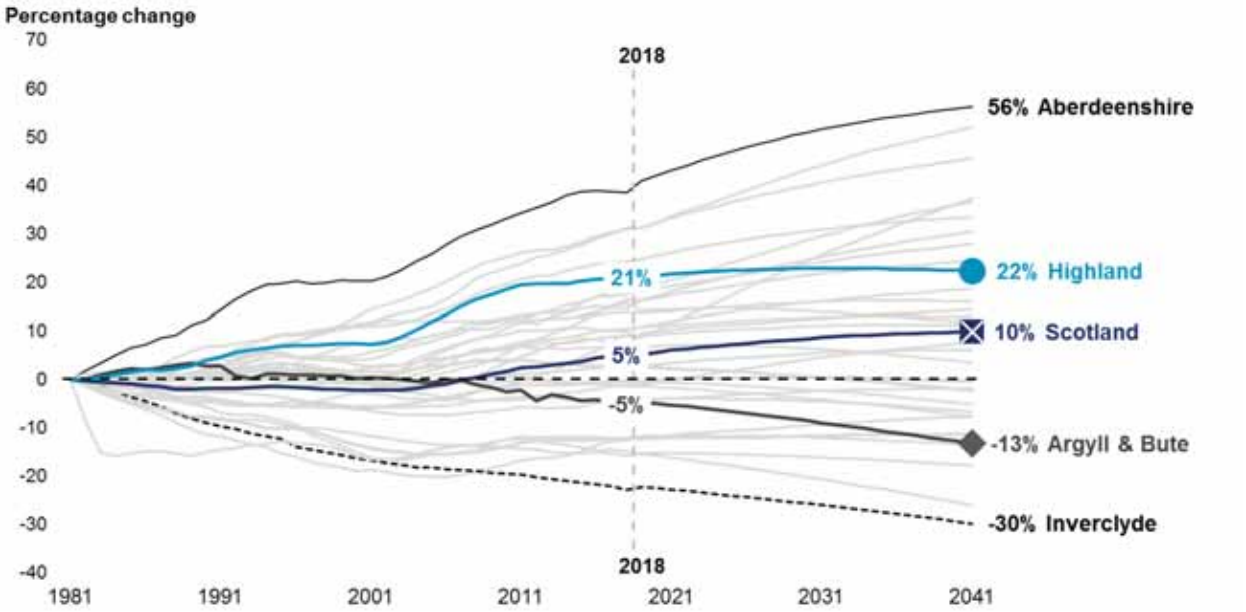
Within the Board area, the population of the Highland Council area is projected to continue to slowly grow while the number of people resident in Argyll and Bute further declines (Figure 2). Figure 3 compares the local population trends to the other 30 Council areas in Scotland highlighting the major period of population growth in Highland between 2001 and 2011.

Figure 2: Estimated and projected change in the size of the populations of Argyll and Bute and Highland



Data source: National Records of Scotland[1,2]

Figure 3: Actual, estimated and projected percentage change in the populations of the Council Areas of Scotland, 1981-2041



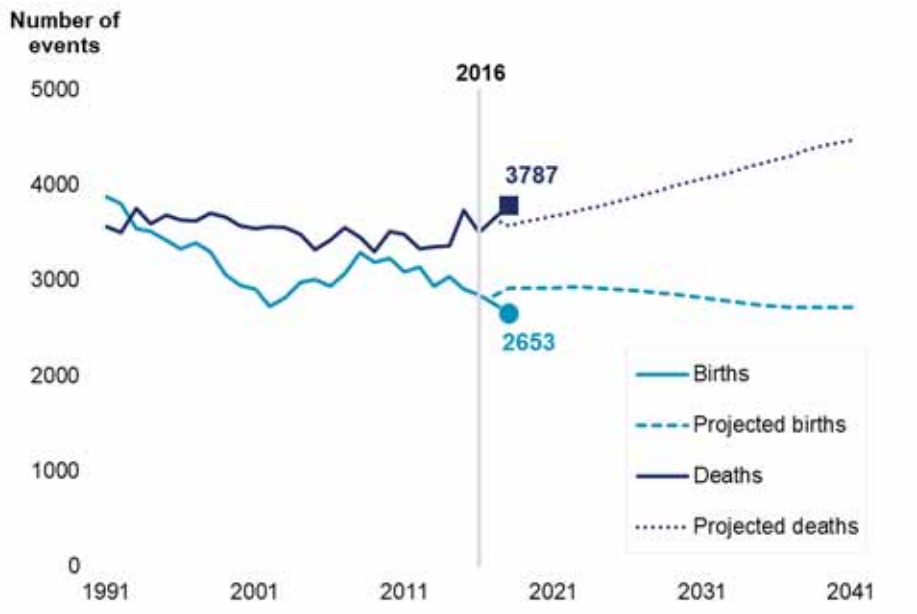
Data source: National Records of Scotland[1,2]

Components of population change: natural change and migration

Population change is primarily the result of the interaction of two factors, natural change (births minus deaths) and net migration (the difference between the number of people coming to and leaving the area). Deaths have outnumbered births in the NHS Highland area since the early 1990s (Figure 4). The gap between the number of births and deaths is projected to increase in future years because of smaller cohorts of women of child bearing age, continued reductions in fertility rates and increases in the number of deaths, as larger cohorts in the population age.

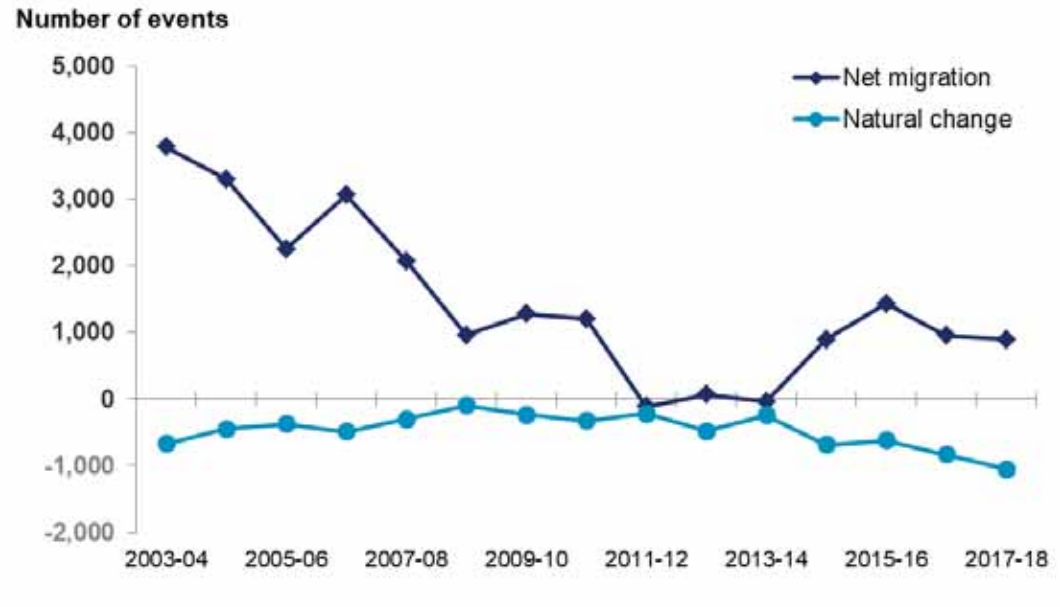
Future population growth is therefore dependent on a net migration balance that attracts new residents and retains existing population to offset what is a long-term trend in the gap between births and deaths (Figure 5).

Figure 4: Actual and projected number of births and deaths in NHS Highland, 1991 - 2041



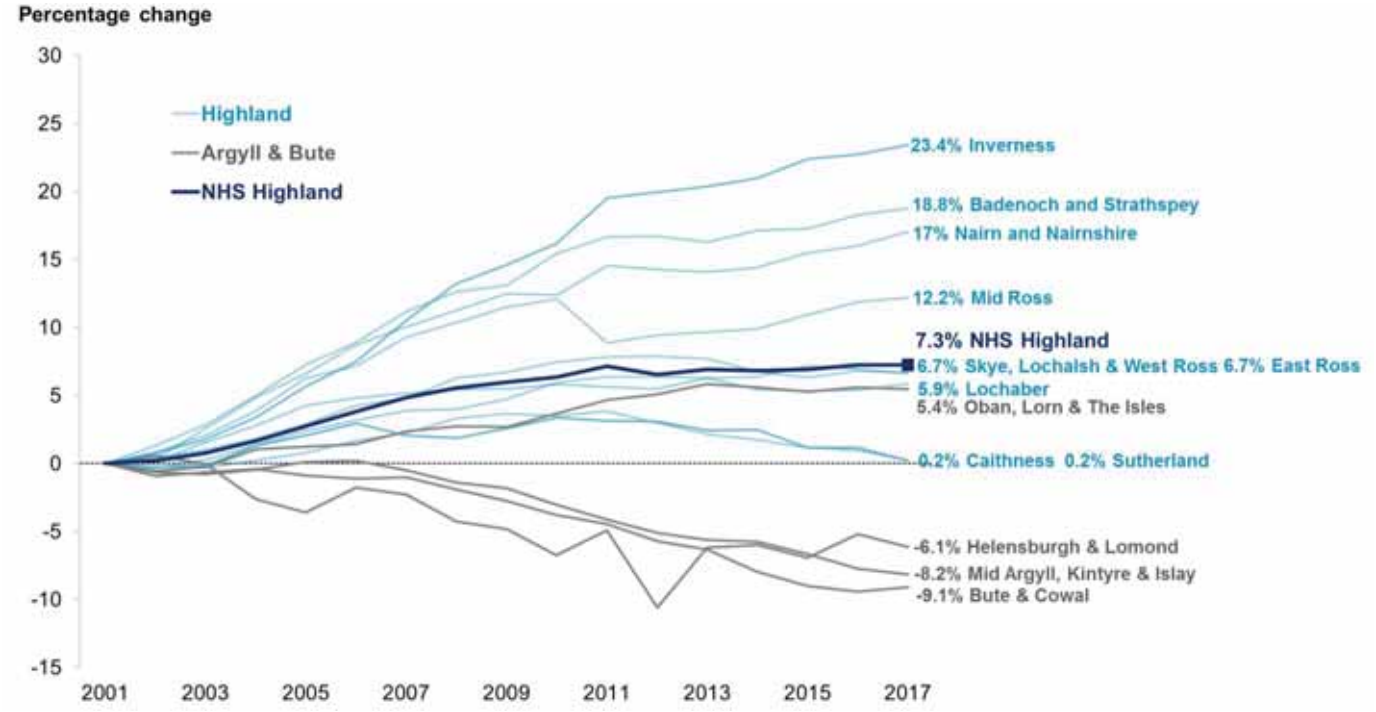
Data source: National Records of Scotland[1,2]

Figure 5: Natural population change and net migration in NHS Highland, 2003-04 to 2017-18



Data source: National Records of Scotland[3,4]

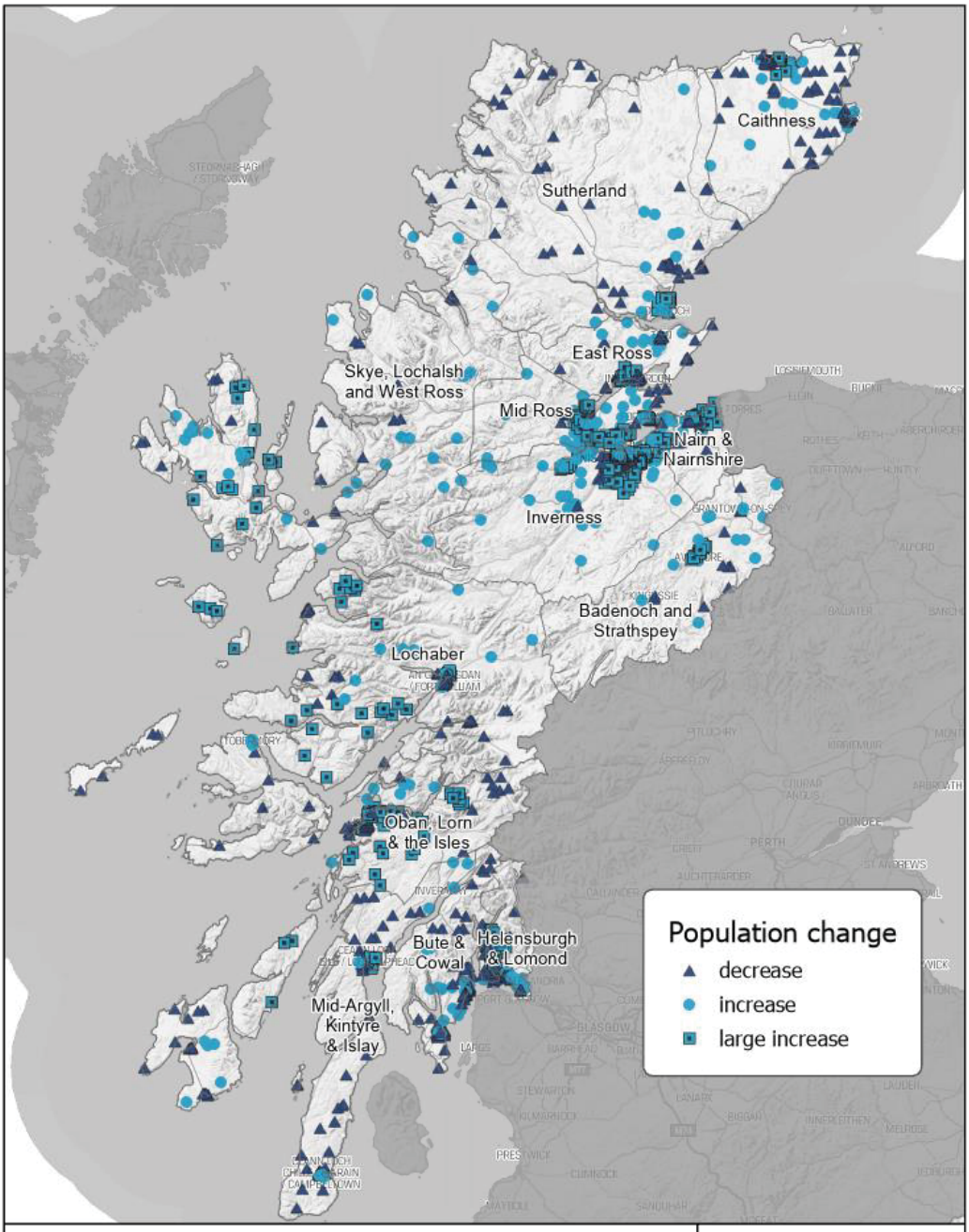
Figure 6: Actual and estimated percentage change in the populations of areas within NHS Highland, 2001 - 2017



Data source: National Records of Scotland[5]

The dot density map (Map 1) provides a visual impression of population change across the NHS Highland area. The categories are based upon the annual growth rate of the population over the last six year period from 2011. The dark blue areas have lost population, while the light blue areas saw population increase. Dots are placed randomly within small area geographies and each represents a single person joining or leaving the population in a year. At small map scales these points may overlap.

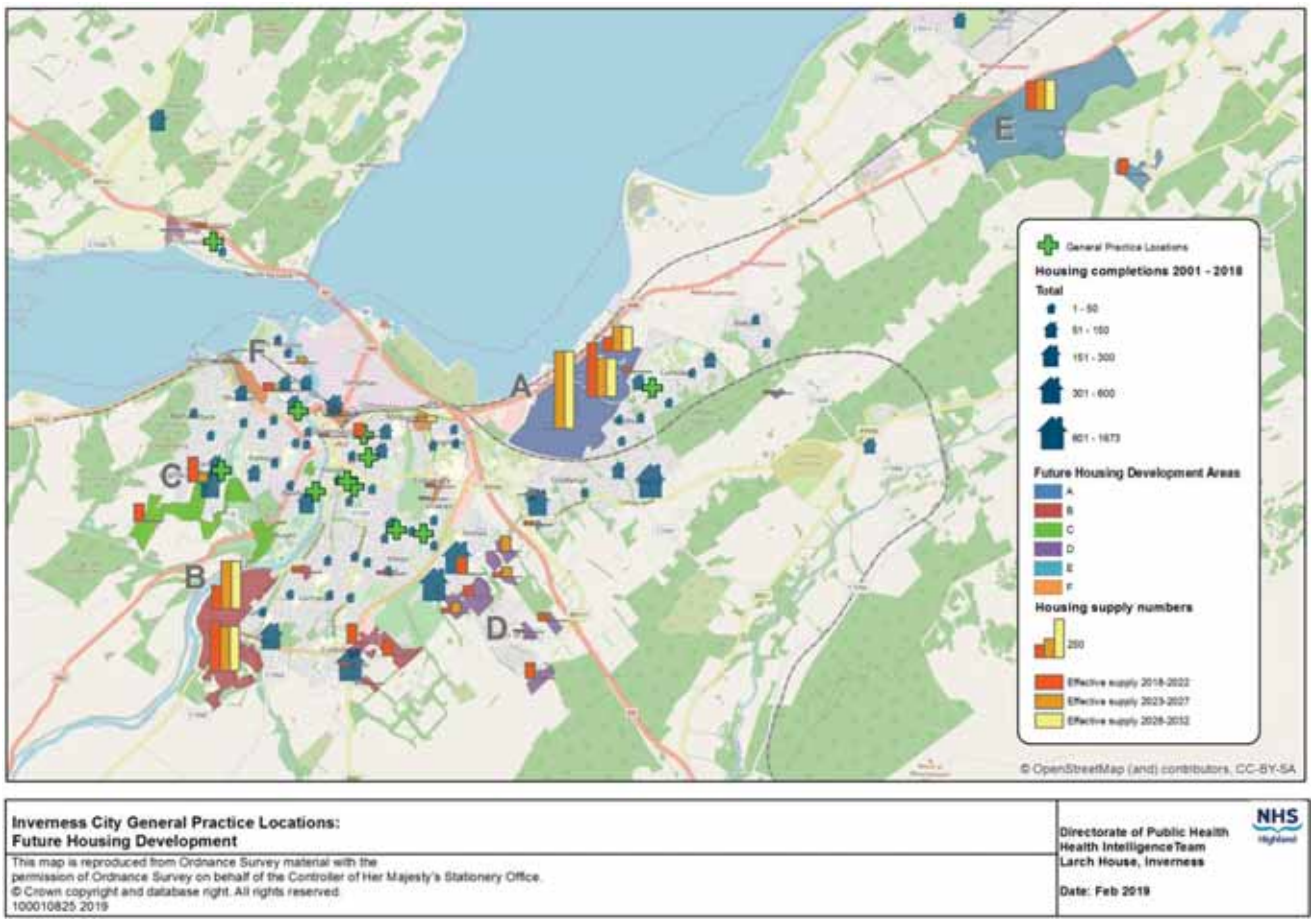
Map 1: Dot density map of population change in NHS Highland 2011-2017



Data source: NHS National Services Scotland – Practitioner Services[6]

As highlighted in Map 1 and Figure 6, population growth is a major driver of the need for service change within the wider Inverness area. Over the period between 2002 and 2018 the population registered with the twelve Inverness City General Practices increased by over 18 percent. This population growth has been absorbed by the existing practice structure of the area that is largely concentrated in the core of Inverness City. Continued house building at scale is anticipated on the outskirts of the City in areas often adjacent to recently completed large developments[7]. By 2032 a further increase of the order of 13,000 people is projected with 70 percent of this population growth occurring in two areas of the City (Map 2). In addition to the impact on General Practices, the continued population growth has implications for a range of community services including Health Visitors, Community Nurses and Allied Care Professionals. The increasing population demand for primary care will also cause increased demand for out-of-hours care, acute hospital beds and A&E services[8].

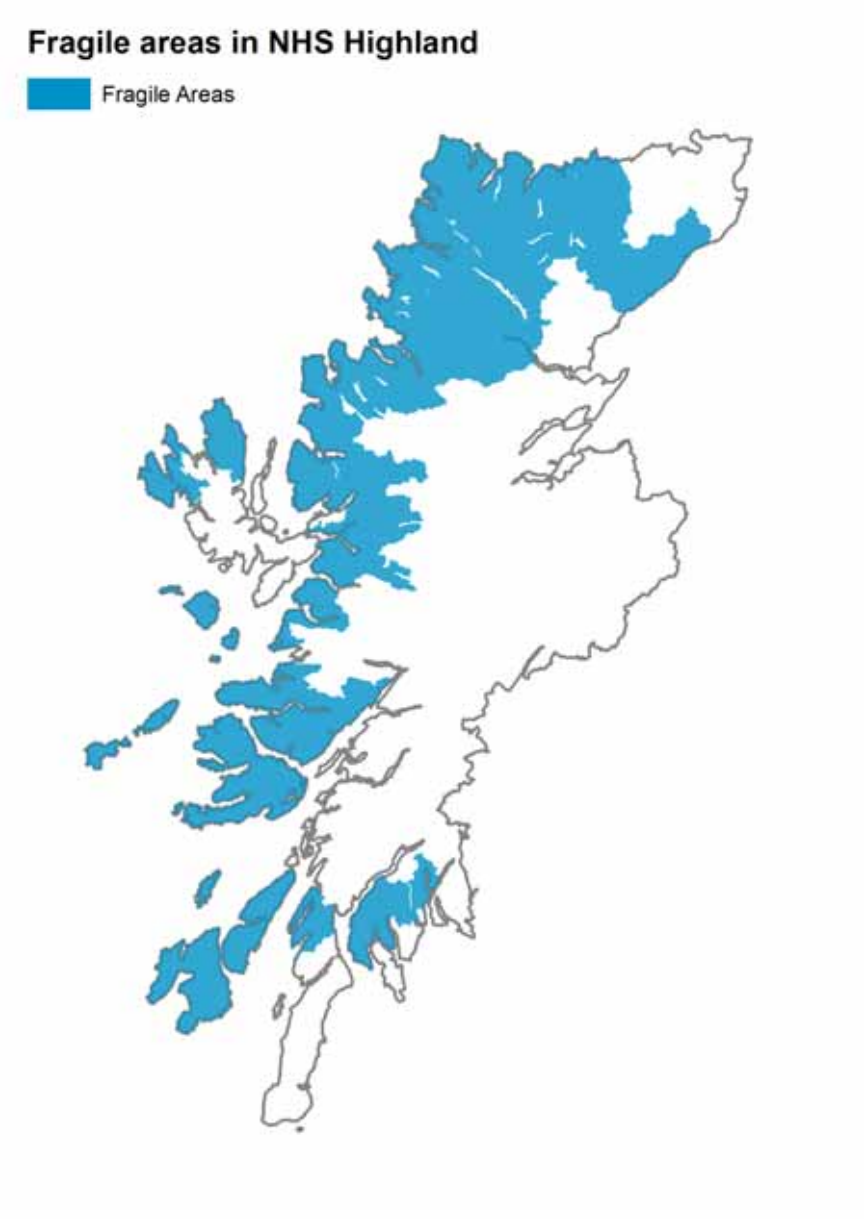
Map 2: Inverness City General Practice Locations showing completed and future housing development areas



Data source: NHS Highland Directorate of Public Health[8] and Highland Council[7]

In contrast to the population growth associated with the Inverness and Inner Moray Firth areas, other parts of NHS Highland are recognised as being economically and demographically disadvantaged. Fragile areas are a measure used by Highlands and Islands Enterprise (HIE) to classify rural areas for targeting resource. These are highlighted in Map 3 and are characterised by declining population, under-representation of young people within the population, lack of economic opportunities, below average income levels, problems with transport, and other issues reflecting their geographic location[9].

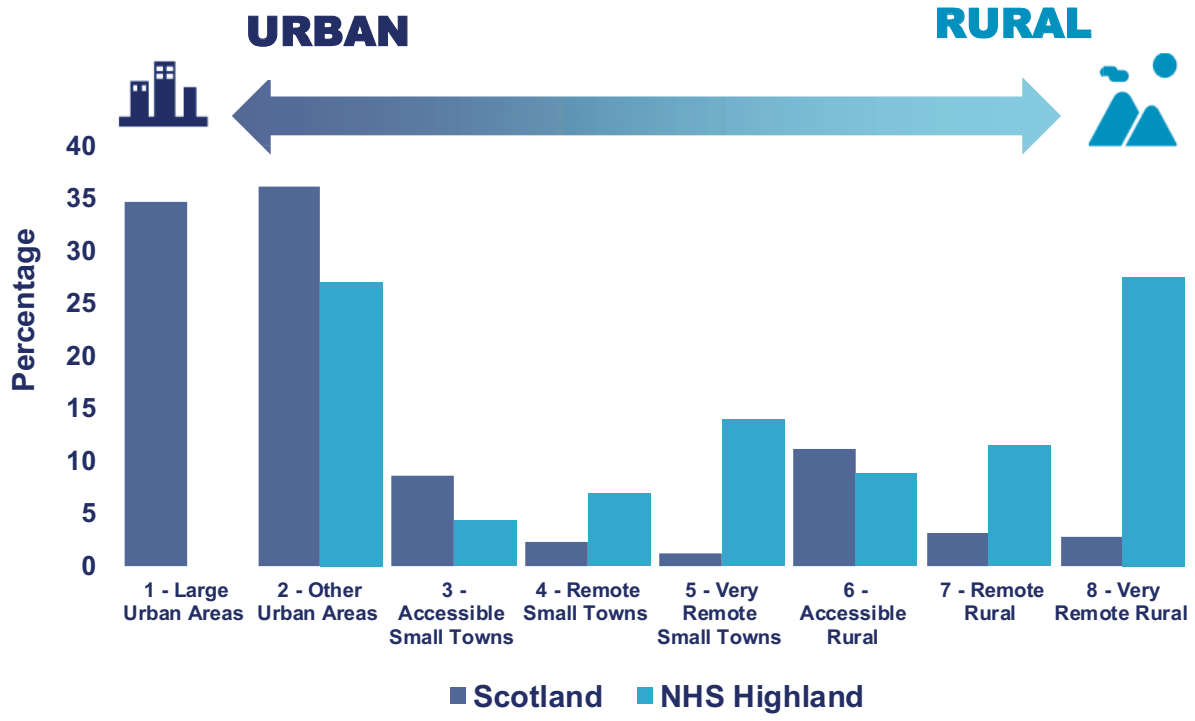
Map 3: Highlands and Islands Enterprise Fragile Areas



Data source: Highlands and Islands Enterprise[9]

While most of the Scottish land mass is rural, most of the population lives in urban areas. The Scottish Government has adopted a standard definition of urban and rural settlement for small area statistical geographies (SGURC)[10]. This ascribes an urban – rural description across an 8-fold classification based upon settlement size and the accessibility of an area. The proportion of the NHS Highland population living in each category of the 8 fold typology is outlined below and compared to Scotland.

Figure 7: Percentage of the population by Scottish Government Urban Rural Classification 2016



Data Source: Scottish Government[10] and National Records of Scotland[11]

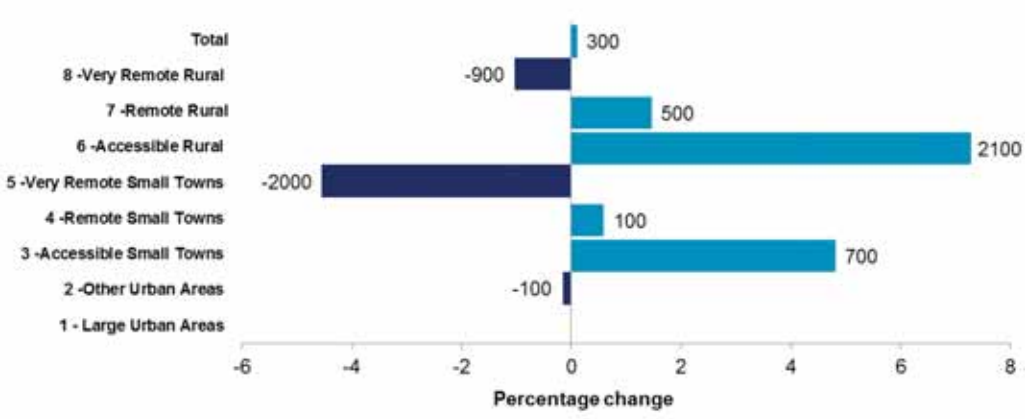
Map 4: Remote rural areas in NHS Highland

Data Source: Scottish Government[10]

Nearly 50 percent of the NHS Highland population lives in an area characterised as rural and 60 percent live in areas that would be consider remote. In the current version of the SGURC (2016) only Inverness, Fort William and Helensburgh are included in the category of 'Other urban' settlements having populations of over 10,000 people.

There were declines in the population of very remote towns and very remote rural areas in NHS Highland over the six year period from 2011. Population growth was largely in accessible rural and small towns within a 30 minute drive time of a settlement of 10,000 people. Within the other urban area category that includes larger settlements, population growth occurred in the Inverness area over the period.

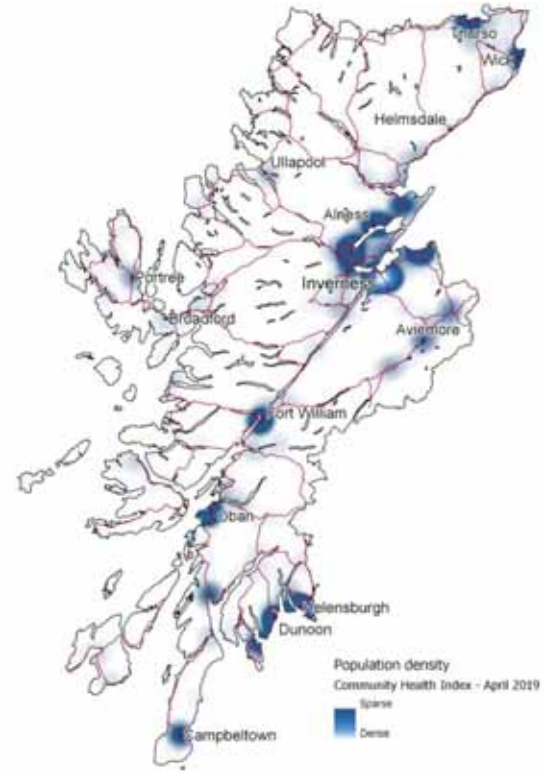
Figure 9: Percentage change in the population of NHS Highland by SGURC, 2011 – 2017



Estimates of absolute change in population numbers shown at bar series end (rounded to nearest 100 people) based upon small area population estimates for data zones.

Data Source: Scottish Government[10] **and National Records of Scotland**[11,13]

Map 5: Population distribution in NHS Highland 2019[6]



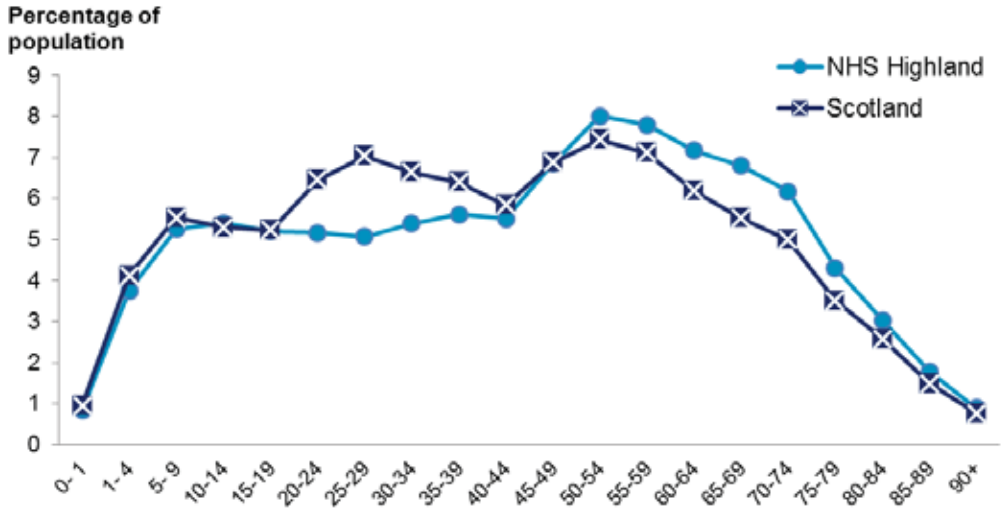
The differing geographic characteristics of the area and population distribution have important implications for service accessibility (Map 5). The natural barriers of the extensive coastline, mountains, lochs and islands, and the limitations of the transport infrastructure increase the peripherality of many Highland settlements. The location of a high number of settlements on the coast also reduces the potential to achieve economy of scale.

Rural populations generally experience decreased accessibility and diminished availability of specialist health care services, particularly as distance from major urban centres increases and local population size decreases. While not unique to NHS Highland, these challenges often operate at the extreme within the area. A result is higher unit cost for services in very sparsely populated areas and in those that are distant from service centres. The geography and the settlement pattern of the area makes efforts to deliver equity of access to health and social care services difficult.

Population ageing

In 2018 the population structure of NHS Highland has fewer younger people, more older people and fewer people of working age than the national average. The Highland population is ageing, and the proportion of older people is increasing (Figure 10).

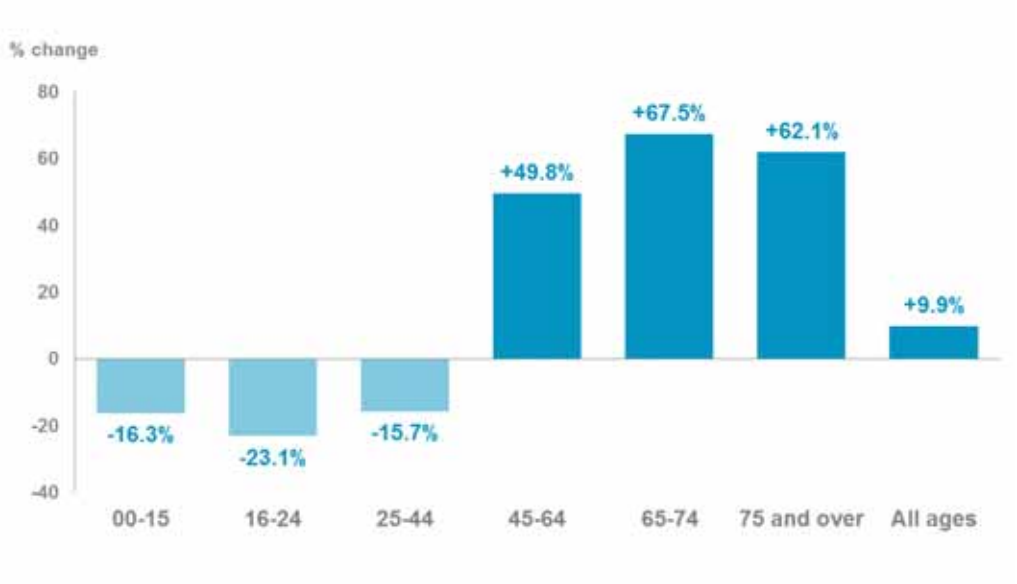
Figure 10: Proportion of the population by age band, Scotland and NHS Highland, 2018



Data source: National Records of Scotland[2]

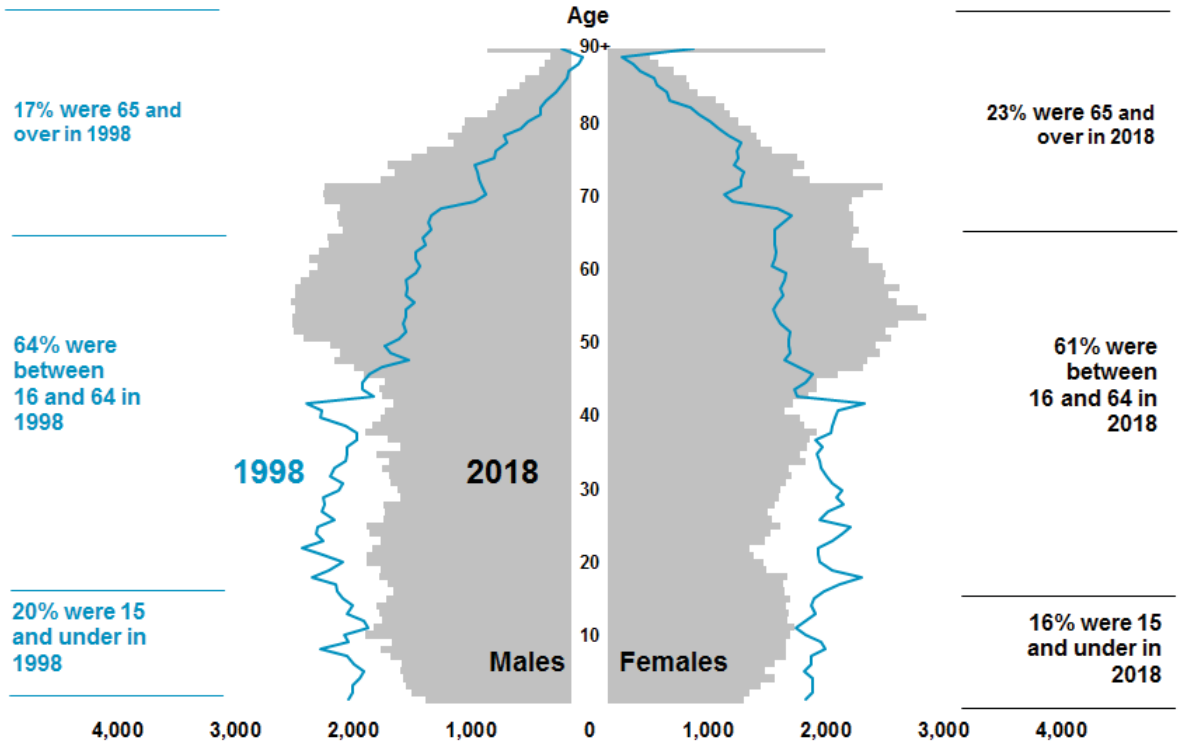
Between 1998 and 2018, the 16 to 24 age group saw the largest percentage decrease (-23.1%). The 65-74 age group saw the largest percentage increase (+67.5%) (Figure 11).

Figure 11: Percentage change in the NHS Highland population by age group between 1998 and 2018



Data Source: National Records of Scotland[14]

Figure 12: NHS Highland population in 1998 and 2018

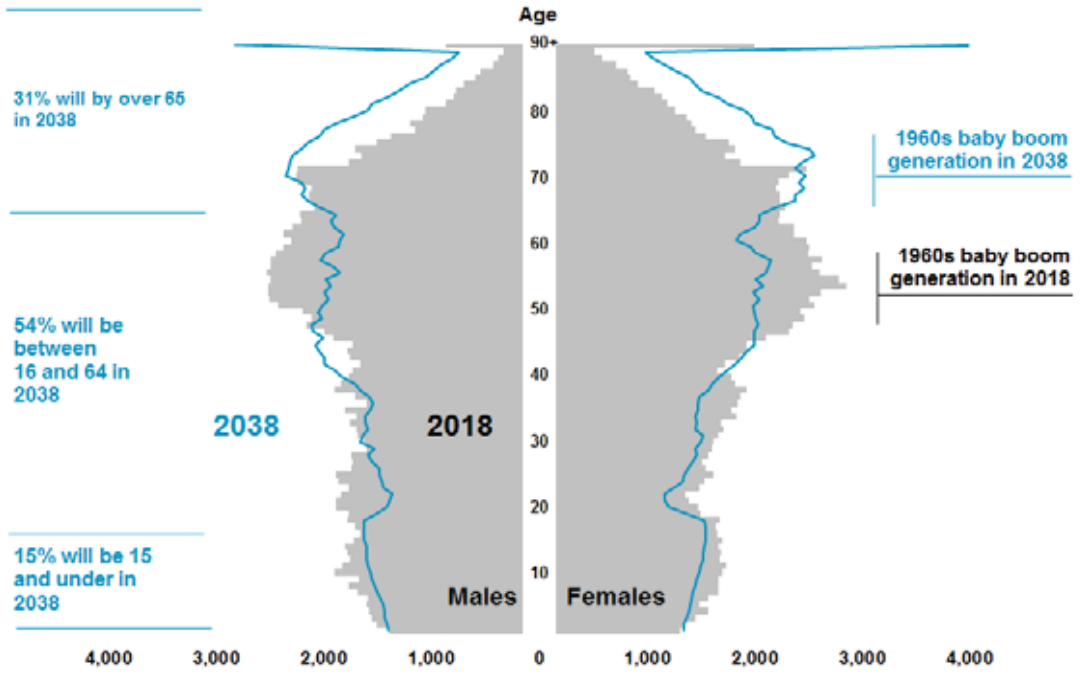


Data source: National Records of Scotland[1,2]

All the variants of the population projections for the NHS Highland area indicate that the population is likely to continue to age considerably, with older individuals making up proportionately larger shares of the population over time[1]. Figure 13 shows the principal population projection for NHS Highland with the top heavy structure becoming increasingly pronounced as the 'baby boom' cohort approach peak ageing

The numbers of people aged over 65 in the area is expected to be over 100,000 by 2038, an increase of 35 percent from 2018. In 2018 about one in ten people are aged over 75 years old, but by 2038 this figure will be over one in six. Figure 13 highlights the large anticipated increase in the population aged over 90 years old by 2038.

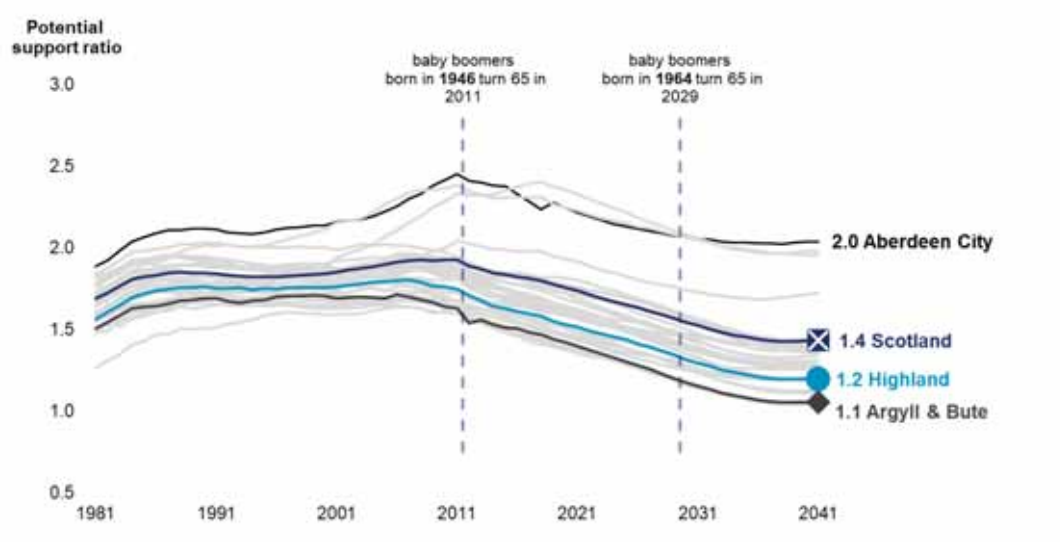
Figure 13: NHS Highland population in 2018 and 2038



Data source: National Records of Scotland[1,2]

Increasingly the population structure includes a smaller and older workforce. Over time the larger cohorts at working age have themselves aged and have been replaced by smaller numbers of people. Consequently further potential decreases are anticipated in Potential Population Support Ratios (PPSRs). In Figure 14 and 15 the PPSRs are calculated as the number of people aged sixteen to sixty-four years divided by the sum of the number of children aged less than sixteen years of age and the number of people aged 65 years and older. The ratio of people of traditional working age to older people is expected to be lower in Highland than the Scottish average, and to be particularly low in Argyll & Bute.

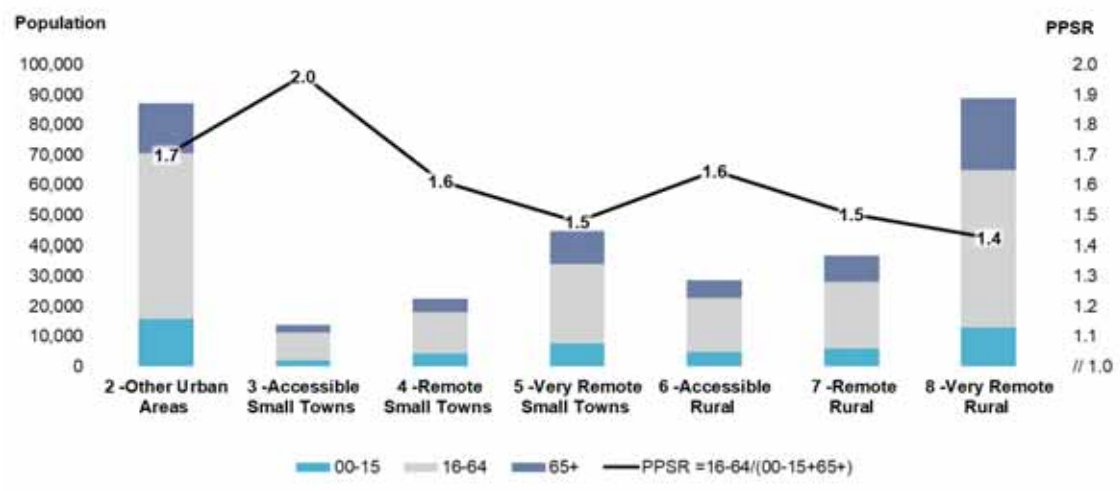
Figure 14: Actual, estimated and projected potential population support ratios of Scottish Councils, 1981 to 2041



Data source: National Records of Scotland[1,2]

Within NHS Highland there are significant variations in the population structures of areas. The most remote and rural communities have large cohorts at older ages with limited numbers of people at working ages available to provide support for services (Figure 15).

Figure 15: Population of NHS Highland by SGURC in 2017 by broad age group highlighting potential population support ratios



Data Source: Scottish Government[10] **and National Records of Scotland**[11]

Conclusion

Maintenance of the Highland population depends on inward migration. Deaths exceed births, and older people in the future are likely to have fewer younger people available to provide formal and informal support.

Trends in population movement within Highland result in sparse populations in rural areas, with a consequent increase in unit care costs, and a marked increase in demand in more urban areas.

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Changes in how we live in NHS Highland

Supplementary paper 2 to the Director of Public Health Annual Report 2019

Public Health Intelligence

Directorate of Public Health

NHS Highland

October 2019

The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland. The team provides an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

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Contents

Director of Public Health Annual Report 2019

This is the second paper in a series that will contribute to the NHS Highland Director of Public Health Annual Report 2019.

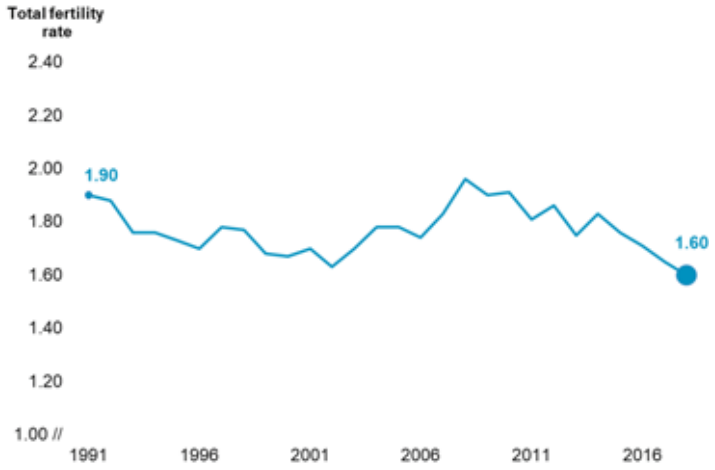
The first report looked at the demography and population dynamics of the area using available population estimates and projections. A subsequent series of supporting papers are planned that will look at, mortality, life expectancy, morbidity, dependency and informal care.

Changes in how we live

The population trends are for an increase in the number of living generations, but a decrease in the number of living relatives.

Demographic trends relating to ageing – falling fertility, falling mortality and increasing longevity – have important implications for the way we live in families and provide care and support. Low mortality rates have resulted in an increase in the number of living generations, a process referred to as 'verticalisation' of family structures. However, at the same time, postponement in childbearing, changes in choices about family size and an increasing number of women not having children has resulted in a decrease in the number of living relatives within each generation – a reduction in horizontal family structures[1].

Figure 1: NHS Highland total fertility rate, 1991 - 2018



The total period fertility rate (TFR) is the average number of children per woman that would be born to a group of women if they experienced the current year's age specific fertility rates for each year of their childbearing years. A TFR of 2.1 children per woman is often quoted as the level at which a European population replaces itself from one generation to the next, without migration. In Highland the TFR is now 1.6 (Figure 1). The trends for smaller numbers of children in families are anticipated to continue in the future.

Data source: National Records of Scotland[2]

At the same time that population ageing is changing family structures the way that we live as families is also changing with an increasing plurality of structures, roles and relationships. Behavioural and societal trends have seen shifts in attitudes about marriage, cohabitation, single parenthood, divorce and childlessness. The consequences are that families have become increasingly diverse, multi-generational and geographically dispersed[3,4].

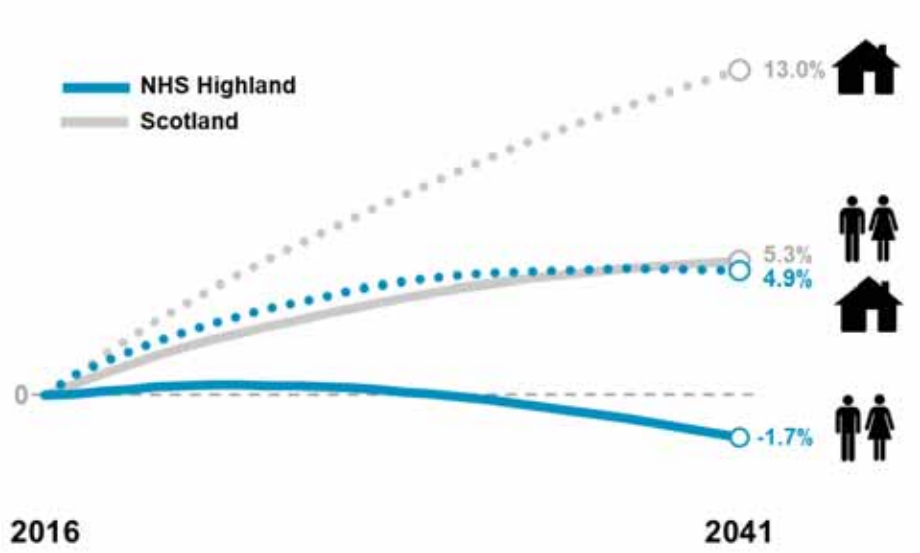
The ageing of the population will increase the demands for informal care but there is limited evidence about how the interrelated trends contributing to an increasing complexity of family types will impact on the future supply of intergenerational support. Most informal care for older people is currently provided by partners and adult children with later life caring responsibilities particularly falling to women. The trends towards smaller family size suggest a reduction in the number of children potentially available to be the carers of the future, but this may be at least partially offset by increasing male life expectancy and greater numbers of people living longer.

The care given by older people will be increasingly important for the families of the future. Longer life has already resulted in an increased probability of people having four living grandparents at birth, as well as at the time of transition to adulthood. The availability of grandparents to provide childcare helps younger people, particularly women to remain in

employment or pursue educational opportunities. As workforce numbers in the population decrease the importance of informal care to support those directly in work will increase.

The ageing population and the changes in the way we live in families also has implications for the demand for housing and particularly for housing adapted to meet the care needs of more older people who want to live independently at home. Over the next 25 years the number of households in NHS Highland is expected to increase by nearly 5 percent to around 156 thousand with the average household anticipated to consist of two people*.

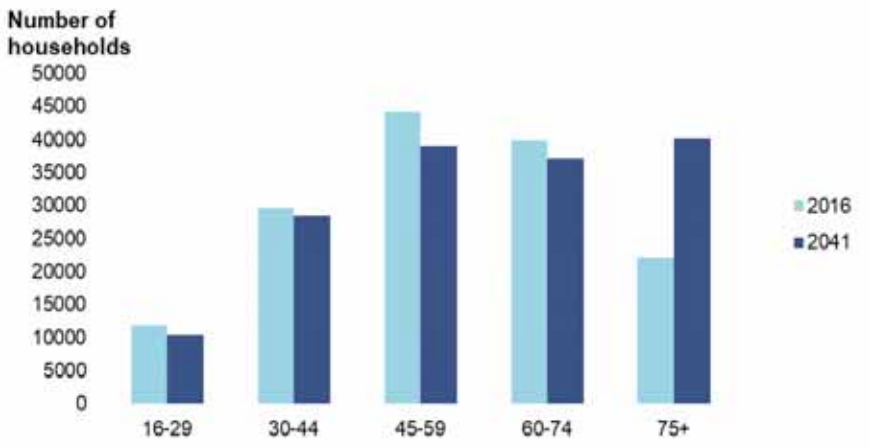
Figure 2: Projected percentage change in population and household numbers in Scotland and NHS Highland, 2016 to 2041



Data source: National Records of Scotland[5,6]

Particularly large increases are projected in households where the oldest person is aged 75 years and over and also in single occupancy households (Figures 3 and 4).

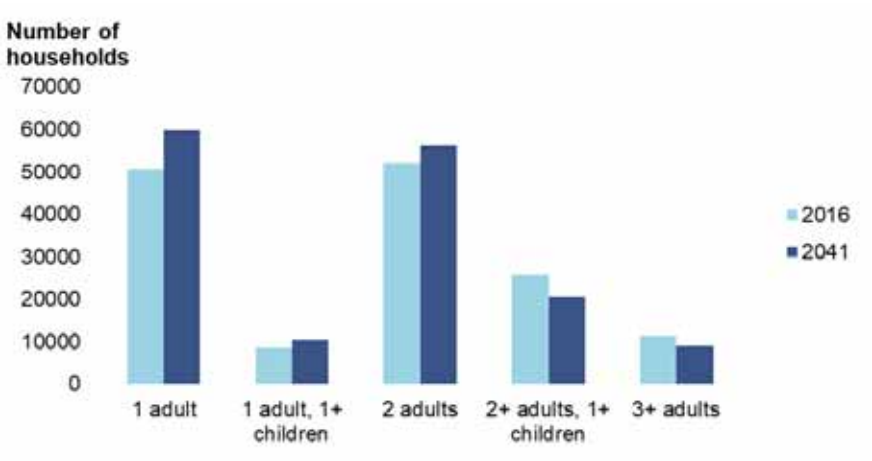
Figure 3: Estimated and projected number of households by age group in NHS Highland, 2016 and 2014



Data source: National Records of Scotland[5]

* A household is one person living alone, or a group of people (not necessarily related) living at the same address. A household can consist of more than one family, or no families in the case of a group of unrelated individuals.

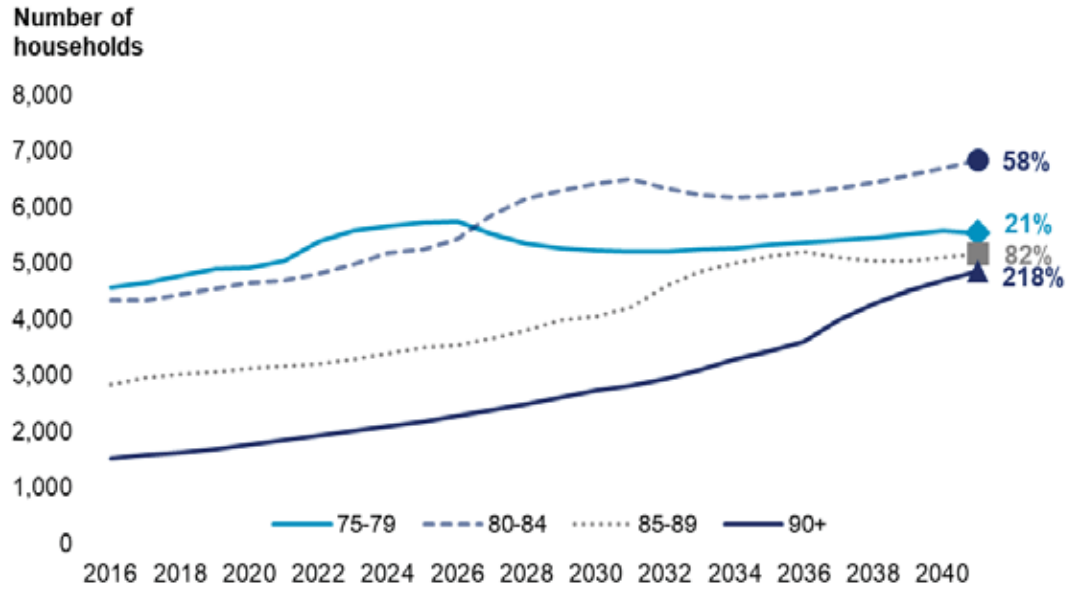
Figure 4: Estimated and projected number of households by type in NHS Highland, 2016 and 2041



Data source: National Records of Scotland[5]

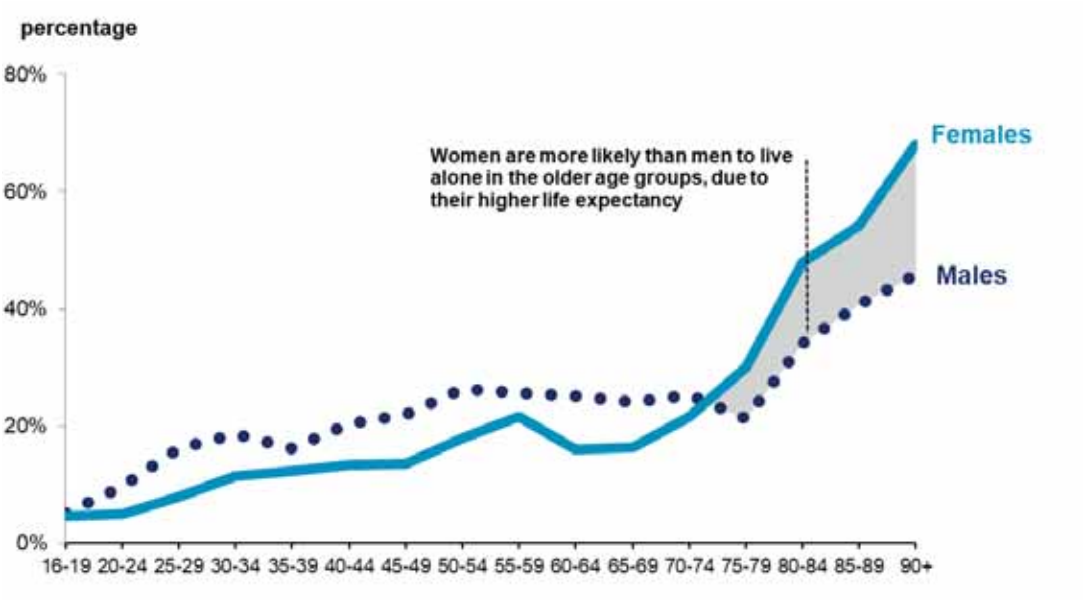
As a consequence of population ageing and the social trends contributing to long term changes in family structures, it is very likely that a greater proportion of the population over 75 years of age will live alone in the future (Figure 5). Significantly for both informal and formal care, very large increases are projected in the numbers living alone in their eighties and nineties with the majority of these people being women (Figure 6).

Figure 5: Estimated and projected numbers of single person households by older age group in NHS Highland, 2016-2041



Data source: National Records of Scotland[5]

Figure 6: Percentage of the NHS Highland population projected to live alone by age band and sex in 2041



Data source: National Records of Scotland[5]

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Mortality in NHS Highland

Supplementary paper 3 to the Director of Public Health Annual Report 2019

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Director of Public Health Annual Report 2019

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The first report looked at demography and population dynamics while the second considered increasing numbers of living generations and changes in how we live. A subsequent series of supporting papers are planned that will look at life expectancy, morbidity, dependency and informal care.

Mortality

Mortality data provides valuable insights into registered deaths and cause of death. This information can be used as an indicator of general health of an entire population. It can also highlight numbers of premature deaths, life expectancy and identify trends and differences between populations in causes of deaths. The main source of deaths data in Scotland (death registrations) is the National Records of Scotland[1*] (NRS). At the time of writing the latest complete year of mortality data published by NRS is for the calendar year 2018[†].

Context

Scotland has one of the highest rates of death (mortality) in Western Europe and this is reflected in the country's comparatively low life expectancy[2,3]. As in a number of other countries, including England, Wales and Northern Ireland, gains in life expectancies that had been improving stalled in Scotland around 2012 and are now in reverse[3]. The status of no improvement or deterioration in this key indicator of population health constitutes a major public health concern. Assumptions based upon expectations of continuous improvement in population health, the case since after the Second World War, are now cast in doubt. Those most affected by the increases in mortality rates live in our most deprived areas and the consequence is further widening of the gap in health inequalities in our society[3].

The Scottish Public Health Observatory is co-ordinating work for the Directors of Public Health to understand these trends and to make recommendation to government about what should be done. There is close collaboration with equivalent bodies across the UK and Ireland that brings together statistical and epidemiological expertise[4,5].

The analysis to date highlights that nationally, men and women, most age groups and almost every cause of death have been affected by these trends. In particular the improvement in deaths from circulatory causes such as stroke and coronary heart disease that had been the major drivers of life expectancy improvement have dropped to a much lower level in recent years. Additionally, drug related deaths have been increasing rapidly in Scotland, particularly amongst an established cohort of users aged 35-55 years. The impact of influenza on the trends remains unclear but there were particularly severe flu seasons in 2015 and 2018 with an excess of winter deaths recorded in these years[6-8]. Deaths attributed to dementia have increased as the population ages. Detailed causes of death are discussed later.

It is much easier to describe these current trends than to explain why these changes are occurring. Life expectancy has continued to improve in other countries whose populations already experience additional years of life compared to Scotland. This indicates that a natural limit in life span has not been reached in Scotland. The best evidence currently available suggests that the recent Scottish mortality trends are due to austerity and pressures on health and social care services that have particularly affected people who live in deprived areas[4]. This suggests that the observed downward trends are not irreversible, but much more needs to be done to address the social determinants of health that create such inequalities.

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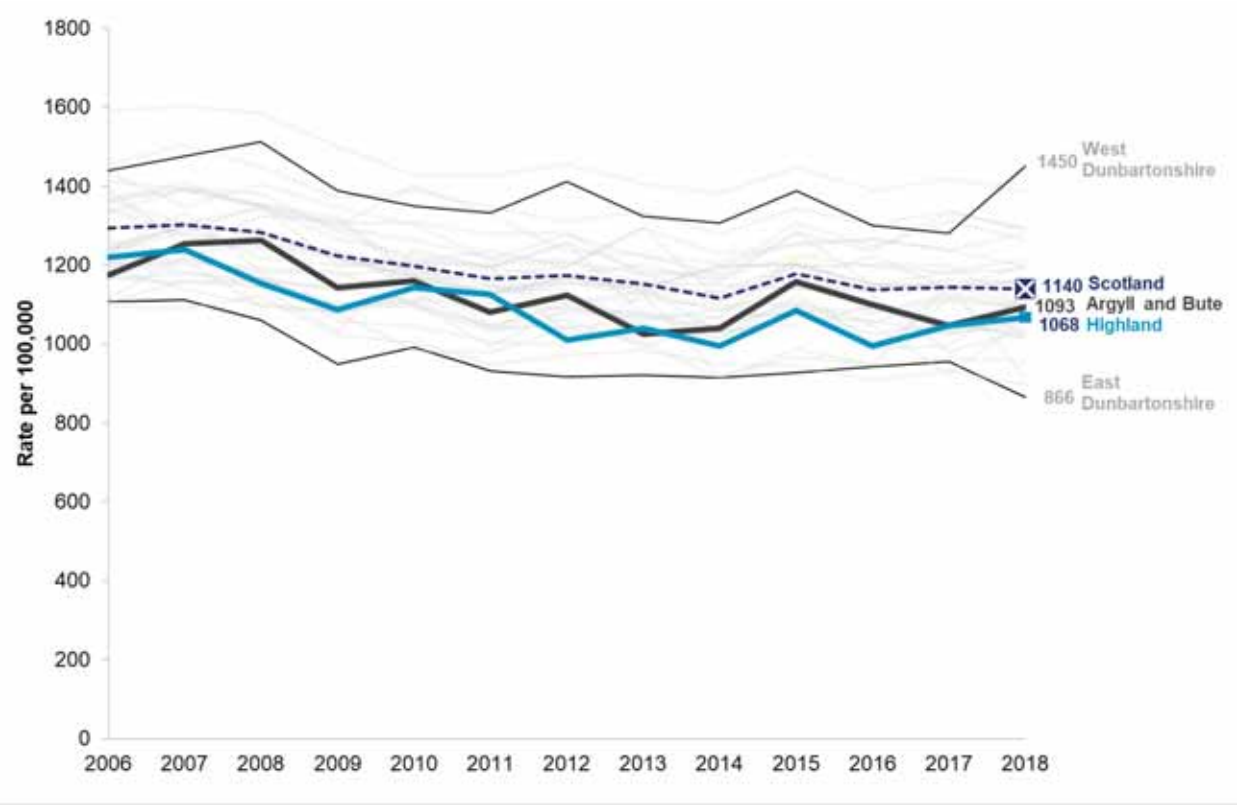
* The National Records of Scotland (NRS) is a non-ministerial department of the devolved Scottish Government responsible for producing statistics about Scotland's population.

† In this chapter we follow national reporting conventions for death data that provide figures on the basis of the underlying cause of death. The underlying cause of death is defined as the disease or injury which initiated the chain of events leading directly to death, or the accident /act that produced the fatal injury. For deaths registered from the 1st of January 2000, the causes of death are coded with the International Statistical Classification of Diseases and Related Health Problems (Tenth Revision) which is commonly referred to as ICD-10.

Mortality trends

To explore all-cause mortality trends over time and to adjust for changes in the age distribution of the population, directly age standardised death rates were calculated with the 2013 European Standard Population (Figure 1). If two area populations have different age distributions, a comparison of the number of deaths and their crude rates (calculated by dividing the total number of deaths by the total population) may be misleading[9].

Figure 1: Deaths from all causes (all ages), directly age standardised rates per 1000,000 population for Local Authorities and Scotland, 2006-2018



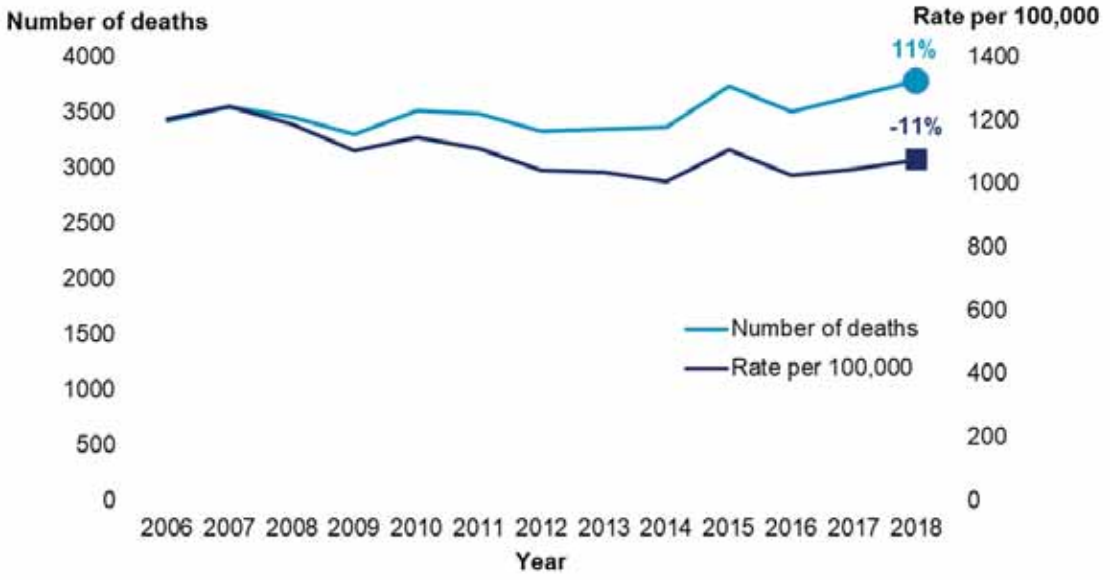
Data source: National Records of Scotland[10]

All-cause mortality rates in Argyll and Bute and Highland are generally very similar and both areas have been consistently lower than that of Scotland over the period. The slowdown in the national rate of improvement can be seen in the data from 2012 onwards. The trends for the Local Authority areas of NHS Highland, while showing greater annual variation, largely mirror the national trend from 2012 with no recent improvement in mortality.

Figure 2 shows that over the period 2006 to 2018 the absolute number of deaths in the NHS Highland area increased while the age adjusted all-cause mortality rate improved. The increase in the absolute number of deaths would be anticipated to continue given that larger cohorts of people are moving into older age ranges. However, as discussed above, the trajectory of recent mortality rates is a major concern indicating additional deaths and years of life lost.

In 2018 there were over 3,750 deaths to NHS Highland residents with 1,121 deaths recorded for the Argyll & Bute area and 2,666 in Highland.

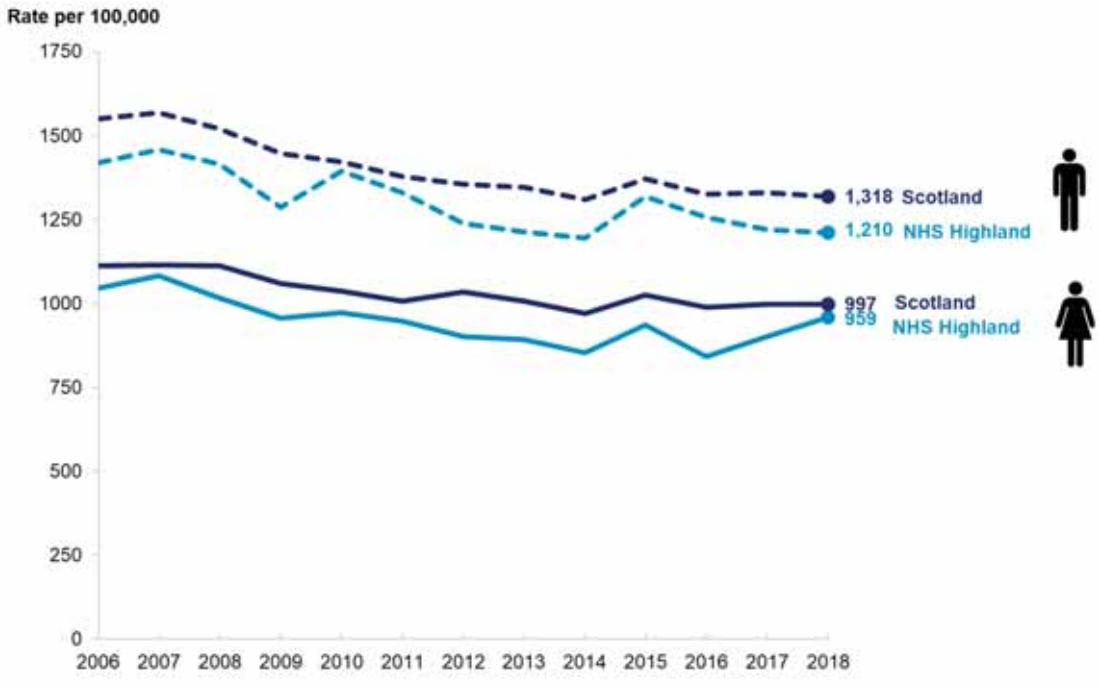
Figure 2: NHS Highland - number of deaths from all causes (all ages) and directly age standardised rates per 100,000 population, 2006-2018



Data source: National Records of Scotland[10]

Male and female mortality rates in NHS Highland are both consistently lower than those nationally and both exhibit the pattern of the slowdown in improvement observed. Males continue to die at younger ages and the age standardised death rate for men in NHS Highland is still 25 percent higher.

Figure 3: Deaths from all causes (all ages) by gender, directly age standardised rates per 100,000 population for NHS Highland and Scotland.

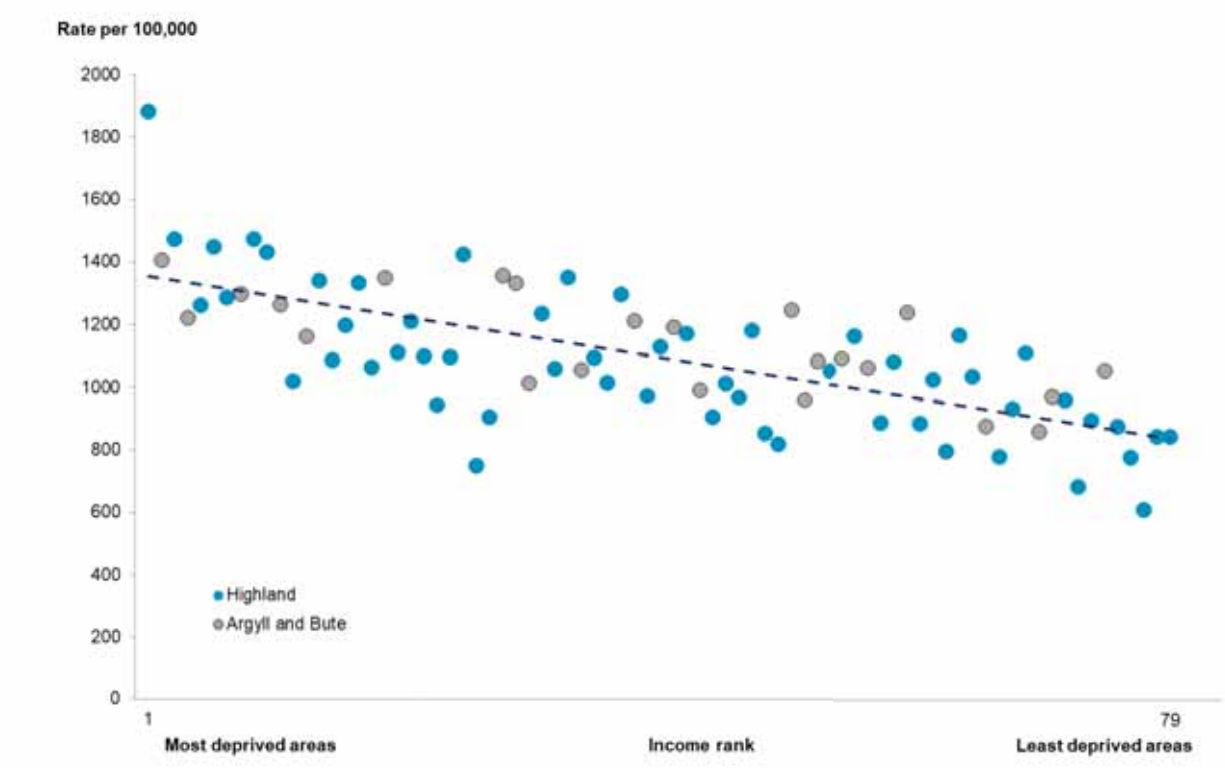


Data source: National Records of Scotland[10]

Comparative All-Cause Mortality in NHS Highland

Figure 4 reports the all cause and all age mortality rates across 79 intermediate geographies[‡] in NHS Highland ranked by an indicator of income deprivation from the Scottish Index of Multiple Deprivation 2016 for the three year period 2015 to 2017[11,12]. There are higher mortality rates in more deprived areas in NHS Highland consistent with the evidence for systematic differences in health between people in poorer and in more affluent communities. The extreme outlying point with the highest mortality rate is the Merkinch area of Inverness.

Figure 4: Variation in age and sex adjusted all-cause (all ages) mortality rates per 100,000 population in the period 2015-2017 across NHS Highland intermediate geographies associated with income deprivation



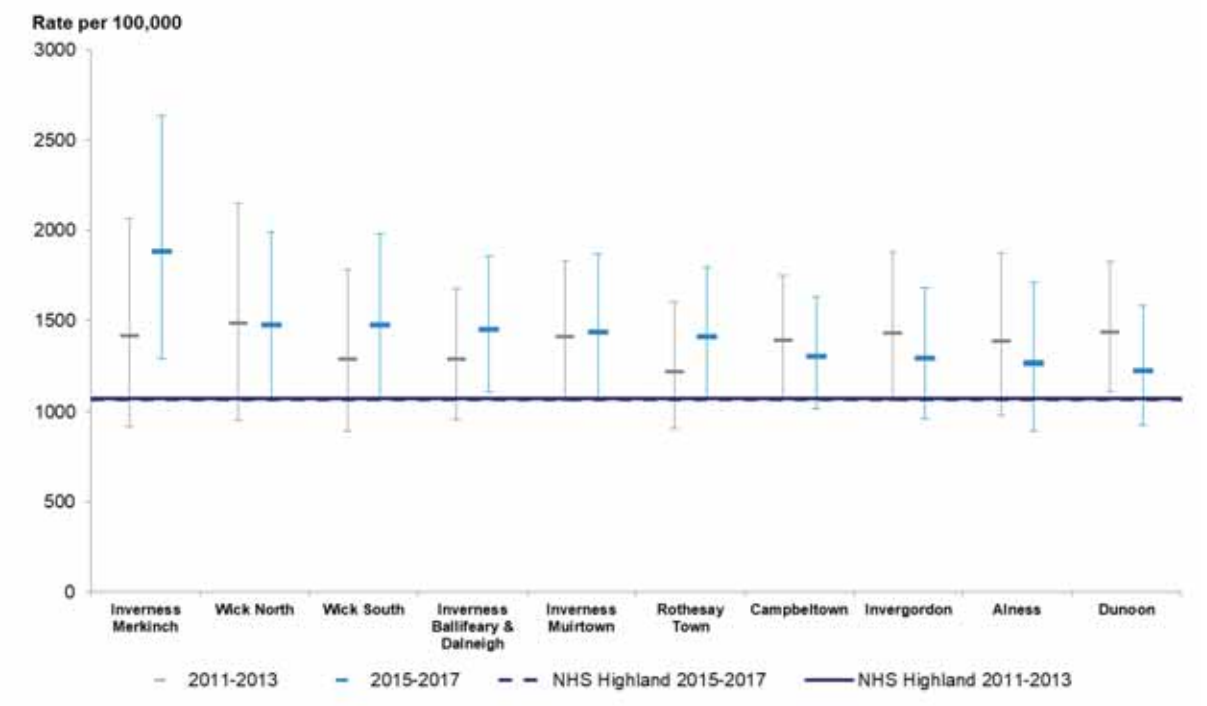
Data Source: Scottish Public Health Observatory[11] and Scottish Government[12]

Between 2011-2013 and 2015-2017 all cause and all age mortality in the Merkinch area increased by 30 percent to a rate of 1,824 per 100,000 population. In absolute terms this is an increase of eight deaths a year compared to the period 2011-2013. Other than Merkinch, the Inverness Ballifeary & Dalneigh area also shows a significant increase above the Highland average with the all age and all-cause mortality rate for the other most deprived areas in NHS Highland showing no significant improvements (Figure 5).

Premature rates of death in those aged under 75 years of age are also higher in the poorer areas of NHS Highland as shown in figure 14 below.

[‡] There are 79 intermediate geographies in NHS Highland – areas with a population between 2,300 and 6,900 with an average population of 4,100. These areas are 'intermediate' between small areas such as data zones and larger areas such as Local Authority areas.

Figure 5: Age and sex adjusted all-cause (all ages) mortality rates per 100,000 population in the periods 2011-2013 and 2015-2017 across the most 10 income deprived NHS Highland intermediate geographies



Data Source: Scottish Public Health Observatory[11] and Scottish Government[12]

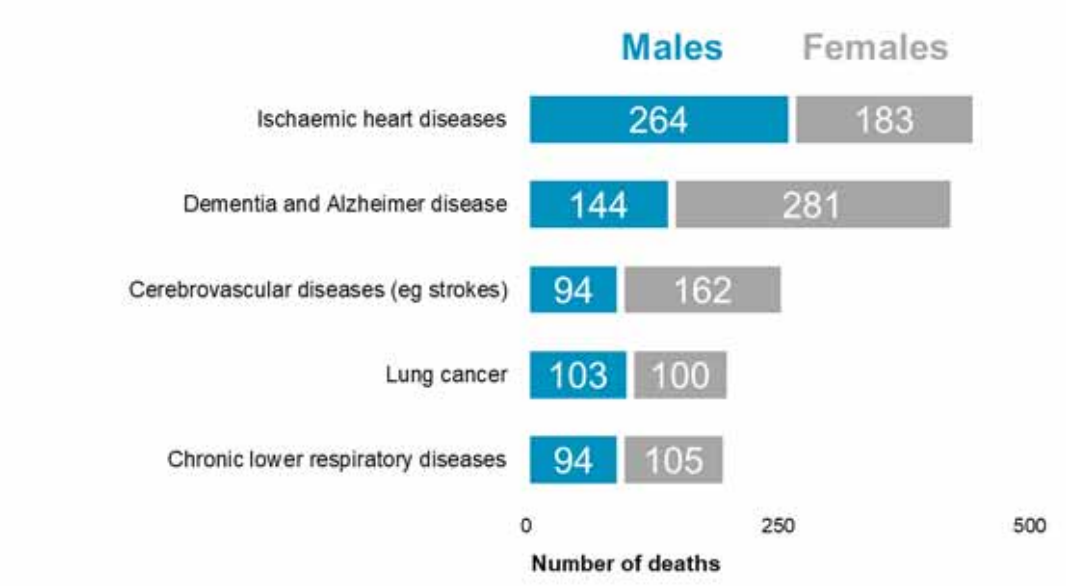
Causes of death

Leading causes of death

The leading cause of death in 2018 in NHS Highland was ischaemic heart disease, which accounted for 11.8% of all deaths. This was closely followed by dementia and Alzheimer's disease which accounted for 11.2% of deaths. The leading cause differed by sex, with females being most likely to die from dementia and Alzheimer's disease (14.4% of female deaths) and males most likely to die from ischaemic heart disease (13.4% of male deaths).

The leading cause of death analysis is based on causes categorised by the World Health Organisation (WHO)[13,14]. There are over 60 categories in total and cancers are grouped according to site. This means that lung; breast and bowel are assigned and counted separately. If all cancers are grouped together, cancer would account for the largest cause of death.

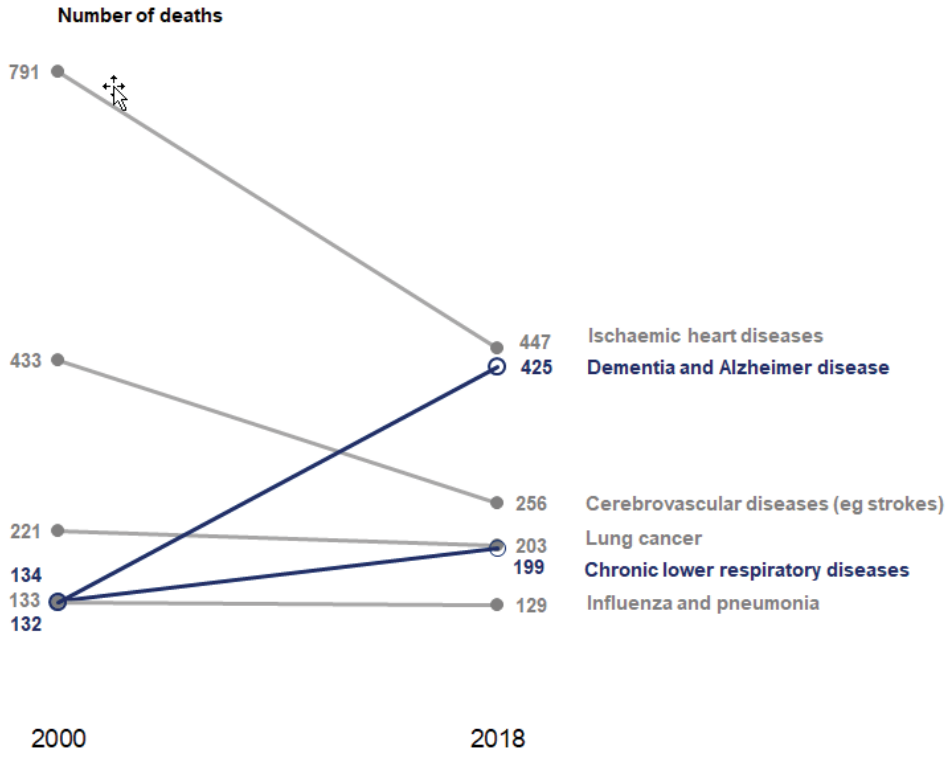
Figure 6: NHS Highland - leading causes of death, 2018



Data source: National Records of Scotland[15]

In NHS Highland Ischaemic heart disease was the leading cause in 2000 and 2018 but numbers have almost halved over the period. Dementia and Alzheimer's deaths were three times greater in 2018 than in 2000, making them the second most common cause of death in 2018. Cerebrovascular disease deaths have fallen by almost 40%. Lung cancer was the fourth most common cause of death in 2018. Influenza and pneumonia was fifth in 2000 but dropped to sixth by 2018.

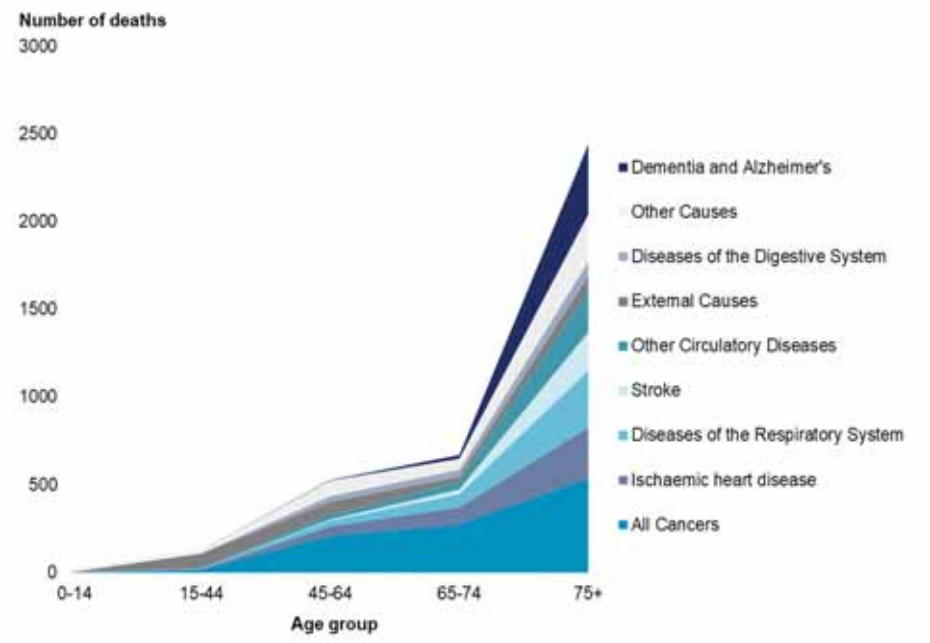
Figure 7: NHS Highland - change in the leading causes of death, 2000 -2018



Data source: National Records of Scotland[15]

Causes of death vary greatly by age, with external causes of death being the major reason for death in younger age ranges, as discussed further below. Cancer, ischaemic heart disease and stroke are increasingly the cause of death in those aged 45 years and over with dementia and Alzheimer's disease for those aged 75 year and older.

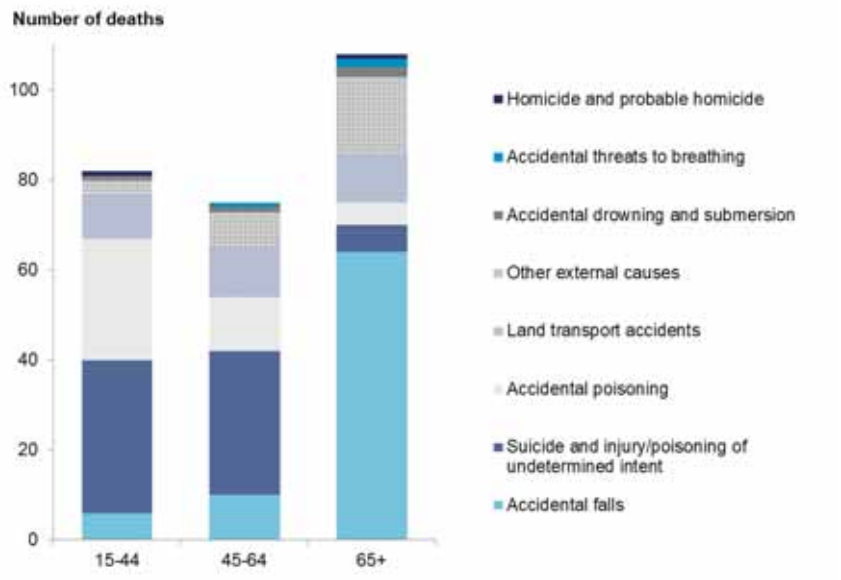
Figure 8: NHS Highland - number of deaths by age group, 2018



Data source: National Records of Scotland[15]

External causes accounted for about 7% of all deaths in NHS Highland in 2018. Within this grouping, deaths from intentional self-harm and accidental poisoning are more common in younger adults than in older adults while injury from falls dominate deaths in older adults.

Figure 9: Number of deaths in NHS Highland from external causes in NHS Highland by broad age group, 2018



Data source: National Records of Scotland[15]

Age-standardised mortality rates by selected cause, 2006-2018

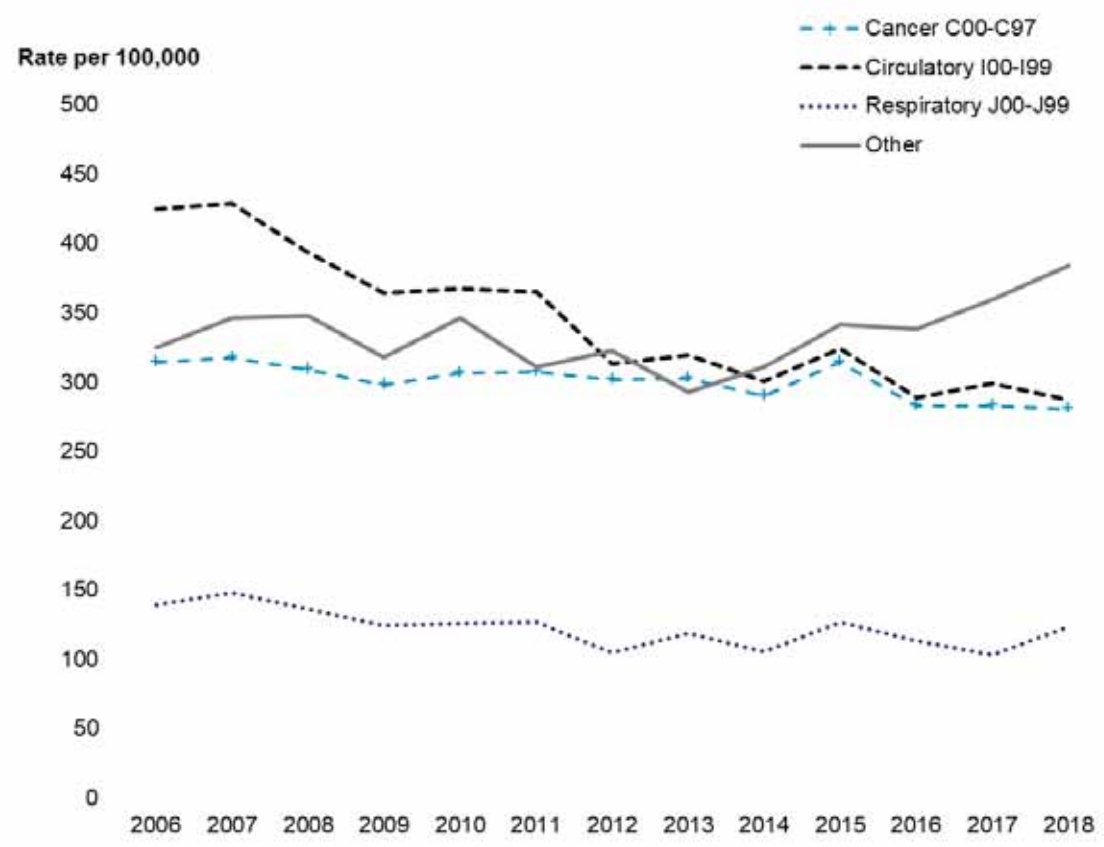
The number of cancer deaths has increased over time (Figure 10). Age-standardised cancer death rates have decreased, so the higher numbers of deaths are mainly a result of larger proportions of older people in the population. Death rates from circulatory diseases have reduced greatly and have substantially driven improvement in all-cause mortality rates over the last thirty years (Figure 11). Rates in NHS Highland have continued to reduce in recent years, but as with the national rate the improvement has slowed. The age-standardised death rates for respiratory diseases at all ages have not altered dramatically over the period. The largest increase in rates has been in 'other' causes of death. This change reflects the considerable increase in dementia and Alzheimer's deaths, particularly in those aged over 85 years of age, and in deaths from external causes as noted earlier. Deaths from external causes that tend to occur at younger ages have greater impact on mortality rates and life expectancy.

Figure 10: NHS Highland -selected causes of death, numbers and age-standardised rates, 2008, 2013 and 2018

		All		Under75	
Cause	Year	Number of deaths	Age standardised death rate	Number of deaths	Age standardised death rate
All	2008	3458	1188.1	1323	448.8
	2013	3353	1035.3	1199	377.2
	2018	3787	1076	1343	400.2
Cancer C00-C97	2008	954	309.1	494	166
	2013	1024	303	482	148.1
	2018	1034	280.9	497	143.3
Circulatory I00-I99	2008	1127	393.7	321	108.1
	2013	1026	320	288	89.7
	2018	1014	287.2	266	76.3
Respiratory J00-J99	2008	381	136.8	94	32.4
	2013	377	119.3	95	29.3
	2018	435	123.9	110	31.1
Other	2008	996	348.5	414	142.2
	2013	926	293	334	110.1
	2018	1304	384.1	470	149.6

Data source: National Records of Scotland[10]

Figure 11: NHS Highland - age-standardised mortality rates for select cause, 2006-2018



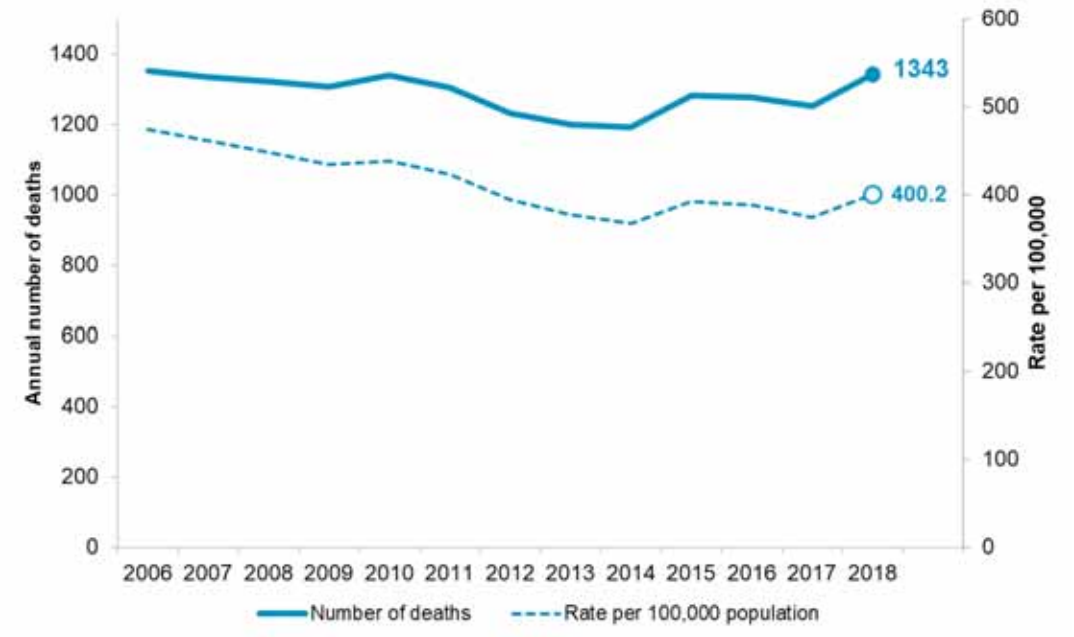
Data source: National Records of Scotland[10]

Premature mortality

Premature mortality is a national quality outcome indicator that is based on the age-standardised mortality rate (using the European Standard Population) per 100,000 people aged less than 75 years.

Around 1,300 people in NHS Highland died before the age of 75 in 2018. Premature mortality in NHS Highland was 16 percent lower in 2018 than it was in 2006, falling from a rate of 475 per 100,000 people in 2006 to 400 per 100,000 people in 2018 (Figure 12). However, from 2013 there has been a reversal in the trend in improvement with rates in 2018 at their highest level since 2011.

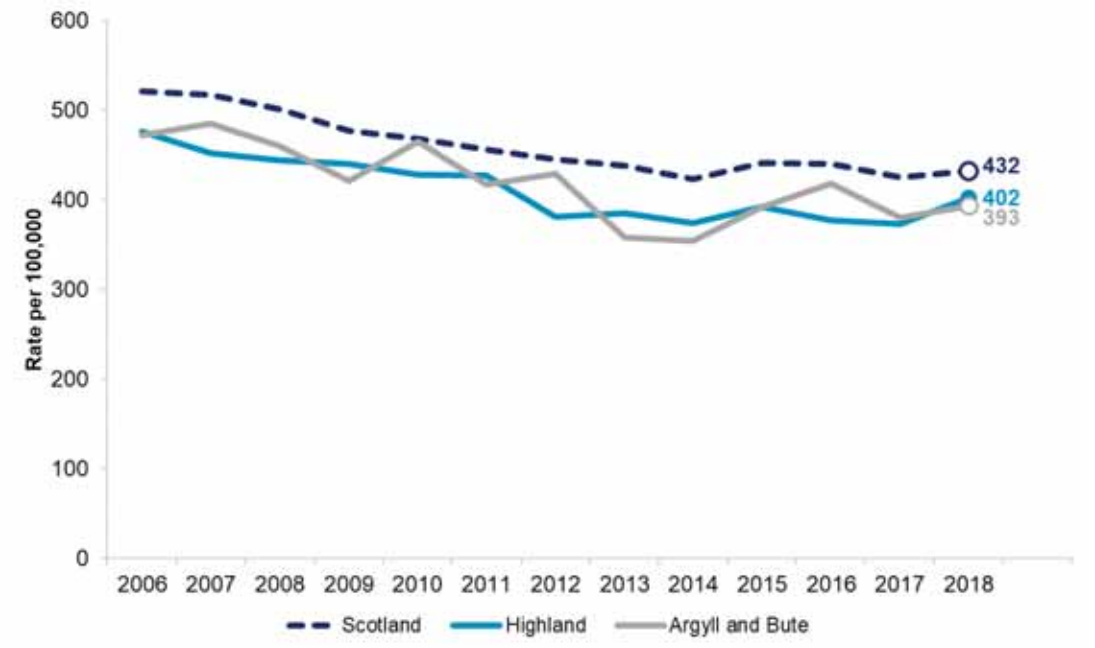
Figure 12: NHS Highland under 75 years of age and age-standardised all-cause mortality rate per 100,000 population and number of deaths



Data source: National Records of Scotland[9,10]

Nationally, in the period 2006-2018, the premature mortality rate fell by 17 percent (Figure 13). Figure 13 also shows the change over time by NHS Highland constituent council area. Both areas have premature mortality rates that are consistently lower than the national rate, but the reductions in mortality observed in the early part of this period have not been sustained in more recent years.

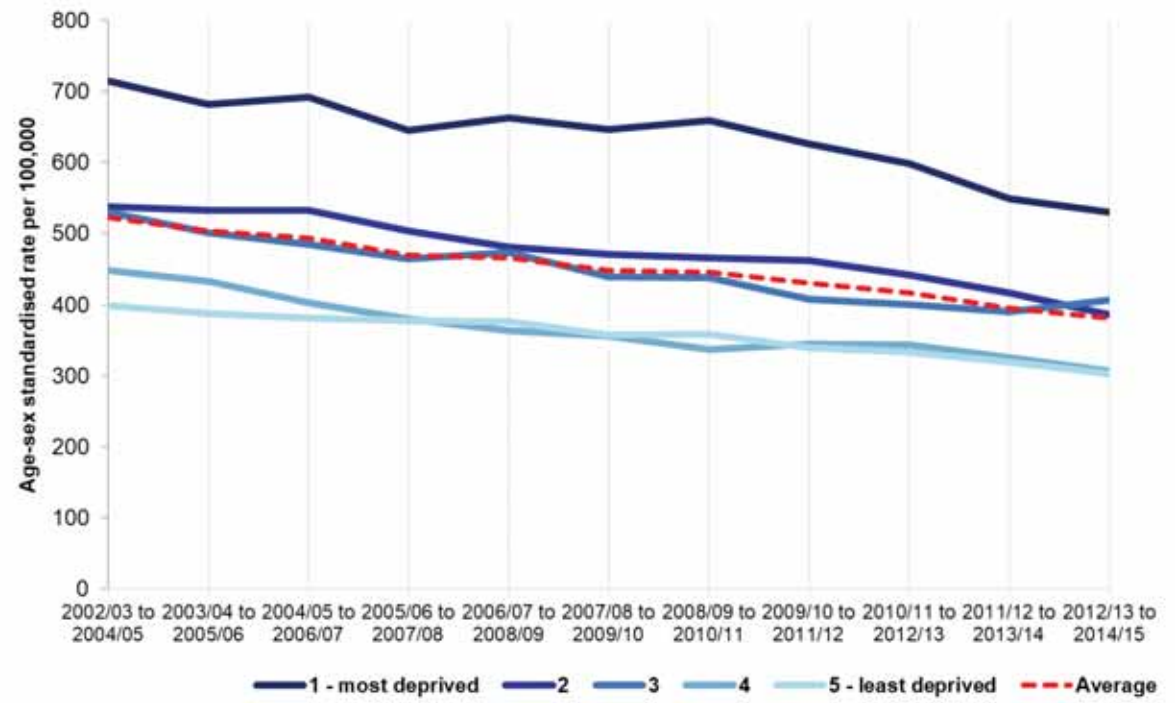
Figure 13: Age-standardised all-cause mortality rate per 100,000 population (under 75s) for residents of Highland council area, Argyll and Bute council area and Scotland



Data source: National Records of Scotland[9]

Premature mortality rates remain consistently higher in the most deprived areas of NHS Highland over time (Figure 14) with rates 1.75 times higher in the most deprived areas compared to the least deprived[16]. The Global Burden of Disease project has investigated premature mortality, disability and risk factors across the UK and found that half of all premature deaths are linked to factors such as alcohol and drug use, obesity, tobacco, diet, low physical activity and high blood pressure. These risk factors are known to correlate closely with deprivation[17].

Figure 14: Differences in all-cause premature mortality between deprivation groups in NHS Highland



Data source: ScotPHO online profiles tool[16]

Avoidable mortality

Avoidable[§] and premature mortality are closely related indicators of population health; for most causes of death considered as avoidable there is an upper age limit of 74 years. These deaths are considered avoidable in the presence of 'timely and effective healthcare' or 'public health interventions'[11,12]. Included in the list are deaths from conditions such as heart disease, some cancers, respiratory diseases and type 2 diabetes – where lifestyle and environment may have contributed to early death. The list also includes those deaths that could have been prevented such as HIV/AIDS, accidental and self-inflicted injuries, rubella and various infections and drug use disorders[18].

[§] The measures of avoidable mortality presented in this report use the definitions and ICD10 codes developed by the Office of National Statistics (ONS) for their statistical bulletin 'Avoidable mortality in the UK'[18.] There are a number of differences in the measure of avoidable mortality calculated by ONS and NRS. NRS include deaths of non-residents of Scotland and neonatal deaths. These are excluded from the ONS methodology and in our local calculations[19].

A particular condition may be avoidable, but this does not imply that every death from that condition can be prevented. Factors such as lifestyle, age of the person, the extent of disease progression at diagnosis and the potential contribution of other medical conditions are not taken into account by the metric.

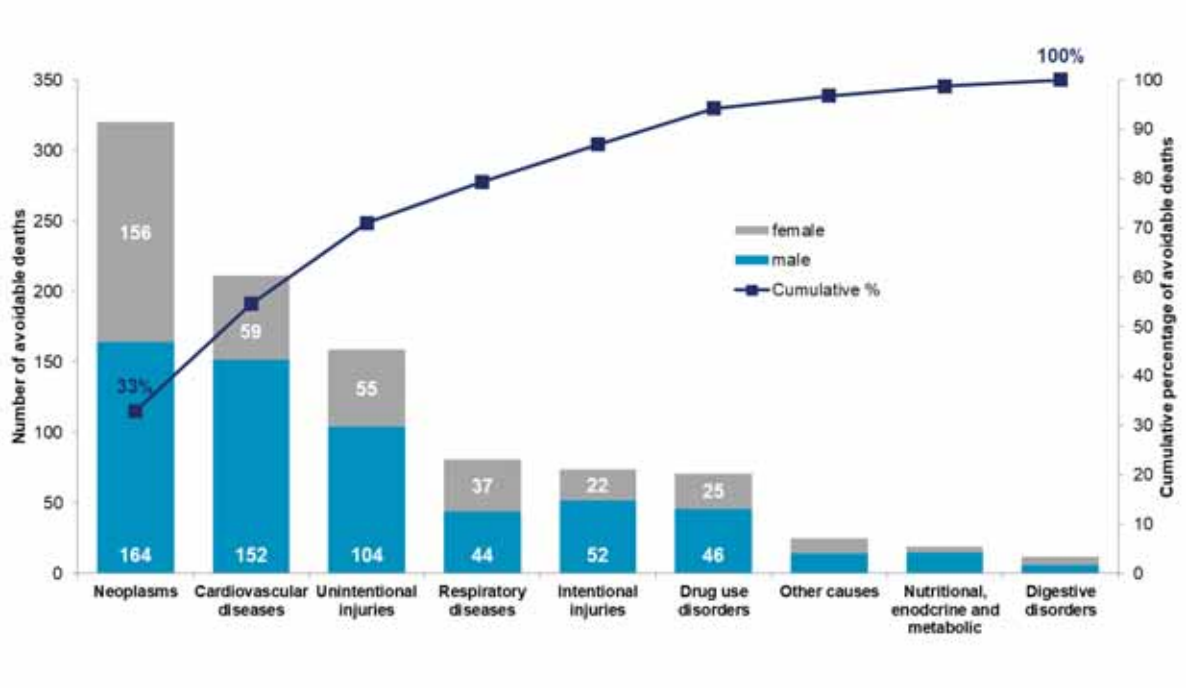
NHS Highland has a lower rate of avoidable deaths compared to Scotland (Figure 15).

Figure 15: Avoidable mortality European age-sex standardised rates (EASR) per 100,000 population for residents of Argyll & Bute, Highland, NHS Highland and Scotland in 2016

Data source: NHS National Services Scotland[20]

In 2018 in NHS Highland, 972 deaths (a quarter of all deaths) were classified as avoidable; 61 percent were male. Around a third of all male deaths in NHS Highland were counted as avoidable (597 out of 1,830 or 33 percent) in 2018, compared with a little under a fifth of female deaths (375 out of 1,955 or 19 percent). The difference between the sexes arises in part because women live longer than men and only a small proportion of deaths aged 75 or older are included in the definition.

Figure 16: Number and cumulative percentage of avoidable deaths of residents of NHS Highland by sex and broad category of cause, 2018



Data source: National Records of Scotland[15]

Winter deaths

More people die in the winter than in the summer with women, the elderly and those with underlying health conditions at greater risk[8]. Both temperature and levels of influenza in the population are important predictors of additional winter deaths but the relationship between these factors and mortality is complicated[21]. Temperature only explains a small amount of the annual variance in winter mortality and higher levels of death can occur during relatively mild winters[22].

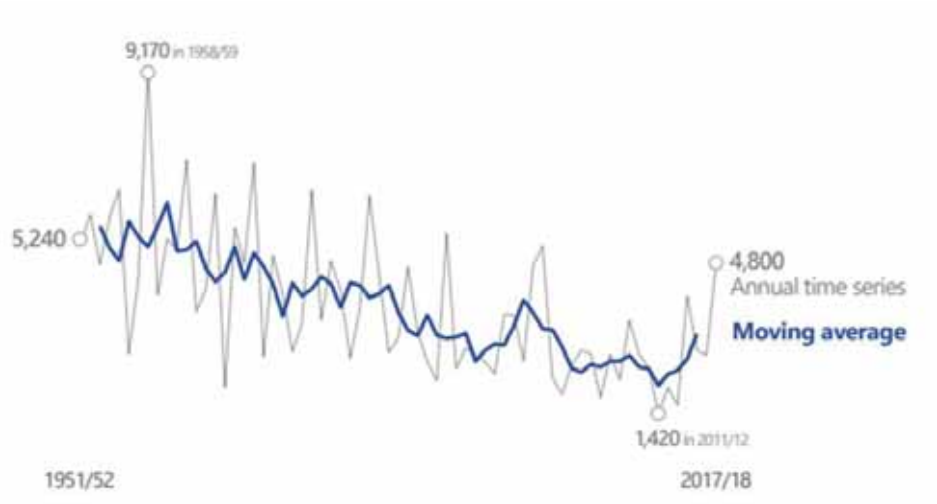
Colder weather directly contributes to increased risk of death due to falls, fractures and road traffic accidents and indirectly by worsening existing chronic conditions, particularly circulatory complaints and respiratory diseases. The level of influenza circulating in the population increases in the winter and in vulnerable groups, influenza can lead to life threatening complications such as bronchitis or secondary bacterial pneumonia[8,23,24]. Conditions directly relating to cold, such as hypothermia are rarely the main cause of death[8].

An excess of all-cause winter mortality, particularly in the elderly, was recorded nationally in 2014-15 and in 2017-18 with moderate to high level of influenza activity observed in the population[25].

The long term winter mortality trend in Scotland has been generally downward (shown in Figure 17 by the 5-year moving average series), but the annual difference has fluctuated in recent years. There were about 4,800 'additional' deaths in Scotland during winter 2017/18 which is the largest values since 1999/2000 when there were 5,190 additional deaths**. The figure of 1,420 deaths in 2011/2012 was the lowest of the whole series.

** The seasonal increase in mortality in the winter is measured by National Records of Scotland (NRS) as the difference between the number of deaths in the four month 'winter' period (December to March, inclusive) and the average number of deaths in the two periods before and after[8].

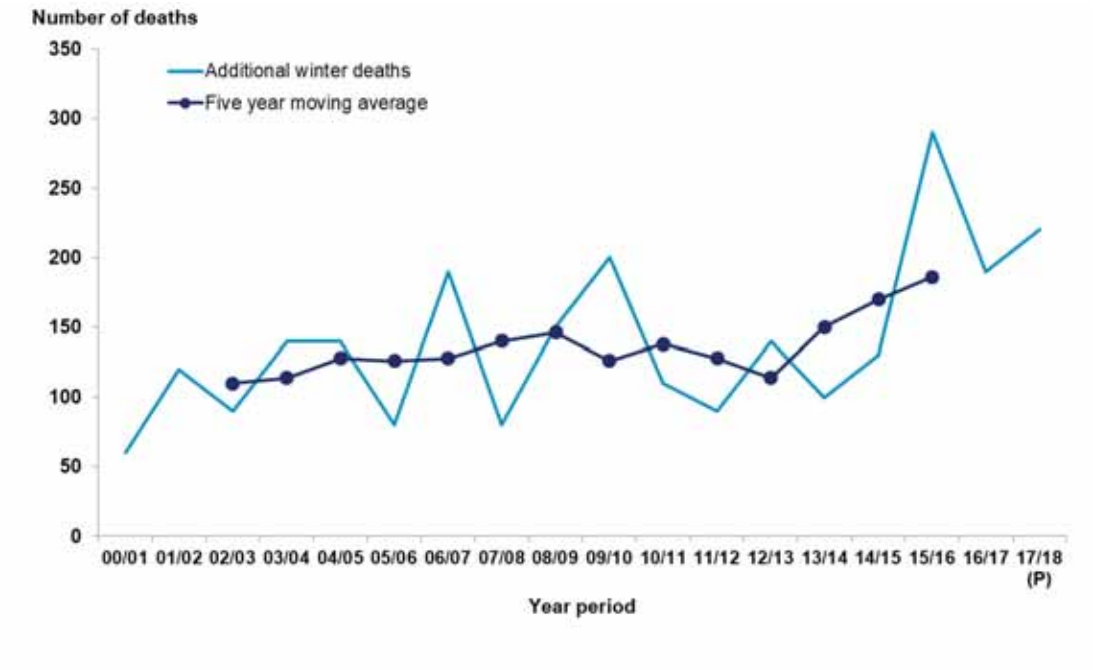
Figure 17: Seasonal increase in mortality all ages (all causes) in the winter in Scotland, 1951/52 to 2017/18



Data source: National Records of Scotland[8]

In NHS Highland the additional winter mortality trend is subject to considerable annual variation. The recent upward direction is heavily influenced by the higher number of deaths in the last three years.

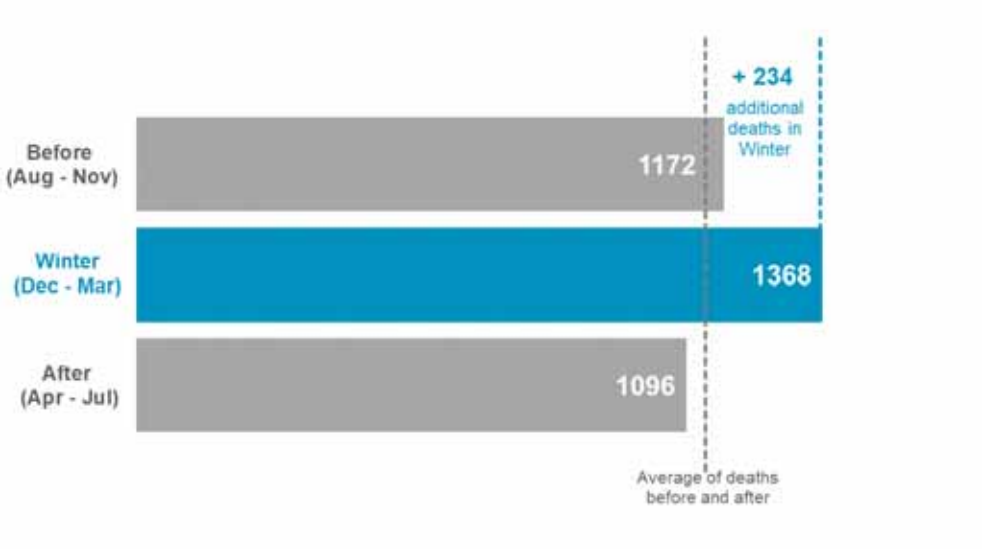
Figure 18: Seasonal increase in mortality all ages (all causes) in the winter in NHS Highland, 2000-2001 to 2017-2018



Data source: National Records of Scotland[8]

Over this three year period there have an average of an additional 234 deaths in the winter.

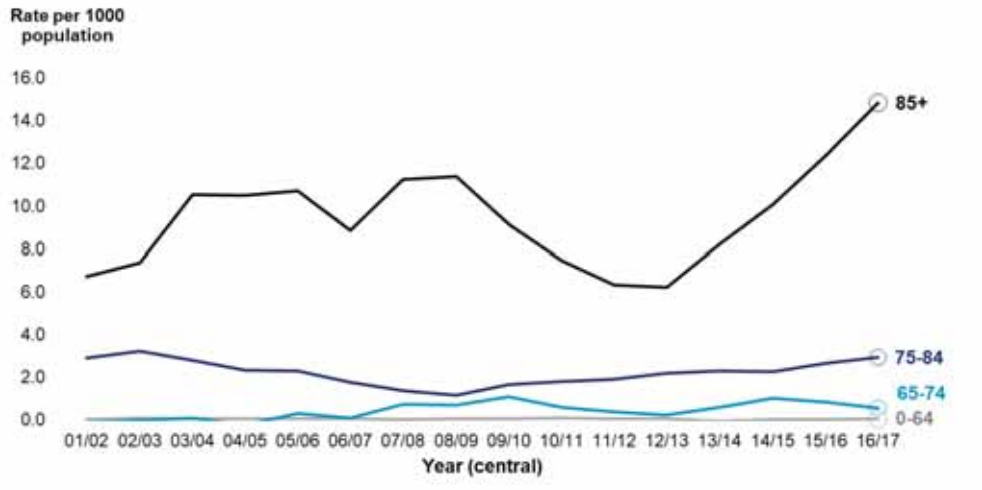
Figure 19: Seasonal increase in winter deaths in NHS Highland – Average of 3 years 2015/16 to 2017/18



Data source: National Records of Scotland[8]

The increase in the number of additional winter deaths in more recent periods in NHS Highland has largely been driven by the increase in the death rate of those aged over 75 years of age (Figure 20).

Figure 20: Annual seasonal increase in additional winter deaths per 1000 population[††] **by broad age group – average over 3 years**

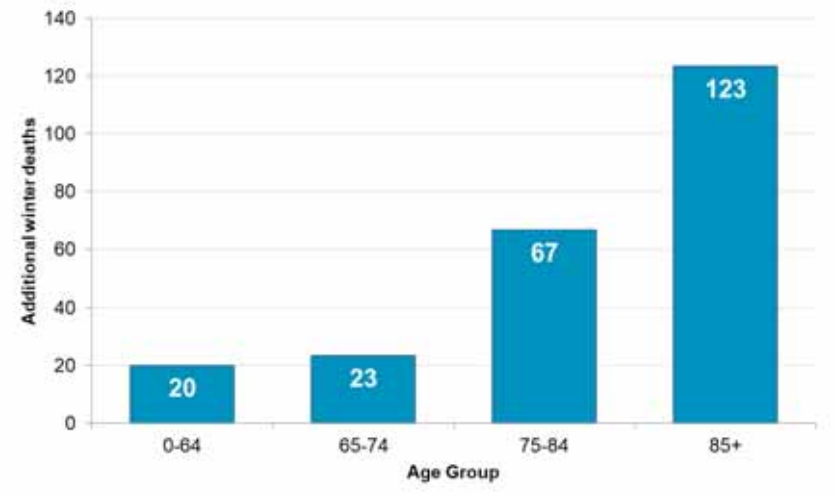


Data source: National Records of Scotland[8]

[††] Calculated at the mid-year before the winter – there is a minor discrepancy between the numerator and denominator, because they cover slightly different populations. However, this should not greatly affect the rates or main patterns.

People in the 75 and over age groups accounted for over 81 percent (n=190) of all additional winter deaths on average in the period 2015/16 to 2017/18. Over 50 percent (n=123) of all additional winter deaths in the same period were amongst the population aged 85 and over (Figure 21).

Figure 21: Number of additional winter deaths in NHS Highland by age group (3 year average - 2015/16 to 2017/18)



Data source: National Records of Scotland[8]

A large share of excess winter death is attributable to the preventable problem of living in a cold home. The National Institute for Health and Care Excellence (NICE) has recognised excess winter deaths and illness, and the health risks associated with cold homes as a priority for health and social care[26].

NICE guidance[26]

Public health and other goals served by reducing risk of death and ill health associated with living in a cold home.

- Reducing preventable excess winter deaths
- Improving health and wellbeing among vulnerable groups
- Reducing pressure on health and social care services
- Reducing fuel poverty and the risk of fuel debt or being disconnected from energy supply
- Improving the energy efficiency of homes and reducing unnecessary energy consumption

Poor energy performance in homes that are difficult and / or expensive to heat particularly exacerbate the risks of respiratory and circulatory problems and poor mental health making a significant contribution to the number of excess winter deaths[27]. Those who are already vulnerable such as young children, older people and those with pre-existing health problems will be particularly susceptible to cold. With lower income households more likely to be at risk of fuel poverty than high income households, this is likely to contribute to social and health inequalities[27,28].

Public Health England cite studies that indicate 10 percent of excess winter deaths are directly attributable to fuel poverty, and a fifth are attributable to the coldest quarter of homes[27]. These estimates are regarded as conservative by the authors and the World Health Organisation suggest that 30 percent is the best estimate of excess winter deaths that can be considered as attributable to cold housing conditions in Europe.

These different measures of excess winter deaths are overlapping. However, based on the average number of 234 excess winter deaths that were observed in NHS Highland over the last three year period, this would suggest that there are currently about 20 deaths a year attributable to fuel poverty, 40 deaths a year in the coldest quarter of homes and 60 deaths each winter from living in cold housing conditions.

Figure 20 indicates that people aged 75 years and over are subject to the greatest increase in excess winter deaths of any age group. There should be concerns that with continued population ageing that there is the potential for a significant increase in the number of people who are vulnerable to cold living conditions and at risk of avoidable winter death.

Winter deaths attributable to cold homes are just one part of a picture that encompasses opportunities to improve public health. In the majority of cases there are preventative measures that can be taken to avoid such outcomes. The NICE guidance highlights the opportunities to best identify those who may be vulnerable in periods of cold weather and how to best look after those who are in contact with health, social care and housing services[26].

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Life Expectancy in NHS Highland

Supplementary paper 4 to the Director of Public Health Annual Report 2019

Public Health Intelligence

Directorate of Public Health

NHS Highland

October 2019

The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland. The team provides an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

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Contents

Director of Public Health Annual Report 2019

This is the fourth paper in a series that will contribute to the NHS Highland Director of Public Health Annual Report 2019.

The first report looked at demography and population dynamics, the second considered increasing numbers of living generations and changes in how we live while the third reviewed mortality. Subsequent supporting papers will look at morbidity, dependency and informal care.

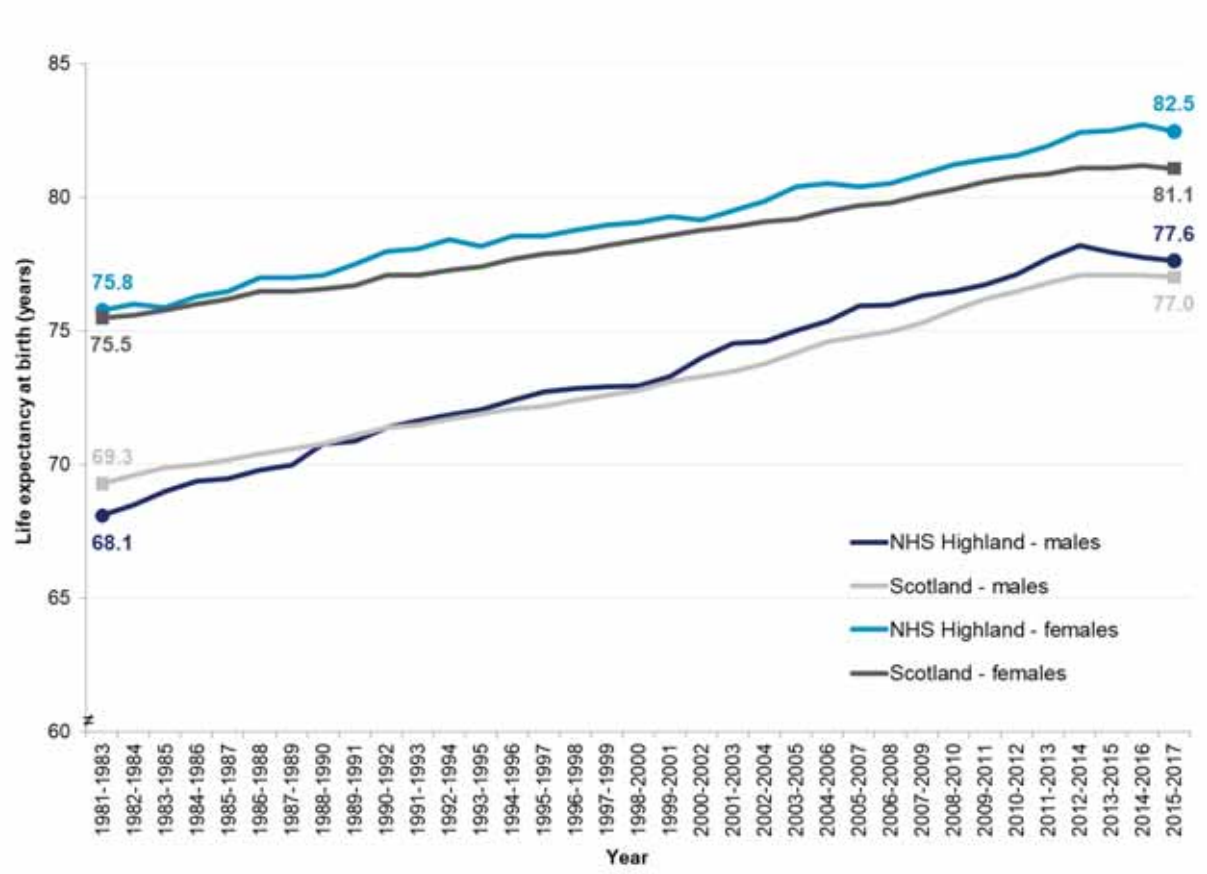
Life Expectancy

Life expectancy is an important summary measure of the health of the population, reflecting the mortality rates experienced in a population over a given period of time. There are a number of measures commonly used to describe life expectancy. Life expectancy at birth is an estimate of the number of years a newborn child would live if they experienced current mortality rates throughout their life, while healthy life expectancy is an estimate of how many years they could expect to live in good health[1]. Both measures reflect the mortality trends discussed in the previous paper.

Trends in life expectancy at birth

The most recent estimates for 2015-2017 show that life expectancy at birth in NHS Highland was 77.6 years for men and 82.5 years for women (Figure 1). Life expectancy in NHS Highland has steadily increased over time for both males and females, with only minor variation from year to year. However, in line with Scotland, the rate of improvement in life expectancy has recently stalled, with decreases observed in male life expectancy between 2013-2015 and 2015-2017 and female life expectancy between 2014-2016 and 2015-2017. Although female life expectancy has always been higher than male life expectancy, male life expectancy has increased faster than that for females. The gap in life expectancy between males and females has narrowed from 7.7 years in 1981-83 to 4.8 years in 2015-17.

Figure 1: Life expectancy at birth, NHS Highland and Scotland, 1981-83 to 2015-17



Source: National Records of Scotland, Life expectancy for administrative areas within Scotland Time series data by NHS Board[2]

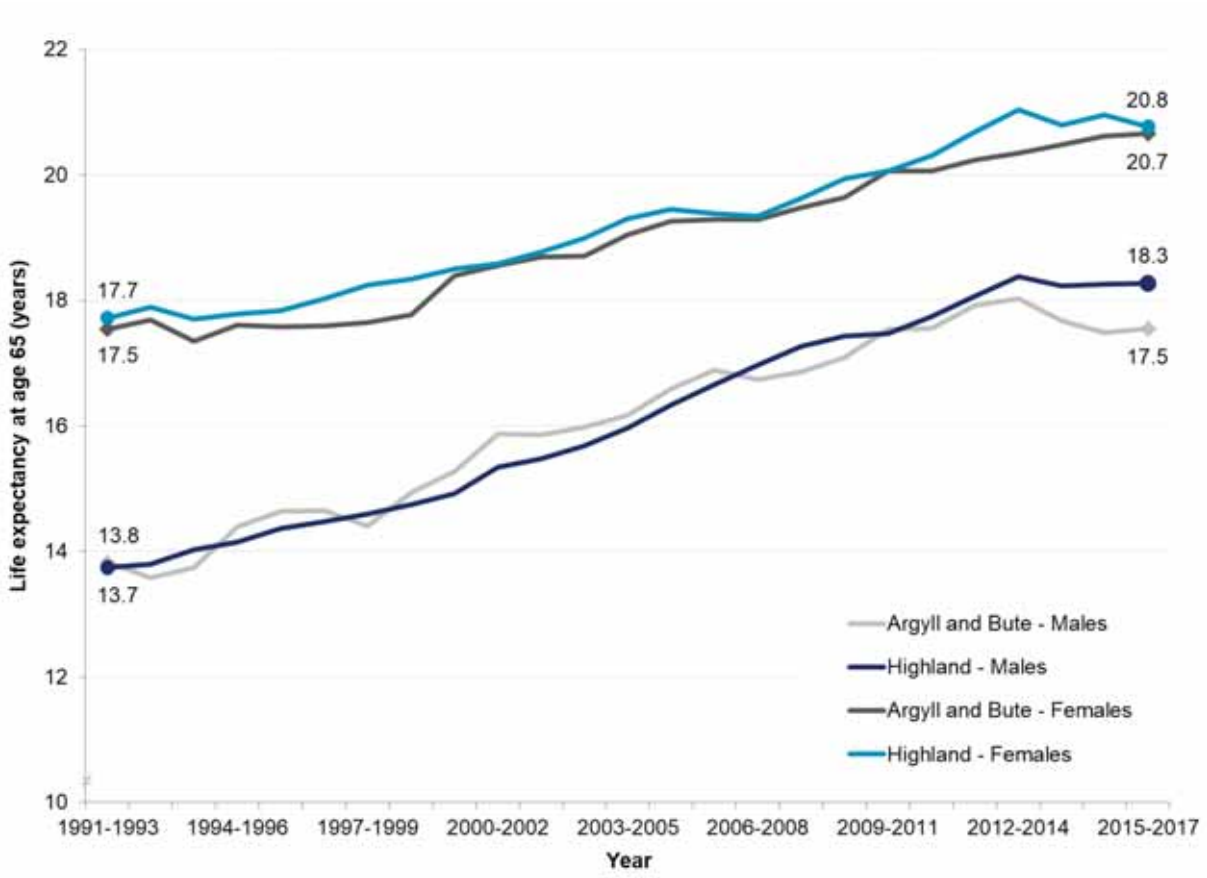
Life expectancy at age 65

Similar to life expectancy at birth, the trend in life expectancy at age 65 years has also been increasing. In 2015-2017, males resident in NHS Highland aged 65 years lived a further 18.0 years (up from 13.8 years in 1991-1993) and females an additional 20.7 years (up from 17.6 years in 1991-1993).

There are some differences in life expectancy trends at age 65 in Highland and Argyll and Bute council areas (Figure 2). In Highland, life expectancy for men aged 65 years in 2015-2017 was 18.3 years, while women of this age could expect to live for an additional 20.8 years. In Argyll and Bute, life expectancy for men and women aged 65 years was 17.5 years and 20.7 years respectively.

There is a notable difference in the rate of improvement in male life expectancy at age 65 years between 1991-93 and 2015-17. The increase over the period was 4.5 years in Highland compared with 3.7 years in Argyll and Bute. This means that the gap in male life expectancy between both council areas has increased from 0.1 year in 1991-93 to 0.7 years in 2015-17.

Figure 2: Life expectancy at age 65 years, Highland and Argyll and Bute, 1991-93 to 2015-17

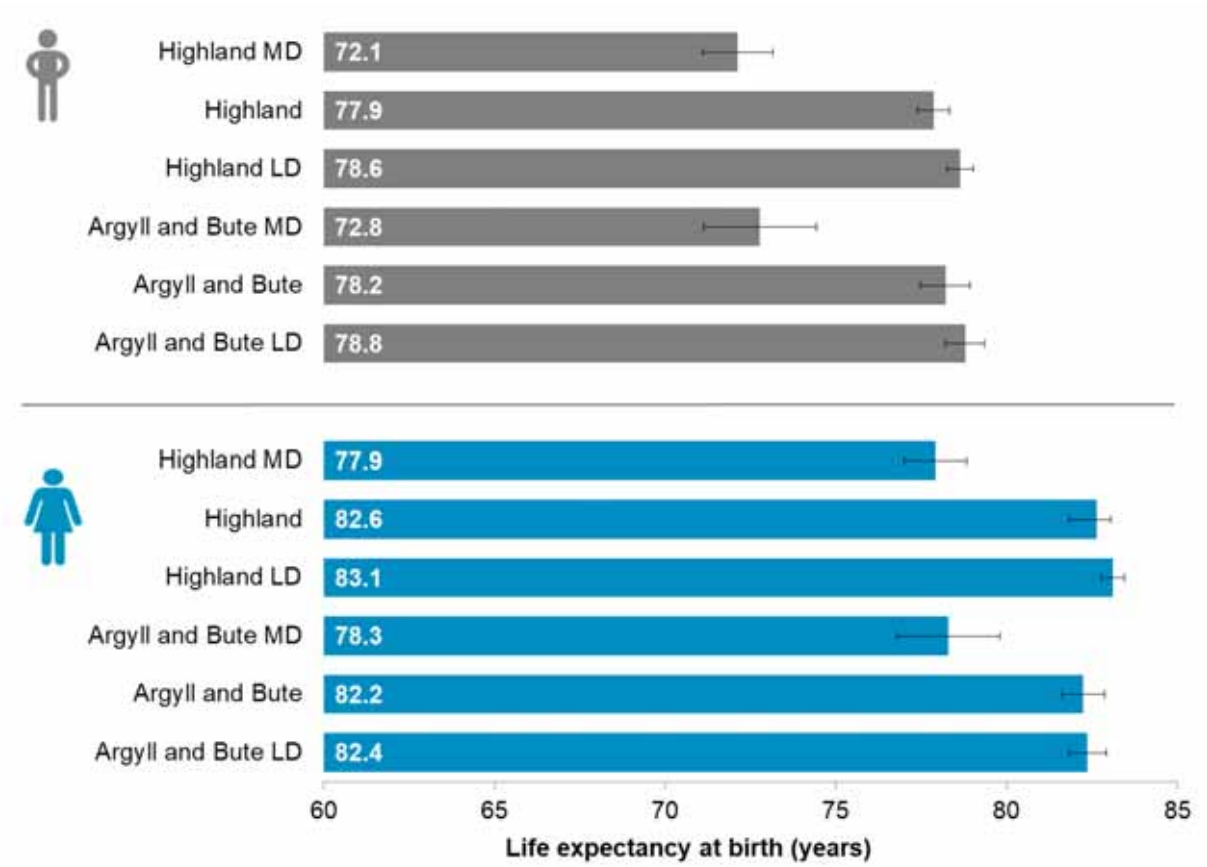


Source: National Records of Scotland, Life expectancy for administrative areas within Scotland Time series data by council area[3]

Inequalities in life expectancy

While life expectancy overall has increased, there has been little improvement in health inequalities (Figure 3). In 2011-2015 the difference in life expectancy between the least deprived and the most deprived areas in Argyll and Bute was 6.0 years for men (78.8 years compared to 72.8 years) and 4.1 years for women (82.4 years compared to 78.3 years). In Highland, the gap was 6.5 years for men and 5.2 years for women (78.6 years compared to 72.1 years and 83.1 years compared to 77.9 years respectively). People living in the most deprived areas are only just approaching the levels of life expectancy that those in the least deprived areas experienced in two decades ago[4].

Figure 3: Life expectancy at birth split by level of deprivation (where MD=most deprived 15% and LD = least deprived 85%), Highland and Argyll and Bute, 2011-2015



Source: National Records of Scotland, Life Expectancy in Scottish Council areas split by deprivation 2003-2007 to 2011-2015[4]
Error bars represent 95% confidence intervals around life expectancy estimates

A comparison of life expectancy at birth for small areas in NHS Highland for the five-year period 2013 to 2017 is shown in Figure 4. Life expectancy varies markedly according to the deprivation levels in the areas people live. In 2013-2017, male life expectancy was highest in Nairn Rural (84.7 years) and lowest in Inverness Merkinch (68.4 years). For females, life expectancy was highest in Cowal South (87.6 years) and lowest in Inverness Merkinch (77.2 years). These estimates represent a life expectancy gap of 16.3 years and 10.4 years for men and women respectively. Female estimates for two areas (Inverness Inshes and Inverness Drakies) are not available due to the small number of deaths in the period.

Figure 4: Estimated life expectancy at birth by intermediate zone; NHS Highland, 2013 to 2017

Source: Scottish Public Health Observatory online profiles tool5

Ranked in ascending order of income deprivation, least deprived to most deprived. Female values for Inverness Inshes and Inverness Drakies not shown due to small number of events in the five year period

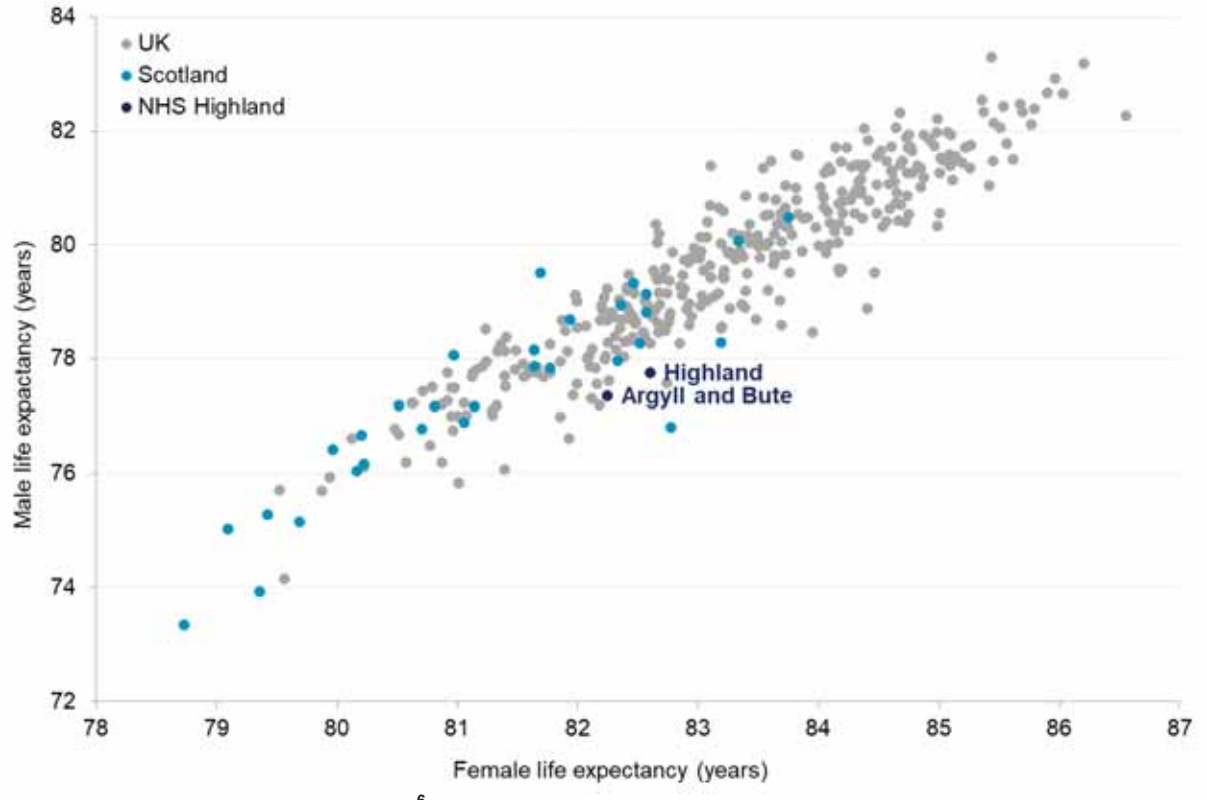
Comparison with other areas

A comparison of life expectancy at birth across local authority areas in the UK in the three-year period 2015 to 2017 is shown in Figure 5. The area with the highest life expectancy for males was the Hampshire district of Hart at 83.3 years. For females, the London Borough of Camden had the highest life expectancy at birth at 86.5 years. Glasgow City had the lowest life expectancy at birth for both males and females at 73.3 years and 78.7 years respectively.

In Argyll and Bute and Highland, male life expectancy is doing comparatively worse than female life expectancy when compared with the rest of the United Kingdom. Among the 389 local authority areas in 2015-2017, Argyll and Bute was ranked 288th for female life expectancy but only 345th for male life expectancy, where rank 389 represents the lowest life expectancy. Similarly, Highland was ranked 329th for male life expectancy and 249th for female life expectancy.

A similar pattern is observed for male and female life expectancy in Argyll and Bute and Highland when compared with the rest of Scotland alone. In 2015-2017, Highland females ranked 5th highest and males ranked 16th among the 32 local authority areas in Scotland. In Argyll and Bute the relative ranking of life expectancy was 12th for females and 17th for males.

Figure 5: Life expectancy at birth by sex across local authorities in the UK, 2015-17



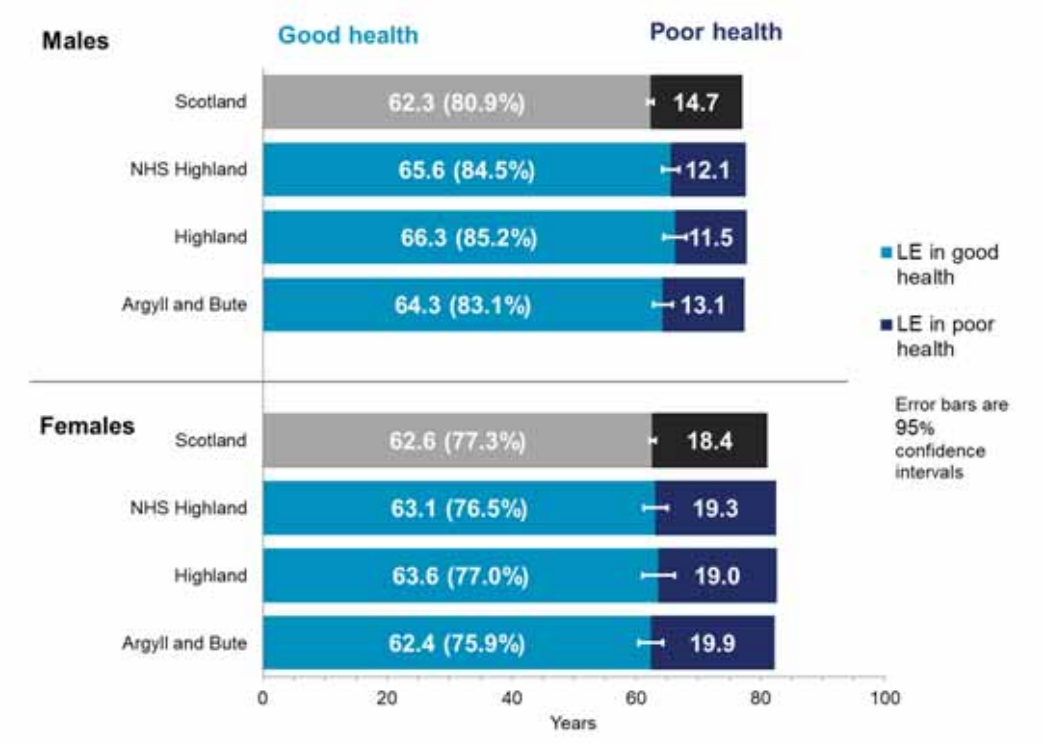
Source: Office for National Statistics[6]
Local areas include lower tier local authorities (LTLAs) in England, unitary authorities in Wales, council areas in Scotland and local government districts in Northern Ireland

Healthy life expectancy

Healthy life expectancy measures the difference between overall life expectancy and the number of years a person could expect to live in good health. By default, the difference between the two provides an estimate of the number of years a person could expect to live in poor health.

In 2015-17, healthy life expectancy at birth in NHS Highland for males was 65.6 years and for females was 63.1 years. A male could expect to live for a further 12.1 years in poor health compared to a further 19.3 years for females. Females therefore spent a greater proportion of life in poor health, 23.5 years compared to 15.5 years respectively. Figure 6 shows that there was more variation in healthy life expectancy in males than females in 2015-17.

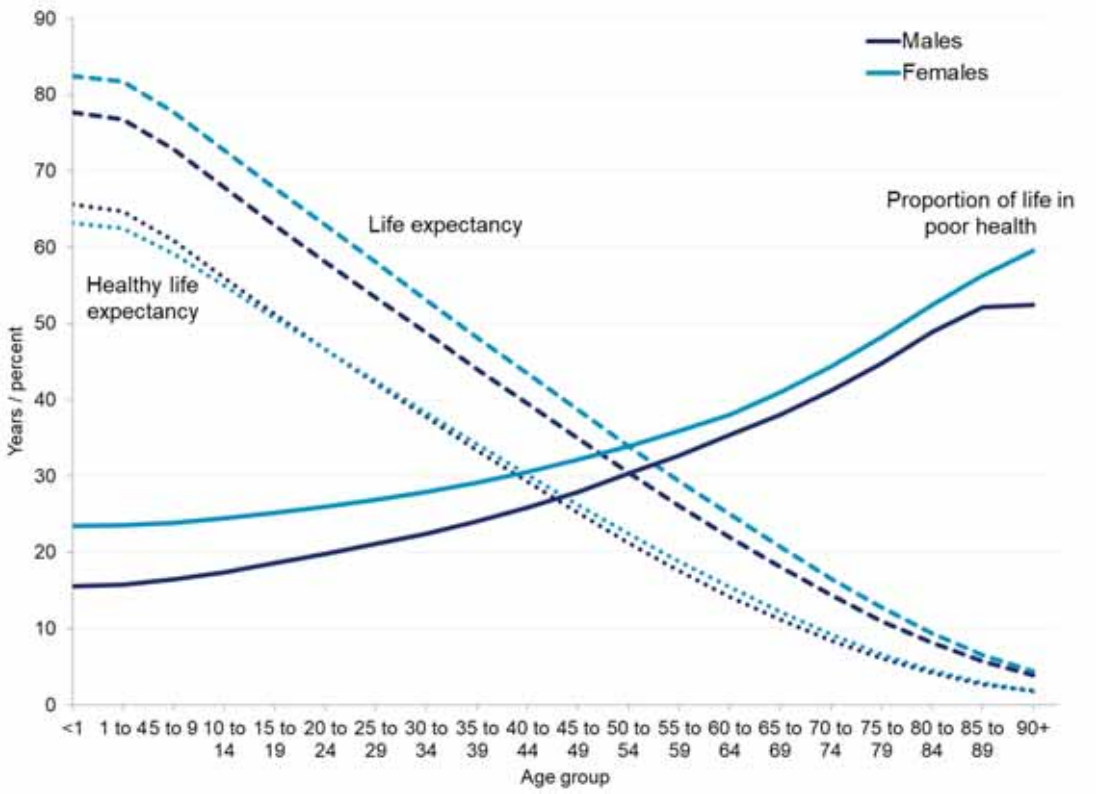
Figure 6: Healthy life expectancy at birth, selected areas, 2015-17



Source: National Records of Scotland, Healthy life expectancy in Scottish Areas 2015[7]

A comparison of life expectancy, healthy life expectancy and the proportion of remaining life expected to be in poor health for men and women of different ages in NHS Highland is shown in Figure 7. Although females live longer than males, in 2015 to 2017 there was little difference in healthy life expectancy between the sexes. Females, therefore, spent more years in poor health than males (19.3 years compared with 12.1 years for males) and a greater proportion of life in poor health (23.5 percent compared with 15.5 percent). At age 65 to 69 years, males spent 6.9 years in poor health (38 percent of remaining life) compared to 8.5 years (41 percent of remaining life) for females. The proportion of life from age 85 spent in poor health was 52.2 percent for males and 56.3 percent for females in 2015 to 2017.

Figure 7: Life expectancy, healthy life expectancy and proportion of life in poor health, NHS Highland, 2015-17



Source: National Records of Scotland, Healthy life expectancy in Scottish Areas 2015[7]

Recent life expectancy trends

Life expectancy improvement rates for men and women in Scotland have been slower since 2012-14, and in some areas and age groups life expectancy has actually fallen. Recent research has shown that life expectancy gains due to cardiovascular diseases have declined, particularly in people aged 55 to 74 years. Life expectancy gains have also fallen in people aged 30 to 54 years due to drug-related deaths, and in people aged 90 years and over, largely associated with dementia and Alzheimer's disease[8]. The slowdown in life expectancy improvement has particularly affected people living in the most deprived areas of Scotland, leading to widening health inequalities[9].

These changes have been almost without precedent in the 20th century and are of major public health concern. While some European countries, including Northern Ireland, England, Wales, and the Netherlands, have experienced similar slowdowns in life expectancy, many other countries with higher life expectancy than Scotland have seen continuing improvements. This suggests that the slowdown is not due to a natural limit in life span being reached[10].

The latest national evidence suggests that a wide range of factors may be contributing, including the effects of austerity, pressure on health and social care services, winter deaths, mental health problems and obesity[11]. A large programme of work to investigate these trends is being co-ordinated through the Scottish Public Health Observatory, including a more detailed review of life expectancy changes within administrative areas of Scotland.

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Health status in NHS Highland

Supplementary paper 5 to the Director of Public Health Annual Report 2019

Public Health Intelligence

Directorate of Public Health

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October 2019

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Health status

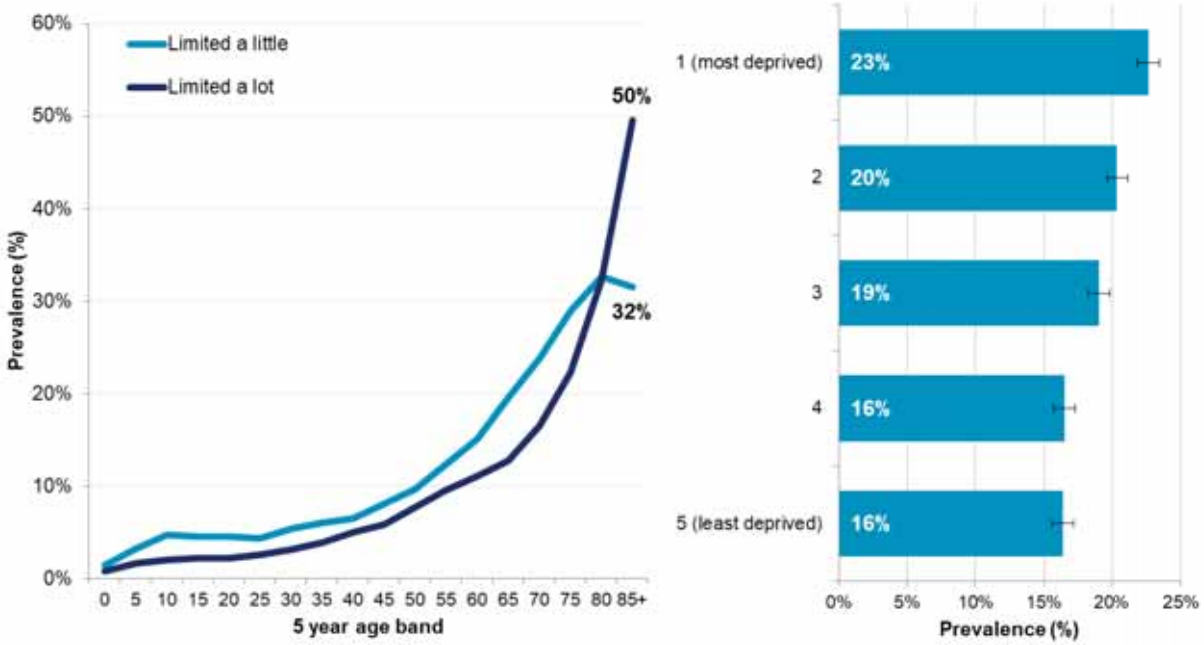
Over the last decade there have been improvements in life expectancy and survival rates for a number of conditions such as coronary heart disease, stroke and some cancers. The demographic trends summarised in this report mean that there will be increasing demands for care from people with long-term conditions and other support needs. At the same time, people are living longer in less than ideal health and with increasingly complex needs. These challenges are recognised in the Scottish Government's Health and Social Care Delivery Plan[1] and latest Financial Framework[2]. This paper provides an overview of morbidity in NHS Highland and highlights some of the key health issues faced now and in the future.

Long-term conditions

The National Institute for Clinical Excellence define a long-term health condition as one which has lasted, or is expected to last, at least 12 months[3]. Conditions can include: defined physical and mental health conditions such as diabetes or schizophrenia, ongoing conditions such as learning disability, symptom complexes such as frailty, sensory impairment such as sight or hearing loss, and problem substance use.

The overall prevalence of long-term health conditions in NHS Highland is available from self-reported health status collected as part of the 2011 Census, which asked respondents how they rate their health at the point of survey. Almost 19 percent of the population (61,000 people) reported that they had one or more long-term health condition. Eleven percent reported that day to day activities were 'limited a little' and 8 percent reported they were 'limited a lot'.

Figure 1: Prevalence of limiting and non-limiting long-term conditions by age and deprivation quintile; NHS Highland



Source: Census 2011 Table QS303SC, DC3101SC[4]
Scottish Index of Multiple Deprivation 2012 Health Board population weighted datazones

Figure 1 shows the point prevalence of limiting and non-limiting long-term conditions by age and deprivation quintile in NHS Highland. The proportion of people reporting a long-term condition increased with each five-year age band, with people over the age of 85 significantly

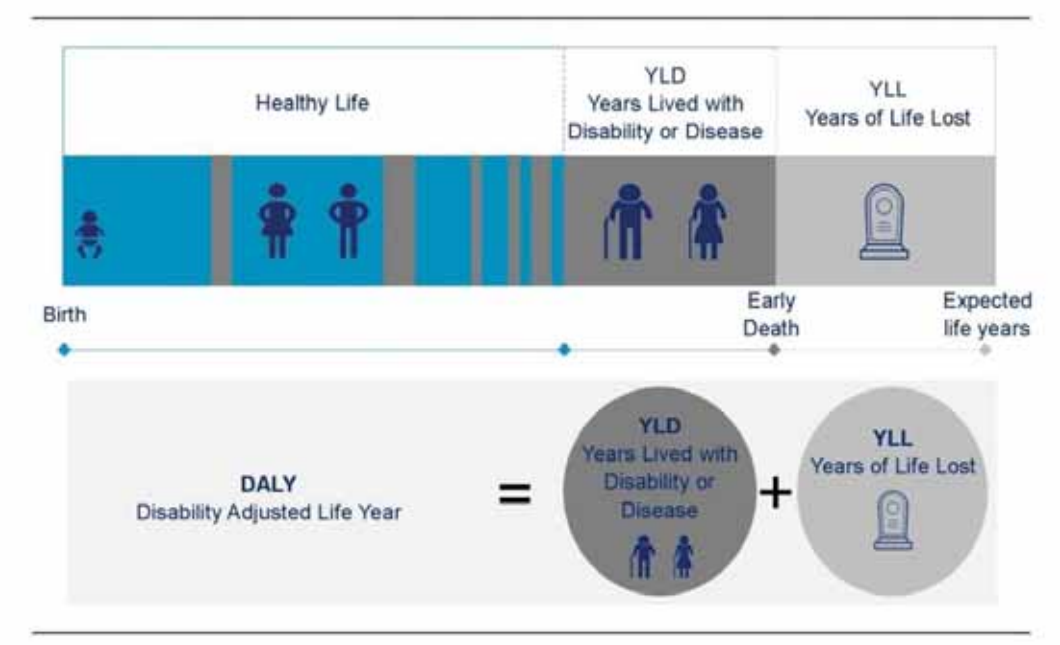
more likely to report that day to day activities were 'limited a lot'. The prevalence of long-term conditions was also socially patterned and significantly associated with levels of area deprivation. Figure 1 shows that 23 percent of people in the most deprived quintile reported having a long-term health condition compared to 16 percent in the least deprived quintile.

Leading causes of morbidity

The leading causes of morbidity, or poor health, in the NHS Highland area can be summarised from estimates published in the Scottish Burden of Disease (SBoD) study for 2016[5]. Burden of disease studies aim to estimate the impact that different diseases, conditions and injuries have on a populations' health at a specific point in time.

A single measure known as the disability adjusted life year (DALY) is used to quantify the difference between living to old age in good health, and the situation where healthy life is shortened by illness, injury, disability and early death[6]. The concept, used extensively by the World Health Organisation, is summarised in Figure 2.

Figure 2: Components of the Disability Adjusted Life Year (DALY) measure



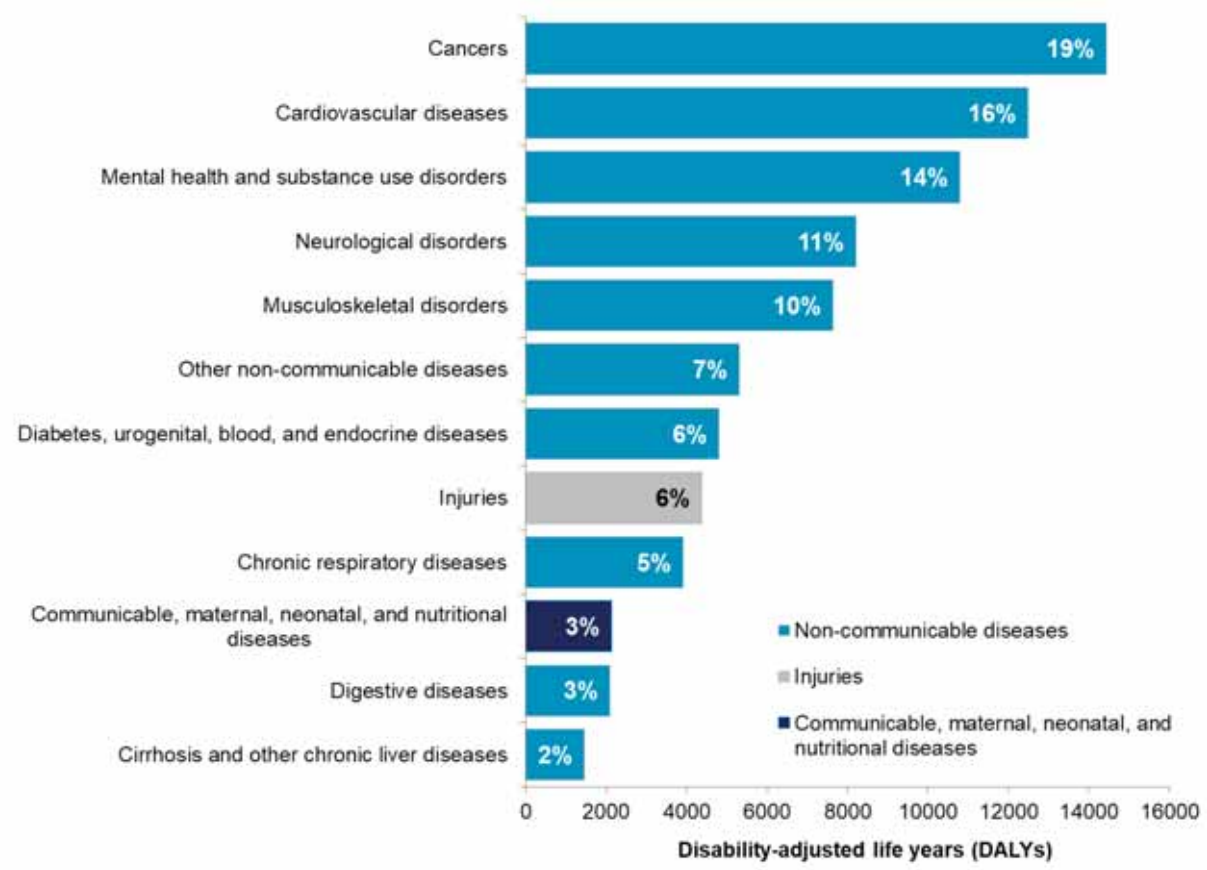
Source: Adapted from Wikimedia Commons[7]

The SBoD study approach is based upon counts of people identified as having different conditions, using data from a range of health information systems. These include death records, hospital, GP and prescribing recording systems, disease registers and surveys. Conditions are presented in a three level hierarchy. The first groups conditions into communicable diseases, non-communicable diseases, and injuries. The second level consists of broad condition groups, for example, cancers and cardiovascular diseases. The third level sub-divides these broad condition groups into more specific causes, such as lung cancer and ischaemic heart disease. All three levels are used in the following analyses.

Figure 3 shows estimates of the leading causes of morbidity by broad condition group in 2016. Cancers (19 percent), cardiovascular diseases (16 percent) and mental health and substance use disorders (14 percent) are the leading causes of DALYs, followed by neurological disorders (11 percent) and musculoskeletal disorders (10 percent). Together, these five condition groups accounted for over two thirds (69 percent) of morbidity in NHS

Highland in 2016. In most cases these conditions may be long term or chronic, and have a significant impact on demand for healthcare services and reduced quality of life.

Figure 3: Estimates of the leading causes of morbidity by broad condition group, NHS Highland, 2016

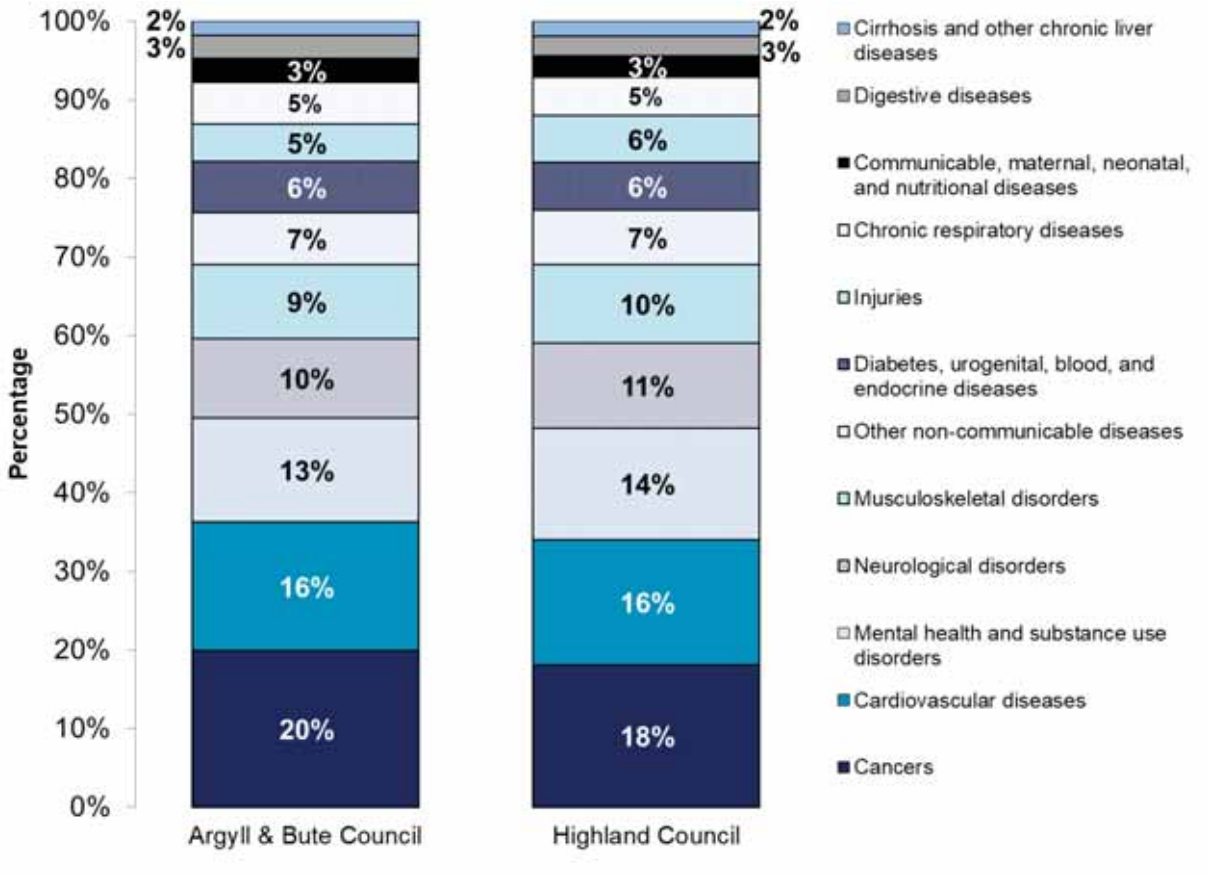


Source: Scottish Burden of Disease local area data, 2016[8]
Percentages shown represent proportion of all DALYs

Morbidity by area and sex

Estimates of the leading causes of morbidity by broad condition group for Argyll and Bute and Highland council areas are shown in Figure 4. Of the total number of DALYs estimated for NHS Highland, 29 percent were in Argyll and Bute residents and 71 percent were in Highland residents. This compares to a population distribution of 27 percent and 73 percent respectively. The overall proportion of DALYs in each broad condition group within both areas was very similar.

Figure 4: Proportion of DALYs by broad condition group, Argyll and Bute and Highland, 2016



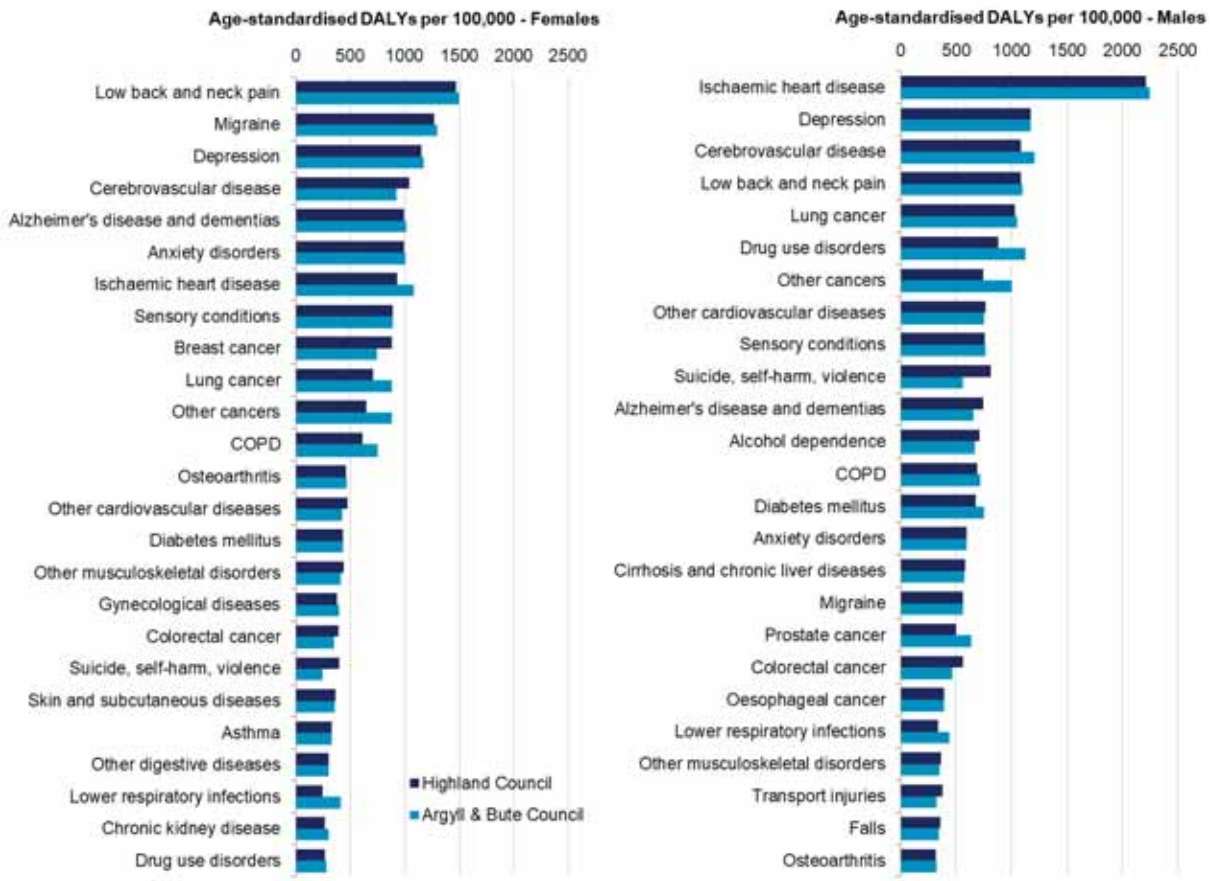
Source: Scottish Burden of Disease local area data, 2016[8]

Figure 5 shows estimates for the top 25 specific conditions for males and females in 2016. The 25 conditions shown covered over three quarters (76 percent) of the burden of disease in NHS Highland in 2016.

For females, the leading causes of morbidity were low back and neck pain, migraine, depression, cerebrovascular disease (stroke) and Alzheimer's disease and other dementias. For males, the leading causes of morbidity were ischaemic heart disease, depression, cerebrovascular disease, low back and neck pain, and lung cancer.

Notable differences include rates of problem drug and alcohol use, transport injuries and suicide, self-harm and interpersonal violence which were higher in men than women. Sensory conditions, such as cataract, macular degeneration and hearing loss, were also a common cause of disability in both males and females.

Figure 5: Top 25 leading causes of DALYs by specific causes for males and females, Argyll and Bute and Highland, 2016



Source: Scottish Burden of Disease local area data, 2016[8]

Age-standardised DALYs (using the 2013 European Standard Population) per 100,000 population

COPD: Chronic obstructive pulmonary disease

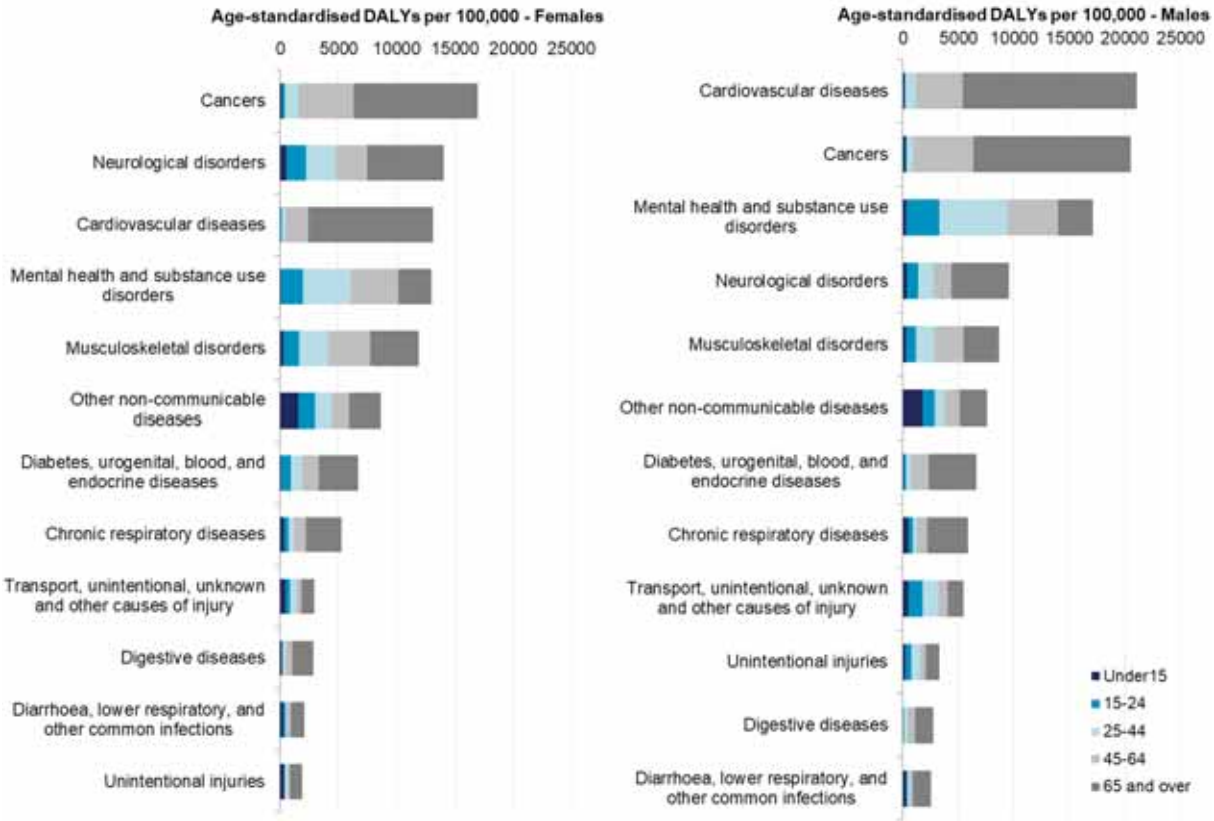
Morbidity by age and sex

The leading causes of morbidity for males and females by age group are shown in Figure 6. The age pattern shown reflects that morbidity from many conditions increases with age, in particular, cancers, cardiovascular diseases, neurological diseases (including Alzheimer's disease and other dementias), diabetes and chronic respiratory diseases. These condition groups were the major contributors to ill health in both men and women aged 65 years and over.

Mental health and substance use disorders have a different pattern, as the greatest impact was in those aged 15 to 24 and 25 to 44 years. Rates were higher in men than women, mainly due to the increased prevalence of substance use disorders in males of this age. Rates of transport, unintentional and unknown causes of injury (including suicide, self-harm and interpersonal violence) were also higher in males aged 15-24 than females. In females aged 15 to 44 years the leading causes of DALYs were migraine, neck and lower back pain, depression and anxiety.

Among babies and children aged 0-14 years the largest contributors to morbidity in this age group come under the grouping of non-communicable diseases (congenital birth disorders, sensory conditions and neonatal disorders), injuries, neurological disorders (migraine) and chronic respiratory diseases (asthma). These five conditions accounted for approximately half (51 percent) of all DALYs in this age group.

Figure 6: Leading causes of morbidity by broad condition group, age group and sex, NHS Highland, 2016



Source: Scottish Burden of Disease local area data, 2016[8]

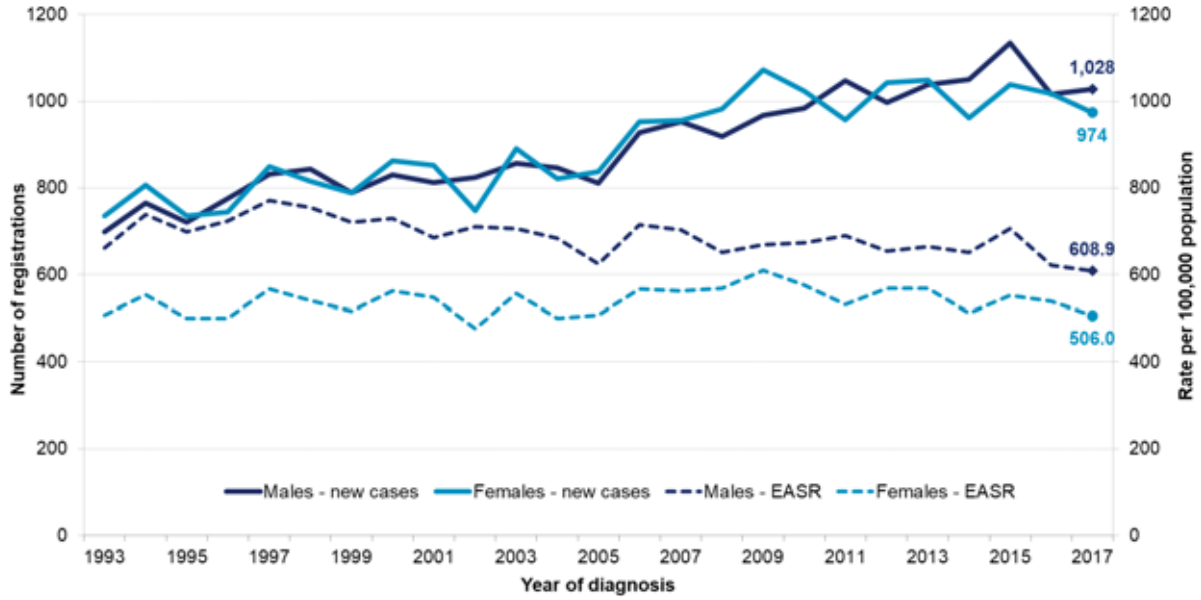
Age-standardised DALYs (using the 2013 European Standard Population) per 100,000 population

Cancer

Although there have been significant advances in improving mortality and survival rates from cancer in recent years, cancer remains a national clinical priority for the Scottish Government. The national strategy 'Beating Cancer: Ambition and Action' highlights the increasing demands on cancer care arising from the continued growth in incidence, complexity and acuity of the disease[9]. The latest national estimates suggest that three percent of men and four percent of women in Scotland are living with cancer, and that over 40 percent of people will be diagnosed with cancer during their lifetime[10].

Trends in cancer incidence rates for males and females in NHS Highland between 1993 and 2017 are shown in Figure 7. Although cancer incidence rates have fallen by five percent over the last decade, the number of people diagnosed each year continues to rise. Between 1993 and 2017, the number of cases of cancer (excluding non-melanoma skin cancer) in NHS Highland has increased from 1,400 to over 2,000 cases a year, a rise of 40 percent.

Figure 7: All cancers excluding non-melanoma skin cancers by sex, number of new cases and directly age-standardised rates per 100,000 population; NHS Highland, 1993 to 2017



Source: Scottish Cancer Registry, ISD Scotland[11]

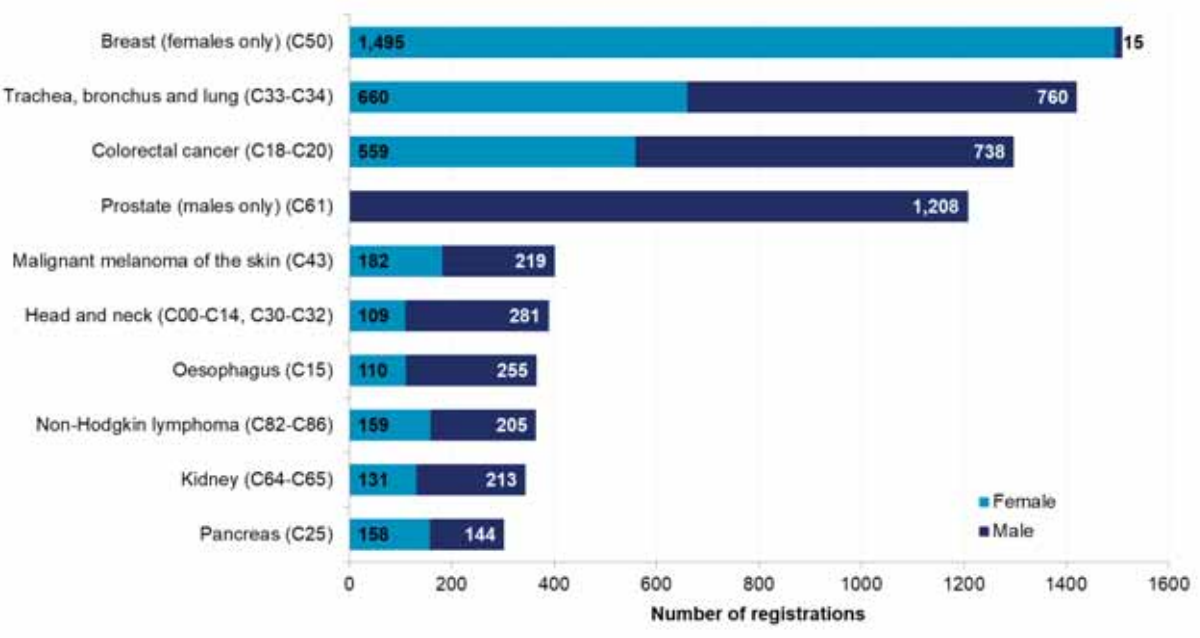
All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excluding C44).

EASR: European Age-Sex Standardised Rate (using the 2013 European Standard Population) per 100,000 person-years at risk

These trends in cancer incidence are, for the most part, a result of the population growing older. The risk of developing cancer increases strongly with age: one in eleven people (9 percent) will develop some form of cancer by the age of 65, increasing to one in three people (32 percent) by the age of 84[10]. They also reflect health inequalities, including the effects of living in poverty, variations in screening uptake and the social patterning of risk factors associated with cancer such as smoking, poor diet, alcohol consumption and obesity going back many years. Evidence from the long-term monitoring of inequalities in Scotland reports that cancer incidence rates have typically been 30% to 50% higher in the most deprived areas compared to the least deprived areas of Scotland[12].

Figure 8 shows the numbers of new cases for the most common cancers in males and females in NHS Highland over the last five years. Breast cancer was the most common cancer with 1,495 cases diagnosed between 2013 and 2017, 14.6 percent of all cancers. There were 1,420 cases of lung cancer (13.8 percent), 1,297 cases of colorectal cancer (12.6 percent) and 1,208 cases of prostate cancer (11.7 percent). These four tumour types accounted for over half (52.7 percent) of all cancers diagnosed.

Figure 8: Most common cancers in NHS Highland by sex, 2013 – 2017



Source: Scottish Cancer Registry, ISD Scotland[11]
All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excluding C44).

Projections of cancer incidence published by ISD Scotland estimate that the number of new cases of cancer in Scotland is expected to increase by 33.5 percent between 2008-12 and 2023-27[13]. Assuming a similar trend, incidence in NHS Highland is predicted to reach 14,000 cases in 2023-27, a 40 percent increase. Improvements in cancer survival are also expected to impact on future needs for cancer care. Five-year survival rates for people diagnosed with cancer between 1987 and 2011 have increased in men from 29 percent to 48 percent in men, and from 40 percent to 54 percent in women.

The National Clinical Strategy for Scotland highlights that increased incidence and survival, developments in medical technology and the rapidly changing range of investigations and treatments for cancer will have a significant impact on the services required to deliver cancer care in the future[14]. The increasing age-profile also means that people using these services will most likely be presenting with multiple health conditions and complex health needs. A key challenge will be for health, social care and third sector services to develop sustainable and innovative approaches to cancer care which meet the changing requirements of people with cancer to support them to live healthy lives at home.

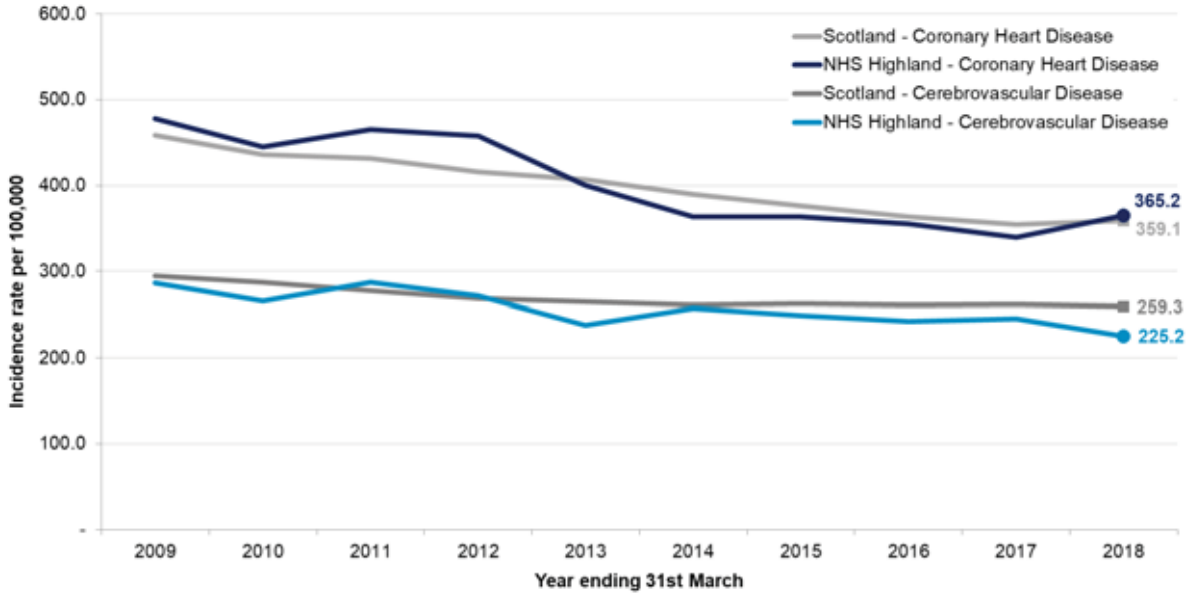
Cardiovascular conditions

Cardiovascular disease is a general term describing diseases of the heart and blood vessels whereby blood flow to the heart, brain or body is restricted. Its main components are coronary heart disease (CHD, or ischaemic heart disease) and cerebrovascular disease (CVD, or stroke). The risk factors for cardiovascular conditions include the following: high blood pressure, high blood cholesterol, smoking, high body mass index (obesity), poor diet, physical inactivity, alcohol consumption above the recommended limits and diabetes. Cardiovascular conditions are leading contributors to morbidity in NHS Highland and are linked to inequalities in health.

Data reported as part of the Scottish Health Survey shows that the prevalence of CHD and stroke are significantly associated with area deprivation. In 2017, the age standardised prevalence of CHD was three times higher in the most deprived quintile than in the least deprived quintile (9 percent compared to 3 percent). A similar pattern was reported for stoke, where the prevalence of adults reporting stroke in the most deprived quintile more than twice as high as those in the least deprived quintile (5 percent compared to 2 percent)[15].

Trends in coronary heart disease and cerebrovascular disease incidence rates in NHS Highland and Scotland between 2009 and 2018 are shown in Figure 9. The age and sex adjusted incidence rate for CHD in NHS Highland decreased by 24 percent from 478 per 100,000 population in 2008/09 to 359 per 100,000 in 2017/18. There was a small increase in age-standardised incidence rates for CHD between 2016/17 and 2017/18. For CVD, the age and sex adjusted incidence decreased from 289 per 100,000 population in 2008/09 to 225 per 100,000 in 2017/18, a fall of 21 percent.

Figure 9: Trend in incidence rates for coronary heart disease and cerebrovascular disease, NHS Highland and Scotland, 2008/09 to 2017/18

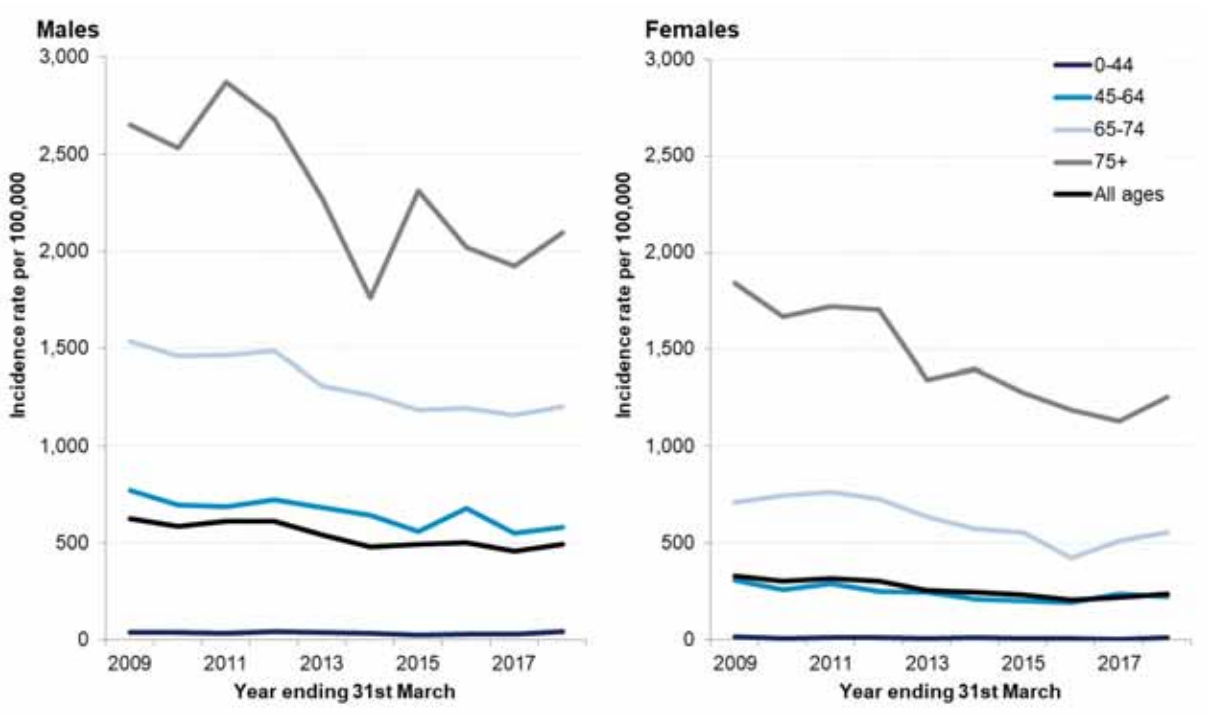


Source: SMR01, ISD Scotland
Coronary Heart Disease: ICD-10 codes I20-I25
Cerebrovascular disease: ICD-10 codes I60-I69, G45
European Age-Sex Standardised Rate (using the 2013 European Standard Population) per 100,000 population

Although incidence rates have decreased, the number of new cases of cardiovascular disease diagnosed each year has not changed at the same rate. For CHD, the number of new cases has decreased by 11 percent from 1,450 cases in 2008/09 to 1,300 cases in 2017/18. The number of new cases of CVD has been relatively stable with 850 cases in 2008/09 compared to 820 cases in 2017/18.

There are notable differences in the incidence of cardiovascular conditions by age and gender in NHS Highland. Figure 10 shows that the risk of a new diagnosis of CHD is higher in males than females. In 2017/18 the age adjusted incidence rate for males was 493 per 100,000 population compared to 237 per 100,000 in females. Incidence increases sharply with age for both men and women.

Figure 10: Incidence of Coronary Heart Disease by age group and sex, NHS Highland, 2008/09 to 2017/18



Source: SMR01, ISD Scotland
Coronary Heart Disease (ICD-10 I20-I25).
European Age-Sex Standardised Rate (using the 2013 European Standard Population) per 100,000 population

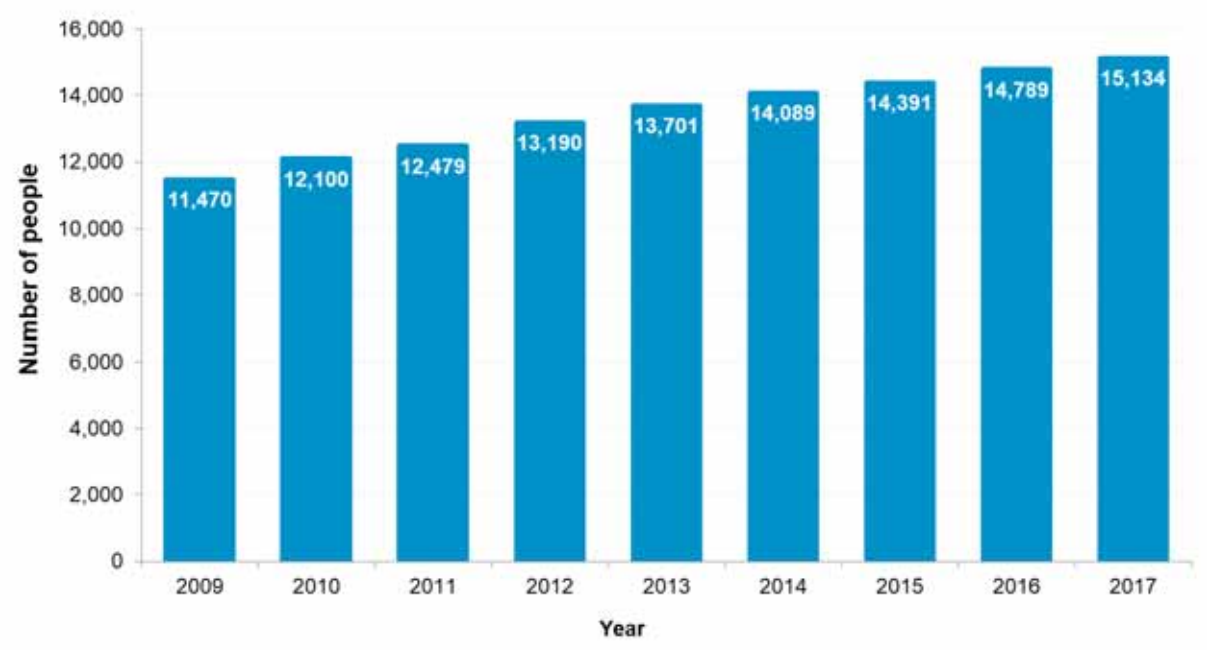
Type 2 diabetes

Type 2 diabetes is an important cause of morbidity. The term refers to a long term and chronic metabolic condition that occurs when the body either stops producing enough insulin for its needs or becomes resistant to the effect of insulin produced[16]. The condition is progressive and increases the risk of coronary heart disease, stroke, renal (kidney) failure, peripheral vascular disease (poor circulation, usually in the legs), neuropathy (damage to nerves) and visual problems, including blindness[16]. Type 2 diabetes is within the leading 15 causes of early death and disability for both men and women[5].

The main source of data for type 2 diabetes in Scotland is the Scottish Diabetes Survey. The survey reports on population-based data for people with diabetes and combines information from primary and secondary care in each health board. In 2017, the prevalence rate of type 2 diabetes in NHS Highland was reported as 4.7 percent, or 15,134 people. There are approximately 1,000 new cases of type 2 diabetes in NHS Highland diagnosed each year[17].

The prevalence of type 2 diabetes has increased over the last ten years. The Scottish Diabetes Survey recorded an increase in the number of people recorded with type 2 diabetes between 2009 and 2017 of 32 percent increase, as shown in Figure 11. In addition, it is estimated that around 10% of cases of diabetes remain undiagnosed[18].

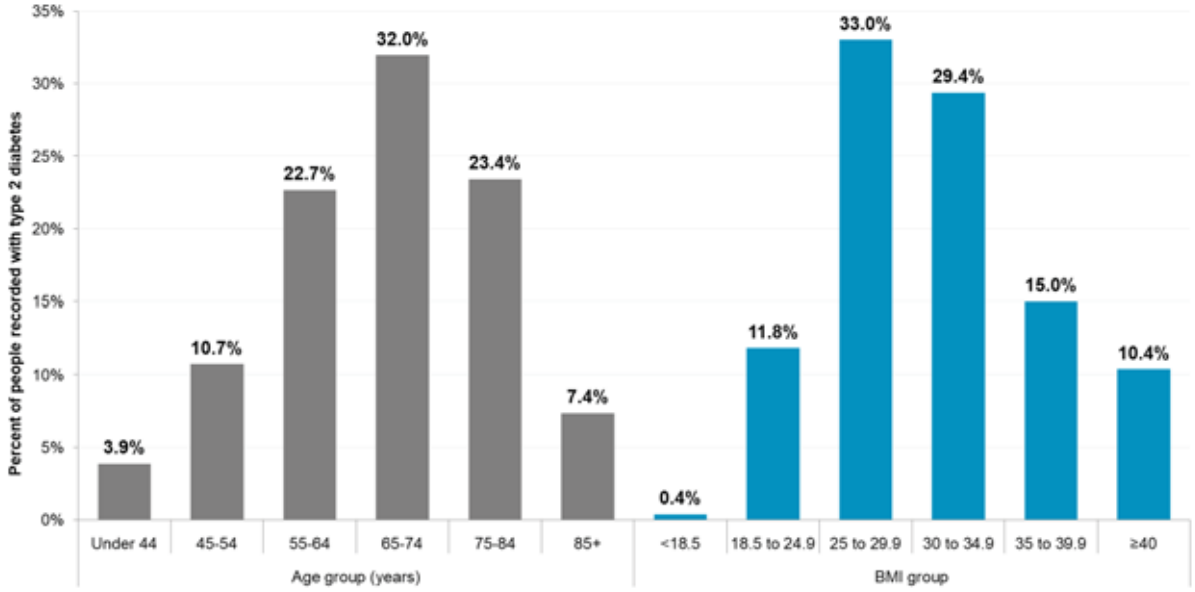
Figure 11: Number of people recorded with type 2 diabetes; NHS Highland, 2009 – 2017



Source: Scottish Diabetes Survey, 2009 - 2017

The main risk factors for type 2 diabetes relate to increasing age and being overweight or obese. Prevalence of type 2 diabetes is more common after the age of forty[19], and in people with a high body mass index in the overweight or obese range[20]. The distributions of these two risk factors in people with type 2 diabetes in NHS Highland are shown in Figure 12.

Figure 12: Age and Body Mass Index distribution for people recorded with type 2 diabetes in NHS Highland, 2019



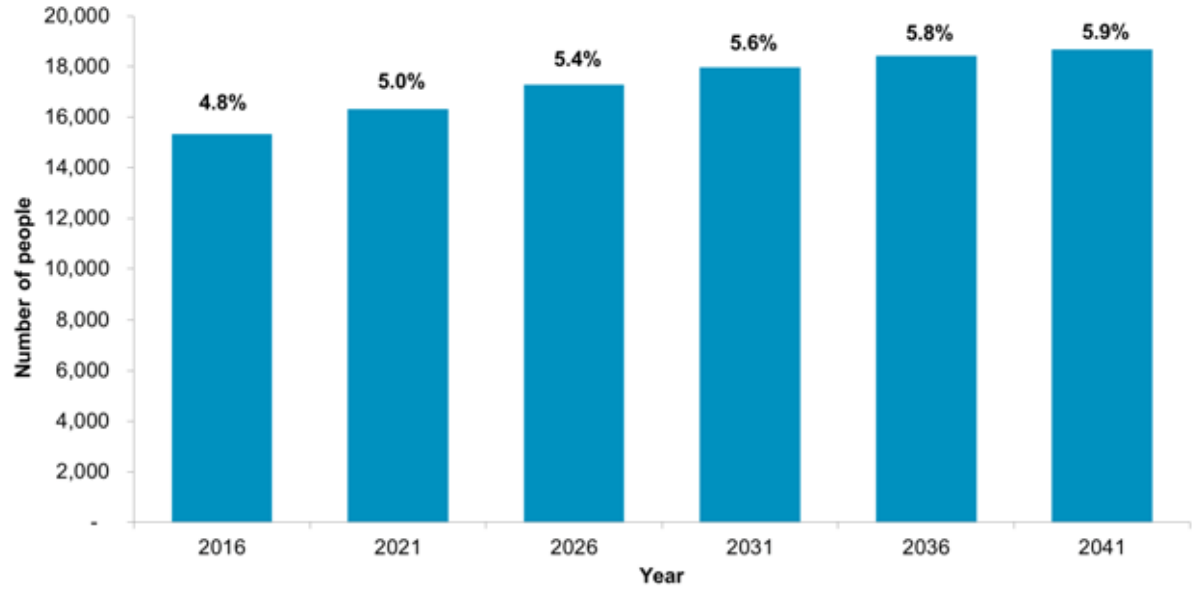
Source: SCI-diabetes

BMI: Body mass index

Underweight BMI <18.5 kg/m2, Healthy weight BMI 18.5 - 24.9 kg/m2, Overweight BMI ≥ 25 kg/m2, Obese BMI ≥ 30 kg/m2, Severely obese BMI ≥ 40 kg/m2

Estimates of the future number of people diagnosed with type 2 diabetes, based on current age and sex specific prevalence rates for NHS Highland, are shown in Figure 13. The projections suggest that the number of people with type 2 diabetes will continue to increase, mainly related to the aging of the population and that there is no change in the underlying prevalence of risk factors such as deprivation and obesity.

Figure 13: Projected number of people with type 2 diabetes and prevalence rate in NHS Highland, 2016 to 2041



Source: SCI-diabetes. NHS Highland age-sex specific prevalence rates applied to National Records of Scotland Health Board Population Projections 2016-based

Mental health

Mental health and wellbeing are increasingly recognised as a major public health concern[21.] Estimates suggest that 15 percent of men and 18 percent of women experienced symptoms of a common mental health condition in 2017[15] and that mental health and substance use disorders grouped together were the third largest contributor to morbidity in Scotland in 2016[5]. Mental health problems can occur at any age, but are increasingly common among younger people and those experiencing poverty and social disadvantage[22].

The Mental Health Strategy for Scotland 2017-27 outlines that good mental health is associated with better physical health, positive interpersonal relationships and more equitable and productive societies[23]. The Scottish Government's Health and Social Care Delivery Plan, reinforces the equal importance of mental and physical health and the need to address the underlying conditions that affect health[1]. The inequalities that drive differences in physical health outcomes are the same inequalities that affect mental wellbeing and incidence of mental health problems[24].

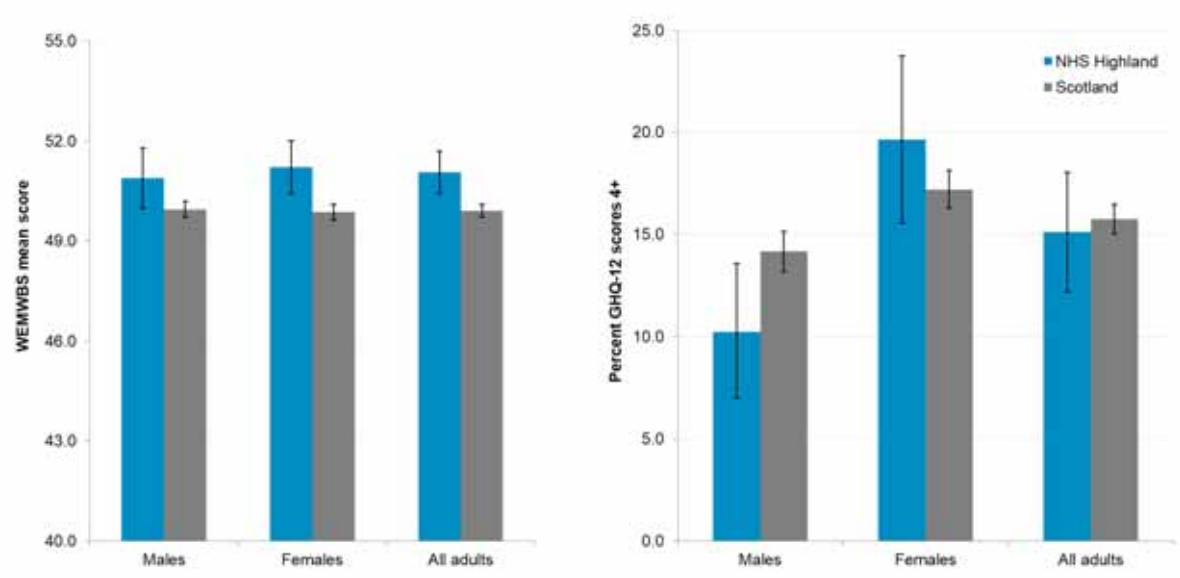
Mental wellbeing and mental health problems are two different facets of health. Mental wellbeing is often viewed as the positive dimension of mental health and includes aspects such as positive relationships, social capital and life satisfaction. Good mental health allows people the resilience to cope with the normal stresses of life. Mental ill-health reflects the presence of a spectrum of disorders, from common conditions such as anxiety and depression, to less common illnesses such as schizophrenia and affective psychoses.

Mental wellbeing in the general population is reported in the Scottish Health Survey using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS). Scores range from 14 to 70 with higher values indicating greater wellbeing. Figure 14 shows that the mean WEMWBS score in NHS Highland in the period 2014 to 2017 was 51.0, which was significantly higher than the Scottish average of 50.2. Women had a slightly higher mean score compared to men, 51.2 and 50.9 respectively[25].

The prevalence of common mental health disorders, as measured using the General Health Questionnaire 12 (GHQ-12), is also shown in Figure 14. The GHQ-12 is a widely used standard measure of mental distress and mental ill-health. Scores range from zero to 12 where a score of zero indicates good psychological wellbeing and a score of four or more indicates the presence of a common mental health condition. In 2014-17, 66 percent of adults in NHS Highland had a GHQ-12 score of zero, 19 percent had a GHQ-12 score of one to three, and 15 percent had a score of four or more. Prevalence of common mental health problems differ by gender and in 2014-17 were significantly higher in women than men, 20 percent compared to 10 percent respectively.

The most common mental health disorders comprise different types of depression and anxiety. These can cause marked emotional distress and interfere with daily function, but do not usually affect insight or cognition. The trend for prevalence is increasing and Figure 15 shows that since 2010 there has been an increase in the number of people prescribed drugs for anxiety and depression from 43,000 to over 55,000 in 2018.

Figure 14: WEMWBS and GHQ-12 scores by sex, NHS Highland and Scotland, 2014-2017 combined

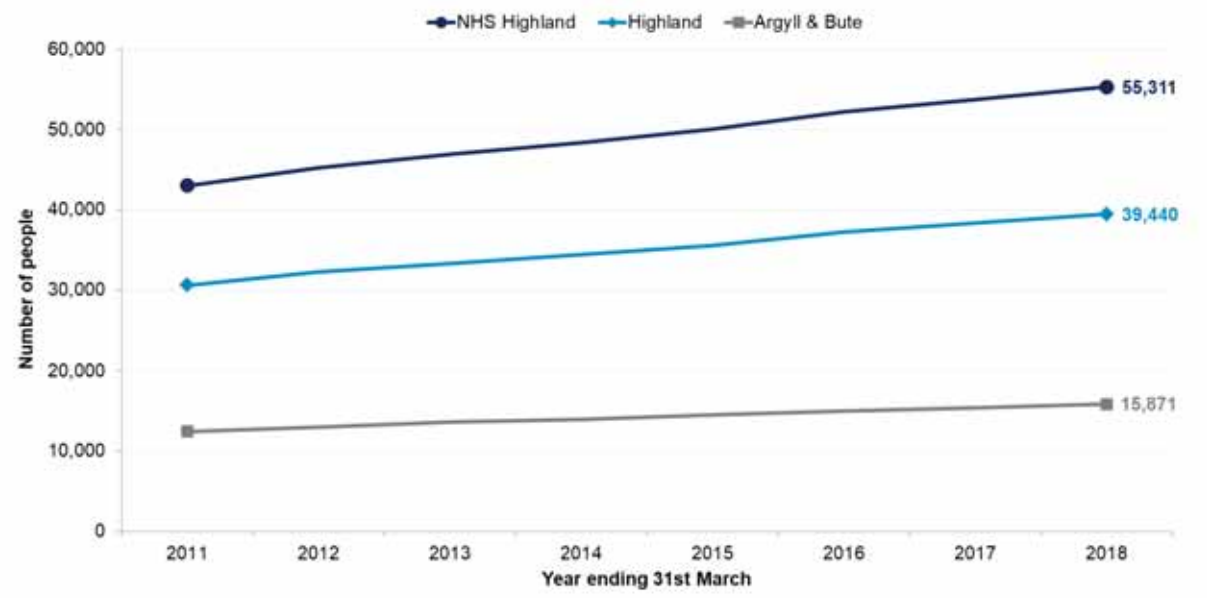


Source: Scottish Health Survey Health Board Tables 2014-17[25]

WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

GHQ-12: General Health Questionnaire 12, where a score of 4 or more indicates signs of the presence of a possible psychiatric disorder

Figure 15: Estimated number of people being prescribed drugs for anxiety, depression or psychosis, NHS Highland, 2011 to 2018.



Source: ISD Scotland (Prescribing Information System), Scottish Public Health Observatory Online Profiles[26]

Children and Young People's Mental Health

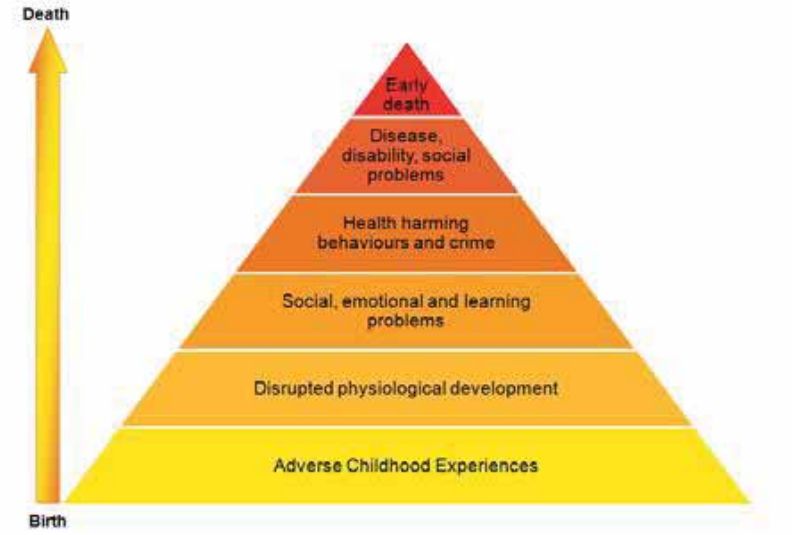
There is growing evidence that exposure to trauma and adversity, particularly in the early years, increase the risk of later development of poor mental health, adverse behavioural responses, and increased risk of a range of physical illnesses.

The term adverse childhood experiences (ACEs) is used to describe a wide range of stressful or traumatic experiences that babies, children and young people can be exposed to whilst growing up. Adverse childhood experiences range from experiences that directly harm a child (such as abuse and neglect), to those that affect the environment in which a child grows up (including parental separation, domestic violence, mental illness, problematic alcohol or drug use, and a family member being in prison).

A number of population surveys have been undertaken to measure the prevalence of adverse childhood experiences. The results of two nationally representative population surveys in England[27] and in Wales[28] found that almost half (47 percent) of the adult population aged 18 to 69 years have experienced at least one type of adversity and over 11 percent have experienced four or more. Assuming a similar prevalence in NHS Highland, this equates to 97,000 adults with at least one and 22,000 adults with four or more adverse childhood experiences.

Population studies show a risk relationship between the experience of multiple adversity and poorer outcomes in terms of physical and mental health and adopting health harming behaviours. A 2018 systematic review reported that people experiencing higher numbers of adverse childhood experiences have poorer outcomes in a number of areas, including increased risk of cardiovascular disease, cancer, diabetes, anxiety, depression, problematic alcohol and drug use, violence and self-harm[29]. A model depicting the impact of adverse childhood experiences on outcomes across the life course is shown in Figure 16.

Figure 16: Impact of adverse childhood experiences across the life course



Source: Based on Felitti et al.[30]

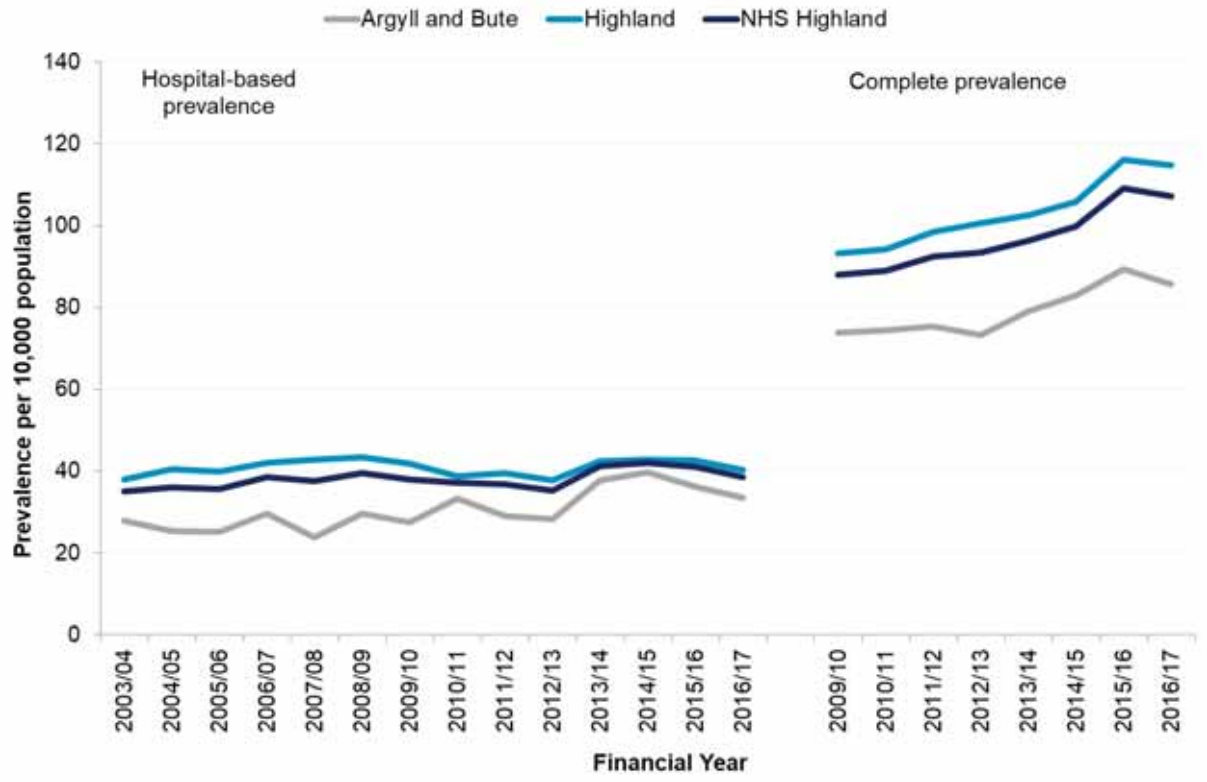
Children and Young People with Life-shortening Conditions

An important aspect of the health needs of babies, children and young people are the number of children living with life-shortening conditions. Life-shortening conditions are defined as both life-limiting conditions where there is no reasonable hope of a cure and from which children or young people will ultimately die prematurely, and life-threatening conditions where curative treatment may be feasible but may fail[31]. These children, and their families, are increasingly living with complex care and support needs.

Research commissioned by Children's Hospices Across Scotland (CHAS) shows that there is an increasing number of children in Scotland with life-shortening conditions. The report also highlights that prevalence is higher in areas of deprivation: 25 percent of children and young people aged 0 to 21 years identified as having a life-limiting condition lived in the most deprived areas compared to 18 percent in the least deprived areas in 2016/17.

Estimates of the prevalence of life-limiting conditions among children and young people in NHS Highland are shown in Figure 17. Between 2009/10 and 2016/17 prevalence rates have increased from 88 per 10,000 population aged 0 to 21 years to 107.2 per 10,000. The number of children identified with life-limiting conditions was 675 in 2009/10 and almost 800 in 2016/17, a 17 percent increase. Hospital-based and overall prevalence was notably higher in the Highland council area than in Argyll and Bute. These data reflect both increased incidence and survival from life-limiting conditions.

Figure 17: Prevalence of life-limiting conditions among children and young people 0-21 years, NHS Highland, 2003-04 to 2016-17



Source: ISD Scotland, Children's Hospices Across Scotland, 2018[31]

Hospital-based prevalence based on Scottish Birth Record (SBR) and inpatient (SMR01) data

Complete prevalence based on Scottish Birth Record (SBR), inpatient (SMR01) and community prescribing data

Multimorbidity

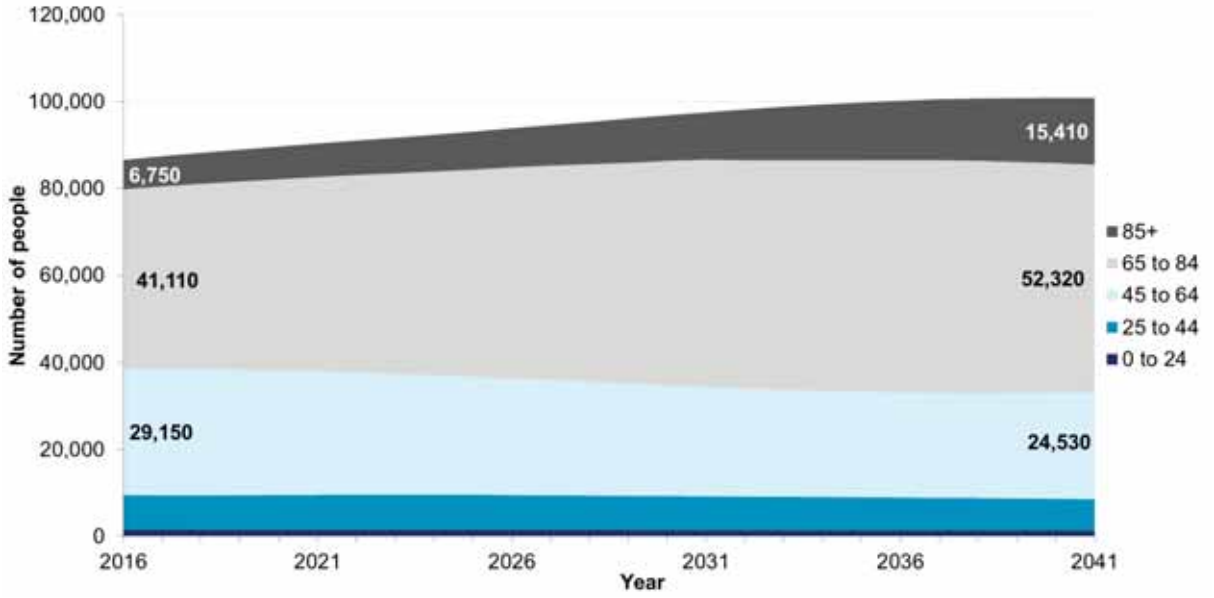
Multimorbidity is commonly defined as the coexistence of two or more long-term health conditions within an individual. The estimates of disease prevalence outlined earlier in this chapter focus on single conditions, whereas in practice many people have multiple health conditions. These require coordination of care, understanding of multiple treatment programs and the management of complex drug regimens[32].

Recent estimates suggest that multimorbidity is common, affecting between one in four (23 percent) and one in six (27 percent) of people[32,]. A 2012 study, based on Scottish general practice data, reported that the number of health conditions and prevalence of multimorbidity is strongly associated with age and socio-economic deprivation[33]. Almost one third of people (30 percent) in the 45 to 64 age group were multimorbid, increasing to 81 percent by the age of 85. Research also shows that the prevalence of mental health conditions in an individual increase with the number of physical health conditions they have[34].

Projections of multimorbidity from the Population Ageing and Care Simulation (PACSim) study in England, suggest that there will be greater numbers of older people with multimorbidity in the future[34]. Furthermore, the authors report that the prevalence of complex multimorbidity (four or more conditions) will increase, and that the majority of people with four or more conditions will also have mental ill-health.

Projections of multimorbidity for the NHS Highland population, based on Scottish age-specific rates, are shown in Figure 18. The prevalence of multimorbidity is estimated to increase from 86,500 (27 percent) in 2016 to 101,000 (32 percent) in 2041. The estimated numbers of people aged 85 years and over with multiple health conditions will more than double, though the absolute numbers will remain higher in those aged 65 to 84 years.

Figure 18: Estimated and Projected number of people with multimorbidity by age group, NHS Highland, 2016 to 2041



Source: Barnett et al.[33] age-specific multimorbidity (2 or more conditions) prevalence rates applied to National Records of Scotland Health Board Population Projections 2016-based

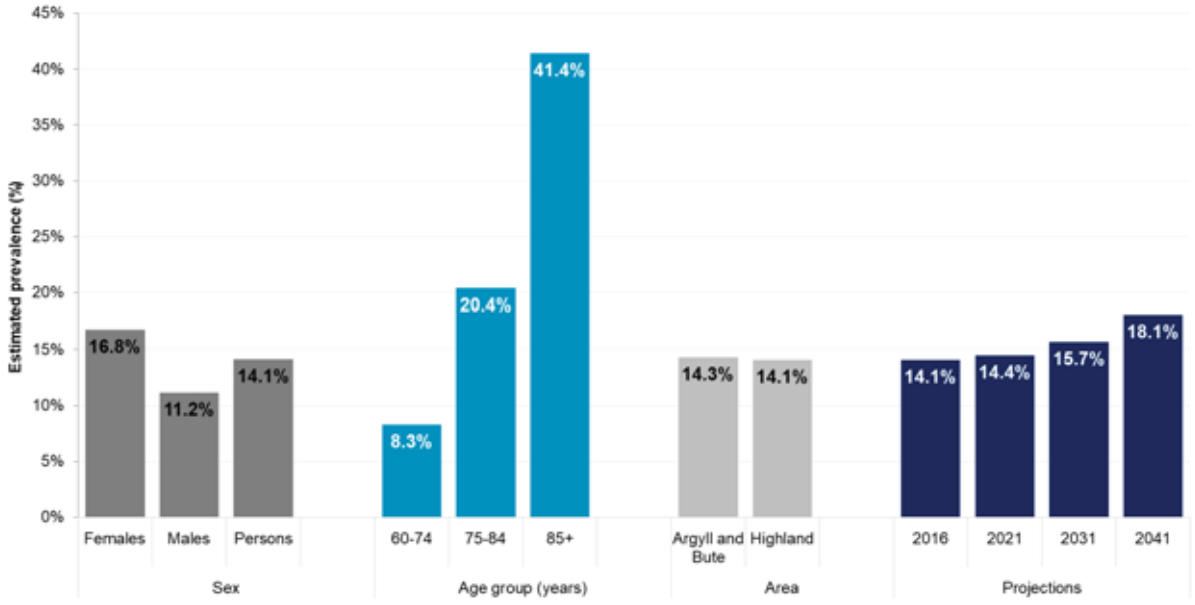
Frailty

Frailty is a term used to describe a health state related to the ageing process in which multiple body systems gradually lose their in-built reserves[35]. Characteristics can include unintentional weight loss, reduced muscle strength, exhaustion, reduced walking speed and low levels of activity[36]. There is some evidence that older people with frailty are vulnerable to a sudden change in their physical and mental health and wellbeing and a range of adverse outcomes including falls, delirium and fluctuating levels of disability[35]. Frailty is therefore an important condition within the context of health status and an aging population.

Although age is the strongest risk factor for frailty, not all old or even very old people are frail. Findings from the English Longitudinal Study of Aging estimated that around 14 percent of people aged 60 years or over have frailty, rising to 65 percent in those aged 90 years or over[37].

Estimates of the prevalence of frailty for different population groups and settings in NHS Highland are shown in Figure 19. In 2017, 13,500 people aged 60 years and over were estimated to have frailty, equivalent to 14.1 percent of the population in this age group. Prevalence was higher in females (16.8 percent) compared to males (11.2 percent), reflecting the higher number of women in the older age groups. If prevalence by age and sex remain constant, the number of people aged 60 years and over with frailty in NHS Highland is expected to increase to 21,500, or 18.1 percent of the population in this age group.

Figure 19: Estimated percentage of people aged 60 years and over with frailty by sex, age group, area and year, NHS Highland



Source: Gale C et al.[37] age-sex specific community frailty prevalence rates applied to National Records of Scotland Council Area Population Estimates 2017 and Health Board Population Projections 2016-based

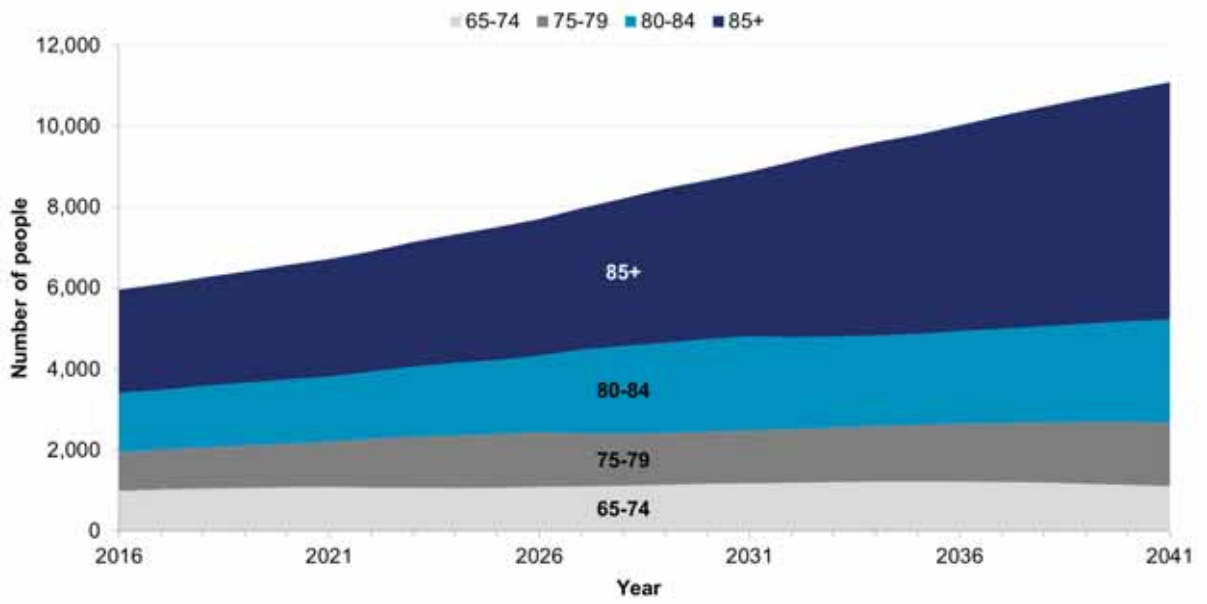
Dementia

Alzheimer's disease and other types of dementia is a major cause of disability and dependency among older people, recognised by the World Health Organisation as a public health priority[38]. Dementia mainly affects older people, although there is recognition that it can occur in people of all ages[39]. Evidence from the European Collaboration on Dementia (EuroCoDe) suggests that dementia affects 1.8 percent of men and 1.4 percent of women aged 65 to 69 years. Rates of dementia increase exponentially with age, so that around 29.2 percent of men and 44.4 percent of women aged 90 to 94 are estimated to have the condition[40]. Approximately 50 to 65 percent of people with dementia will have a formal diagnosis at a given point in time.

A recent estimate carried out by Alzheimer Scotland suggests that there were 6,600 people with dementia in NHS Highland in 2017[41]. Of that number, approximately 2,000 (30 percent) are resident in Argyll and Bute and 4,600 (70 percent) are resident in Highland. Almost two thirds (64 percent) of those affected by dementia are women, reflecting the higher number of women in the population aged 65 years and over.

The increasing age of the population is likely to have a significant impact on the number of people affected by dementia. Projections of the future number of people with dementia, based upon current age and gender specific prevalence rates, suggest that there will be an estimated 8,000 people with dementia in NHS Highland by 2026 and over 10,000 people by 2036. An increasing proportion of people with dementia will be aged 85 years and over, as illustrated in Figure 20.

Figure 20: Projected number of people aged 65 and over with dementia by age group, NHS Highland, 2016 to 2041



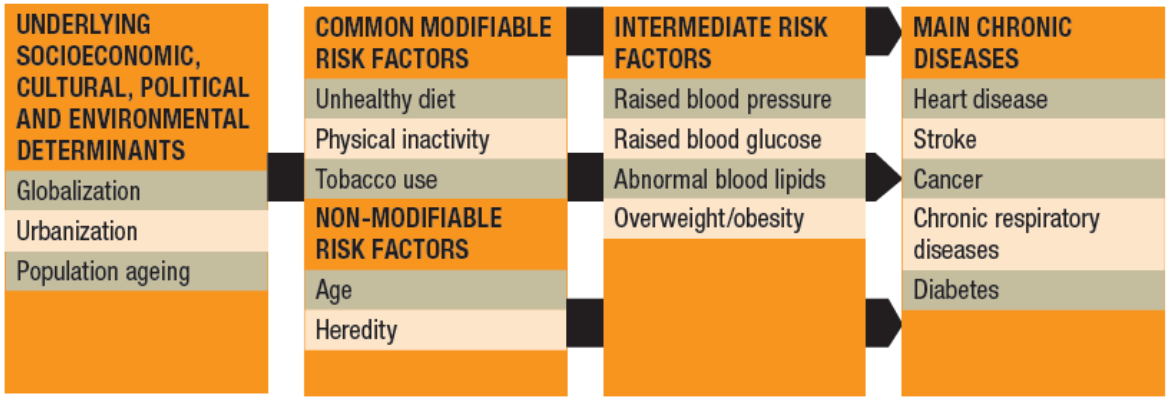
Source: EuroCoDe[40] and Harvey[42] age-sex specific dementia prevalence rates applied to National Records of Scotland Health Board Population Projections 2016-based

The increasing prevalence of dementia in an older population has considerable implications for future support needs. Symptoms of dementia can range from some memory loss and confusion to complete dependence on others for all aspects of personal care. An estimate carried out by the Alzheimer's Society suggests that the severity of dementia at any given point in time is 55.4 percent mild, 32.1 percent moderate and 12.5 percent severe dementia[43]. While the majority of people with dementia manage to live independently in the community, with input from family members and informal carers, those with more progressive dementia are likely to require a higher level of care. Symptoms linked to dementia profoundly affect the quality of life of people with dementia and their caregivers.

Common risk factors

The causes of ill health are well established, with a small set of common risks associated with the main causes of morbidity[44]. A model by the World Health Organisation shows these include common modifiable risks such as tobacco use, unhealthy diet and physical inactivity and non-modifiable risks such as age and genetics. These are interconnected with the underlying social determinants of health: poverty, deprivation, inequality, social exclusion and other factors. People living in adverse circumstances have greater exposure to risks and psychosocial stress. The World Health Organisation model is conceptualised in Figure 21.

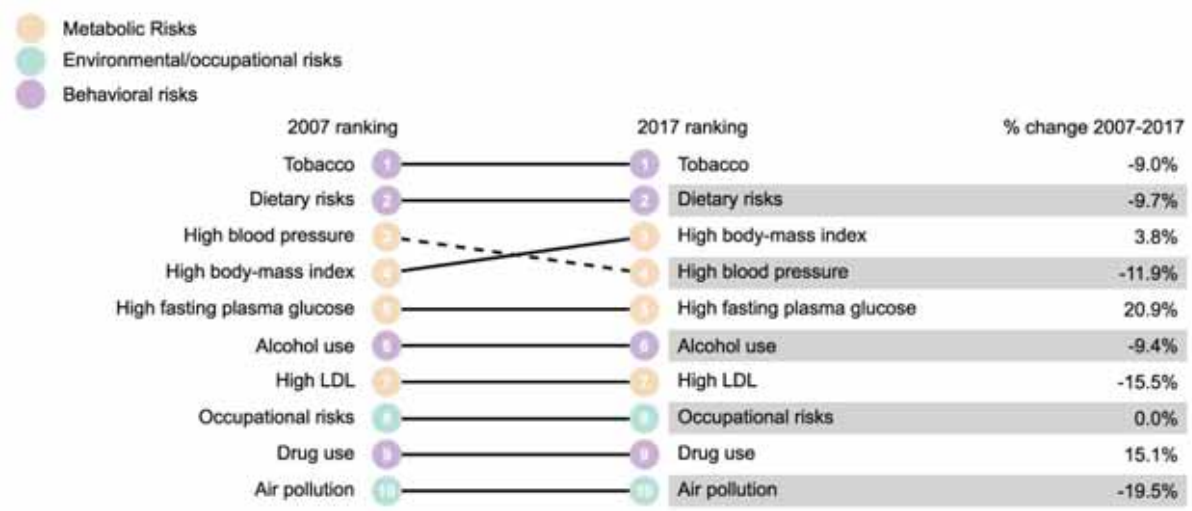
Figure 21: Risk factors associated with chronic diseases



Source: World Health Organisation[44]

Another model reported in the Global Burden of Disease Study 2017 grouped risk factors that drive the leading causes of morbidity into three broad categories: metabolic, environmental and behavioural risks. The study estimated that the five leading risk factors in Scotland were tobacco, diet, high body mass index, high blood pressure and high fasting plasma glucose (high blood sugar). Alcohol use and problem drug use also play a role. The top 10 risks in 2017 and the change from 2007 are shown in Figure 22. Although the approach may underestimate the role of socio-economic, cultural and psychosocial factors, it is a useful model for comparative purposes[45].

Figure 22: Top 10 risks contributing to DALYs in 2017 and percent change, 2007-2017, Scotland



Source: Institute for Health Metrics and Evaluation (IHME). United Kingdom-Scotland profile[46]

The Scottish Governments ambitions to address the underlying conditions that affect health and the key public health issues of alcohol and tobacco misuse, diet, obesity and physical inactivity are set out in the 2016 Health and Social Care Delivery Plan[1] and 2018 Public Health Priorities for Scotland[21]. The prevalence of these factors in NHS Highland, using aggregated data from the Scottish Health Survey for 2014 to 2017, are summarised below.

Alcohol consumption

In 2016, the UK Chief Medical Officers published new guidelines on alcohol consumption, updated in the light of recent evidence that establishes a clear link between alcohol and cancer. This means there is no amount that a person can drink without there being a risk to their health. The new weekly guideline for 'low risk' drinking is for both men and women not to exceed 14 units per week on a regular basis. In 2014-2017, almost one in three men (34 percent) of men and one in six women (17 percent) exceeded the usual weekly alcohol consumption guidelines. This equates to over 51,000 adults drinking alcohol at hazardous/harmful levels.

Obesity

In 2014-17, over a quarter of adults (27 percent) in NHS Highland were classified as having a BMI in the obese (BMI ≥30 kg/m^2) range. Prevalence of obesity is higher in women than men, 29 percent compared to 25 percent. Prevalence of high BMI has been relatively stable since 2008. High BMI is also associated with increasing levels of area deprivation, particularly in women[15].

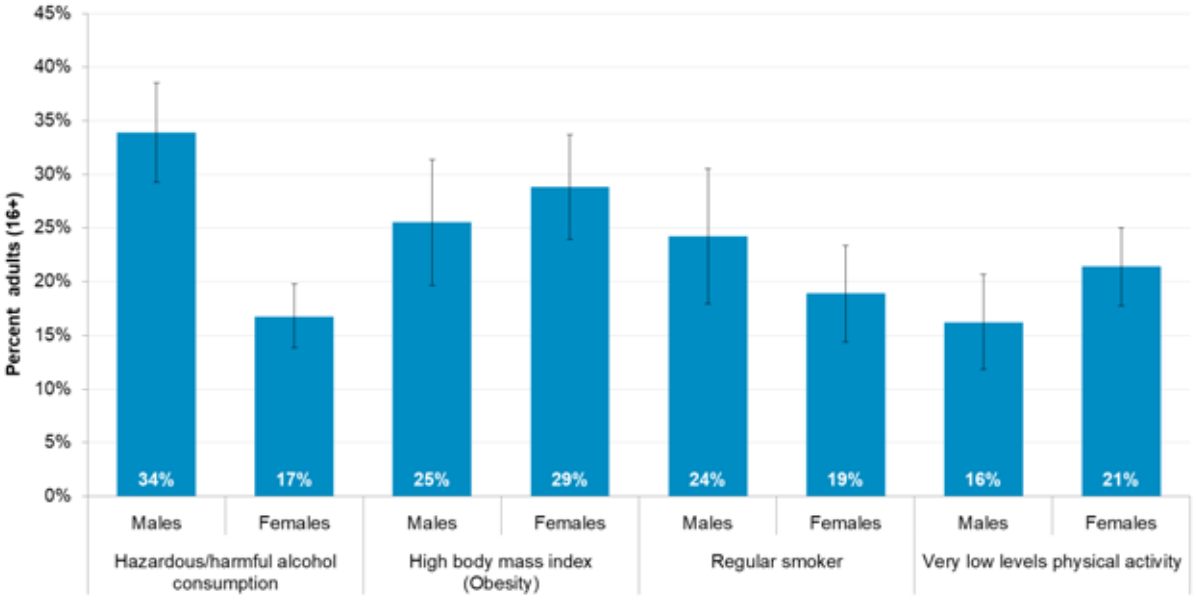
Smoking

Smoking remains one of the leading causes of preventable disease and premature death in the UK[47]. Nationally, current smoking prevalence fell significantly from 28 percent of adults in 2003 to 18 percent in 2017. In NHS Highland, the prevalence of regular smoking in 2014-2017 was 21 percent. Men were more likely than women to identify as current smokers, 24 percent and 19 percent respectively.

Physical inactivity

Realistic physical activity is good for overall health and wellbeing. The UK Chief Medical Officers' guidance on physical activity recommends that adults should meet moderate/vigorous physical activity (MVPA) guidelines of at least 150 minutes of moderately intensive physical activity or 75 minutes vigorous activity per week or an equivalent combination of both. Very low activity is defined as less than 30 minutes of moderate activity or less than 15 minutes of vigorous activity or combination of these. Locally, 67 percent of adults met the MVPA guidelines compared to 64 percent in Scotland as a whole. In NHS Highland 16 percent of males and 21 percent of females reported very low levels of physical activity.

Figure 23: Prevalence of key risk factors in adults aged 16 years and over, by sex, NHS Highland, 2014-2017 combined



Source: Scottish Health Survey Health Board tables

Alcohol consumption: Exceeds 2016 CMO recommendations of 14 units per week

High body mass index: ≥ 30 kg/m2

Very low levels of physical activity: < 30 minutes of moderate activity or < 15 minutes of vigorous activity a week

The main risk factors are socially patterned and influenced by socio-economic, cultural and psychological factors across the life course. Living in poverty and relative deprivation is linked to increased risk of poor health outcomes at all stages of life, with evidence suggesting it can be particularly harmful before birth and in early childhood[48]. Research shows that people in the most deprived areas were more likely to smoke, have a high BMI and very low levels of physical activity than adults in the least deprived areas[15]. In addition, men living in the most deprived areas were more likely to drink alcohol at harmful levels and have possible alcohol dependence than those in the least deprived areas.

What this means for the future

There are considerable challenges to improving health and wellbeing and providing services to meet the needs of the population of NHS Highland. While people are, on average, healthier than ever before, the increasing numbers of older people in the population will inevitably lead to an increased demand for health and care services.

Evidence shows that the main impact of population aging will be increasing demands for care from people with long-term conditions and other support needs. The risk of developing long term conditions increases as people age. This means that there will be more cases of certain conditions associated with older age, for instance, cancer, cardiovascular disease, type 2 diabetes, frailty and dementia. There will also be more people with complex multimorbidity (four or more conditions), combining both physical and mental health ill health.

Established adult risk factors put people at relatively greater risk of developing certain conditions at older ages. For example, a recent evidence review highlights that while age is the strongest known risk factor for cognitive decline, dementia is not an inevitable consequence of ageing[49]. Studies have shown a relationship between the development of dementia with risk factors such as tobacco use, physical inactivity, unhealthy diets, harmful use of alcohol, social isolation and cognitive inactivity. This highlights the importance of taking a life course approach to prevention and early intervention treatment.

Research is also increasingly showing that the origins of risk for many chronic conditions, such as diabetes and heart disease, begin before birth and in early childhood. Challenges such as poverty, deprivation, discrimination and adverse childhood experiences are linked to poor health outcomes at all stages of life, with evidence suggesting they can be particularly harmful in the early years.

A life course approach to prevention and the proactive management of modifiable risk factors in mid and later life promotes healthy aging. Healthy or active aging is a concept promoted by the World Health Organisation that considers the ability of people at all ages to live a healthy, safe and socially inclusive life[50]. Healthy aging values the contribution that older people make to society, and aims to extend the quality of life for all people as they age, including those who are frail, disabled or with other support needs.

These health issues are reflected in the 2016 Health and Social Care Delivery Plan[1] and the Public Health Priorities for Scotland[21] published in 2018. These outline a comprehensive approach to improving health based on supporting healthier lives from the earliest years; recognising the equal importance of physical and mental health; reducing health inequalities by addressing the underlying conditions that affect health, and taking a life course approach to prevention and early intervention treatment.

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Care dependency in the older population of NHS Highland

Supplementary paper 6 to the Director of Public Health report 2019

Public Health Intelligence

Directorate of Public Health

NHS Highland

October 2019

The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland. The team provides an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

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Contents

Director of Public Health report 2019

This is the sixth paper in a series that will contribute to the NHS Highland Director of Public Health report 2019.

The first report looked at demography and population dynamics, the second considered increasing numbers of living generations and changes in how we live, the third and fourth reviewed mortality and life expectancy and the fifth discussed health status. The final supporting paper will look at informal care.

Estimating care dependency in the older population of NHS Highland

This paper updates estimates of the number of older people in NHS Highland who will require health and social care at various levels of intensity by 2035. The projected prevalence of dependency from a larger population model is used. An assessment is made of how appropriately these prevalence rates can be applied in NHS Highland. The estimates are compared to current Department of Work and Pensions Attendance Allowance payments and numbers of Care Home occupants.

Key points

- Over the next 20 years it is anticipated that the number of older people who are able to live independently will increase
- As more people live to be 85 years and older who have dementia and comorbidities, the number of individuals with 24 hour complex care needs are projected to increase
- Projections indicate that by 2035 7,000 people living in NHS Highland will require 24 hour care compared to 5,800 today
- The figure of 7,000 highly dependent people by 2035 is likely to be an underestimate of future need

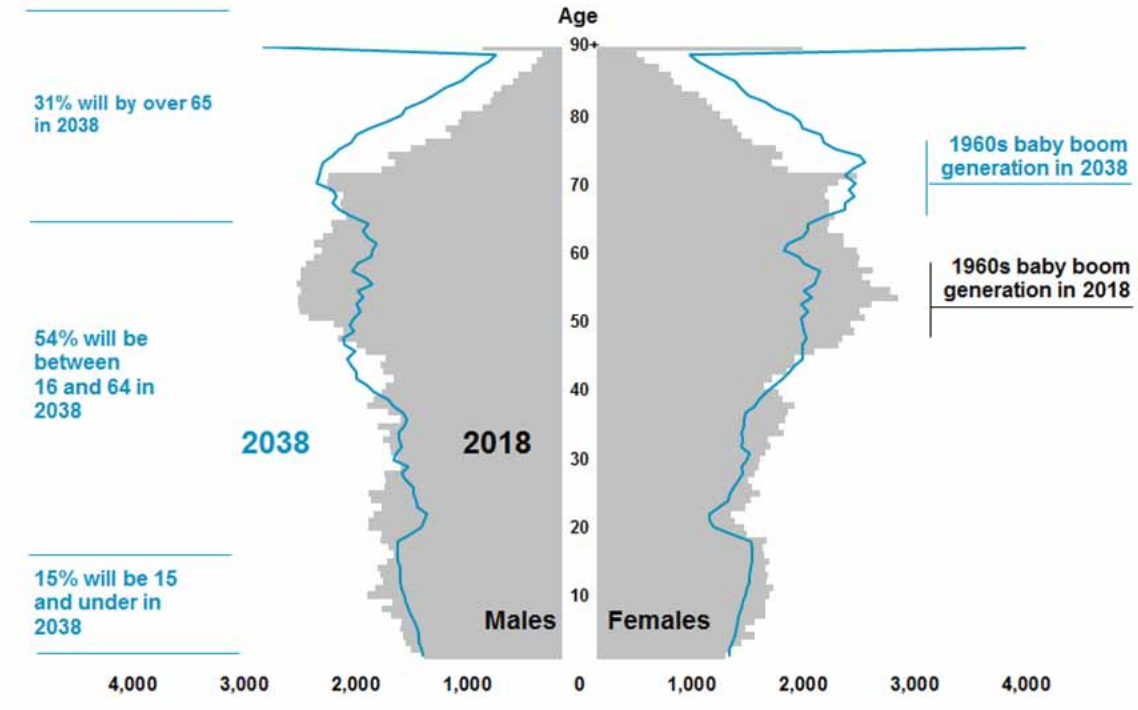
Background

The proportion of older people within the NHS Highland population is forecast to continue to increase over time as the 'baby boom' cohort approach peak ageing (Figure 1).

The number of people aged over 65 years is expected to be over 100,000 by 2038, an increase of 35 percent from 2018. Projections suggest about one in six people living in the NHS Highland area will be over 75 years old by 2038.

At the same time the number of people of working age is in decline.

Figure 1: NHS Highland population 2018 and 2038



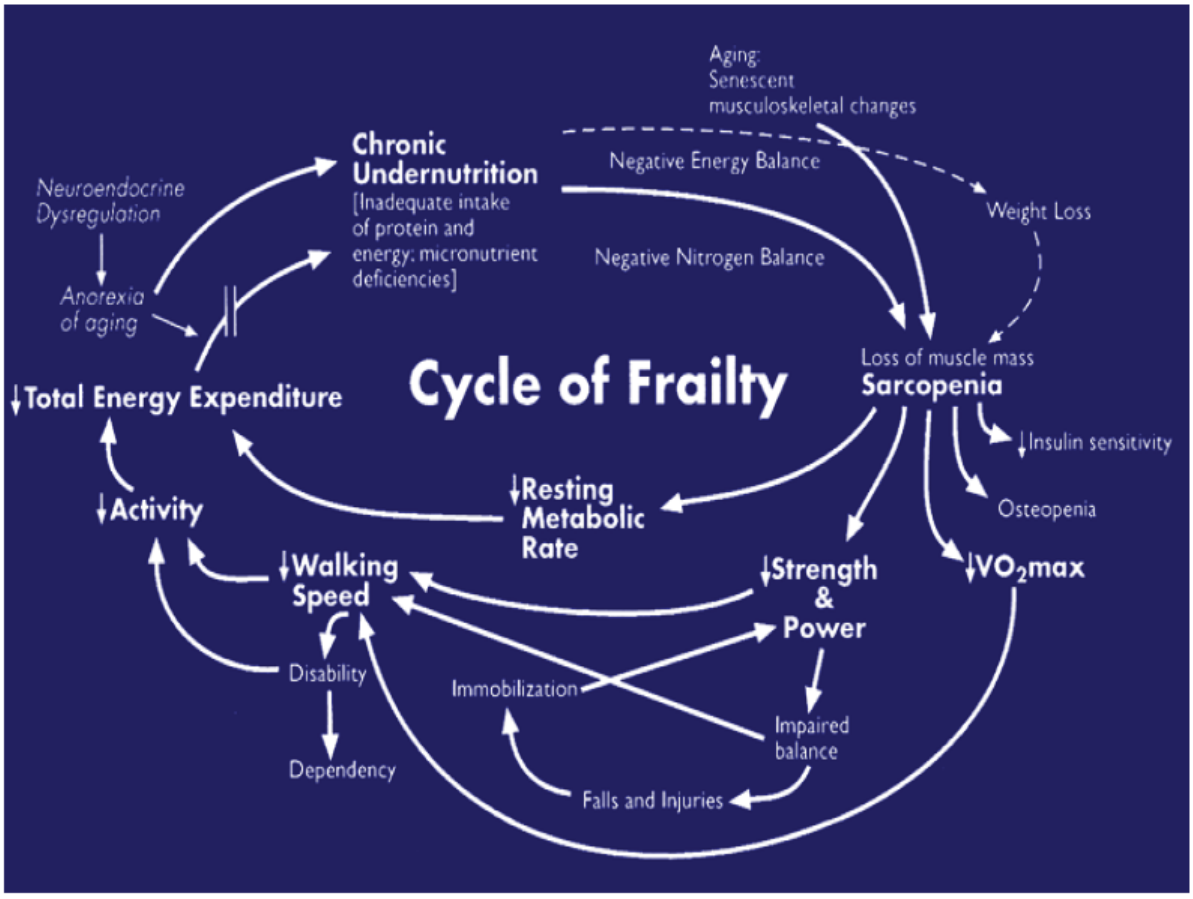
Source: National Records of Scotland[1,2]

What assessing dependency tells us

Dependency states indicate the amount of help and supervision a person will need. The required delivery of care can be used to group dependency as high (24 hour care), medium (daily care at regular intervals), low (care less than daily) or independent (no help or supervision necessary).

The World Health Organisation (WHO) defines intrinsic capacity as "the combination of the individual's physical and mental, including psychological, capacities"; and functional ability as "the combination and interaction of intrinsic capacity with the environment a person inhabits"[3]. Care dependence "arises when functional ability has fallen to a point where an individual is no longer able to undertake the basic tasks that are necessary for daily life without the assistance of others"[4]. As people reach the oldest-old age they tend to move from robustness to frailty and care dependence. This is illustrated in Figure 2.

Figure 2: World Health Organisation – cycle of frailty



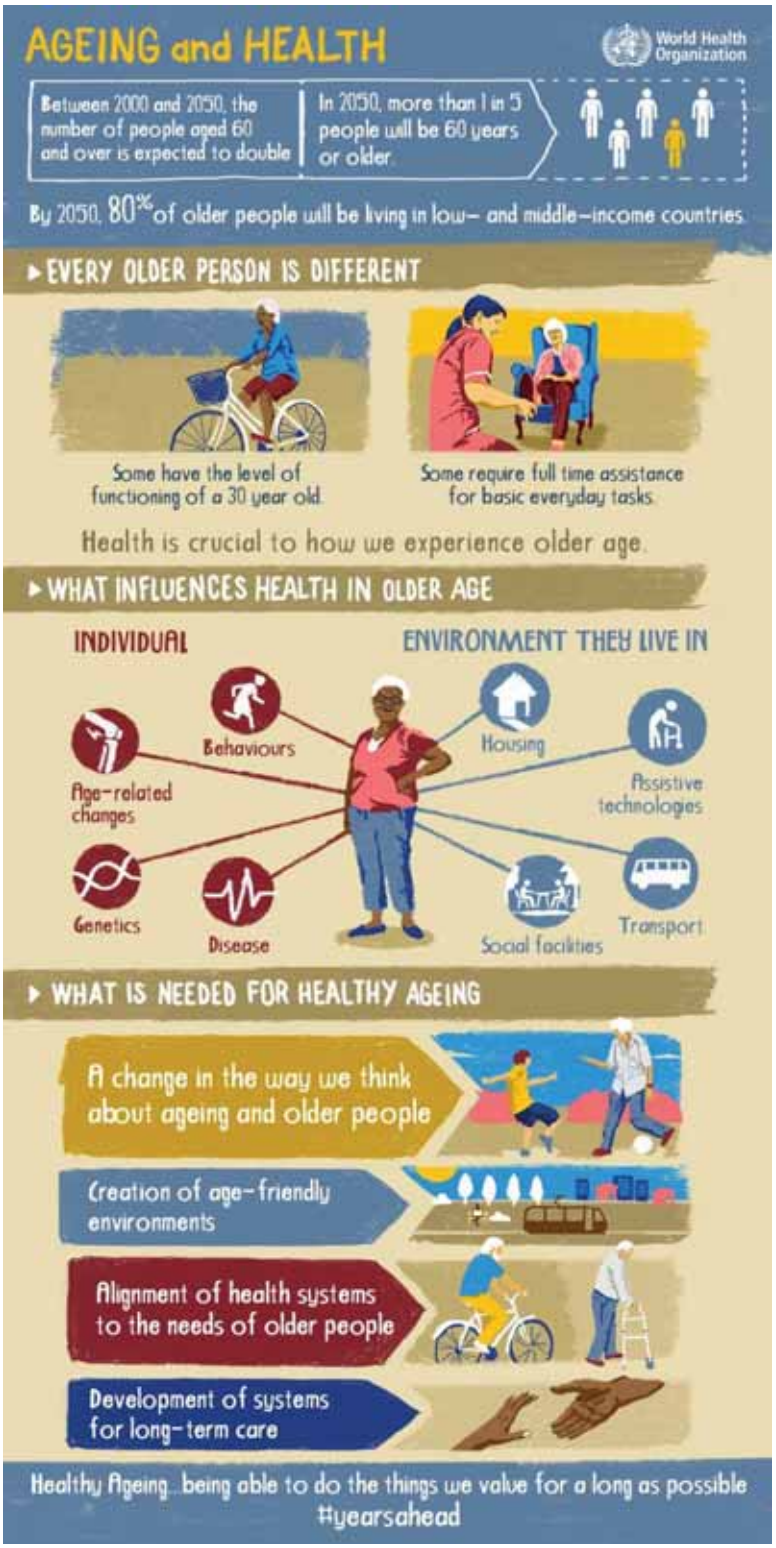
Source: Fried and Walston *(8)*; adapted with permission. VO_2max: maximal oxygen consumption

Source: World Health Organisation[3]

Most of the disease burden in older age is due to chronic conditions and multimorbidity with increasing rates of obesity and common risk factors, such as the harmful use of alcohol, tobacco, unhealthy diets, and physical inactivity and poor mental health[4].

The World Health Organisation illustrates their vision of healthy ageing in Figure 3.

Figure 3: World Health Organisation – Ageing and Health



Source: World Health Organisation[5]

Assessing care dependency in older people

Audit Scotland recommended in 2014 the use of a consistent tool to assess dependency in older people[6]. In 2017 NHS National Services Scotland endorsed the redesigned data collection and assessment tool 'Indicator of Relative Need (ioRN2)'[7]. Data from this tool were not yet available in NHS Highland therefore alternative methods of estimating care needs based on dependency in later life were considered to inform the strategic planning of health and social care services.

In 2017 results from Cognitive Function and Ageing Studies (CFAS) in England were published in the Lancet[8]. Data were collected during 1991 (CFAS (i)) and 2011 (CFAS (ii)) from two cohorts of people, aged 65 years and over, registered with three general practices in England. The data allowed the assignment of four levels of care dependency to populations aged 65 and over. The profiles are based on Isaacs' and Neville's 'interval of need'[9]. The four groups categorise people based on their cognitive status, continence status and time elapsed between people requiring help with activities of daily living (ADLs):

- High dependency (24h care): Help may be required at any time or constant supervision needed
- Medium dependency (care at regular times each day): help required at regular intervals each day
- Low dependency (care less than daily): Requires help less often than daily
- Independent: Supervision or help for any activity is not essential

In 2017, NHS Highland Public Health Intelligence and Epidemiology Team[10] applied the age and sex specific proportions, by dependency status of the studies' cohorts, to the estimated and projected populations of the Highland Council area. This assumes the local dependency profile is similar to the English cohorts; analysis of life expectancies suggests this method may underestimate medium and high dependency estimates in Highland. Forecasts were calculated based on two scenarios:

- Scenario 1: The age and sex specific proportions by dependency status of the CFAS (ii) 2011 study cohort were applied to the projected population of Highland Council. This assumes that dependency rates stay the same, and that only the proportion of people by age group changes.
- Scenario 2: The changes in the dependency rates between the two cohort studies, one in 1991 (CFAS (i)) and one 20 years later in 2011 (CFAS (ii)) were applied to the projected populations in Highland. A linear projection from 2015 to 2035 applied 50 percent of the change to 2025. This assumes that the prevalence of dependency states in the study cohorts would be relevant to the Highland population and also that the trends seen in the previous 20 years would continue over the next 20 years.

The results of the analysis undertaken in 2017 are not included in this report as it applied to the Highland Council area only and was based on superseded population projections. However the CFAS dependency state rates, for the two scenarios described above, will be applied as a comparison in this updated analysis.

In 2018 Kingston et al published a revised forecasting model in The Lancet titled Population Ageing and Care Simulation (PACSim)[11]. Unlike CFAS this study did not look at care delivery setting (community or care home). PACSim combined three studies – Understanding Society (wave 1)[12], the English Longitudinal Study of Ageing (wave 5)[13] and CFAS (ii)[8] – enabling it to be more generalisable. The resulting pooled dataset and the English population in 2014 were used to create a base population. Simulations applying sociodemographic, health behaviour, chronic disease and geriatric condition variable probabilities to the base population aged 35 years and over were incremented monthly for the period 2014 to 2042. The article notes that in recent years some risk factors, including dementia, have changed positively while others, such as obesity and multimorbidity at younger ages, have changed negatively.

The PACSim models the prevalence of dependency of older adults in England in 2015, 2025 and 2035 by age group and gender. The study authors validated the model against the Health Survey for England 2014[14] and report that PACSim modelling may underestimate obesity prevalence by around 8 percent. They go on to note that obesity is an underlying risk factor for several conditions which increase the likelihood of dependency. The authors also discuss how technological advances may change the morbidity symptoms which require carer intervention in future and therefore alter the allocation to dependency groupings.

The overall findings of the PACSim study suggests “the proportion of independent older people will increase between 2015 and 2035 although absolute numbers with low or high dependency will still rise by around a third”.

Table 1 and Figure 4 compare the application of CFAS and PACSim models on forecast dependency classifications of people aged 65 years and over in the NHS Highland area using the most recent population estimates (2018) and projections (2016-based).

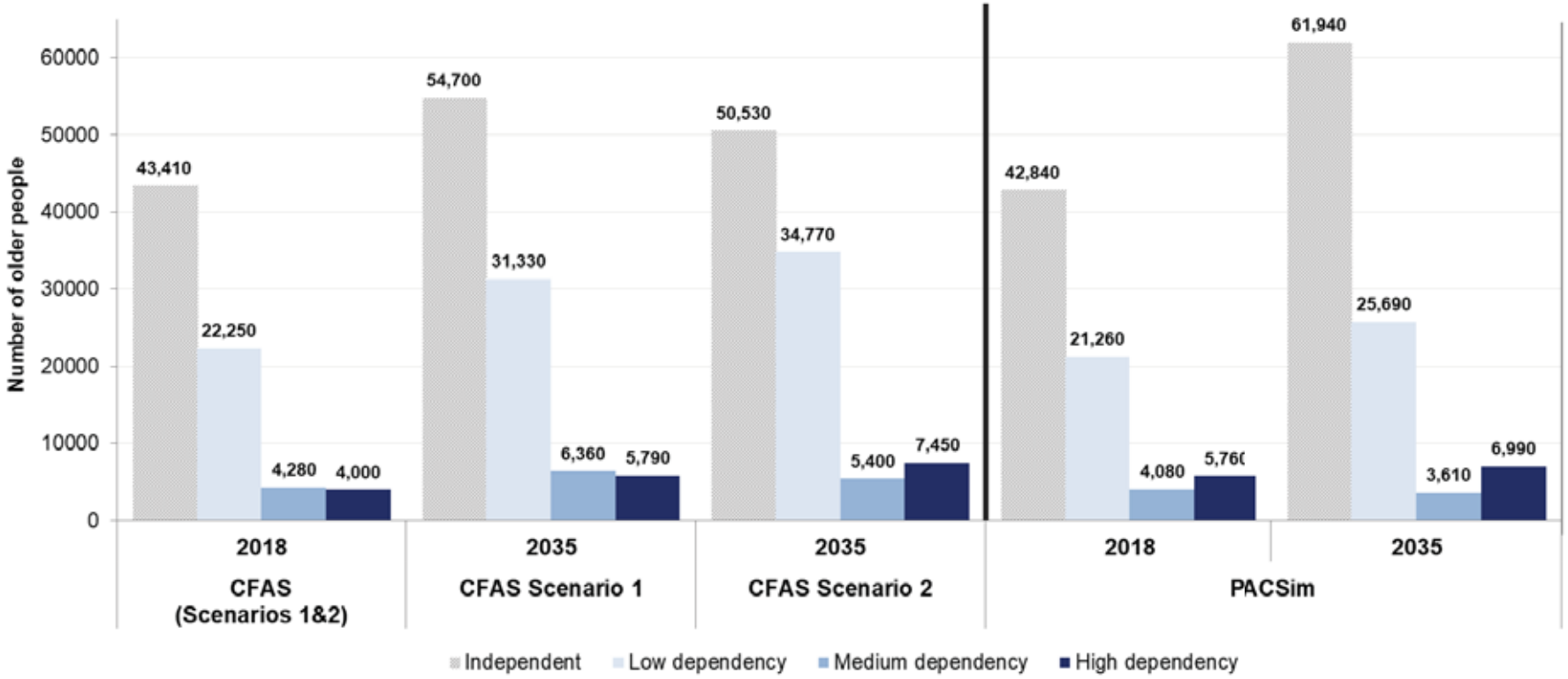
Table 1: Estimated and projected number of older people by dependency level living in NHS Highland by model applied

	CFAS			PACSim	
Dependency level	**2018**	**2035 scenario 1**	**2035 scenario 2**	**2018**	**2035**
Independent	43,410	54,700	50,530	42,840	61,940
Low dependency	22,250	31,330	34,770	21,260	25,690
Medium dependency	4,280	6,360	5,400	4,080	3,610
High dependency	4,000	5,790	7,450	5,760	6,990
Total NHS Highland population aged 65 years and over*	**73,900**	**98,200**		**73,900**	**98,200**

*application of model rates to populations result in rounding differences; totals rounded to nearest hundred

Data sources: Kingston et al (2017)[8], Kingston et al (2018)[11], National Records of Scotland[15] [2]

Figure 4: Comparison of estimated and projected dependency states of older people living in the NHS Highland area

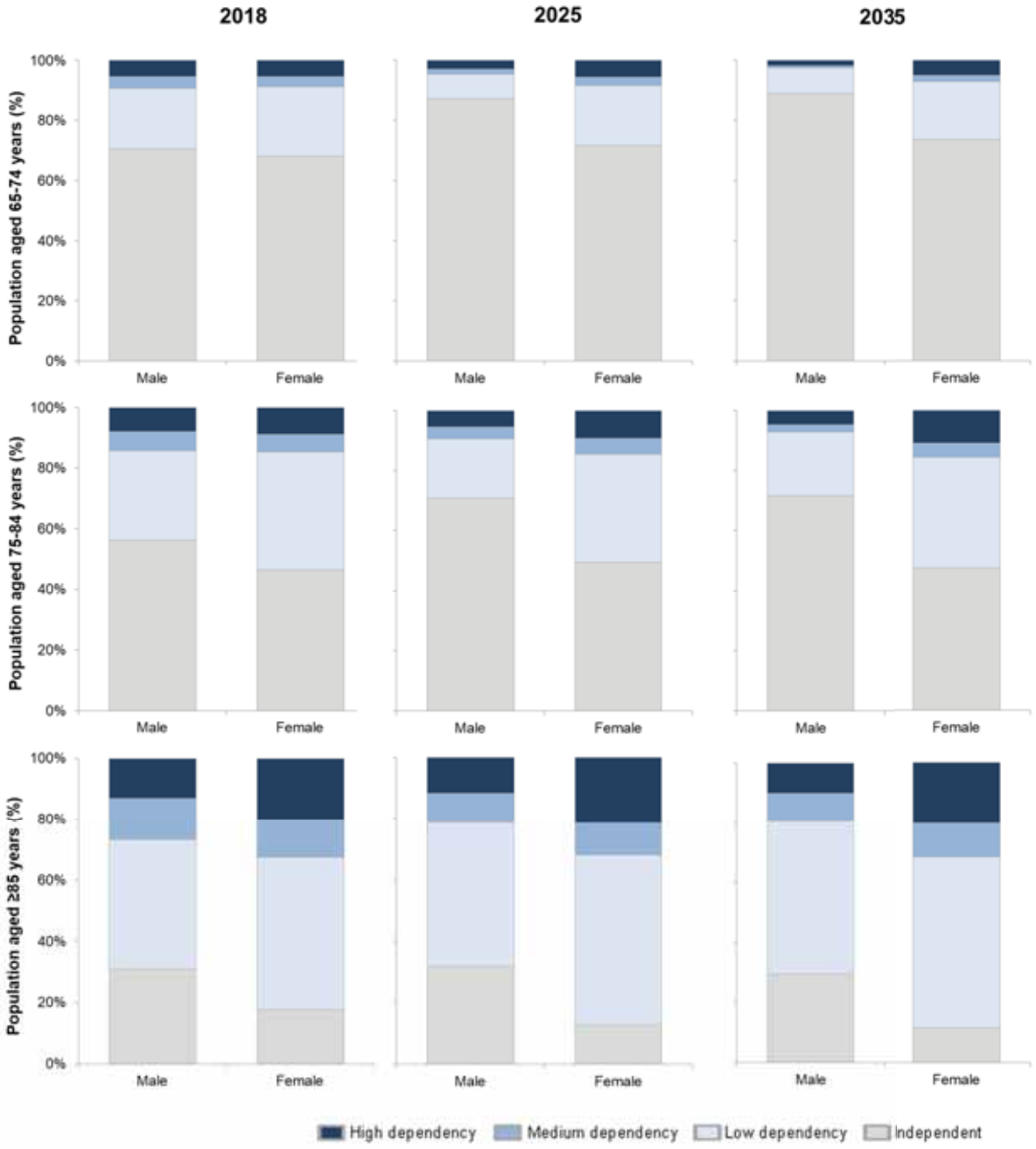


Data sources: Kingston et al (2017)[8], Kingston et al (2018)[11], National Records of Scotland[15 2]

These calculations assume a similar local health and life expectancy profile to the study population in England. Although Life Expectancy for residents of NHS Highland is higher than for Scotland overall, it remains lower than in England. Similarly, morbidity rates are worse in NHS Highland and Scotland than in England[16]. This suggests the forecasts in Figure 4 overestimate dependency because life expectancy is lower in NHS Highland and underestimate for increased morbidity because people are relatively less healthy.

Figure 5 shows the differing PACSim forecast trends between genders and age groups. It illustrates in particular, the forecast compression of dependency for men aged 65-74 years and to a lesser extent for those aged 75-84 years. There is expected to be some expansion of dependency for the oldest women.

Figure 5: PACSim model estimated and projected proportions of the older population by dependency status by sex and age group



Data sources: Kingston et al (2018)[11], National Records of Scotland[15 2]

Table 2 is supplementary to Figure 5 and details the estimated and projected numbers for both council areas with a total for NHS Highland.

Table 2: PACSim model estimated and projected number of the NHS Highland population aged 65 years and over by dependency status

Area	Sex	Age group	2018				2025				2035			
			Independent	Low dependency	Medium dependency	High dependency	Independent	Low dependency	Medium dependency	High dependency	Independent	Low dependency	Medium dependency	High dependency
Highland	Male	65-74	10,147	2,893	576	777	13,107	1,219	256	451	14,741	1,390	132	298
		75-84	4,100	2,149	475	577	6,913	1,918	389	526	8,087	2,391	271	530
		85+	699	946	310	292	957	1,411	289	352	1,488	2,577	474	504
			14,946	**5,988**	**1,361**	**1,646**	**20,977**	**4,548**	**934**	**1,329**	**24,316**	**6,358**	**877**	**1,332**
	Female	65-74	10,214	3,465	510	810	11,400	3,164	445	890	13,228	3,469	359	917
		75-84	4,269	3,562	523	817	5,640	4,121	605	1,050	6,171	4,840	613	1,422
		85+	688	1,926	480	777	601	2,593	493	1,005	792	3,940	771	1,384
			15,171	**8,953**	**1,513**	**2,404**	**17,641**	**9,878**	**1,543**	**2,945**	**20,191**	**12,249**	**1,743**	**3,723**
			30,117	**14,941**	**2,874**	**4,050**	**38,618**	**14,426**	**2,477**	**4,274**	**44,507**	**18,607**	**2,620**	**5,055**
Argyll & Bute	Male	65-74	4,185	1,193	237	321	5,311	494	104	183	6,004	566	54	121
		75-84	1,789	938	207	252	2,895	803	163	220	3,230	955	108	212
		85+	278	376	123	116	346	511	105	127	500	867	159	170
			6,252	**2,507**	**567**	**689**	**8,552**	**1,808**	**372**	**530**	**9,734**	**2,388**	**321**	**503**
	Female	65-74	4,350	1,476	217	345	4,460	1,238	174	348	5,057	1,326	137	350
		75-84	1,838	1,534	225	352	2,336	1,707	251	435	2,332	1,829	232	537
		85+	285	797	199	322	253	1,090	207	423	310	1,541	302	541
			6,473	**3,807**	**641**	**1,019**	**7,049**	**4,035**	**632**	**1,206**	**7,699**	**4,696**	**671**	**1,428**
			12,725	**6,314**	**1,208**	**1,708**	**15,601**	**5,843**	**1,004**	**1,736**	**17,433**	**7,084**	**992**	**1,931**
NHS Highland	Male	65-74	14,332	4,086	813	1,098	18,418	1,713	360	634	20,745	1,956	186	419
		75-84	5,889	3,087	682	829	9,808	2,721	552	746	11,317	3,346	379	742
		85+	977	1,322	433	408	1,303	1,922	394	479	1,988	3,444	633	674
			21,198	**8,495**	**1,928**	**2,335**	**29,529**	**6,356**	**1,306**	**1,859**	**34,050**	**8,746**	**1,198**	**1,835**
	Female	65-74	14,564	4,941	727	1,155	15,860	4,402	619	1,238	18,285	4,795	496	1,267
		75-84	6,107	5,096	748	1,169	7,976	5,828	856	1,485	8,503	6,669	845	1,959
		85+	973	2,723	679	1,099	854	3,683	700	1,428	1,102	5,481	1,073	1,925
			21,644	**12,760**	**2,154**	**3,423**	**24,690**	**13,913**	**2,175**	**4,151**	**27,890**	**16,945**	**2,414**	**5,151**
			42,842	**21,255**	**4,082**	**5,758**	**54,219**	**20,269**	**3,481**	**6,010**	**61,940**	**25,691**	**3,612**	**6,986**
	65+ population		**73,937**				**83,979**				**98,229**			

Data sources: Kingston et al (2018)[11], National Records of Scotland[15 2]

Comparing estimated dependency from PACSim modelling to benefits, care homes occupancy and survey data

To validate the numbers of dependents calculated by applying the PACSim prevalence to the NHS Highland population we compare the results with current disability benefit claims and care home residency in the area. Attendance Allowance is a claimable benefit contributing towards disability-related extra costs of severely disabled, physically or mentally, people who are aged 65 and over. To qualify, people must have needed help with personal care for at least 6 months, unless terminally ill when there is no qualifying period[17]. The benefit is paid at a 'lower' or 'higher' rate. The higher rate is paid when help or supervision is required throughout both day and night or the person is terminally ill. The lower rate is for those requiring frequent help or supervision either during the day or at night. The Attendance Allowance statistics are available as two distinct datasets. One includes people currently receiving benefit payments (in payment) and the other contains cases with entitlement i.e. it includes people where payment is suspended as they are being looked after in a hospital or care home (with entitlement). The numbers in each dataset are detailed in Table 3.

Not all qualifying people claim benefits, therefore the data reported in Table 3 are likely to understate the numbers of severely disabled people aged 65 and over in NHS Highland.

Table 3: Attendance Allowance entitled cases; average of 4 quarters to February 2019 for residents of NHS Highland*

Gender	Age band	in payment				with entitlement			
		Lower Rate	Higher Rate	Total	% of total	Lower Rate	Higher Rate	Total	% of total
Male	65-69	56	116	177		62	124	187	
	70-74	165	328	491		175	356	531	
	75-79	193	433	628		207	475	685	
	80-84	230	466	697		253	530	785	
	85-89	207	413	619		238	482	721	
	90+	125	232	361		148	287	435	
		976	**1,988**	**2,973**	**37%**	**1,083**	**2,254**	**3,344**	**36%**
Female	65-69	74	125	195		77	134	209	
	70-74	182	349	531		196	374	571	
	75-79	326	536	862		357	598	955	
	80-84	445	804	1,250		512	901	1,413	
	85-89	444	756	1,199		537	921	1,459	
	90+	361	591	952		505	778	1,279	
		1,832	**3,161**	**4,989**	**63%**	**2,184**	**3,706**	**5,886**	**64%**
NHS Highland total		**2,808**	**5,149**	**7,962**		**3,267**	**5,960**	**9,230**	

Data source: Department for Work & Pensions[17]

Over 80 percent of people claiming Attendance Allowance in NHS Highland are aged 75 years and over.

The main disabling condition when claiming Attendance Allowance is recorded. This is reported in Appendix 1. Over 40 percent of claims in payment cite musculoskeletal conditions and 10 percent dementia as the main disease. Within the female cohort claiming the higher rate allowance, around half report a musculoskeletal condition as the principle reason.

* Numbers are rounded so may not add exactly to the total

Older people living in care homes do not qualify for Attendance Allowance benefit. In March 2018 there were around 2,000 care home residents in NHS Highland aged 65 years and over[18]. Assuming these residents would be classified as high or medium dependency then Table 4 compares the PACSim estimate numbers to the sum of Attendance Allowance claimants and care home residents.

The PACSim baseline estimate of 9,800 medium and highly dependent older people is very close to the number of people aged 65 years and over in NHS Highland who are either being paid attendance allowance or living in a care home. Table 4 suggests the difference is around 200 (2 percent). The small under-estimate is likely to be larger if non-uptake of benefits is taken into consideration. No published estimates of the percentage uptake of attendance allowance in the UK have been sourced.

Table 4: Comparison of PACSim modelling estimates and sum of benefit claimants and care home residents in NHS Highland

Measure	time period	Medium dependency	High dependency	Total
PACSim model	mid-2018 population estimates	4,082	5,758	**9,840**
Attendance Allowance claimants (in payment)	average of 4 quarters to February 2019	2,808	5,149	7,957
non-uptake of Attendance Allowance				unknown
Care home residents	census date March 2018			2,072
Sum of attendance allowance claimants and care home residents				**10,029**
PACSim under-estimate (not including non-uptake of benefits)				**(189)**

Data sources: Kingston et al (2018)[11], National Records of Scotland[15], Department for Work & Pensions[17] and Information Services Division[18]

Applying the proportions from the UK Family Resources Survey 2017/18[19] to the NHS Highland population indicates around 8,500 people aged 65 years and over receive care (formal and/or informal) while living in the community; 6,200 of whom receive care once or twice a day (n=1,600), several times a day (n=1,850) or continuously (n=2,700). The sum of these three categories approximates to a dependency status of medium or high. This estimate of 6,200 medium or highly dependent people in NHS Highland, derived from UK wide rates, is lower than that suggested by Attendance Allowance data and the PACSim model.

In the Balance of Care file associated with the 2019 ISD[18] Insights report on Social Care there were 1,064 older people living in NHS Highland who received at least 10 hours formal home care per week in 2018 which was funded by health and social care partnerships.

Carer's Allowance benefit is payable to adults who look after severely disabled people for over 35 hours per week[20]. In 2018, around 6,000 people in NHS Highland were entitled to this benefit[21]. This covers unpaid carers providing informal care for people of all ages and one carer may be providing care to more than one person.

Conclusion

Comparing with the normative data detailed above suggests that the baseline estimates of dependency status derived using prevalence from the PACSim model in NHS Highland can be used with some confidence. However, reliability over the projection course to 2035 will depend on the future morbidity profile of the NHS Highland population. The PACSim study authors also note that the methods for defining dependency levels are likely to change as technological advances replace carer interventions[8].

Summary

A key message from the PACSim model is that the number of people aged 65 years and over who can live independently will increase over the next 20 years.

These numbers represent a success story for public health, medical science and for the broader socio-economic determinants of health with older people reaching the age of 75 without long-term conditions preventing independent living. In the Census levels of self-reported good health remain high in older age groups[22].

However, not everyone shares in this experience and there are major inequalities in healthy life expectancy with age and those more socially deprived are at greater risk of living with multiple long-term conditions at earlier age[23].

The PACSim model also reports an increase in the total number of people living with substantial additional care needs with increasingly larger number requiring 24 hour care. Within the projection, trends for women and men are different, with women aged 85 years and over seeing an expansion of years lived with low and high dependency while older men will experience a compression in the years lived with dependency.

Our figure of 7,000 highly dependent people by 2035 is likely to be an underestimate of future need.

Considering the major impact of increasing population dependency on individuals, families and health and social care systems, prevention programmes that promote independence and social inclusion are required in addition to those aimed at the prevention of chronic conditions through risk factor management and encouraging lifestyle changes.

Over the period modelled the age of retirement is to be increased but the number of people of working age is anticipated to reduce. These trends are likely to result in a decline in informal care within families from adult children. There are concerns that there may not be sufficient numbers of unpaid carers in the future to meet demand, particularly from older people in an ageing population[24].

In recent years the number of people in NHS Highland in long-term residential care has decreased, despite the ageing of the population and the greater numbers living with dependency[18]. The number of older people anticipated to depend on high levels of care support for complex needs in the near future requires that integrated Health and Social care services and housing provision across NHS Highland must continue to adapt.

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Appendix 1: Attendance Allowance entitled cases; average of the 4 quarters to February 2019 for residents of NHS Highland†

Main Disabling Condition	in payment			with entitlement		
	Lower Rate	Higher Rate	Total	Lower Rate	Higher Rate	Total
Arthritis	799	1609	2412	889	1789	2,681
Spondylosis	35	55	89	34	63	94
Back Pain - Other / Precise Diagnosis not Specified	92	181	275	109	201	309
Disease Of The Muscles, Bones or Joints	195	333	526	222	360	585
Trauma to Limbs	32	76	108	37	80	118
Blindness	161	133	293	177	154	331
Deafness	22	17	38	24	18	41
Heart Disease	236	419	656	263	465	729
Chest Disease	167	302	471	175	321	494
Asthma	11	32	43	14	32	45
Cystic Fibrosis						
Cerebrovascular Disease	167	332	499	180	376	554
Peripheral vascular Disease	21	35	59	28	38	65
Epilepsy	14	12	25	15	12	25
Neurological Diseases	59	95	155	64	107	173
Multiple Sclerosis	10	20	32	10	23	35
Parkinsons Disease	42	178	220	51	210	262
Motor Neurone Disease		4			4	
Chronic Pain Syndromes	7	13	19	7	16	20
Diabetes Mellitus	32	69	103	37	80	114
Metabolic Disease		6	7		6	10
Traumatic Paraplegia/Tetraplegia		6	7		6	7
Major Trauma Other than Traumatic Paraplegia/Tetraplegia	7	1	6	7	1	6
Learning Difficulties	7		8	11	3	13
Psychosis	39	43	79	47	50	96
Psychoneurosis	18	28	48	24	32	57
Personality Disorder						
Dementia	317	443	758	463	710	1,173
Behavioral Disorder						
Alcohol and Drug Abuse	9	12	21	13	17	31
Hyperkinetic Syndrome						
Renal Disorders	26	48	71	28	51	79
Inflammatory Bowel Disease		8	8		9	9
Bowel and Stomach Disease	5	22	30	5	26	35
Blood Disorders	5	6	10	5	5	11
Haemophilia						
AIDS						
Multi System Disorders	16	24	41	17	25	45
Multiple Allergy Syndrome						
Skin Disease	12	10	22	12	10	22
Malignant Disease	103	207	309	109	221	329
Severely Mentally impaired						
Double Amputee						
Deaf/Blind						
Haemodialysis						
Frailty	21	43	65	24	55	79
Total Parenteral Nutrition						
Infectious diseases: Bacterial disease - Tuberculosis						
Infectious diseases: Bacterial disease - precise diagnosis not specified						
Infectious diseases: Protozoal disease - Malaria						
Infectious diseases: Protozoal disease - other / precise diagnosis not specified						
Infectious diseases - other / precise diagnosis not specified						
Cognitive disorder - other / precise diagnosis not specified	51	53	105	74	76	149
Terminally Ill		172	172		188	188
Unknown	68	97	165	81	121	202
Total	**2,807**	**5152**	**7958**	**3267**	**5961**	**9,230**

Data source: Department for Work & Pensions[17]

† Numbers are rounded so may not sum to total. Statistical disclosure control has been applied with Stat-Xplore therefore some counts may be suppressed.

Informal care provision in NHS Highland

Supplementary paper 7 to the Director of Public Health Annual Report 2019

Public Health Intelligence

Directorate of Public Health

NHS Highland

October 2019

The Public Health Intelligence team are part of the Directorate of Public Health of NHS Highland. The team provides an expert resource on epidemiology, demography and population health information. We support decision making by the analysis, interpretation and presentation of data and evidence.

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Contents

Director of Public Health Annual Report 2019

This is the seventh and final paper in a series that will contribute to the NHS Highland Director of Public Health Annual Report 2019.

The first report looked at demography and population dynamics, the second considered increasing numbers of living generations and changes in how we live, the third and fourth reviewed mortality and life expectancy, the fifth discussed health status and sixth analysed the modelling of care dependency in the older population.

Informal Care

Like the rest of Scotland, NHS Highland depends on informal care providers. The 2011 Census indicates that nearly thirty thousand people spend at least an hour a week on a regular basis providing unpaid care and support to a family member, friend or neighbour to enable that person to live in their own community[1]. The provision of unpaid care makes a vital contribution to the supply of care and this will be increasingly important factor as the population continues to age and people's care needs become more complex[2].

Between 2001 and 2011 the provision of unpaid care in NHS Highland increased by 10 percent, faster than population growth, with the greatest percentage increase in caring among those providing over 20-49 hours a week of unpaid care[1]. Research by the charity Carers UK reports that three in five people are expected to need to provide care at some point in their lives[4].

Prevalence of unpaid care

It is now eight years since Census 2011 collected valuable results about carers and more recent in-depth surveys such as research using the Understanding Society data suggest that the figures of the number of carers and time spent caring have increased[5,3]. Recent research by Carers UK on work and unpaid care suggest that one in seven people in work are juggling unpaid care commitments, compared with previous Census based figures of one in nine workers[6].

At the same time, many carers do not self-identify as a carer and studies have shown under-reporting of the amount of support provided compared with responses from care recipients[7,8].

Understanding the health of the carers' population is important both in relation to the ability to provide support and in terms of their own care needs. Research from the British Household Panel Survey and Understanding Society found that full-time carers often become poorer and experience lower wellbeing and health, the longer they provide care[3].

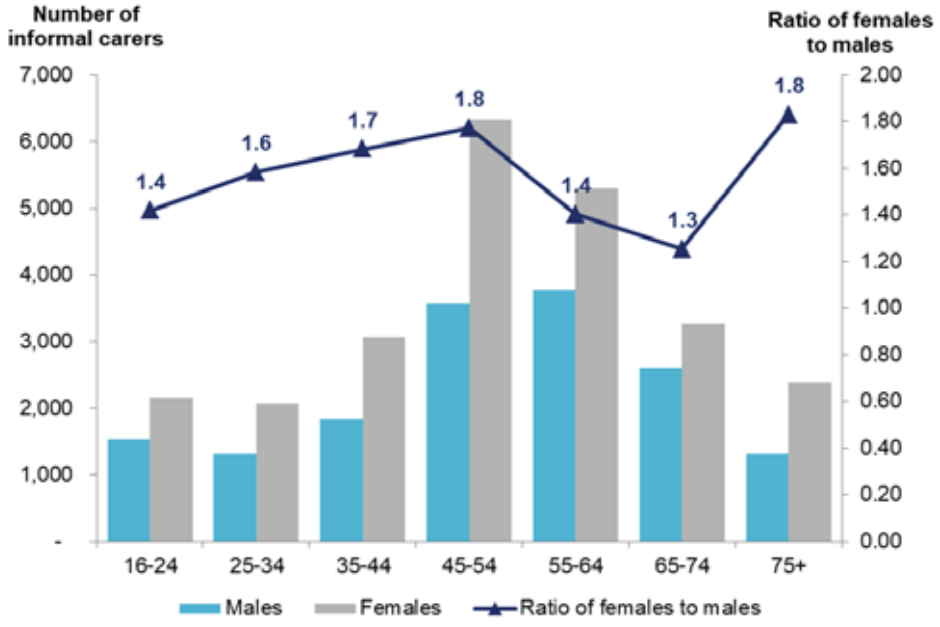
While likely to be an underestimate of the number of carers and time provided in caring, the Scottish Health Survey of 2017 provides more up to date figures of adults looking after sick, disabled or frail people. Women make up 60% of carers. Many carers are older people themselves. With about 1 in 9 of people aged 75 and over providing care, older people are more likely to be carers than the population as a whole. Older carers are also amongst those most likely to care at higher levels of intensity, especially those caring for a co-resident partner.

Figure 1: Estimated numbers of people, by age band and gender, in NHS Highland providing any regular help or care for any sick, disabled or frail person in 2018

	Age band							All
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Males	1,524	1,302	1,826	3,570	3,772	2,606	1,307	15,907
Females	2,160	2,061	3,069	6,328	5,289	3,265	2,390	24,562
Total	**3,761**	**3,392**	**4,899**	**9,872**	**9,078**	**5,882**	**3,706**	**40,590**

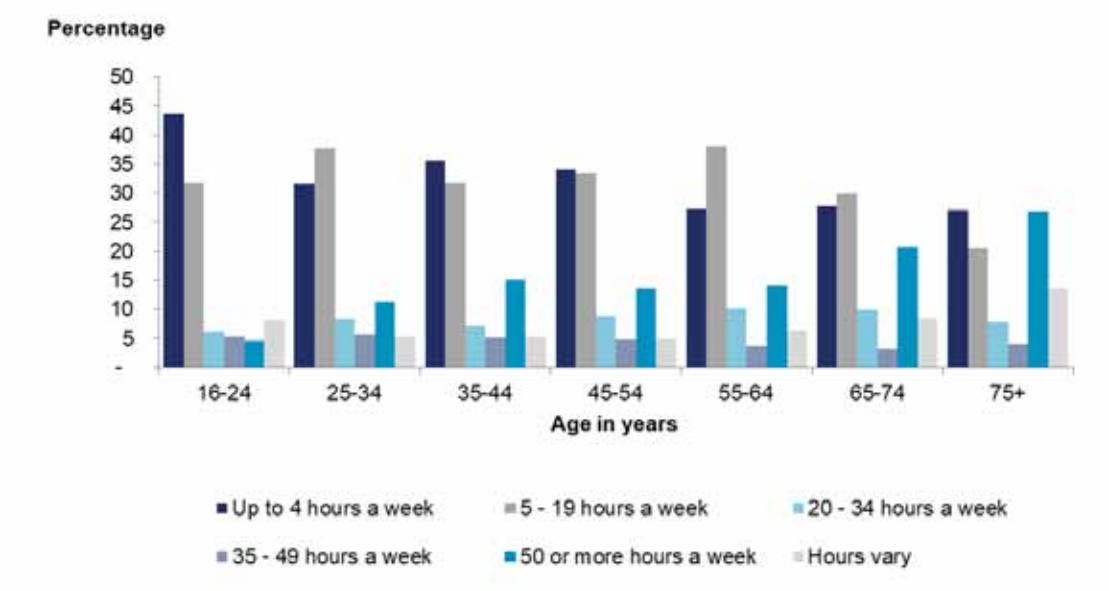
Data sources: Scottish Health Survey[9] and National Records of Scotland[10]

Figure 2: Estimated caring prevalence by age and gender in NHS Highland



Data sources: Scottish Health Survey[9] and National Records of Scotland[10]

Figure 3: Hours spent each week providing help or unpaid care by age



Data source: Scottish Health Survey[9]

Based on the 2017 Scottish Health Survey caring proportions, in NHS Highland around a third of informal unpaid carers (n~13,000) will be providing regular care for up to 4 hours a week and another third for between 5 and 19 hours a week. 15 percent of all carers (n~6,000) indicate that they provide more than 50 hours per week; this reaches around a quarter for carers aged 65 years and over.

The Carers (Scotland) Act 2016 that came into force in April 2018 sets out a range of measures intended to improve the support given to carers. It gives carers the right to a plan that identifies their needs and provides them with information about support available, and puts a duty on local authorities to support carers whose identified needs meet local eligibility criteria. Local authorities and health boards are required to jointly prepare a local carers strategy[11-14].

When the level of multiple deprivation in the area where the carer lives is considered, 20 percent of those living in the most deprived quintile (SIMD16) are likely to be spending 50 or more hours a week providing regular care compared to around 10 percent in the least deprived quintile.

Around 90 percent of carers have been providing care for more than a year. 13 percent of carers in Scotland who are aged 75 years and over have been providing care for 20 years or more.

The scale of the contribution made by family and friends as informal carers suggests that even a small shortfall in this provision can have a large impact on demand for formal care services and public finances.

There are concerns that there may not be sufficient numbers of unpaid carers in the future to meet demand, particularly from older people in an ageing population[15]. Factors such as increasing female employment, fewer children, and higher divorce rates amongst men over 60 years may affect the future availability of unpaid care[16-18].

Supporting informal carers effectively is therefore important. Care recipients generally prefer to be looked after by family and friends, but without support, informal care-giving is associated with a reduction in the supply of labour, higher risks of poverty and greater risk to carers' own health.

Types of support for carers can include:

- financial support
- employment support
- respite care (temporary provision of care by people other than the primary caregiver, such as day centres)
- education and training (for example, on nutrition or using hoists and other mobility equipment), and
- emotional and social support, such as counselling.

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PUBLIC HEALTH

NHS Highland

The Annual Report of the **Director of Public Health**

NHS Highland

2019

Appendix 8: Update on NHS Highland Director of Public Health Annual Report 2018 - Adverse Childhood Experiences

The lens of adverse childhood experience, as explored in the 2018 Director of Public Health Annual Report: Adverse Childhood Experiences, Resilience and Trauma Informed Care, challenges accepted norms and responses to understanding and responding to experiences of adversity at an individual, family and community level. The report asks for a shift in understanding and response from “What is wrong with you?” to “What Happened to you?”, “Who was there for you?” and “Who is there for you now?”.

Since being published in November 2018, the report has received wide spread attention and positive commentary, including the Scottish Chief Medical Officer and the Director of the Violence Reduction Unit in Glasgow. It also came second in the United Kingdom Director of Public Health Report awards for 2018.

The report has been well received in both the Argyll & Bute and Highland Health & Social Care Partnerships and has prompted a wide range of interest and activity as detailed in the summary tables below.

Moving ahead, the opportunities presented by the World Health Organisation Trauma informed cities and communities initiative will be explored further in the Sutherland and Caithness Community Partnerships through the Community Justice Partnership and with the support of the Violence Reduction Unit. This will involve a whole system approach to understanding the impact and influence of adversity, in a community, that accords with the whole system thinking being developed by the emergent Public Health Scotland body.

Further details of the report are available on the NHS Highland website:
https://www.nhshighland.scot.nhs.uk/Publications/Documents/DPH-Annual-Report-2018_(web-version).pdf

Argyll and Bute HSCP: Mid-Year Summary 2018/19

Leadership				
Work across Argyll and Bute in relation to Adverse Childhood Experiences began in May 2017 The development of the NHS Highland Director of Public Health Annual Report 2018 further developed the thinking and further supported the innovative work undertaken in the HSCP.				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
The Health Improvement Team delivered a Health Development Day in May 2017 which focussed upon ACEs with guest speakers and workshops.	Around 130 people attended this event and an event report was written and published in June 2017 which identified nine recommendations.	The HSCP ACE Working Group was established to progress the work and continues to meet.	Work is progressing across the nine recommendations as detailed in this summary.	Ongoing 2019/20.
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Building relationships with national and regional networks.	Leadership has been provided by the Health Improvement Team and relationships built with the NHS Health Scotland team and the national ACE Hub.	ACEs informed approaches including disseminating evidence based practice; link with national work streams and organisations to support implementation of all recommendations in this and other ACEs report.	Increased awareness of the nature and influence of adversity on individuals, families and communities.	Ongoing 2019/20.
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Presentation of the NHS Highland Director of Public Health Annual Report 2018 to Argyll and Bute IJB, Argyll and Bute Council and Argyll and Bute Community Planning Partnership.	Presentation and discussion by the CHC and/ Health Improvement Senior.	Support from Senior Management who set aside time at IJB meeting to discuss ACEs.	Health Improvement Senior invited to present report from ACEs events in 2019 at Argyll and Bute Children's Strategic Committee.	Nov 2018 – May 2019.

Activity	Input	Output	Outcome	Timescale/BRAG
Use of social media to raise awareness promoting events and provide additional information via Twitter account (@ aceargyllbute) NES animations Opening Doors https://vimeo.com/274703693 Growing Seeds https://vimeo.com/334642616	Maintaining Twitter site. Raise awareness of animations.	Increase in Twitter followers. Viewings of the animations Emailed to networks – summer 2019. Shared on Healthy Argyll and Bute facebook page Oct 2019.	Raised awareness. As above Reach 466 for Sowing Seeds Animation and reached 703 for Opening Doors animation.	Ongoing 2019/20.
Primary Prevention/Intervention				
Developing a community of interest among young people by:				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Working with young people to develop approaches to understanding adversity and supporting resilience, for example, through matching the UNCRC with adverse childhood experiences.	ACEs action identified within the Argyll and Bute Children's Services Action Plan 2017-2020. Discussion initiated regarding inclusion in CPP actions.	Develop a methodology to involve young people in discussion about adversity through strength and rights based approaches that support a relational approach to resilience.	A greater awareness of the origins of adversity and the impact and the importance of self care and skills to look after oneself and peers. Where and how to seek help and support.	Spring 2019/20.

Developing communities of interest Argyll and Bute by:				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Hosting of Resilience screenings and follow up discussion with community involvement.	Coordination of screenings and panel representation. Various across the HSCP with highlight events in Dunoon Jan 2019 (180 attendees) and Oban March 2019 (50 attendees). Event delivered in Islay Oct 2019. Local Partnership event planned for Bute March 2020. Local partnership event planned for Helensburgh Feb 2020.	A licence for the documentary Resilience was brought and the film has been screened extensively across the HSCP with panel discussions. Additional awareness raising events with guest presenters, panel discussion and a range of professional and lay audiences. Final summary reports written. Resilience Film screened. Event well attended.	Increased awareness of the impact of adversity and how to best respond through safe nurturing relationships. As above.	Ongoing 2019/20.
Nurture Principles and Compassionate Classroom materials being delivered by Educational Psychology in primary/secondary schools.	Training and awareness raising across schools.	Increased skills in the workforce to create whole school relational safety.		

Secondary Prevention/Intervention				
Building awareness amongst Community Planning partners of the origins of adverse childhood experiences and the associated effects, impacts and costs across the life course in different services and settings.				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Consideration of trauma informed policy and practice To develop a Trauma Informed Workforce across children's services and inculcate culture change that is embedded into practice.	Secure NES funding to support a trauma informed approach to services through training £40k received from NES to implement this development.	Funding to support a trauma informed journey and awareness raising across Argyll and Bute Train and develop staff to be Trauma Informed, Skilled & Enhanced as appropriate to their role.	Increased skills in the workforce to support children young people families communities and services to understand and make sense of trauma and its impact.	Spring/Summer 2019.
Service and team awareness raising and associated assessment of skills and training needs.	Sub group of ACE Awareness Working Group	Trauma Training Pilot Bid agreed with NES and funding released.	A more trauma informed and trauma aware and responsive workforce.	Spring/Summer 2019.
Explore options and funding to undertake routine enquiry.	Develop proposal and explore/agree funding opportunities	Proposal developed and funding identified.	Increased skills in the workforce to respond to adversity.	Autumn 2019.
Work with the Health and Wellbeing Network to support and promote trauma informed services.	Time of staff to participate and support/ undertake awareness raising.	Additional capacity to support wellbeing through a trauma informed lens.	Increased skills in the workforce to understand and make sense of trauma and its impact.	Ongoing 2019/20.
Promotion and delivery of Psychology of Parenting Programme and the Incredible Years in Argyll and Bute.	Time of staff to undertake training and deliver programmes.	Increased skilled workforce.	High quality support for children and families	Ongoing 2019/20.

Guided Self Help Study in Secondary School. First school completing June 2019. Two further schools pilots planned.	Development and piloting of approach with key stakeholders bespoke to the setting and culture.	Resources aligned to service/team to underpin delivery.	Increased confidence to respond to need.	Ongoing 2019/20.
Stress and Resilience sessions delivered to staff in the HSCP 2018-19 arranged by Public Health.	Public Health Team input to staff wellbeing events.	Resources to support staff wellbeing.	Increased awareness and skills to look after wellbeing.	2019.
Tertiary Prevention				
Developing a community of interest around the development of trauma informed vision and values across Public Protection Committees including:				
Action	**Input**	**Output**	**Outcome**	**Timescale/Brag**
Child Protection.	Trauma Training Pilot will inform the work of the Committee.	Training will be available for members and practitioners.	Increased awareness of the opportunities presented by taking a trauma informed and responsive approach to the work of the committee.	Ongoing 2019/20.
Adult Care and Protection.	Trauma Training Pilot will inform the work of the Committee.	Training will be available for members and practitioners.	Increased awareness of the opportunities presented by taking a trauma informed and responsive approach to the work of the committee.	Ongoing 2019/20.
Alcohol and Drugs Partnership.	Trauma Training Pilot will inform the work of the Committee.	Training will be available for members and practitioners.	Increased awareness of the opportunities presented by taking a trauma informed and responsive approach to the work of the committee.	Ongoing 2019/20.

Violence Against Women Partnership.	Trauma Training Pilot will inform the work of the Committee.	Training will be available for members and practitioners.	Increased awareness of the opportunities presented by taking a trauma informed and responsive approach to the work of the committee.	Ongoing 2019/20.
Community Justice Partnership.	Trauma Training Pilot will inform the work of the Committee.	Training will be available for members and practitioners.	Increased awareness of the opportunities presented by taking a trauma informed and responsive approach to the work of the committee.	Ongoing 2019/20.

Highland HSCP : Mid-Year Summary 2018/19

Leadership				
Work across Highland in relation to Adverse Childhood Experiences began in May 2017 The development of the NHS Highland Director of Public Health Annual Report 2018 further developed the thinking and further supported the innovative work undertaken in the HSCP.				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
The Public Health Directorate supported a screening of the documentary film Resilience: The Biology of Stress and the Science of Hope as part of a Scotland wide tour.	Around 70 people attended this event with a panel discussion.	The value of a public health approach to understanding and responding to adverse childhood experiences was noted and further discussions were held across the Public Health Directorate.	The 2018 Director of Public Health Annual Report addressed Adverse Childhood Experiences, Resilience and Trauma Informed Care: A Public Health Approach to Understanding and Responding to Adversity.	Ongoing 2019/20.

ACE Hub meets monthly to share developments and best practice in relation to Adverse Childhood Experiences.	Key stakeholders.	Representation at Glasgow Roundtable Event March 2018. Attending ACE Aware Nation Glasgow Dr Gabor Mate. Visit from NHS Health Scotland colleagues in Sep 2019. Planning regional ACE Hub event autumn 2019 with Health Scotland. Input to refresh Polishing the Diamonds ScotPHO Report 2017.	Growing awareness of opportunities and learning from the DPH Report.	Ongoing 2019/20.
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Building relationships with national and regional networks.	Leadership has been provided by the Public Health Directorate and relationships built with the NHS Health Scotland team and the national ACE Hub.	ACEs informed approaches including disseminating evidence based practice; link with national work streams and organisations to support implementation of all recommendations in this and other ACEs reports.	Increased awareness of the nature and influence of adversity on individuals, families and communities.	Ongoing 2019/20.

Activity	Input	Output	Outcome	Timescale/BRAG
Presentation of the NHS Highland Director of Public Health Annual Report 2018 to the NHS Highland Board, Highland Council, Highland Health and Social Care Partnership, Area Clinical Forum, MNAHP Committee.	Presentation and discussion by the CHC.		Increased awareness and wider discussion over trauma informed approaches.	Nov 2018 – May 2019.
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Use of social media to raise awareness promoting events and provide additional information via Twitter (@acehighland). NES animations Opening Doors https://vimeo.com/274703693 Growing Seeds https://vimeo.com/334642616	Maintaining Twitter site. Raise awareness of animations.	Increase in Twitter followers. Promotion of the Report. Viewings of the animations.	Raised awareness. As above.	Ongoing 2019/20.
Primary Prevention/Intervention				
Developing a community of interest among young people by:				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
A series of workshops to look at trauma informed approaches and rights based approaches with young people are being explored for later 2019 into 2020.	Working with HighLife Highland and partners involved in workshops as part of preparing the DPH report: Inverness Fort William, Golspie.	Develop a methodology to involve young people in discussion about adversity through strength and rights based approaches that supports a relational approach to resilience.	A greater awareness of the origins of adversity and the impact and the importance of self care and skills to look after oneself and peers. Where and how to seek help and support.	Spring 2019/20.

Developing communities of interest across north Highland by:				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Hosting of Resilience screenings and follow up discussion with community involvement.	Coordination of screenings and panel representation with teams and services including: Spirit of Advocacy, The Bridge, Phoenix Service, The Pines, Caithness, Fort William. Discussion to support further work in Fort William and Skye.	A licence for the documentary Resilience was brought and the film has been screened extensively across the HSCP with panel discussions.	Increased awareness of the impact of adversity and how to best respond through safe nurturing relationships.	Ongoing 2019/20.
Nurture Principles and Compassionate Classroom materials being delivered by Educational Psychology in primary/secondary schools.	Training and awareness raising across schools.	Increased skills in the workforce to create whole school relational safety.		
Secondary Prevention/Intervention				
Building awareness amongst Community Planning partners of the origins of adverse childhood experiences and the associated effects, impacts and costs across the life course in different services and settings.				
Activity	**Input**	**Output**	**Outcome**	**Timescale/BRAG**
Consideration of trauma informed policy and practice with presentation and discussion NHS Board Development session re Adverse Childhood Experiences and Trauma Informed approaches.	Involvement of Executive and Non Executive Directors.	Further discussion with Communications Director and Director of HR.	Increased skills in the workforce to support children young people families communities and services to understand and make sense of trauma and its impact.	Spring/Summer 2019.

Exploring trauma informed approaches with paediatric diabetes tea, Special Care Baby Unit, Maternity teams Occupational Health team.	Key stakeholders, various.	Trauma Informed self evaluations and tests of change: in development.	A more trauma informed and trauma aware and responsive workforce.	Spring/Summer 2019.
Work with the Health and Wellbeing Working to support and promote trauma informed services.	Time of staff to participate and support/ undertake awareness raising.	Additional awareness and skills to support wellbeing through a trauma informed lens.	Increased skills in the workforce to understand and make sense of trauma and its impact.	Ongoing 2019/20.
Screening of Resilience with presentation of the DPH Report and discussion over trauma informed approaches with Inverness Scottish Fire and Rescue Service.	Time of staff to participate and support/ undertake awareness raising.	Additional awareness and skills to support wellbeing through a trauma informed lens.	A more trauma informed and trauma aware and responsive workforce.	Summer 2019.
Screening of Resilience with presentation of the DPH Report and discussion over trauma informed approaches with Family Mediation Highland.	Time of staff to participate and support/ undertake awareness raising.	Additional awareness and skills to support wellbeing through a trauma informed lens.	A more trauma informed and trauma aware and responsive workforce.	Summer 2019.
Tertiary Prevention				
Developing a community of interest around the development of trauma informed vision and values across Public Protection Committees including:				
Action	**Input**	**Output**	**Outcome**	**Timescale/Brag**
Child Protection presentation of the DPH Report and discussion over trauma informed approaches at CPC Development Day and Annual Conference.	Committee members, Conference attendees.	Presentation and discussion captured in event summary.	Increased skills in the workforce to understand and make sense of trauma and its impact.	Ongoing 2019/20.

Alcohol and Drugs Partnership Seminar presentation of the DPH Report and discussion over trauma informed approaches at ADP Development Day.	Delegates at the day.	Presentation and discussion Summary of trauma informed self assessments.	Increased skills in the workforce to understand and make sense of trauma and its impact.	Ongoing 2019/20.
Violence Against Women Partnership.	Members of the Violence Against Women Partnership.	Presentation and discussion.	Increased skills in the workforce to understand and make sense of trauma and its impact.	Spring 2019.
Community Justice Partnership Screening of Resilience panel discussion Seminar presentation of the DPH Report and discussion over trauma informed approaches with Director of the Violence Reduction Unit.	Partnership members.	Presentation and discussion.	Commitment from Violence Reduction Unit to support Sutherland and Caithness Community Planning Partnerships to better understand experiences of adversity in remote and rural communities.	Ongoing 2019/20.
Presentation and discussion to Public Protection Chief Officers Group on DPH Report re options to develop awareness of adverse childhood experiences and trauma informed approaches.	Chief Officers NHS Highland Council, North Highland Police.	Presentation and discussion.	Increased awareness of leaders to understand and make sense of trauma and its impact across services and with populations most at risk of poorer outcomes.	Winter 2019.

Notes

Notes

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