

Health Inequalities in Scotland

Trends in deaths, health and wellbeing, health behaviours, and health services since 2000



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Health inequalities in Scotland:
An independent review

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Foreword

Understanding any complex problem requires the best possible data. Research is not an end in itself – it does not provide the fix. But robust evidence and analysis provide an indispensable underpinning to action which can.

Unfair differences in health and wellbeing are among the most profound of challenges facing Scotland at the beginning of the 21st century. That poverty and deprivation continue to have a marked impact on the life expectancy of far too many people in our country is unacceptable. But it is not inevitable.

It is with that challenge in mind that the Health Foundation embarked on a review of health and health inequalities in Scotland in 2022. This report, compiled by researchers at the University of Glasgow, provides a cornerstone for the review.

Focusing on trends in deaths, health and wellbeing, health behaviours, and health services, it tells the story of what has happened in Scotland since devolution. That story is one of gradual improvement during the first decade, followed by a stalling of progress and subsequent decline.

The consequences are that despite well intended policy interventions, the gap in health and wellbeing outcomes is widening and that Scotland has the lowest life expectancy in Western Europe.

While it is true that COVID-19 related deaths contributed significantly to the latest fall in overall life expectancy, this report makes clear that the increasingly evident reversal of progress dates back to the beginning of the last decade.

Drug related deaths are a prominent part of the decline in life expectancy – and the growing inequalities gap. But they are just one part of a bigger, more disturbing picture.

Across a raft of measures, it is clear that the fortunes of people in our most deprived communities throughout the life course are not merely worsening. They are becoming increasingly detached from the population at large, storing up trouble for the future.

This report provides the first step to understanding what has been happening in Scotland since devolution. Further review outputs will focus on related socio-economic trends, and the perspectives of policy makers, delivery agents, and the public at large on the nature of the problem and what we must do to fix it.

But what is clear from this report alone is that unfair outcomes in health and wellbeing present us with a challenge which is inherently complex and long term. It is one which may appear intractable – but one which we must not shy away from.

Neither is the challenge merely a public policy problem – or one we can simply expect government and its agencies to face and act on our behalf. The route to fairer outcomes is one which presents choices – political, strategic and financial – for each and every one of us.

Chris Creegan

Chair, Expert Advisory Group

Background to Health Inequalities in Scotland: An independent review

Health Inequalities in Scotland: An independent review is a collaborative research project being undertaken by the Health Foundation starting in 2022. The Health Foundation is an independent charity committed to bringing about better health and health care for people across the UK. The review is analysing the health trends and wider factors that have influenced people's health in Scotland over the last two decades. It is exploring how public services and Scottish Government support can be changed to address health inequalities, as well as considering the role of third sector and business.

The Health Foundation is working with Scottish research partners and is being advised by an expert advisory group.

The University of Glasgow's research aims to compile data on inequalities in specific, meaningful health outcomes. The Fraser of Allander Institute will analyse trends in the wider determinants of health such as work, education, and housing and how these are experienced differently across the population.

Nesta in Scotland will conduct in-depth workshops with health-related stakeholders, to help understand implementation challenges for policy, and delivery services that support better health. The Diffley Partnership will undertake a series of deliberative workshops with members of the public, exploring public perceptions of the reasons behind health inequalities, informed by the evidence from the other strands of research.

Building on the work of these partners, the final, Health Foundation authored report, will provide a holistic view of health inequalities in Scotland and what actions are needed to reduce these inequalities.

Health inequalities in Scotland:
An independent review



Executive Summary

Unfair differences in health and wellbeing across Scotland's population are stark. For example, healthy life expectancy is a quarter of a century shorter in the most deprived tenth of areas in Scotland compared to the least deprived tenth of areas. Following a global pandemic, and as Scotland enters a cost-of-living crisis, concern around the impacts on health inequalities is considerable among researchers, policy makers, and the Scottish public.

These inequalities are not a new concern. At both Scottish and UK government levels, parliamentary inquiries have considered evidence on health inequalities, and provided recommendations for action. This includes, most recently, the Health, Social Care and Sport Committee Report: Tackling health inequalities in Scotland³. Our understandings of the scale of the problem and what progress has been made is supported by well-established monitoring of health inequalities in Scotland. Yet despite this focus, and some improvements made during the 2000s, health inequalities have persisted and, in some cases, worsened over the last decade.

Wide-ranging analysis and synthesis of new and existing data is critical in establishing the magnitude of the problem, where improvements or deteriorations are evident, and who is most affected. This report, funded by the Health Foundation as part of their independent review of health inequalities in Scotland, describes trends in inequalities in the timing and causes of deaths, health and wellbeing, health-related behaviours, and health and social care services in Scotland over the last two decades. It is published alongside a series of other reports on the social determinants of health and public and stakeholder perceptions of health inequalities.

Following a period of improving mortality rates and reducing inequalities in the first decade of the 21st century, improvements have stalled, and some inequalities have widened.

Between 2000 and 2012, life expectancy was increasing, and avoidable mortality was decreasing. Progress was being made in deaths from cancer and cardiovascular disease, alcohol deaths, and suicides. In line with these improvements, absolute inequalities in mortality outcomes were generally reducing. However, in the decade since we have seen a stagnation in these previous improvements and in some cases a worsening of outcomes and inequalities.

For example, inequalities in infant mortality rates and all-cause mortality in 15 to 44-year-olds narrowed between 2000 and 2013, but improvements now show signs of reversing. Drug-related deaths and associated inequalities are particularly striking, which were increasing between 2000 and 2013, but are now growing at an exponential rate. In some cases, these worsening mortality rates and widening inequalities seen over the past decade have likely been exacerbated by the COVID-19 pandemic.

Health consistently worsens as deprivation increases, but the most deprived are faring particularly badly.

Across almost every outcome considered in the report, the least deprived fifth of areas have the best outcomes, with health worsening with each increase in deprivation level. However, in many cases, we see the most deprived fifth of areas faring particularly badly. That is, the gap between the most and second most deprived fifths of areas (fifths 1 and 2) was equal to or greater than the gap between the second most deprived and the least deprived fifth of areas (fifths 2 and 5). We see this pattern for avoidable mortality, deaths from drugs and alcohol, and outpatient appointments where the patient 'Did Not Attend'. Patterns were similar but less pronounced for low birthweight, child development concerns, antenatal services, and amenable mortality.

These patterns have been shown according to area-level deprivation, the most consistently available measure of social circumstances. However, this is unlikely to be solely an issue of area or geography, but one of social disadvantage, which is also experienced by people living outside Scotland's most deprived areas.

A life course framework can help us to consider why there are especially high rates of ill health and deaths in the most deprived groups. Possible explanations include the accumulative effects of social disadvantage on health across the life course, the strong links between children's educational and employment opportunities and that of their parents, and the negative consequences that ill health can have for life opportunities such as employment. These can lead to the perpetuation and deepening of health inequalities across people's lives and from one generation to the next.

Inequalities are greatest for the most severe outcomes.

The starkest inequalities are seen for outcomes relating to the timing and cause of death. People living in the most deprived fifth of areas are at least twice as likely to die for each of the outcomes considered in the report compared to those in the least deprived fifth of areas. Those living in the most deprived fifth of areas are five times as likely to die from an alcohol-specific death and 20 times as likely to die from a drug-related death compared to those living in the least deprived fifth of areas.

Healthy life expectancy also showed very large inequalities. Given current levels of health and death rates, people living in the most deprived tenth of areas could expect to live almost a quarter of a century less in good health than people living in the least deprived tenth of areas.

Young and middle-aged men are faring particularly badly for some outcomes.

One group that stands out is young-to-middle-aged men, especially those living in the most deprived areas. For men living in the most deprived tenth of areas healthy life expectancy fell by almost five years (between 2015 and 2020) to 45 years, compared to being maintained at around 70 years for men living in the least deprived tenth of areas. Young and middle aged, socioeconomically deprived men are most likely to suffer deaths of despair (suicide, drug, or alcohol related deaths) and the exponential rise in drug deaths has largely been concentrated among men.

Young and middle-aged men living in deprived areas are also most likely to experience multiple overlapping social disadvantages (homelessness, justice involvement, opioid dependence, and psychosis) associated with premature mortality. The proportion of outpatient and GP appointments where the patient 'Did Not Attend' is higher in the most deprived fifth of areas and among men in their 20s and 30s.

The foundations for maximising health, wellbeing, and life opportunities are built in the early years and while there have been some improvements, children's start in life is not equal.

The picture is not all negative for child health – rates of timely antenatal booking, smoking in pregnancy, breastfeeding at 6-8 weeks and development in toddlerhood are all improving, although some remain far below optimum levels and all have large inequalities. We see worrying patterns for childhood obesity risk. While overall prevalence has remained at around 10%, this masks decreasing rates in the least deprived areas and increasing rates in the most deprived areas. In 2019/20, children living in the most deprived areas were twice as likely to be at risk of obesity than their peers living in the least deprived areas.

Childhood immunisations, previously a success story of high uptake and small inequalities, are now falling and inequalities are widening. Aside from placing some children at unnecessary risk of infection, this trend points towards increasing social barriers to utilising health services more generally. The widening of inequalities in some early years' outcomes may lead to inequalities in adult health, such as in diabetes and cardiovascular disease. We may therefore be storing up problems for the future, in terms of population health, life chances, and inequalities.

Trends and patterning of health-related behaviours highlight complexities in the generation, explanation, and consequences of health inequalities.

Not all health-harming behaviours are more prevalent in more deprived groups. High alcohol consumption is greater in *less* deprived areas, but those living in *more* deprived areas are more likely to die from alcohol-related harms. Furthermore, while children living in deprived areas are at higher risk of obesity, overall levels of physical activity show they are just as active as their more advantaged peers. This reflects the increasingly negative consequences of health-risk factors for less advantaged groups, due to the presence of other health-harming factors accumulated over the life course, including food insecurity, low quality green space, targeted advertising, as well as time constraints, and barriers to high quality preventative health services and treatment, to name a few.

Health-related behaviours that affect infants (smoking in pregnancy and breastfeeding) have seen sustained improvements over the past 20 years in Scotland. However, inequalities remain. For example, in 2020 the prevalence of smoking in pregnancy was 11 times as high in the most deprived fifth of areas compared to the least. These examples show the importance of avoiding interventions and policies which focus solely on health behaviours, or that suffer from lifestyle drift.

Social, demographic, and other characteristics interact to shape experiences of health.

Health varies according to a multitude of characteristics which we refer to as the 'axes of inequality', including social deprivation, ethnicity, migration status, gender, sexual identity, and living with disabilities. These different characteristics are not experienced in isolation and their effects, when in combination, are not uniform.

Exploration of the combined relationships of area-level deprivation and ethnicity shows that the social gradient in health (by area-level deprivation) varies for different ethnic groups. It is most pronounced for people in the White Scottish group. Health in the White Polish group was relatively good regardless of area-level deprivation, whereas in the Pakistani ethnic group, health was relatively bad regardless.

Furthermore, for some groups, including those with experience of the care system or adults with learning disabilities, the prevalence of ill health was high across all levels of area deprivation, indicating the potential severity of other barriers to good health for these groups even in affluent areas.

Health and social care services have an important role in tackling inequalities but are only part of the picture.

Inequalities exist across the health and social care service outcomes described. Progress has been made in uptake of specific services, such as antenatal bookings and bowel screening, and the proportion of outpatient appointments where the patient 'Did Not Attend' has fallen. Amenable mortality (that is, deaths which could be avoided through good quality healthcare), like many other mortality outcomes, was improving in the first decade of the 21st century but has since stalled. Repeated emergency hospital admissions have seen little improvement in overall rates or inequalities over the past decade. Uptake of the childhood immunisations, the HPV vaccine, and cervical screening meanwhile have started to decline, and inequalities have widened.

A focused look at the cancer 'care cascade' highlighted how there are inequalities in cancer prevention, diagnosis, and care, which can accumulate to create large inequalities in cancer mortality. This points towards the important role of health services in early identification and treatment. There are a complex set of barriers to health services in Scotland, including differences in people's propensity to consider themselves a legitimate 'candidate' for services, as well as inequalities in access to and quality of services once received. These factors are in turn influenced by a range of barriers including competing priorities and other health needs, language barriers, and experiences of stigma or mistrust in services.

Deepening our understanding of health inequalities is dependent on the availability of data.

Monitoring of health in Scotland using health surveys and routinely collected data such as hospital records underpins our knowledge of health inequalities in Scotland. These valuable sources most consistently provide information on how health differs according to area-level deprivation, sex, age, and geographical location. Other types of health inequalities, such as inequalities according to ethnicity, individual socio-economic circumstances, and disability,

are less routinely measured and monitored. Where these additional axes of inequality are available, they are normally reported in isolation, often because of a reliance on small sample sizes or bespoke datasets.

This siloed approach to monitoring means that health inequalities resulting from the accumulation of multiple forms of disadvantage may currently be overlooked, and we have a limited understanding of how this is changing over time. The same applies to our approach to monitoring health outcomes. We know that poor health can cluster, and that it is more likely to do so in disadvantaged groups. However, our understanding of trends in multimorbidity or the co-occurrence of poor health over time is limited because health outcomes are normally reported in isolation.

This report shows the depth and breadth of health inequalities that affect the population of Scotland. These inequalities are seen across people's lives, in experiences of health and wellbeing, health-related behaviours, health and social care services, and in the timing and causes of deaths. In the first decade since 2000, we see a pattern of modest improvements in health and inequalities, particularly in mortality rates. However, many have stalled, and some have worsened in the decade since. Today, we see considerable inequalities in health and wellbeing, which are widest for the most severe outcomes, especially deaths that occur early in life and from causes linked to despair. The worsening picture over the past decade indicates the importance of action now, in the aftermath of the pandemic and facing a cost-of-living crisis, which will likely exacerbate inequalities further.

Patterning of health-related behaviours does not always align with patterning of health outcomes. Further, we see some improvements and less pronounced inequalities in some health service outcomes. Therefore, while health-related behaviours and health services are important, they cannot alone explain inequalities in health and deaths experienced across the population. The wider determinants of health continue to be of utmost importance in understanding and addressing inequalities.

Our findings also go some way to confirming that the scale of health inequalities in Scotland is not inevitable. Despite concern at the generally worsening trends we now face, the period of health improvement and narrowing of absolute inequalities in the first decade of the 21st century should not be overlooked. Trajectories are amenable to change for the better, as well as for the worse.

As part of the Health Foundation's "Health Inequalities in Scotland: An Independent Review", this report has presented trends in inequalities in timing and causes of deaths, health and wellbeing, health-related behaviours, and health and social care services over the last two decades. Further reports explore social and economic trends that influence these outcomes; public perceptions of health inequalities and the action needed to tackle them; and views of policy and practice stakeholders about the difficulties in taking action to improve health and reduce inequalities.

Background to this report



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Health inequalities in Scotland:
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Differences in how long people live in Scotland, and how healthy they are in their lifetimes, are the subject of much monitoring, research, and policy attention. These differences are considered to be ‘health inequalities’ when they are systematic, avoidable and unfair, and occur either between social groups or as a gradient across the population⁴. Health inequalities are largely the result of inequalities in the social, economic, and environmental conditions people experience at birth and over their lifetime. The drivers of health inequalities are often considered at different levels: differences in health outcomes are shaped by differences in individual experiences resultant from socio-economic and environmental factors which are in turn shaped by “fundamental causes” - the unequal distribution of income, power and resources⁵. The greatest impacts of health inequalities are felt by citizens and communities. However, there are also wider economic costs including loss of productivity, lost taxes, and increased welfare spending, as well as direct costs to the healthcare system⁶.

Following a global pandemic and in the eye of a cost-of-living crisis, concern in Scotland around the magnitude and impact of health inequalities, areas of improvement or deterioration, and who is most impacted, is considerable. Understanding the extent and development of health inequalities within the national context is essential for developing effective policy action to address this entrenched problem at a crucial time.

Aims of this report

This report, initiated and funded by the Health Foundation, describes trends in health inequalities, with a central focus on timing and causes of death and health and wellbeing outcomes, alongside health-related behaviours and health and social care services (domains shown in Figure 0.1 in blue). The context of these findings is of utmost importance, and how the trends and insights presented here fit with wider socio-economic trends is critical to our understandings of how health inequalities are generated. To this end, our report is complementary to the forthcoming companion report on the social determinants of health from the Fraser of Allander Institute (FAI), also funded by the Health Foundation as part of their Independent Review of Health Inequalities. The trends on the social determinants presented there, relate to the six domains shown in Figure 0.1 in amber. These can be seen as the broad context for the trends and insights we present on health inequalities.

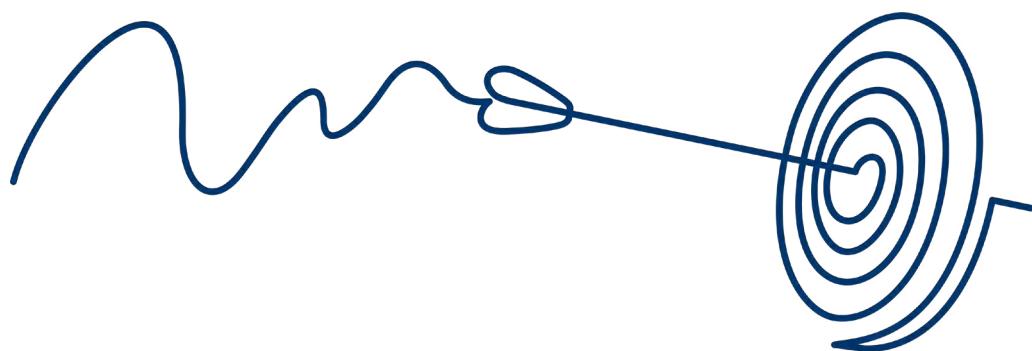
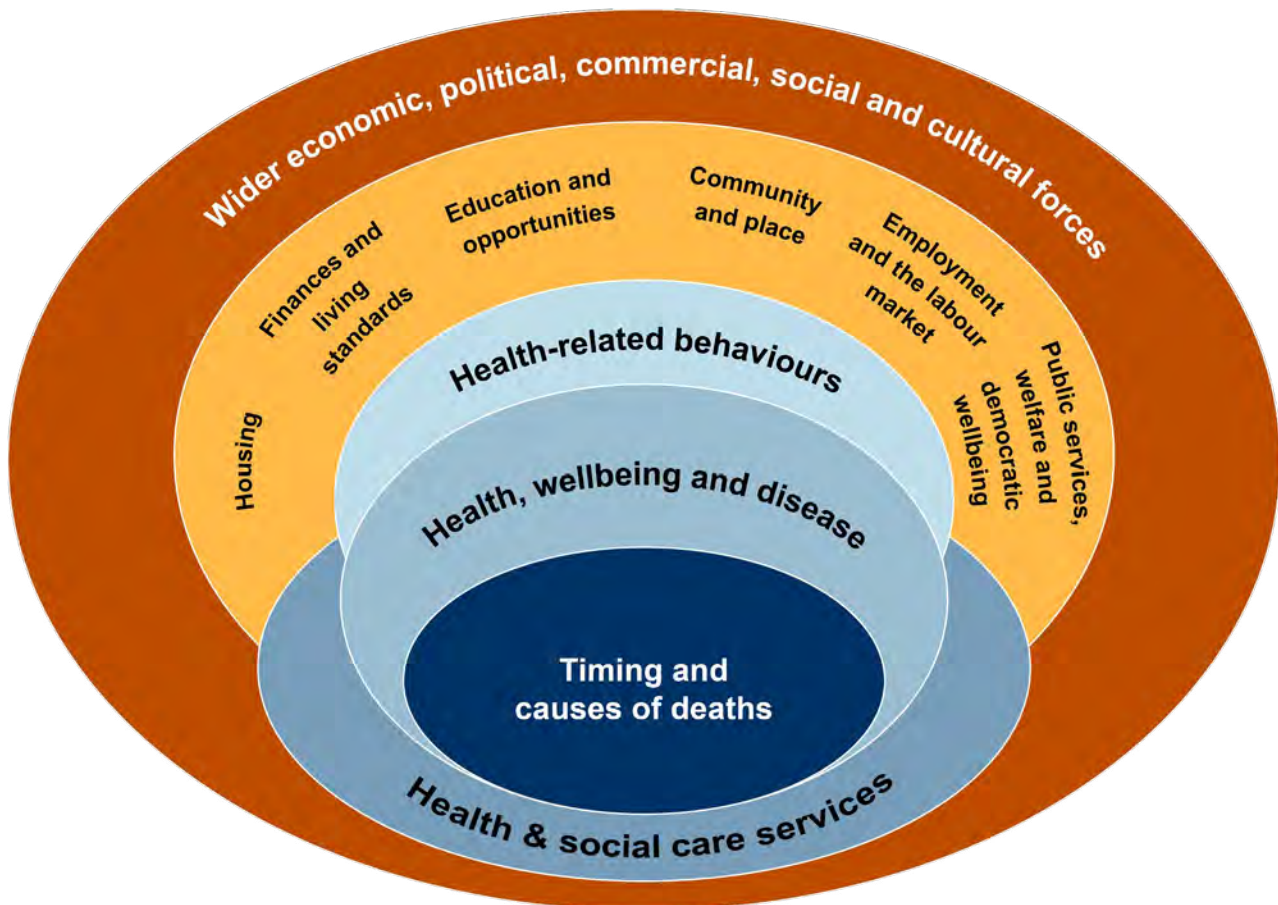


Figure 0.1. Areas covered in this report (blue), nested within those covered in the Fraser of Allander Institute report on social determinants (amber)



The design and development of this report builds on Scotland's well-established monitoring of health inequalities. With input from the Expert Advisory Group for the Health Foundation independent review and an additional group of stakeholders representing third sector organisations (health, community, poverty), local government, Scottish Government, public health and press/media, this report aims to:

- Provide a wide-ranging review of health inequalities in Scotland, reporting trends from 2000 as far as is possible given data availability.
- Synthesise insights across the life-course and consider how health outcomes and different aspects of disadvantage can cluster in particular communities, creating health impacts that are more than the sum of their parts.
- Consider multiple elements of socio-economic disadvantage, including area-level and individual-level circumstances, as well as other 'axes of inequality' (e.g. urbanicity, ethnicity, disability).
- Focus closely on those issues identified by stakeholders as important to Scotland, including drug deaths and health and development in the early years, and issues where gaps in evidence have been identified, e.g. healthy and successful ageing.
- Take a life course approach to consider the timing, duration and accumulation of exposure to health risks, and seek to examine health inequalities at important stages of the life course.
- Maximise interpretability of the report and provide synthesis and analytic commentary.

Appendix A contains a summary of the main points arising from our stakeholder conversations.

It was not an aim of this report to unpick the specific influences and impacts of policies and interventions across UK, Scottish and local government levels. Many policies are developed with the aim of improving population health. Others are developed and implemented outside of the health domain, yet have important implications for health, and indeed health inequalities. Understanding the impacts of these policies requires complex analysis⁷ beyond the scope of this report. This type of evaluation is critical to understanding the impacts of specific policies and interventions, however, there is also no silver bullet to solving health inequalities. Rather, meaningful systems level changes to policies at all levels and across all sectors is required. This report aims to underpin this type of effective action by providing up to date insights on the extent and development of health inequalities in Scotland.

Scotland has an impressive history of valuable research and policy activity which has drawn attention to health inequalities, with one of the most sophisticated systems of monitoring health inequalities in the world. Data are published by the National Records of Scotland and Public Health Scotland on key outcomes, and various analytical tools and reports are produced by Public Health Scotland and the Scottish Public Health Observatory. The annual Scottish Government Long-term Monitoring of Health Inequalities reports provide an overview of several headline indicators which is exemplary in its methodological rigour and consistency over time. This report builds on the availability of these data, and ongoing monitoring and scrutiny, to provide a wide-ranging overview of health inequalities in Scotland at a critical time.

Health inequalities in contemporary Scotland: looking back, looking forward

At times dubbed the 'sick man' of Europe, unfair differences in health and wellbeing across Scotland's population have been a consistent concern for citizens, researchers and policy makers for decades and a central focus of the work of the MRC/CSO Social and Public Health Sciences Unit since its creation in 1998. However, the current trends in mortality, health and wellbeing in Scotland is of particular concern.

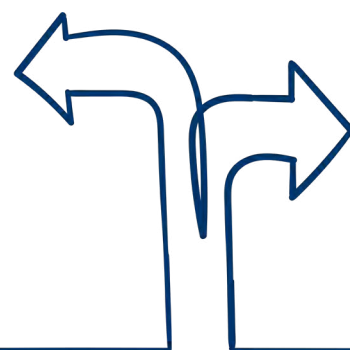
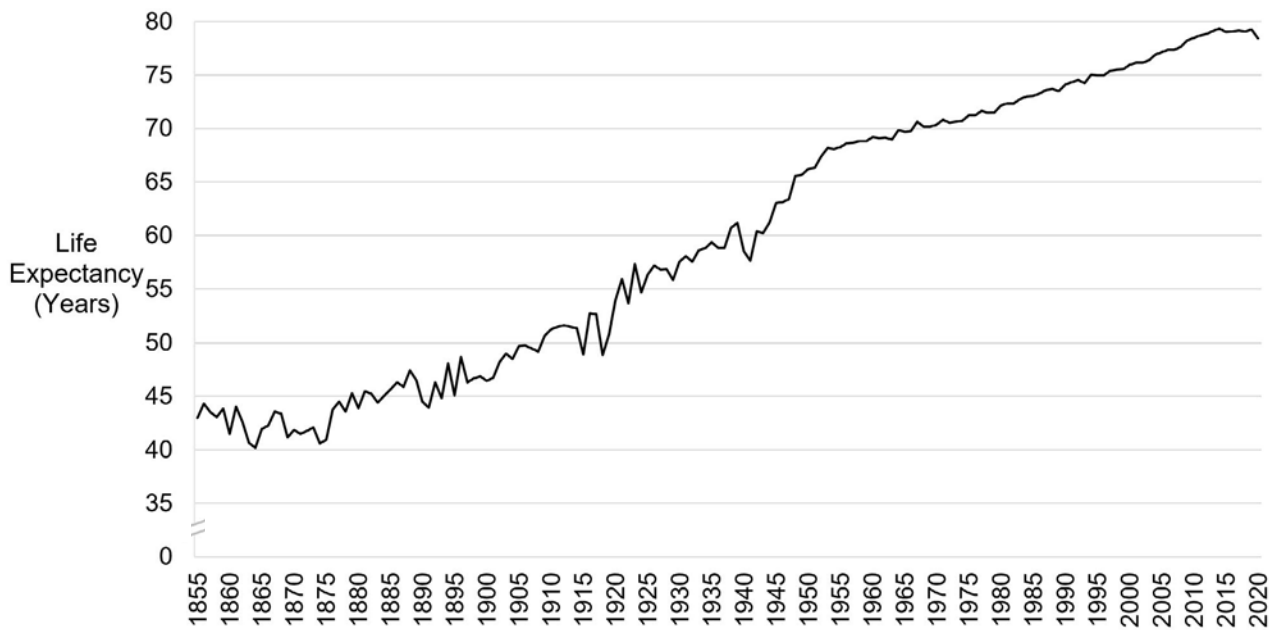


Figure 0.2. Life expectancy (years) in Scotland, 1855-2020



Source: Human Mortality Database, Scotland Period Life Expectancy Tables⁸

Since 1900, life expectancy in Scotland has, broadly speaking, increased, with exceptions only for times of pandemic disease (e.g. influenza in 1918-1919) and war (e.g. 1940-1945). However, around 2012-2014, these improvements stalled across both sexes, all ages, and almost all causes of death. This stalling masks considerable inequality, with life expectancy not just plateauing but falling for those living in the most deprived areas in Scotland. Reflecting the importance of the social and economic context, recent analysis suggests that “austerity” policies (cuts to public spending across social security and key public services) are likely to be substantially contributing to these trends in Scotland (and across the UK)⁹.

Over two decades since the opening of the Scottish Parliament, the government and population face several challenges, on top of the stall in life expectancy. The COVID-19 pandemic had significant impacts across all of Scotland’s National Outcomes with particularly negative consequences indicated for health, economy, fair work and business, poverty, education and children-related outcomes. Furthermore, disproportionate impacts of the pandemic on the least well-off has been noted across domains¹⁰. Set against this backdrop, the cost-of-living crisis represents an unprecedented challenge for the UK and Scottish Governments and the Scottish population. The impact and extent of rising household costs is not yet fully understood, but the potential harms are likely to fall hardest on those on lowest incomes. Taken together, these crises and their unequal impacts pose a particular threat to population health, with the potential to increase differences between groups and across the population, with particular worsening for the most deprived. Reflecting this concern, health inequalities have once again become the focus of increased policy activity with the timing of this report coinciding with the latest parliamentary inquiry into health inequalities led by the Scottish Parliament Health, Social Care & Sport Committee³.

How to read this report

In this report we provide a wide-ranging and up-to-date overview of health inequalities in Scotland, presented in four chapters:

- **Chapter 1: Timing and causes of deaths** presents trends in outcomes relating to timing and cause of death in Scotland.
- **Chapter 2: Health, wellbeing and disease** presents trends in outcomes for physical and mental health, wellbeing, and disease, including Healthy Life Expectancy.
- **Chapter 3: Health-related behaviours** presents a selection of trends in key health-related behaviours for both adults and children.
- **Chapter 4: Health and social care services** presents a selection of trends related to access, quality and the performance of health and social care services.

We order the findings within each chapter according to the life course to emphasise the importance of this concept in understanding how disadvantage impacts and accumulates over the life course to produce inequalities.

Specific outcomes presented have been identified through consultation with academic, third sector, and policy stakeholders. For prioritised outcomes we present trends in inequalities across the socio-economic gradient, going back to 2000 where possible. Alongside trends we present “Spotlights” to describe key conceptual issues and mechanisms for understanding how health inequalities are generated; highlight gaps in the data and present more detail on specific issues. Throughout chapters we also summarise key relevant findings for additional aspects of health where these are routinely monitored (for example in the annual Long-term Monitoring of Health Inequalities reports).

We mainly report social gradients by area-level deprivation as the most consistently available socio-economic measure. Occasionally highlighted throughout the report are social inequalities which go ‘beyond area-level deprivation’. This includes for ethnicity, looked-after status, disability, gender identity and LGBTQ+, largely drawn from qualitative research and bespoke surveys. Where possible, we examine the health impacts of experiencing multiple disadvantages, or specific combinations. Below we present a brief outline of our approach, including some methodological detail that might support readers’ interpretations.

Our approach

This report was produced over the period February – October 2022, with input from an Expert Advisory Group for the wider Health Foundation Independent Review on Health Inequalities in Scotland; an additional group of stakeholders representing third sector organisations (working on health, community, poverty), local government, Scottish Government, public health and press/media; an internal expert advisory group at the University of Glasgow (see Acknowledgements); and colleagues working on the FAI report on trends in the social determinants of health.

Time period covered and impact of the COVID-19 pandemic

We aimed to cover trends from 2000. These trends extend to the pandemic period where feasible and if the data were available and reliable. It is important to note that in many cases inequalities in the UK widened during the pandemic and so this report may not always fully reflect the size of the problem in Scotland.

Data sources

In general, we draw upon administrative data which are already presented in reports or available for downloading from official websites such as Public Health Scotland and National Records of Scotland. Administrative data have the benefit of being largely representative of Scotland's population. However, they tend to have limited information on individual socio-economic circumstances, less severe health conditions and health-related behaviours. New analyses, using the Scottish Health Survey, have been carried out to examine additional outcomes and axes of inequality.

Scoping of available data sources which could be used to provide a comprehensive picture of health inequalities in Scotland was carried out. Appendix B contains the results of this exercise. It does not contain an exhaustive list of datasets and is likely to become out of date as new data become available, but we include it in case a useful reference source. A brief analysis of the gaps in data availability, and mention of forthcoming data sources, is provided in the Gaps section of the Discussion.

Measuring inequalities (axes of inequality)

In this report we largely rely on the Scottish Index of Multiple Deprivation (SIMD), which is the most readily available measure for examining socio-economic health inequalities over time in Scotland. More information on the SIMD is provided in Box 1.

Where relevant, we describe trends in health differences according to other widely available axes – sex or gender, age, and region (health board or local authority). In many cases the data we analyse likely refer to biological sex, although in surveys it is possible that self-reported classifications represent gender rather than biological sex. We acknowledge the limitations of using binary definitions of gender and highlight this as an important data gap. The geographical location, population size and proportions living in the most and least deprived areas in each local authority are provided in Appendix C.

We also, where possible, examine differences according to the Scottish Government Urban-Rural Classification. Differences between urban and rural areas capture differences in population density and accessibility of services and are also related to area-deprivation (with urban areas more likely to be deprived). Some evidence also suggests that the distribution of the social determinants of health may be more heterogeneous in rural areas¹¹. It can therefore be challenging to disentangle what proportion of inequalities seen between urban and rural regions are due to differences in the deprivation levels (captured by SIMD), and urban-rural differences need to be interpreted with this context in mind. An explanation for the different urbanicity categories, their prevalence and average deprivation levels is provided in Appendix C.

Finally, we consider wherever possible (and usually using published, cross-sectional research) axes of inequality which are important but less readily available over time. These include ethnicity, disabilities, occupational status, household income, experience of homelessness, Gypsy and Traveller identity, and experience of care as a child.

Where appropriate and possible we present trends which are adjusted for age and sex, for example against the European Standard Population. However, we do not account for other characteristics. This can mean that, for example, regional differences we observe are partly accounted for by deprivation levels.

Box 1: A bit more on the Scottish Index of Deprivation (SIMD)

The Scottish Index of Multiple Deprivation (SIMD) summarises the degree of 'deprivation' within 6,976 small areas, or 'data zones', in Scotland, each covering approximately 500 to 1,000 residents. The SIMD is recalculated every few years, to allow for the fact that areas can change over time.

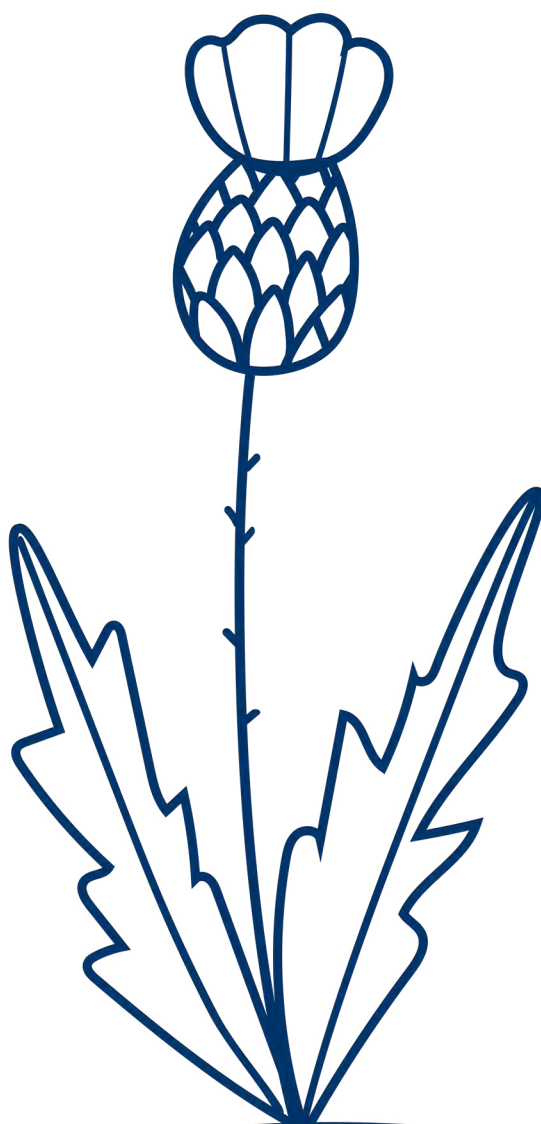
Each area is assigned a score based on the different elements of deprivation: Income, Employment, Health, Education, Access to Services, Crime, and Housing, with Employment and Income making the greatest contribution to the score (28% each in 2020¹²). Areas are then ranked by score and grouped to represent relative levels of deprivation across Scotland. In this report we mainly compare health across five, equally sized groups, ranging from the most to the least deprived areas. In some situations, we make comparisons across tenths, such as when summarising findings from Scotland's Long-term Monitoring of Health Inequalities reports, and this is clearly indicated. It is also worth noting that in these long-term monitoring reports, the standard SIMD is replaced by a bespoke measure combining the income and employment domains only.

Note that the SIMD is based on averages and does not reflect the individual experiences of everyone living in those areas. For example, ***less than half of income poor people in Scotland live in the most deprived areas.***

Rural areas are less densely populated and therefore cover larger spaces, meaning that within any one area there is likely to be more varied individual experiences of deprivation. On average, ***SIMD underestimates individual experiences of socio-economic disadvantage in rural areas and overestimates it in urban areas*** (in rural Scotland, five times as many people are experiencing income poverty than are living in the most deprived fifth of areas; while, in urban areas, more than twice as many people live in the most deprived fifth of areas than those who experience income poverty¹³). The degree of social disadvantage may be further underestimated in rural areas when costs of living are higher.

Quantifying inequalities

In addition to describing the prevalence or rate of each outcome across different groups, we calculate the size of the difference between groups. This might be the difference between the most and least deprived groups, or between sexes, for example. We provide two measures of this difference between groups: the 'absolute gap', and the 'relative difference'. This helps us to quantify how inequalities have changed over time. Appendix D provides an accessible guide for understanding how we do this. In this appendix we also briefly discuss alternative approaches for quantifying inequalities (such as the slope and relative indices of inequalities, which are used in Scotland's routine Long-term Monitoring of Health Inequalities reports) and further justification on our approach.



CHAPTER 1:

Timing and causes of deaths



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Health inequalities in Scotland:
An independent review

Introduction

In this Chapter we present trends and inequalities in the harshest outcomes – those relating to timing and causes of deaths.

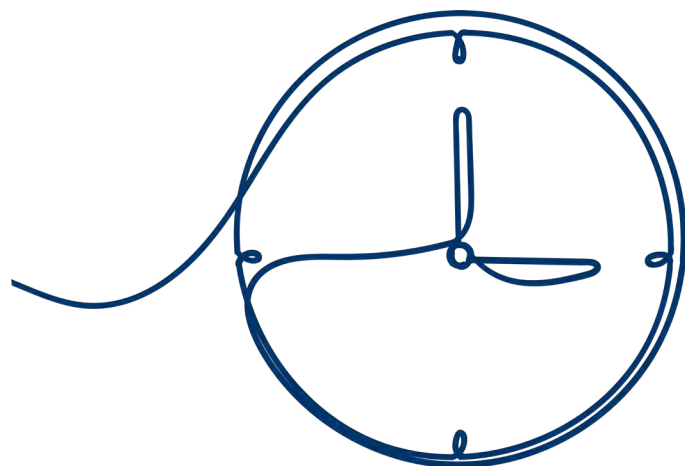
We find high levels of inequality in deaths early in life (e.g. for infant mortality and all-cause mortality in 15 to 44-year olds), and especially high inequalities for causes of death that are avoidable (i.e. are treatable through healthcare or preventable through healthcare and policy action), particularly the so-called deaths of despair.

For some outcomes there have been large declines in overall prevalence over the past two decades, often leading to a narrowing of absolute inequalities, although in all cases, large inequalities remain. This is the case for premature (< 75 years) mortality and deaths from suicide, alcohol, cancer and coronary heart disease. However, in many cases these improvements mostly occurred in the first decade of the 21st century and started to stall in the second.

Steady progress was also being made for life expectancy, infant mortality, all-cause mortality in 15 to 44-year-olds, and avoidable mortality, but this progress has potentially begun to reverse, especially in the most deprived groups.

Finally, drug-related deaths have increased dramatically over the past twenty years, and exponentially in the most recent decade. While this phenomenon has been seen across the UK, the burden is far higher in Scotland. There are extremely high inequalities both in relative and absolute terms. Those living in the most deprived fifth of areas are twenty times as likely to die of a drug-related death as those living in the least deprived areas.

In a Spotlight on multiple disadvantages, we find that people who have experiences of homelessness, the justice system, opioid dependence, or psychosis are far more likely to die young¹⁴. Experiencing more than one of these types of social exclusion had a particularly large impact on dying young.



Life expectancy

A summary of inequalities from routine reports

Life expectancy – the average number of years a person would expect to live if current mortality rates do not change – is lower in Scotland than all other UK countries, and is low when compared to Western Europe¹⁵. For example, in 2020 male life expectancy was more than two years shorter in Scotland than in England (at 76.8 and 79.3 years respectively)¹⁵.

Between 2000-02 and 2012-14, life expectancy at birth increased in Scotland by 16 weeks per year for males (from 73 to 77 years) and by 10 weeks per year for females (from 78 to 81 years). These improvements then stalled up until 2017-19 (increasing by less than one week per year in both men and women).

By 2018-2020 life expectancy had fallen (by 17.6 weeks for males and 6.1 weeks for females compared to 2017-19)¹⁵. Deaths from COVID-19 accounted for most of this decrease, although increased drug-related deaths and deaths from other external causes (such as accidents) also contributed.

In 2018-20 the absolute gap in life expectancy between women living in the most compared to the least deprived tenth of areas was 10.2 years. For males, that difference was even greater, at 13.5 years. This inequality has widened since 2013-15 (when the absolute gap was 8.6 years for women and 12.2 years for men).

The trends in stalled life expectancy and their potential causes have been considered in depth in the recent “Resetting the course for population health” report⁹.

Beyond area-level deprivation

As noted in the opening chapter, inequalities exist beyond local area deprivation, but they are harder to measure and are not regularly captured in official statistics. Below we summarise some of the evidence for inequalities in life expectancy according to ethnicity and learning disabilities. In both cases, we are largely reliant upon research published using data from the Scottish census. These estimates will only include people resident in Scotland during the relevant census, but still provide an indication of different patterns of life expectancy.

Ethnicity

Using ethnicity data from the 2001 census, life expectancy was found to be lower in White Scottish groups than most other ethnic groups¹⁶.

Women of Pakistani ethnicity had the longest life expectancy, at 84.6 years. Life expectancy was around 83 years in Indian, Chinese and Other White women. It was 79.4 years in White Scottish women and 79.3 years in those from Any Mixed ethnic backgrounds.

Among men, life expectancy was longest among those of Indian ethnicity (80.9 years). Life expectancy in White Scottish men was 74.7 years and only those from Any Mixed ethnic backgrounds had shorter life expectancy (73.0 years).

People with learning disabilities

In 2014 there were estimated to be 15,600 school aged children and 25,842 adults living in Scotland who had a learning disability. Census data indicate that in 2011 these individuals experienced as many health conditions at age 20 as the general Scottish population does at age 50. On average, life expectancy is 20 years shorter.

Another source of information on this group is school records, which have been used to create a cohort of children and young people with learning disabilities in Scotland. The most common causes of death in this group were related to the nervous system (33%) and congenital malformations, deformations and chromosomal abnormalities (22%). This contrasted with the cohort's peers who did not have a learning disability, amongst whom 46% of deaths were due to external causes. These data refer to deaths occurring between 2008 and 2015, so note that numbers were relatively small (566 total deaths)¹⁷.

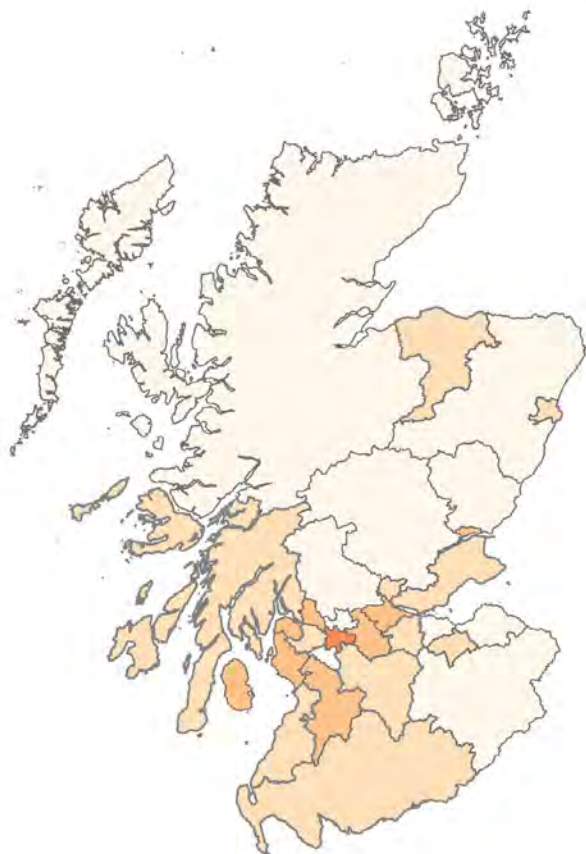
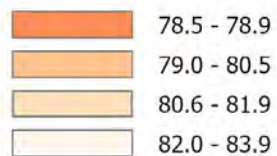
Geographical differences in life expectancy

Life expectancy is higher in women than men, but the geographical patterning is similar. As shown in Map 1.1 overleaf, life expectancy is lower across the central belt and especially in Glasgow and Dundee. These also tend to be areas with higher levels of deprivation, as noted in Appendix C.

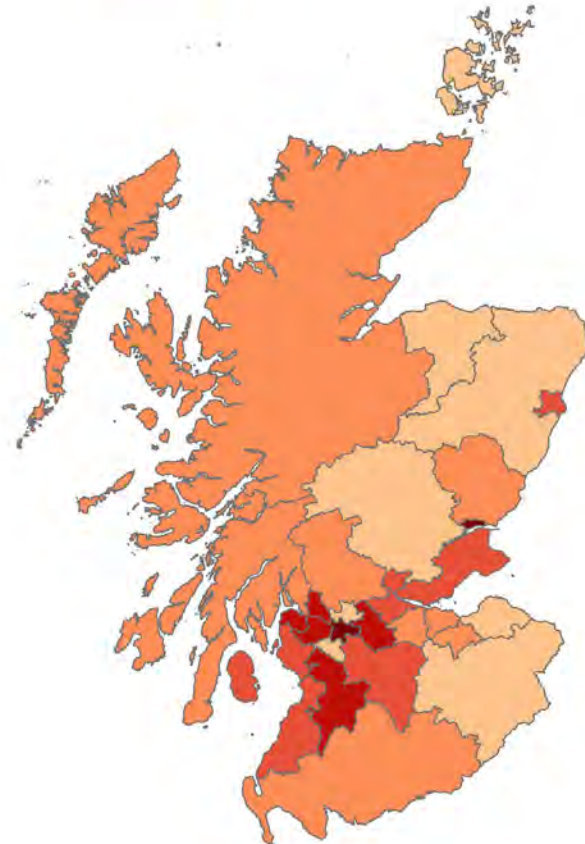
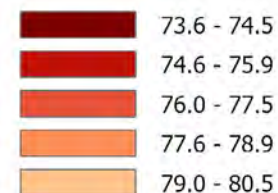


Map 1.1. Geographical inequalities in life expectancy Scotland, females and males, 2017-2019

Life expectancy (years) in females 2017-2019



Life expectancy (years) in males 2017-2019



150

Kilometers

Life expectancy provides a high-level summary of mortality trends and inequalities. We now move on to consider mortality at particular points in the life course and specific causes of death, which can provide further insight into how inequalities in deaths have been changing in Scotland.



Infant mortality

The infant mortality rate is the number of infant deaths (before first birthday) for every 1,000 live births. Rates today are around 3.3 per 1,000 births – more than ten times lower than they were a century ago. However, infant mortality remains a sensitive indicator of societal health and can act as an early warning system for future adverse trends.

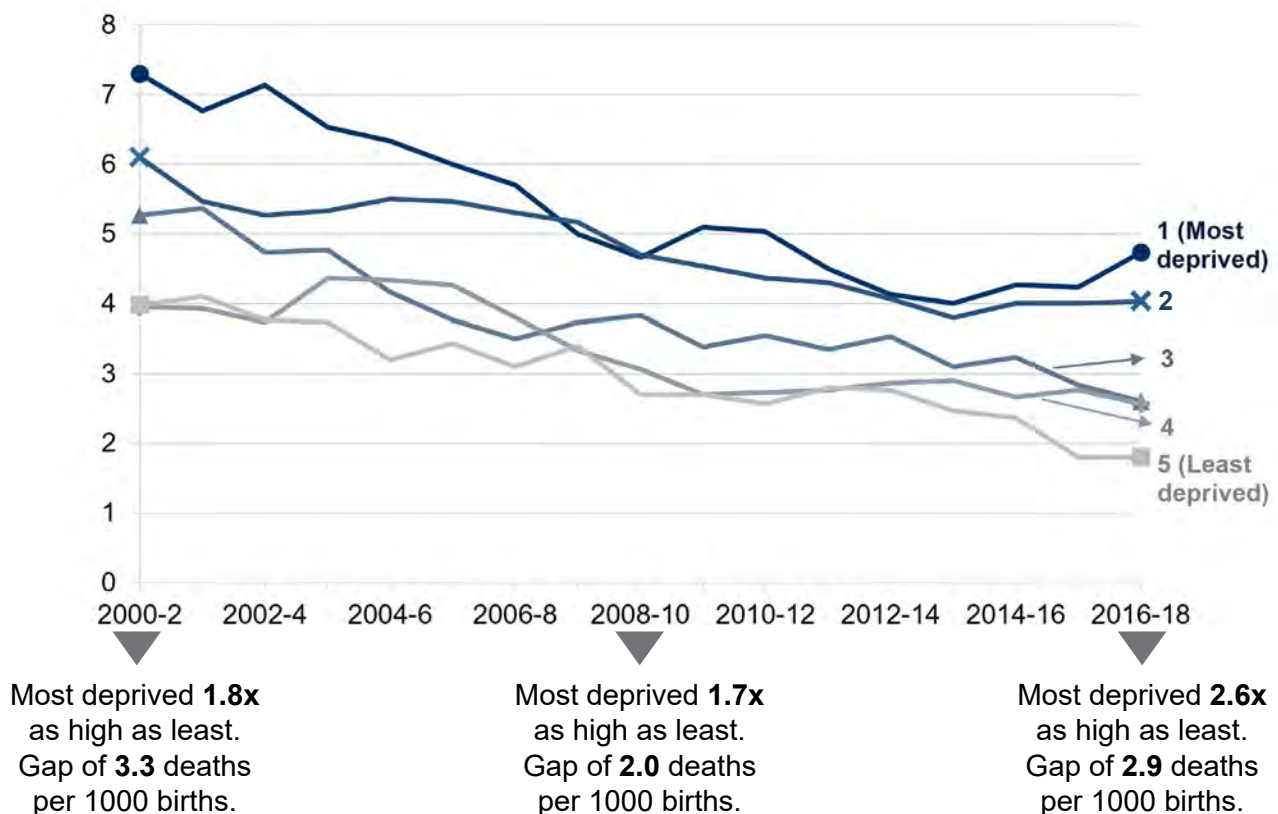
Infant mortality has declined overall since 2000 (Figure 1.1), and in Scotland rates are lower than many other high-income countries. However, we still fall behind some, such as Finland and Japan, which have achieved rates well below 2 per 1,000 births¹⁸. Furthermore, rates are not equal across different social groups. As Figure 1.1 shows, rates get progressively worse from areas of lowest deprivation (lightest) to areas of highest deprivation (darkest).

The figure also shows that between 2000-2 and 2012-14, the difference in rates between the most and least deprived fifth of Scottish areas (i.e. the absolute gap) declined from 3.3 per 1,000 to 1.4 per 1,000. Similarly, the ratio of rates (i.e. relative inequality) fell from 1.8 to 1.5.

However, since then, infant mortality has started to rise in the most deprived fifth of areas, whilst continuing to improve in the least deprived 60% of areas. This has led to a widening of inequalities, with relative inequalities considerably worse in 2016-18, at 2.6. The absolute gap is 2.9 deaths per 1,000, which is lower than the gap in 2000 but higher than it was in 2012-14.

Figure 1.1. Children living in deprived areas are 2.6 times as likely to die before their first birthday as children in less deprived areas

Deaths in < 1-year-olds per 1,000 live births, according to fifths of area-level deprivation: 2000-2 to 2016-18.



	2000-02	2004-06	2008-10	2012-14	2016-18
Population average (per 1,000)	5.5	4.9	4.0	3.5	3.3
Relative difference	1.8	2.0	1.7	1.5	2.6
Absolute gap (per 1,000)	3.3	3.1	2.0	1.4	2.9

Source: Harpur, A., et al., Trends in infant mortality and stillbirth rates in Scotland by socio-economic position, 2000–2018: a longitudinal ecological study. *BMC Public Health*, 2021. 21(1): p. 995.

These trends in inequalities are largely the same when differentiating between neo-natal (<28 days old) and post-neonatal infant deaths¹⁹.

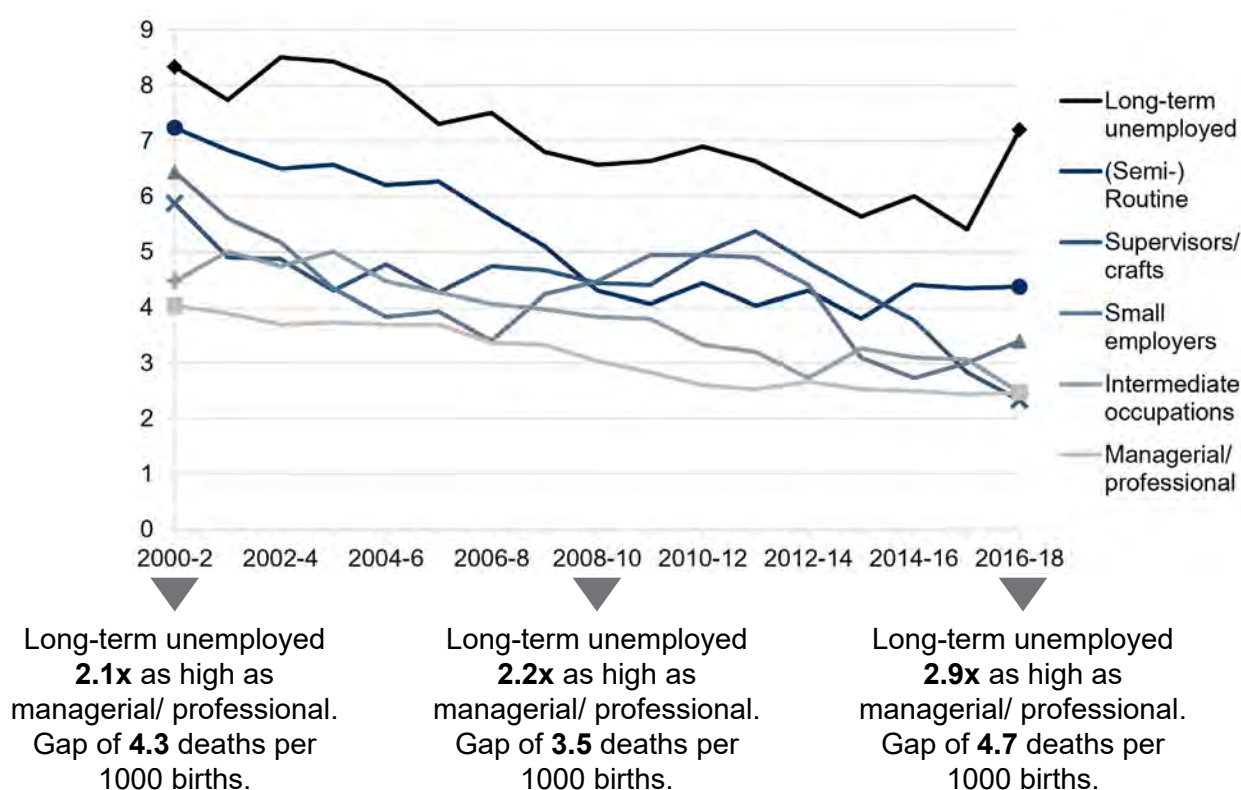
Widening inequalities in infant mortality since 2014 have also been seen in England, where population-level infant mortality rates have also increased, with rising child poverty rates suggested to be a driving force²⁰.

Beyond area-level deprivation: infant mortality by parent's occupational status

Inequalities in infant mortality rates are also large when comparing different parental occupational classes (Figure 1.2). Children whose parents were long-term unemployed or had never worked were experiencing rates that were triple those in managerial and professional occupations in 2016-18, with an absolute gap of 4.7 deaths per 1,000. Parent occupational class was measured using the highest household occupational class at birth.

Figure 1.2. Inequalities in infant mortality are large by parental occupational class

Deaths in < 1-year-olds per 1,000 live births, according to parental occupational status at birth: 2000-2 to 2016-18.



	2000-02	2004-06	2008-10	2012-14	2016-18
Population average (per 1,000)	5.5	4.9	4.0	3.5	3.3
Relative difference	2.1	2.2	2.2	2.3	2.9
Absolute gap (per 1,000)	4.3	4.4	3.5	3.5	4.7

Source: Harpur, A., et al., Trends in infant mortality and stillbirth rates in Scotland by socio-economic position, 2000–2018: a longitudinal ecological study. *BMC Public Health*, 2021. 21(1): p. 995.

The inequality measures cannot be compared directly across Figure 1.1 and 1.2, because the long-term unemployed group is smaller and probably more disadvantaged, on average, than those living in the most deprived fifth of areas. More complex analysis, which allows a fairer comparison, indicates that inequalities are comparable between area-level deprivation and occupational class¹⁹. However, Figure 1.2. does highlight an especially large gap between never worked / long-term unemployed and the semi-routine occupational groups.

The recent trend of rising infant mortality rates among areas and families experiencing social disadvantage will be driven, at least in part, by increased vulnerability to the wider determinants of health – including rising child poverty and worsening living and working conditions of families²¹. For example, the FAI report on social determinants shows extreme poverty increasing over the past decade, and in 2019/20 almost half of single parents were not ‘food secure’.

All-cause mortality in 15 to 44-year-olds

A summary of inequalities from routine reports

In this section we very briefly summarise findings from the Long-term Monitoring of Health Inequalities reports, which are published annually by Scottish Government. These include another measure of early mortality – deaths from all causes occurring in 15 to 44-year-olds.

Generally, all-cause mortality among 15 to 44-year-olds fell between 1997 and 2014 (from 116 to 97 deaths per 100,000) but had returned to 1997 levels by 2019 (at 120 deaths per 100,000)²². Relative inequalities (according to area-level deprivation) increased right across the period. Absolute inequalities reached their lowest levels in 2013 but then increased (due to rises in mortality in the most deprived areas).

Mortality trends in 15 to 44-year-old men have been driven by external causes²³. Suicide was the leading cause of external deaths and of overall mortality in 15 to 44-year-old men in Scotland up until 2013, when it was overtaken by drug deaths.

In 2018, drug-deaths accounted for around 50% of all external deaths. Alcohol-related mortality increased from mid-1990s to 2007 but has since declined. Nevertheless, it remains the third leading external and fourth overall cause of death. Internal causes of death have steadily declined, mainly due to reductions in mortality from coronary heart disease and cancer²³. These causes of death are explored in more detail in the following sections.

Avoidable mortality

Avoidable mortality is designed to collectively measure causes of death that can be mainly avoided through timely and effective healthcare and public health interventions. For example, deaths from cancers which can be avoided through reduced exposure to health harms (e.g. lung cancer), immunisation and screening (e.g. cervical cancer); infectious diseases that can be prevented through vaccination (e.g. influenza); and deaths from injuries, alcohol and drugs which can be reduced by public health interventions. However, avoidable deaths are also the responsibility of (and can be prevented by) policies across all sectors, not just health.

In 2020, 27% of deaths in Scotland were avoidable²⁴. In 2020, Scotland had higher avoidable mortality rates (336 per 100,000) than England (257 per 100,000) and Wales (287 per 100,000)²⁴. The leading causes of avoidable deaths were cancers, diseases of the circulatory system and alcohol and drug related disorders. We will return to these causes of death individually in the following sections.

As Figure 1.3 shows, avoidable mortality in men was falling up until 2013, but since then the trend has stalled or even reversed.

Absolute inequalities declined across the first decade or so of the 21st century, but then increased again slightly. In 2019 the absolute gap in avoidable mortality was almost 549 deaths per 100,000 between men living in the most and least deprived fifth of areas. Relative inequalities increased across the entire period, with the rate of avoidable mortality for men in the most deprived fifth of areas reaching quadruple that in the least deprived areas in 2019. By way of comparison, the absolute gap in *all-cause* mortality rates²⁵ (also standardised for age) between men living in the most and least deprived areas was 870 per 100,000 in 2019, so 549 of these are made up of avoidable causes. The relative difference in *all-cause* mortality rates was 1.92.

Although inequalities in avoidable mortality are seen across the gradient of area deprivation, the absolute gap between the *first* and *second* most deprived fifth of areas is far larger than the gap between all other subsequent pairs.

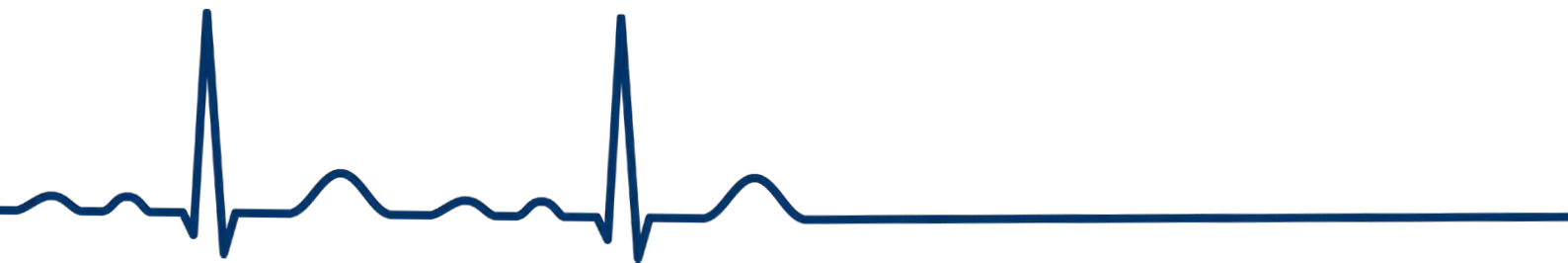
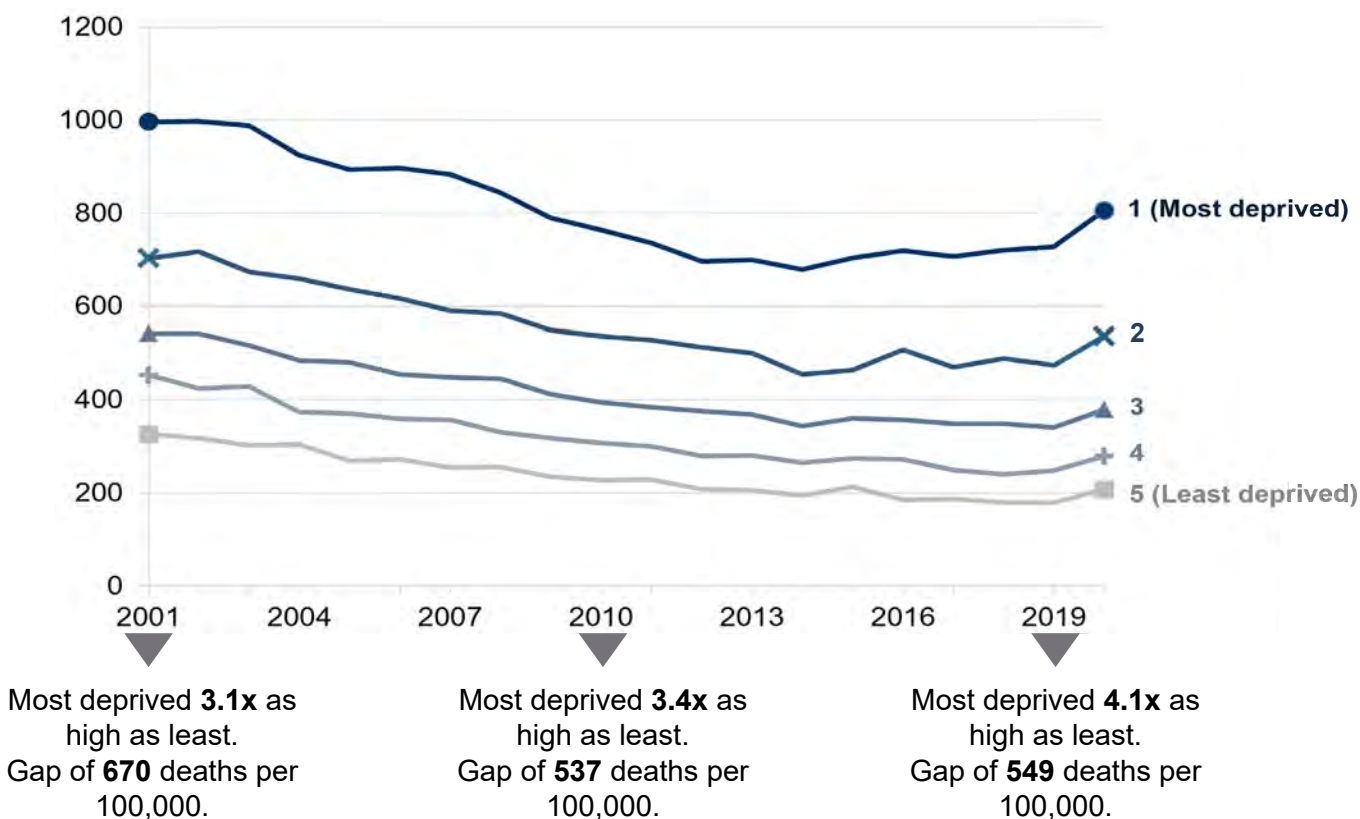


Figure 1.3. Absolute inequalities in avoidable mortality in males were falling during the 2000s, but have started to increase

Male avoidable mortality rates, per 100,000 population, age standardised, according to fifths of area-level deprivation: 2001 to 2020.



	2001	2004	2007	2010	2013	2016	2019
Population average (per 1,000)	602	540	494	434	397	395	380
Relative difference	3.1	3.0	3.5	3.4	3.4	3.9	4.1
Absolute gap (per 1,000)	670	621	629	537	493	535	549

Source: National Records of Scotland. Avoidable Mortality 2020 report (Published 2022)²⁴.

Coronavirus (COVID-19) has been assigned as an avoidable death in the international definition (along with other respiratory diseases such as influenza). An increase in avoidable mortality between 2019 and 2020 (of 9%) is largely attributed to COVID-19 deaths in under-75s²⁴.

Of all avoidable deaths occurring in 2020, the lead causes were still cancer, circulatory diseases, and alcohol and drugs²⁴, as in previous years²⁶. For example, cancers and circulatory diseases accounted for 29% and 25% of all avoidable deaths respectively²⁴.

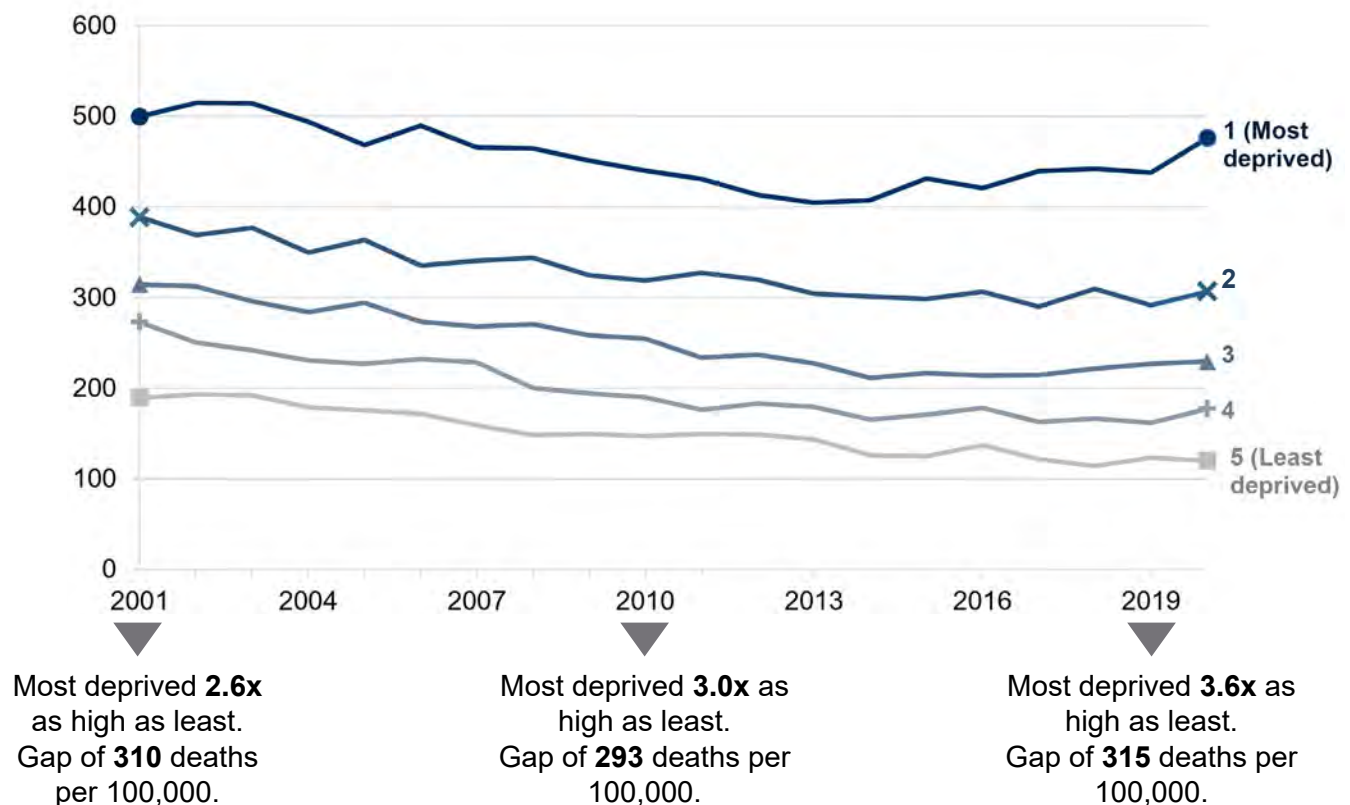
As shown in Figure 1.4, rates of avoidable mortality are far lower in women compared to men (note the change in axis scale on the figure). However, they are still unequal.

Both absolute and relative inequalities have widened over time, with increases in avoidable mortality in women living in the most deprived fifth of areas since 2013. In 2019, women living in the most deprived fifth of areas were 3.6 times as likely to die as those in the least deprived areas (similar relative difference as seen in men). The absolute gap in rates between the most and least deprived areas was 315 per 100,000. Again, the gap between the most and second most deprived fifth of areas was especially large.

As with men, we can compare these rates to those from all-causes of death. After standardising for age, there was an absolute gap of 594 deaths from all-causes per 100,000 in women living in the most and least deprived fifth of areas in 2019, and a relative difference of 1.8²⁵. Thus, a large proportion of inequalities in all-cause mortality can be attributed to avoidable causes of death. An upturn in avoidable mortality occurred in the most deprived areas between 2019 and 2020, but not the least deprived areas, due to stark inequalities in COVID-19 deaths (as we saw with men).

Figure 1.4. Declines in absolute inequalities in female avoidable mortality during the 2000s have reversed

Female avoidable mortality rates, per 100,000 population, age standardised, according to fifths of area-level deprivation: 2001 to 2020.



	2001	2004	2007	2010	2013	2016	2019
Population average (per 1,000)	335	307	289	265	245	245	240
Relative difference	2.6	2.8	2.9	3.0	2.8	3.1	3.6
Absolute gap (per 1,000)	310	315	306	293	261	284	315

Source: National Records of Scotland. Avoidable Mortality 2020 report (Published 2022)²⁴.

Beyond area-level deprivation: Avoidable mortality in different ethnic groups

Differences in avoidable mortality are not limited just to those we see between areas with different levels of deprivation. Data collected in the census can provide an understanding of how avoidable mortality differs between ethnic groups. More recent data are currently limited, but steps are being made to improve ethnicity recording within health and other administrative records to allow for more thorough and timely monitoring in the future.

The analysis shows that white Scottish men and women were most likely to die from avoidable causes, and Chinese men and women are least likely to die over the period 2001-2011.

In men, overall levels of avoidable mortality were highest among white Scottish (427.3 per 100,000), Any Mixed background (438.4 per 100,000), and white Irish (410.4 per 100,000) groups. Chinese men had the lowest rates (188.9 per 100,000)²⁷.

White Scottish women also had the highest rates (279.9 per 100,000), followed by those from Any Mixed backgrounds (247.7 per 100,000) and African origin (246.6 per 100,000). Chinese women had the lowest rates (164.8 per 100,000).

The elevated mortality in white Scottish men and women was partly accounted for by differences in socioeconomic position²⁷.

In the final results chapter of this report, a Spotlight on ethnicity and COVID-19 examines how ethnic inequalities emerged during the pandemic, applying a widely used framework for 'elucidating the pathways from social context to health outcomes and for introducing policy interventions'²⁸. This framework recognises that sources of health inequalities include differences in vulnerability, exposure to risk factors, and the severity of health outcomes.

We now take a closer look at three other specific causes of avoidable deaths, which tend to affect young and middle-aged people, and especially so in Scotland – deaths which are drug-related, alcohol-related or probable suicides – collectively known as the deaths of despair.

Deaths of despair

Deaths from alcohol, drugs, and suicide are collectively referred to as “deaths of despair”. These deaths are avoidable and are thought to stem from the cumulative effects of adverse living and working conditions, in the context of wider socio-economic trends.

For most causes of death, risk increases with age. This is not the case for deaths of despair, some of which peak at far younger ages. These deaths are included in the avoidable mortality data considered earlier, but are considered separately here, because they have been considerably and consistently higher in Scotland than England and Wales, for both sexes, since the 1980s. This remains the case even when comparing the Scottish cities Aberdeen, Dundee, Edinburgh and Glasgow to a selection of English cities, including Manchester and Liverpool (which have similar levels of social deprivation)²⁹.

Drug-related deaths

In 2020 drug deaths were the fourth most common cause of premature mortality (deaths under age 75) in Scotland, after heart disease, lung cancer and coronavirus³⁰. The large majority of drug deaths occur in men^{29 31} and those born between the mid-1960s and mid-1980s²⁹. When looking at the age distribution across all cohorts, people in their mid-thirties are at highest risk^{29 31}.

The age and cohort patterns of drug-related deaths are similar in England and Wales, but overall rates are far higher in Scotland. In 2020, deaths from drugs were 3.6 times higher in Scotland than the UK average and 2.6 times higher than Northern Ireland and the North East of England (which had the next highest rates)³¹. In a detailed study on mortality differences between British countries and cities, Walsh et al, conclude that the factors influencing mortality have been similar across Britain, but that their effects have been greatest in Scotland²⁹.

As shown in Figure 1.5, drug deaths have increased over the past two decades in Scotland. Between 2000 and 2010 they increased from 6.2 to 9.0 per 100,000. Since then, the rate of increase has been exponential, reaching 24.4 per 100,000 in 2019 (amounting to 1,280 deaths³¹).

The absolute gap and relative inequalities between the most and least deprived fifths have also widened dramatically since 2013. By 2019, those living in the most deprived fifth of Scottish areas were a staggering 20 times as likely to die from a drug-related death as those living in the least deprived fifth of areas (after accounting for age), corresponding to an additional 65 per 100,000 deaths in the most compared to the least deprived areas³¹. Rates of drug-related deaths were <5 per 100,000 in the least deprived fifth of areas and 69 per 100,000 in the most deprived fifth in 2019³¹.

Rates in the second and third most deprived fifths have also increased substantially, meaning that drug deaths are no longer predominantly confined to the most deprived areas. Even so, the most deprived fifth of areas stand out – the gap between the most deprived fifth and the second most deprived fifth of areas is as large as the gap between the second most deprived and the least deprived fifth of areas.

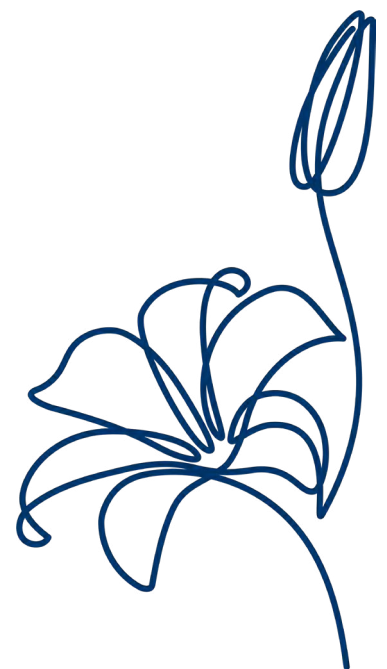
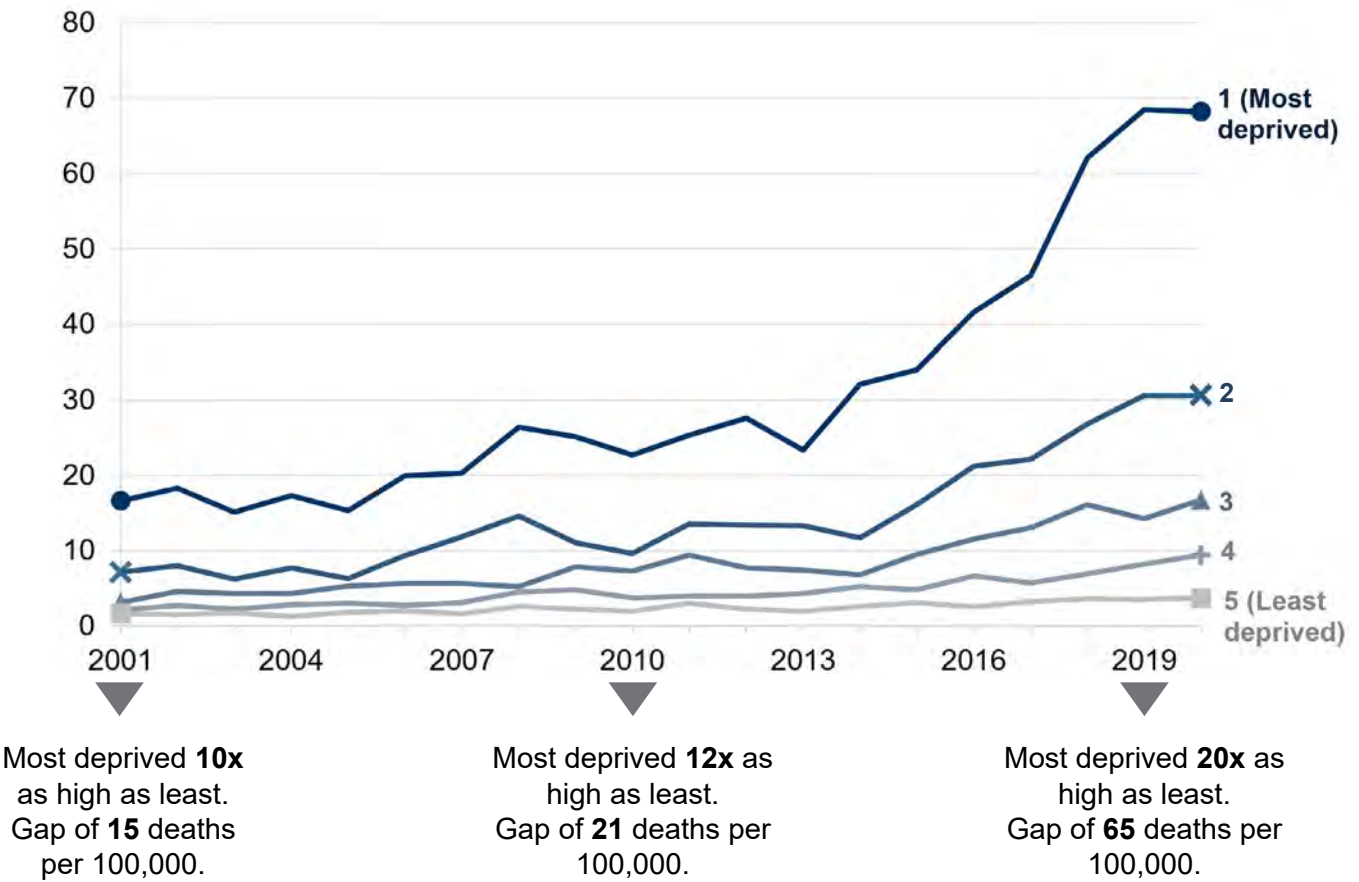


Figure 1.5. Drug deaths have increased exponentially since 2013 and those living in the most deprived areas are 20 times as likely to die

Drug-related death rates, per 100,000 population, age standardised, according to fifths of area-level deprivation: 2001 to 2020.



	2001	2004	2007	2010	2013	2016	2019
Population average (per 1,000)	6.2	6.7	8.5	9.0	9.9	16.4	24.4
Relative difference	10.4	14.4	12.7	11.9	12.3	16.6	19.6
Absolute gap (per 1,000)	15.0	16.1	18.7	20.8	21.4	39.1	65.0

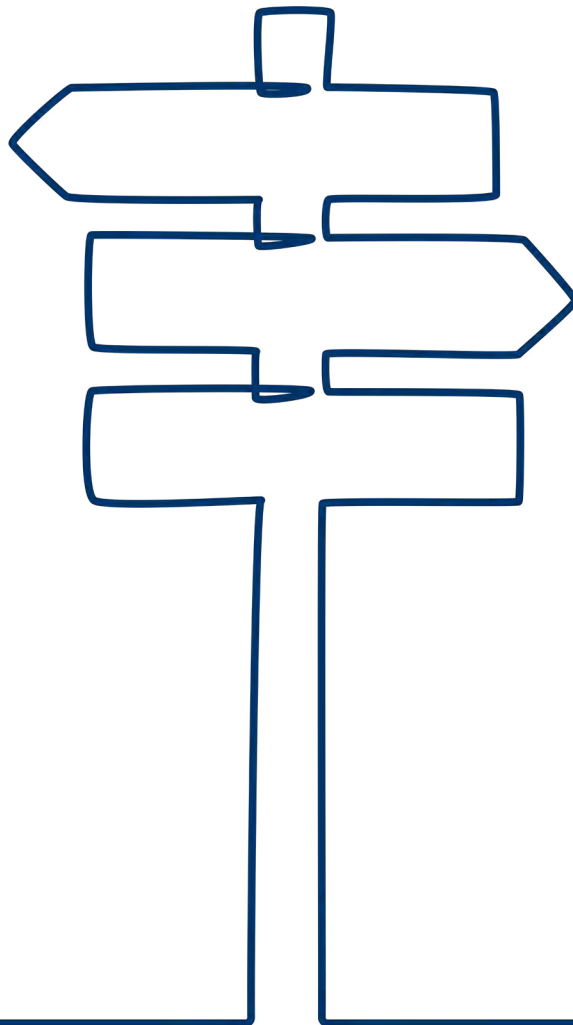
Source: National Records of Scotland. Drug-related deaths in Scotland 2020. Data. (Published 2021).

A Drugs Deaths Taskforce was established in summer 2019 by the Scottish Government and a report, “Changing Lives” published in 2022³² laid out recommendations and actions to reduce drug harms in Scotland. This identified several issues driving the trend in drug-related deaths, including high risk drug use (e.g. using multiple drugs at the same time); chronic and multiple disadvantages, which are potentially geographically concentrated; a lack of adequate service funding and access to treatments; and stigma around drug use, which can discourage health seeking behaviours.

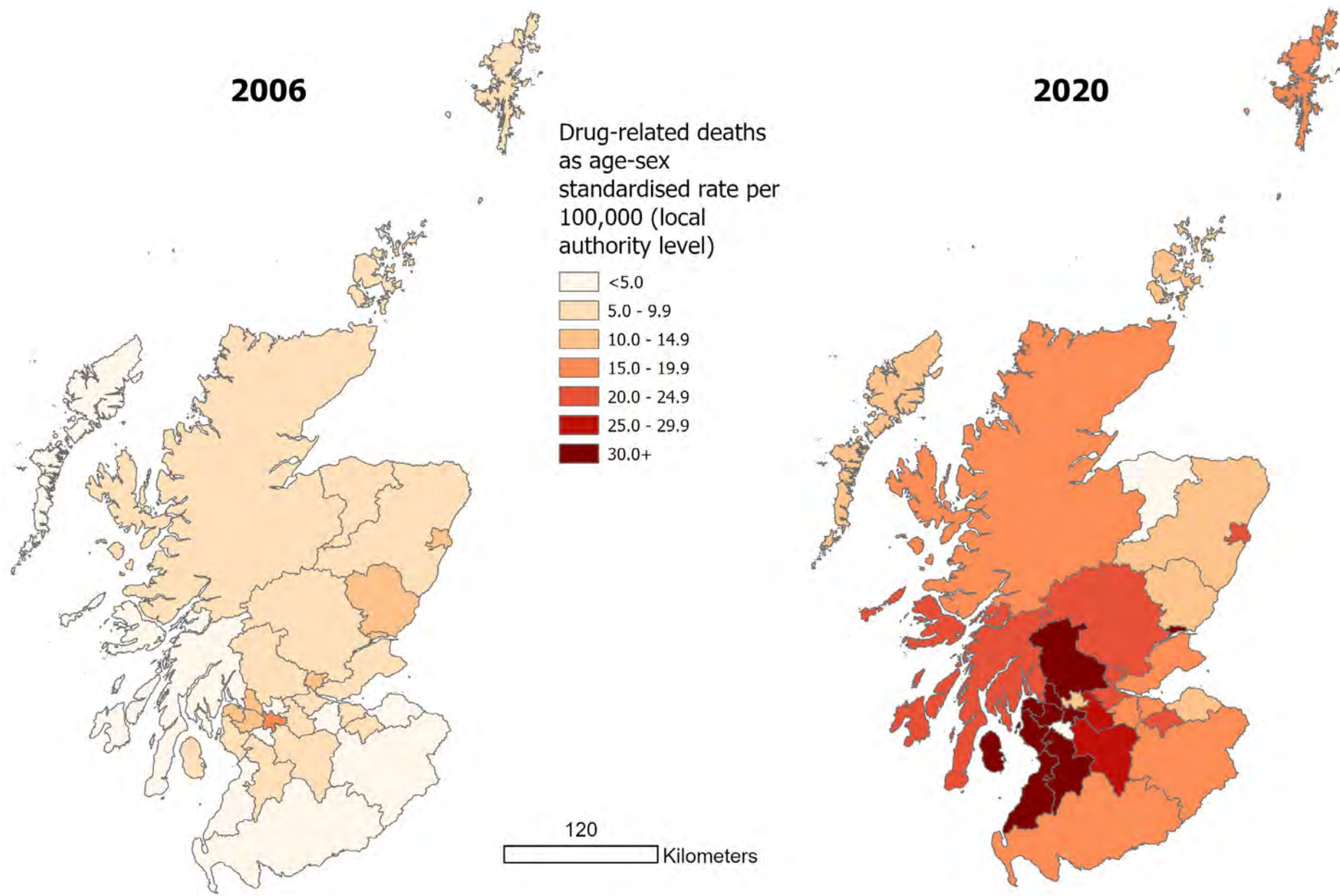
Geographical differences in drug related deaths

Map 1.2 shows how absolute inequalities in death rates (between the most and least deprived fifths of areas) vary across Scotland and over time.

The dramatic increase in absolute inequalities between 2006 and 2020 has occurred across all areas. By 2020, absolute inequalities are extremely large in Aberdeen and Dundee, and there is a clustering of high inequality in the West – including Glasgow, West Dunbartonshire, Inverclyde, Ayrshire, and Stirling. The rates of drug-related deaths in Glasgow, Aberdeen and Dundee are far higher than the similarly deprived English cities of Liverpool and Manchester.



Map 1.2. Geographical inequalities in drug-related death rates between local authorities across Scotland, 2006 and 2020



Author: L Macdonald, 2022. British National Grid, GCS OSGB 1936, Transverse Mercator. Local authority boundary data: Office for National Statistics licensed under the Open Government Licence v.3.0 Contains OS data © Crown copyright and database right [2022]. Mortality data: Scottish Public Health Observatory

Alcohol-specific deaths

Alcohol-specific deaths also contribute to the deaths of despair. Like drug-related deaths, deaths from alcohol are more common in men than women, but they are concentrated among a slightly older age group of 50-64 years³³. A study looking at alcohol-related death rates over the period 1981–2017, found that rates have been particularly high among those born between the late 1930s and early 1960s²⁹.

Like drug-related deaths, rates of alcohol specific deaths are higher in Scotland than the rest of the UK, at 21.5 deaths per 100,000 people in 2020 compared to 19.6 in Northern Ireland, 13.9 in Wales and 13.0 in England³⁴.

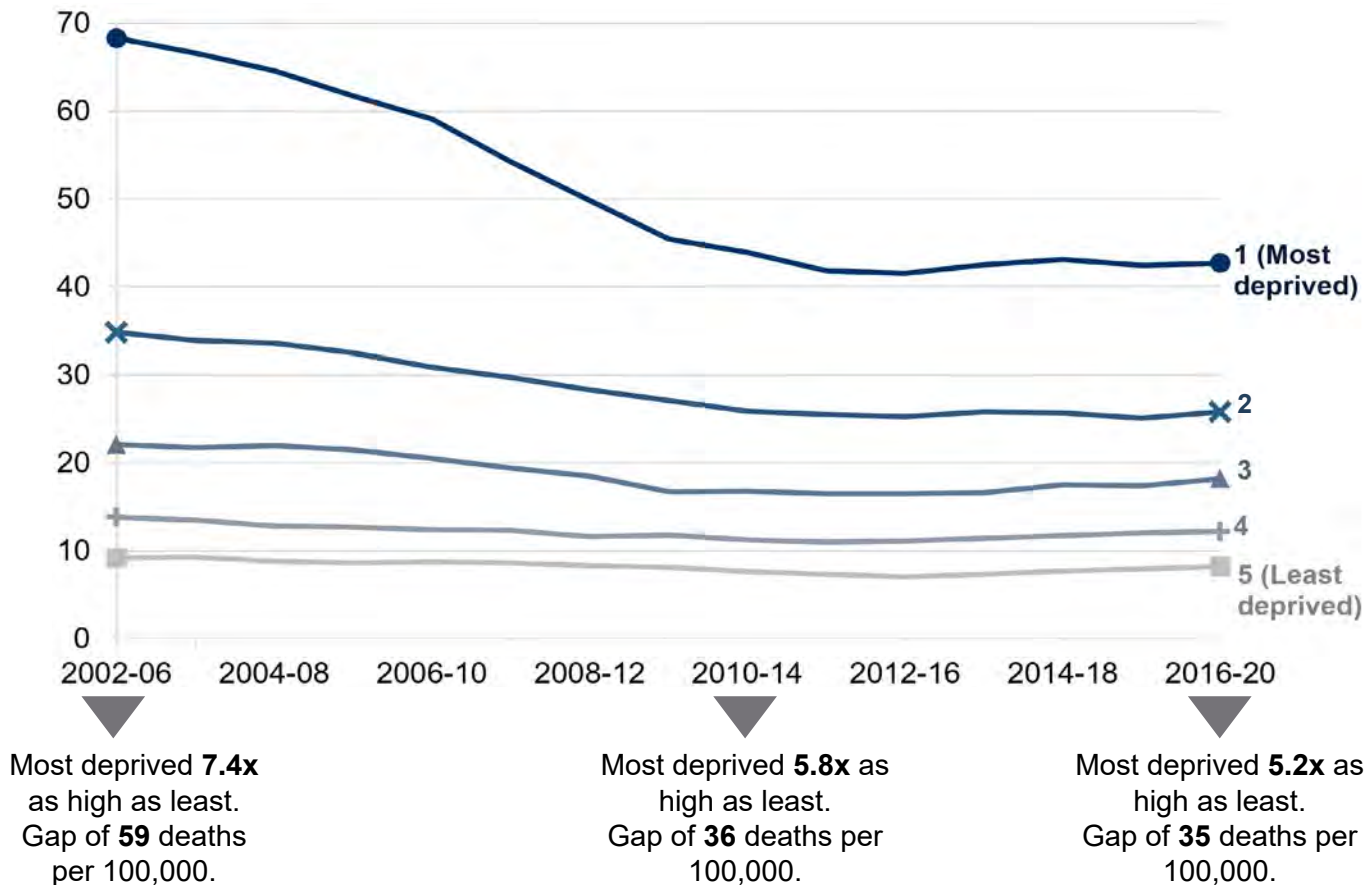
Figure 1.6 displays trends in alcohol-specific deaths among adults in Scotland. The period from 2002-6 to 2010-14 was one of improvement, with large declines among the most deprived areas.

Unfortunately, progress has since stalled, and inequalities remain large - those living in the most deprived fifth of areas being five times as likely to die due to alcohol. This reflects an absolute gap of 35 deaths per 100,000.

Furthermore, alcohol remains the fourth biggest contributor to deaths in 15 to 44-year-olds²³.

Figure 1.6. There were large declines in absolute inequalities in alcohol deaths in the first decade of the 21st century, but these have stalled, and inequalities remain large

Alcohol-specific death rates, per 100,000 population, age standardised, according to fifths of area-level deprivation: 2002-6 to 2016-20.



	2002-2006	2004-2008	2006-2010	2008-2012	2010-2014	2012-2016	2014-2018	2016-2020
Population average (per 1,000)	28.5	27.4	25.5	22.7	20.6	19.8	20.6	20.8
Relative difference	7.4	7.3	6.8	6.0	5.8	5.9	5.6	5.2
Absolute gap (per 1,000)	59.1	55.8	50.4	41.5	36.3	34.5	35.4	34.5

Source: Scotland Public Health Observatory Profile [scotland.shinyapps.io/ScotPHO_profiles_tool/].

Alcohol-harms are recognised as a significant issue in Scotland and approaches to tackle this have included banning quantity discounts for alcohol (2011), lowering the drink-drive limit (2014) and the introduction of Minimum Unit Pricing (MUP, 2018)³⁵. These changes largely came into effect after the large decline in deaths seen between 2000-6 and 2010-14 in Figure 1.6. However, this is not to say that these policies have not been influential – trends may have been worse still had these not been implemented, and the effects of some may not have had time to play out.

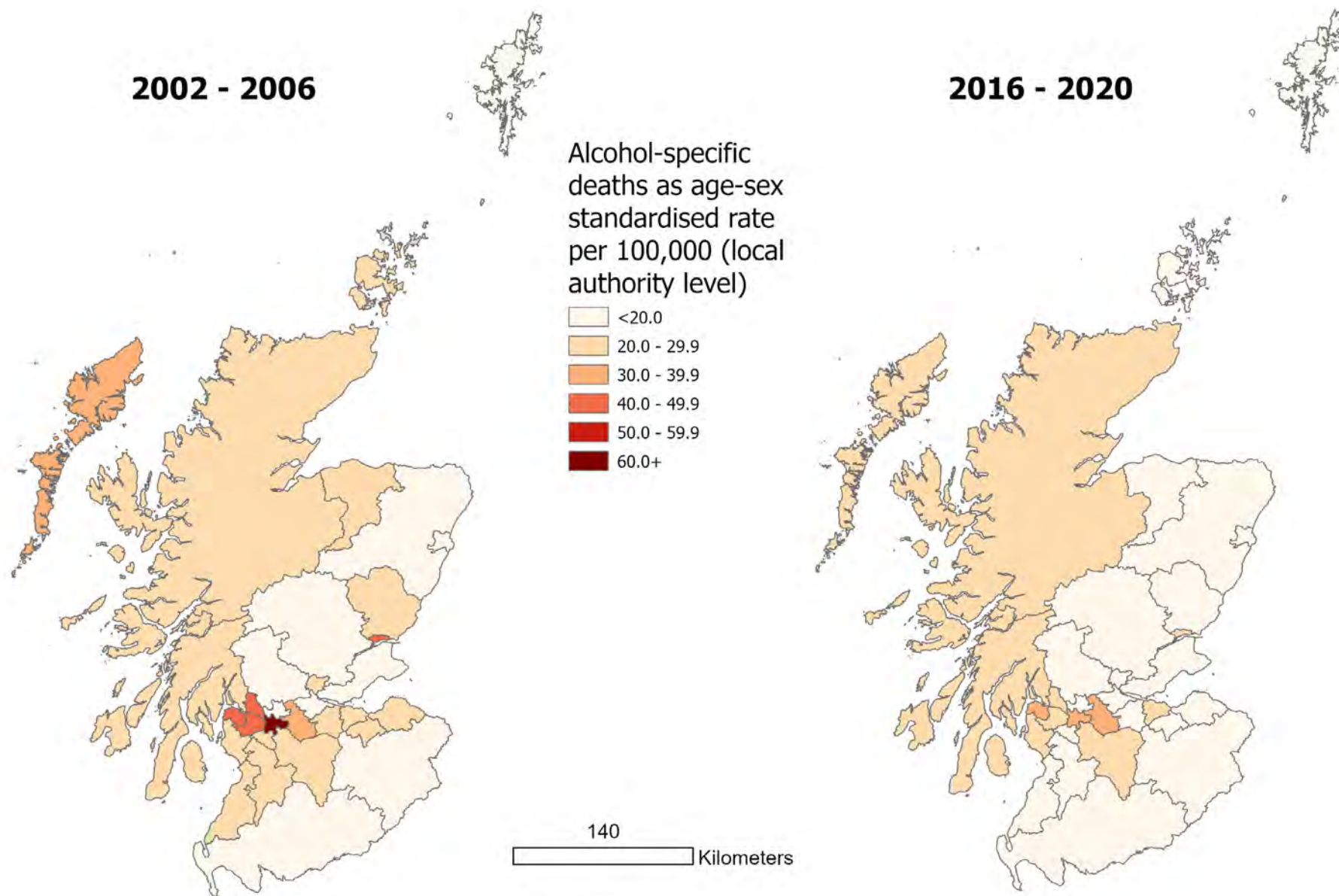
It is not an aim of the report to comment on the effectiveness of these (or any other) policies, nor is it appropriate to do so using only descriptive trend data. While it is widely accepted that policies such as these can play an important role, wider systemic change across the social determinants of health (including those discussed in the FAI report on social determinants) is also required in order to reduce inequalities^{9 36 37}. As an example, MUP led to decreased alcohol purchases, particularly among higher purchasing households³⁸, meaning there were likely benefits to population health. However, there has been no clear evidence of reduced alcohol consumption or severity of alcohol dependence in people who were drinking at harmful levels³⁹, so additional measures will be important for reducing inequalities in alcohol harms.

Geographical differences in alcohol deaths

Looking across Scotland, most areas have experienced declines in alcohol-specific deaths and especially Glasgow, Renfrewshire and West Dunbartonshire (Map 1.3). Map 1.4 shows absolute inequalities in alcohol-related death rates. Despite dramatic declines in deaths, absolute inequalities remain large in some areas – including Ayrshire, Highlands and North Renfrewshire. On the other hand, the cities of Dundee, Edinburgh and Glasgow have seen large decreases in inequalities.

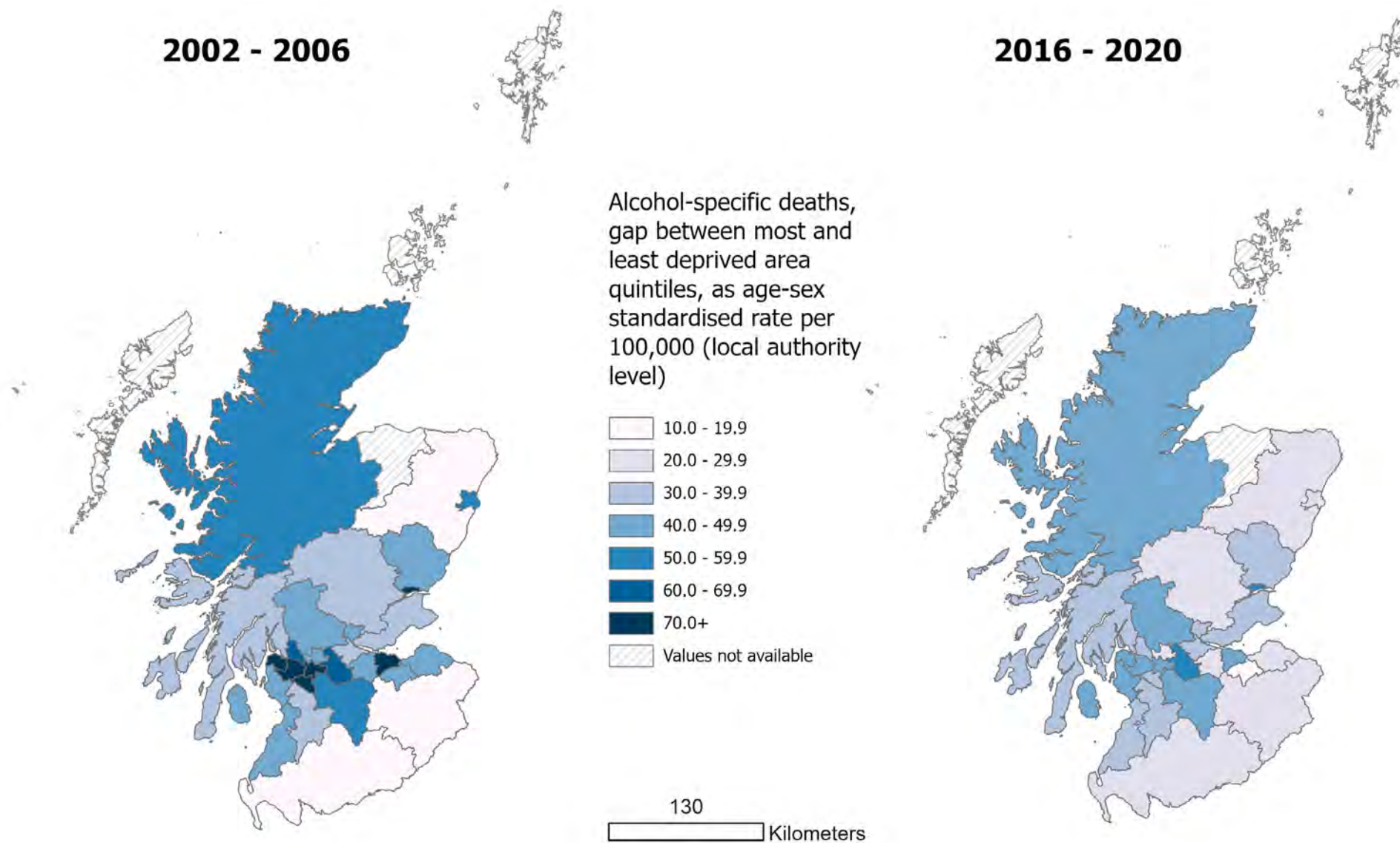


Map 1.3. Alcohol-specific death rates within local authorities across Scotland, in 2002/6 and 2016/20



Author: L Macdonald, 2022. British National Grid, GCS OSGB 1936, Transverse Mercator. Local authority boundary data: Office for National Statistics licensed under the Open Government Licence v.3.0 Contains OS data © Crown copyright and database right [2022]. Mortality data: Scottish Public Health Observatory

Map 1.4. Absolute gap in alcohol-specific death rates (between the most and least deprived fifth of areas) within local authorities across Scotland, 2002/06 and 2016/20



Probable suicide

'Probable suicides' are deaths from intentional self-harm and events of undetermined intent (deaths that are not identified as suicide with high certainty are included because it is thought that most deaths of this type are actually suicides)⁴⁰.

Suicide rates in Scotland fell from 17.8 per 100,000 in 2000 to a low of 12.5 per 100,000 in 2015. These declines have since stalled, and more recently suicide rates have increased to 15.2 per 100,000 in 2019⁴¹.

Like the other deaths of despair, deaths from probable suicide are concentrated among males. The highest rates have been observed in the cohort born in 1965-1974²⁹, and in the 35-44 year age group⁴⁰ (regardless of year of birth).

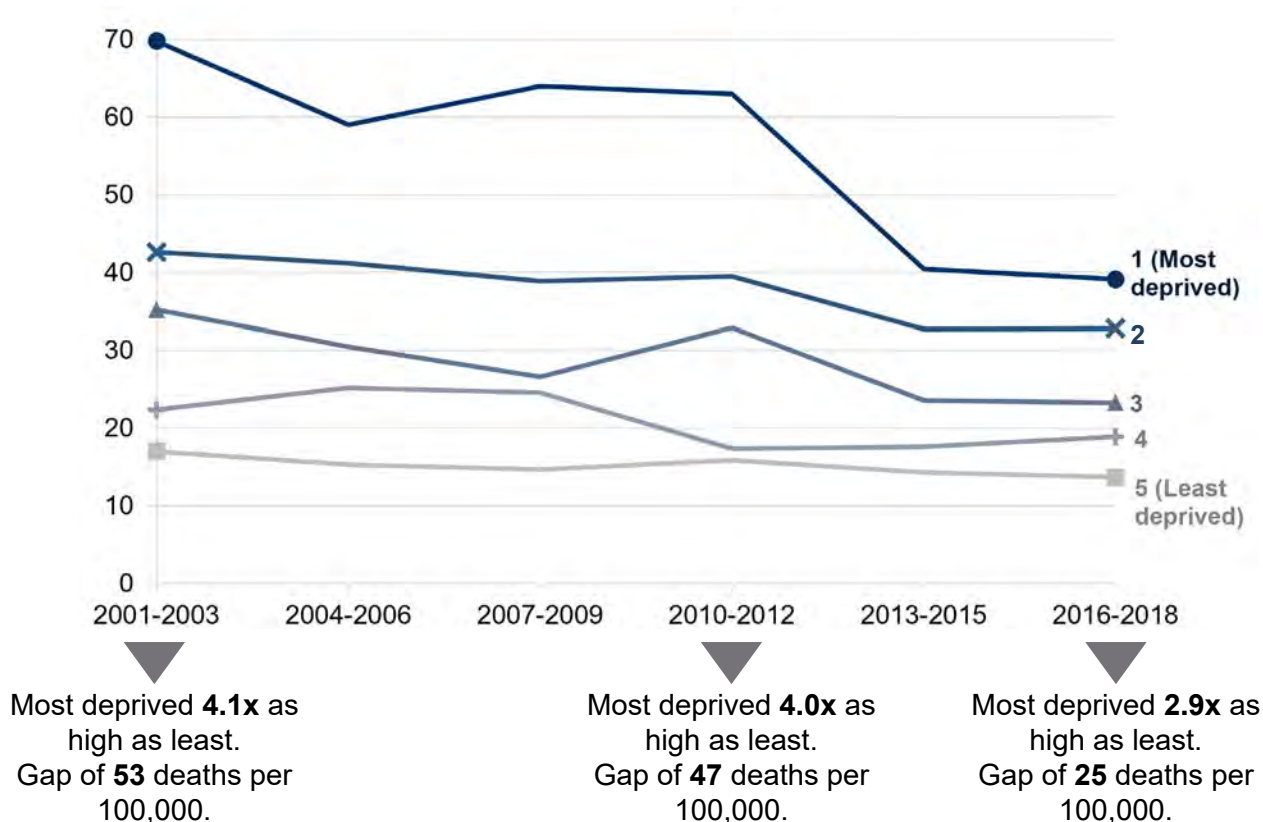
The data presented in the Figure 1.7 below refer specifically to *probable suicides in men aged 15-44 years* (unlike the sections on alcohol and drugs, which were in the whole of the population).

Overall, probable suicide rates in 15 to 44-year-old males have declined, from 36.9 per 100,000 in 2001-2003 to 25.8 in 2016-2018. There were large inequalities in deaths by probable suicide at the turn of the century and whilst improvements in the most disadvantaged areas fuelled a decline in inequalities, these improvements have potentially stalled between 2013-15 and 2016-18, along with improvements in the overall population average rate.

In 2018, 15 to 44-year-old men living in the most disadvantaged Scottish areas remained 3 times as likely to die from suicide as those living in the least disadvantaged areas.

Figure 1.7. Inequalities in probable suicide deaths in 15 to 44-year-olds males declined between 2010 and 2015

Probable suicide rates, per 100,000 population, age standardised, according to fifths of area-level deprivation: 2001-3 to 2016-18.



	2001-03	2004-06	2007-09	2010-12	2013-15	2016-18
Population average (per 1,000)	36.9	34.3	34.1	34.3	25.9	25.8
Relative difference	4.1	3.9	4.4	4.0	2.8	2.9
Absolute gap (per 1,000)	52.8	43.7	49.3	47.1	26.1	25.4

Source: Allik, M., Brown, D., Dundas, R. et al. Deaths of despair: cause-specific mortality and socioeconomic inequalities in cause-specific mortality among young men in Scotland. *Int J Equity Health* 19, 215 (2020).

Summary across the deaths of despair

Whilst improvements have been made in the overall rates of death from suicide and alcohol, with the greatest declines in the most disadvantaged fifth of areas, inequalities remain large. Both remain leading causes of death among young (15 to 44-year-old) men²³.

Whilst inequalities in deaths from suicide and alcohol have improved, the effect of this on overall inequalities in the deaths of despair has been more than cancelled out by a quadrupling of drug deaths in the most disadvantaged areas. In combination, the deaths of despair make up two thirds of absolute inequalities in total mortality in young (15 to 44-year-old) men in Scotland²³.

The report “Resetting the course for population health” found that increases in drug deaths have partially contributed to the stalled improvements in mortality in Scotland, but emphasises the importance of looking to the root causes behind these trends⁹. These include the wider social of determinants of health covered in the FAI report on social determinants. The aftermath of the COVID-19 pandemic and the cost-of-living crisis threaten to make things worse.

Premature mortality

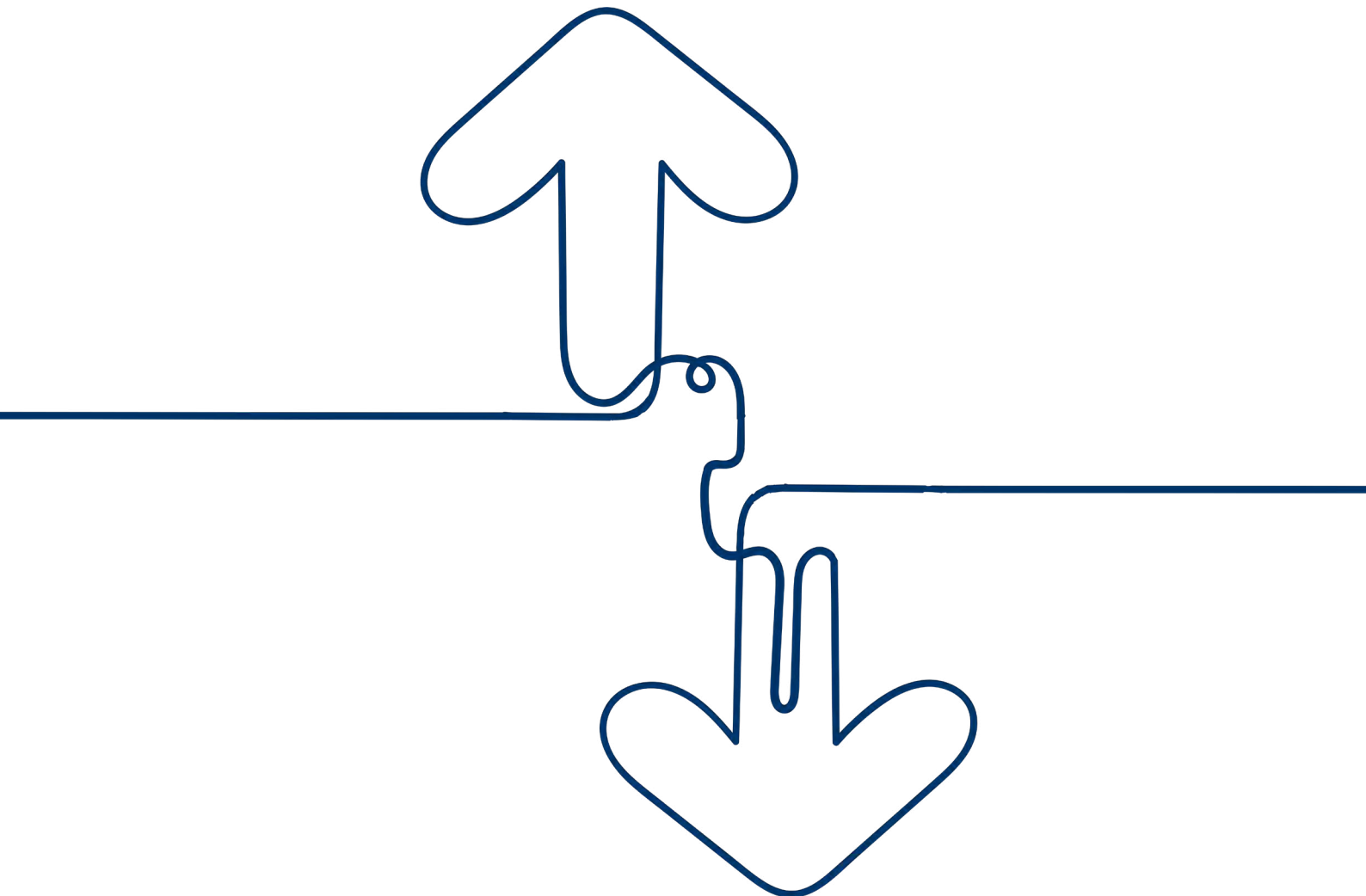
In the following Spotlight on multiple disadvantages, we present findings from a recent piece of research, examining premature mortality rates among people with experiences of homelessness, the justice system, opioid dependence, and/or psychosis (as compared to the general Glaswegian population)¹⁴.

Before this we briefly summarise overall trends and inequalities in premature mortality between different levels of area deprivation in the general Scottish population.

Trends in inequalities in premature mortality: a summary of routine reports

Scotland's Long-term Monitoring of Health Inequalities reports show how rates of premature mortality (i.e. number of deaths among under 75-year-olds, per 100,000 population, per year) declined from 652 per 100,000 in 1997 to a low of 423 per 100,000 in 2014. However, rates have since increased slightly to 457 per 100,000 in 2020.

Relative inequalities have increased over the total period and are now at their highest point. The absolute gap declined throughout the 2000s but has increased again since 2013. In 2020, the premature mortality rate in the most deprived tenth of areas was 891 per 100,000 per year, four times higher than in the least deprived areas (211 per 100,000)²².



Spotlight on multiple disadvantages

Premature mortality in people affected by homelessness, justice involvement, opioid dependence, and / or psychosis

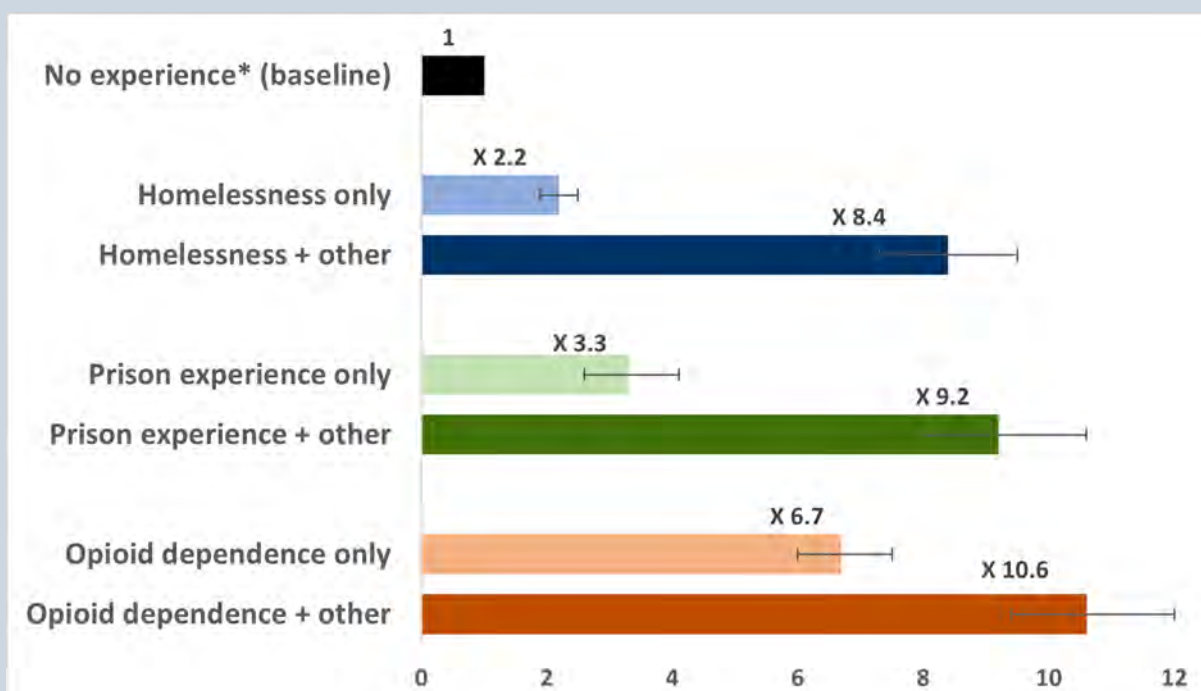
In other sections of this report, we have shown that there are numerous aspects of disadvantage in Scotland that can have a powerful influence on health. In this Spotlight we describe the health consequences of some of the more extreme and understudied disadvantages, based on findings from a data linkage study¹⁴.

More than one in twenty adults living in Glasgow City between 2010 and 2014 had experienced one or more of the following: homelessness, imprisonment, criminal justice social work involvement, opioid dependence, and psychosis. The majority of those affected were White males, aged 30-50, living in the most deprived fifth of areas. After accounting for age, gender, area deprivation, and calendar year, people with one or more of these experiences were 3.7 times as likely to die young (<75 years) during the follow up period (2014-2019) as those who had experienced none (hazard ratio 3.7, 95% confidence interval: 3.5-3.9).

Premature mortality was even higher among those experiencing two or more of the above sources of social exclusion, although the degree of excess risk varied from combination to combination. For example, as shown in Figure A, the risk of premature mortality in those who experienced homelessness (shown in blue) and prison (in green) was considerably higher when in combination with another risk factor (dark shading) than on its own (lighter shading). Opioid dependence (orange) carried a very high risk of mortality, regardless of whether it co-occurred with other experiences.

Figure A. Relative difference in premature mortality rates according to experiences of homelessness, prison and opioid dependence

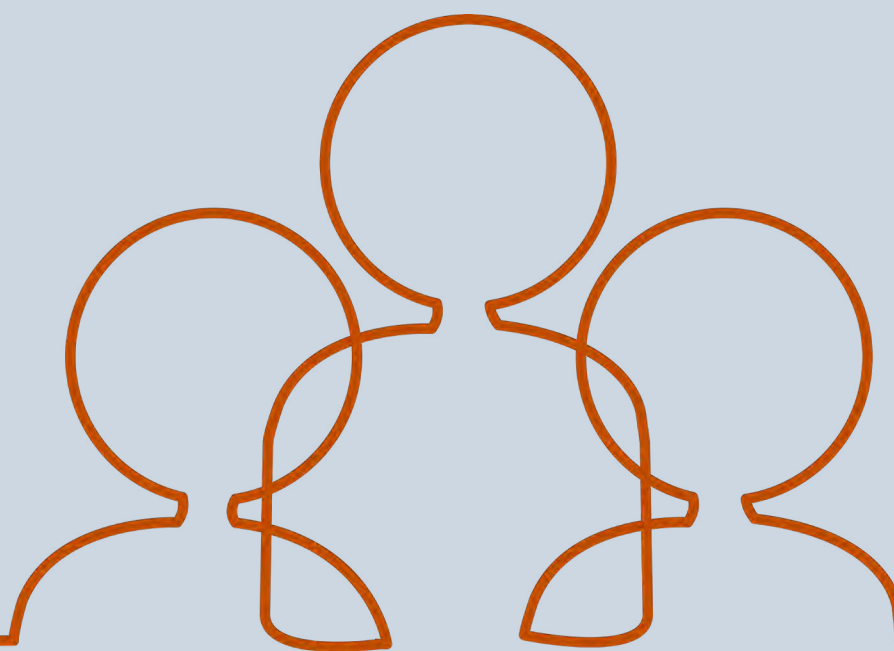
Hazard ratios for premature mortality, adjusted for age, gender, deprivation, calendar time: 2014-2019.



*no experience of: homelessness, imprisonment, criminal justice social work, opioid dependence, and psychosis

The experiences examined in this Spotlight are amenable to change through policy-making (for instance, housing availability, affordability and eligibility for housing assistance, poverty and social security, or justice and sentencing policy). The stigma and discrimination, restrictions to basic freedoms or rights (e.g. voting, privacy, and liberty), and barriers to accessing public services (including healthcare) that these groups experience have dire consequences for health, wellbeing and society at large. There is a need to reorientate (currently siloed) services to recognise the multiple and cumulative disadvantages that some individuals experience, as well as to address the root causes of such disadvantages^{42 43}.

The information in this Spotlight is largely taken from: Tweed, E. et al. 2022. Premature mortality in people affected by co-occurring homelessness, justice involvement, opioid dependence, and psychosis: a retrospective cohort study using linked administrative data. *Lancet Public Health*, e733–43.



Deaths from leading causes – coronary heart disease & cancer

In this section we summarise two specific causes of death, which are covered by the Long-term Monitoring of Health Inequalities reports - cancer and coronary heart disease (CHD). Both are among the most common causes of death in Scotland (at the population level – as we have noted in earlier sections, for some age groups, such as young and middle-aged men, the main causes are different).

Inequalities in cancer deaths (45 to 74 years): a summary of routine reports

Cancer deaths (45 to 75 years), standardised for age and sex, have fallen from 530 per 100,000 in 1996 to 350 per 100,000 in 2020²².

Relative inequalities increased over this period, reaching their highest level in 2020, when those living in the most deprived *tenth* of areas were more than twice as likely to die from cancer than those in the least deprived *tenth* of areas (573.7 deaths per 100,000 population compared to 220.0). The absolute gap has fluctuated but in 2020 was at its highest since 2015.

Analysis from Public Health Scotland indicates that in the first year of the COVID-19 pandemic, cancer death rates and inequalities were not over and above what would have otherwise been expected²².

Describing cancer deaths collectively can disguise important trends occurring in different cancer types. Brown et al. found that rates of liver cancer and head and neck cancer in men increased between 1981 and 2016, and at a faster pace in the most deprived areas. Lung cancer declined but at a faster pace in the least deprived areas⁴⁴. Current inequalities in cancer mortality are largely driven by lung cancer, with contributions from liver, and head and neck. Among women, there has been an increase in the rate of lung and liver cancer mortality with the increase higher in more deprived areas. Lung cancer is the major contributor to absolute and relative inequalities, although for women in their thirties, relative inequalities in total cancer mortality tend to be due to breast, ovarian and stomach cancer and cancer of the cervix. Public Health Scotland reported that the rate of deaths caused by preventable cancers was more than twice that of treatable cancer deaths in 2020²⁴.

In Chapter 2 we consider trends in inequalities in cancer incidence, and in the care cascade Spotlight in Chapter 4, we consider how inequalities in cancer mortality can arise at various points along the patient journey.

Inequalities in coronary heart disease deaths (45 to 74 years): a summary of routine reports

Between 1997 and 2020²², deaths rates from coronary heart disease (CHD, in 45 to 74-year-olds) had fallen to a third of their original levels (from 373 to 123 per 100,000). However, CHD remains the most common cause of premature mortality in Scotland³⁰.

Whilst the absolute gap in CHD deaths between the most and least deprived *tenth* of areas halved over this period, the gap remains large (at 185 deaths per 100,000 in 2020). Relative inequalities, between the most and least deprived areas, increased from a 3 to 4-fold difference to a 4 to 5-fold difference between 1997 and 2020.

In Chapter 2 we discuss how hospital admissions for first-time heart attacks and inequalities in this outcome have changed over time.



Timing and cause of death: synthesis of findings

A clear pattern emerges that those living in more deprived areas have higher rates of death, from all causes examined, and across the life-course. Those living in the most deprived fifth of areas are *at least* twice as likely to die from almost every cause examined as those in the least deprived fifth, and for some outcomes, such as the deaths of despair, these inequalities are far greater.

For life expectancy, infant mortality, all-cause mortality in 15 to 44-year-olds, and avoidable mortality, steady progress was being made throughout the first decade of the 21st century, after which these improvements started to stall. There are even recent signs of a worsening in these outcomes, especially in the most deprived areas, leading to a widening of inequality. Other analyses of Scottish mortality have documented the same pattern⁹.

When we look individually to the causes of death which make the biggest contributions to the composite mortality measures, we also see a stalling of reductions in inequalities in recent years. Deaths from cancers and circulatory diseases have fallen quite dramatically since 2000. This has been accompanied by a widening of relative inequalities, which is common when prevalence falls. However, absolute inequalities in cancer have also potentially widened recently. Large declines in both the overall prevalence, and absolute inequalities in, alcohol-specific deaths and probable suicide rates in the 2000s have since stalled. The biggest single contributor to mortality in 15 to 44-year-olds is drug deaths, which have dramatically increased over the past two decades and particularly so since 2013.

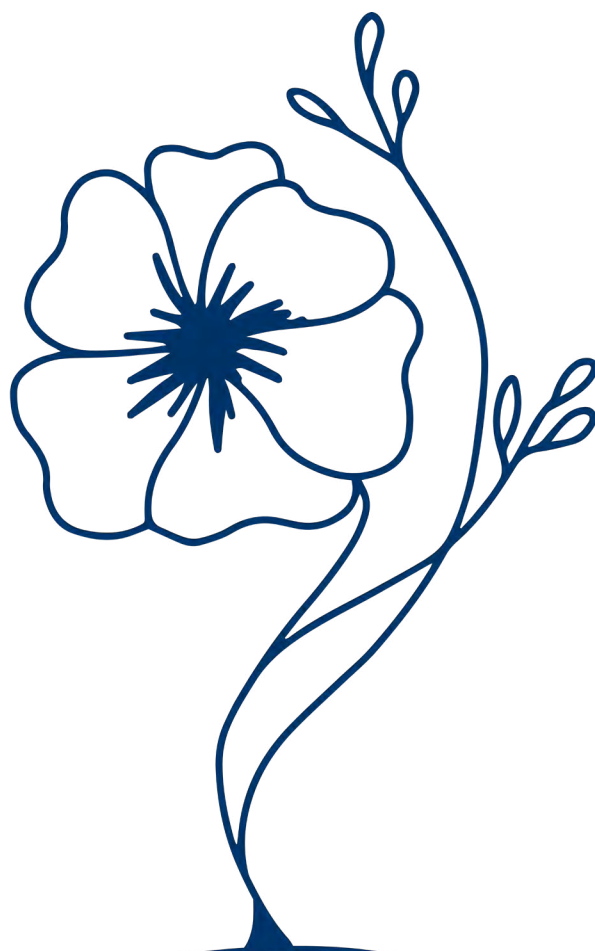
In 2020, accidental poisonings including drug-deaths were the fourth most frequent cause of premature mortality in Scotland, causing 5.7% of deaths in those aged under 75³⁰. In 2019, the rate of drug-related deaths in the most deprived fifth of areas was 20 times as high as that in the least deprived fifth. This is up from a relative difference of 10 in 2001 and 12 in 2010. Whilst all areas of Scotland experience inequalities in drug deaths, inequalities are greatest for areas with large and relatively deprived urban centres, a pattern that is also true for alcohol-related deaths.

For many causes of mortality, including drug deaths, rates get progressively higher in each fifth of area-level deprivation – in other words, these inequalities are not confined to the most disadvantaged areas. That said, there is often an especially large gap between the most deprived fifth compared to the next. We see this for avoidable mortality, alcohol deaths, and for drug deaths which provides the most striking example: the absolute gap between the first and second most deprived fifth of areas is greater than the gap between the second most and least deprived fifth of areas. This potentially points to an accumulation of multiple sources of deprivation that are likely to be more prevalent among those living in these areas. The effects of multiple forms of disadvantage can be greater than the sum of their parts when experienced together or in the harshest dosages, as highlighted in the Spotlight on multiple

disadvantages. Here we saw that the risk of premature mortality in those who experienced homelessness or prison was considerably higher when in combination with one or more additional risk factors.

In conclusion, stark inequalities in mortality rates are seen in infancy and throughout the life-course in Scotland. It is important to consider deaths across the life course in their entirety – the most vulnerable populations are more likely to die in infancy or in young and middle adulthood, and so will be underrepresented in statistics on deaths at older ages. Therefore, only looking at inequalities in causes of death at older ages would downplay the size of the problem. Many of these inequalities have been widening over the past decade. Deaths of despair are of particular concern and now make up two-thirds of absolute inequalities in mortality amongst young men.

In the following Chapter we turn to inequalities in health, wellbeing, and disease. In Spotlights we consider inequalities in multi-morbidity, the health of care experienced children and young people, and how social, demographic and health characteristics interact to shape experiences of health, often with stark consequences.



CHAPTER 2:

Health, wellbeing, and disease



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Health inequalities in Scotland:
An independent review

Introduction

In this chapter we examine a wide-ranging selection of outcomes representing physical and mental health, wellbeing, and disease.

- Perhaps the most striking finding is that healthy life expectancy at birth has fallen in the most deprived tenth of areas and is now 24 years shorter than in the least deprived tenth of areas.
- Looking at health over time suggests that in many cases adult health is declining in Scotland – with recent rises in cancer incidence, longstanding limiting illness and poor mental health among adolescents and adults.
- Asthma diagnoses are an exception, remaining reasonably stable over time with small inequalities. However, hospital admission data imply that there are large inequalities in severe, uncontrolled asthma.
- Some outcomes in childhood show neutral or positive trends in the population average – child development has been improving, the risk of childhood obesity has remained at around 10%, and the prevalence of low birthweight has also remained relatively stable. However, these averages mask worrying patterns within different socio-economic groupings – with obesity risk increasing in the most deprived areas and signs that low birthweight may be too. A Spotlight on care experienced children highlights the very high levels of mortality and ill health in this group compared to the general population.
- The Spotlight on intersectionality shows that different elements of social disadvantage experienced together can affect health in different ways – for example we see large socio-economic inequalities (by area-level deprivation) in white Scottish adults, whereas Pakistani groups tend to experience worse health than the average no matter where they live.
- A Spotlight on multimorbidity describes how the proportion of the Scottish population suffering from more than one health condition is rising. Not only are deprived communities at greater risk of each individual health outcome explored, but they are also at greater risk of experiencing multiple health conditions simultaneously. Therefore, the trends presented for each individual condition in this section may undersell the size of the health burden in some groups.

Healthy life expectancy

Healthy life expectancy is the average age that we would expect babies born now to reach whilst still in a state of 'good' general health, assuming that current levels of health and mortality remain the same. In other words, it adds a 'quality of life' dimension to life expectancy, which focuses only on length of life. Healthy life expectancy was identified as important by our stakeholders because of its relevance to citizens' lived experience and quality of life in later years, and because of its identification as a policy priority for both Scottish and UK governments.

As described in a study by Walsh et al, healthy life expectancy increased markedly in Scotland between 1995 and 2009, but then decreased by approximately 2 years between 2011 and 2019⁴⁵. This decline varied by sex. As shown in the following figures, between 2015-17 and 2018-20, healthy life expectancy declined by 1.4 years in men and 0.9 years in women.

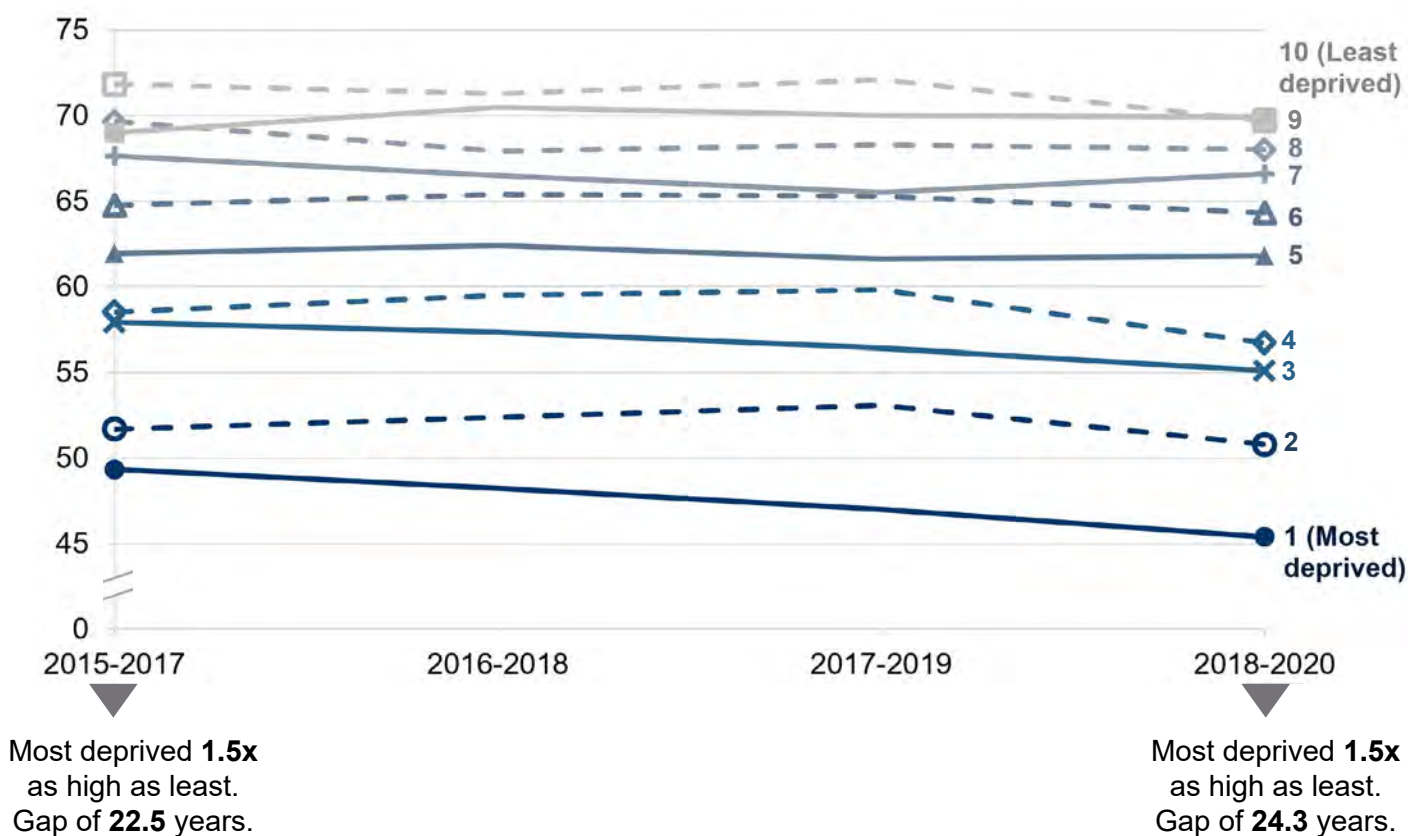
These trends differ from the other UK countries. For example, between 2015-17 and 2018-20 in England, healthy life expectancy fell for men, although only slightly (-0.2 years), and remained similar for women (+0.1 years)⁴⁶. As of 2018-20, healthy life expectancy was lowest in Scotland out of all UK countries: male healthy life expectancy was 60.9 compared to 61.5 years in Wales and Northern Ireland, and 63.1 years in England. For women, it was 61.8 in Scotland, 62.4 in Wales, 62.7 in Northern Ireland, and 63.9 years in England.

Figures 2.1 and 2.2 show trends in healthy life expectancy broken down by *tenths* of deprivation (in contrast to other graphs in this report which have compared *fifths*) since 2015-17. The differences in healthy life expectancy are extremely high – babies born in the least deprived areas of Scotland can expect to live for a quarter of a century longer in good health than their peers born in the most deprived areas (70 years compared to 45 years in males and 73 years compared to 49 years in females). Inequalities persisted between 2015-17 and 2018-20 and healthy life expectancy fell by almost five years among men living in the most deprived tenth of areas.



Figure 2.1. Healthy life expectancy for male babies has declined and is now 24 years shorter in the most deprived areas compared to the least

Male healthy life expectancy at birth (years), by area deprivation tenth: 2015-17 to 2018-20.



	2015-2017	2016-2018	2017-2019	2018-2020
Population average (years)	62.3	61.9	61.7	60.9
Relative difference	1.5	1.5	1.5	1.5
Absolute gap (years)	22.5	23.0	25.1	24.3

Source: National Records of Scotland. Healthy Life Expectancy in Scotland reports (Data files).

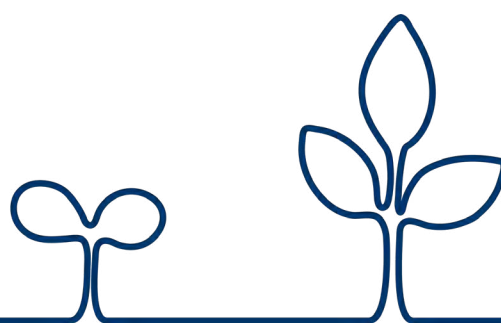
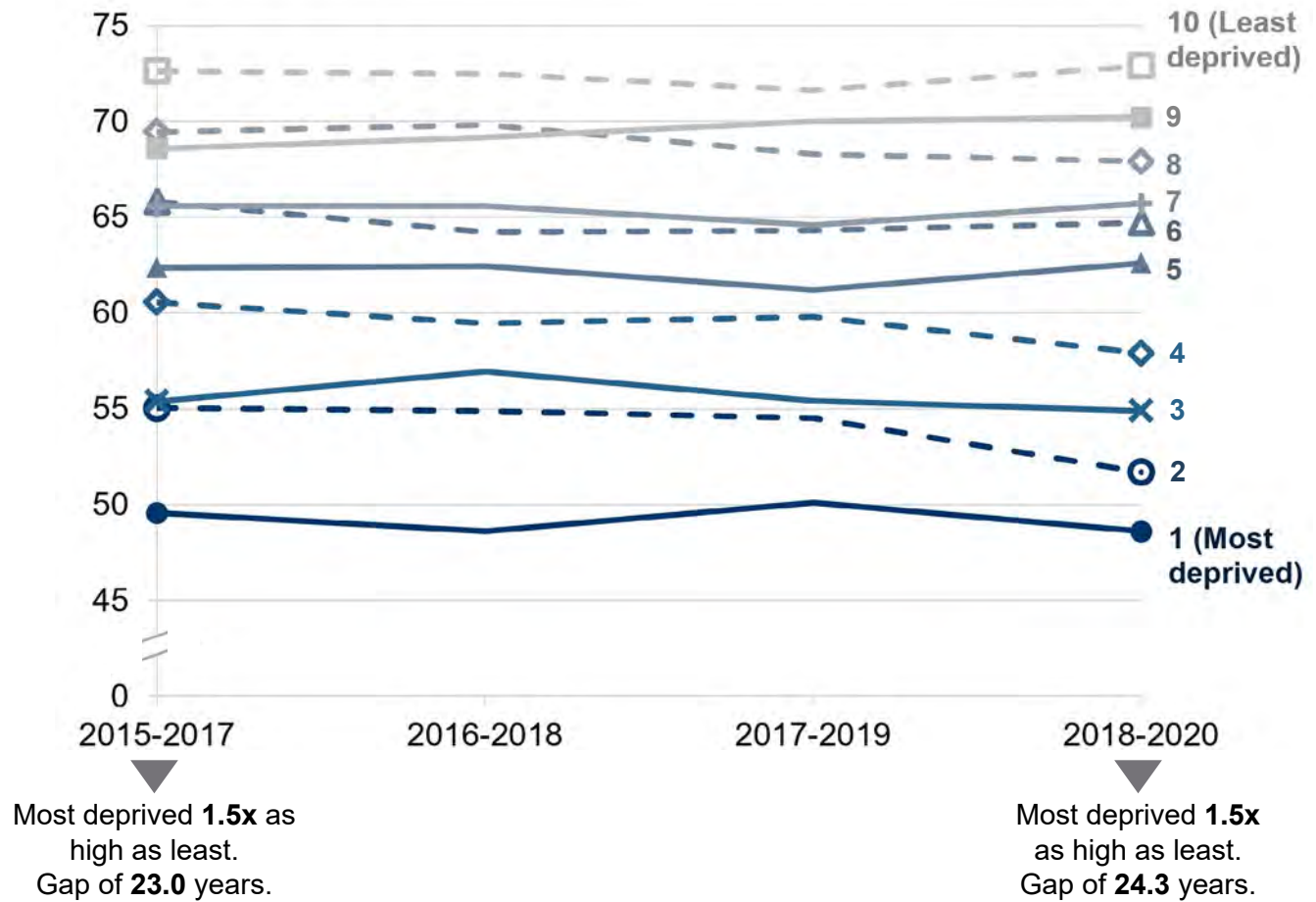


Figure 2.2. There are extremely large inequalities in female healthy life expectancy

Female healthy life expectancy at birth (years), by area deprivation tenth: 2015-17 to 2018-20.



	2015-2017	2016-2018	2017-2019	2018-2020
Population average (years)	62.6	62.2	61.9	61.8
Relative difference	1.5	1.5	1.4	1.5
Absolute gap (years)	23.0	23.9	21.5	24.3

Source: National Records of Scotland. Healthy Life Expectancy in Scotland reports (Data files).

Beyond area-level deprivation: healthy life expectancy in rural and urban areas

There is also evidence of substantial differences in healthy life expectancy between urban and rural areas, although these are not so large as for area-level deprivation. For example, healthy life expectancy of male babies born in remote rural areas is seven years longer than those born into urban areas. This difference shows possible signs of widening, driven by a fall in healthy life expectancy in urban areas over time (Appendix E.2.1). The differences in healthy life expectancy between large urban and remote rural areas are smaller for women than for men (four years). It is worth noting that the sample size is relatively small for some of the groups examined, particularly rural categories, and so confidence in these estimates is quite low, especially when looking at change over time. As discussed in the methods

section (with more detail given in Appendix C), differences between urban and rural areas are hard to disentangle from differences between deprivation levels, because urban areas are on average more deprived than rural areas. However, other factors may also be at play, including different access to services, different employment patterns, and variations in infrastructure and the built environment.

The inequalities seen in this section on healthy life expectancy are the combined result of the picture of mortality and life expectancy we saw in Chapter 1, and self-rated health (which we will return to later in this Chapter). With these overall inequalities in healthy life expectancy in mind, we now describe more specific aspects of health, with a particular focus on the early years as arguably the most important period in the life course to intervene to maximise life chances and reduce inequalities^{36 47}. Important physical, cognitive and social developments occur during this time, which support current and future health and wellbeing, as well as social outcomes like schooling and employment⁴⁸.

Birthweight

Birthweight is an important indicator of foetal health and growth, the mother's own health, and it is associated with mortality⁴⁹. It is the only early years outcome included in the Long-term Monitoring of Health Inequalities reports, which show that the percentage of singleton babies born low birthweight (<2500g) has remained stable since 2000, at around 5-6%²².

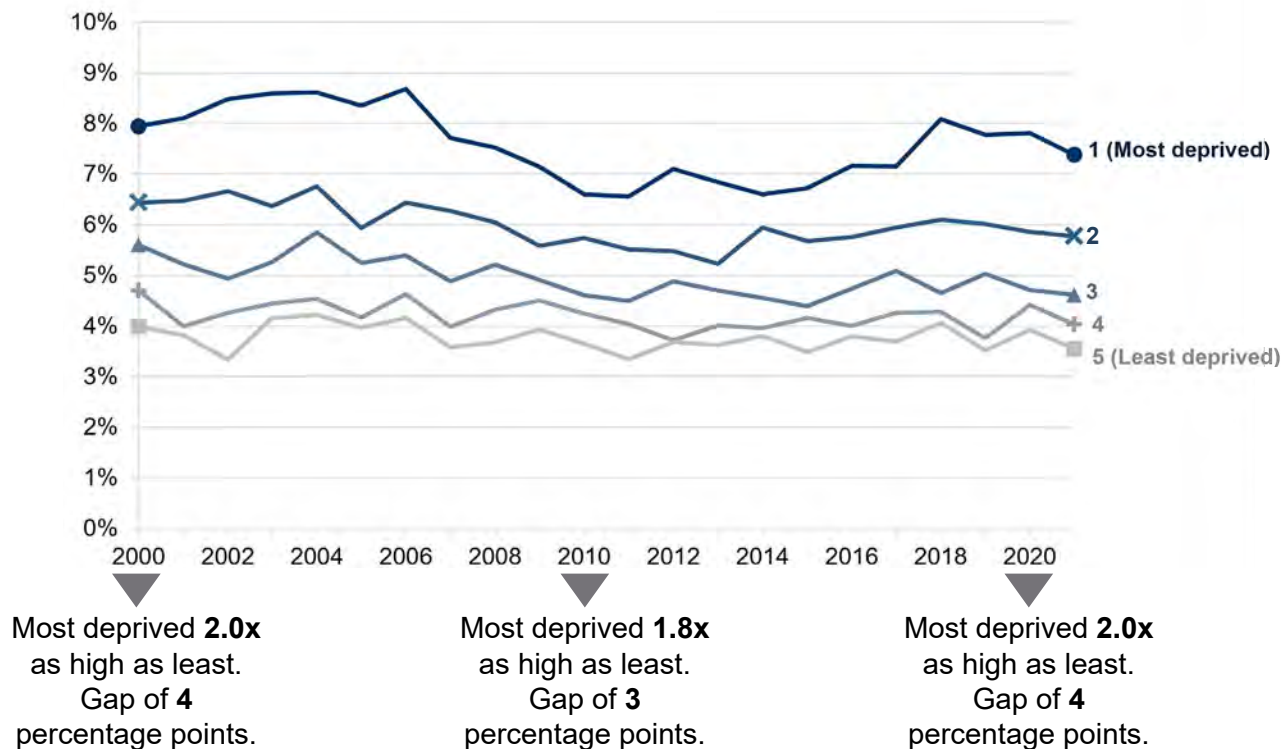
The relative difference in low birthweight by area-level deprivation decreased between the early 2000s and 2014 but has since shown signs of returning to earlier levels (with a two-fold difference between the most and least deprived fifths of areas in 2020) (Figure 2.3). This has mainly been driven by increases in the prevalence of low birthweight in the most deprived fifth of areas. Similar patterns were seen in the absolute gap, which declined until approximately 2015 when it began to widen again.

Many babies will be born with low birthweights because they are born early. The proportion of premature births (<37 weeks gestation) has increased with time, driven by women giving birth at older ages and by health care developments which have led to increases in preterm deliveries due to medical intervention and better infant survival. These factors will also be contributing to trends in low birthweight. Pre-term deliveries have also increased because of rises in assisted reproductive technologies leading to more multiple births, however this should not contribute to the trends we see in low birthweight, as the data are limited to singleton babies.



Figure 2.3. Babies in the most deprived areas twice as likely to be born low birthweight, with few signs of improvement

Proportion of singleton babies born low birthweight (<2500g) (%), according to fifths of area-level deprivation: 2000 to 2021.



	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
Population average (%)	5.9%	5.7%	6.2%	6.1%	5.6%	5.1%	5.2%	5.1%	5.3%	5.7%	5.5%
Relative difference	2.0	2.5	2.0	2.1	2.0	1.8	1.9	1.7	1.9	2.0	2.0
Absolute gap (% points)	4%	5%	4%	5%	4%	3%	3%	3%	3%	4%	4%

Source: Public Health Scotland. Births in Scottish Hospitals year ending 31 March 2021.

Early child development

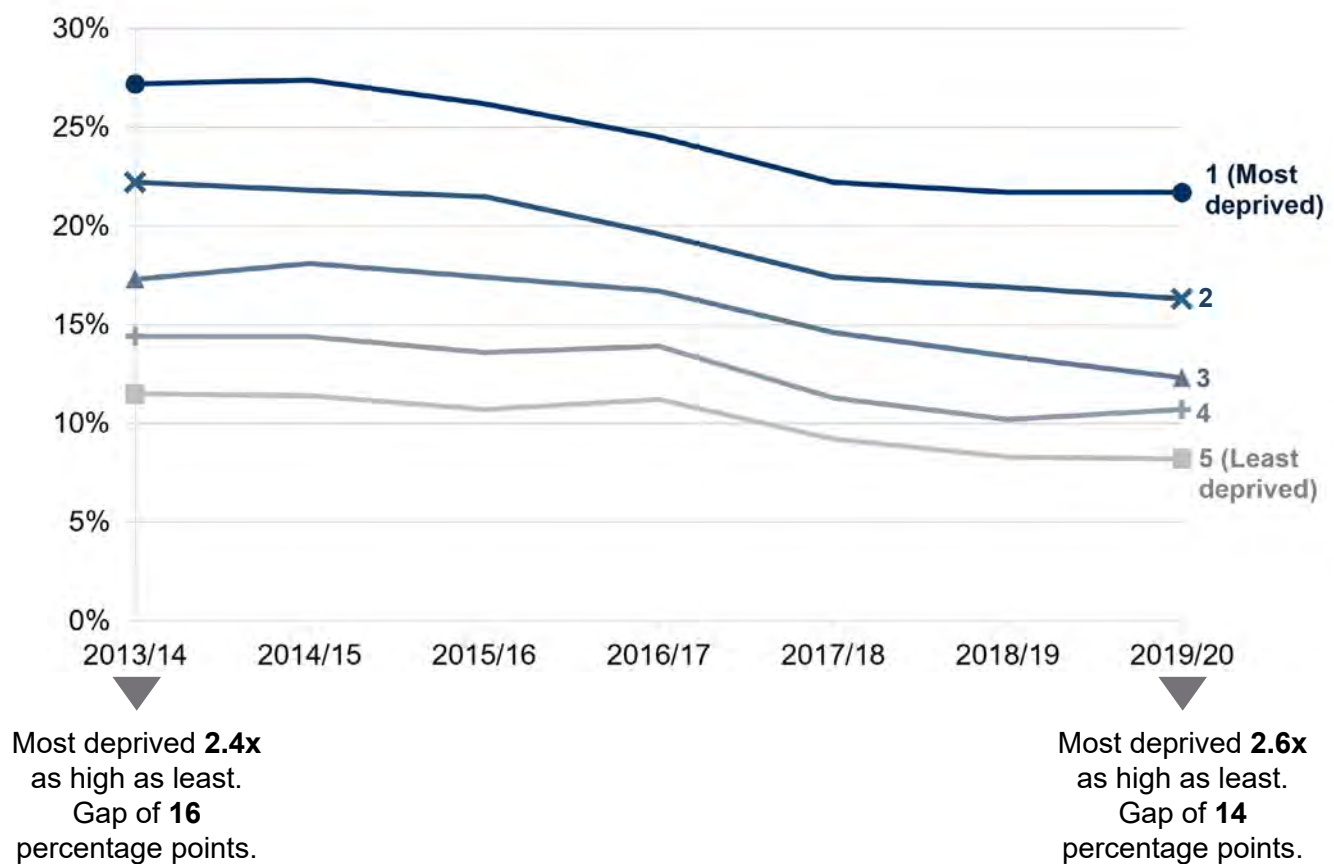
At the age of 27-30 months, health visitors assess children’s development and note down if there are concerns in one or more areas – language, speech and communication; hearing; seeing; motor skills (such as climbing stairs or holding a pencil); emotional / behavioural wellbeing; problem solving; and social skills. Developmental concerns, if not resolved, may have implications for children’s school readiness, which in turn affects academic attainment and job opportunities, perpetuating inequalities^{36 48}.

Figure 2.4 shows that the proportion of children with development concerns has fallen since 2013, overall and across all levels of area-level deprivation (and potentially slightly more so in those in the most deprived areas). However, development concerns are still identified in 14% of children, and whilst the absolute gap may have fallen slightly with decreasing overall prevalence, relative inequalities have increased.

The absolute gap in developmental concerns between children living in the most and least deprived fifth of areas was 14 percentage points, which equates to children in the most deprived fifth being 2.6 times as likely to have developmental concerns. In other words, whilst things are improving overall, unfair differences warrant further action.

Figure 2.4. Developmental concerns in toddlers have fallen, but inequalities remain

Prevalence of developmental concerns at 27-30 months review (%), according to fifths of area-level deprivation: 2013/14 to 2019/20 (financial years).



	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Population average (%)	19.2%	19.2%	18.4%	17.6%	15.4%	14.5%	14.3%
Relative difference	2.4	2.4	2.4	2.2	2.4	2.6	2.6
Absolute gap (% points)	16%	16%	16%	13%	13%	13%	14%

Source: Public Health Scotland. Early child development Scotland 2019/20. 27 to 30-month tables. Coverage of checks ranged from 87% in 2013/14 to 91.7% in 2018/19⁵⁰.

Childhood obesity

Experiencing obesity in childhood and adolescence can negatively impact on self-esteem and quality of life⁵¹ and, because it increases the risk of obesity in adulthood, can place people at a higher risk of type 2 diabetes, cardiovascular conditions and premature mortality⁵².

Identifying obesity in children is complex, as their height and weight growth varies with age and by sex. Epidemiological definitions⁵³ can be used to identify the proportion of children in a population who are 'at risk' of being or becoming obese (based on the average childhood growth patterns of adults who experienced obesity).

Figure 2.5 shows trends in the proportion of children who were at risk of obesity (BMI in or above the 95th centile of the 1990 UK distribution) according to fifths of deprivation between 2001/2 and 2019/20. At the population level, the proportion has remained fairly stable over the past twenty years in Scotland, with around one in ten children at the start of school at risk of obesity.

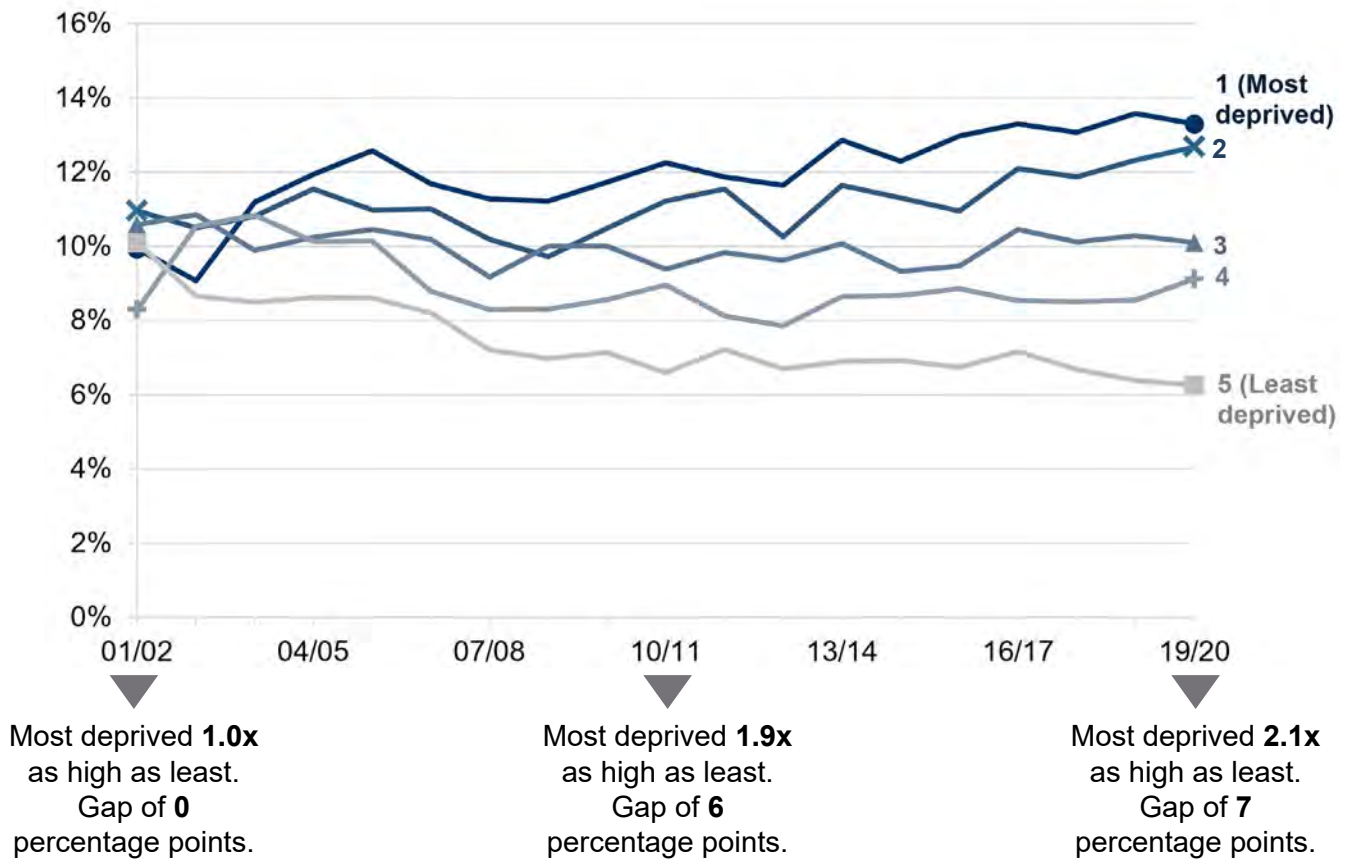
However, this disguises potentially worrying differences across areas. Risk of childhood obesity has fallen slightly in the least deprived areas, whereas it has increased slightly in the most deprived areas, leading to a widening of inequalities. By 2018/2019 children living in the most deprived fifth of areas were twice as likely to be at risk of obesity, with an absolute gap of 7.2%.

The lack of inequality seen in the early 2000s must be interpreted with some caution because coverage of the Primary 1 weight and height checks was below 50% up to 2007/8. Coverage reached over 90% and remained high after 2012, with a slight drop in 2018/19 when temporary changes to the consent process were made. Therefore, the increase in obesity risk in deprived areas over the past decade is likely to be robust. Between 2019/20 and 2020/21 (years covering the COVID-19 pandemic), risk of obesity increased across all deprivation fifths. This upturn is unlikely to be solely attributed to the lower proportions of children who could be measured over the course of the pandemic⁵⁴.



Figure 2.5. Inequalities in childhood obesity risk at the start of school have widened over the past decade

Proportion of children in Primary 1 at risk of obesity (%), according to fifths of area-level deprivation: 2001/2 to 2019/20.



	01/02	04/05	07/08	10/11	13/14	16/17	19/20
Population average (%)	10.1%	10.5%	9.3%	9.7%	10.2%	10.5%	10.3%
Relative difference	1.0	1.4	1.6	1.9	1.9	1.9	2.1
Absolute gap (% points)	-0.2%	3.3%	4.1%	5.6%	6.0%	6.1%	7.0%

Source: Public Health Scotland. Primary 1 Body Mass Index (BMI) statistics Scotland report. (2021)

Coverage of the Primary 1 weight and height checks was below 50% up to 2007/8. Coverage reached over 90% and remained high after 2012, with a slight drop in 2018/19 when temporary changes to the consent process were made.

Similar patterns are observed when looking at the proportion of children who are at risk of overweight, including those at risk of obesity (Appendix E.2.2), although the relative inequalities are smaller. This follows a common pattern where inequalities are widest for the most severe manifestations of an outcome. Different cut-offs are also available for identifying obesity in clinical settings, for diagnosis and treatment. These clinical definitions use more extreme thresholds, to minimise the chances of mistakenly identifying a child as obese when they are not. Examining patterns using these clinical cut-offs again shows similar patterns of inequality and increases among those in the more deprived areas (Appendix E.2.3).

This widening of inequality in obesity has been shown for a broader age group of children (2-15 years) in survey data^{55 56}. The situation is similar in England, with obesity risk increasing in the most deprived areas and declining in the least⁵⁷.

For some children, being at risk of overweight or obesity may be transient, but those living in deprived areas are more likely to experience persistent overweight or obesity risk. By examining measurements of children born 2009-2013 from their 27-30 month checks and the primary school checks, we see that those living in more deprived areas are 1.5 times as likely to be at risk of overweight or obesity at *both* time points as those living in less deprived areas⁵⁸.

In the next chapter on health-related behaviours, we consider trends and inequalities in diet and physical activity and how they are determined by a range of societal factors. We also describe the reasons why targeting diet and activity alone is unlikely to reduce inequalities in childhood overweight and obesity.

Adolescent mental wellbeing

Anxiety and depression are among the leading causes of ill health and disability in adolescents⁵⁹. Poor mental health at this age tracks into adulthood and can affect life chances, including academic attainment, employment opportunities and the formation of relationships, perpetuating inequalities⁶⁰.

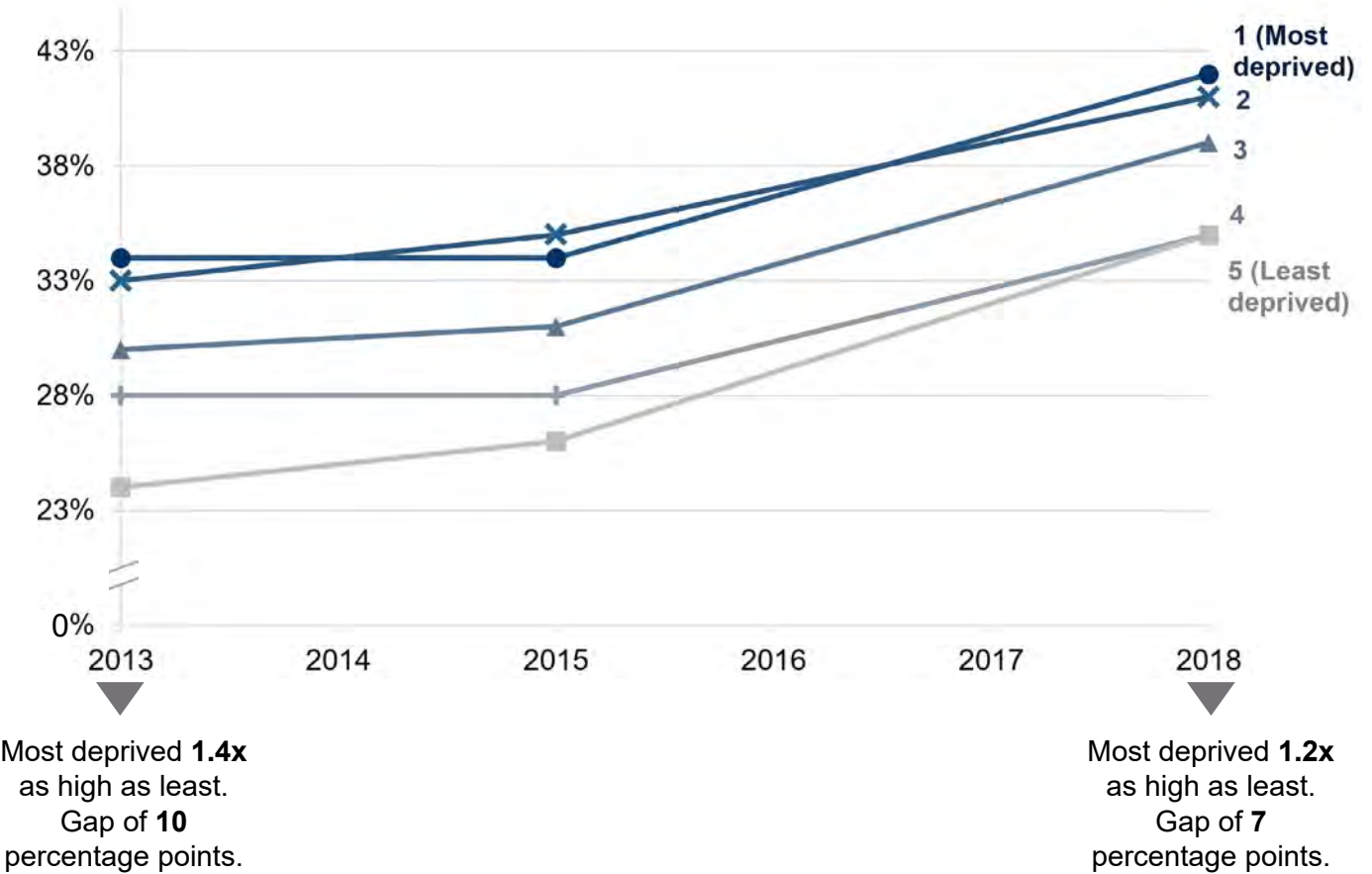
It is possible to look at trends in poor adolescent mental wellbeing between 2013 and 2018 using the Scottish Adolescent Lifestyle and Substance Use Survey (based on borderline-abnormal Strengths and Difficulties scores). Figure 2.6 shows a large increase in poor mental wellbeing (from 30% to 38%). It is likely that the prevalence of mental health problems has increased further during the COVID-19 pandemic⁶¹.

Relative and absolute inequalities narrowed slightly, over this period, but this is the result of 'levelling down' (i.e. a more rapid rise in poor mental wellbeing in less deprived groups). It should therefore not be viewed as a success story. There are signs that further 'levelling down' may have occurred during the pandemic in children and young people⁶².



Figure 2.6. Poor mental wellbeing in adolescents has increased across all levels of deprivation, with a small decline in inequalities

Proportion of 13 and 15-year-olds with poor mental wellbeing (%), according to fifths of area-level deprivation: 2013, 2015 and 2018.



	2013	2015	2018
Population average (%)	30%	31%	38%
Relative difference	1.4	1.3	1.2
Absolute gap (% points)	10.0%	8.0%	7.0%

Source: Scottish Government. The Scottish Schools Adolescent Lifestyle and Substance Use Survey. Mental wellbeing reports.

The following Spotlight on care experienced young people shows that particularly stark inequalities in mental health are seen amongst care experienced children and young people. This group has often experienced traumas or harsh disadvantages from early ages, which can have substantial impacts on all aspects of health and wellbeing.

Spotlight on care experience

Health of care experienced children & young people

Written in collaboration with M. Allik

Care experienced children and young people have at some point in their life been formally 'looked after' in foster, residential, or kinship care, or have resided with family while supervised by social workers. Approximately 15,000 children and young people were currently 'looked after' in Scotland in 2020⁶³. The numbers cared for at some point during their childhood are far higher⁶⁴.

All children have a right to flourish, but evidence suggests that care experienced children may need more support to reach their potential⁶⁵. Up until now the health of children in care has not been well understood in Scotland. Below we summarise a selection of findings⁶⁶ from the Children's Health in Care Scotland (CHiCS) study, which follows children born in 1990-2004⁶⁴.

Care experienced children have higher mental health needs

The CHiCS study shows that many care experienced children face complex and often long-term mental illness when compared to the general population, for example they are:

- 3 times as likely to be prescribed medication for mental illness.
- 4 times as likely to have attended at least one psychiatry outpatient visit.
- 6 times as likely to have been hospitalised for a reason related to mental health.

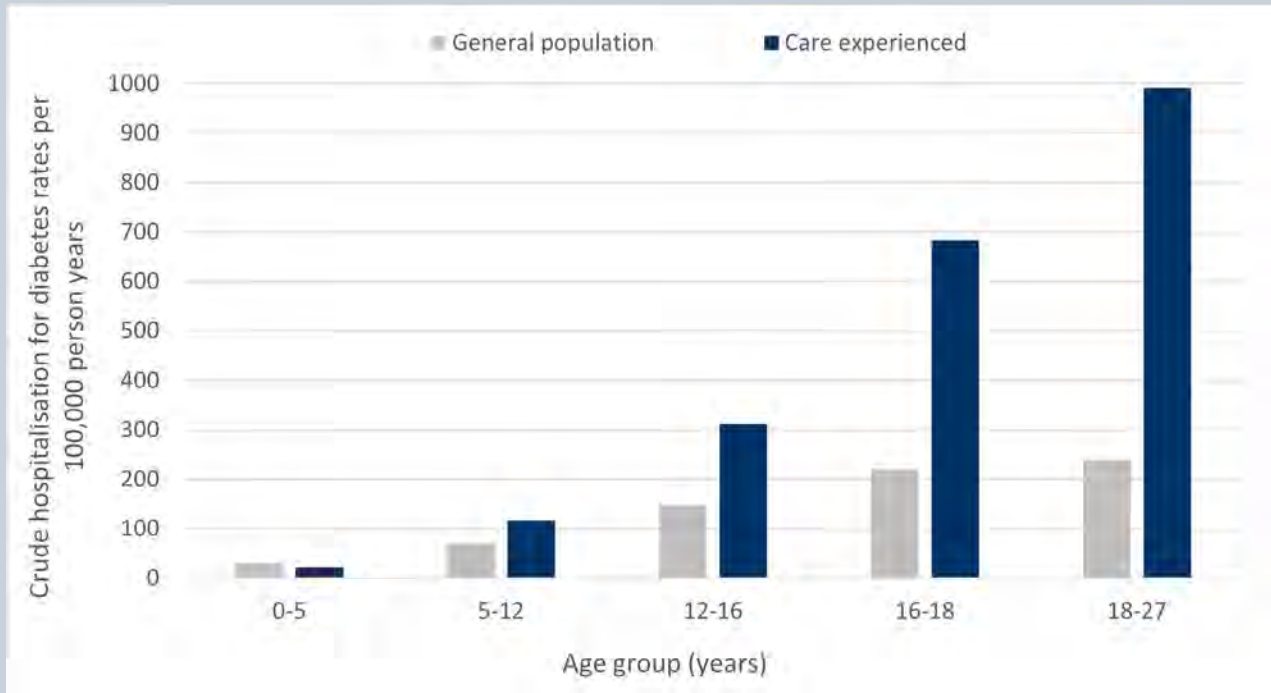
Care experienced children's health varies by the type of care they receive. For example, children living with foster families tend to have better mental health than those who experience residential care.

These inequalities represent a failure to minimise the mental health impacts of the experiences that bring a child into care or that occur during their time in care.

Care experienced children with diabetes need more support to manage their condition

Between the ages of 11-23, the percentage of care experienced children with diabetes is no different from the general population (1%, majority Type I). However, care experienced children had more than double the number of potentially avoidable hospitalisations related to diabetes. These differences widened with age (see Figure A). This implies there needs to be stronger systems in place to ensure all those leaving care have their health needs sufficiently supported.

Figure A. Children who have experienced care are more likely to be hospitalised for diabetes than their peers who have not been in care and these differences widen with age

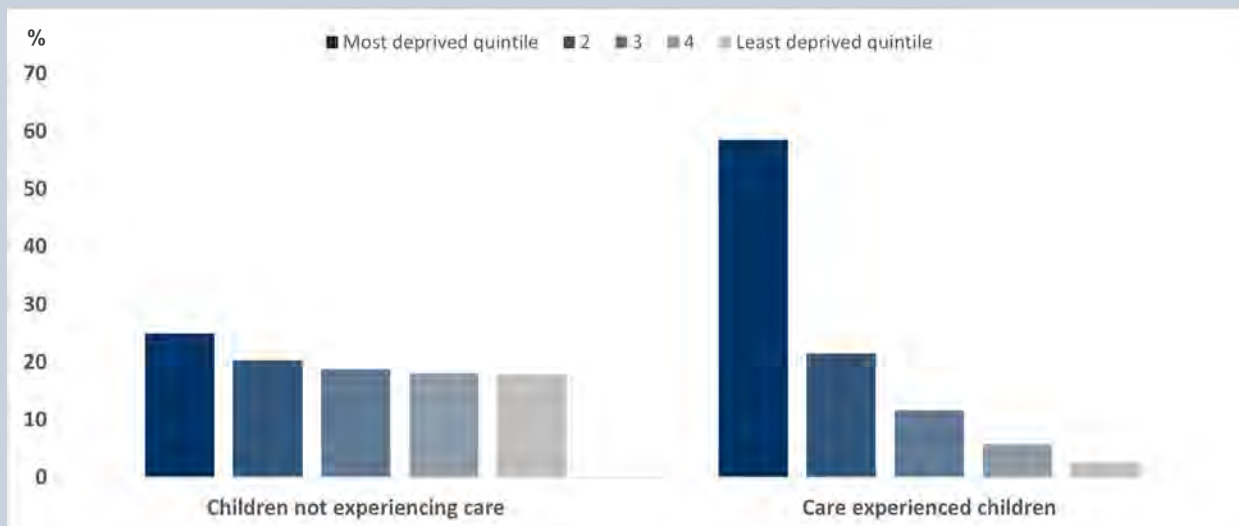


Deaths among children and young people are extremely rare, **yet care experienced children are more than 5 times as likely to die as those not experiencing care** (83.5 deaths per 100,000 compared to 15.3 deaths per 100,000 among school-aged children followed up for 7 years between 2009 and 2016)⁶⁷. These differences are especially stark when looking at external causes of death, with substantially higher rates of suicide and deaths linked to accidents. The majority of deaths do not occur while in care and may reflect the underlying and cumulative adversities that these children and their families have faced.

Social deprivation and health inequalities

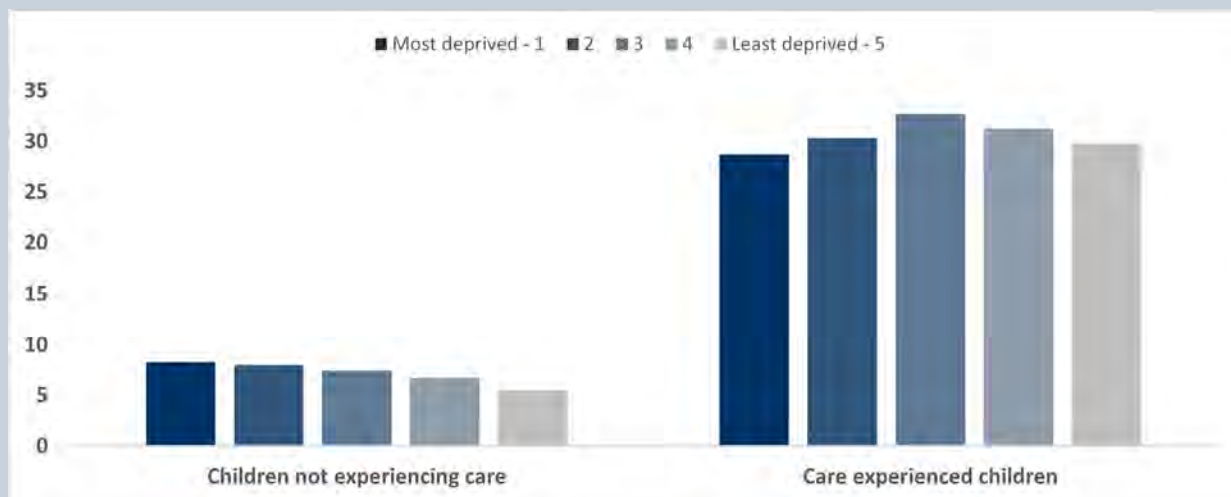
Social disadvantage greatly increases the chances of ending up in the care system. For example, care experienced children are far more likely to be born into deprived areas (Figure B).

Figure B. Children in care are far more likely to have been born in deprived areas



However, when looking at inequalities in mental health and diabetes, CHiCS found no social gradient by area-level deprivation among care experienced children (Figure C right hand side). This is probably due to their already high and unmet needs, with regards to socio-economic, mental and physical wellbeing, that far exceed the influence of the characteristics of their neighbourhoods.

Figure C. Percentage of children with a psychiatry visit by deprivation



Conclusion

Throughout this wider report we have highlighted how there are inequalities in health, right across the social gradient. Here, we highlight how some groups, such as care experienced children and their families, require additional and tailored support to experience good health. This is both necessary and within reach, as highlighted by the Independent Care Review carried out between 2017 and 2020, with The Promise report committing to drive forward change⁶⁸. This responsibility does not only lie with the care system – addressing inequalities in the wider social determinants of health will better support families with young children and can prevent some children entering care.

The information in this Spotlight is largely taken from: Allik et al. 2022 Children's Health in Care in Scotland (CHiCS): Main findings from population-wide research. University of Glasgow. doi: 10.36399/gla.pubs.279347

Now we turn to health and wellbeing measures experienced in adulthood, starting with trends in poor self-rated health and limiting long-term illness. These outcomes are presented in summary, and more detailed descriptions of trends in inequalities in these outcomes can be found in the Scottish Long-term Monitoring of Health Inequalities reports. We then go on to consider other health outcomes including adult asthma, mental health and markers of healthy and successful ageing.

Self-rated health and limiting long-term illness

A summary from routine reports

The proportion of adults describing their general health as “bad” or “very bad” has increased slightly from 7% to 9% between 2008 and 2019. Differences between groups are very large (21% in the most deprived *tenth* of areas compared to 3% in the least deprived *tenth* in 2018/19). Since 2008 relative inequalities have been maintained whilst the absolute gap between the most and least deprived areas has increased. These figures are adjusted for age⁶⁹.

Limiting long-term illness refers to physical or mental health conditions which have lasted or are expected to last for 12 months or more, and which limit day-to-day activities. The proportion of adults experiencing limiting long-term health conditions increased over the past decade from 26% in 2008/9 to 34% in 2018/19. There are big differences according to area-level deprivation, with the prevalence at 47% in the most deprived *tenth* of areas compared to 24% in the least deprived *tenth* of areas in 2018/19 (meaning a gap of 23% and a relative difference of 2). Looking back over the past decade, relative inequalities have decreased. The absolute gap increased between 2008/9 and 2014/15 (from 21 to 29%) but have since returned to 23% in 2018/19. Again, these figures are age-adjusted⁶⁹.

Beyond area-level deprivation: self-rated health and long-term health conditions in Gypsy and Traveller Communities

In Scotland we are heavily reliant upon census data to understand the health of Gypsy and Traveller communities. These communities were not given the option to officially report their ethnicity until the 2011 census, when a ‘White: Gypsy/Traveller’ category was first included in the ethnic group question. At this point, 4,000 people in Scotland identified as Gypsy/Traveller. These individuals were more than three times as likely to report having poor general health and twice as likely to report experiencing a long-term health problem or disability as White Scottish people⁷⁰. Rates of poor health are likely to have changed since the 2011 census, which is the last available data source on the health of this community.

Outreach initiatives were undertaken during the census period to encourage participation of travelling communities but note that not everyone who identifies as Gypsy/Traveller is currently travelling. Individuals might live in council or private housing, especially over winter, on fixed caravan sites, or in local authority official Gypsy/Traveller sites.

In this chapter so far, we have shown that health outcomes including healthy life expectancy, self-rated health and long-term illness are all patterned along a gradient of area deprivation. However, this picture misses some of the complexity of how ill-health is distributed across Scotland. For example, residents of deprived areas with high personal income are unlikely to have the same health experiences as residents of deprived areas who are living in poverty. Similarly, white residents in deprived areas will not have the same experiences as residents from ethnic minority backgrounds. Social, demographic and health characteristics interact to shape health, in ways that may differ from the effect of each individual characteristic in isolation. This is explored in the following Spotlight on intersectionality.

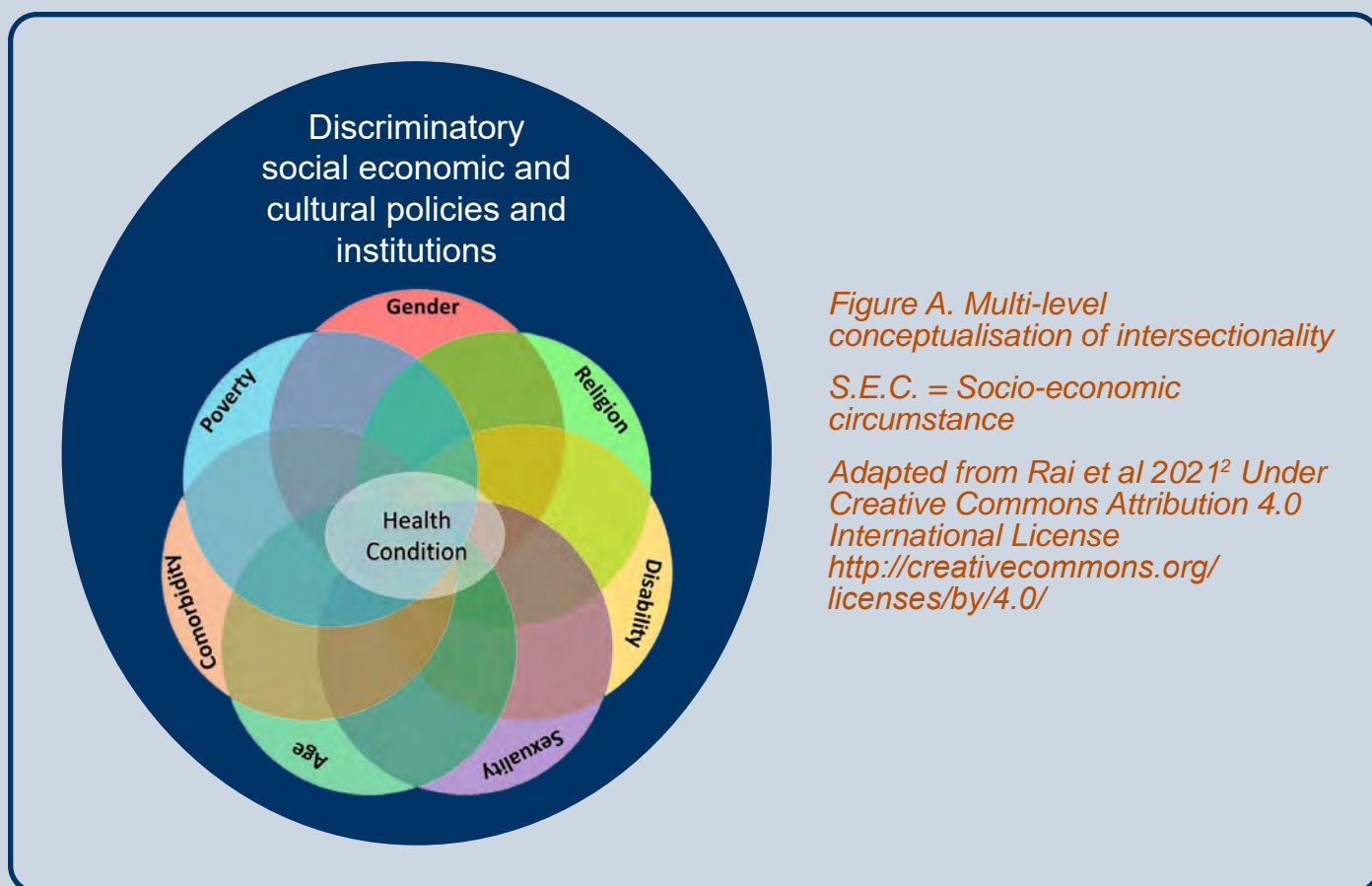


Spotlight on intersectionality

How the effects of social disadvantage accumulate and interact to shape health

In this report we have shown stark inequalities according to single elements of social disadvantage. However, people within these categories are not homogenous. For example, people living in the most deprived areas of Scotland have varying levels of household income, different types of jobs, and will come from different ethnic backgrounds. Additionally, the causes of social disadvantage, and their consequences for health, may vary for men and women.

An intersectional approach recognises that these characteristics are dynamic and interacting (Figure A). The results of these interactions can be unexpected and have effects on health that are more than the sum of their parts. Furthermore, interactions between different social experiences are occurring throughout life, and their effects on health accumulate across time. The impact of these interactions can be highly context-dependent, since the relative power and privilege that various characteristics entail can shift over time, as institutions, cultures, and economies evolve⁷¹.

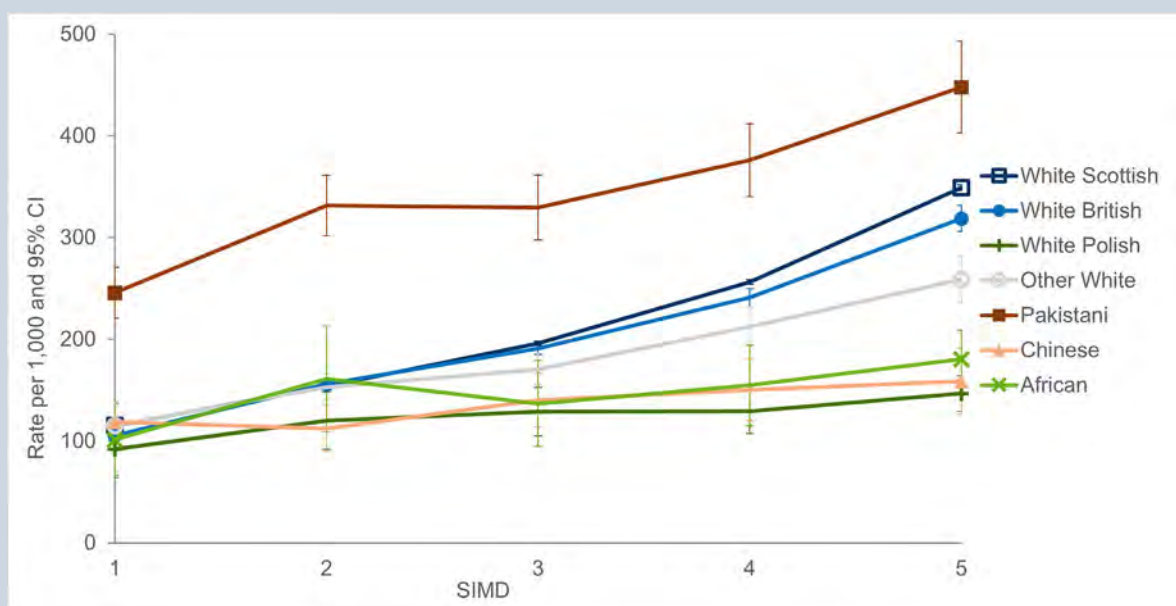


Examples of how different experiences and characteristics interact to shape health synergistically in Scotland

Ethnicity alters the effect of socio-economic circumstances on health:

- We have seen that in the general population there is a strong gradient in health by area deprivation, such as the gradient in limiting long-term illness shown in Figure B. However, what Figure B also shows is that this gradient varies for different ethnic groups. For example, the social gradient is far greater for White Scottish than White Polish people, with White Scottish groups living in the most deprived areas faring far worse¹. This may be related to different experiences of area deprivation for different ethnic groups, and additionally to a different relationship between area-level and individual-level deprivation among different ethnicities⁷².
- The Pakistani community has higher prevalence still (Figure B), with the *least* deprived fifth having similar rates of limiting long-term illness to the most deprived fifth for Other White groups and the second most deprived fifth for White Scottish¹.
- Figure B also demonstrates that there is more variation in health between ethnic groups in deprived areas, where Pakistani and White Scottish communities fare particularly badly whilst White Polish, Chinese, and African communities experience less limiting long-term illness.

Figure B. Limiting long-term illness in 45 to 59-year-olds, by deprivation fifths, in different ethnic groups, 2011. Adapted figure, using selected ethnicities only, from Allik et al, 2022¹ under terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>)



Similarly, the effect of migration status on health varies in different ethnic groups.

- On average, those born outside the UK have better self-rated health than those born in the UK. This effect is thought to arise because adults in poor health are less able to migrate to the UK for work, meaning those who do migrate are on average healthier than the general population in the UK. However, the difference between those born in the UK compared to outside the UK is not seen among the Pakistani ethnicities in Scotland, and is weaker among White Irish individuals and Indian, Black, and Chinese females⁷³.

Disabilities can compound barriers to accessing health services, in combination with other marginalised characteristics.

- In a survey of disabled people with other protected characteristics (including being from the trans community, ethnic minority groups, and low-income backgrounds), 91% reported unfair treatment some or every time they access public services, due to the combination of their disability and other characteristics. This included being dismissed or denied choice over healthcare options and experiencing invasive questioning about their backgrounds from service providers⁷⁴.
- An assumption among providers that disabled people are a homogenous group was noted. Disabled people have reported that they are made to feel a burden if their circumstances required services to make any additional adjustments, e.g. ensuring appointment times do not conflict with religious practices or festivals. In these situations, participants experienced negative consequences including delayed appointment times and negative reactions from staff.

Other identities and experiences, including gender, sexuality and religion are also likely to have important interactions, however data on this are poor in Scotland.

- In the Spotlight on multiple disadvantages (Chapter 1) we discuss in further detail how extreme experiences of social disadvantage and exclusion can accumulate and interact. However, it should also be noted that an intersectional approach considers the health experiences of all individuals, not just minority groups, since everyone is affected by societal power structures, and the privilege and disadvantage they create.
- The impacts of ethnicity, disability, migration status, and socio-economic circumstances will all be further shaped by other elements of an individual's identity and experiences, including gender, sexuality, and religion. However, since the data that are currently available to monitor health inequalities in Scotland and normally reported on each axis of inequality in isolation, our understanding of the way that different characteristics interact, and how this has changed over time, is limited.

What does this mean for policy-making in Scotland?

This Spotlight draws attention to the fact that representing health inequalities between a single element of disadvantage and health can be helpful for monitoring progress but should be considered in the context of underlying complexity. One-size-fits-all policies, for example those which target only deprived areas, may neglect the unique needs of minority populations experiencing disadvantages beyond area deprivation, and risk leaving people behind.

An intersectional perspective emphasises that there is no single magic bullet for reducing health inequalities. Instead, The Poverty and Inequality Commission and the Expert Reference Group on COVID-19 and Ethnicity have both called for a shift in the policy-making process to recognise and address the unique barriers and experiences of individuals with multiple minority or disadvantaged characteristics^{75 76}. This requires policy-making to be democratised so that all voices can be heard in policy deliberations⁷⁷.

Ultimately, an intersectional approach highlights the need to tackle all fundamental causes of health inequalities - that is the social, economic and cultural structures that establish privilege or marginalisation - as this will benefit most widely.

Asthma diagnoses and admissions

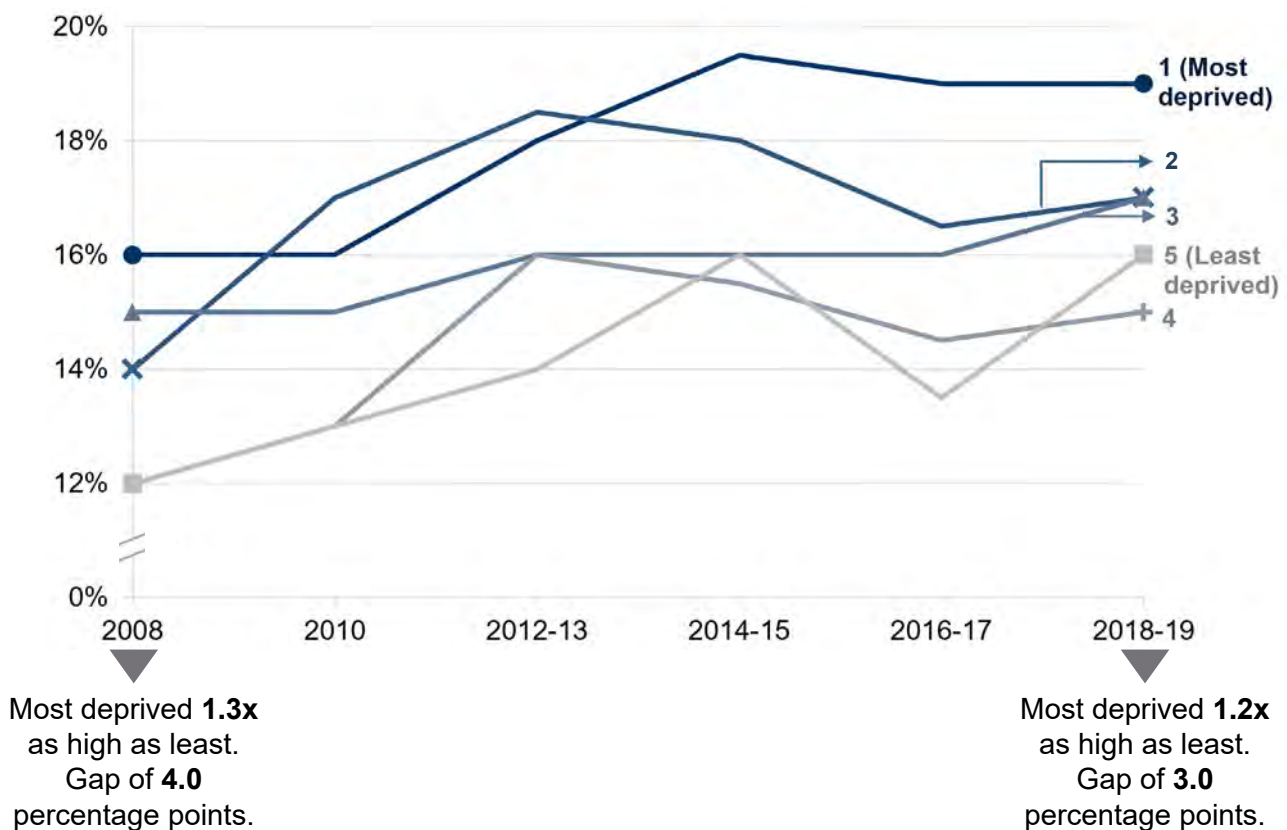
Asthma affects over 1 in 7 adults in Scotland. Asthma is a complex condition made up of several different sub-types, including allergic asthma (which is brought on by exposure to allergens like pollen, pets, and dust mites) and non-allergic asthma (the triggers of which are less well understood). Allergic health conditions (which also include eczema, hay fever and food allergies) are a rare exception when it comes to health inequalities – they can be more prevalent in more advantaged groups⁷⁸.

It is therefore not necessarily surprising that we see a lack of a clear social gradient in asthma diagnoses and potentially smaller inequalities than for the other health outcomes considered in this chapter, with 1.2 times as many diagnoses in the most deprived fifth of areas as the least deprived fifth in 2018-19. Another reason these inequalities may be smaller than for other health outcomes is that people who experience symptoms may be more likely to seek health advice and gain a diagnosis if they are from more advantaged backgrounds. Individuals from disadvantaged backgrounds who have asthma may be systematically missed from measures using diagnoses, so the gradient in asthma prevalence may be underestimated. Issues relating to health care demand, access and quality are explored in more depth in Chapter 4. Weak or inconsistent social gradients in asthma diagnoses have also been observed elsewhere⁷⁸.

Looking to trends, inequalities by area-level deprivation have been maintained at relatively low levels over the period covered (since 2008, Figure 2.7) and those according to household income may have fallen (Figure 2.8).

Figure 2.7. There are small inequalities in asthma diagnoses, with little change over the past decade

Prevalence of doctor diagnosed asthma amongst adults (%), according to fifths of area-level deprivation: 2008 to 2018-19.

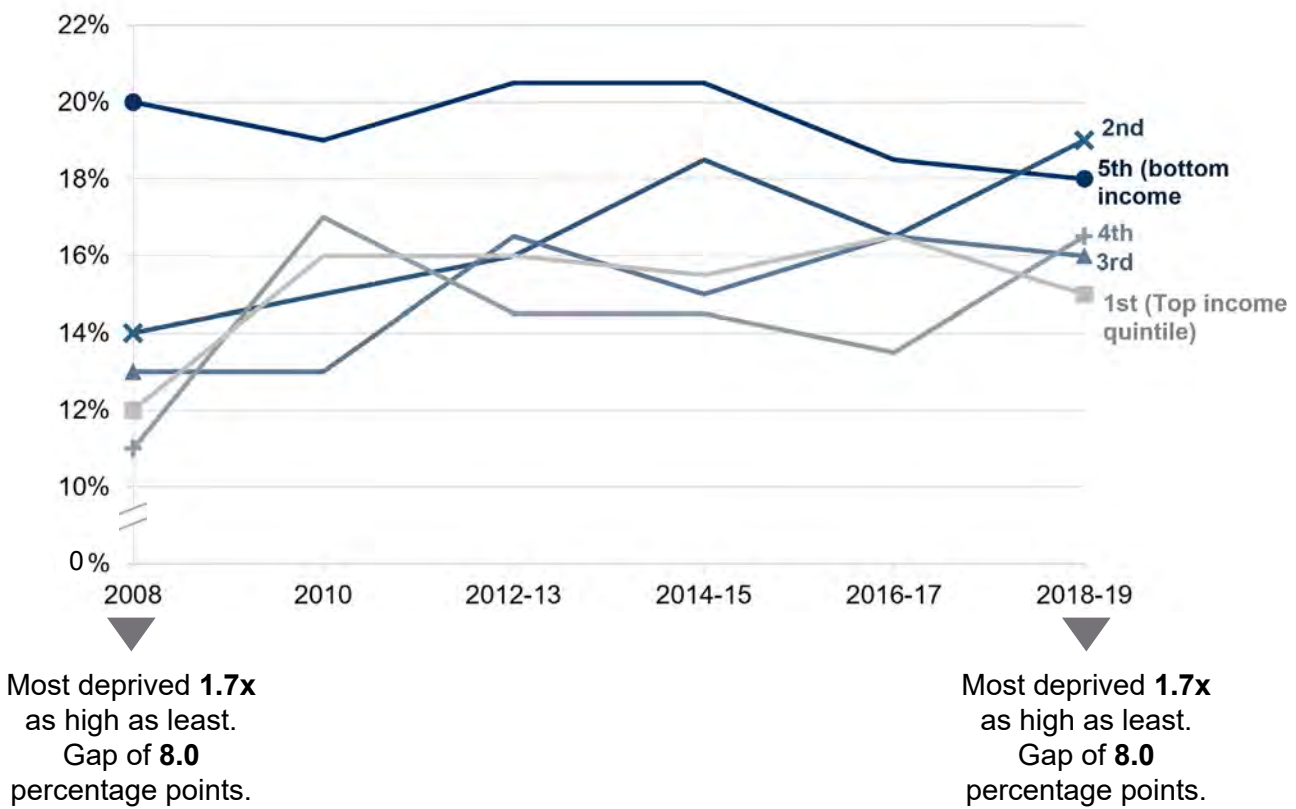


	2008	2010	2012-13	2014-15	2016-17	2018-19
Population average (%)	14.0%	15.0%	16.0%	17.0%	15.5%	16.5%
Relative difference	1.3	1.2	1.3	1.2	1.4	1.2
Absolute gap (% points)	4.0%	3.0%	4.0%	3.5%	5.5%	3.0%

Source: Scottish Health Survey Dashboard, 2022.

Figure 2.8. Inequalities in asthma diagnoses by household income are also small

Prevalence of doctor diagnosed asthma amongst adults (%), according to income fifths: 2008 to 2018/2019.



	2008	2010	2012-13	2014-15	2016-17	2018-19
Population average (%)	14.0%	15.0%	16.0%	17.0%	15.5%	16.5%
Relative difference	1.7	1.2	1.3	1.3	1.1	1.2
Absolute gap (% points)	8.0%	3.0%	4.5%	5.0%	2.0%	3.0%

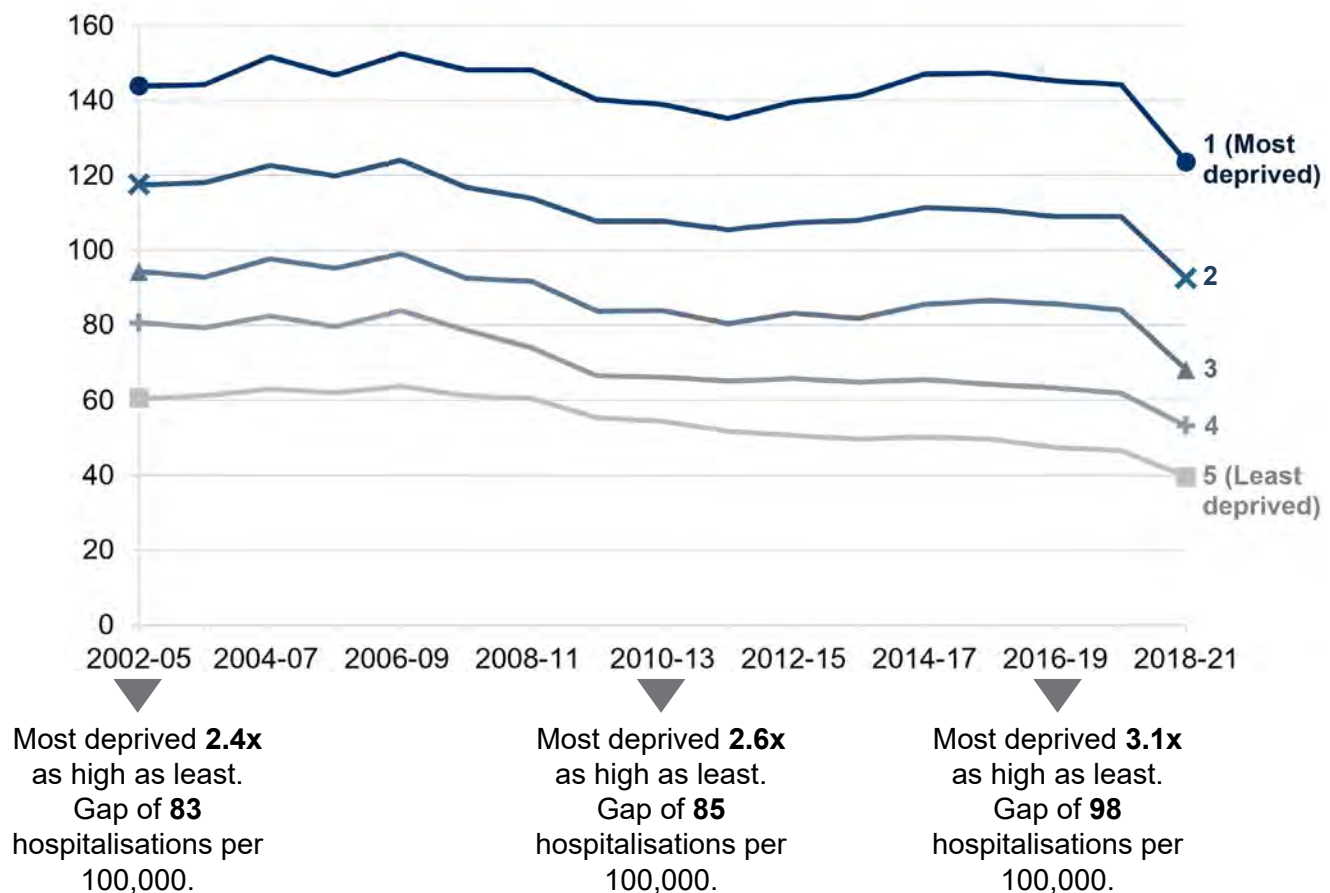
Source: Scottish Health Survey Dashboard, 2022.

Inequalities in *hospitalisations for asthma* are much larger (Figure 2.9), with those in the most deprived fifth of areas being more than 3 times as likely to be hospitalised for asthma in 2018-21 as those in the least deprived fifth. These hospitalisations reflect uncontrolled or exacerbated asthma. This exacerbation can arise due to higher exposure to co-morbidities, environmental triggers (for example from air pollution, occupational exposures, or damp housing – all of which are more common in deprived areas) and potentially poorer self-management, possibly due to poor access to primary care, which we will touch upon again in Chapter 4. Hospitalisations are also less likely to systematically miss cases than measures using diagnoses.

The absolute gap in age and sex adjusted rates of asthma hospitalisation increased between 2002-05 and 2016-19, from 83.3 hospitalisations per 100,000 to 97.9 per 100,000. Hospitalisation rates then declined during the pandemic. This may be due to a combination of changes in how health services were operating during lockdown, changes in health seeking behaviours, and reduced risk (due to reduced exposure to pollution or exercise, for example). Relative inequalities increased across the same period of 2002-05 and 2016-19, from 2.4 to 3.1.

Figure 2.9. Inequalities in asthma hospitalisations by area deprivation are greater than they are for asthma diagnoses

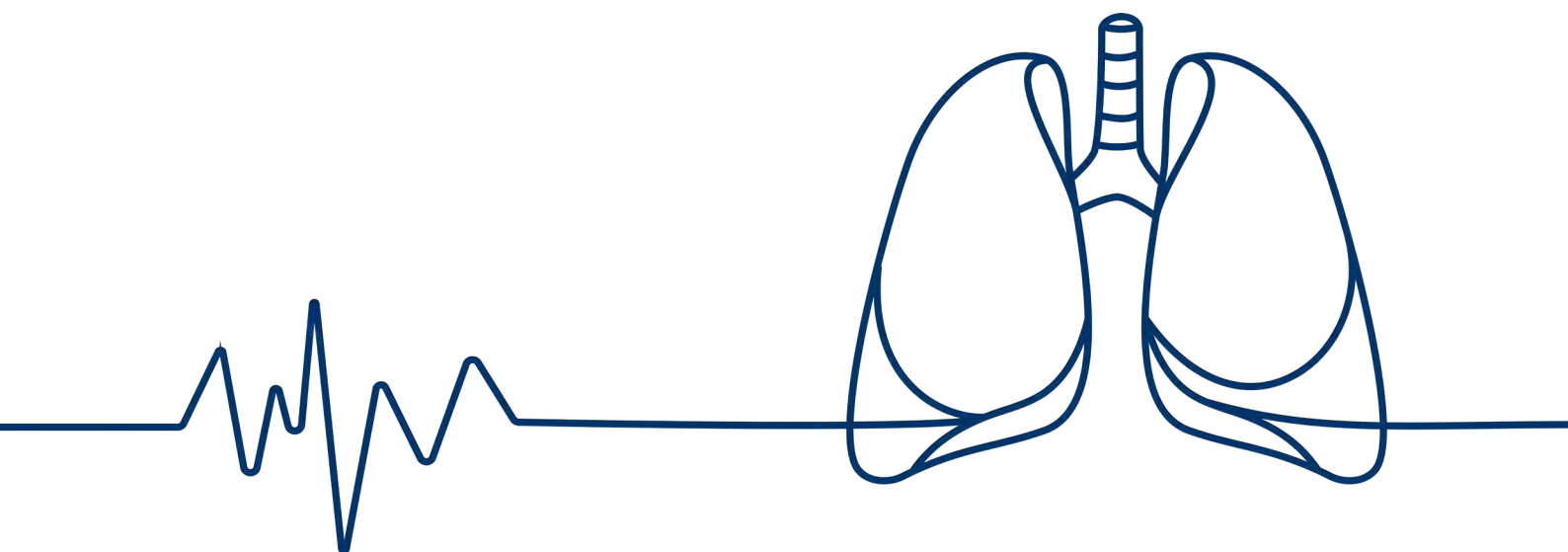
Rate of asthma hospitalisations (per 100,000 population, age standardised), according to fifths of area-level deprivation: 2002-05 to 2018-21.



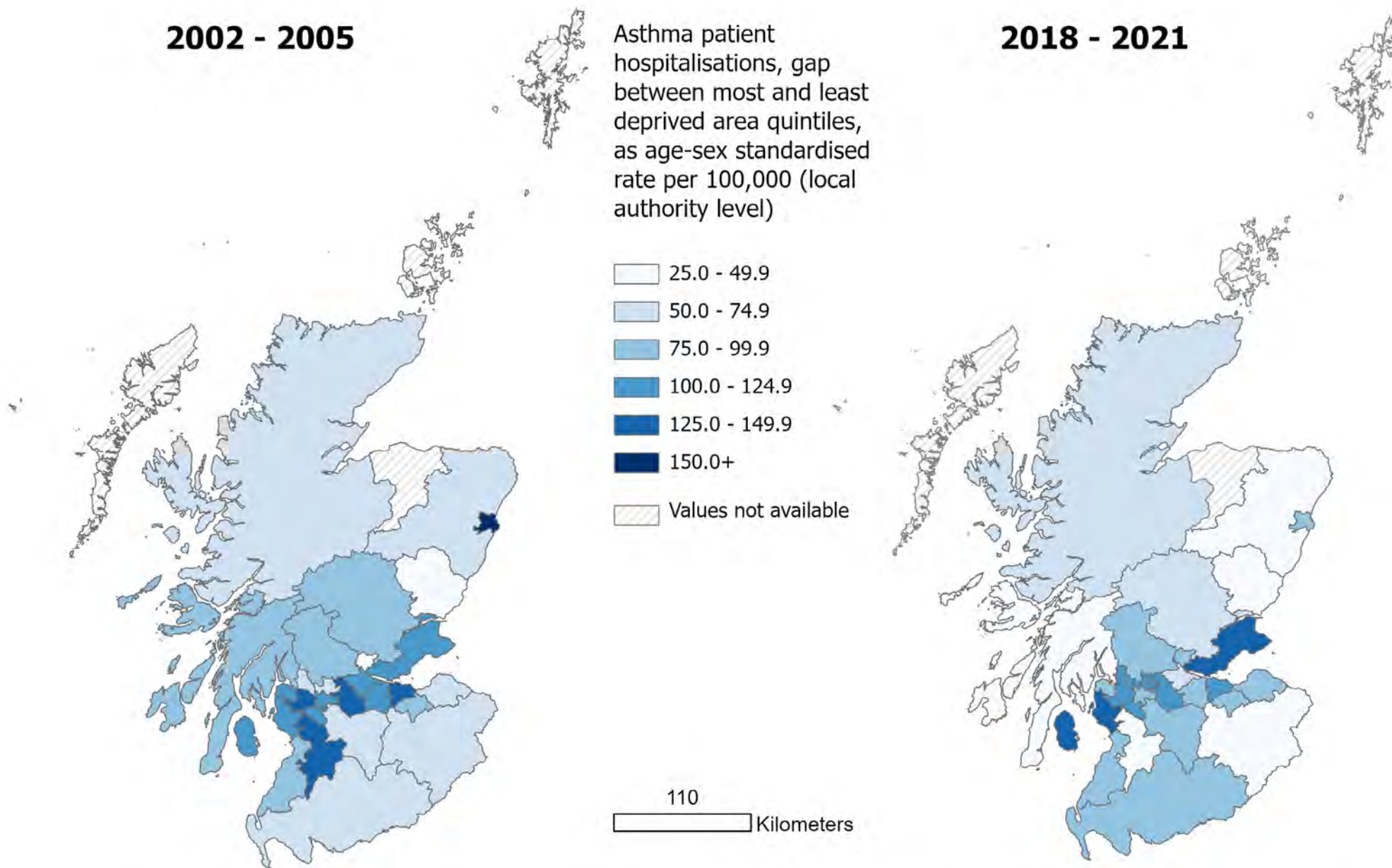
	2002-05	2004-07	2006-09	2008-11	2010-13	2012-15	2014-17	2016-19	2018-21
Population average (per 100,000)	99.0	103.5	104.9	98.2	91.0	90.1	92.3	90.7	75.8
Relative difference	2.4	2.4	2.4	2.4	2.6	2.8	2.9	3.1	3.1
Absolute gap (per 100,000)	83.3	88.6	88.8	87.7	84.6	88.9	96.8	97.9	84.0

Source: Scottish Public Health Observatory. Online Profiles Tool.

Map 2.1 overleaf shows how the absolute gap in asthma hospitalisations between the most and least deprived fifth of areas varies across Scottish local authorities, and the extent to which this has changed over the past twenty years. Absolute inequalities are greatest along the central belt at both time points. Many council areas have seen reductions in inequalities between 2002-5 and 2018-20 – including the cities of Aberdeen, Edinburgh and Glasgow, and their surrounding areas - although part of this reduction may be explained by the temporary changes to health service utilisation and operation during the pandemic as discussed. Some local authorities, for example Dumfries and Galloway, Fife, and North Ayrshire, have seen widening of inequalities.



Map 2.1. Absolute gap in asthma hospitalisations (between the most and least deprived areas), within local authorities, 2002-05 and 2018-21.



Adult mental health

Figure 2.10 shows the proportion of adults identified as likely to be experiencing psychological distress (12-item General Health Questionnaire score >4). There was a small increase in the population average prevalence between 2012/13 and 2018/19 (from 16% to 18%).

The Long-term Monitoring of Health Inequalities report mirrors this finding⁶⁹, showing little change in the prevalence of adults experiencing 'below average' mental wellbeing (approximately 15% between 2008/9 and 2018/19) using the Warwick-Edinburgh Mental Wellbeing Scales (WEMWBS).

There have been divergent trends for different age groups. Amongst young adults the prevalence of psychological distress has increased (from 16% in 2009 to 23% in 2019 amongst 16 to 24-year-olds), whereas older adults have seen decreases in prevalence over the same time period (from 15% to 11% in those aged over 74⁷⁹).

As shown in Figure 2.10, inequalities have persisted across the period, and in 2018/19 those living in the most deprived fifth of areas were 1.8 times as likely to be experiencing psychological distress as those in the least deprived fifth, with an absolute gap of 11%. It is worth highlighting that the size of the inequalities we see are dependent on the choice of screening tool – for example, relative inequalities in 'below average' mental health measured using the WEMWBS scale⁶⁹ are larger (showing a three-fold difference) than those seen here for psychological distress measured using the General Health Questionnaire, also with little change over time.

The COVID-19 pandemic had a substantial impact on mental health, with UK-wide data suggesting that self-rated measures of personal wellbeing, including life-satisfaction, happiness, self-esteem, and anxiety levels, all worsened over the first year of the pandemic. These had begun to return to pre-pandemic levels, or close to pre-pandemic levels, in the summer of 2021⁸⁰. However, the impact of the pandemic on mental health inequalities is not yet clear, with studies showing mixed or inconsistent results^{81 82}.

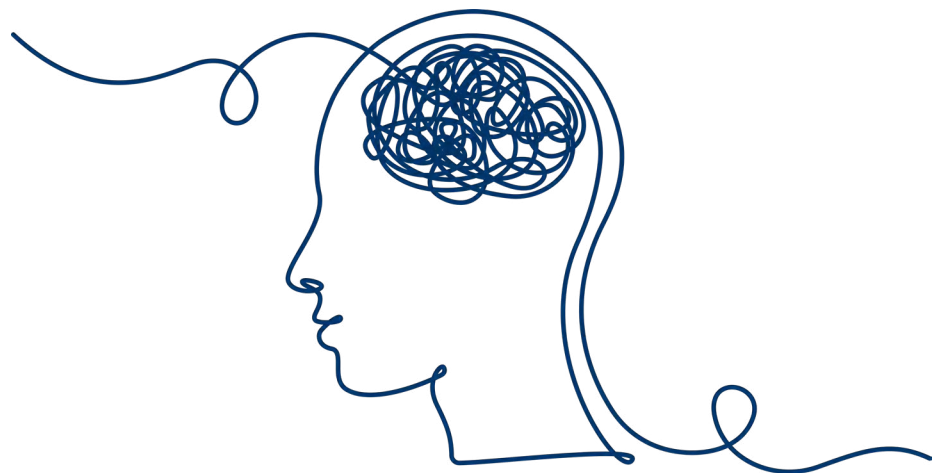
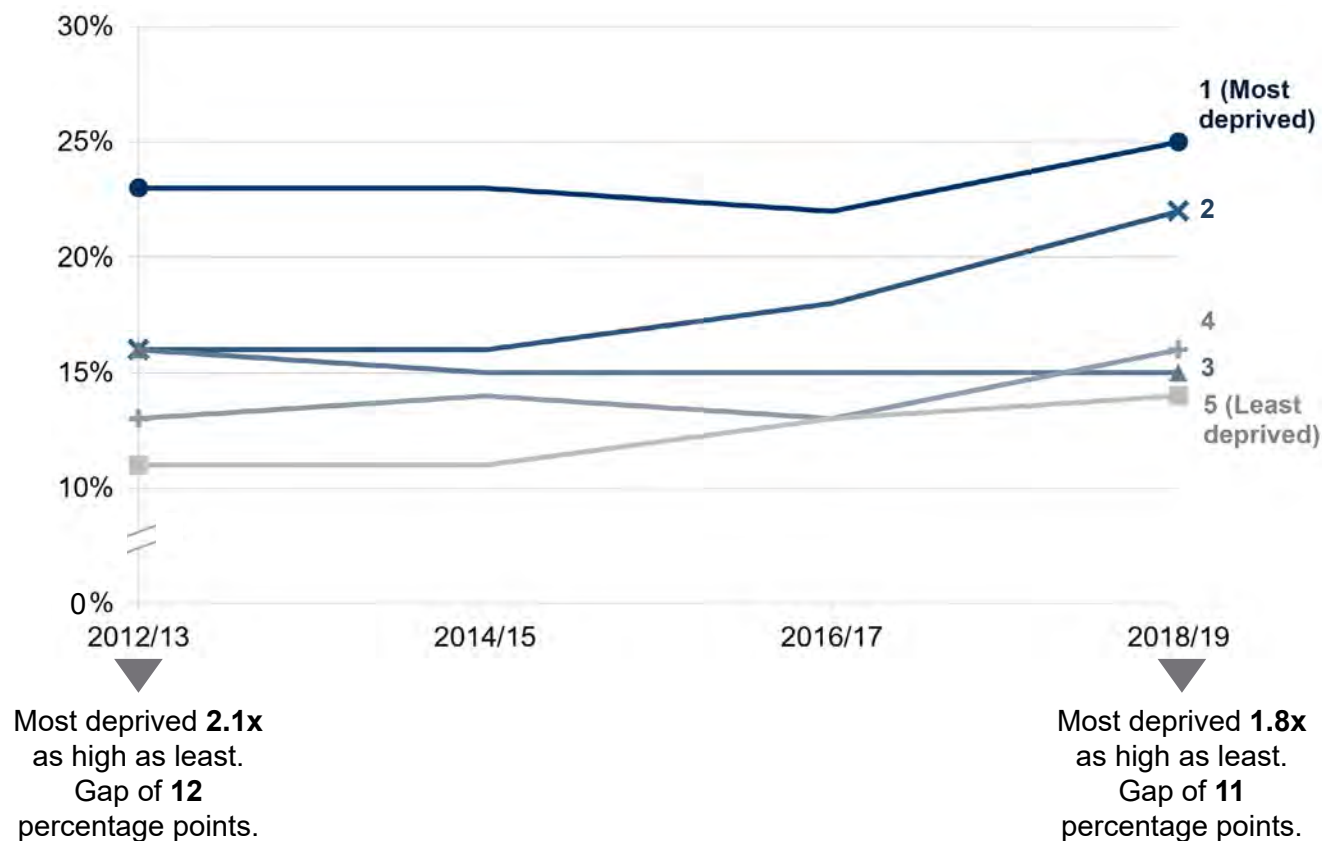


Figure 2.10. The prevalence of psychological distress amongst adults has increased slightly, with no signs of improvement in any group

Prevalence of psychological distress (%): 2012/13 to 2018/19, according to fifths of area-level deprivation.



	2012/13	2014/15	2016/17	2018/19
Population average (%)	16.0%	17.0%	16.0%	18.0%
Relative difference	2.1	2.1	1.7	1.8
Absolute gap (% points)	12.0%	12.0%	9.0%	11.0%

Source: New analysis of the Scottish Health Survey.

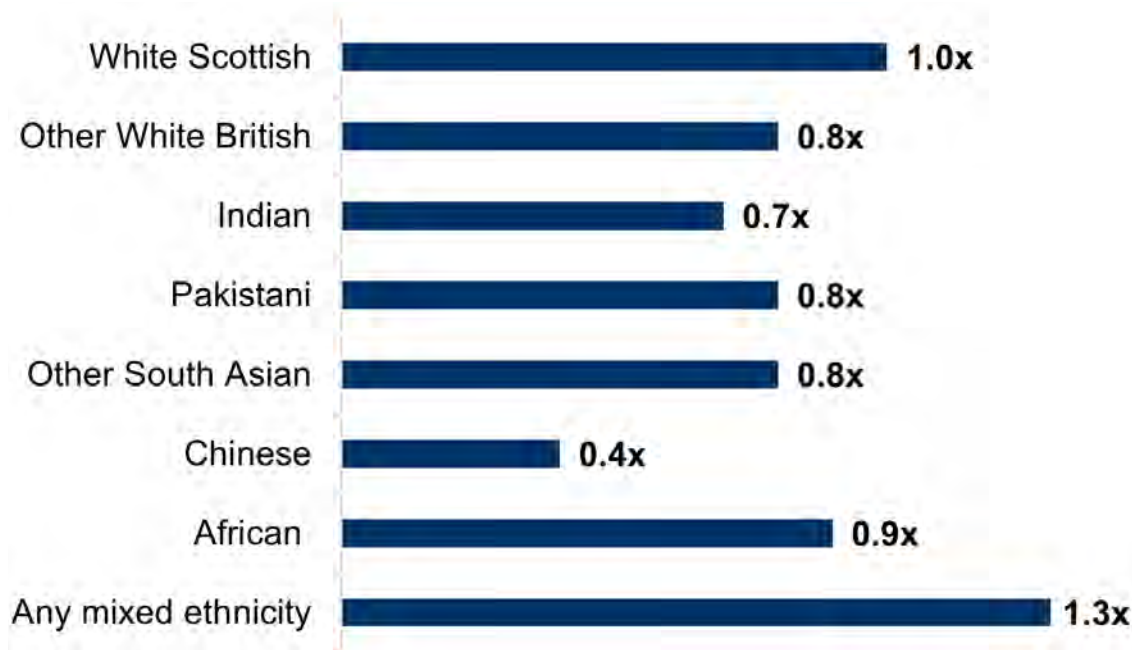
The trends in psychological distress by area deprivation we have shown above provide a limited picture of inequalities in mental health in Scotland. For example, there are also large differences in mental health between ethnic groups, as shown below. As we see for many health outcomes, White Scottish and Mixed ethnicities tend to fare worse than other ethnic groups.

Beyond area-level deprivation: mental health in different ethnic groups

Rates of psychiatric hospitalisation, after adjustment for age, car ownership, and housing tenure, were lower among men from almost all other ethnic groups when compared to White Scottish men between 2001 and 2008. The lowest rates were seen in men from Chinese backgrounds, where the risk of hospitalisation for psychiatric conditions is lower than half that of White Scottish men. Men from mixed ethnic backgrounds were the one exception to the rule, as shown in Figure 2.11, reproduced using data from Bansal et al⁸³.

Figure 2.11. Hospitalisations for psychiatric disorders are highest among White Scottish men and those with a mixed ethnicity

Relative risk of hospitalisation for first psychiatric disorder, adjusted for age, car ownership and housing tenure, men: 2001–2008.



Source: Bansal, et al. 2014. Disparate patterns of hospitalisation reflect unmet needs and persistent ethnic inequalities in mental health care: the Scottish health and ethnicity linkage study. *Ethn Health*, 19(2): 217-39.

Cancer incidence and hospital admissions for first heart attack

A summary from routine reports

Cancer incidence in the under 75ys has fluctuated over the past two decades. The main trend points towards increases during the 2000s, from 421 per 100,000 in 2000 to 447 per 100,000 in 2009. Incidence fell throughout the 2010s, to 427 per 100,000 in 2017, but have since then increased (to 447 per 100,000 in 2019). In 2019 rates were 564 per 100,000 in the most deprived *tenth* of areas, and 399 per 100,000 in the least deprived *tenth*²², an absolute difference of 165 per 100,000 and a relative difference of 1.4. There has been no clear pattern of change over time in either relative or absolute inequalities. It is worth noting that trends and inequalities in overall cancer incidence hide variations between cancer types.

Findings from the Long-term Monitoring of Health Inequalities reports, described in Chapter 1, show that relative inequalities in cancer mortality are greater than inequalities in cancer incidence. People living in the most deprived *tenth* of areas are 40% more likely to get cancer but twice as likely to die from cancer, when compared those in the least deprived areas. These inequalities in poorer survival suggest a role for health services, which is considered in the Spotlight on the cancer care cascade in Chapter 4.

Hospital admission rates for first heart attack in the under 75ys were steadily declining between 1997 (at 145 per 100,000) up until 2007 (when rates reached 80 per 100,000)²². Since 2007 rates have been fluctuating. The relative difference between the most and least deprived tenth of areas has also fluctuated. In 2020 the rate was almost twice that in the most deprived *tenth* of areas compared to the least deprived *tenth* of areas (136 per 100,000 compared to 73 per 100,000). The absolute gap narrowed between 1997 and 2008, followed by half a decade of potential widening. Since 2013, the absolute gap has again narrowed slightly.

Healthy and successful ageing

Improving quality of life in later years is a growing priority - the population aged over 75 years in Scotland is predicted to increase by 68% by 2035⁸⁴. However, health is less well monitored at this stage in the life-course, and the focus tends to be on mortality rather than successful ageing.

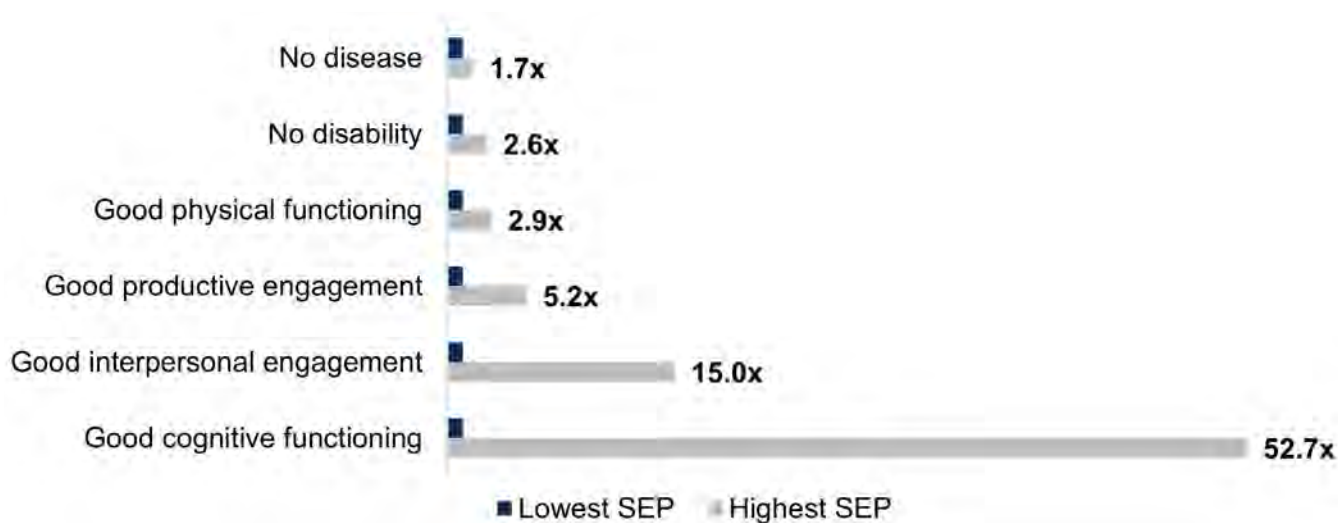
Qualitative research and stakeholder consultation have taught us about which aspects of successful ageing are important to older people, but there is very little data on how inequalities in these indicators have changed over time in Scotland. Here we summarise findings from published research looking at inequalities in important indicators of healthy and successful ageing in Scotland.

We have seen that chronic and age-related conditions such as cancer and heart disease show strong social patterning, and that those in more deprived areas spend a much lower proportion of their life living in good health. However, research has revealed that independence, physical and cognitive functioning, and social connectedness are valued above being disease-free in older age⁸⁵.

A study of 1,733 individuals aged 57 or 76 years in the West of Scotland in 2007/08 found that increasing socioeconomic advantage was associated with more successful ageing, as measured over six domains encompassing disease, disability, physical and cognitive functioning, and interpersonal and productive engagement⁸⁶. Socioeconomic position scores were created to capture circumstances across the life course, including in childhood, adulthood, and older age. The strongest association (based on the relative index of inequality) was seen for cognitive functioning, measured using a test of non-verbal reasoning, where individuals with the most favourable socio-economic scores were 52.7 times as likely to experience good cognitive functioning as individuals with the least favourable scores (95% confidence interval: 33.0-84.1).

Figure 2.12. There are large inequalities in successful ageing and especially for cognitive functioning

Relative inequalities in experiencing successful ageing across 6 domains, comparing those with the most advantaged compared to the least advantaged (based on lifetime socio-economic scores), age and gender adjusted: 2007/08.



SEP: socio-economic position scores.

Source: Whitley, E., Benzeval, M., & Popham, F. (2018). Associations of successful aging with socioeconomic position across the life-course: The West of Scotland Twenty-07 prospective cohort study. *Journal of Aging and Health*, 30(1), 52–74.

It was also found that socioeconomic influences experienced during older age (such as car ownership and housing tenure in older age) had the strongest effect on successful ageing, yet influences as far back as childhood, such as parent occupation and age at leaving school, were still important. For example, high compared to low parent occupation class was associated with a 27% increase in successful ageing based on all six domains⁸⁶. This is an example of how socio-economic experiences in childhood have impacts throughout the life course, including into old age.

Successful ageing measures beyond disease and disability are not routinely monitored in Scotland. A data scoping exercise, completed whilst preparing this report (Appendix B), demonstrates a notable gap in recent information on ageing, particularly using measures that are important to older people. Greater understanding of how health and health inequalities in this group are changing will become increasingly important as the older age population grows. Scotland's first comprehensive, longitudinal study of healthy and successful ageing (Healthy Ageing in Scotland (HAGIS)) offers greater potential to do this (<https://www.hagis.scot/>).

The results in this chapter clearly show that, with few exceptions, health conditions cluster amongst disadvantaged groups. Looking across all the health conditions discussed, individuals in disadvantaged groups are not only more likely to experience each individual condition, they are also more likely to experience multiple chronic conditions in combination, as shown in the following Spotlight on multimorbidity. This Spotlight also shows how social disadvantage in childhood can have long reaching consequences for health, independent of adulthood socio-economic circumstances.

Spotlight on multimorbidity

Multimorbidity - experiencing two or more chronic health conditions - is considered one of the largest challenges facing health systems globally and has considerable impact on quality of life^{87 88}. Multimorbidity is associated with reduced physical and cognitive function, leads to higher inpatient and ambulatory health care use, and a higher risk of mortality (including from COVID-19)⁸⁹.

Multimorbidity may arise from exposure to health risk factors that cause multiple health problems (such as smoking or obesity), and its consequences can be exacerbated by health care systems traditionally set up to focus on the diagnosis and treatment of single conditions. However, as we discuss below in the context of Scotland, dealing with multimorbidity requires an approach which looks beyond health services and individual behaviours, to the wider determinants of health.

It is not easy to examine trends in inequalities in multimorbidity over time and these are not included within the scope of this report. However already published findings provide some insights into the issue in Scotland.

Multimorbidity increases with age and is becoming more common

Around one in four people experience multimorbidity in Scotland, with age increasing prevalence⁹⁰.

Multimorbidity is becoming more common over time. For example, men born in the 1950s experienced a higher prevalence of multimorbidity by age 60 years (59%), than men born in the 1930s (37%)⁹¹.

There are large inequalities in multimorbidity

Onset of multimorbidity occurs 10–15 years earlier in people living in the most compared to the least deprived tenth of areas in Scotland⁹⁰. This means that, for example, 50-year-olds living in most deprived tenth of areas would have, on average, the same prevalence of multimorbidity as 60 to 75-year-olds living in the least deprived tenth of areas.

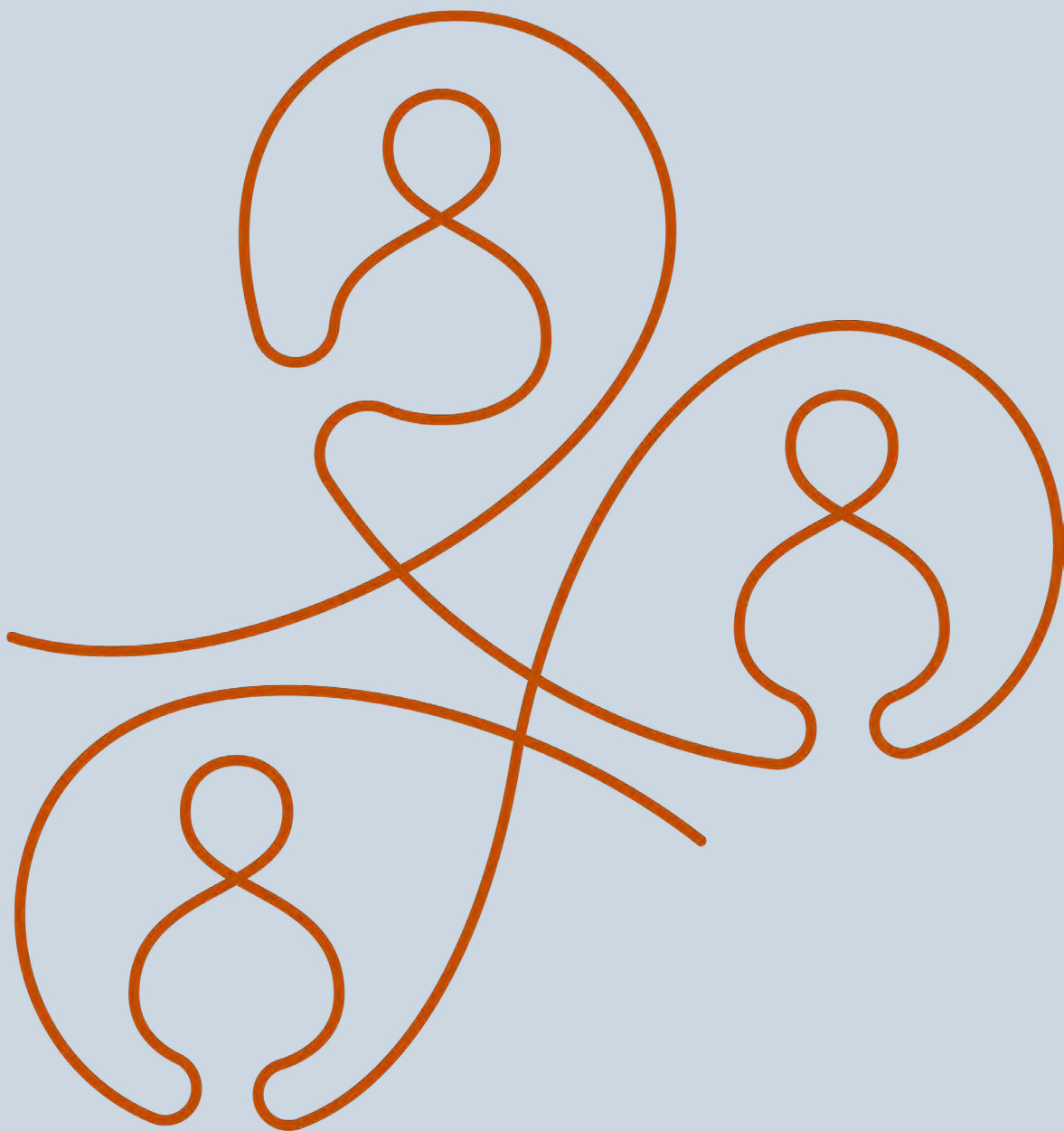
Lower quality of services may widen inequalities further

There is evidence of an inverse care law (where those who most need care are least likely to receive it)⁹² with respect to multimorbidity. For example, patients with multimorbidity have reported gaps in continuity of care, arising from poor coordination across multiple health professionals⁹³. Furthermore, there are inequalities in the experiences of health services among those living with multimorbidity – those living in more deprived areas have shorter GP consultations and GPs who were less empathetic and attentive to the illness experience of patients⁹⁴. Issues relating to health care access, quality and unmet needs are covered in more depth in Chapter 4.

Inequalities in multimorbidity are not fully explained by health-related behaviours

Important risk factors for multimorbidity include high body mass index, poor diet, high alcohol consumption, and smoking. As we have seen in this report, these are not equally distributed in the population. It might therefore be reasonable to think that inequalities in multimorbidity are explained by some groups being more likely to engage in certain behaviours. However, less than half of the inequalities we see in multimorbidity between people living in Scotland's most and least deprived areas can be explained by these health-related behaviours⁹¹.

Interventions seeking to reduce obesity and smoking could reduce levels of future multimorbidity to an extent, but additionally tackling the social determinants of health, including health and social care, will reduce the everyday burden for those who experience multimorbidity and prevent multimorbidity at the population level.



Health, wellbeing, and disease: synthesis of findings

Chapter 1 of this report demonstrated that those who live in deprived areas, or who experience other forms of social disadvantage, are more likely to die early and unnecessarily. For example, those in the most deprived fifth of areas die from avoidable causes at a rate that is four times as high as those in the least deprived areas. This second chapter has demonstrated how such harsh inequalities in mortality may emerge from inequalities in individuals' experiences of health, wellbeing and disease over their lifetime.

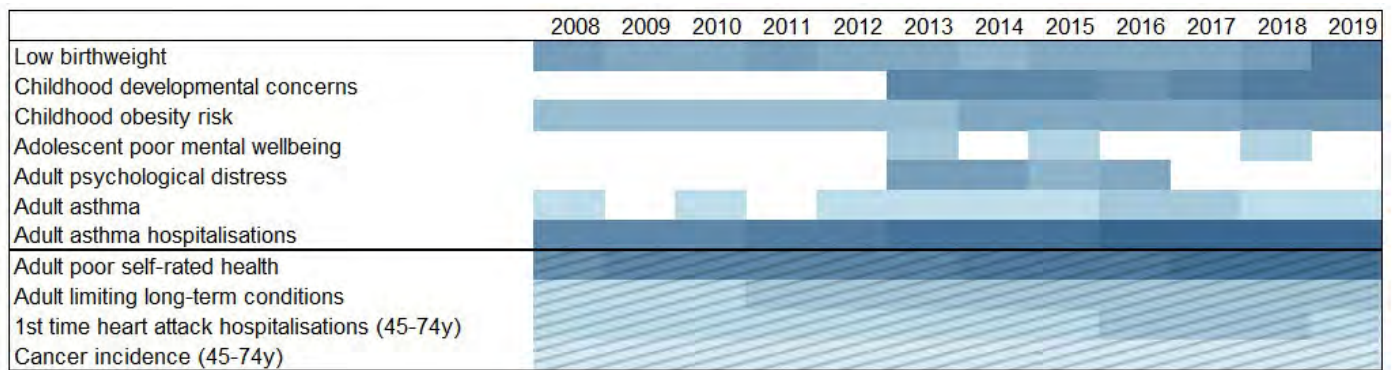
Inequalities emerge early in life, in the prevalence of low birthweight, early child developmental concerns and risk of obesity at the start of school. Inequalities across the range of health outcomes examined were in general smaller than those for mortality, with the exception of healthy life expectancy – here we see that people living in the least deprived *tenth* of areas in Scotland can expect to live 24 years longer in good health than people living in the most deprived tenth of areas. Men living in the most deprived tenth of areas have seen a decline in healthy life expectancy over the past five years, from around 50 in 2015/17 to around 45 in 2018/20. This is a combined result of persisting inequalities in life expectancy (shown in Chapter 1) and in general health.

When looking at change over time, the general picture for specific areas of health and wellbeing is also not positive – with recent rises in cancer incidence, longstanding limiting illness and worsening mental health. Other outcomes have shown no recent signs of improvement, including general health and first-time heart attacks. The proportion of toddlers with development concerns has fallen but inequalities have remained. Some outcomes in childhood show neutral or positive trends at the population level – for example childhood obesity risk has remained at around 10%. However, these disguise worrying patterns within different socio-economic groupings. Obesity risk has been increasing in the most deprived areas and decreasing in the least deprived areas, so that by 2019/20 children living in the most deprived fifth of areas were twice as likely to be obese, with an absolute gap of 7%.

Figure 2.13 shows how *relative* inequalities in these different aspects of health have changed over time. Each row represents a different health outcome. The shading is used to show how relative inequalities have changed over time (running from left to right) – with darker shades showing greater relative inequalities. It does not show how inequalities for most aspects of health are seen across the entire socio-economic spectrum – that is, health inequalities are not limited to only the most disadvantaged areas. Nevertheless, the figure shows a picture of persistence, with inequalities changing very little over the past twelve years. One exception to the general pattern is adolescent mental health – inequalities have narrowed slightly but this is the result of 'levelling down' (i.e. a greater increase in problems in more advantaged groups) and so should not be viewed as a success story.

Figure 2.13. Relative inequalities in health have largely been maintained

Relative inequalities between the most and least deprived fifth/ tenth of areas, 2006 to 2019, outcomes ordered by the life course.



Relative difference between most and least deprived fifth of areas =

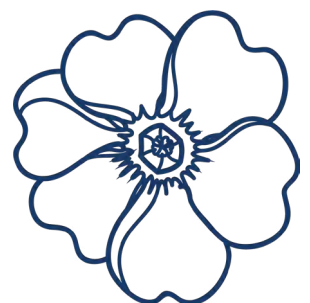
1-1.1	1.2-1.3	1.4-1.5	1.6-1.7	1.8-1.9	2.0-2.1	2.2-2.3	2.4-2.5	2.6-2.7	2.8-2.9	3.0-3.9	Data unavailable
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Relative difference between most and least deprived tenth of areas =

1.2-1.4	1.5-1.7	1.8-2.0	2.1-2.3	2.4-2.6	2.7-2.9	3.0-4.0	4.1-5.0	5.1-6.0	6.1-7.0	7.1-9.0	Data unavailable
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The Spotlights in this chapter demonstrate the complexity of health inequalities. Children who have experience of the care system have particularly poor health compared to the rest of the population, although deprivation levels in the area they live have minimal implications for health, likely because their exposure to other aspects of disadvantage is so high. We saw other examples of this in the Spotlight on intersectionality, where the social gradient (by area-level deprivation) varied by ethnicity. The Spotlight on multimorbidity highlighted how the proportion of the Scottish population suffering from more than one health condition is on the increase and is far more prevalent among disadvantaged groups. This accumulation of poor health means that even small inequalities in individual health conditions may contribute to larger inequalities in morbidity.

The full impacts of changes to socio-economic circumstances can often take years to manifest in health. For example, a study in the US tentatively found that for those in older age groups (over 44 years of age), income inequality 15 years previously may be more strongly associated with self-rated health experience than current income inequality⁹⁵. The section on healthy ageing showed how socio-economic circumstances in early life influence health many years later, even after accounting for adulthood socio-economic position. Likewise, the knock-on effect of these health inequalities on mortality trends will also take time, particularly those experienced earlier on in the life course. Therefore, current social inequalities and the influence of contemporary social and economic policy will continue to have ramifications for health and mortality in Scotland for some time, and the full cost of these effects are yet to be felt.



CHAPTER 3:

Health-related behaviours



MRC/CSO Social and Public Health Sciences Unit



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Health inequalities in Scotland:
An independent review

Introduction

- The previous two chapters have shown clear social gradients in outcomes for health and deaths with few exceptions. It is easy to assume that this might be explained by differences in health-related behaviours. In fact, this chapter reveals a more complex picture, with some health-related behaviours showing very little social patterning such as childhood physical activity, or even the opposite gradient to that seen in health outcomes, such as in alcohol consumption.
- Inequalities in health-risk behaviours impacting infant health are large, although absolute inequalities are showing modest decreases.
- Health-risk behaviours in adulthood, such as gambling and alcohol consumption, are seen across all social groups, but the harms are clustered amongst disadvantaged communities.
- Behaviours which support health – such as consumption of healthy diets and formal physical activities, can be constrained by availability, accessibility, and affordability, which are shaped by people’s socio-economic circumstances and the environments they live in.
- Many health-risk behaviours are highly stigmatised. Stigma creates barriers to seeking support and contributes to social isolation, which can have a further detrimental impact on health. Furthermore, stigma can be pushed onto certain communities, heightening exclusion and marginalisation of these groups.

A note on ‘Lifestyle drift’

Lifestyle drift refers to a tendency in policy and research to focus on individual behaviours when describing and addressing the causes of health inequalities⁹⁶. Whilst the need for action on the social determinants of health is recognised in research and policy frameworks, this can often give way to a focus on behaviours when specific objectives, research questions or interventions are introduced⁹⁷. The result is that strategies to tackle health inequalities frequently focus on health promotion and behaviour change campaigns. Such approaches can exacerbate inequalities, because only individuals with sufficient time, material resources, health literacy and ‘head-space’ to implement the changes will benefit⁹⁸. The structural processes that shape individuals’ agency to enact behaviour change are overlooked. Furthermore, behaviour change is framed as a direct link between structural factors and health. For example, poverty is often framed as acting on obesity through poor diet and physical activity alone. However, there is evidence that structural processes can have direct impacts on health, which do not only operate through behaviour changes. There is therefore a need for multi-level action, with strategies that recognise the multiple factors shaping the social determinates of health, including commercial interests as well as policies across all sectors⁹⁹. In acknowledgement of these issues, we take a slightly different approach in this chapter to the previous, highlighting where possible some examples of important social determinants alongside the data showing trends in inequalities in health-related behaviours.

Technical note:

The prevalence of health-related behaviours described in this chapter are all estimated using self-reported questions. Infant feeding and smoking during pregnancy are self-reported by mothers at healthcare appointments. The other behaviours are all measured using self-reported responses to questions in the Scottish Health Survey. Self-reported measures can be at risk of introducing bias because health-harming behaviours can be highly stigmatised. This can create a barrier to reporting engagement with those behaviours, meaning that the prevalence of these health-harming behaviours tends to be underestimated using self-reported measures.

The Scottish Health Survey data carry an additional risk of bias, because some groups in the population are less able to participate in voluntary surveys and therefore are systematically underrepresented in these results. In general, more disadvantaged groups are less likely to participate in surveys. Those with the worst health may also be less able to complete surveys. The results in this chapter have been weighted to account for non-response, but they are unlikely to have fully accounted for these important differences. For example, research has shown that the respondents to the Scottish Health Survey have lower all-cause mortality rates and alcohol-related mortality than the general population, and that weighting does not fully account for the difference¹⁰⁰. So, both the prevalence of health outcomes, and inequalities in these outcomes, may be underestimated in this Chapter. Furthermore, any changes in inequalities over time may in part be attributable to changes in response rates¹⁰¹, which have decreased in the Scottish Health Surveys, with 54% of eligible adults responding in 2008¹⁰² compared to 49% in 2019¹⁰³.

Nevertheless, in Scotland we are reliant on the Scottish Health Surveys to gain any understanding of how the patterning of health-related behaviours has changed in the population over time, as there is very little alternative monitoring of this information.



Smoking in pregnancy

Smoking in the general population

The prevalence of smoking in adults has fallen over the past two decades in Scotland, from 28% in 2003 to 17% in 2019¹⁰⁴. This has occurred against a backdrop of various policy actions including regulations to restrict smoking in public and private places, controls on advertising and pricing of tobacco products, and legislation to increase the legal age of purchasing¹⁰⁵. However, inequalities have persisted – in 2019, 32% of adults living in the most deprived fifth of areas were current smokers, compared to 6% in the least deprived areas¹⁰⁴.

The tobacco industry has been shown to employ marketing strategies that target disadvantaged areas and groups in society. In a study linking geolocation data to the Growing Up in Scotland cohort, Caryl et al found that children were on average exposed to tobacco retailing for 23 mins each week, over 43 independent encounters. This exposure varied greatly by area-level deprivation, with children living in the most deprived fifth of areas experiencing six times the duration and seven times the number of encounters compared to their peers living in the least deprived fifth of areas¹⁰⁶. In addition to targeted marketing, economic and housing insecurity, social isolation and a lack of opportunities are all known to increase the risk of smoking and create barriers to cessation¹⁰⁷. Qualitative research suggests smoking can be used as a coping mechanism to manage stress and can be an important way to participate in social norms for some communities¹⁰⁷.

Smoking in pregnancy

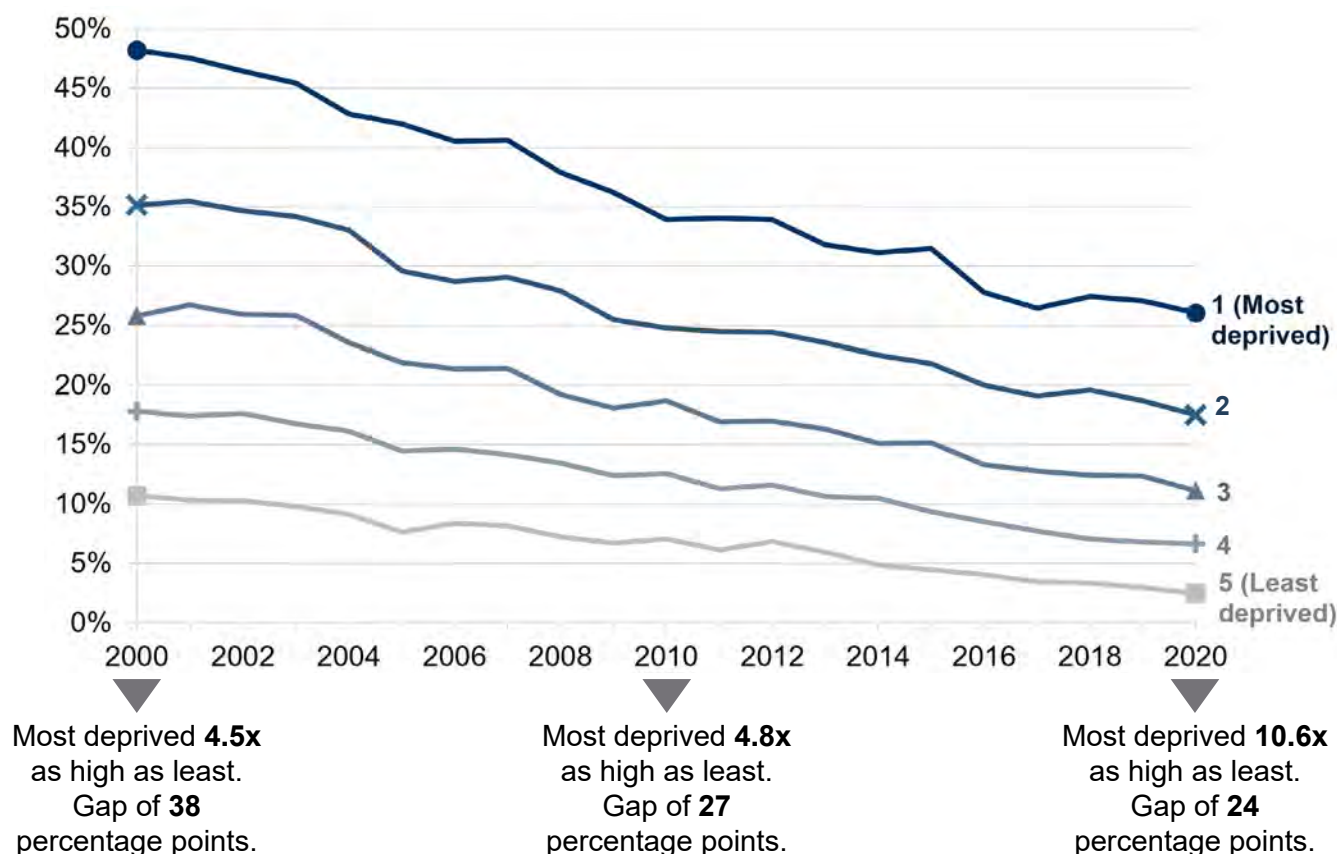
Smoking in pregnancy increases the risk of being born small for gestational age, postnatal mortality, and being hospitalised for respiratory illnesses in the early years¹⁰⁸. One purpose of the Child Health Programme in Scotland is therefore to promote and support parents with smoking cessation, alongside other behaviours important to infant health including breastfeeding and immunisation.

The proportion of women who report smoking at the time of their first antenatal booking (see Chapter 4 for further details on inequalities in antenatal booking) has halved over the past two decades, falling from 29% in 2000 to 14% in 2020 (Figure 3.1). This reduction occurred across all levels of area deprivation and the absolute difference between the most and least deprived fifths has fallen. However, the relative inequality has been maintained, with the prevalence of smoking during pregnancy being eleven times higher in the most deprived fifth compared to the least in 2020.

In addition to the direct health consequences of smoking, the increased concentration of smoking during pregnancy amongst less advantaged groups may increase stigma, with implications for whether mothers who smoke feel able to engage with health services.

Figure 3.1. Smoking in pregnancy is decreasing but inequalities are large, with rates eleven times higher in the most deprived (compared to the least deprived) fifth of areas

Prevalence of smoking during pregnancy (percentage of maternities with known smoking status), according to fifths of area-level deprivation: 2000 to 2020.



	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
Population average (%)	28.9%	28.5%	25.9%	23.9%	22.3%	21.0%	20.4%	18.3%	15.9%	15.2%	13.9%
Relative difference	4.5	4.5	4.7	4.8	5.2	4.8	5.0	6.4	6.8	8.2	10.6
Absolute gap (% points)	37.5%	36.2%	33.7%	32.2%	30.6%	26.9%	27.1%	26.3%	23.7%	24.1%	23.6%

Source: Public Health Scotland, Births in Scotland Year ending 31 March 2021. Table 3 – maternal smoking status.

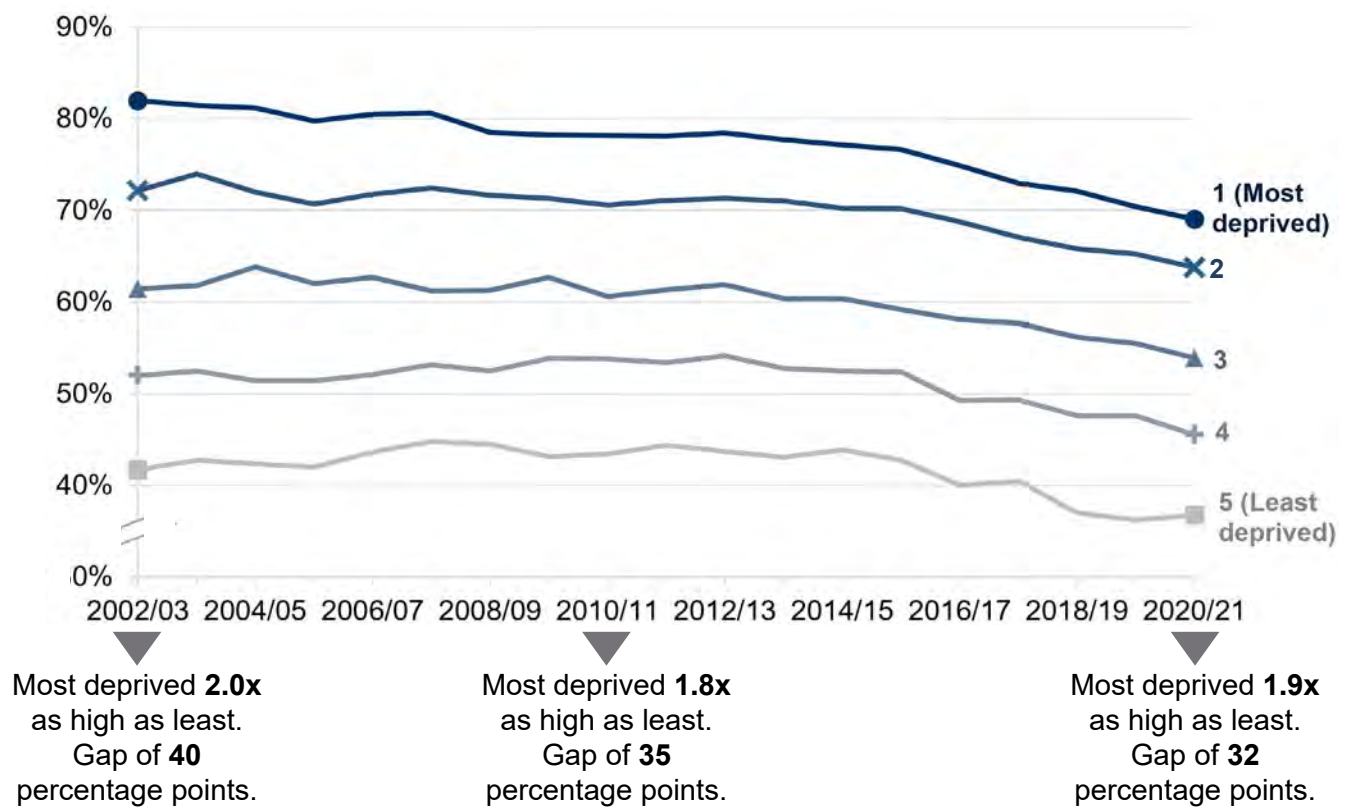
Infant feeding

Infant feeding has implications for infant and child health, with potential effects across the life course. For example, breastfeeding has been found to be protective against hospitalisation for diarrhoea and lower respiratory tract infection in UK infants¹⁰⁹. It has been previously estimated that the reduced incidence of common childhood illnesses such as ear, chest and gut infections from increased breastfeeding could save the NHS up to £50 million each year¹¹⁰. Furthermore, there can be benefits to maternal health¹¹¹, and child health at older ages¹¹².

In Scotland, breastfeeding up to 6-8 weeks provides a rare instance of improving prevalence and narrowing inequalities. As shown in Figure 3.2, the proportion of babies not being breastfed at 6-8 weeks (excluding babies who are both breast and formula fed as well as exclusively breastfed) has slowly been decreasing since the beginning of the time series in 2002. The absolute gap between the most and least deprived fifth of areas has also been gradually decreasing, with fluctuating relative inequalities. However, the overall prevalence of exclusive formula feeding (i.e. no breastfeeding, 55%) is still considered high when compared to other countries and recommended targets¹¹³. And substantial inequalities remain, with an absolute gap between the most and least deprived fifth of areas of 32%, and a relative difference of 1.9.

Figure 3.2. The proportion of babies not being breastfed at 6-8 weeks is gradually declining, but inequalities are persisting

Proportion of babies who are not being breastfed at 6-8 weeks (%), according to fifths of area-level deprivation: 2002/03 to 2020/21.



	02/03	04/05	06/07	08/09	10/11	12/13	14/15	16/17	18/19	20/21
Population average (%)	63.8	64.1	64.3	64.1	63.2	63.8	62.2	59.6	56.9	54.8
Relative difference	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Absolute gap (% points)	40.2%	38.8%	36.8%	34.0%	34.7%	34.7%	33.2%	34.8%	35.1%	32.3%

Source: Public Health Scotland, Infant Feeding Statistics Scotland Financial year 2020 to 2021 (Data files).

While breastfeeding may not always be the best option for all families, findings from the 2017 infant feeding survey reported that three out of four mothers would have liked to have breastfed for longer. Reasons for stopping earlier than they wished included concerns about feeding problems, milk supply and finding it too difficult¹¹⁴. Influences on breastfeeding are multifaceted, with some mothers experiencing multiple barriers to breastfeeding and targeted marketing of formula milk¹¹⁵.

Many interventions and policies to support breastfeeding have been introduced over the past few decades in Scotland. For example, the UNICEF Baby Friendly Initiative was introduced in the early nineties, which offers accreditation to maternity units displaying best practice breastfeeding promotion and support. In 2005 the Breastfeeding Act enshrined a legal right to public breastfeeding in Scotland. More recently, the 2019 “Becoming Breastfeeding Friendly Scotland” report laid out recommendations for continued protection, promotion and support for breastfeeding. This included strengthening regulation of the marketing of breastmilk substitutes; and ensuring families have equitable access to feeding support, when and how they need it¹¹³.

Duration of breastfeeding is also known to be important to health. Since 2003 the NHS has recommended exclusive breastfeeding for the first 6 months of life. Data from the Growing Up in Scotland surveys suggested that mothers with lower levels of education were more likely to end breastfeeding earlier, as were younger, single and white mothers¹¹⁶.

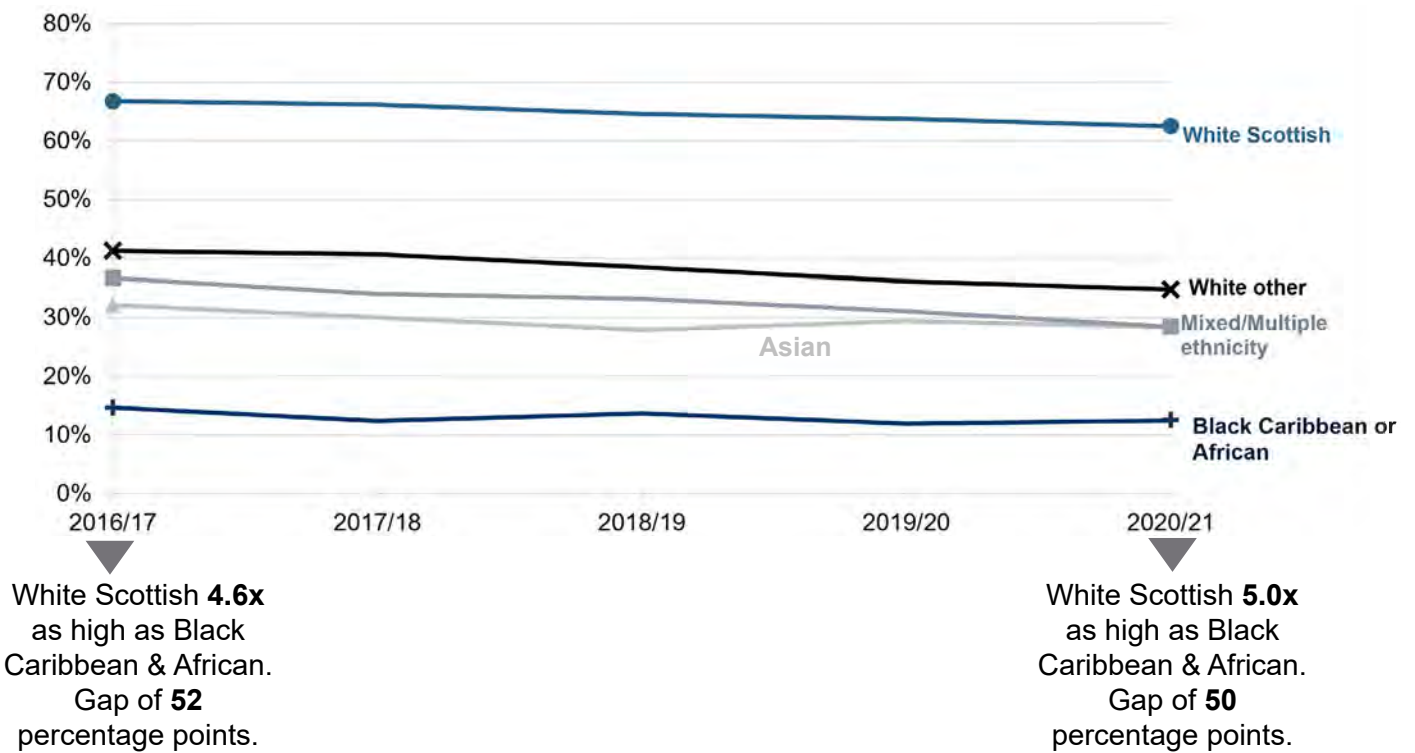
Beyond area-level deprivation: breastfeeding uptake in different ethnic groups

As shown in Figure 3.3, which looks only at short-term trends, two thirds of White Scottish babies born in 2020/21 were not being breastfed (either exclusively or in combination with formula milk) at 6-8 weeks (63%). This was 50 percentage points higher (and five times as high in relative terms) than the Black, Caribbean and African population, who were the least likely of the ethnicities measured to not be breastfeeding at this point. This difference is understood to be related to social norms and community support. For example, in the UK, children born to white mothers with partners from a different ethnic group, or white mothers who live in communities with a high density of ethnic minority residents, are more likely to initiate breastfeeding than white mothers without these social contacts¹¹⁷.



Figure 3.3. Babies from White Scottish backgrounds are most likely to not be breastfed

Proportion of babies not being breastfed at 6-8 weeks (%), according to fifths of area-level deprivation: 2016/17 to 2020/21.



% in each ethnic group	2016/17	2017/18	2018/19	2019/20	2020/21
White Scottish (%)	66.7*	66.2	64.5	63.8	62.5*
White other British (%)	41.2	40.7	38.5	36.1	34.7
Asian (%)	32.1	30.0	27.9	29.4	28.3
Black, Caribbean or African (%)	14.6*	12.3	13.6	11.9	12.5*
Mixed/Multiple Ethnicity (%)	36.6	34.0	33.1	31.0	28.4

Source: Public Health Scotland, Infant Feeding Statistics Scotland Financial year 2020 to 2021 (Data files). *data used to calculate the relative and absolute inequalities shown on the graph.

Physical activity in children and young people

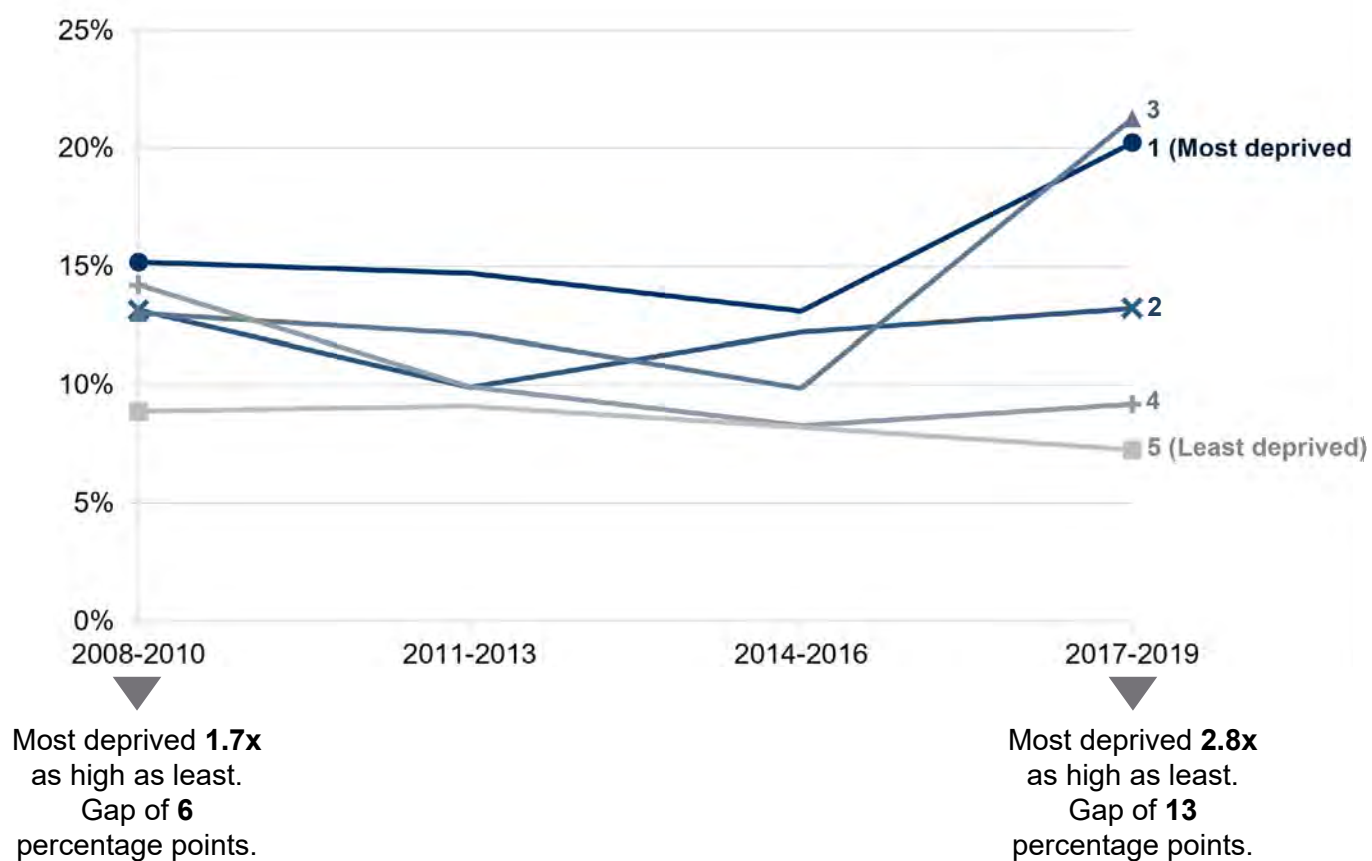
Physical activity is known to substantially benefit mental, physical and cognitive health throughout life, and therefore the Chief Medical Officer and the World Health Organisation recommend that children take part in 60 minutes or more of moderate to vigorous physical activity every day. However Scottish Health Survey data reveal that since 2008 over one in ten children (aged 2-12 years, reported by parents) and young people (aged 13-15 years,

self-reported), have not been engaging in even 30 minutes of sport or active play on any day in the previous week. The proportion of children and young people who were not meeting even these very low levels of formal physical activity fell between 2008-10 and 2014-16, from 13% to 10%, but then rose again to 14% in 2017-19.

Children living in the most deprived areas were 2.8 times as likely to report very low activity (less than 30 minutes on any day in the previous week) in 2017-19 as those in the least deprived areas (Figure 3.4). This represents an increase in inequality, from a relative difference of 1.7 in 2008-2010. However, unlike most other health outcomes, there is no clear gradient in prevalence from the most to least deprived fifths of areas.

Figure 3.4. Children living in more deprived areas are more likely to engage in low levels of formal physical activity (although accelerometer data, including informal activity too, show no inequalities)

Proportion of children (2-15 years) who did not participate in 30 minutes of sport or active play on any day in the previous week (%), parent-reported (in 2-12-year-olds), according to fifths of area-level deprivation: 2008-10 to 2017-19.



	2008-10	2011-13	2014-16	2017-19
Population average (%)	12.9%	11.2%	10.3%	14.1%
Relative difference	1.7	1.6	1.6	2.8
Absolute gap (% points)	6.3%	5.6%	4.9%	13.0%

Source: New analysis of the Scottish Health Survey.

Researchers have called for multilevel action to promote and support physical activity, with interventions aimed at social and physical environments, not just individual behaviours¹¹⁸. It is critical that policies remove barriers to physical activity including a lack of resources or spaces in which to participate, alongside promoting activity. Particular targets include the transport system, urban design, and workplaces.

Beyond area-level deprivation: children's formal physical activity according to household income

In 2017-19, 19.3% of those in the lowest income fifth reported very low physical activity, compared to only 8.0% of those in the top fifth, with an absolute gap of 11.2% and a relative difference of 2.4 (Appendix E.3.1). Both absolute and relative inequality in activity in children have increased since 2008-10, from 7.4% and 2.0-fold respectively. Unlike inequalities according to area-level deprivation, there is a clearer social gradient in organised child physical activity by income.

Inequalities in self-reported, formal physical activities present a misleading picture of overall physical activity levels

The self-reported data from the Scottish Health Survey may not capture the full picture of activity, for example the questions (which asked about sports and active play) will not necessarily pick up on active travel to school or the shops. Accelerometer data, which objectively capture all movement, show that children from less advantaged backgrounds are as active as (and potentially more active than) their more advantaged peers. This has been observed in the Growing Up in Scotland cohort and in other UK child cohorts^{119 120 121}.

So while the trends presented in the above figure, using data from the Scottish Health Survey, may be showing increasing barriers to formal physical activities with increasing area level deprivation, it is unlikely that the large inequalities in childhood obesity, seen in Chapter 2, can be addressed through initiatives which purely focus on increasing physical activity¹²². This is in addition to the limitations associated with interventions to address health that only target behaviour change, described in the previous section on lifestyle drift.

Physical activity in adults

It is recommended that every adult participates in a minimum of 150 minutes of moderate intensity activity or 75 minutes of vigorous activity every week¹²³. The recommendations also advise minimising sedentary time which is independently damaging to health.

Not all groups are equally able to meet physical activity recommendations. For example, people who have caring responsibilities, work multiple or sedentary jobs, experience chronic health conditions, or have limited access to spaces in which to exercise may face greater barriers to physical activity.

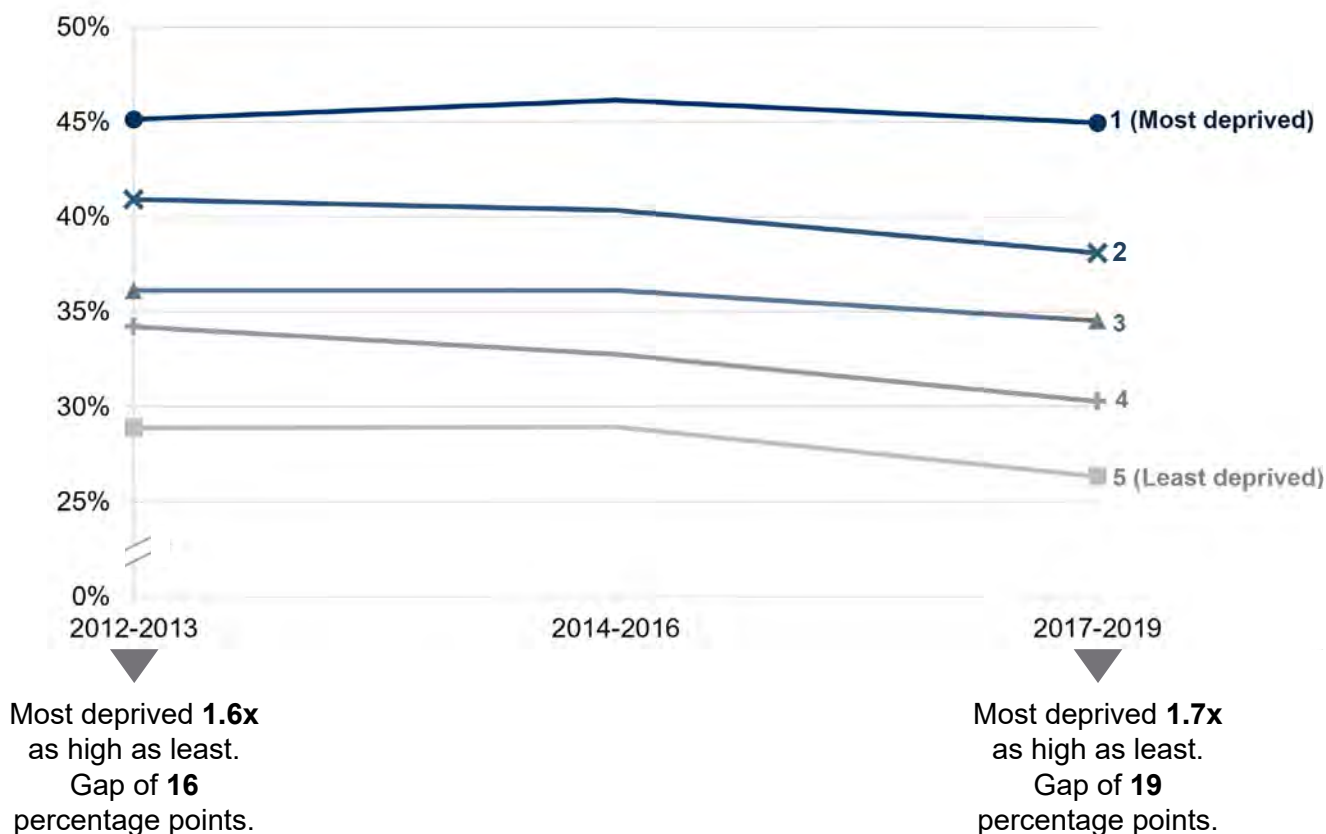
In Scotland, self-reported physical activity in the Scottish Health Survey suggests that approximately a third (35%) of adults did not meet the recommended targets in 2017-2019 (Figure 3.5). This proportion has remained high over the last decade. It is worth noting that the Scottish Health Survey collect this information by asking for self-reported information about housework and gardening, walking, sport and exercise, and work-based activity.

Small decreases in the proportion of adults with low activity levels have been seen amongst the least deprived areas, but not the most deprived, leading to a small widening of inequalities. In 2012-2013, 16% more adults did not meet physical activity guidelines in the most deprived fifth of areas compared to the least deprived fifth, and this difference rose to 19% in 2017-2019.

A decrease in physical activity and an increase in sedentary behaviour was seen during the COVID-19 pandemic¹²⁴.

Figure 3.5. The proportion of adults not meeting recommended physical activity levels are falling in the least deprived fifth of areas faster than the most deprived fifth

Proportion of adults not meeting daily activity guidelines (%), according to fifths of area-level deprivation: 2012-13 to 2017-19.



	2012-13	2014-16	2017-19
Population average (%)	36.8%	36.7%	34.6%
Relative difference	1.6	1.6	1.7
Absolute gap (% points)	16.2%	17.2%	18.6%

Source: New analysis of the Scottish Health Survey.

Beyond area-level deprivation: physical activity in adults according to household income

Inequalities by household income are even wider than those seen for area-level deprivation, with an absolute gap between the highest and lowest income fifths of 26.5% in 2017-19 (Appendix E.3.2). This corresponds to 2.3 times as many adults in the lowest income fifth having low physical activity levels compared to the highest fifth.

Hazardous and harmful alcohol consumption

Alcohol consumption is a particularly important public health issue in Scotland, with higher rates of alcohol-related deaths compared to other countries and large inequalities, as shown in Chapter 1. Alcohol consumption also carries short-term risks to health, including injury, alcohol poisoning or violence related harm, and long-term risks such as addiction, liver damage, and cancer.

In the Scottish Health Survey, alcohol use can be defined as drinking that causes harm (harmful consumption) or risk of harm (hazardous consumption), based on the frequency and intensity of drinking, and experience of negative consequences such as injury, guilt or memory loss. As shown in Figure 3.6, the prevalence of harmful and hazardous alcohol consumption (combined) is highest in the least deprived areas, and has been this way since at least 2008, when data collection begins. This is a pattern that has been observed multiple times in the UK³⁶, and is linked to the so-called alcohol harm paradox which describes how those in lower socioeconomic groups have been found to consume less alcohol yet are more likely to be hospitalised or die from an alcohol-related cause than those in higher socioeconomic groups¹²⁵.

The absolute gap between the most compared to the least deprived areas is increasing over time, driven by an increase in the prevalence in hazardous and harmful alcohol consumption in the least deprived fifth. In 2017-2019, residents of the most deprived areas were almost half as likely as residents of the least deprived areas to experience hazardous or harmful alcohol consumption (relative difference: 0.6). This was more pronounced than the relative difference of 0.8 in 2008-10.

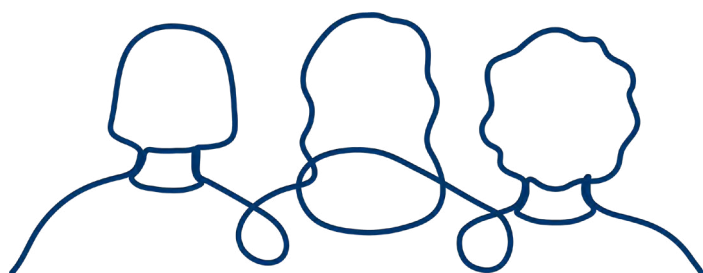
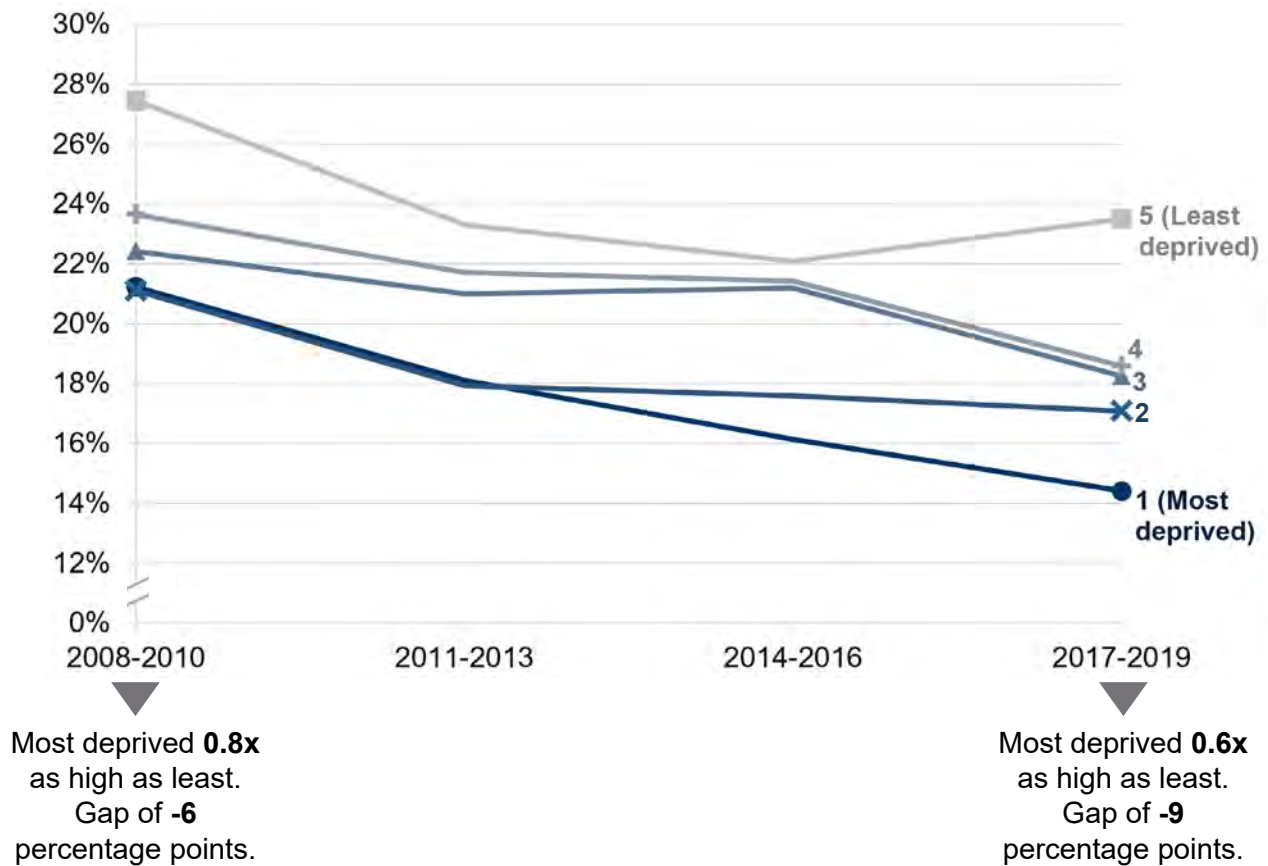


Figure 3.6. Hazardous and harmful alcohol consumption increases as area deprivation decreases

Prevalence of hazardous and harmful weekly alcohol consumption amongst adults (%), according to fifths of area-level deprivation: 2008-10 to 2017-19.



	2008-10	2011-13	2014-16	2017-19
Population average (%)	23.2%	20.5%	19.7%	18.5%
Relative difference	0.8	0.8	0.7	0.6
Absolute gap (% points)	-6.2%	-5.2%	-5.9%	-9.1%

Source: New analysis of the Scottish Health Survey.

Beyond area-level deprivation: hazardous and harmful alcohol consumption in different income groups

Inequalities according to household income are similar to those seen by area-level deprivation. The prevalence of hazardous and harmful alcohol consumption in households in the lowest income fifth was lower than the highest income groups (Appendix E.3.3).

When considering harmful drinking only (Appendix E.3.4), the most extreme categorisation of alcohol consumption, the social gradient becomes more mixed, with the most deprived fifth of areas but the highest income fifth both tending to have the highest prevalence, although not in every year, and the other fifths (of both area deprivation and income) show no consistent pattern.

So, as already noted, for alcohol consumption we see the opposite social gradient to that for alcohol-related deaths in Chapter 1. This is referred to as the alcohol harm paradox. One factor that might contribute is that disadvantaged groups experience greater harms from the same level of alcohol consumption compared to advantaged groups in Scotland. This is true even after adjustment for binge drinking patterns, body mass index and smoking status¹²⁶.

Some underestimation of alcohol consumption is also likely to contribute to this paradox. Linking the Scottish Health Survey to hospital and sales data has shown that non-response and selection bias of the surveys leads to underestimated alcohol consumption, particularly for men from more disadvantaged areas¹⁰¹. However there is also convincing evidence that other contributors include the clustering of exposures to additional health risks in disadvantaged groups (e.g. alcohol can be more harmful to those with other health conditions), poorer access to healthcare (see Chapter 4 for themes around this), and the harmful effects of poverty (e.g. people with fewer resources may be more likely to experience and be less protected from the impacts of stressful life events)¹²⁵.

Gambling

Gambling in Scotland is common. In 2017, data from the Scottish Health Survey found that six in ten adults had spent money on gambling during the past year. Gambling activities ranged from playing bingo and the lottery to slot machines, betting on the races, and online gambling apps. The majority do not experience harmful consequences from this behaviour. The social patterning of spending money on gambling is also modest. For example, in 2017 the proportion of adults who self-reported spending money on gambling activities in the previous year was 60% in the least deprived fifth of areas and 63% in the most deprived fifth⁵⁶.

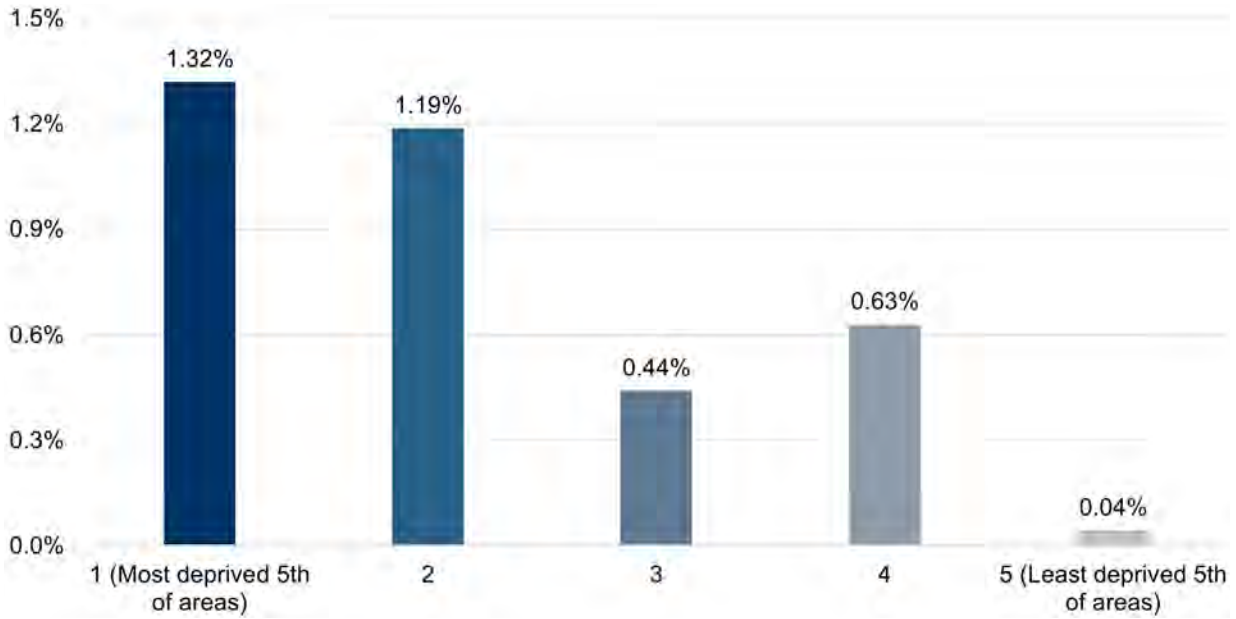
However, those in more deprived areas are much more likely to experience harm from gambling, which is sometimes termed problem gambling. Gambling is identified as harmful when it begins to impact someone's daily life, including their thought patterns, employment, and relationships. Problem gambling has been linked to poor mental health, substance use, social isolation and stigma¹²⁷. The increased experience of harm from gambling in the most deprived areas and income groups might be linked to clustering of morbidities and disadvantages in these communities, as described in the discussion of multimorbidity in Chapter 2, and the Spotlight on multiple disadvantages and premature mortality in Chapter 1.

In 2012-2015, 1.3% adults in the most deprived areas experienced problem gambling compared to 0.4% in the least deprived areas. This was based on whether participants reported negative feelings about their gambling, whether it has caused them financial difficulties, and whether it has led them to chase losses.

Due to the low overall prevalence of problem gambling, this represents a modest absolute gap of 1.28%, but a stark relative difference (33-fold) (Figure 3.7). Interpretation of this difference should be made with caution, since the low overall prevalence makes it challenging to make comparisons with precision and may inflate the impact of low response rate biases.

Figure 3.7. The prevalence of problem gambling is very low overall, but highest in the most deprived areas

Prevalence of problem gambling amongst adults (%), according to fifths of area-level deprivation: 2012-2015.



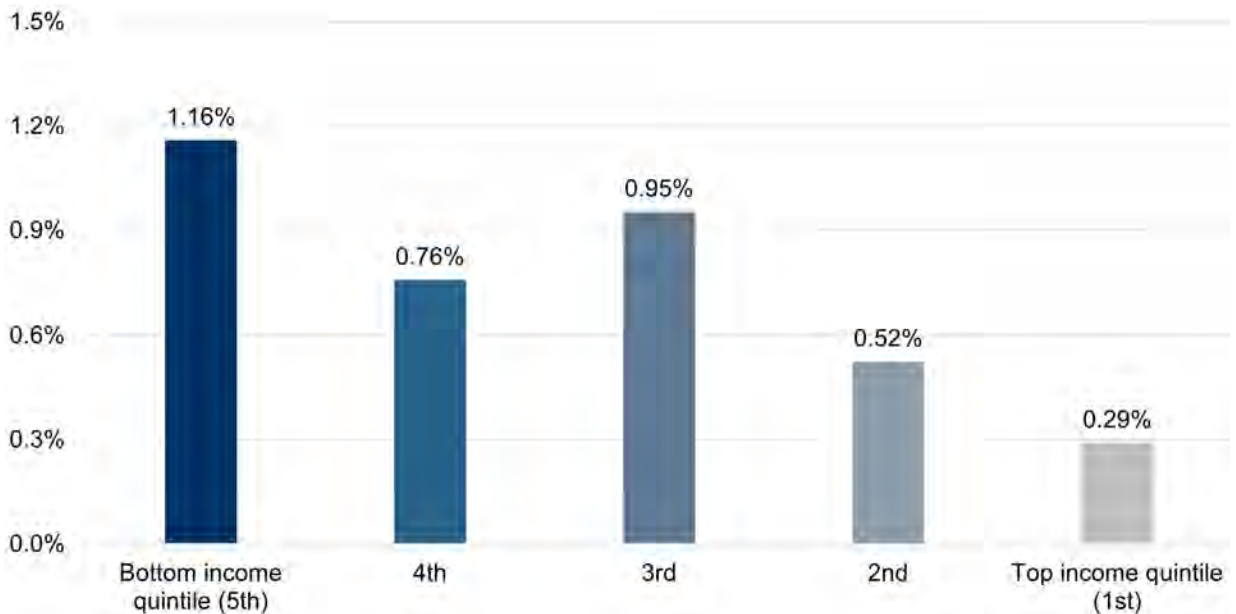
Source: New analysis of the Scottish Health Survey.

Beyond area-level deprivation: problem gambling in different income groups

Inequalities in gambling by household income are slightly lower, with a 0.9 percentage point absolute gap between the prevalence in the most and least deprived income fifths and a relative difference of four (Figure 3.8).

Figure 3.8. The social gradient in problem gambling is smaller for income than for area-level deprivation, although numbers are very small

Prevalence of problem gambling amongst adults by income quintile (%), according to income fifths: 2012-2015.



Source: New analysis of the Scottish Health Survey.

As already noted, we are dealing with small numbers because we are reliant upon survey data. So, while these results should be read with caution, it is possible that a steeper social gradient in gambling by area deprivation rather than income points to the potential importance of neighbourhood effects. This could include social and community norms, a lack of alternative activities, and availability of gambling outlets.

In the UK (and other countries) the density of gambling premises is higher in more deprived areas¹¹⁶. In 2020, one in five gambling sites were located in the most deprived *tenth* of areas in the UK, compared to only 1 in fifty in the least deprived *tenth* of areas^{128 129}. The same has been shown at a more local level in Glasgow, where the most deprived areas have the greatest clustering of gambling outlets¹³⁰. Density of gambling sites has also been associated with economic inactivity and the age profile of an area. More research into the effects of these different exposures is needed to understand their relationship to inequalities in gambling behaviours.

Diet

The study of health impacts of diet is a contested field since it is very challenging to identify independent health effects of different dietary components. Nevertheless, it is established that poor diet and nutrition can impact bone density, adiposity, cardiovascular health and dental health¹³¹.

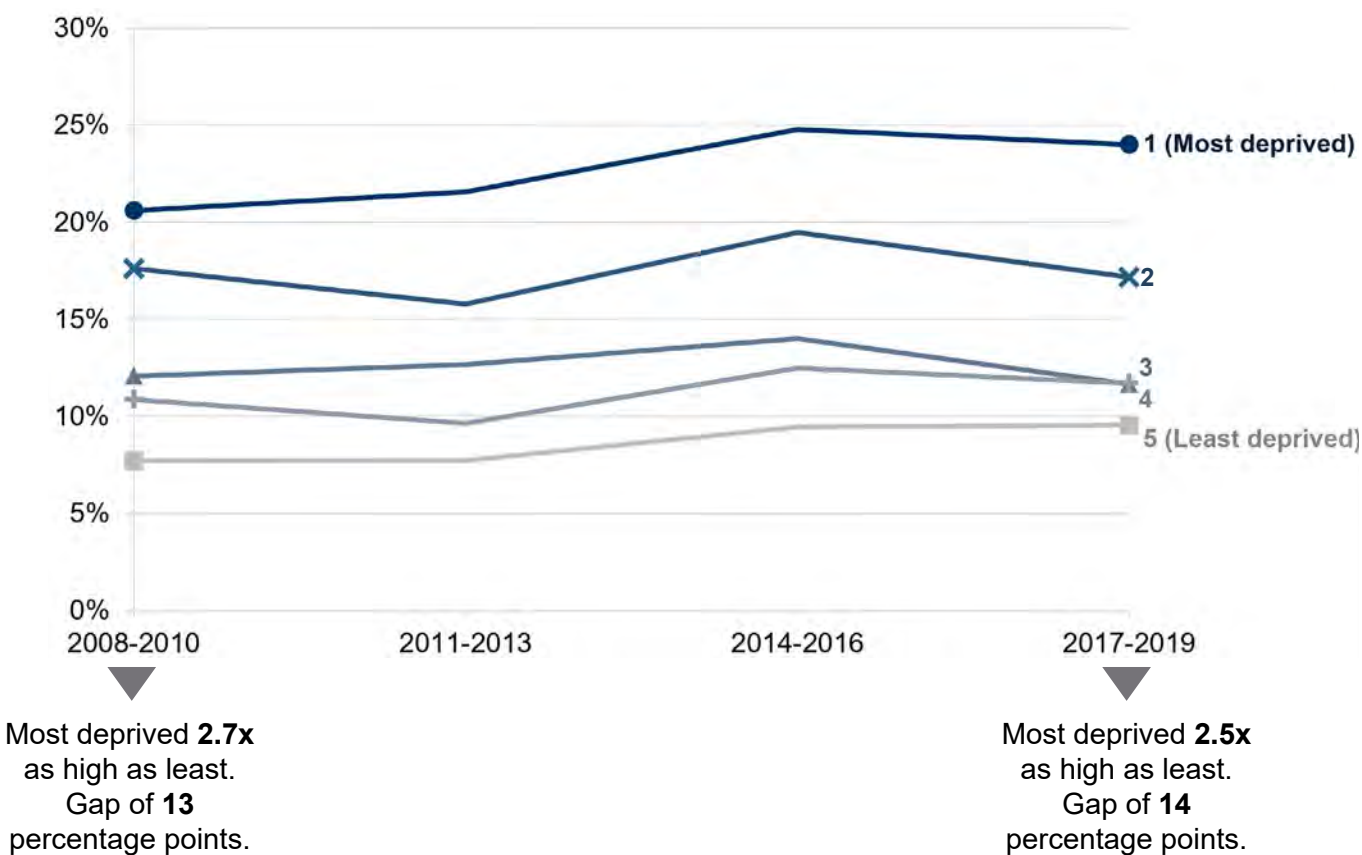
Monitoring of Scottish diets relies on self-reported data of certain food items (such as fruit and vegetables) in the Scottish Health Survey. These are imperfect data, with biases introduced through mistakes in memory, or diets being misreported to appear more socially acceptable (alongside non-response biases described previously). The measure used in this section (proportion of adults eating less than one portion of fruit and vegetables today), captures only one small element of diet.

Figure 3.9 points to a high prevalence of very low fruit and vegetable consumption in Scotland. In 2017-19, 14.6% of adults had not eaten a whole portion of fruit or vegetables in the previous day. This was nearly a quarter (24.0%) of those living in the most deprived fifth, compared to 9.6% in the least deprived fifth – giving an absolute gap of 14% and a relative difference of 2.5. The magnitude of this inequality has been reasonably stable over the past decade.



Figure 3.9. Inequalities in very low fruit and vegetable consumption by area deprivation are large and have been maintained since 2008-10

Proportion of adults who ate less than 1 portion of fruit and vegetables in the previous day (%), according to fifths of area-level deprivation: 2008-10 to 2017-19.



	2008-10	2011-13	2014-16	2017-19
Population average (%)	13.7%	13.3%	15.9%	14.6%
Relative difference	2.7	2.8	2.6	2.5
Absolute gap (% points)	12.9%	13.8%	15.3%	14.4%

Source: New analysis of the Scottish Health Survey.

Beyond area-level deprivation: diet according to household income

Inequalities in fruit and vegetable consumption by income follow the same pattern but are marginally smaller in magnitude. In 2017-19, the proportion of adults in the bottom income fifth who reported low fruit and vegetable consumption was twice as high as that in the top income fifth (Appendix E.3.5), whereas the proportion in the most deprived areas was 2.5 times as high as the least deprived areas.

Inequalities in other aspects of diet

A nationally representative survey exploring the types of food retailers used by teenagers during school lunchtimes in Scotland in 2010 found that the use of fast food takeaways compared to supermarkets was not patterned by socio-economic circumstances¹³². This hints

that inequalities in diet may differ between adults and adolescents. We speculate that this may in part be related to the geographical patterning of food outlets. In Glasgow, deprived areas have the highest densities of fast-food outlets overall¹³⁰, however research suggests that around schools the patterning of different types of food outlet does not follow this area deprivation gradient¹³³.

Inequalities in diet point to the importance of both the availability and affordability of fresh and healthy foods. Residents of more deprived areas face greater barriers to achieving a healthy diet. When matched calorie for calorie, nutrient dense foods are three times as expensive as unhealthy foods and in 2020-21, UK households with the lowest fifth of incomes in the UK would need to spend 47% of their disposable income to follow a healthy diet, compared to just 11% in the highest fifth¹³⁴. Preparing healthy food can also introduce costs both in terms of time required and fuel.

There are large inequalities in food insecurity (identified by whether households have enough nutritious food, skip meals, or reduce portion sizes because of a lack of resources), as shown in the FAI report on social determinants. Rates are especially high amongst single parents and those living in poverty. Data from the 2019 Scottish Health Survey confirms that there are also large inequalities in food insecurity according to area-level deprivation, with adults living in the most disadvantaged fifth of areas five times as likely to experience food insecurity as those in the least (absolute gap of 13%). These are greater still according to income and particularly for women – those in the bottom income fifth are eleven times as likely to experience food insecurity when compared to those in the top (absolute gap of 19%). Food insecurity also varies by age, with younger adults (16-44) twice as likely to be affected than those who are 45 years and over⁵⁶. This already concerning picture will be exacerbated by the cost-of-living crisis, which is expected to tip many more households into food insecurity.

In the closing results section of this chapter, we briefly summarise how health-related behaviours and their drivers vary between rural and urban areas.

Beyond area-level deprivation: health-related behaviours in rural and urban areas

Scotland's geography is varied, containing both dense urban neighbourhoods and very remote and rural areas. These areas vary with respect to built infrastructure, transport, employment, social networks and local environment – all of which can influence risk factors. Compared to remote rural areas, urban areas in Scotland have slightly higher prevalence of potentially health-harming risk factors. For example, our analysis of the Scottish Health Survey indicates that the prevalence of problem gambling is twice as high; harmful, or hazardous alcohol use and food insecurity are both 1.6 times as high; and the prevalence of low fruit and vegetable consumption is 1.3 times as high⁷⁹. The reasons behind these patterns are challenging to unpick, since urban areas tend to be more deprived (see Appendix C), but also have better access to services and infrastructure.

Health-related behaviours: synthesis of findings

This chapter presents a more mixed picture of inequalities than the previous chapters. For many outcomes, such as smoking in pregnancy, there are very clear and persistent inequalities along the social gradient. However, for physical activity and harmful or hazardous alcohol consumption, the gradient is minimal or even reversed.

Outcomes that primarily affect infants (smoking in pregnancy and breastfeeding) have seen sustained improvements over the past 20 years in Scotland, and there is some indication that absolute inequalities may be showing modest reductions. On the other hand, unfortunately both outcomes remain worse in the most deprived fifth of areas – with one in four children exposed to smoking in utero and two out of three not breastfed by 6-8 weeks of age. Inequalities in smoking in pregnancy remain very stark, with the prevalence being 11 times as high in the most deprived fifths compared to the least in 2020. This difference is concerning not only because it can establish inequalities in health from an early age; it also has implications for exacerbating stigma among certain communities.

As relative inequalities in smoking have widened, the behaviour has become perceived as more strongly linked to social disadvantage, which pushes some of the stigma attached to smoking onto these deprived and often already excluded communities. This stigmatisation has implications for the engagement of these communities with health services and any public health messaging, potentially creating further barriers to smoking cessation. It is therefore important for public health policy makers to consider any potential unintended consequences of new strategies related to unhealthy commodities or behaviours, including the risk of creating heightened stigmatisation or marginalisation of particular communities¹³⁵.

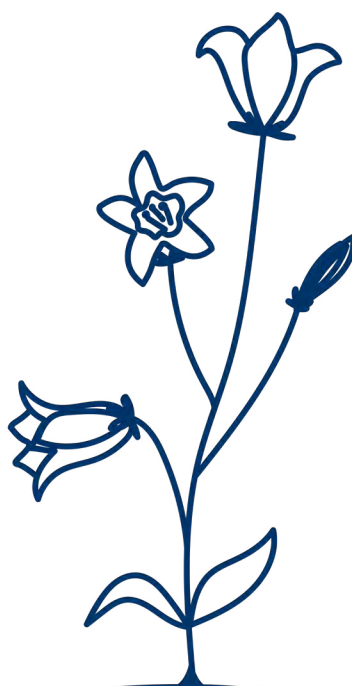
Physical activity and diet are common targets for behaviour change interventions, as they are important for many aspects of health. However, the data and related literature presented in this chapter demonstrate the complexity of this issue. Very low fruit and vegetable consumption is more common in Scotland's more disadvantaged areas, but this cannot be separated out from the influences of food insecurity. One in 12 adults in Scotland experienced worries about running out of food during 2019. This lack of secure access to nutritious food presents a very significant barrier to meeting diet recommendations. Inequalities in the ability of households to afford healthy diets is staggering (with households in the bottom fifth of incomes needing to spend 47% of their disposable income to eat nutritious food, compared to just 11% for the richest fifth¹³⁴), and the cost of living crisis is likely to exacerbate barriers to achieving healthy diets.

Inequalities were observed in children's engagement in formal physical activities in the Scottish Health Survey, however these survey responses are unlikely to pick up all the activity a child takes part in, including activity beyond organised play and sport (such as walking to shops or a bus stop). More robust data using accelerometers suggests only weak social gradients in physical activity and that, if anything, more deprived groups have slightly higher physically activity levels.

Some health-risk behaviours, including alcohol consumption and gambling, are present in all population groups in Scotland. For example, 60% of adults had spent money on gambling at least once in the past year, with very small inequalities. High levels of alcohol consumption are more common in the least deprived groups. Yet most of the associated health harms of these behaviours, including addiction and in some cases mortality, are clustered amongst the most disadvantaged groups. Factors that may contribute to this pattern include the accumulation of other risk factors experienced by these groups. As noted previously, this can include other health conditions, poverty, and negative life events. Multiple risk behaviours may result from the clustered availability and marketing of gambling, fast food and tobacco outlets in more deprived areas, as seen in Glasgow¹³⁰. It is difficult to determine to what extent these behaviours are the cause or effect of the clustering of these facilities in certain areas.

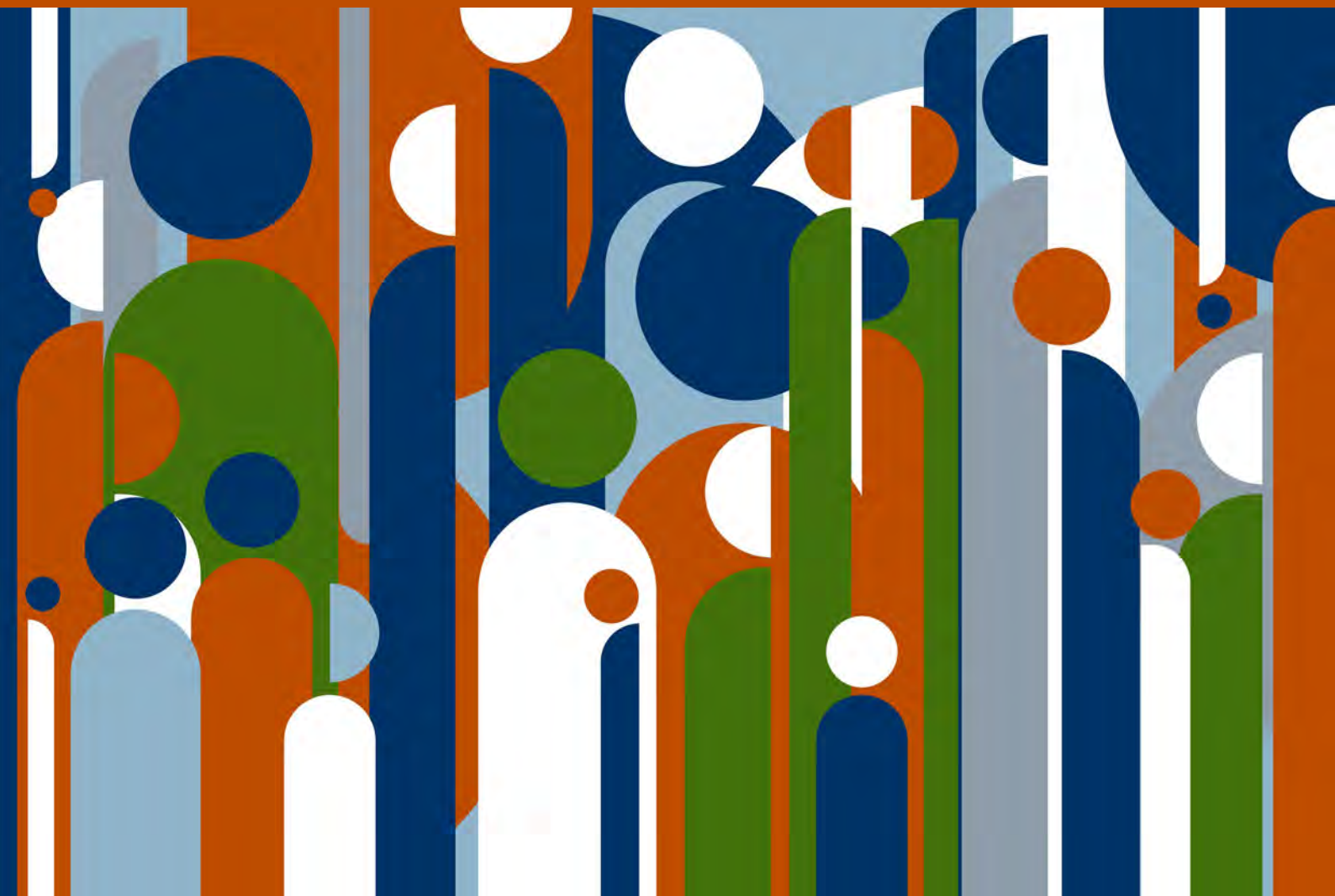
The importance of culture and community norms in shaping behaviour, alongside access to resources, means that these outcomes are often challenging and slow to change at a population level. Interventions aimed at voluntary behaviour change tend to have higher uptake in more advantaged groups, meaning they can widen health inequalities¹³⁶. The tendency of both research and policy to focus on understanding and addressing the impact of behaviours on health is termed lifestyle drift.

However, it is well recognised that wider social and economic reforms can have significant impacts on health-related behaviours, and health inequalities. This approach of targeting wider systems rather than individual behaviours also acknowledges that, compared to advantaged individuals, those in disadvantaged circumstances may experience worse health impacts from the same actions. This is one reason why policies that can improve equity in economic and social circumstances are a higher priority for action on health inequalities than specific behavioural interventions¹³⁷.



CHAPTER 4:

Health and social care services



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Health inequalities in Scotland:
An independent review

Introduction

- In this Chapter we focus on a series of measures which reflect access to, and the quality and performance of, health and social care services.
- Inequalities can arise at different points of the patient journey, in complex and sometimes competing ways. This chapter opens with a brief overview of this sequence to aid navigation through the following sections.
- Overall, we find a mixed picture. Even within particular types of services (such as screening) patterns are not always consistent.
- Timely antenatal booking and uptake of bowel screening have improved, but there have been worrying declines in the uptake of cervical screening. In all cases, inequalities have persisted.
- Childhood immunisation uptake – a previous success story in Scotland – has started falling, with widening inequalities since around 2012-14. This is seen across all types of immunisations examined.
- One success story has been a decline in patients not attending outpatient appointments. These remain unequally distributed and are highest among young and middle-aged men.
- There have been no improvements in the rate of repeated emergency admissions over the past decade, and improvements in amenable mortality have stalled with disadvantaged groups left behind.

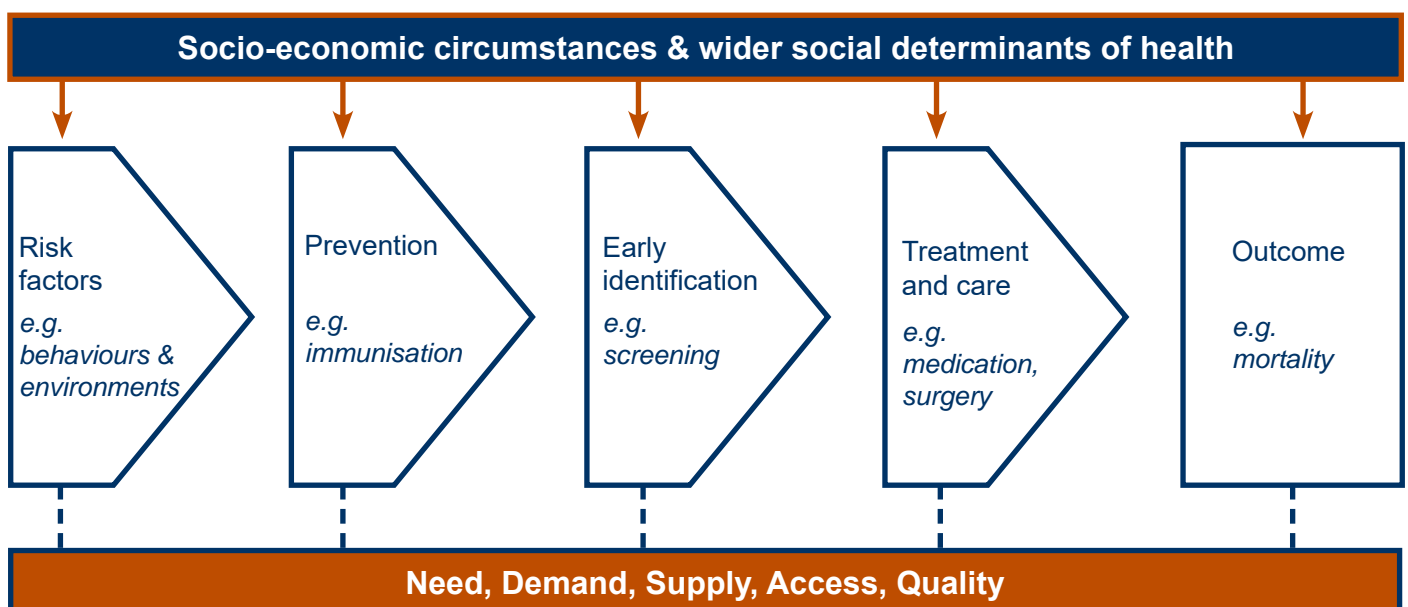


Inequalities in health and social care along the patient journey

The inverse care law, that “the availability of good medical care tends to vary inversely with the need for it in the population served”, was first defined by Tudor Hart, in 1971⁹². He went on to state that “this inverse care law operates more completely where medical care is most exposed to market forces, and less so where such exposure is reduced”. It has been suggested that health and social care services are designed and delivered under the assumption that everyone will access and receive the same level and quality of care¹³⁸, especially in contexts where that care is universal and free (such as in Scotland). Unfortunately, this is unlikely to be the case.

Inequalities in health and social care may arise at various points along the ‘patient journey’. Figure 4.1 provides a visualisation of how we consider this throughout the following Chapter. The figure starts with the heightened exposure to risk factors for ill health we see among some groups in Scotland. These include health-related behaviours that are the focus of Chapter 3, and other environmental exposures such as air pollution and occupational exposures. Health care has a role to play in reducing or mitigating against these exposures – for example through cessation services in primary care, or occupational health (which is not a focus of this chapter). Following on from this are the services which seek to prevent illness and disease (e.g. immunisation), to identify conditions early (e.g. screening) and treat or control health conditions. Inequalities may accumulate across the patient journey and can lead to inequalities in outcomes, including mortality. The top of the figure shows that the socio-economic circumstances of individuals, as well as the wider social determinants of health, interact with factors relating to the services to determine the care an individual receives. These include the provision of, access to, and quality of health services (all of which are overlapping and inter-dependent¹³⁹), as well as individuals’ perceived eligibility for services, and their ability to engage and navigate across services.

Figure 4.1. How inequalities may be introduced at each stage of the patient journey



Technical note:

In this Chapter we note targets or performance indicators which relate to the outcomes considered where relevant. We acknowledge that the introduction of these targets can lead to change via a number of mechanisms, including amendments to reporting that can create spurious change, as well as shifts in resources which can create real improvement (although potentially at the expense of other outcomes)¹⁴⁰. Considering these is beyond the scope of this report.

Antenatal booking

High quality antenatal care is important for expectant mothers and their babies, and it is advised that contact with a GP or midwife is made as early as possible, preferably by 8-12 weeks of pregnancy¹⁴¹. In 2012 a target was introduced that at least 80% of mothers had received their 'antenatal booking' by the 12th week of pregnancy, by 2015¹⁴². The target specifies that this should be achieved across all levels of deprivation.

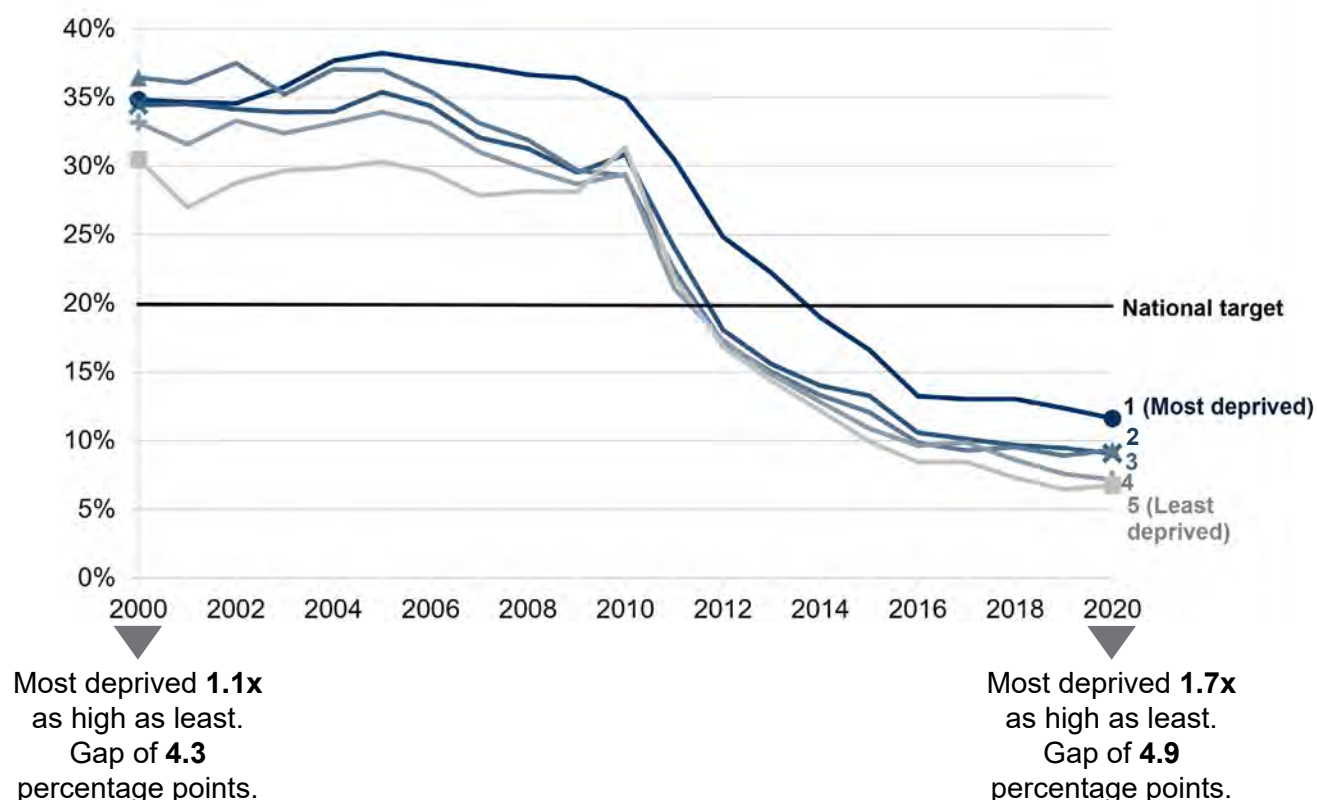
Timely 'antenatal booking' is important, because the first few months of pregnancy represent a particularly important period for foetal development and maximising the potential benefits of identifying and supporting any issues around the mother's physical and mental wellbeing, health-related behaviours, and relationship with the baby's father^{143 144}. Antenatal booking may also be used to raise awareness and/or access to additional support, such as the Family Nurse Partnership (an intensive home visiting programme for young mothers) and the Best Start scheme (which provides means tested financial support in the form of grants and prepaid cards to buy healthy foods)¹⁴⁵.

Since antenatal care is a universal and free service, we consider inequalities in uptake or timing of uptake to represent barriers to accessing these services. These may be physical, psychosocial or cultural.

Figure 4.2 overleaf shows impressive progress in the proportions of pregnant women receiving their antenatal booking before 12 weeks. The target that no more than 20% expectant mothers are not booked by 12 weeks (black line) had been met across all deprivation fifths by 2014. However, it is not possible to look at how much the average date of booking has changed (for example these trends could be entirely driven by a shift from most mothers booking by 13 weeks to booking by 12 weeks with no change in the proportion of very late bookings). Nevertheless, these data showed a decline in booking after 12 weeks has occurred across all levels of deprivation. However, the most deprived fifth of areas stand out as having worse rates relative to the other groups.

Figure 4.2. 'Delayed' antenatal bookings have fallen, but inequalities remain, and the most deprived areas in particular have been left behind

Proportion of pregnancies not booked by target of 12 weeks pregnancy, according to fifths of area-level deprivation (%): 2000 to 2020.



	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
Population average (%)	34.0%	33.8%	34.6%	34.3%	31.8%	31.4%	19.2%	14.6%	10.6%	9.9%	9.0%
Relative difference	1.1	1.2	1.3	1.3	1.3	1.1	1.5	1.6	1.6	1.8	1.7
Absolute gap (% points)	4.3%	5.8%	7.8%	8.2%	8.5%	3.5%	8.0%	6.8%	4.8%	5.8%	4.9%

Source: Public Health Scotland. Births in Scottish hospitals Year ending 31 March 2020.

These changes have occurred against a complex landscape of policies relating to the early years¹⁴⁶, including those directly relating to pregnant mothers^{145 147}.

The most recent Maternity Care Survey (2018) shows that nine out of ten pregnant women felt that the antenatal care they received was good or excellent, with little change since previous surveys (91% in 2013, for example). A breakdown of these ratings by socio-demographic characteristics is not available, although the survey under-represented younger mothers and those living in deprived areas¹⁴⁸.

Measles, mumps and rubella (MMR) vaccination in 2-year-olds

Vaccination is one of the most successful public health interventions, preventing outbreaks of vaccine-preventable infectious diseases which can lead to ill health and, in rare cases, disability and death. Vaccinations not only protect the individuals who receive them, but also (if coverage is high enough) others in the population for whom immunisation may not be an option, for example due to medical contraindications.

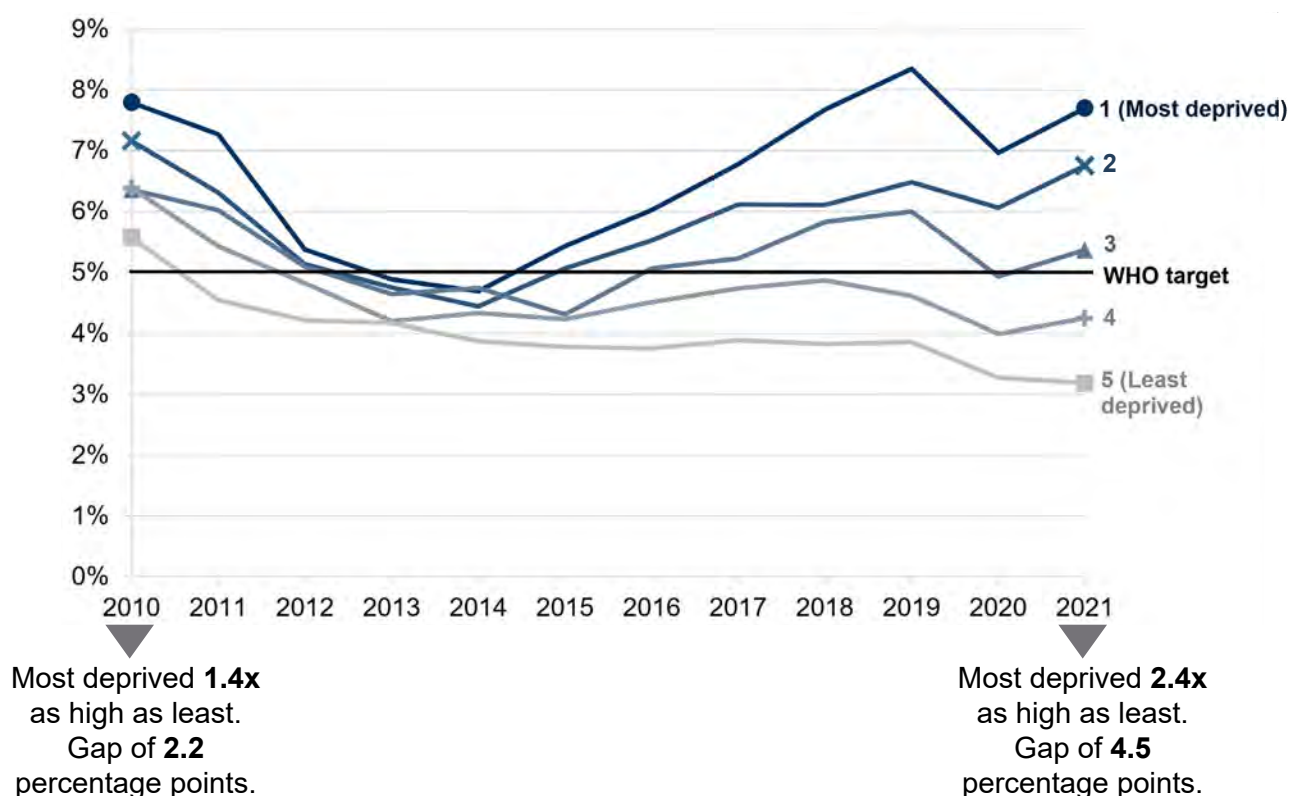
In this section, we describe inequalities in uptake of the first measles, mumps, and rubella (MMR) vaccine. As noted later on in this section, patterns are similar for the primary vaccines (which are given in the first few months of life), and inequalities in the Human Papilloma Vaccine are discussed in the cancer care cascade Spotlight.

Figure 4.3 shows the proportion of children who had not received the first dose of the MMR vaccine by 24 months of age (due by age 12-13 months) since 2010. The proportion not immunised started to increase from 2014/15 onwards, after a period of dramatic improvements.

Since 2016, the WHO target (that 95% of children are immunised with the MMR by age 2 years) has not quite been met at the population level. This has been driven by increases in the proportion of children not immunised in the three of the five most deprived areas in Scotland. The absolute gap between the most and least deprived areas has increased from 0.8% in 2014 to 4.5% in 2021, with relative inequalities rising (from 1.2 to 2.4).

Figure 4.3. Inequalities in MMR uptake (first dose, 2 years) have widened since ~2014 and the WHO target is only met in the least deprived 40% areas

Percentage of 24-month-olds who had not received the first dose of the MMR, according to fifths of area-level deprivation: 2010 to 2021 (calendar years).



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Population average (%)	6.8%	6.0%	5.0%	4.6%	4.4%	4.6%	5.1%	5.4%	5.8%	6.0%	5.1%	5.6%
Relative difference	1.4	1.6	1.3	1.2	1.2	1.4	1.6	1.7	2.0	2.2	2.1	2.4
Absolute gap (% points)	2.2%	2.7%	1.2%	0.7%	0.8%	1.6%	2.3%	2.9%	3.9%	4.5%	3.7%	4.5%

Source: Public Health Scotland. Childhood immunisation statistics Scotland reports.

Children represented in the 2020 data point (covering the period January to December 2020) were due to be immunised 12 months prior (and therefore before the COVID-pandemic hit). However catch-up immunisation may have been affected. A large proportion of children represented in the most recent period (January-December 2021) were due to be immunised after the COVID-19 pandemic hit.

The childhood immunisation statistics report for 2021 shows that, even among those children who are immunised by 24 months (and would therefore appear as fully immunised in the trend graph above), there are inequalities in the timing of uptake. Those living in more deprived areas are immunised at later ages than those from less deprived areas. For example, 86% had received their first dose of MMR by 15 months of age in the most deprived fifth of areas compared with 94% in the least deprived areas¹⁴⁹. These differences indicate barriers to timely immunisation. During the COVID-19 pandemic, timeliness of uptake improved in Scotland, in contrast to other countries like England, where things worsened. These improvements occurred across all SIMD fifths, although inequalities persisted¹⁵⁰.

The trends in inequalities we have observed here start early, with similar patterns for the primary vaccines which are given in the first few months of life (see Appendix E.4.1). They also persist across childhood, with inequalities also seen in the pre-school booster vaccines¹⁴⁹. New analysis of an administrative cohort of children born 2009-2013⁵⁸ showed that there were even larger inequalities in the proportion of children who (at average age of 6 years) were not fully up to date with all of the immunisations (i.e. the primary vaccinations, first dose and second doses of the MMR, and the preschool booster). In this cohort, children living in the most deprived fifth of areas were 1.5 times as likely to have not received all vaccinations due by the start of primary school (compared to a relative risk of 1.4 for the first dose of the MMR by age 12 months). This indicates that some groups are experiencing high and persistent barriers to immunisation and require additional support. This is explored in greater detail in the following section.

Beyond area-level deprivation: childhood immunisations by family-level characteristics

A linkage study combining birth registry and immunisation records⁵⁸ indicates that focussing on area-level deprivation can disguise important differences occurring at the individual or household level.

For example, among children born in 2009-2013, those living in the most deprived areas were 1.4 times as likely to have missed the MMR vaccination as those living in the least deprived areas (absolute gap 1.2%). Inequalities according to parental relationship status

at birth (comparing sole registrations to married parents) and mother's occupational status (comparing never worked/long-term unemployed to managerial and professional occupations) were larger, with relative differences of 2.1 and 3 respectively, and absolute gaps of 1.6% and 2.1%. Given the widening of area-deprivation level inequalities since 2014/15 we have observed in Figure 4.3, it is possible that these family-level inequalities are an underestimate of what we would observe today.

Again, inequalities in the proportions of children not fully immunised with all vaccines due by the start of primary school (at age 6 years) were even greater. Relative inequalities according to area-level deprivation, parental relationship status, and mother's occupational status were 1.5, 1.7 and 2.2 respectively, with absolute gaps of 2.5%, 4% and 5.7%.

The broader evidence base points towards two fairly distinct groups of children who are under-immunised – those whose parents have concerns about safety and effectiveness¹⁵¹ ¹⁵² ('vaccine hesitant'¹⁵³) and those who face barriers relating to social disadvantage^{151 152 154}. The impact of social disadvantage on immunisation uptake is acknowledged in Scotland's vaccination transformation programme, which has included a detailed look at strategies with potential to improve uptake of immunisation in under-served groups, including those living in deprived areas, people whose first language is not English, Gypsy and Traveller communities and individuals with learning disabilities¹⁵⁵.

Bowel screening

There are three NHS cancer screening programmes in Scotland, for cervical, bowel and breast cancers. In this section we focus on inequalities in bowel cancer, with cervical screening covered in the Spotlight on the cancer care cascade.

Bowel (or colorectal) cancer was the fourth most common cancer in Scotland in 2019¹⁵⁶ and the second most common cause of death from cancer¹⁵⁷.

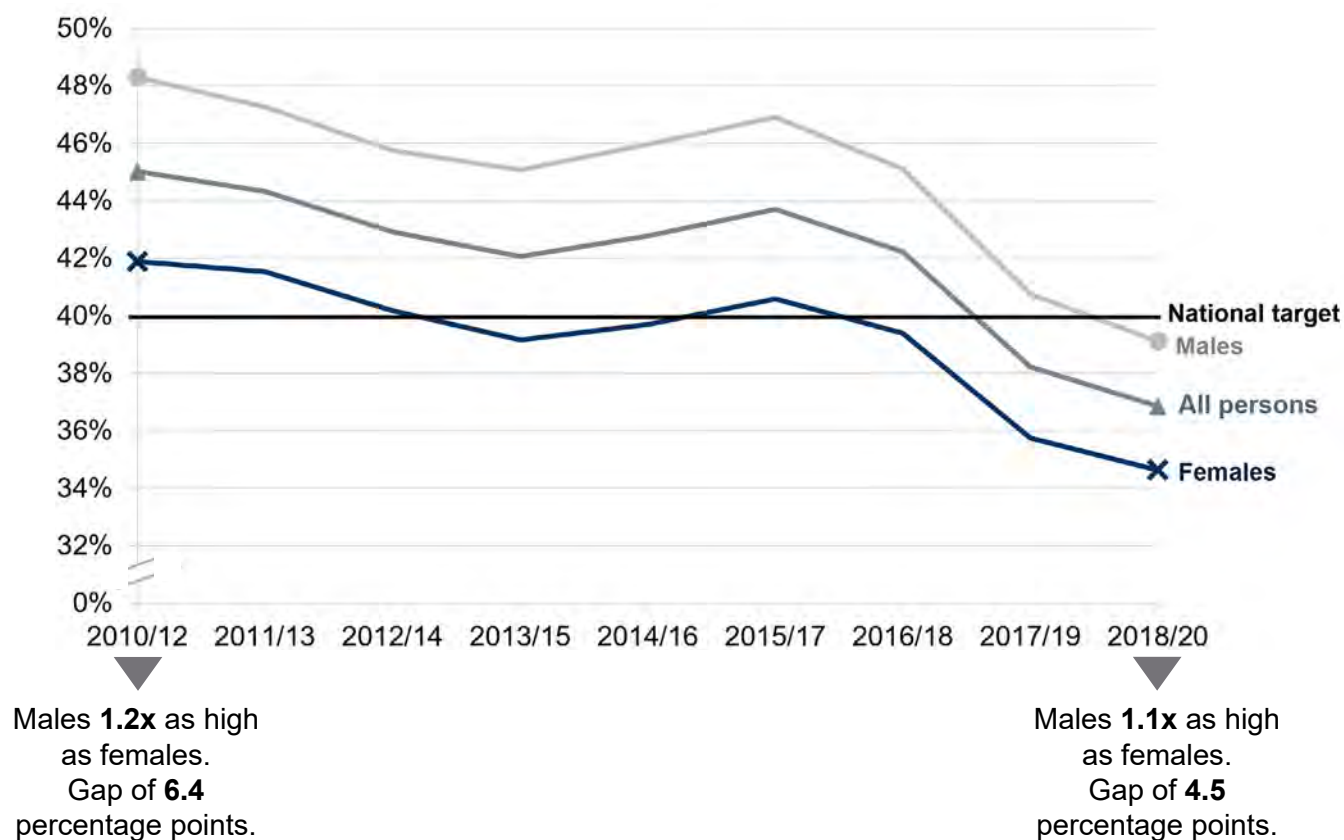
Bowel screening became available to men and women aged between 50-74 years old in Scotland after a phased roll out between 2007 and 2009. Screening is recommended every two years, with the view to identifying bowel cancer at an early stage when treatment is far more effective. Eligible adults are posted a test kit which is completed at home. In 2017 a newer, easier test (requiring fewer stool samples, known as the Faecal Immunochemical Test (FIT)), replaced the Faecal Occult Blood Test (FOBT).

In Scotland there is a target of 60% for bowel screening uptake (or in other words, fewer than 40% not taking up bowel screening – shown with the black line in Figure 4.4). As this figure shows, proportions of those invited who did not complete the screening test have fluctuated since the beginning of the period covered (2010/12) with potential declines after the introduction of the easier, FIT.

There has been a persistent sex gap, however, with men remaining more likely to not return their test.

Figure 4.4. Since the introduction of a new, simpler test (in 2017), failure to take up bowel screening has potentially started to decrease - although uptake is still lower among males

Proportion of eligible adults (50-74 years) who do not return a 'correctly completed' bowel screening kit, according to sex (%): 2010/12 to 2018/20.



	2010/12	2012/14	2014/16	2016/18	2018/20
Population average (%)	45%	43%	43%	42%	37%
Relative difference	1.2	1.1	1.2	1.2	1.1
Absolute gap (% points)	6.4%	5.6%	6.3%	5.7%	4.5%

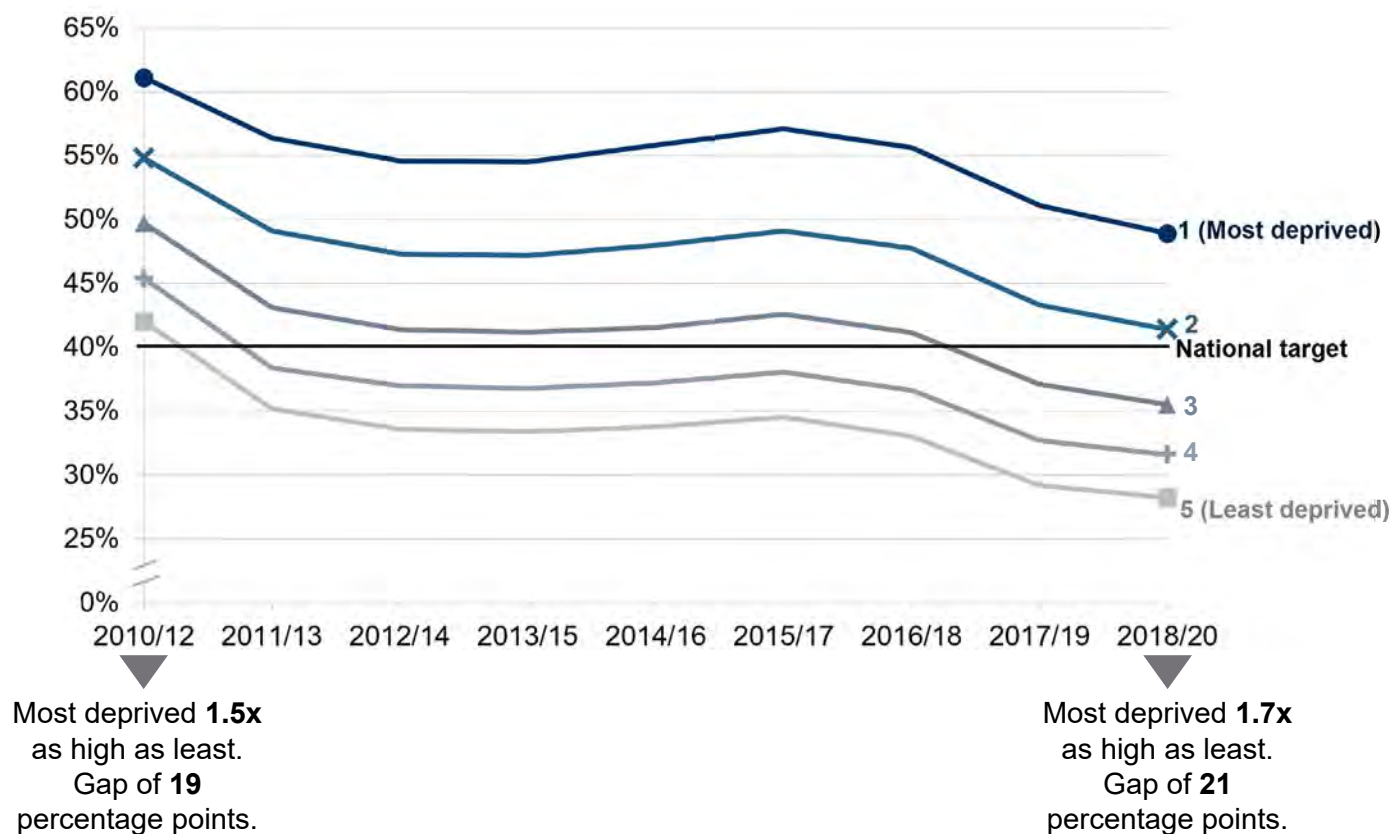
Source: Public Health Scotland. Scottish Bowel Screening Programme Statistics (KPI reports).

NB. Data are presented for the years during which bowel screening was available across Scotland (after the phased roll out (2007-2009)). From 2010/12 to 2012/14 the uptake figures reported are measured between May and April. From 2013/15 uptake rates are measured between November and October.

These patterns have been seen across all deprivation levels (Figure 4.5). Relative inequalities have increased since 2010/12, while absolute inequalities have fluctuated. Uptake remains lowest in the most deprived fifth of areas, where the proportion who do not take up testing was 20.7 percentage points higher than in the least deprived fifth in 2018/20.

Figure 4.5. Proportion of eligible adults not taking up bowel screening has declined across all areas, although national targets are still not being met in the most deprived areas

Proportion of eligible adults (50-74 years) who do not return a 'correctly completed' bowel screening kit, according to fifths of area-level deprivation (%): 2010/12 to 2018/20.



	2010/ 12	2011/ 13	2012/ 14	2013/ 15	2014/ 16	2015/ 17	2016/ 18	2017/ 19	2018/ 20
Population average (%)	45%	44%	43%	42%	43%	44%	42%	38%	37%
Relative difference	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.7
Absolute gap (% points)	19.1%	21.2%	21.0%	21.1%	22.0%	22.6%	22.6%	21.9%	20.7%

Source: Public Health Scotland. Scottish Bowel Screening Programme Statistics (KPI reports).

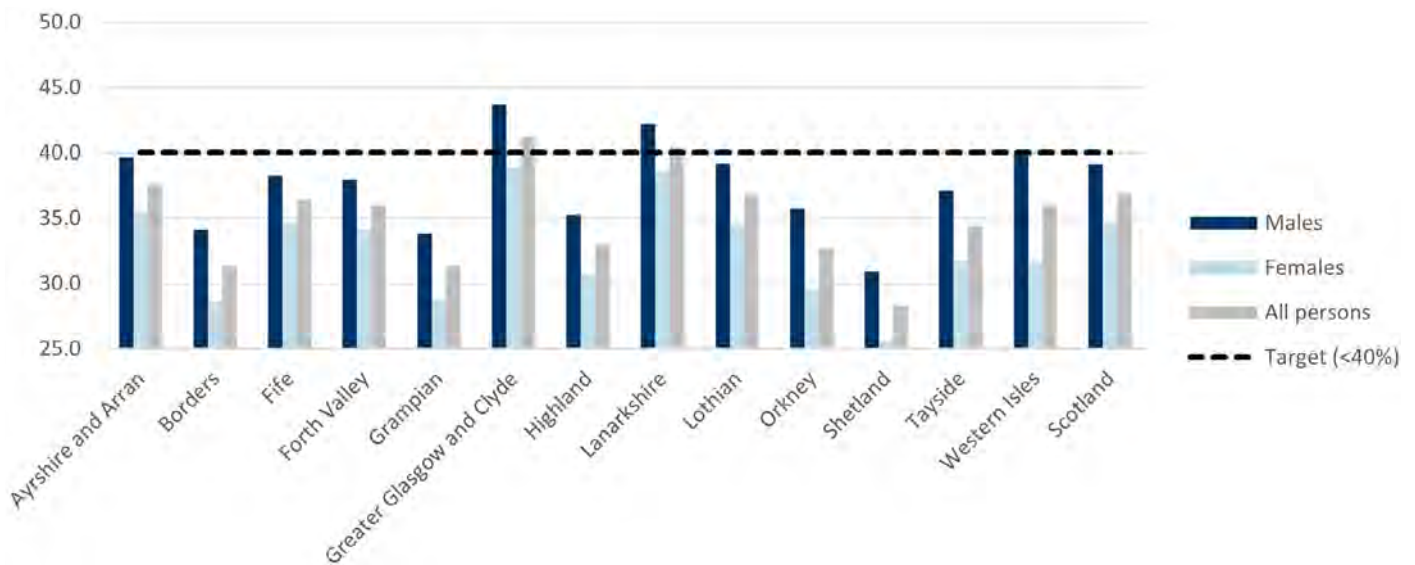
NB. Data are presented for the years during which bowel screening was available across Scotland (after the phased roll out (2007-2009)). From 2010/12 to 2012/14 the uptake figures reported are measured between May and April. From 2013/15 uptake rates are measured between November and October.

While the incidence of bowel cancer overall has minimal inequalities, stage of diagnosis has strong socio-economic patterning. In 2019, patients in the most deprived fifth of areas in Scotland were less likely to be diagnosed with Stage 1 bowel cancer and more likely to be diagnosed with Stage IV cancer compared with patients in the least deprived areas¹⁵⁶.

There are also large variations across Scotland and targets are not being met for men in Greater Glasgow and Clyde and Lanarkshire (Figure 4.6). However, these differences are likely to in part reflect differences in deprivation, which tends to be higher in these areas (see Appendix C).

Figure 4.6. There is geographical variation in bowel screening uptake with some areas not meeting targets

Proportion of eligible adults (50-74 years) who do not return a 'correctly completed' bowel screening kit, according to sex and NHS Health Board (%): 2018/20.



Source: Public Health Scotland. Scottish Bowel Screening Programme Statistics (KPI reports).

Dental services – registration and attendances

NHS dentist registration rules were dramatically changed in Scotland in the late 2000s. Until 2009, registration with a dentist lapsed after 3-4 years if the patient had not attended for a check-up or treatment (referred to as 'participation'). In 2010 'lifetime registration' was introduced.

This meant that patients remained registered with a dentist indefinitely, regardless of their participation, fuelling large decreases in the proportion of adults and children not registered with an NHS dentist (from 46% in 2008 to 5.0% in 2019 for adults, and from 26% to 6% in children). Inequalities by area deprivation narrowed for children and were reversed for adults (Appendix E.4.2).

However, this has been accompanied by declines in participation among those who are registered. The proportion of registered individuals who had not attended a check-up in 2 years rose from 7% to 34% in adults and from 7% to 16% in children. Both adults and children living in deprived areas are least likely to participate, and this pattern has widened in parallel with increasing registration rates. It is likely that this is an underestimation of inequalities, because those living in less deprived areas are more likely to use private dental care, which is not captured.

Thus, barriers to engaging with NHS dental services among those in disadvantaged areas remain an issue, despite changes to registration rules.

Dentist attendances dropped dramatically in March 2020, when dental practices suspended all dental treatments due to the COVID-19 pandemic. Although NHS dental services have slowly reopened, starting first with emergency care, at the time of writing attendances have not recovered to pre-pandemic levels, especially among disadvantaged groups¹⁵⁸. There is a concern that unidentified or untreated oral health problems are accumulating due to the backlog of patients on waiting lists. Some patients are turning to private care, but this will not be an option for those with fewer financial resources.

Beyond area-level deprivation: dental outcomes in care experienced children

Care experienced children are slightly less likely to regularly attend a dentist, more than twice as likely to have urgent dental treatment at 5 years and almost twice as likely to have teeth extracted under general anaesthesia¹⁵⁹ compared to children in the general population. It was not possible to disentangle whether these negative outcomes occurred before or after coming into care, but the data demonstrate that this group is particularly vulnerable to poor dental health.

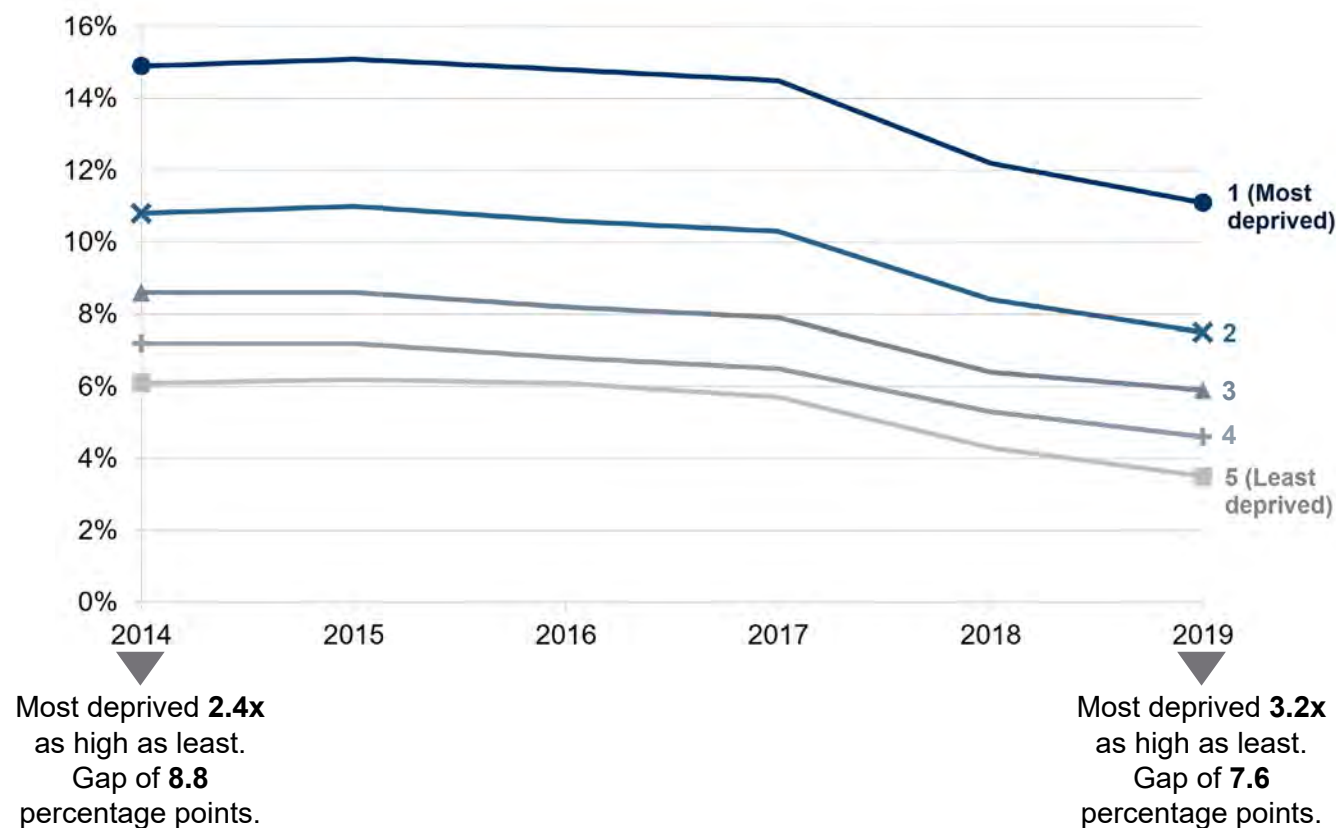
Did not attend (DNA) outpatient appointments

Inequalities in patients who Did Not Attend (DNA) hospital outpatient medical appointments (e.g. X-rays, minor surgeries, some cancer treatments), without prior warning can indicate inequalities in access to health services. These may relate to structural barriers (such as transport options, timing of the appointment, language barriers or experiences or expectations of stigma), a higher burden of ill health (making navigation of the health system harder), or perceptions around the importance of the appointment¹⁶⁰.

Figure 4.7 presents trends in the proportion of DNAs in new outpatient appointments since 2014. Whilst DNAs have fallen, inequalities have persisted, with DNAs remaining especially high in the most deprived fifth of areas. These figures are not standardised for age and sex. As we see in the following figure (Figure 4.8), DNAs tend to be higher among young and middle aged men, who are also more likely to live in deprived areas, so it is hard to differentiate the effects of age, sex and deprivation.

Figure 4.7. DNAs have fallen slightly over the past five years, but they remain far higher in the most deprived areas

Proportion of outpatient hospital appointments not attended* (unadjusted for age and sex), according to fifths of area-level deprivation (%): April-June, 2014 to 2019.



	2014	2015	2016	2017	2018	2019
Population average (%)	9.9%	10.0%	9.7%	9.3%	7.6%	6.8%
Relative difference	2.4	2.4	2.4	2.5	2.8	3.2
Absolute gap (% points)	8.8%	8.9%	8.7%	8.8%	7.9%	7.6%

Source: ISD Scotland, Acute Hospital Publication, years 2014-2019. Data presented refer to quarters April-June.

*Percentage of new outpatient appointments recorded as: Attendance Status = 8 (Patient did not attend and gave no prior warning).

It has been suggested that this decline in DNAs has occurred alongside changes in practice which have included “NHS boards proactively using patient-focused booking and ‘attend anywhere’ [a video consultations platform], as well as having patients phone to arrange suitable appointments and introducing text reminders”¹⁶¹. However, as far as we are aware the impact of these changes on DNAs has not been formally evaluated.

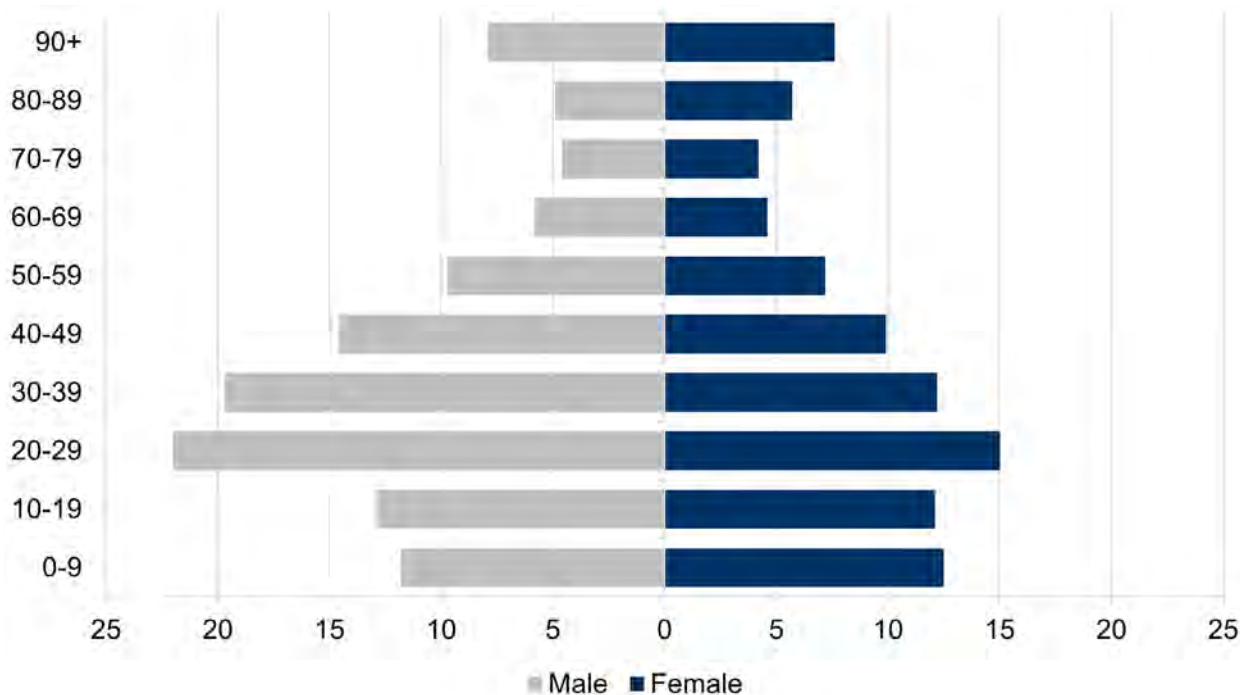
The age and sex distribution of DNAs has not changed significantly between 2014 and 2019 (Figure 4.8). DNAs tend to be higher in men than women, and among those in their 20s and 30s. Although these data are not routinely reported in Scotland¹⁶², DNAs are thought to be especially high for appointments at alcohol and drug related services, due to the multiple barriers that drug and alcohol users experience, related to poor health, stigma, and wider

social disadvantages. Although we are only able to compare across a five-year period, the persisting shape of the age and sex distribution would imply that the higher rate of DNAs in young men is not due to a cohort effect.

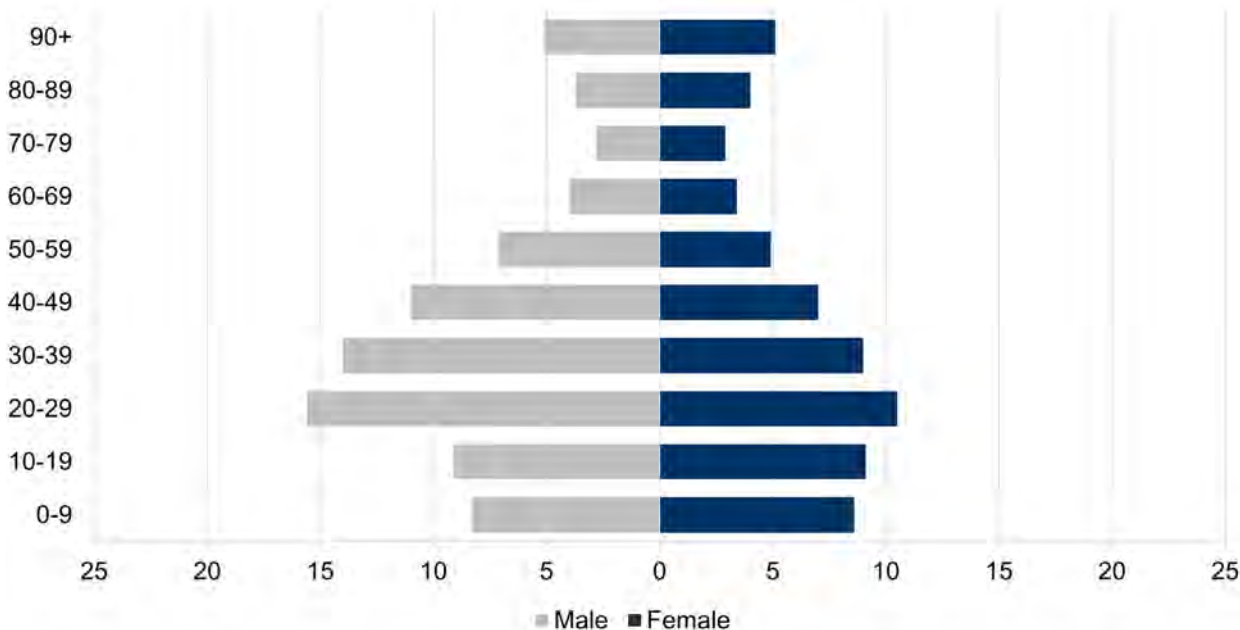
Figure 4.8. Percentage of outpatient appointments not attended decreased between 2014 and 2019, across both sexes and all age groups, although they remain highest among men in their 20s and 30s

Percentage of outpatient hospital appointments not attended* (unadjusted for age and sex), according to age and sex, April – June: 2014 and 2019.

2014



2019



Source: ISD Scotland, Acute Hospital Publication, years 2014-2019. Data presented refer to quarters April-June. Percentage of new outpatient appointments recorded as: Attendance Status = 8 (Patient did not attend and gave no prior warning).

Missed GP appointments

The data presented in the preceding section refer to hospital outpatient appointments. Similar issues are seen for GP appointments. In a cohort of 13 million GP appointments over the period 2013-2016 (representing 10% of all practices in Scotland), patients attending GPs serving the most deprived 10% of patients (based on area deprivation) were more than twice as likely to miss an appointment. Inequalities appeared even greater when focusing on multiple missed appointments¹⁶³. Men were slightly more likely to miss appointments than women, once the number of total number of appointments was taken into account.

Beyond area-level deprivation

Missed appointments in people with multi-morbidities

Missed GP appointments are more likely among patients who experience multimorbidity¹⁶⁴. This is especially the case for those experiencing mental illness (and alcohol and substance abuse in particular). The risk of premature mortality steadily increased with how many appointments patients missed, with those in the 'high' missed appointments group (missing > 2 per year, on average) three times as likely to die before the age of 75 years as those who had missed no appointments. This was after accounting for a range of confounding factors including area-level deprivation, number of health conditions and number of appointments¹⁶⁴. Serial missed appointments are considered not only an indicator of engagement in health care, but also potential social vulnerability. This impression has been echoed in a focus group with GPs in Scotland, where it was suggested that multiple missed appointments were linked to housing instability, financial problems and chaotic lifestyles¹⁶⁰. It is worth noting it is not just patient outcomes which vary between deprived areas - GPs working at these practices report experiencing more stress, especially after longer consultations¹⁶⁵.

Gender identity, sexual orientation and satisfaction with health services

People's sexual orientation or gender identity is not routinely reported in health services settings, however, a bespoke survey found that one in six LGBT people felt they had experienced poor treatment from health services in the previous three years because of their sexual orientation or gender identity¹⁶⁶.

Health service use among people with disabilities

Physical and mental disabilities are not routinely recorded in health administrative datasets. We are therefore reliant upon data linkage studies which use information from the census or registers.

Cooper et al. used a primary health care register of people with intellectual disabilities to compare the prevalence and management of long-term health conditions in Greater Glasgow and Clyde over the period 2007-2010¹⁶⁷. They found that adults with intellectual disabilities, compared to the general population, were more likely to have various long-term health conditions including epilepsy (28% vs. 1%), psychosis (8% vs. 1%), asthma (9% vs. 5%), diabetes (6% vs. 3%), heart failure (3% vs. 1%) and hypothyroidism (5% vs. 3%). Management of these long-term health conditions was also poorer. For example, adults

with intellectual disabilities were less likely to receive timely tests relevant to their health conditions (e.g. a kidney screen for those with diabetes (67% vs. 94%), a blood test in those with hypertension (74% vs. 90%) or cholesterol check for those having suffered from a stroke (46% vs. 85%)).

Particularly large differences were found for asthma reviews, just 32% of asthmatic adults with intellectual disabilities had received an asthma review in the past 15 months compared to 72% in the general population. Cervical screening uptake in the last 5 years was also far lower in 21 to 60-year-old females with intellectual disabilities compared to those without (23% vs. 91%). Intellectual disability is also identified as a barrier to health screening programmes in the Keys to Life report – which discusses cervical screening as well as dental check-ups, and sensory impairment assessments¹⁶⁸.

There was no consistent evidence that area-level deprivation was associated with the likelihood of suffering from long-term health conditions amongst this cohort, contrary to what we see in the general population. Cooper et al. conclude that there appear to be more important factors that influence health and health care among individuals with intellectual disabilities than those we typically see in the general population (such as deprivation)¹⁶⁷.

In the following Spotlight, we use cancer as an example to summarise how inequalities can be introduced at each stage of the patient journey. As we have seen in the early chapters, people living in less advantaged circumstances are more likely to be exposed to health-harming exposures and to experience ill health. However, how inequalities can develop from here is complex – they are shaped by demand for, access to and quality of services, as well as the wider societal influences which range from living and working conditions to stereotypes, prejudice and discrimination in services and society more widely.

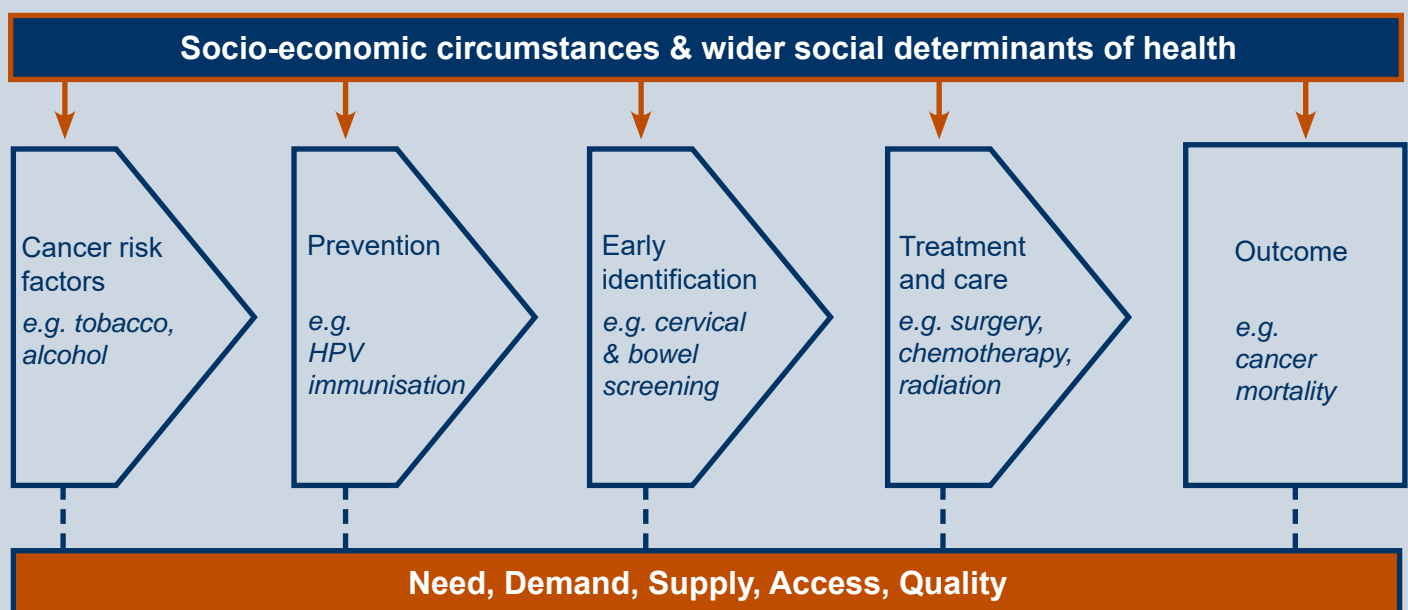
A useful concept for understanding how inequalities arise is ‘candidacy’ – the extent to which individuals consider themselves a legitimate ‘candidate’ for services and how they then act upon this perception at different stages of the patient journey. The assessment of candidacy can vary from health condition to health condition and can be influenced by a range of individual characteristics including knowledge of health and local health services, age, sex, and socio-economic and cultural characteristics¹⁶⁹.

We have briefly highlighted, here and elsewhere in the report, how for some social groups (e.g. Gypsy and Traveller communities, disabled communities) stigma is a barrier to health service engagement. This stigma arises in societal and service structures as well as in interactions with other people. In the following Spotlight we have focussed on a health condition which is relatively stigma-free. It is important to note that among people with certain health conditions, such as mental illness and drug and alcohol misuse, experiences of stigma can be greater still.

Spotlight on the cancer ‘care cascade’

Inequalities in health and mortality are introduced at various points along the ‘patient journey’. Here we provide an example of how these may arise, drawing upon new data and data from the chapters of this report, using an adapted version of Figure 4.1 introduced earlier on in this chapter (now Figure A).

Figure A. How inequalities can be introduced at each stage of the patient journey: example of cancer

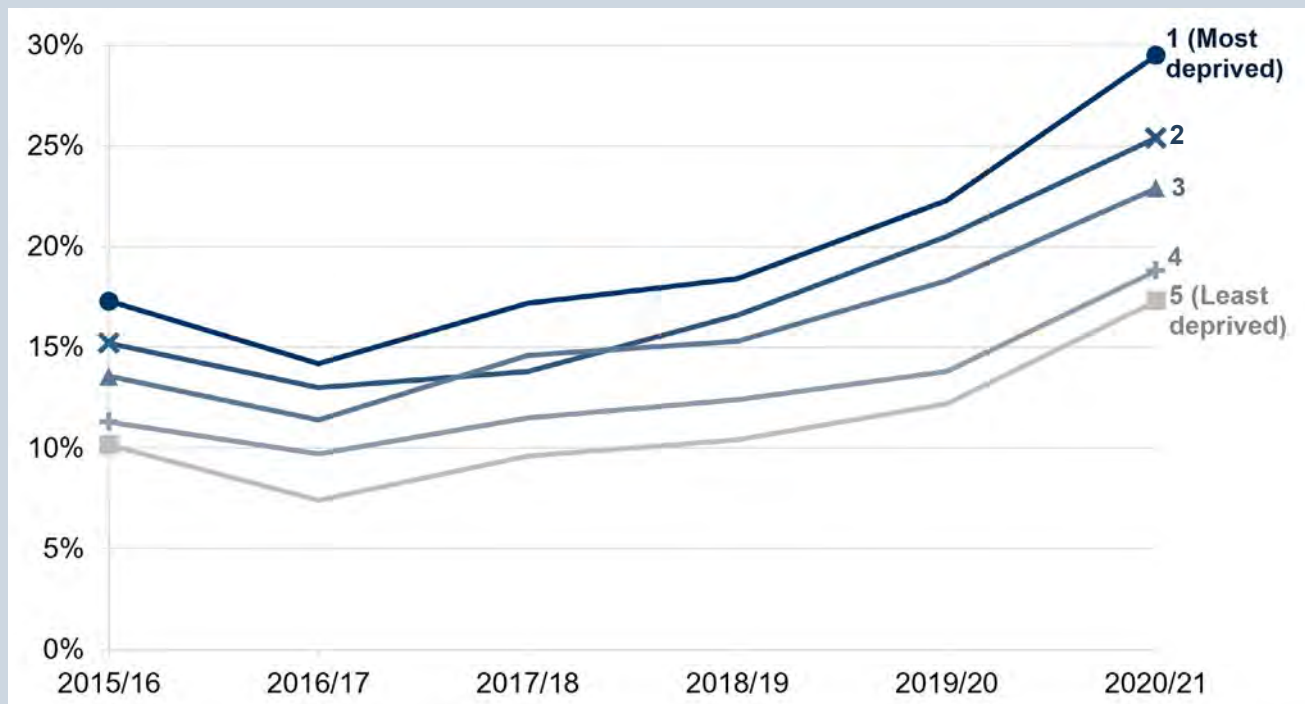


Cancer risk factors

- Exposure to important cancer risk factors such as tobacco smoke and alcohol is not equally distributed in the population. People living in less advantaged areas are three times as likely to smoke¹⁷⁰, and as we see in the FAI report on the social determinants of health, people living in more disadvantaged areas are exposed to more pollution.
- These risk factors create inequalities not only if they are more prevalent in some groups than others, but if they are more harmful. This has been found for alcohol. Among excessive drinkers, those from disadvantaged social groups are more likely to experience alcohol-attributable harms than those from less disadvantaged backgrounds, even after accounting for different drinking patterns, physical health and smoking¹²⁶.
- Inequalities can be introduced at this stage if demand for, access to or quality of health services aiming to support healthier behaviours is unequal, such as the inequalities in accessing antenatal care seen in this Chapter.

Preventative services

Figure B. Percentage of girls not fully immunised with two doses of the HPV vaccine at the end of S3: 2015/16 - 2020/21. Source: Public Health Scotland. HPV immunisation statistics Scotland

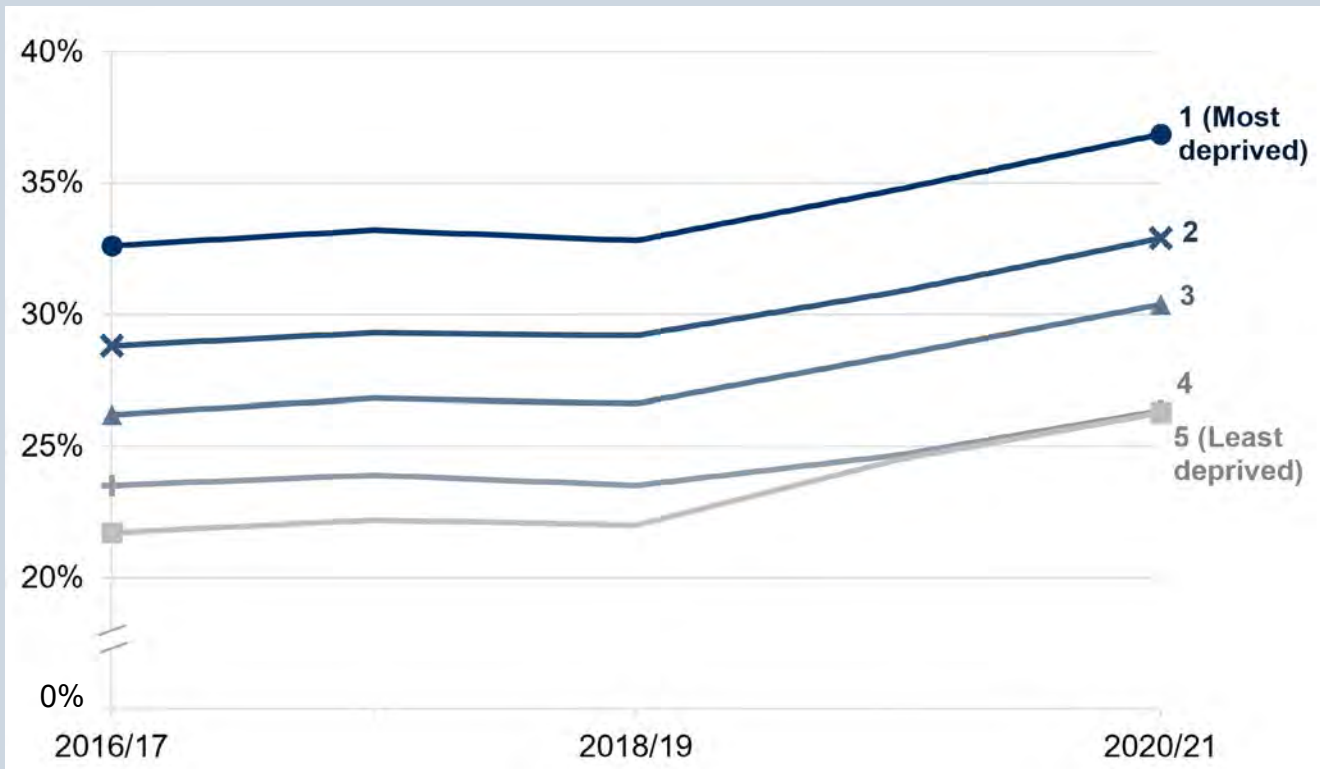


HPV Vaccine (Figure B)

- Since 2014, the Human Papilloma Virus (HPV) vaccine has been offered to girls in the form of two doses, usually in the first two years of secondary school (S1-2), with opportunities to 'catch-up' in S3 and S4.
- The proportion of girls not fully vaccinated by the end of S3 has been increasing since 2016/17, although the situation was exacerbated by the COVID-19 pandemic when schools were forced to close.
- There have been large inequalities across the period, in both relative and absolute terms.
- The reasons behind a lack of uptake of preventative services, including immunisation, are complex and can be linked to cultural barriers (health services are not perceived as trustworthy to some groups, e.g. Gypsy and Traveller Communities, based on past experiences including stigmatisation), social norms and values (around sexual debut and behaviour), concerns about safety and effectiveness of the vaccine, and problems around physical access (e.g. those who miss school for health or other reasons)¹⁷¹.



Figure C. Percentage not taking up cervical screening within 6 months of invitation: 2016/17 - 2020/21. Source: Public Health Scotland. Scottish cervical screening programme statistics annual updates, various



Cervical screening (Figure C)

- The proportion of eligible adults not attending for cervical screening on time is relatively high and showing signs of increase.
- Those living in the most deprived areas are 1.4 times as likely to not attend for screening on time compared to those in the least deprived areas, with an absolute gap of more than 10%.
- In 2020/21, uptake was lowest in 20–25-year-olds (55.4%).

Early identification

- The same barriers to preventative services can affect engagement in services that aim to identify cancer early.
- While inequalities in bowel screening have fallen (possibly due to the introduction of a simpler test), large barriers persist for cervical screening where overall uptake has decreased and inequalities remain.
- Since early identification can alter treatment pathways and improve treatment outcomes, inequalities are already present at the point of diagnosis.

Treatment

- People's ability to access and navigate treatment is again not equal. Physical, psychosocial and cultural barriers noted earlier may still be at work, and people managing multiple health conditions may face particular barriers.
- We see evidence of this in the large inequalities in patients who 'Did Not Attend' planned outpatient appointments. These are more likely among young men, deprived areas, and those experiencing multimorbidity.
- There may also be inequalities in 'candidacy'¹⁶⁹, that is the propensity for someone to consider themselves a legitimate candidate for health services – this is influenced by a range of factors acting at the individual, local and societal level.
- Quality of services also vary. For example, there are large inequalities in repeated emergency admissions, a systems level indicator of health and social care quality. Health spending has been insufficient to maintain service quality in the face of growing need. The FAI report on social determinants highlights how patients from more deprived areas are potentially more likely to be dissatisfied with health services.

Bypassing delays or barriers in the care system: Across all of the above stages, more advantaged individuals are better able to bypass delays (e.g. waiting lists), by accessing private care.

The end-point is large and potentially widening inequalities in cancer deaths in Scotland^{22 44}. People from less advantaged groups are more likely to be exposed to risk factors for cancer and less likely to access preventative services, which increases their chances of getting cancer. The rate of deaths caused by preventable cancers was more than twice that of treatable cancer deaths in 2020²⁴. Poorer engagement in screening contributes to inequalities in the stage at which cancer is diagnosed. As discussed in Chapter 2, inequalities in cancer incidence are lower than inequalities in cancer mortality, suggesting that inequalities in cancer treatment are also playing an important role.

Scotland's 2016 cancer strategy committed to improving service delivery and reducing inequalities in outcomes for people with cancer, through providing more equitable access to screening, earlier diagnosis, support for health literacy and access to services that are aimed directly at "hard-to-reach" groups¹⁷². A new cancer strategy, which refocuses efforts post-COVID-19 pandemic, is expected in March 2023, where inequalities remain a cross-cutting theme across the patient journey.



Multiple emergency hospital admissions

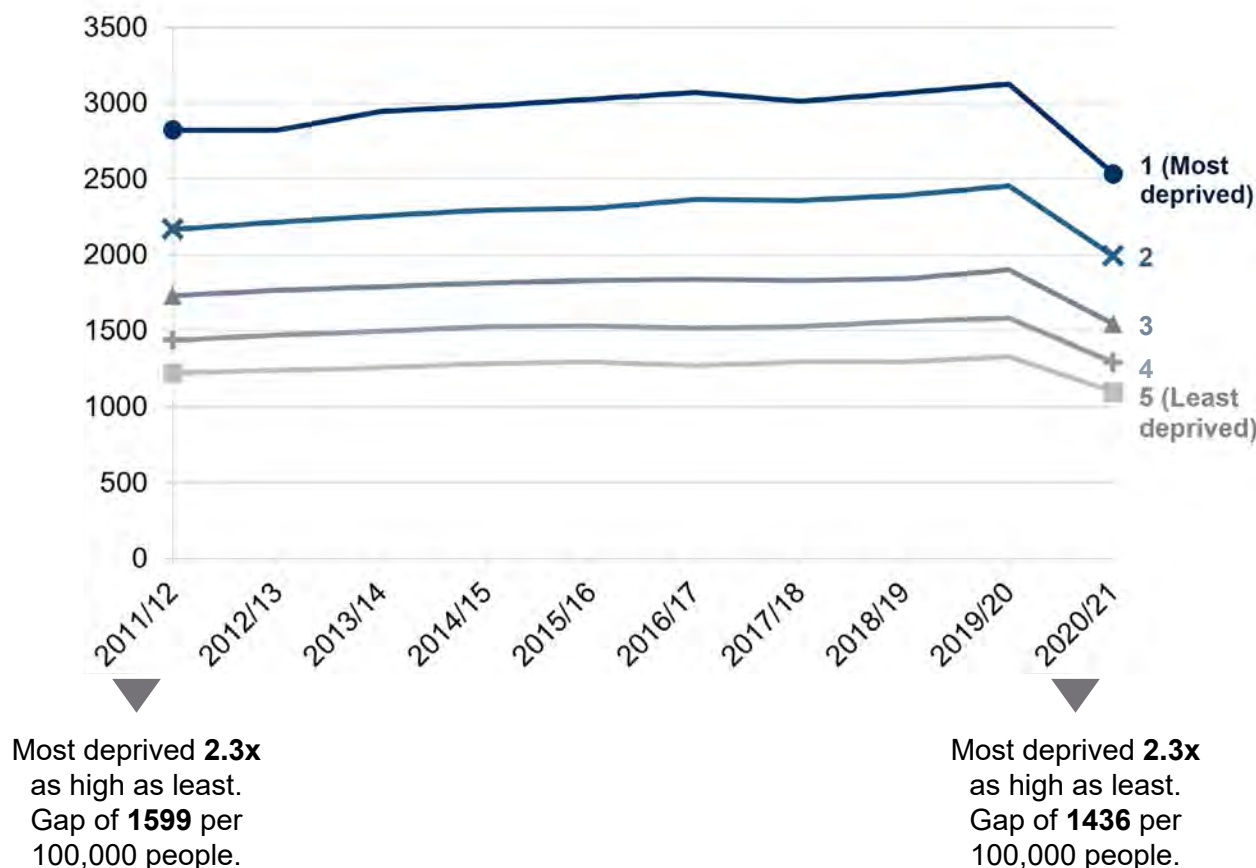
Emergency admissions are those when patients are admitted to hospital urgently and unexpectedly and are therefore unplanned. These may be related to an event which could not be anticipated (such as a serious accident) or could signal a failing of health and community care services to identify and deal with issues before they reach this level of urgency.

Here we focus on multiple (2+) emergency admissions, standardised for age and sex, where a second emergency admission has occurred within 12 months of the first. This is considered an overall indicator of quality of health and social care systems¹³⁸.

Rates of repeated emergency admissions have remained at similar levels and inequalities are relatively large over the past decade (Figure 4.9). In 2018/19, those living in the most deprived fifth of areas were more than twice as likely to experience multiple admissions than those living in the least deprived areas, with an absolute gap of 1,770 per 100,000. The rate of repeated emergency admissions dropped fairly dramatically during the COVID-19 pandemic, due to a combination of how health services were operating during lockdown, changes in health seeking behaviour, and reduced rates of some illnesses and injuries. However, inequalities, in relative terms, persisted.

Figure 4.9. Inequalities in repeated emergency admissions have persisted

Multiple emergency admission rates, per 100,000, age standardised, according to fifths of area-level deprivation: 2011/12 to 2020/21.



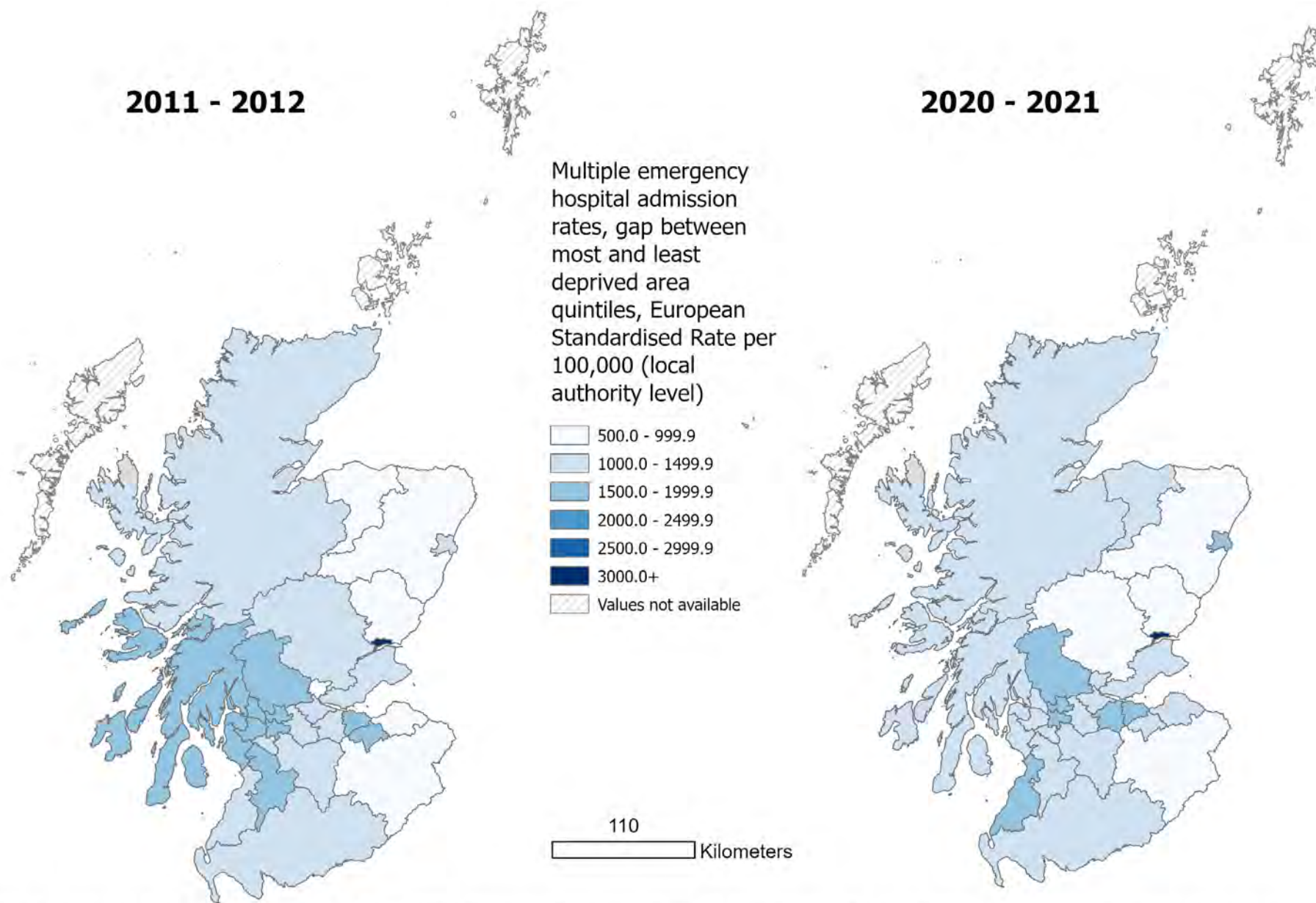
	2011/12	2014/15	2017/18	2020/21
Population average (per 100,000)	1869	1967	1989	1675
Relative difference	2.3	2.3	2.3	2.3
Absolute gap (per 100,000)	1599	1694	1714	1436

Source: Public Health Scotland. Acute hospital activity and NHS beds information (Multiple Emergency Admissions tables).

Map 4.1 overleaf shows how absolute inequalities in multiple hospital emergency admissions vary across Scotland and how these have changed over the past decade. The gap in 2011/12 was greatest in Dundee, followed by the west of Scotland and Edinburgh. In 2020-21 Dundee remained an area of high inequalities and there was little change in Edinburgh and Stirling. Matters appear to have worsened in Aberdeen, despite overall reductions in emergency admissions during the pandemic.



Map 4.1. Absolute gap in multiple emergency hospital admission rates (between the most and least deprived fifth of areas) within local authorities across Scotland in 2011/12 and 2020/21



Author: L Macdonald, 2022. British National Grid, GCS OSGB 1936, Transverse Mercator. Local authority boundary data: Office for National Statistics licensed under the Open Government Licence v.3.0 Contains OS data © Crown copyright and database right [2022]. Hospitalisations data: Public Health Scotland. Acute hospital activity and NHS beds information (Multiple Emergency Admissions tables)

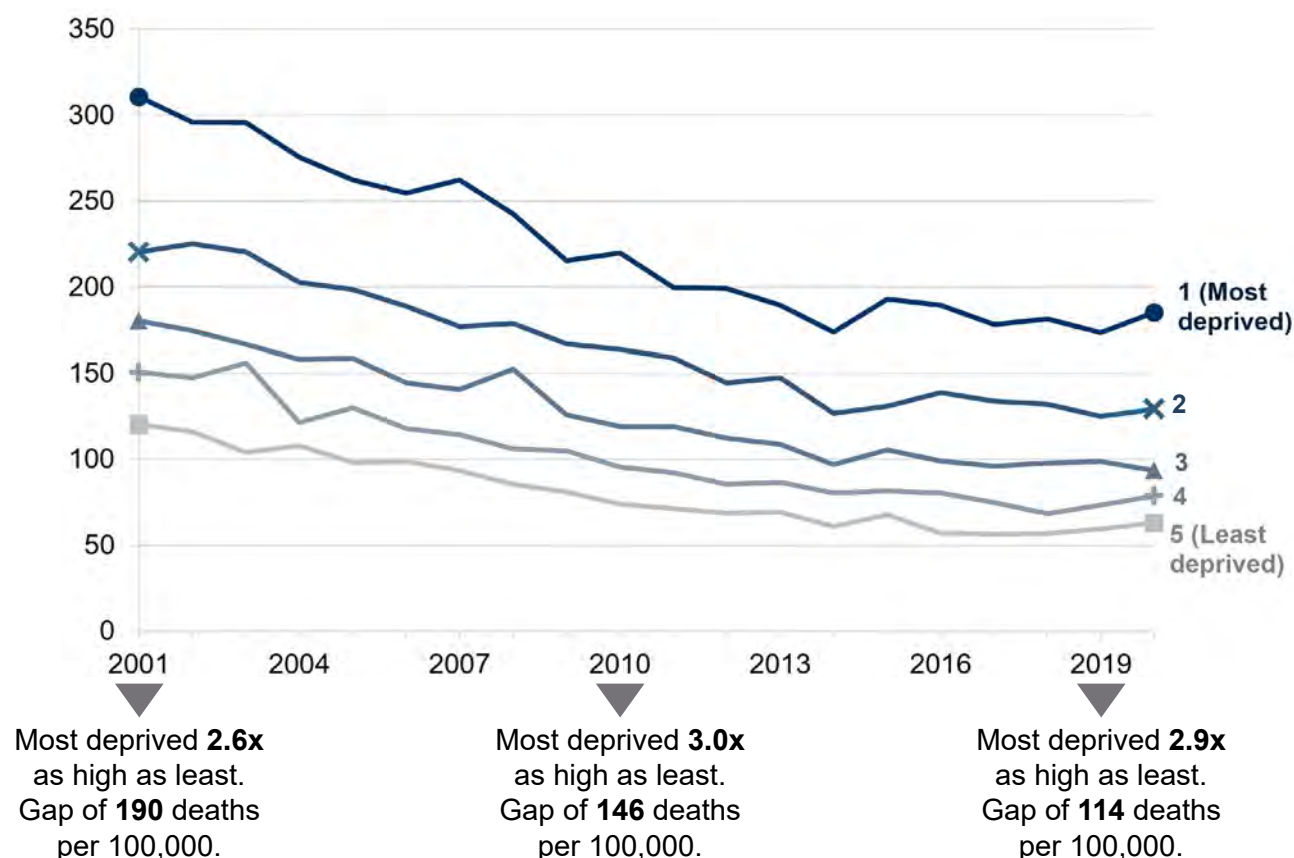
Amenable mortality

The Office for National Statistics (ONS) defines amenable mortality (also known as treatable mortality) as deaths that ‘could be avoided through good quality healthcare’, after the onset of the health condition. It is considered an indicator of improved outcomes for health and social care services¹³⁸.

Amenable mortality has fallen over the past two decades, for both men (Figure 4.10) and women (Figure 4.11), although improvements have slowed (and potentially halted) since 2014. Inequalities have remained large, and men and women living in the most deprived fifth of areas are 2-3 times as likely to die from causes that have been classified as being potentially preventable by treatment and secondary prevention as those living in the least deprived areas.

Figure 4.10. Amenable mortality and absolute inequalities were falling in men, but these improvements have stalled

Amenable mortality rates in males, per 100,000, age standardised, according to area-level deprivation: 2001 to 2020.

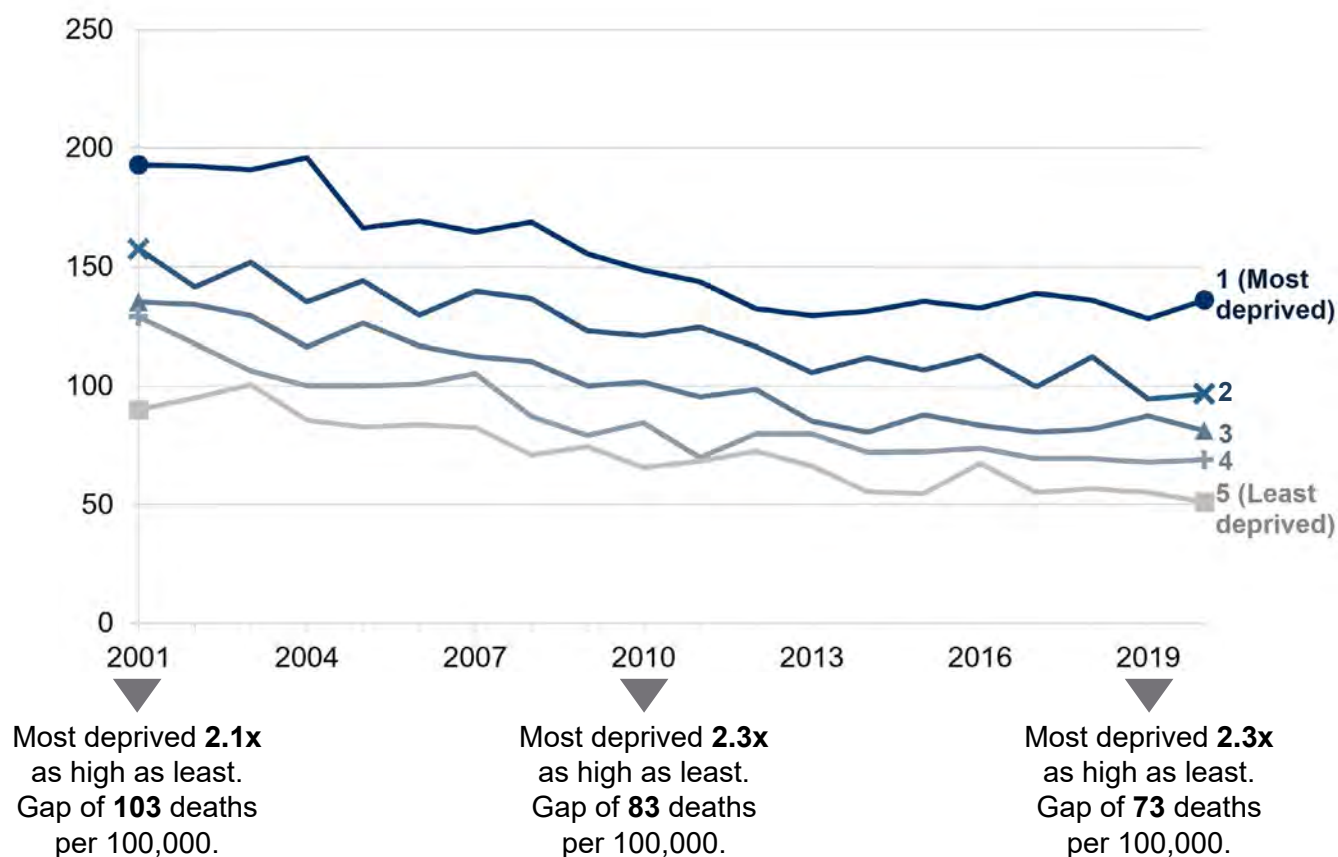


	2001	2004	2007	2010	2013	2016	2019
Population average (per 100,000)	196.1	170.9	154.1	130.9	116.5	109.4	102.8
Relative difference	2.6	2.6	2.8	3.0	2.7	3.3	2.9
Absolute gap (per 100,000)	190.3	167.5	168.7	145.7	120.1	132.2	114

Source: National Records of Scotland: Avoidable mortality data ('treatable mortality' tables).

Figure 4.11. Amenable mortality has also fallen in women, as has the absolute gap between the most and least deprived areas, but less dramatically than for men

Amenable mortality rates in males, per 100,000, age standardised, according to area-level deprivation: 2001 to 2020.



	2001	2004	2007	2010	2013	2016	2019
Population average (per 100,000)	141.6	126.3	119.9	102.8	91.6	92.2	84.8
Relative difference	2.1	2.3	2.0	2.3	2.0	2.0	2.3
Absolute gap (per 100,000)	102.9	110.5	82.0	83.0	63.2	65.1	73.0

Source: National Records of Scotland: Avoidable mortality data ('treatable mortality' tables).

Technical note:

Variations in amenable mortality between men and women are partly due to sex differences in the main causes of death and the extent to which these are considered to be amenable in international definitions (which may not be reflective of what could be amenable to health care intervention in Scotland).

Health and social care services: synthesis of findings

Inequalities in health and social care can arise at various points along the patient journey – from the point of perceived candidacy for and access to services, through to the quality and effectiveness of treatment received. As noted by Tudor Hart, in defining the Inverse Care Law: ‘the availability of good medical care tends to vary inversely with the need for it in the population served’⁹². This can contribute to the inequalities in health outcomes that we see in Scotland.

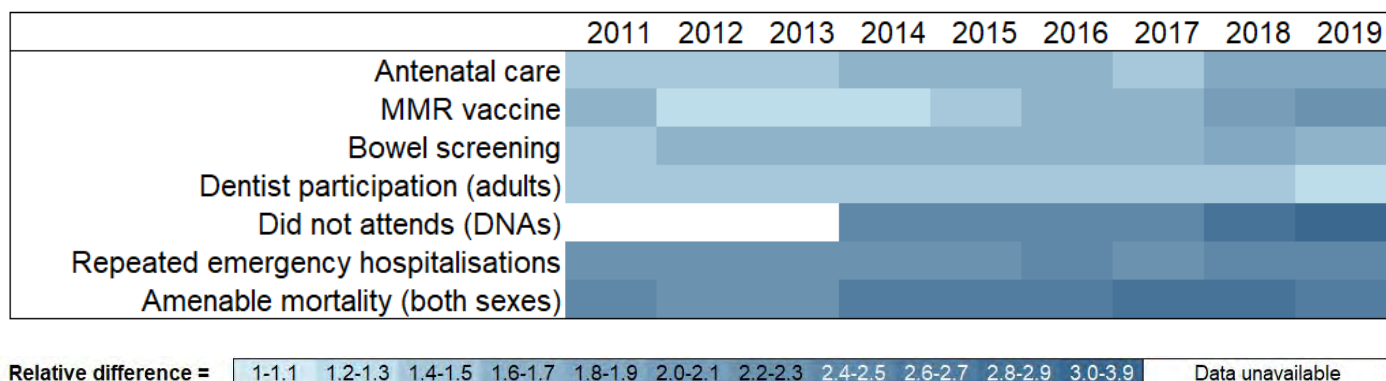
However, inequalities in health services and social care should not be viewed as solely the responsibility of health and social care systems. Improvements to people’s living and working conditions and the reduction of social inequality will reduce need by preventing unnecessary ill health, support people to recognise symptoms and seek advice at earlier stages of illness, remove barriers to accessing services, and could improve the population’s means and confidence in navigating the health system and any treatment regimes. These wider factors are the focus of the FAI report on social determinants.

Figure 4.12 is designed to give a general sense of how *relative* inequalities in health service outcomes have changed over time. Multiple emergency admission rates (a system level measure of quality of health and social care) have shown no improvements in terms of prevalence or inequalities. Furthermore, uptake of some preventative services has been declining and inequalities are widening. For example, childhood immunisation – a previous success story in Scotland – is falling, with widening inequalities. There have also been worrying declines in cervical screening. There have been population-level improvements in timing of antenatal bookings and bowel screening. Unfortunately, though, relative and sometimes absolute inequalities have still widened.

Amenable mortality rates (i.e. deaths which can be prevented by treatments after the onset of disease) have been declining, although improvements have potentially stagnated over the past decade, like other mortality measures in Chapter 1. Inequalities by area deprivation are relatively large and have been fluctuating, although they are smaller than those seen for premature mortality and avoidable mortality. This may point to a positive sign for how equitably health services relating to treatment are working (although this would require further examination, which is beyond the scope of this report). There has been a decline in outpatient appointments where patients ‘Did Not Attend’, potentially due to changes in practice, including text message reminders, video consultations and patients booking their own appointments¹⁶¹. However relative inequalities in DNAs have increased and the absolute gap between the most and least deprived areas of Scotland is large. Young men, in their 20s and 30s, continue to have the highest risk of DNAs.

Figure 4.12. Relative inequalities in health and social care services have mainly fluctuated, although they remain relatively large

Relative inequalities between the most and least deprived fifth of areas, 2011 to 2019, outcomes ordered by the life course.



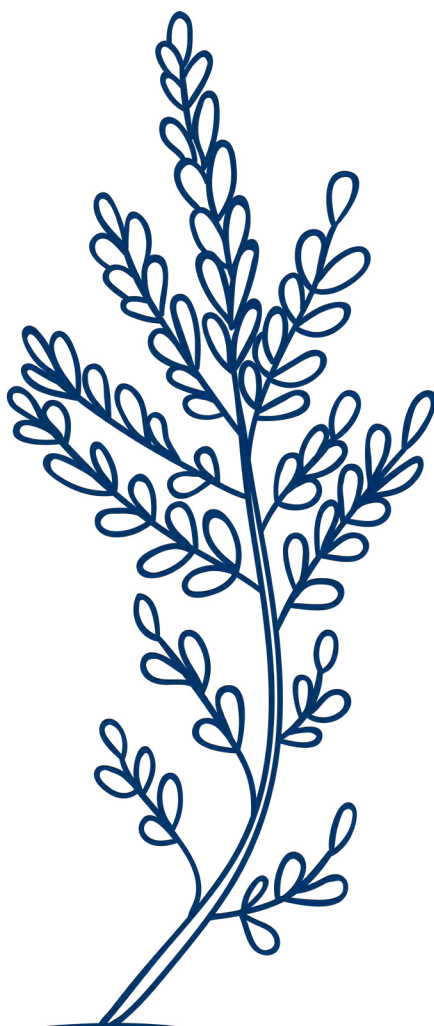
Inequalities in some of the indicators, especially those measuring uptake of specific services, are the combined result of health needs, as well as demand, access, and supply – many of these are influenced by a complex and inter-related set of factors that include willingness to engage with services, the availability of services that take into account other needs, and other challenges such as language barriers and experiences of stigma. We have considered this further in a Spotlight describing how inequalities can emerge along different points of the patient journey, culminating in inequalities in cancer mortality – which remains the biggest contributor to avoidable and amenable mortality in Scotland²⁴.

The trends we show here do not include large and important inequalities in health and social care among other groups which are not easily identified in the data – qualitative research and bespoke surveys show how particular barriers to receiving adequate care exist among people who are care experienced or disabled, the LGBTQ+ community, and those from an ethnic minority background.

The trends in this Chapter have occurred in the context of numerous strategies, initiatives and targets to tackle inequalities in health and social care^{141 165 172-175}. While we cannot comment on the effectiveness of these strategies, it is worth noting that these have been implemented against a backdrop of health spending which has been insufficient to maintain service quality in the face of growing need (see FAI report on social determinants). There have been and will continue to be major challenges facing the health and care system, including increasing pressure of low-funding, as well as an ageing population, increases in chronic conditions and complex patient needs, and dealing with the long-term consequences of the COVID-19 pandemic.



We finish this Chapter with a Spotlight on Ethnicity and COVID-19. This is highly relevant, given the timing of this report. But this Spotlight also acts as a striking example of how inequalities in health can arise in our society and where action needs to be taken, beyond just health and social care. It starts with unfair differences in health-harming exposures – this includes health-related behaviours, as we have seen in Chapter 3, and wider environment factors, such as pollution and poor housing as discussed in the FAI report on social determinants. To add to this, the health consequences of these exposures are not equal – for example, alcohol is more harmful when combined with co-morbidities (unrelated to alcohol) or other forms of social disadvantage. Following on from this, the effects that being ill has on jobs, income and housing vary, due to differences in the security of jobs and generosity of sick leave, flexibility and levels of housing costs, and availability of a safety net of savings. The FAI report on social determinants demonstrates how these socio-economic factors are not equal in the Scottish population.



Spotlight on ethnicity and COVID-19

Pathways to ethnic inequalities in COVID-19 outcomes

As shown throughout this report, health and mortality varies according to ethnicity in Scotland, although data are relatively limited. **Structural racism** is pervasive in Scotland, shaping both need for, and access to health and social care as well as other social determinants of health such as working and living conditions.

The COVID-19 pandemic has thrown ethnic inequalities in health into new prominence, and reinvigorated calls for better monitoring of this issue⁷⁶. Here we go into more detail on what might lie behind some of these inequalities using a well-known framework, initially developed by Diderichsen et al. for 'elucidating the pathways from social context to health outcomes and for introducing policy interventions'²⁸, and adapted for use by Katikireddi et al, with the following findings¹⁷⁶:

Unequal exposure to COVID-19

There were higher rates of positive test rates among some ethnic minority groups in Scotland, including Pakistani and Bangladeshi people, even after accounting for testing behaviours. This is driven by higher exposure to risk factors such as:

- Ethnic minority groups are disproportionately employed in key-worker jobs and therefore were less likely to be able to work from home, and more likely to come into contact with infectious people. Within key worker groups, ethnic minority groups were also less likely to have access to personal protective equipment.
- Ethnic minority groups are more likely to live in overcrowded housing and in multi-generational households, where children who had high social-contacts at school were more likely to infect older relatives, increasing risk of infection through inter-household transmission.

Unequal likelihood of catching COVID-19 if exposed

Although data were not available to study this pathway, it is possible that ethnic minority groups could be more likely to develop COVID-19 once exposed. This could be because:

- Differences in nutritional status, comorbidities and immune responses can impact on the likelihood of catching COVID-19, with these differences in turn driven by environmental conditions, such as air pollution, or stress.

The introduction of vaccines has been transformative, but may have widened inequalities further, since some ethnic minority groups have lower levels of vaccine confidence, which is reflected in vaccination uptake. The reasons for this are complex but are likely to include:

- Vaccine communications and campaigns being less likely to take into account the needs of ethnic minority groups.
- Barriers to accessing vaccination sites including limited location & appointment time options.
- Longstanding experiences of discrimination which have created mistrust in public services.

Unequal health consequences of catching COVID-19

Of those with COVID-19, some ethnic minority groups are more likely to develop severe disease, require mechanical ventilation, experience complications, and potentially die. In Scotland, rates of hospitalisation or death compared to the White Scottish group were four times higher in Pakistani and mixed groups; two times higher in Indian, other Asian, Caribbean or Black, and African groups¹⁷⁷. This may be explained by:

- Higher rates of comorbidities in some ethnic minority groups, which are to some extent explained by the negative health consequences of structural racism experienced across the life course.
- Some ethnic minority groups have poorer access to quality healthcare if they become ill, due to structural racism, as evidenced, for example, by an inquiry into racial injustice and human rights in UK maternity care¹⁷⁸. This manifests in individual interactions between patients and healthcare workers, the training of healthcare workers (where white bodies are treated as the default), ethnic minority representation and work-culture amongst healthcare staff, and the policies that shape access to care.

Unequal social consequences of being ill with COVID-19

The social consequences following recovery from COVID-19 disease, which may include long-lasting disability that results in job loss and future loss of earnings due to poor health, can also be unequal. People from ethnic minority groups are more likely to be in insecure jobs (such as being self-employment or on 'zero hours' contracts), putting them at higher risk of job loss and falling into poverty¹⁷⁶.

Unequal consequences of social mitigation measures

The social and economic impacts of social mitigation measures (such as closure of businesses and loss of income) could have disproportionately affected disadvantaged groups¹⁷⁶. For example:

- Some ethnic minority groups were more likely to be made unemployed during the initial lockdown period.
- Some ethnic minority groups saw larger increases in mental distress over the pandemic, widening inequalities further.

Conclusions

An Expert Reference Group on COVID-19 and Ethnicity has made policy recommendations to address structural factors placing those from ethnic minority backgrounds at greater risk from COVID-19 in Scotland¹⁷⁹.

Many of the pathways are also at play in the development of inequalities according to other aspects of social disadvantage. However, the role of structural racism discussed in this Spotlight is unique to ethnic differences in health and the determinants of health¹⁸⁰.

The information in this Spotlight is largely taken from: Katikireddi et al. Unequal impact of the COVID-19 crisis on minority ethnic groups: a framework for understanding and addressing inequalities. *J Epidemiol Community Health*. 2021 Oct;75(10):970-974.

Discussion



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Health inequalities in Scotland:
An independent review

In this report, we aimed to bring together a wide-ranging picture of health inequalities in Scotland. We have endeavoured to gather, in one place, a comprehensive range of outcomes, identified as important by stakeholders, and which span the life course. We have seen inequalities in almost every aspect of health examined, in addition to the wide inequalities seen in the headline indicators of health that are already routinely monitored in Scotland. In the following sections we draw out the main themes identified, starting with a recap of findings from each chapter.

Chapter by chapter summary and interpretation

Timing and causes of death (Chapter 1)

This chapter contains the harshest of outcomes and the biggest inequalities. For some outcomes there have been large declines in overall prevalence over the past two decades, often leading to a narrowing of absolute inequalities (although, large inequalities remain). This is the case for premature (< 75 years) mortality and deaths from suicide, alcohol, cancer, and coronary heart disease. However, in many cases these improvements mostly occurred in the first decade of the 21st century and started to stall in the second. Steady progress was also being made for life expectancy, infant mortality, all-cause mortality in 15 to 44-year-olds, and avoidable mortality, but this progress has potentially begun to reverse, especially in the most deprived groups. Finally, drug-related deaths have increased dramatically over the past twenty years, and exponentially in the most recent decade. While this phenomenon has been seen across the UK, the burden is far higher in Scotland. There are extremely high inequalities both in relative and absolute terms. Those living in the most deprived fifth of areas are twenty times as likely to die of a drug-related death as those living in the least deprived areas.

Many of these outcomes examined in Chapter 1 are overlapping – for example trends in deaths from suicide or drugs are contributing to trends in avoidable mortality and especially to all-cause mortality in 15 to 44-year-olds, since they are by far the most common causes of death in this age group.

It is important to consider the results in their entirety of the life course - members of vulnerable groups who die in infancy or in young and middle adulthood will be missed from statistics looking at deaths in older age. Thus, only looking at inequalities in causes of death at older ages would downplay the size of the problem.

Health, wellbeing, and disease (Chapter 2)

Inequalities across the range of health outcomes examined in Chapter 2 were smaller than those for mortality, with the exception of healthy life expectancy, which is 24 years longer in the least deprived tenth of areas than the most deprived *tenth* of areas. This is the combined result of trends in life expectancy and trends in general health.

When looking at change over time, the general picture for more specific aspects of health is also not positive – with recent rises in cancer incidence, longstanding limiting illness and poor mental health. Some outcomes in childhood show neutral or positive trends at the population level – for example the prevalence of children identified as having developmental concerns has fallen and childhood obesity risk has remained at around 10%. However, these sometimes disguise worrying patterns within different socio-economic groupings. For example, childhood obesity risk has been increasing slightly in the most deprived areas and decreasing in the least deprived areas, so that by 2019/20 children living in the most deprived fifth of areas were twice as likely to be obese, with an absolute gap of 7%. The Spotlight on multimorbidity highlighted how the proportion of the Scottish population suffering from more than one health condition is on the increase and is more prevalent among disadvantaged groups. Therefore, the trends presented for each health outcome separately in this chapter are likely to undersell the size of the health burden in some groups.

Health-related behaviours (Chapter 3)

Findings are more mixed for health-related behaviours and often looking over shorter periods of time than for deaths. Some health-related behaviours, such as high levels of alcohol consumption and low physical activity in children, are not necessarily more prevalent in the most deprived groups. In infancy we see some signs of progress over time - the prevalence of children not breastfed at 6-8 weeks has declined, as has smoking in pregnancy. Unfortunately, both remain highest in the most deprived fifth of areas – with one in four children exposed to smoking in utero and two out of three not breastfed by 6-8 weeks of age. As noted in Chapter 3, the increasing concentration of these behaviours among more disadvantaged groups is explained by a range of economic, cultural, and societal factors, yet may increase stigma experienced by these communities. This Chapter helps to highlight the complexities of health inequalities. For example, low fruit and vegetable consumption is more common in Scotland's more disadvantaged areas, and this cannot be separated out from the influences of food insecurity. High alcohol consumption is greater in *less* deprived areas, but as we see in Chapter 1, those living in *more* deprived areas are more likely to die from alcohol-related harms. This is thought to arise (at least in part) due to differential vulnerability, where the negative consequences of health-risk factors, such as alcohol, are greater among disadvantaged groups, due to the presence of other health-harming exposures.

Health and social care services (Chapter 4)

There have been some improvements in outcomes which reflect, to varying extents, access and quality of health and social care services. Timely antenatal bookings and uptake of bowel screening have improved over the past decade, and outpatient appointments where people 'Did Not Attend' have fallen. However, inequalities have persisted in all cases. Childhood immunisation uptake – a previous success story in Scotland – is falling, with widening inequalities. There have also been worrying declines in cervical screening. Looking to higher-level outcomes, there have been no improvements in repeated emergency hospital admission rates over the past decade, and a possible stalling in improvements in amenable mortality, with deprived groups especially being left behind.

Key insights

Following a period of declining mortality and reducing inequalities in the first decade of the 21st century, improvements have stalled, and some inequalities have widened

For the first decade of the 21st century, health in Scotland, as represented by various measures of mortality, was improving on many fronts. Life expectancy was increasing and infant, avoidable, and amenable mortality rates were decreasing. Alcohol deaths were falling and while drug deaths were increasing, that growth was not yet exponential. Progress was being made in deaths from cancer and cardiovascular disease, with declines in absolute inequalities. However, over the past decade we have seen a stagnation in these previous improvements, in some cases a worsening of outcomes and inequalities, and, for a few, a return to levels in the early 2000s. These patterns are mainly observed for outcomes relating to the timing and causes of deaths, but not exclusively. For example, immunisation uptake, which was high and with minimal inequalities ten years ago, is now declining and inequalities are widening.

These patterns mirror findings from the Fraser of Allander Institute (FAI) report on the social determinants of health. Between 2000 and the start of the financial crisis, things were largely improving for many of the social determinants of health. Since then, there has been a stagnation of real earnings, increased poverty, rises in housing costs in the private rental sector, and a rise in relatively low-paid employment. Changes to the welfare system have eroded the value of working age benefits and increased requirements to meet eligibility criteria, with growing evidence that this has caused mental health problems and anxiety. There has also been a rapid decline in social capital - community cohesion, community empowerment, social networks, and social participation - albeit from the latter half of the 2010s. This implies that not only are indicators of health deteriorating, but so are some important influences on people's health.

Health worsens across the social gradient, but the most deprived groups are faring particularly badly

Across all aspects of health examined, outcomes worsen as area deprivation increases. In other words, inequalities exist across the entire social gradient. That said, for many outcomes, we see the most deprived group faring disproportionately badly. Avoidable mortality, deaths from drugs and alcohol, and outpatient appointments where the patient 'Did Not Attend', offer extreme examples. In each of these, the absolute gap between the most and second most deprived fifths of areas was equal to or greater than the gap between the second most deprived and the least deprived fifth of areas. Patterns were similar, albeit less pronounced, for low birthweight, child development concerns, uptake of antenatal services, and amenable mortality.

These patterns have been shown according to measures of area-level deprivation because it is the most consistently available axis of inequality. It is important to remember that not all people who experience socio-economic deprivation (such as poverty) live in deprived areas.

It is crucial therefore to not overlook individuals who experience social disadvantage and who do not reside in Scotland's most deprived areas.

There are several possible explanations for the trend towards the most deprived groups being left behind. One is that the degree of deprivation has gone up in absolute terms in more deprived areas or population groups. For example, it could be that the proportions of people living in poverty, or that the depth of poverty has increased in the most deprived areas of Scotland. This may be partly explained by people who experience disadvantage or ill health being more likely to move to particular areas. Another explanation is that vulnerability to impacts of disadvantage is increasing in disadvantaged groups, due to the accumulation or combination of different aspects of disadvantage and multiple health conditions. Spotlights on the health of care experienced children and premature mortality among adults who have experienced combinations of homelessness, the justice system, opioid dependence, and psychosis, showed extreme contrasts in outcomes between these groups and the general Scottish population. Although it has not been possible to look at population-level trends in inequalities in multi-morbidity, the evidence we do have in Scotland indicates that more disadvantaged groups are increasingly more likely to be dealing with multiple health conditions and that health services are not currently set up to deal with this inequity.

Considering the findings from this report through a life course lens⁴⁸ may also help to understand how social inequalities and poor health might persist or become more polarised:

- First, we have seen in this report that inequalities in health emerge from birth, and there is strong evidence that socio-economic circumstances in childhood have causal effects on child health¹⁸¹.
- Second, poor health in childhood can lead to worse health in adulthood and there is also strong evidence that socio-economic circumstances in childhood can have independent effects on adult health (we saw an example of this in the section on healthy ageing).
- Third, as shown in the FAI report on social determinants, children's educational and employment opportunities are closely tied to their parents, leading to an 'intergenerational transfer of disadvantage'.
- Fourth, health can affect academic achievement and, moving into adulthood, other life chances such as job prospects. The FAI report highlights the powerful influence of current health on employment opportunities in Scotland.

Thus, these complex relationships between socio-economic circumstances, where people live, opportunities and health can produce a downward spiral across the life course and from one generation to the next.

Inequalities are greatest for the most severe outcomes

The starkest inequalities are seen for outcomes relating to the timing and cause of death, including early and avoidable deaths and deaths related to drugs, alcohol and suicide (i.e. the deaths of despair) (Chapter 1). We found that people living in the most disadvantaged fifth of areas were at least twice as likely to die for each of the outcomes examined than those in the least deprived fifth, with especially large inequalities in the deaths of despair. The level of inequalities seen in these harshest of outcomes is not necessarily surprising, as they are the culmination of the inequalities in poor health, health-harming exposures, and barriers

to health services examined in Chapters 2-4 of this report, and in the social determinants covered by the FAI report. The collective impact of large inequalities in life expectancy and general health in Scotland is shown by the 24-year gap in healthy life expectancy between the most and the least deprived tenth of areas.

Young and middle-aged men are faring particularly badly for some outcomes

One group that stands out is young-to-middle-aged men, especially those living in the most deprived areas. This group is more likely to die from the deaths of despair (particularly from drug-related deaths), to not attend outpatient and GP appointments, and to experience multiple social adversities (such as homelessness and contact with the justice system), which can infringe upon civil rights and dramatically increase the chances of dying early. The social gradient in life expectancy and avoidable mortality (according to area-level deprivation) was greater for men than women. The FAI report on social determinants highlights the large gender gap in higher education participation, which has been widening with time.

The Intersectionality Spotlight, and the Spotlight on multiple disadvantages, showed how different aspects of social disadvantage can combine and interact in their effects on health. For some young and middle-aged men, we may be witnessing the cumulative effects of social disadvantage, some of which will have been transferred across generations, combined with limited educational and employment opportunities, and social and cultural barriers to utilising health services. An individual's previous experiences are also likely to play an important part, with different cohorts having different experiences across their lifetime. For example, drug-deaths are especially high in men born between the mid-1960s and mid-1980s and it has been proposed that their high vulnerability can be linked to "a toxic combination of adverse historical living conditions and waves of detrimental national and local government policymaking"²⁹. These explanations potentially speak to findings from the Drugs Deaths Taskforce and the resultant report, "Changing Lives"³². The report highlighted geographically concentrated chronic and multiple disadvantages, combined with a lack of adequate services and stigma around drug use, as a possible underlying cause behind the dramatic increases and huge inequalities in drug-related deaths in Scotland.

Trends in the health of children and young people point towards potential future problems

During their first few years of life, children go through a number of important stages of physical, cognitive, and social development. Healthy development during the early years supports current and future health and wellbeing, as well as social outcomes like schooling and employment. It is for this reason the early years are considered to be the most effective point in the life course to intervene to support population health and reduce inequalities. Rates of timely antenatal booking, smoking in pregnancy, breastfeeding at 6-8 weeks, and development in toddlerhood are all improving in Scotland, although in some cases they remain far below optimum levels and inequalities persist. There are other trends which signpost probable future issues. Infant mortality is a good barometer for the state of societal health and, while rates are low in Scotland compared to many other countries in Europe, there are possible signs that rates are increasing in the most deprived areas. We see similar

patterns for immunisations and risk of childhood obesity – with the most deprived areas seeing a worsening of these outcomes over the past few years while the least deprived areas continued to see improvements up until the start of the COVID-19 pandemic. Increasing inequalities in immunisation uptake, as well as placing some children at unnecessary risk of infection, point towards increasing social barriers to utilising health services. Obesity risk as a child can affect mental wellbeing, increase risk of obesity in adulthood, and increase risk of other health conditions such as Type II diabetes. We may therefore be storing up problems for the future, in terms of population health, life chances, and inequalities. The rise in adolescent poor mental health is an immediate issue but also one which could have long-term consequences for population health, as it affects the next generation of parents.

Health behaviours show a mixed picture and highlight complexities in the generation and explanation of health inequalities

As already highlighted, not all health-harming behaviours are higher in more deprived groups. For example, harmful levels of alcohol are more prevalent in advantaged groups, yet the health impacts of harmful drinking are greater in disadvantaged groups (as shown by the large inequalities in alcohol deaths). Children living in deprived areas are more likely to be obese, but they are just as active as their more advantaged peers when total physical activity (as opposed to just formal activities) is considered. These examples show how health promotion and behavioural interventions are not going to be sufficient to reduce health inequalities. Health behaviours could be evenly distributed among the population, but inequalities could still arise because people experiencing social disadvantage are more exposed to other health-harming factors – food insecurity, low quality green space, targeted advertising, as well as time constraints, limited access to high quality preventative health services and treatment to name a few. The trend towards some stigmatised health-related behaviours (such as smoking in pregnancy) becoming more concentrated in the most disadvantaged groups can increase marginalisation of those who are already likely to be impacted by stigma and exacerbate existing barriers to engagement with health services. This shows the importance of avoiding interventions and policies which focus only on health behaviours, or that suffer from lifestyle drift.

Social, demographic, and other characteristics can come together to affect health in complicated ways

Health varies according to a multitude of characteristics which we refer to as the ‘axes of inequality’, including social deprivation, ethnicity, migration status, gender, sexual identity, and living with disabilities. These different characteristics are not experienced in isolation and their effects, when in combination, are not uniform. For example, there is a strong social gradient (by area-level deprivation) in the health of White Scottish adults, much as we see for the general population in the main results throughout this report. But for other ethnic groups, we see different patterns – the social gradient in health is less steep in White Polish and Pakistani ethnic groups, although in very different ways. Health in the White Polish group was relatively good regardless of area-level deprivation, whereas in the Pakistani ethnic group, health was comparatively bad across the board. We have also seen this among care experienced children and adults with learning disabilities. While these groups are far more likely to live in deprived areas, their health does not vary according to area-level deprivation

in the way that it does for the general population. The minimal social gradients in health seen in these two communities may indicate the severity of the other barriers that these groups may face, which over-ride any area-level influences. Unfortunately, it was not possible to consider how these relationships between different axes of inequalities have changed over time. A truly intersectional approach will consider how *all relevant* axes of inequality come together to influence health, which was outside the scope of this report. In Scotland we are limited in the axes we can consider, including by small sample sizes in the datasets which contain the richest social information. This is considered further in the 'Gaps' section.

Health services have an important role to play but are only part of the picture

Inequalities exist in all health and social care service outcomes considered. However, the extent to which these inequalities have improved or worsened since 2000 varies. Repeated emergency hospital admissions, a systems level indicator of health and social care quality, have seen little improvement in overall levels or inequalities over the past decade. Amenable mortality, like many other mortality outcomes, was improving, but this has recently stalled. Progress has been made in the uptake of specific services, such as antenatal bookings and bowel screening, and the proportion of outpatient appointments where the patient 'Did Not Attend' has fallen. On the other hand, uptake of childhood immunisations, the HPV vaccine, and cervical screening are declining, and inequalities have persisted or widened.

As was shown in the care cascade Spotlight, the large inequalities seen in cancer mortality in Scotland can arise at various points along the patient journey. This includes the unequal distribution of barriers to healthy lifestyles, and access to good quality preventative services such as screening appointments. These differences will be contributing to the moderate inequalities in cancer incidence shown in Chapter 2. Inequalities in cancer mortality are considerably greater than inequalities in cancer incidence, implying that health services have a key contribution to make towards reducing inequalities in survival. These survival inequalities can arise from people's varying propensity to consider themselves a legitimate 'candidate' for services, differences in access to services and quality of treatment once received, and pre-existing vulnerabilities. This idea is reinforced in our closing Spotlight, which sought to explain the large ethnic differences in COVID-19 outcomes in Scotland. Ethnic inequalities in mortality from COVID-19 were the combined result of differences in exposure to infection (due to inequalities in living and working conditions), differences in the chances of infection once exposed (for example, due to inequalities in nutritional status or co-morbidities) and differences in the risk of death after contracting COVID-19 (which was partly driven by poorer access to good quality health services).

The findings from these spotlights, and the mixed patterns for these health and social care outcomes, emphasise that the design and provision of services are important. However, they will be most effective if people's living and working conditions can also support them to navigate their health needs and the health system.

Gaps in the evidence

To compile the findings in this report, we have drawn on both routinely collected data such as hospital records, and regularly conducted surveys, such as the Scottish Health Survey. These data sources are invaluable for understanding trends in health and have good coverage of many health outcomes. Nevertheless, our understanding of health inequalities in Scotland over the past two decades (or sometimes less, due to data collection periods) is still limited by gaps in several areas. These gaps relate to data availability, the feasibility of using these data for monitoring health inequalities, or both. The full results of a scoping exercise to explore the availability of data over the past two decades is available in Appendix B.

Gaps in populations included

Some important populations can be missed from some data sources which can lead to an underestimation of inequalities and important gaps in our knowledge. For example, those living in unstable housing or communal institutions are often excluded from surveys which use household addresses to recruit participants. Those with unstable housing may also face more barriers to accessing healthcare and so be systematically missed from routine data collected in healthcare settings. This is a crucial population, who often experience particularly severe health outcomes, as shown in the Spotlight on multiple disadvantages in Chapter 1. Barriers to accessing services or completing voluntary surveys also mean that other marginalised groups are likely to be systematically underrepresented in health data monitoring in Scotland. This includes migrant and asylum-seeking communities and those experiencing severe disabilities or multiple forms of disadvantage.

Gaps in the life course

The range of data on health inequalities most relevant to the early and later years of life is limited compared to adulthood. For childhood, this is partly because the outcomes which are well documented in administrative data (like hospitalisation and death) are relatively rare in children. On the other hand, individual-level measures of socio-economic circumstances (such as parental occupational status and relationship status) recorded on birth certificates can be linked to health records and used to look at inequalities in early child health.

Scotland's child health programme is an excellent source of data on inequalities in pregnancy and early years' outcomes over time, but for later childhood and the teenage years fewer routine data are collected. This is set to change with the newly introduced Health and Wellbeing Census, which holds much potential for monitoring children and young people's physical and mental health, health-related behaviours and other factors that may support or undermine health such as relationships, bullying, and quality of their local environments going forward¹⁸². The Health Behaviour in School-aged Children (HBSC) study has collected data from Primary 7, Secondary 2, and Secondary 4 pupils in Scotland every four years, since 1990¹⁸³. A detailed description of trends in inequalities in outcomes using these data are forthcoming from the HBSC team.

As described in the section on older age in Chapter 2, there is a very substantial gap in data describing the outcomes that are identified as the most important by older populations, including independence and social connectedness in older age. Scotland's first comprehensive, longitudinal study of healthy and successful ageing (Healthy Ageing in Scotland (HAGIS)) offers greater potential to do this in the future¹⁸⁴.

Health outcome gaps

Certain aspects of health are not well covered in existing data. Mental health in particular is less well covered compared to the wide range of physical health measures available. For example, while trends in general mental wellbeing scores are available from the Scottish surveys, there is little disaggregated coverage of different mental health conditions. Outcomes relating to relationships and sexual health are also less well covered, including relationship quality, intimate partner violence and measures of loneliness.

Gaps in axes of inequality covered

Area deprivation is the only measure of socio-economic inequality that is consistently covered in health data sources, along with sex, age, and other geographical characteristics such as region. Other measures, including (among others) individual socio-economic circumstances, ethnicity, disability, and migration status are much more sporadically covered. For example, there is a rich field of literature on ethnic inequalities in health in Scotland, however the data are mainly cross-sectional, so cannot be used to examine how inequalities have changed over time. This is a very crucial data gap, as inequalities between ethnic groups can be very wide, and may not always follow expected patterns. Furthermore, it is tempting to predict that income or individual socio-economic circumstance measures will show the same results as area deprivation measures, however individual socio-economic circumstance can be poorly correlated with area deprivation, and any differences in patterns between these two inequalities can be important and revealing. For example, the shallower gradient in problem gambling by income compared to the gradient by area deprivation implies that the local environment, including access to gambling sites, access to other services, and the local community norms, may be a particularly important influence. However, because the prevalence of problem gambling was very low, and the data are from self-report in a survey, numbers were very small and so confidence in the inequality estimates are reduced for this outcome. Problem gambling contrasts with the social patterning of physical activity where the gradient is considerably steeper by income than by area-level deprivation, indicating that household circumstances may be important for activity, although this warrants further investigation.

There are several challenges in monitoring factors that contribute to these gaps in coverage of different axes of inequality. Some axes are not yet well recorded. For example, a report by NHS National Services Scotland describes “a dearth of data in routine health datasets on disability, sexual orientation, gender identity and religion/belief”¹⁸⁵. Other axes, such as ethnicity, are routinely reported in administrative health datasets, however often with low coverage of the population, or other limitations to quality. Other axes, such as income, educational achievement, and employment are routinely collected, but only by different government departments and in isolation from health datasets. Linking these different datasets together is often challenging and time-intensive but has been achieved for bespoke

projects in Scotland (such as those reported in the Spotlights on multiple disadvantages and care experienced children) and at scale in other countries. These data can provide extremely valuable and rich information on inequalities. For example, it would allow us to examine the links between income and mortality to further understand the extremely high burden of ill-health seen in the most deprived areas.

Most reports covering health inequalities refer to only single health outcomes and single axes of inequality

In existing research which monitors trends in health inequalities, outcomes are normally considered in isolation, meaning that our understanding of the burden that multimorbidity places on different populations is more limited. Producing new analysis around clustering of poor health was not possible within the remit of this report, although we have summarised the available published evidence on multimorbidity in Chapter 2. Further research to understand how the prevalence of multimorbidity is distributed in Scotland and how this is changing over time is crucial.

Just as our understanding of multimorbidity in Scotland is limited by data on each health outcome being presented in isolation, our understanding of the intersectional effects of different social circumstances on health is limited by each type of inequality being considered individually. Survey datasets collected a wider range of information on demographic, social, and economic circumstances, but attempts to analyse their combined effects are limited by sample size. Administrative datasets such as hospital records, which cover the whole of the population, offer unique opportunities to understand inequalities from an intersectional perspective (although with a more limited range of axes of inequalities). Incorporating a greater recognition of the entire system of health inequities into health monitoring, including how disadvantage and poor health may cluster and interact, would allow more granular understanding of the distribution of poor health in Scotland.

Conclusion

Across the breadth of this report, we have shown inequalities in experiences of health and wellbeing, health-related behaviours, health and social care services, and deaths. These unfair differences are seen from birth and in early years' outcomes, which provide important building blocks for healthy and happy lives. Inequalities are greatest for the most severe outcomes, such as early deaths, avoidable deaths, and the deaths of despair, which are culmination of the poor health, health-harming exposures, and greater barriers to health services shown in this report and are shaped by inequalities in the social determinants of health. Health consistently worsens across the social gradient, but we are witnessing what appears to be an increasing polarisation of ill health and early deaths in the most disadvantaged groups. This worrying finding requires further investigation but is likely driven by the cumulative effects of social disadvantage, across different axes of inequalities and the life course. This lends increased support to the idea of a proportionate universal approach to health inequalities recommended in the Marmot report more than two decades ago³⁶.

The complex and sometimes opposing patterns of inequalities in health-related behaviours, the mixed trends in health and social care services, and the consistent demonstration of inequalities in health and mortality support the need for change right across the system and across all levels of the social determinants of health. The Fraser of Allander report provides a detailed look at how the social determinants of health have changed in Scotland over the same period.

Descriptions of trends cannot tell us what would have happened had things been different. But what the trend data do show is that for the first decade of the 21st century, improvements in some aspects of health and mortality were being made and the absolute gap between the most and least deprived areas was in many cases falling. Thus, health inequalities in Scotland are not inevitable and it is within our powers to change them. For the past ten years, these improvements have stalled and, in some cases, started to reverse. Action is required now, to avoid the exacerbation of health inequalities in the face of the cost-of-living crisis.



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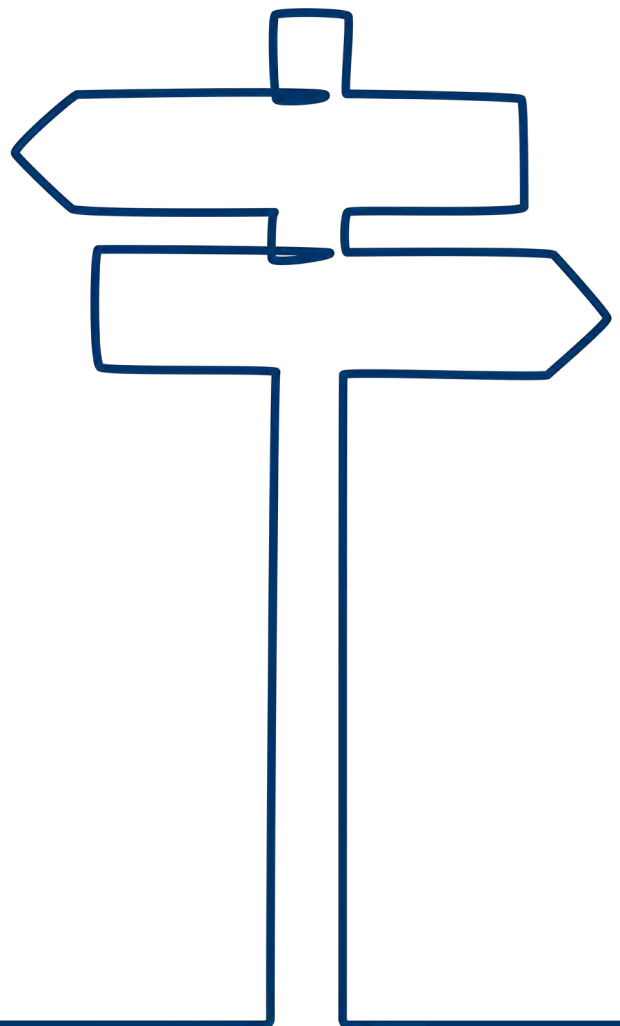
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Health Inequalities in Scotland

Trends in deaths, health and wellbeing, health behaviours, and health services since 2000

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Health inequalities in Scotland:
An independent review

Health Inequalities in Scotland

Trends in deaths, health and wellbeing, health behaviours, and health services since 2000



APPENDICES

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Health inequalities in Scotland:
An independent review

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Appendix A. Stakeholder engagement: summary of process and insights

To inform the focus and presentation of the report, and its integration with the companion report(s), a process of stakeholder engagement was undertaken. Seven one-to-one meetings were held with nine stakeholders, representing third sector organisations (health, community, poverty), local government, Scottish Government, public health and press/media. Insights were shared on the project scope, key content to include, presentation preferences, accessibility and language/framing. Alongside these specific insights, stakeholders offered interesting research questions, and directions for rigorous examination of the intersections between research, policy making, advocacy and public engagement around health inequalities. Unfortunately, due to the scope and timescale of this project we were unable to address some of the most innovative and ambitious suggestions, however, these warrant close consideration for future research and engagement. Below is a summary of the key themes.

Preconceptions and expectations

Several stakeholders conveyed some sense of health inequalities being “overdone” in terms of data/evidence describing the problem. Despite this, most acknowledged the value of the report, and highlighted potential contributions it could make by:

- Bringing things up-to-date, in the context of COVID-19 and the cost-of-living crisis
- Presenting complexity: fundamental causes, extent/gradient of inequalities as well as multiple/overlapping disadvantage
- Saying it differently, e.g. framed positively, addressing stigma, emphasising injustice/solidarity
- Making it accessible: less technical/academic and offering commentary/synthesis
- Including new voices, e.g. from qualitative research, direct lived experience, and under-served groups
- Confirming that “this is not inevitable” but the result of policy decisions

And in relation to the Scottish context, substantive focus on:

1. Early years – differences to rest of UK in childcare, Scottish child payment, education policy & child poverty action plan
2. Drug deaths – given the unfavourable comparison to other UK nations
3. Ethnicity – differences in Scotland compared to rest of UK in terms of diversity, and what this means for outcomes, services etc

Perceptions of the challenges associated with producing the report included: the enormity of the task; the crowded landscape in terms of evidence/voices; and the potential to enable lifestyle drift or shift focus from fundamental causes because the report brief is to describe inequalities in health outcomes and health-related behaviours (and not on the social determinants of health, which are the focus of a separate report being produced by the Fraser of Allander Institute). Despite these concerns, all stakeholders offered generous comments on what would be useful substantive issues to cover, and the best ways to present and frame content.

Limitations (of existing evidence/data, predominantly Long-term monitoring of health inequalities reports)

The Long-term monitoring of health inequalities reports, which are published annually by Scottish Government, were universally described as an important and credible source of data/evidence. However, limitations were mentioned in relation to how they are presented and used. Some stakeholders were keen to see more interpretation of data/findings and more narrative content. Some related this to the difficulty of interpreting differences in direction of trends in absolute and relative inequalities, and in interpreting the relative and slope indexes of inequality (these

measures are briefly explained in Appendix D). Others mentioned the importance of considering health outcomes in the wider context of the social determinants of health and policy landscape, and some suggested findings should be more integrated with lived experience data.

Outcomes for inclusion

Stakeholders were broadly supportive of including a range of health outcomes as trends over time. Particular emphasis was given to healthy life expectancy: as a key policy target; because it is a measure that is meaningful to citizens and because it shows stark inequalities. Many also advocated for inclusion of physical activity measures, given this is an area of current policy attention. Cancer was also mentioned by some stakeholders as an important outcome for inclusion.

Despite some interest in showing trends in physical activity, various stakeholders were ambivalent about the inclusion of health behaviour trends and others were keen these be excluded from the report. Several stakeholders mentioned potential for supporting a “judgy” narrative, placing blame on poorer communities for poorer health outcomes.

Spotlight topics

Across the interviews, stakeholders were positive about the proposed Spotlight topics - no comments suggested any were inappropriate. However, some hinted at potential tensions to be resolved in presenting/structuring and framing. Some stakeholders expressed a concern to balance any focus on the most marginalised groups with emphasis on the importance of gradients and the impact of inequalities across the population. Others discussed the importance of ensuring the underpinning/most important issues were not reduced to the same level as important (but less fundamental) issues. Some also mentioned a concern with discussing place-based approaches and focus on communities at the expense of a focus on fundamental causes.

Geography

Stakeholders were asked about any important geographic comparisons to consider in the report. Several stakeholders mentioned the relevance of exploring differences, in terms of health outcomes, health-related behaviours and social determinants between urban and rural areas, with an interest in the particular character of deprivation in some rural areas, including issues around transport, public services and housing being different in urban areas. More nuanced comparisons were also of interest - suburban areas were mentioned and a particular interest in large towns impacted by post-industrialisation. Several stakeholders also mentioned an interest in the particular issues faced by the largest city, and within the “intense pockets of deprivation” found in Glasgow and Dundee. There was generally less interest in, and a concern to avoid, comparing Glasgow and Edinburgh.

Two stakeholders described finding the [Local Government Benchmarking Framework](#), which compares clusters of similar areas, useful. This was of interest in relation to identifying policy successes, but also as a more useful and less stigmatising way to compare areas. Generally, maps were considered a useful, accessible and interesting way of presenting data/findings.

Presentation

Presentation of trends and Spotlights was discussed at length, based on the various examples shared. Stakeholders articulated the importance of considering the audience to establish the correct tone. Most suggested that the examples of trends and Spotlight charts could be simplified to improve accessibility - clear labelling, avoiding jargon and better use of boxes and explanations were all advised. Good design and infographics were generally seen as positive additions. However, some stakeholders expressed caveats to over-simplification, and use of metaphors which obscured relevant complexity.

Framing and language

Stakeholders were asked about language and framing of evidence in relation to health inequalities. The potential for evidence to contribute to stigmatising individuals and communities was highlighted as a key concern across almost all interviews. In particular, the characterisation of areas and communities as of high deprivation, and therefore doing worse in terms of life expectancy was deemed problematic. Repetition of the message that health inequalities exist and are particularly stark in Scotland was seen by some stakeholders as potentially disempowering to citizens - a further report to this end might suggest these differences are intractable, and a deeply embedded national problem. In addition, presentation of inequalities in health-related behaviours was described as particularly problematic, promoting, or aligning with, moralising discourses. Strategies mentioned for addressing these were: including lived experiences in the report that reflect the complexity/diversity within groups/outcomes, and/or developing alternative framing and language in collaboration with communities – that foreground injustice, establishes the current state is resultant from policy decisions, and calls for action.

Appendix B. Results from the data scoping exercise

The Table B1 overleaf details data coverage for different areas of health, according to different stages of the life course. Below, we briefly summarise the main data gaps that were identified. Please note, this scoping exercise (carried out in spring of 2022) was not intended to provide an exhaustive list of all possible data sources, but those most likely to be useful for examining trends in inequalities in health for this report. We provide these below, in case helpful as a source of reference.

Gaps in outcomes:

- Healthy and successful ageing
- Multimorbidity and co-occurrence of poor health and wellbeing
- Disaggregated mental health (e.g. anxiety, depression, eating disorders) – in comparison to specific respiratory diseases or cancers.
- Menstrual health and fertility (e.g. endometriosis)
- Relationships and social health outcomes (Including sexual health, intimate partner violence, loneliness)
- Violence
- Potential gaps/areas to monitor in the future:
 - Online risks
 - Anti-microbial resistance
 - Climate crisis indicators (vulnerability to extreme weather injuries, heat etc)

Inequalities

- Little data on individual socio-economic circumstances (SEC). Available SEC measures are usually income or housing tenure, and include fewer social elements (education, job class etc)
- Ethnicity - where data is available it is normally cross-sectional, meaning data are limited for examining trends
- Migration status
- There were few areas where intersectionality could be assessed using publicly available data. Intersections by geography (e.g. region) and the Scottish Index of Multiple Deprivation are available for some outcomes in administrative data. Surveys offer a greater range of SEC and demographic measures, but the sample sizes limit potential to examine intersectionality.

Missed populations in administrative records and survey data

- Those living in unstable housing or communal institutions
- Those with barriers to participate in surveys (limited internet/phone access; disabilities; limited time, for example due to caring responsibilities; those who are most unwell) – these groups are less likely to be excluded from routine data³

Table B1: summary of data availability for documenting trends in health inequalities in Scotland, ordered according to the life course

		SIMD	Individual SEC	Ethnicity	Sex	Disability	Regional	Other
Gestation	Birthweight	1996-20	2004/5 ¹ *	2001-8 grouped ^d *	*		2002-21	*
	Smoking/drinking in pregnancy	2003-20	2004/5, 2010/11 ¹ *	2001-8 grouped ^d *			2003-20	*
	Preterm birth	2014-20		2001-8 grouped ^d			2002-21	
	Congenital abnormalities	2000-19			2000-19		2000-19	Mother age 2000-19
Early years	Ante-natal smoking	2000-19					2000-20	
	Child development milestones	2014-20	*	2014-20	2014-20		2013-20	English as main language, looked after child 2014-20
	Breastfeeding	2003-21	2004/5 & 2010/11 ¹	2016-21			2002-21	Care experienced children 2016-21, Mother age 2003-21
	Infant mortality	2000-19	2000-19		2000-20		2002-20	
	Parent mental health	2005-8 grouped & 2010 ¹	2005-8 grouped ¹ ; 2007/8; 2013/14 ¹					Family structure, Urban/rural, social support, mother age 2005-8 grouped ¹
Mid-childhood to adolescence	Smoking or drug use	2015 and 2018 ⁴	*	*	2015 ⁴ *	2015 and 2018 ⁴		Family structure 2015 and 2018 ⁴ *
	Teenage pregnancy	2010-19			NA		2004-18	
	Drinking	2015 and 2018 ⁴	*	*	*	2015 and 2018 ⁴	2002-20	Family structure and urban/rural 2015 and 2018 ⁴ *
	Adverse Childhood Experiences	2019 retrospective ² ; 2004-12 grouped ¹	2019 retrospective ² ; 2004-12 grouped ¹		2004-12 grouped ¹	2019 retrospective ²		Mother age, urban/rural 2004-12 grouped ¹
	Unintentional injury	2009-18 grouped ^d ; 2021	2009-18 grouped ^d		2011-21		2005-20	Relationship status of parents at birth 2009-18 grouped ^d
	Dental	2009-19					2012-20	
	General self-rated health	2008-19 ²	2012-19 ²		2008-19 ²	2008-19 ²	2006-13	Sex and family affluence intersection 2017/18 ³
	Mental health	2008/9 ¹ , 2015 and 2018 ⁴	2008/9 ¹ *	*	2002-20 *	2015 and 2018 ⁴	2010-13 grouped	Caring responsibility 2015 and 2018 ⁴ *
Overweight and obesity	2001-20	*	*	*		2002-19	*	
Adulthood	COVID-19 hospital admissions	2020-21		2020-21			2020-21	
	Cardiovascular: CVD, CHD, heart attacks, stroke, angina	1997-20, 2002-21	2008-19 ² *	2008-11 grouped ²	2008-19 ² *	2008-19 ²	2002-21	Religion and sexual orientation 2008-11 grouped ² *
	Gastrointestinal diseases			2001-10 grouped ^d				

	Cancer (incidence or deaths)	1997-19	*	2001-8 grouped [†] *	*		2002-18	*
	Respiratory disease e.g., Asthma	2008-19 ² and 2002-21	2012-19 ²	2001-10 grouped [†] *	2008-19 ²	2008-19 ²	2002-21	Intersection ethnicity & SEC at area, household and individual level 2001-10 grouped (8 measures of SEC) *
	Diabetes		*	2013-20	2002-20	2008-11 grouped ²	2005-20	Sexual orientation and religion 2008-11 grouped *
	Alcohol (consumption; hospitalisation; deaths)	1997-20	2012-19 ²	2001-10 [†] &	2008-19 ²	2008-19 ²	2002-20	Sexual orientation and religion 2008-11 grouped ² *
	Drug use	1996-21	*	*	2002-20		2002-20	*
	Smoking or e-cigarettes	2008-19 ²	2012-19 ²	2008-11 grouped ² *	2008-19 ²	2008-19 ²	2002-20	Sexual orientation and religion 2008-11 grouped ² *
	Mental wellbeing	2002-21	2012-19 ²	2008-11 grouped ² *	2008-19 ²	2008-19 ²	2008-17	Sexual orientation and religion 2008-11 grouped ² *
	Limiting long-term illness	2008-19²	2012-19 ²		2008-19 ²	2008-19 ²	2012-19 ²	Ethnicity and SEC intersection 2011 [†]
	General self rated health	2008-19²	2012-19 ²	2008-11 grouped ²	2008-19 ²	2008-19 ²		Sexual orientation and religion 2008-11 grouped ²
	Overweight and obesity	2008-19 ²	2012-19 ²	2008-11 grouped ²	2008-19 ²	2008-19 ²	2012-19 ²	Sexual orientation & religion 2008-11 grouped ² , urban/rural 19-20
	Feeling safe	2013-19 ²	2013-19 ²	2013-19 ²	2013-19 ²		2013-19 ²	Urban/rural 2013-19 ²
	Unintentional injury	2011-21		2001-13 grouped [†]	2011-21		2011-21	
	Activity and diet	2008-19 ²	2008-19 ²	2008-11 grouped ²	2008-19 ²	2008-19 ²	2007-19	
	Sexual health	1998-15 grouped; 2016			2010-19		2010-19	
Dental health	2008-19 ²	2008-19 ²	2008-11 grouped ²	2008-19 ²	2008-19 ²		Sexual orientation and religion 2008-11 grouped ²	
Older Age	Successful ageing score		2007/8 ^{5†}					
	Proportion last 6mnths spent in hospital	2011-21			2011-21			Urban/rural 2011-21
Death	(Healthy) Life expectancy	2000-19⁶; 2013-20		2001-4 grouped	2000-19 ⁶ ; 2013-20		2002-18	Urban/rural 2015-20
	Premature mortality	1997-20	1991-2000 and 2000-10 grouped ^{7†}	2001-13 grouped [†]	2006-17 [†]		2006-20	Social connection and sex 1991-2000 and 2000-10 grouped ⁷
	Suicide	2006-10 grouped & 2016-20; 2001-19 ⁶			2002-20		2002-20	

Key:

Green: Trend in inequality available over at least 5 years.

Yellow: Trend not available or only available for a limited geographic region.

Red: Data not available.

Superscript: Survey data source (see below), no superscript indicates routine data source.

Bold: Included in most recent Long-Term Monitoring of Health Inequalities Report.

* Potential to do novel analysis.

[†] Data from journal articles

Data sources:

Below are brief descriptions of the datasets referred to in Table B1.

Outcomes in the table without superscripts are documented in administrative data sources, which include:

- Census data, Hospital and NHS records; death registers; SCI-diabetes; Child Health Surveillance Programme School system; SHELS; Scottish cancer registry
- Often requires engagement with health-care services and residence in Scotland

¹ Growing Up in Scotland *birth* cohorts: <https://growingupinScotland.org.uk/about-gus/>

- 5217 children born 2004/5 and 6127 born 2010/11
- Sampled families at random from Child Benefit records, invitation by letter, interview face-to-face
- Population representative, but maybe missing children in care or unstable housing
- Provides limited picture of trends (comparisons only between two time points corresponding to the two birth cohorts)

² Scottish surveys:

- Annual publications of 3 cross-sectional household surveys: Scottish Household Survey; Scottish Health Survey and Scottish Crime and Justice Survey
- Systematic random sampling used to select the addresses from the Postcode Address File with the addresses ordered by urban-rural classification, SIMD rank and postcode (two-stage, clustered sampling)
- Often excludes prisons; hospitals; military bases; nursing homes; student halls of residence; communal establishments, mobile homes; sites for travelling people. May miss those recently or not stably settled in Scotland. During the COVID-19 pandemic misses those without telephone or internet access
- Addresses selected for any of the surveys (SHS, SHeS, SCJS) are removed from the sample frame for a minimum of 4 years so that they cannot be re-sampled for another survey
- Scottish Health Survey
 - 11,691 households sampled in 2019. Annual interview target of 4,006 adults for Scotland as a whole and a minimum of 125 for each Health Board
 - Representative of adults at Health Board level (over every four-year period)
 - Interviewing was in-person up to the COVID-19 pandemic, and by phone and online self-completion during the pandemic.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sample	8215	10138	9038	9531	6602	6732	6327	6418	5884	5300	6790	6881	1920

- Scottish Household survey
 - 10,577 households sampled in 2019
 - Interviewing was in-person up to the COVID-19 pandemic, and by phone or video call during the pandemic.
 - Lower response rate during the COVID-19 pandemic (20% compared to 63% in 2019).

³ Health Behaviours School Age Children Survey

- Cross-national school-based survey using self-completion questionnaires across 51 countries, including Scotland
- Nationally representative
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2732766/>

⁴ Scottish Schools Adolescent Lifestyle and Substance Use Survey

- Samples children in S2 (age 13) and S4 (age 15) in local authority and independent schools (excludes special schools). In some cases, matched to administrative data from Health Boards, Local Authorities and Alcohol and Drug Partnership
- Survey in paper format up to 2015, followed by combination of paper and online formats. Includes children in attendance at school on survey days only
- Sampled using Scottish Govt school database. Primary Sampling Units were S2 and S4 classes, stratified by local authority, school type, year group
- In 2015 61% schools invited responded, meaning 1036 classes and 21650 pupils. Pupil response rate was 91%. <https://www.gov.scot/publications/scottish-schools-adolescent-lifestyle-substance-use-survey-salsus-technical-report-2018/pages/4/>
- Results are weighted for the following variables: local authority; sex; year group; sector; denomination; rural/urban to bring distribution in line with the pupil census

⁵ West of Scotland Twenty-07 study

- Following 4510 people from 1986 to 2007/8
- Respondents were aged 35, 55 or 75 years in 2007/8
- Regional sample representative of Central Clydeside Conurbation
- The Primary Sampling Unit is the postcode sector stratified by level of employment and socioeconomic group. Individuals within each sector are then chosen for each age cohort. Additional locality sample focuses on North West and South West Glasgow. Survey tries to interview even if people have since moved to other parts of the UK
- In person interviews at home
- Not nationally representative

⁶ Glasgow Centre for Population Health

- Uses administrative data for Glasgow only
<https://www.understandingglasgow.com/indicators/population/overview>

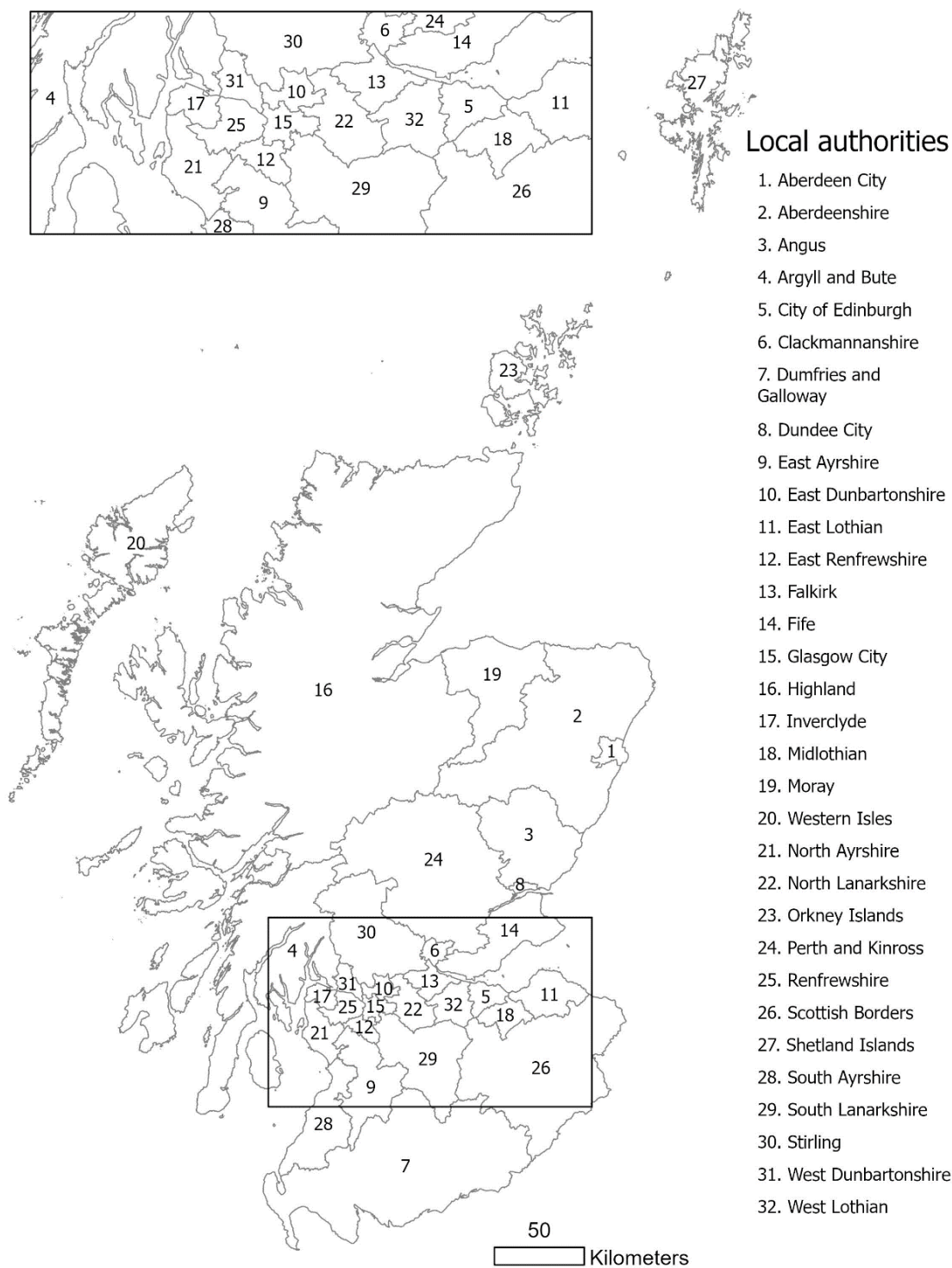
⁷ Scottish Longitudinal Study

- Links administrative data for 5.3% of the population (representative)
- Samples everyone born on one of 20 semi-random birth dates each calendar year. Must have been registered with the NHS for linkage (includes immigrants provided registered with NHS)

Appendix C. Technical information on some of the measures used

D.1. Local authorities across Scotland

Map D.1.1: Geographical location of local authorities



Author: L Macdonald, 2022. British National Grid, GCS OSGB 1936, Transverse Mercator. Local authority boundary data: Office for National Statistics licensed under the Open Government Licence v.3.0 Contains OS data © Crown copyright and database right [2022].

Table D.1.1 shows the variation in the population size of Scotland's local authorities over the past two decades. Glasgow City has consistently had the largest population share (around 11-12% of the total Scottish population), closely followed by City of Edinburgh (9-10%). Orkney and Shetland are the smallest, both home to just 0.4% of the population across the entire period.

Table D.1.1: Population size of local authorities: % share of the Scottish population in 2000, 2010 and 2020 (mid-year estimates)

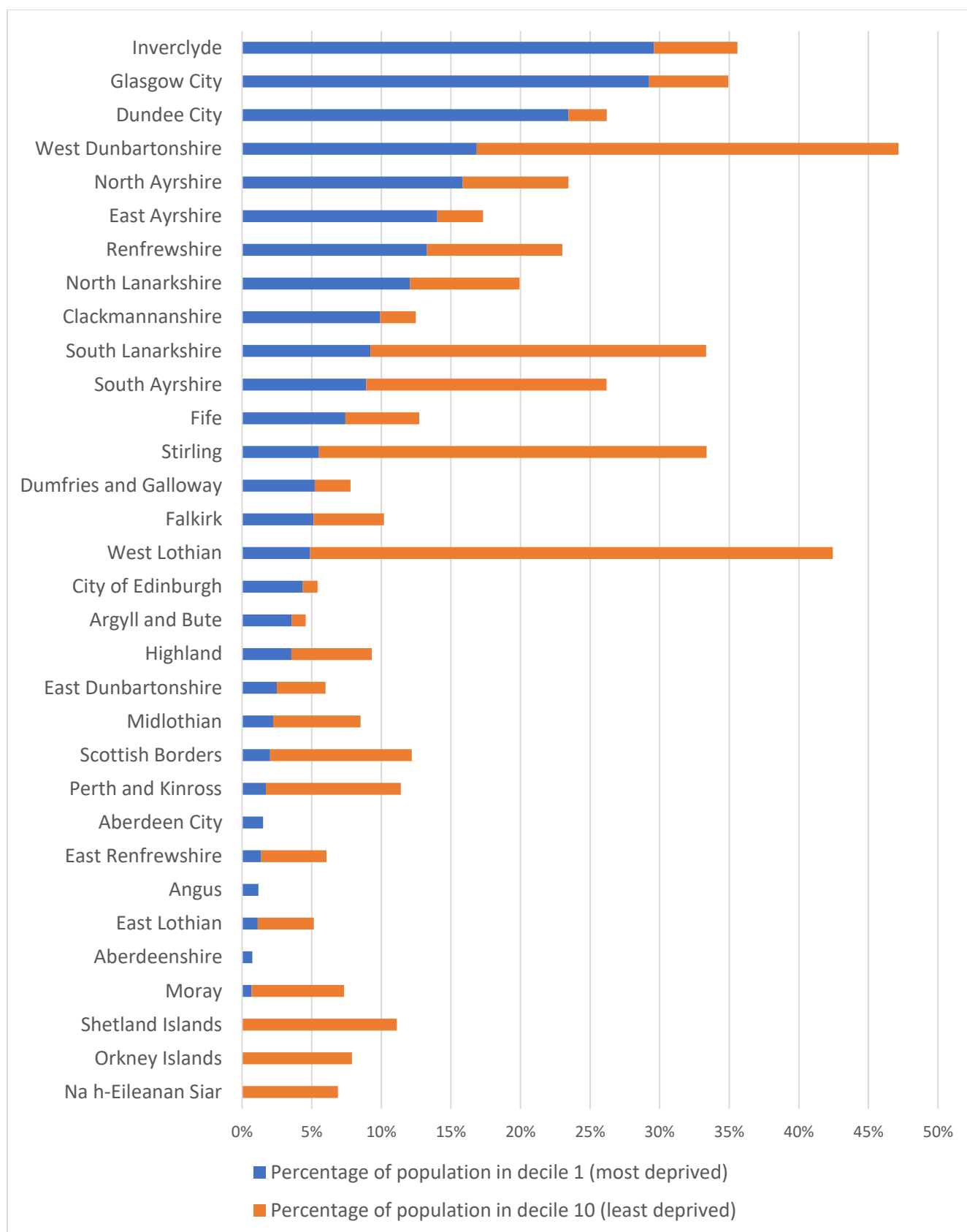
Local authority	% share 2000	% share 2010	% share 2020
Aberdeen City	4.2	4.2	4.2
Aberdeenshire	4.5	4.8	4.8
Angus	2.1	2.2	2.1
Argyll and Bute	1.8	1.7	1.6
City of Edinburgh	8.9	8.9	9.7
Clackmannanshire	1.0	1.0	0.9
Dumfries and Galloway	2.9	2.9	2.7
Dundee City	2.9	2.8	2.7
East Ayrshire	2.4	2.3	2.2
East Dunbartonshire	2.1	2.0	2.0
East Lothian	1.8	1.9	2.0
East Renfrewshire	1.8	1.7	1.8
Falkirk	2.9	2.9	2.9
Fife	6.9	6.9	6.8
Glasgow City	11.4	11.1	11.6
Highland	4.1	4.4	4.3
Inverclyde	1.7	1.5	1.4
Midlothian	1.6	1.6	1.7
Moray	1.7	1.8	1.8
Na h-Eileanan Siar	0.5	0.5	0.5
North Ayrshire	2.7	2.6	2.5
North Lanarkshire	6.3	6.4	6.2
Orkney Islands	0.4	0.4	0.4
Perth and Kinross	2.7	2.8	2.8
Renfrewshire	3.4	3.3	3.3
Scottish Borders	2.1	2.2	2.1
Shetland Islands	0.4	0.4	0.4
South Ayrshire	2.2	2.1	2.1
South Lanarkshire	6.0	6.0	5.9
Stirling	1.7	1.7	1.7
West Dunbartonshire	1.9	1.7	1.6
West Lothian	3.1	3.3	3.4
Total, number	5,062,940	5,262,200	5,466,000

Source: Mid-2021 Small Area Population Estimates Figures, Scotland¹

Figure D.1.1 overleaf shows how deprivation varies across local authorities in Scotland in 2021. The blue bars show the proportion of the population living in the most deprived tenth of areas, and the orange bars show the proportion living in the least deprived tenth of areas. It shows a picture of high variation. Inverclyde and Glasgow City have the highest deprivation levels, with almost one in three people living in Scotland's 10% most deprived areas. In contrast, West Lothian has very high proportions living in the least deprived areas, followed by Stirling, and West Dunbartonshire. West Dunbartonshire has the most varied population in terms of deprivation, with almost half of the population living either in the most or least deprived tenth of areas.

As discussed in the results chapters of this report, it is essential to bear in mind these variations in deprivation when considering geographical variations in health in Scotland – whether they be by local authority or degree of urbanicity - as any differences in health will be, to an extent, explained by deprivation.

Figure D.1.1: Proportion of population living in the most and least deprived tenths, by local authority, 2021*



Source: Mid-2021 Small Area Population Estimates Figures, Scotland¹

D.2: Scottish Government Urban Rural Classification

Table D.2.1: Description and size of settlements, according to the Scottish Government Urban/Rural Classification, 6-fold class

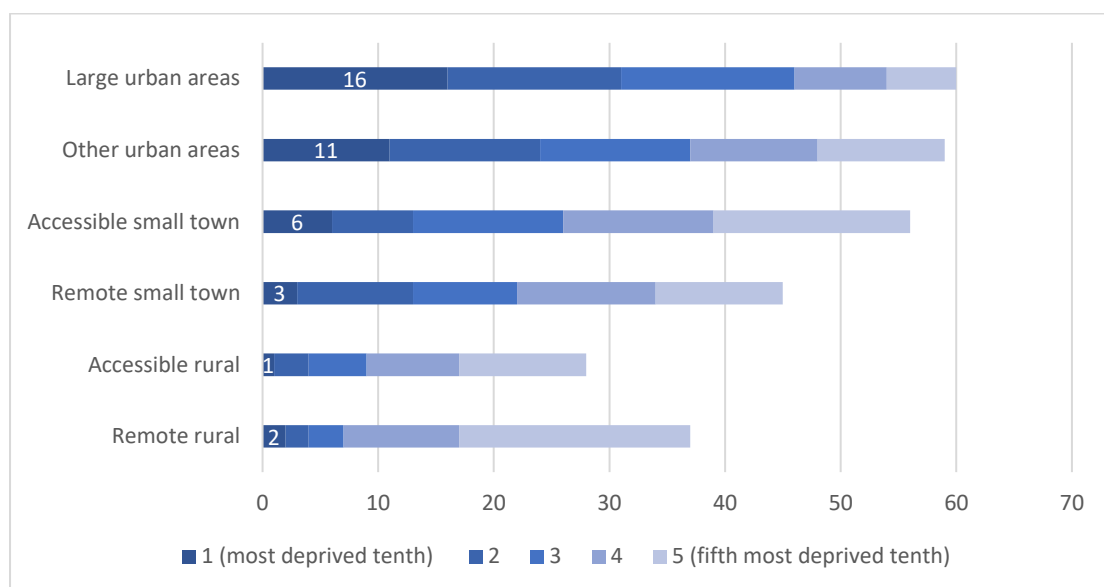
Class Name	Description of settlements *	% Scotland's population 2021^
<i>Large Urban Areas</i>	>=125,000 people	38%
<i>Other Urban Areas</i>	10,000 - 124,999 people	34%
<i>Accessible Small Towns</i>	3,000-9,999 people, within a 30-minute drive time of an urban area	8.6%
<i>Remote Small Towns</i>	3,000-9,999 people, more than a 30-minute drive to an urban area	2.6%
<i>Accessible Rural Areas</i>	<3,000 people, within a 30-minute drive time to an urban area	12%
<i>Remote Rural Areas</i>	<3,000 people, more than a 30-minute drive to an urban area	5.5%

Sources: *Poverty in rural Scotland: evidence review²; ^Population Estimates by Urban Rural Classification³

Table D.2.1 describes how settlements are characterised under the Scottish Government 6-fold urban/rural classification, alongside the proportion of the population resident in each class in 2021. The Rural Scotland Key Facts 2021 report also highlights the proportionate share of Scotland's landmass and the total population using 2019 population estimates according to a three-fold rural/urban classification which consists of remote rural areas, accessible rural areas, other areas). This shows that remote rural areas make up 70% of Scotland's land mass, although just 6% of the Scottish population live in these areas. Accessible rural areas make up 28% of landmass, with 11% population. Urban areas make up just 2% of Scotland's landmass but 83% of the population lives in them. There has been little change over the past ten years⁴.

Figure D.2.1 shows the proportion of the population living in the five most deprived tenths of areas in the most rural to the most urban settlements. As shown by the white labels, the proportion of people living in the most deprived tenth of areas in remote rural, accessible rural and small towns is just 1, 2, and 3% respectively. This is in contrast to 16% in large urban areas and 11% in other urban areas. The stacked bars show how 60% of people living in large urban settlements and 28% of people living in accessible rural settlements live in the 50% most deprived areas.

Figure D.2.1: proportion of population living in the five most deprived tenths of areas, across more rural and urban settlements



Source: Poverty in rural Scotland: evidence review

D.3. National Statistics Socio-Economic Classification (NS-SEC)

Figure 1.1 (Chapter 1, Timing and Causes of Deaths), describes inequalities in infant mortality from a paper by Harpur et al⁵. In this analysis, they used the modified five-class National Statistics Socio-Economic Classification (NS-SEC) to look at parental occupation, consisting of these groups:

1 Managerial and professional; 2 Intermediate; 3 Small employers and own account workers; 4 Supervisors/craft related; 5a. Semi-routine and routine occupations; 5b. Never worked, long-term unemployed and uncoded occupations.

Where parents were living together, the highest occupation of both parents was assigned. More detail on NS-SEC is available from National Records of Scotland⁶.

Appendix D. Guide to interpreting graphs and measures of health inequalities

Guide to reading trend graphs

Overleaf we provide a guide to reading the trend graphs which are used throughout the report to show how health has changed over time, according to area-level deprivation fifths (or sometimes tenths). Also included in these figures are text boxes and tables which quantify the degree of inequality between the most and least deprived areas.

Measures of disease frequency:

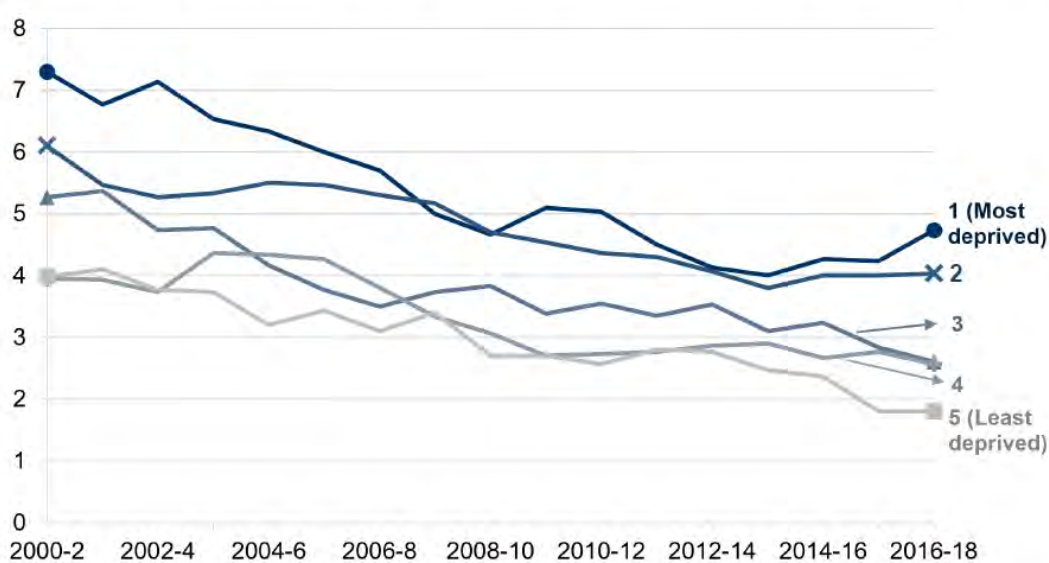
Three measures of disease frequency (the y-axis) are used in this report. These are:

1. Rates (as here) = the number of cases/deaths that occur for every 100,000 or in this case 1,000 members of the population in this year.
2. Prevalence = the proportion of the population with this disease/performing this behaviour in this year.
3. Life expectancy/Healthy life expectancy = how long a baby born in this year would live/live in good health if mortality and morbidity age-patterns remained the same across its life.

The measure used in each graph (the y-axis) is shown in the technical title directly above each graph

Figure 1.1. Children living in deprived areas are 2.6 times as likely to die before their first birthday as children in less deprived areas

Deaths in < 1-year-olds per 1,000 live births, according to fifths of area-level deprivation: 2000-2 to 2016-18.



Most deprived 1.8x
as high as least.
Gap of 3.3 deaths
per 1000 births.

Most deprived 1.7x
as high as least.
Gap of 2.0 deaths
per 1000 births.

Most deprived 2.6x
as high as least.
Gap of 2.9 deaths
per 1000 births.

	2000-02	2004-06	2008-10	2012-14	2016-18
Population average (per 1,000)	5.5	4.9	4.0	3.5	3.3
Relative difference	1.8	2.0	1.7	1.5	2.6
Absolute gap (per 1,000)	3.3	3.1	2.0	1.4	2.9

Source: Harpur, A., et al., Trends in infant mortality and stillbirth rates in Scotland by socio-economic position, 2000–2018: a longitudinal ecological study. *BMC Public Health*, 2021. 21(1): p. 995.

Annotations highlight the size of inequalities at the start and end of the timeframe.

The 'gap' reports the size of the absolute difference in disease rate between the most and least deprived groups. For example, in 2000-2 the absolute difference is $7.3 - 4.0 = 3.3$ deaths per 1,000. This number is strongly affected by the overall prevalence/rate of the disease across the entire population.

The relative difference shows how many times greater the rate/prevalence of the disease is in the more disadvantaged group. For example, in 2001 the relative difference is $7.3 \div 4.0 = 1.8$.

Key:

The darkest blue line represents the most deprived fifth of areas (SIMD 1) and the palest grey line represents the least deprived fifth (SIMD 5).

What does it mean if the absolute and relative gaps show different trends?

The absolute gap is more affected by how common the disease/behaviour is in the population overall than the relative difference. This means that in cases where the overall frequency of the disease/behaviour is changing the absolute gap and relative difference may change in different ways. This can be seen in the example figure in the guide to trend graphs, where the absolute gap in infant mortality decreases (from 3.3 deaths per 1,000 births to 2.9 deaths per 1,000) between 2000-2 and 2016-18, but the relative difference increases (from 1.8 to 2.6). For rare diseases, absolute inequalities are likely to be small but relative differences can still be very large. Whilst the opposite can be true of absolute differences.

The absolute difference conveys the overall excess burden of disease in disadvantaged communities, whereas the relative difference is helpful for assessing whether inequalities are changing in a way which is less dependent on changes in the overall frequency of the disease in the population.

Alternative ways of quantifying inequalities: the indices of inequality

Some health inequalities publications and routine reports use the slope and relative indices of inequality (known as the SII and the RII). These provide single estimates of absolute and relative inequality, across the social gradient, which can allow for change in the size of social groups over time (e.g. numbers educated to degree level have increased).

After discussions with our stakeholders, we opted to take the simpler approach of showing data across all levels of deprivation (to show the shape of the social gradient) and using measures of inequality comparing the two extreme groups. This was considered easier to interpret and more grounded in what people wanted to know about health inequalities. For example, it allows us to consider whether the health of the most deprived groups is disproportionately worse than the others.

In order to minimise the impacts of changes in the size some socio-economic groups (e.g. the number of people with degrees has increased), we report trends in the Scottish Index of Multiple Deprivation and household income, which can easily be divided equally sized groups.

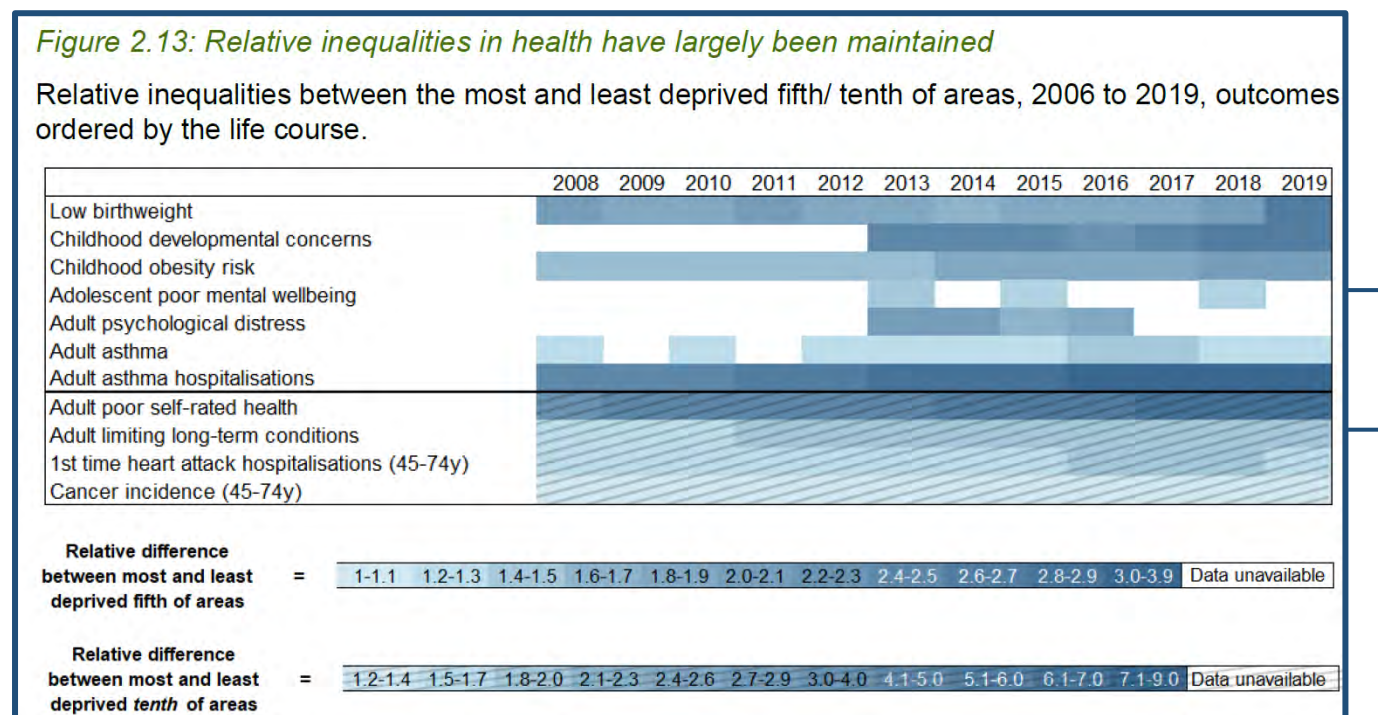
Alternative measures to the Scottish Index of Multiple Deprivation

As noted in the main report, the SIMD is made up of several domains, including a health domain. The health domain (which captures mortality rates, hospital stays related to alcohol and drug misuse, welfare claims linked to disability and ill health, emergency stays in hospital, proportion of population being prescribed drugs for anxiety, depression or psychosis, and low birthweight) has a weighted contribution of 14% to the overall SIMD score used in our main analyses. The inclusion of the health component in the SIMD potentially creates some circularity when looking at health inequalities. However, research examining the impact of removing the health domain from the SIMD score when analysing health inequalities has found it made no practical difference (Danny Bradford, Denise Brown (MRC/CSO Social and Public Health Sciences Unit), verbal communication).

Guide to reading the synthesis heat maps

In chapters 2 and 4, heat maps are used to present a synthesis of trends in *relative* inequalities in all outcomes described in that chapter, with time running from left to right and each row representing a different outcome. The darker the shade of blue, the greater the inequality.

The unhatched rows of the heat map (towards the top) show relative inequalities between the most and least deprived *fifth* of areas for the main outcomes considered (and shown in the Figures).



The hatched rows beneath present inequalities in outcomes that are summarised in text form only throughout the report, because they are presented in detail in the Long-term Monitoring of Health Inequalities reports⁷. For these outcomes, relative inequalities between the most and least deprived *tenth* of areas are shown. This is an important distinction as the inequalities presented in the hatched rows are comparing more extreme groups. For this reason, the hatched area and unhatched area have their own shading schemes, shown in the two different keys.

This heat map only shows the inequality between the extremes of the socio-economic spectrum, so it is important to keep in mind that there may also be large inequalities between intermediate groups on the spectrum. The diagram shows inequalities by area deprivation because this is the most consistently available measure of socio-economic circumstances.

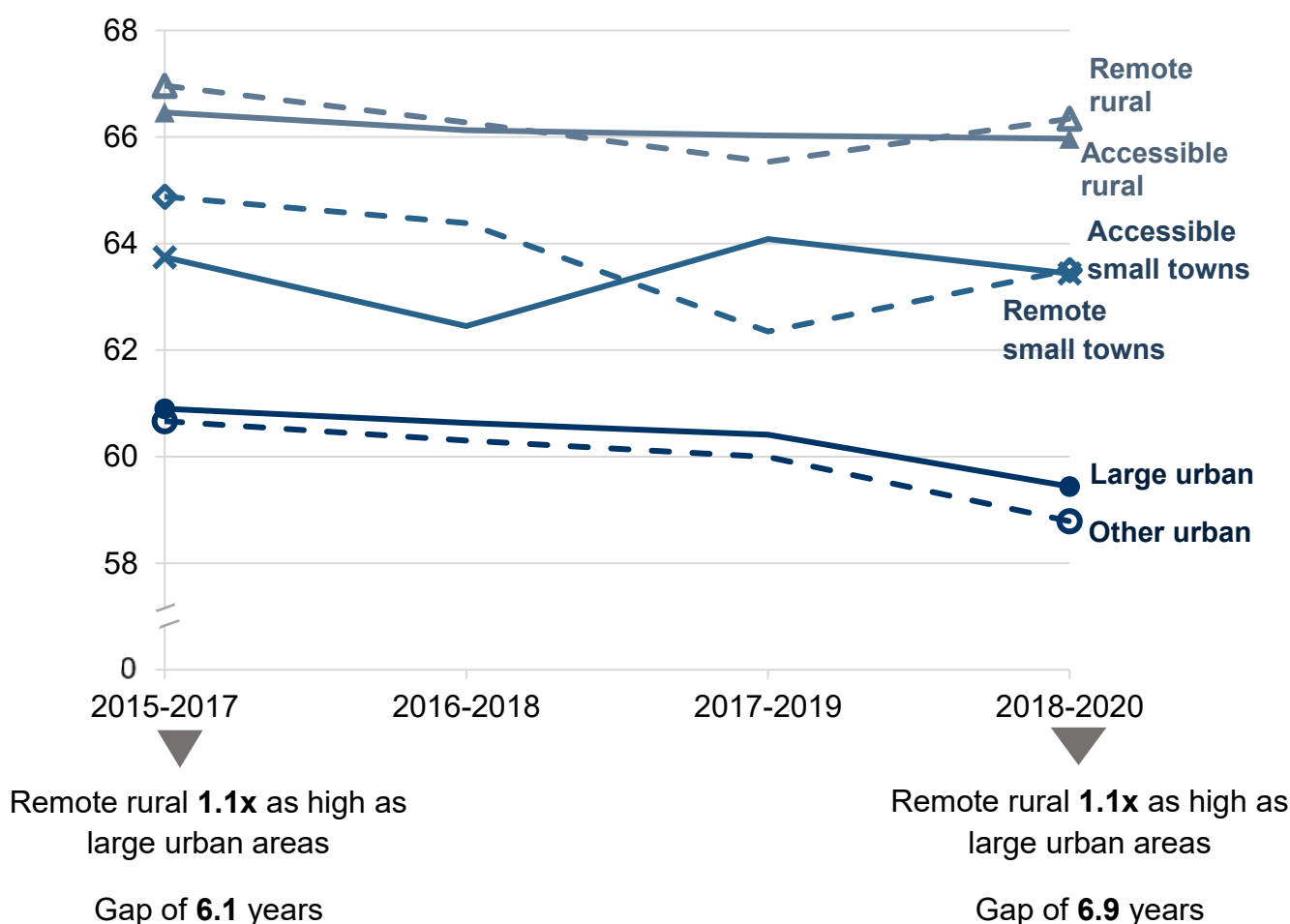
Appendix E. Additional results

Chapter 2: Health and wellbeing

E.2.1 Healthy Life Expectancy by Urban/Rural Classification

As shown in Chapter 2 of the main report, differences in healthy life expectancy between the most and least deprived tenth of areas are large, at 24 years for both men and women in 2018-20. Inequalities in healthy life expectancy are narrower between urban and rural areas, as shown below, but are still seen for both males and females. Healthy life expectancy in remote rural areas compared to large urban areas is approximately 7 years longer among men, and 4 years longer among women. Among males there is a fairly clear social gradient, with decreasing healthy life expectancy running from rural areas, to small towns, to urban areas. Among females the pattern is less clear, with remote small towns in particular showing rapid changes in healthy life expectancy across the time period. However, it is important to note that the confidence intervals around the estimates for some groups were wide, making it harder to be certain that these differences are representative of what is occurring in the Scottish population.

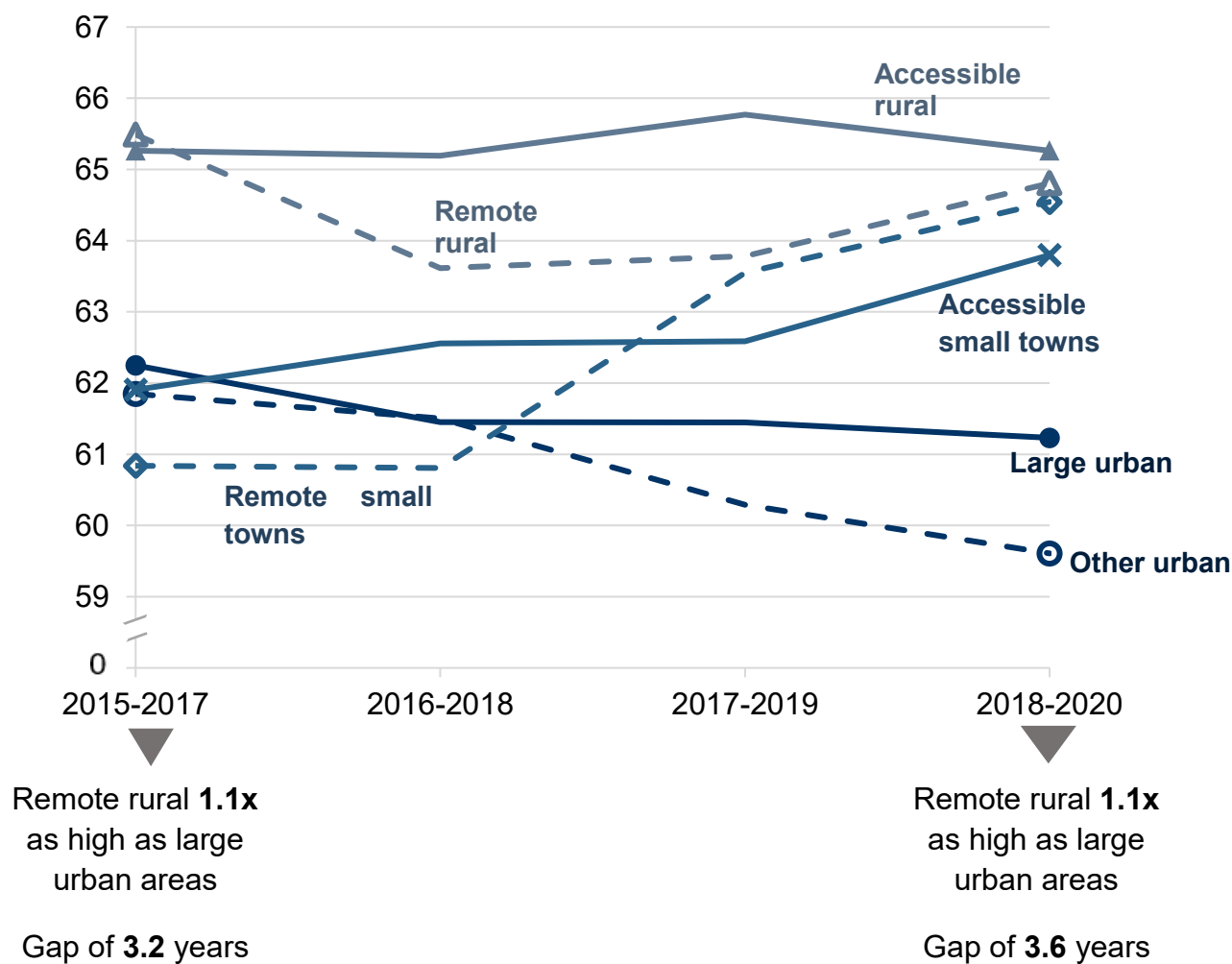
Figure E.2.1.a: Male healthy life expectancy is 6.9 years longer in remote rural areas than large urban areas.
Healthy life expectancy (years), according to the urban-rural classification of areas: 2015-2017 to 2018-2020



	2015-2017	2016-2018	2017-2019	2018-2020
Population average (years)	62.3	61.9	61.7	60.9
Relative difference*	1.1	1.1	1.1	1.1
Absolute gap (years)*	6.1	5.6	5.1	6.9

*Comparing remote rural areas compared to large urban areas. Source: National Records of Scotland.

Figure E.2.1.b: Female healthy life expectancy is 3.6 years longer in remote rural areas than large urban areas.
Healthy life expectancy (years), according to the urban-rural classification of areas: 2015-2017 to 2018-2020



	2015-2017	2016-2018	2017-2019	2018-2020
Population average (years)	62.6	62.2	61.9	61.8
Relative difference*	1.1	1.0	1.0	1.1
Absolute gap (years)*	3.2	2.2	2.3	3.6

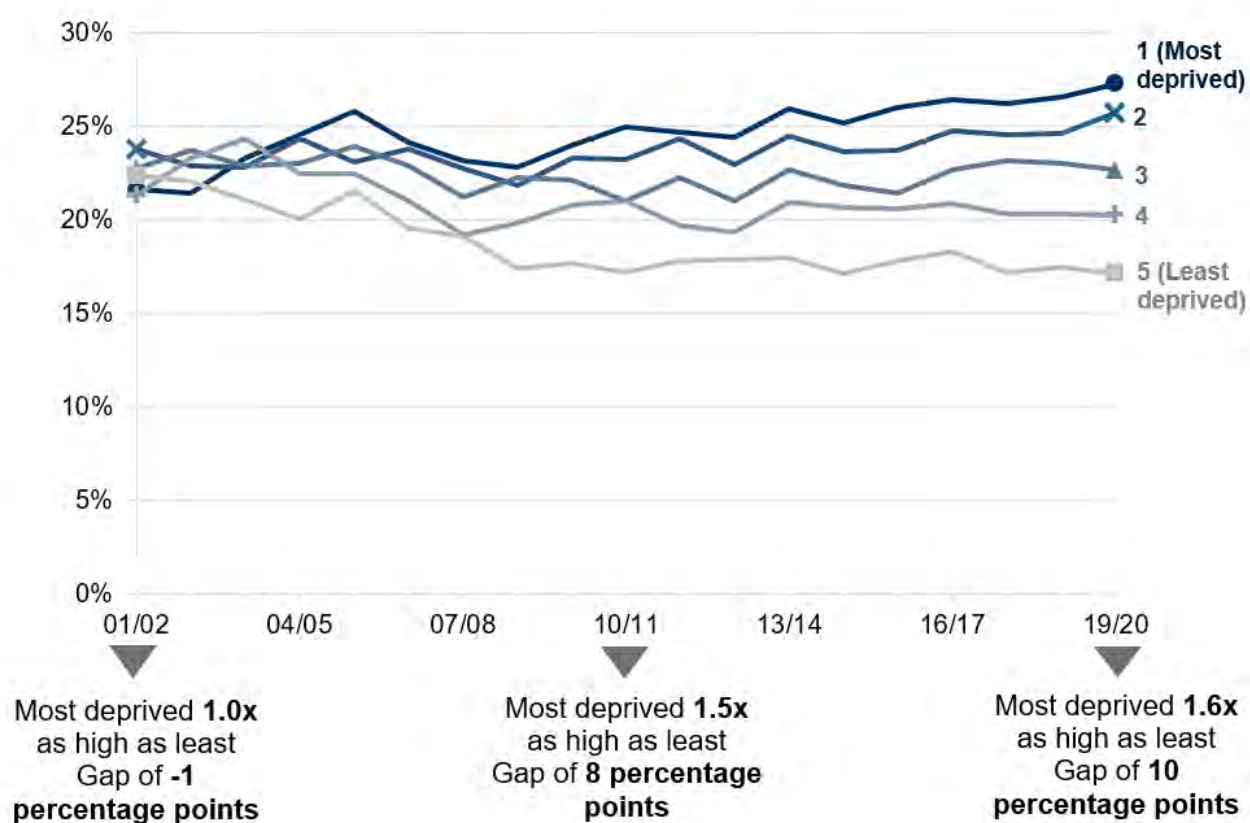
*Comparing remote rural areas compared to large urban areas. Source: National Records of Scotland.

E.2.2 Childhood overweight and obesity

Compared to inequalities in risk of obesity at P1 (which was 7 percentage points in 2019/20, Chapter 2 of main report), the proportion of children at risk of overweight (including children at risk of obesity - in other words BMI in or above the 85th centile) shows wider absolute gaps between the most and least deprived areas (e.g. 10 percentage points in 2019/20). This may in part be related to the higher population average risk of overweight compared to obesity. In contrast the relative difference is smaller when considering inequalities in overweight and obesity risk (1.6) rather than just obesity risk (2.1), suggesting that the social gradient is larger for the more severe forms of this outcome. As noted in the main report, coverage of the Primary 1 checks was relatively low throughout the 2000s but the widening of inequality since 2010 is likely to reflect trends at the population level.

Figure E.2.2: Inequalities in risk of childhood overweight and obesity have widened

Proportion of children in Primary 1 at risk of overweight or obesity (%), according to fifths of area-level deprivation: 2001/02- to 2019/20



	01/02	04/05	07/08	10/11	13/14	16/17	19/20
Population average (%)	22.4%	22.9%	21.2%	21.5%	22.6%	22.9%	22.7%
Relative difference	1.0	1.2	1.2	1.5	1.4	1.4	1.6
Absolute gap (%)	-0.8%	4.5%	4.0%	7.8%	8.0%	8.1%	10.1%

Source: Public Health Scotland. Primary 1 Body Mass Index (BMI) statistics Scotland report. (2021).

As seen in the main report for risk of obesity, the risk of overweight (including obesity) increased during the pandemic (in 2020/21) to 29.5%. Inequalities also widened, with an absolute gap of 14.8 percentage points and a relative

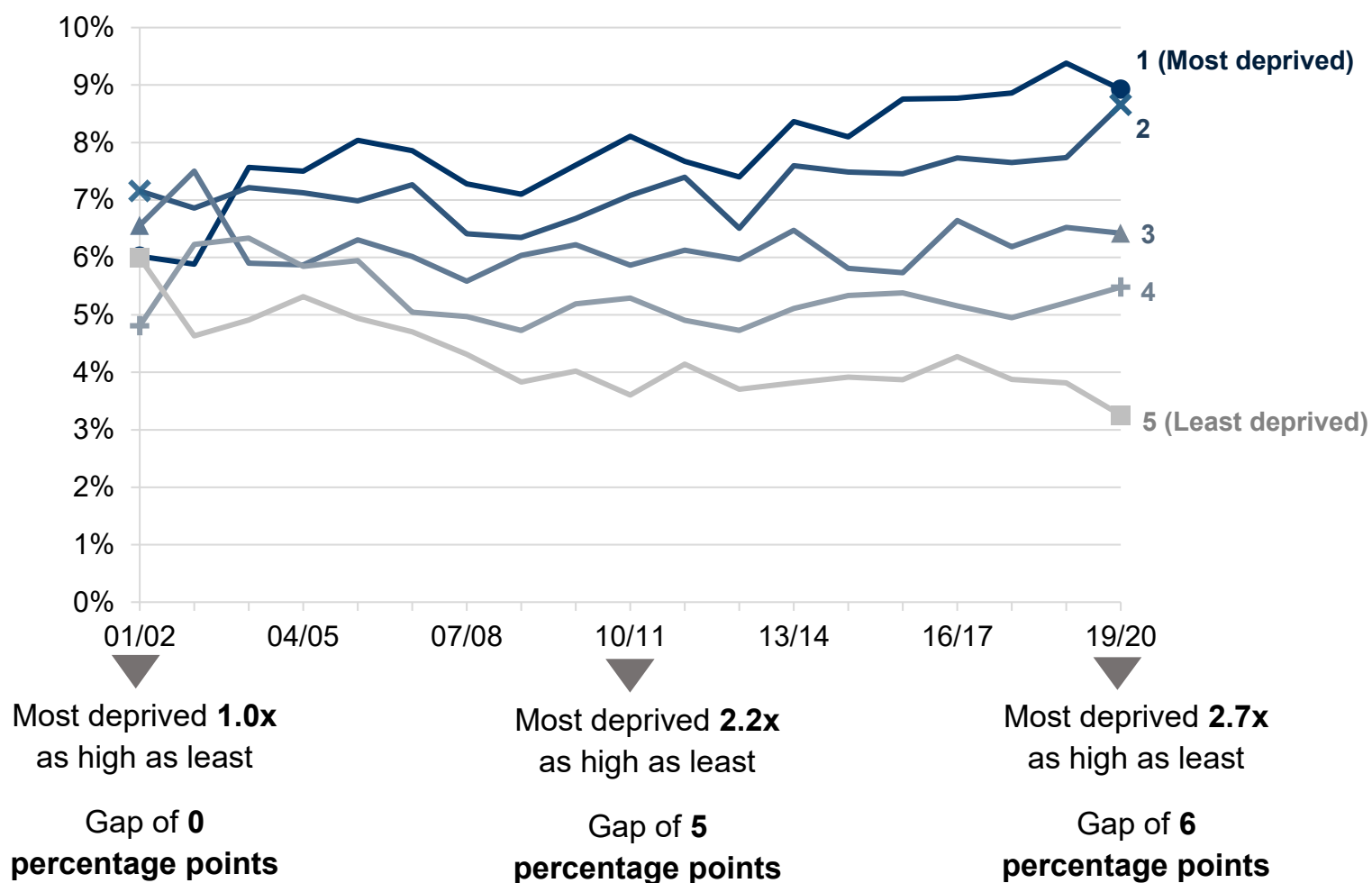
difference of 1.7. Analysis from Public Health Scotland concluded that the increase in prevalence was unlikely to be fully explained by the lower proportions of children measured during the pandemic⁸.

E.2.3 Childhood obesity using clinical definitions

Measuring childhood obesity using clinical definitions (BMI in or above the 98th centile) rather than the epidemiological cut-offs used in the main report leads to very similar trends in social inequalities in childhood obesity. The proportion of children identified as obese using clinical definitions also increased in 2020/21 to 15.1%, with an absolute gap of 10 percentage points and a relative difference of 3.

Figure E.2.3: Inequalities in childhood obesity measured using clinical definitions have widened

Prevalence of obesity among children in Primary 1 (%), according to fifths of area-level deprivation 2001/02 to 2019/20



	01/02	04/05	07/08	10/11	13/14	16/17	19/20
Population average (%)	6.2%	6.3%	5.8%	6.0%	6.4%	6.7%	6.6%
Relative difference	1.0	1.4	1.7	2.2	2.2	2.1	2.7
Absolute gap (%)	0%	2%	3%	5%	5%	5%	6%

Source: Public Health Scotland. Primary 1 Body Mass Index (BMI) statistics Scotland report. (2021).

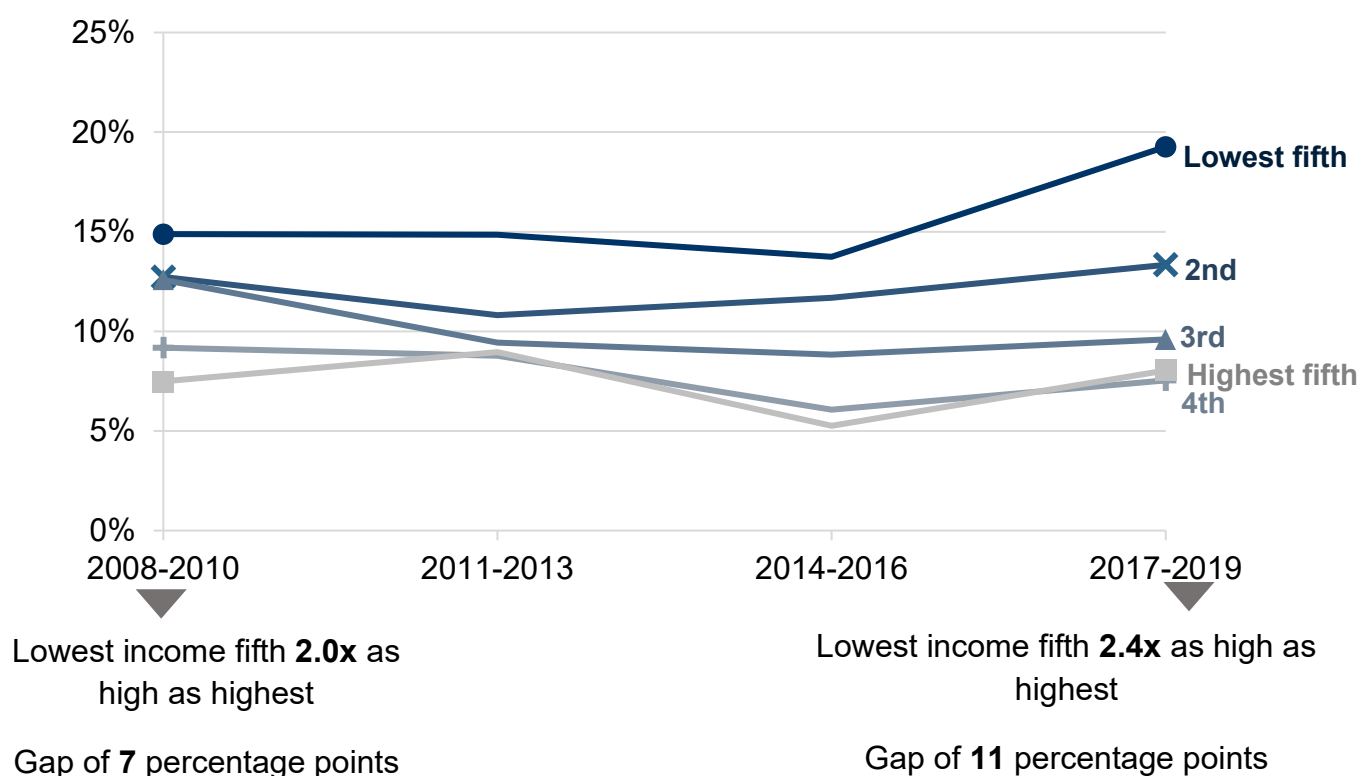
Chapter 3: Health-related behaviours

E.3.1 Children's formal physical activities by income fifths

A modest gradient in formal physical activities is seen by income, with the proportion of children with very low levels of formal physical activity being 11 percentage points higher in the lowest income fifth than the highest (a ratio of 2.4x) in 2017-2019. This compares to an absolute gap of 13 percentage points and a relative difference of 2.8 according to area deprivation (main report, Chapter 3). As described in Chapter 3, this self-reported measure of children's physical activity may be misleading as informal activities such as active travel to school are missed, and these may be a more common form of physical activity among less affluent families. Objective data using accelerometers show little inequality, or even a possible reverse social gradient in total physical activity in children⁹⁻¹¹.

Figure E.3.1: Inequalities in formal physical inactivity among children are similar between income fifths to between area deprivation fifths

Proportion of children (2-15 years) who did not participate in 30 minutes of sport or active play on any day in the previous week (%), according to fifths of household income: 2008-20 to 2017-19



	2008-10	2011-13	2014-16	2017-19
Population average (%)	13%	11%	10%	14%
Relative difference	2.0	1.7	2.6	2.4
Absolute gap (%)	7.4%	5.9%	8.5%	11.2%

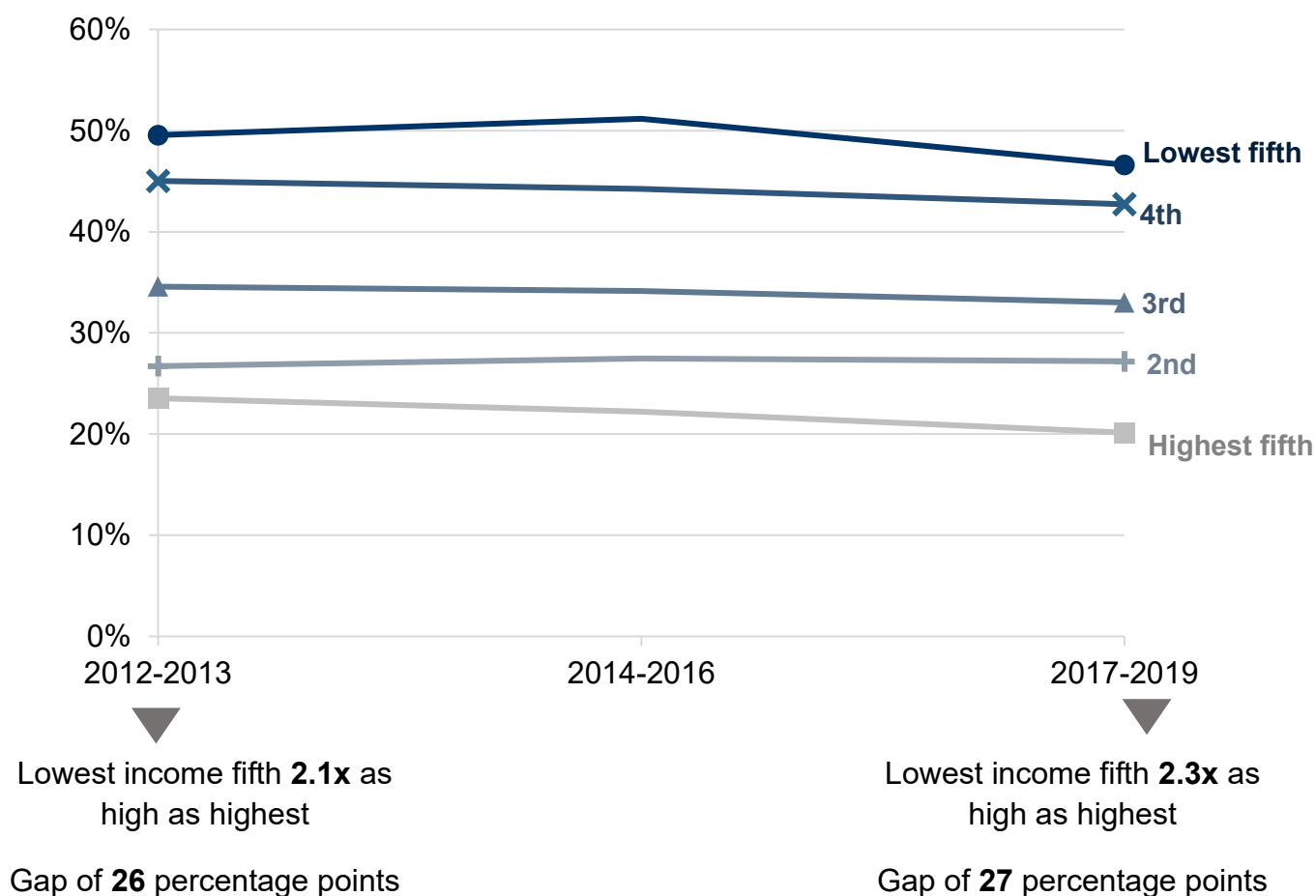
Source: New analysis of the Scottish Health Survey.

E.3.2 Adult physical activity by income fifths

The difference between the proportion of adults not meeting the CMO guidelines for physical activity in the lowest income fifth and highest income fifth has been large since 2012-13 (with a 27 percentage point gap and 2.3x relative difference in 2017-19). These inequalities are larger than those seen between the most and least deprived fifths of areas (which were 19 percentage points and 1.7 in 2017-19, as shown in Chapter 3 the main report).

Figure E.3.2: Inequalities in physical inactivity among adults are greater by income fifth than by area deprivation

Proportion adults not meeting CMO daily activity guidelines (%), according to fifths of household income: 2012-13 to 2017-19



	2012-13	2014-16	2017-19
Population average (%)	36.8%	36.7%	34.6%
Relative difference	2.1	2.3	2.3
Absolute gap (%)	26.0%	28.9%	26.5%

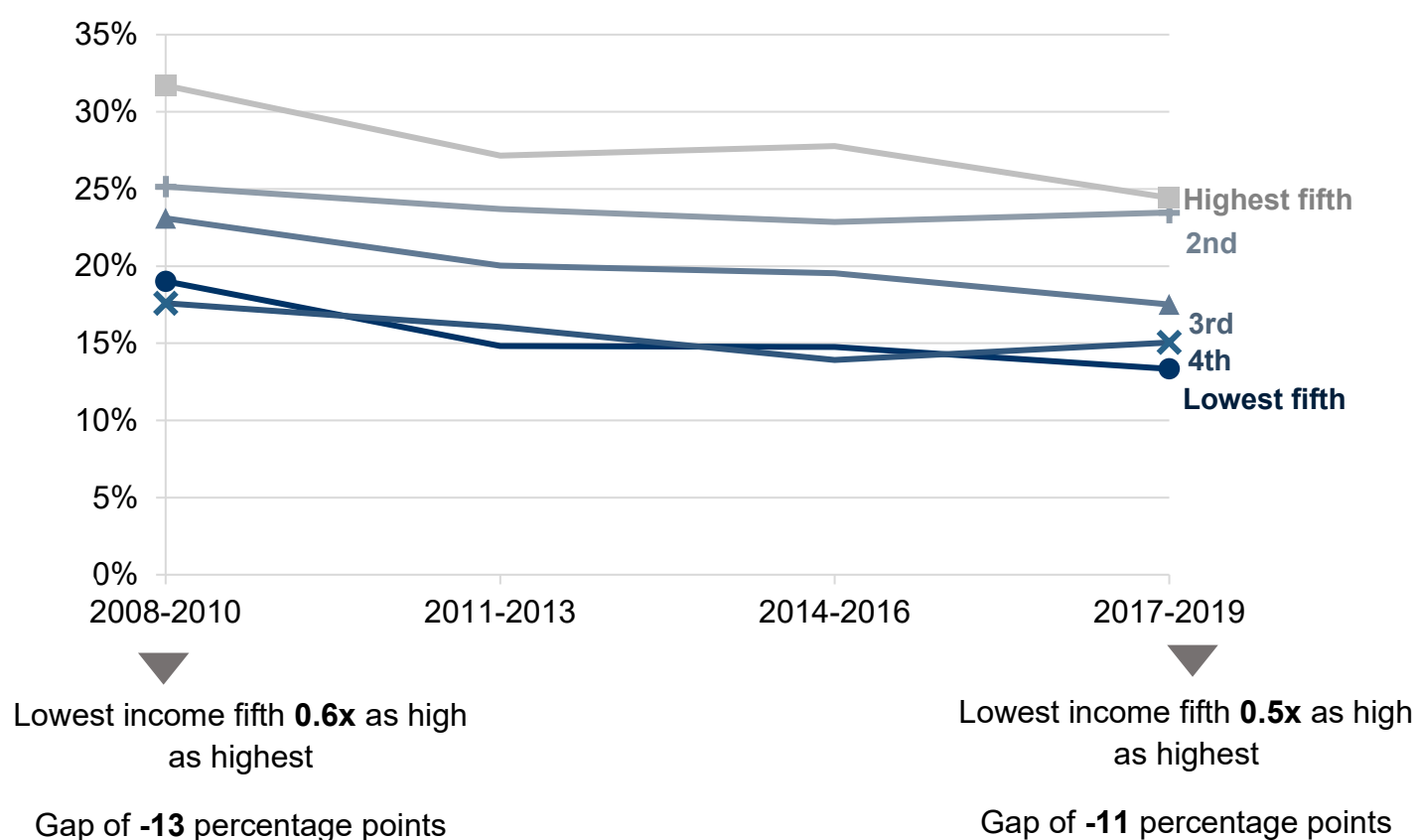
Source: New analysis of the Scottish Health Survey.

E.3.3 Hazardous and harmful alcohol consumption by income fifths.

A reverse social gradient in hazardous and harmful alcohol consumption is seen when consumption is stratified by household income, with the highest income fifths showing the highest prevalence of hazardous/harmful drinking (Figure E.3.3 below). This reverse social gradient is also seen for area deprivation (Chapter 3, main report). Inequalities are slightly larger between the highest and lowest income fifth than the most and least deprived fifths of areas (for example a -11 percentage point absolute gap by income in 2017-19, compared to a -9 percentage point absolute gap by area deprivation).

Figure E.3.3: A reverse social gradient in hazardous and harmful alcohol consumption is seen for household income as well as area deprivation

Prevalence of hazardous or harmful alcohol consumption (%), according to fifths of household income: 2008-10 to 2017-19



	2008-10	2011-13	2014-16	2017-19
Population average (%)	23.2%	20.5%	19.7%	18.5%
Relative difference	0.6	0.5	0.5	0.5
Absolute gap (%)	-12.7%	-12.3%	-13.0%	-11.1%

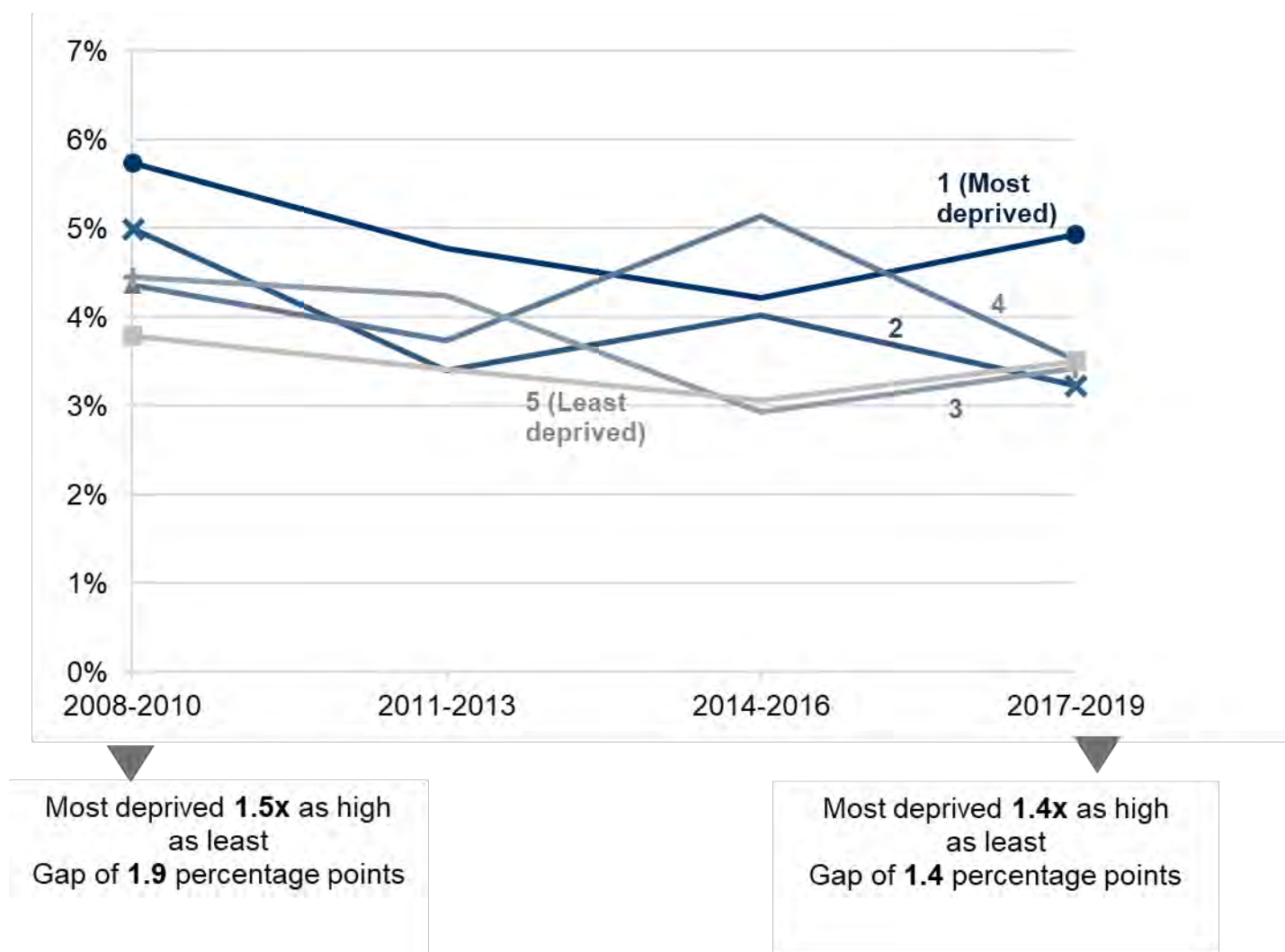
Source: New analysis of the Scottish Health Survey.

E.3.4 Harmful alcohol consumption only, according to area-level deprivation and income fifths

The reverse social gradient seen in hazardous alcohol consumption (see in Chapter 3 and previous section of this appendix) is less clear when separating out alcohol consumption which causes harm from hazardous alcohol consumption. The prevalence of harmful drinking is relatively rare across all groups although it is highest in the most deprived fifth of areas in most of the years studied. There is no consistent gradient across the other fifths.

Figure E.3.4.a: A gradient in harmful alcohol consumption by area deprivation is less clear than for hazardous and harmful consumption combined.

Prevalence of harmful alcohol consumption (%), according to fifths of area-level deprivation: 2008-10 to 2017-19



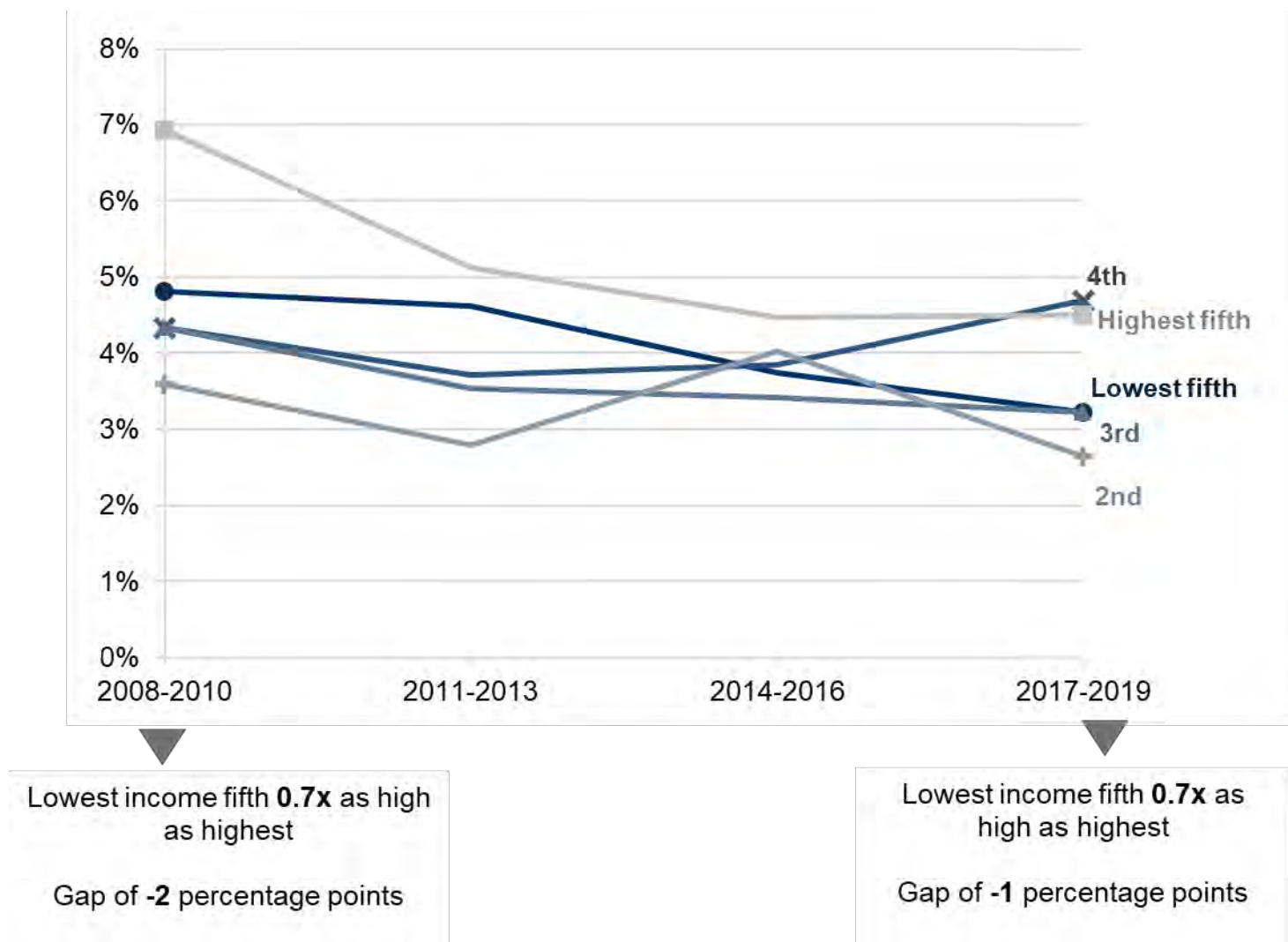
	2008-10	2011-13	2014-16	2017-19
Population average (%)	4.7%	3.9%	3.9%	3.7%
Relative difference	1.5	1.4	1.4	1.4
Absolute gap (%)	1.9%	1.4%	1.2%	1.4%

Source: New analysis of the Scottish Health Survey.

When considered by income fifth, the reverse gradient is again less clear when looking at harmful alcohol consumption only than when looking at hazardous and harmful consumption together. Both the highest and lowest income fifths tend to have high levels of harmful alcohol consumption across the time period.

Figure E.3.4.b: Both the highest and lowest income fifths have high prevalence of harmful alcohol consumption.

Prevalence of harmful alcohol consumption (%), according to fifths of household income: 2008-10 to 2017-19



	2008-10	2011-13	2014-16	2017-19
Population average (%)	4.7%	3.9%	3.9%	3.7%
Relative difference	0.7	0.9	0.8	0.7
Absolute gap (%)	-2.1%	-0.5%	-0.7%	-1.3%

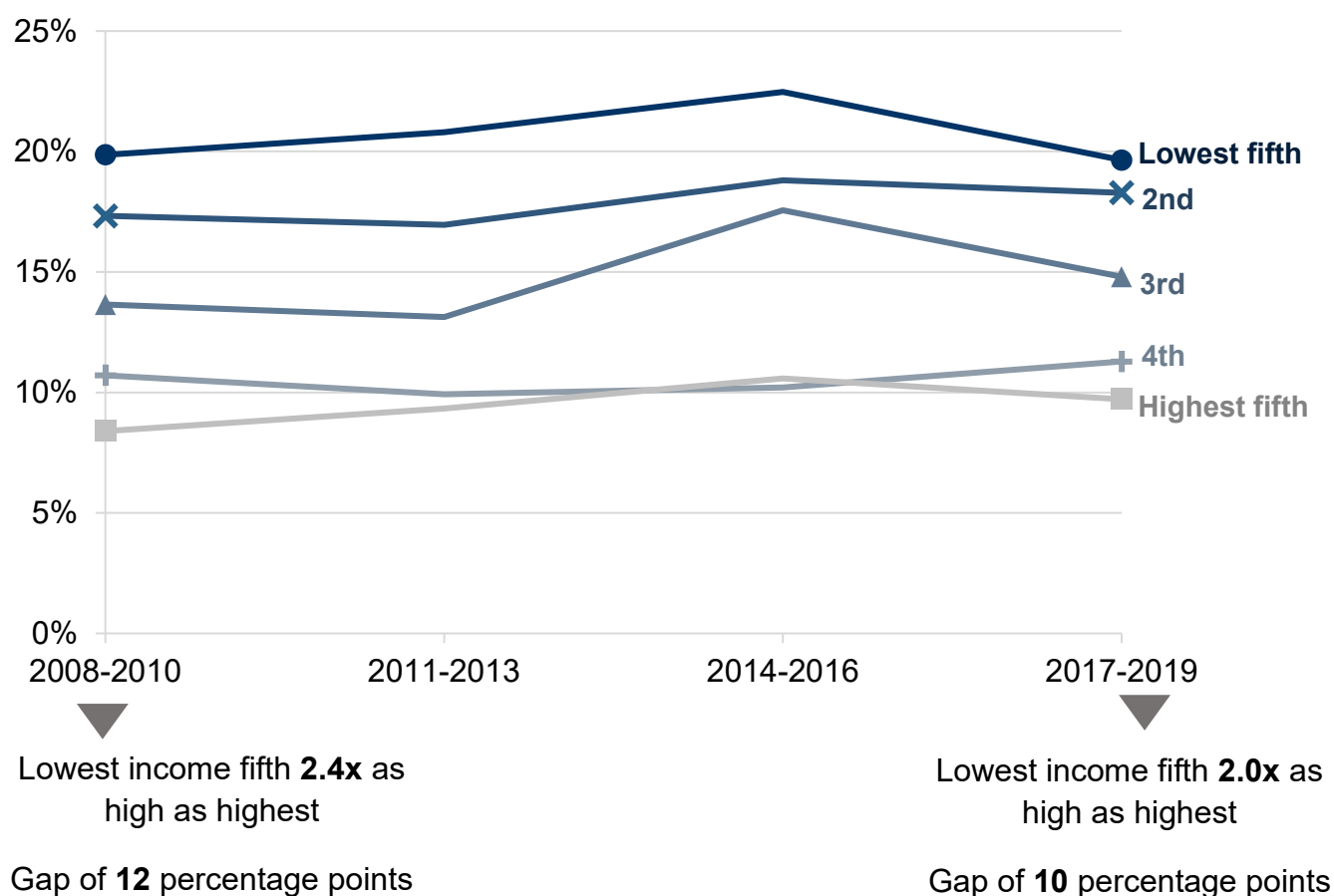
Source: New analysis of the Scottish Health Survey.

E.3.5 Diet by income fifths

A social gradient in very low fruit and vegetable consumption is seen by income fifth, although the gap between the highest and lowest income fifth is slightly narrower than the gap between the most and least deprived fifth of areas, particularly in more recent years as the gap by income has narrowed slightly. For example, in 2017-2019 the proportion of adults who reported not eating a whole portion of fruit/vegetables in the previous day was 10 percentage points higher in the lowest income fifth than the highest (a relative gap of 2.0), but 14 percentage points higher in the most deprived fifth of areas than the least deprived fifth (with a relative gap of 2.5x relative) – as shown in Chapter 3 of the main report.

Figure E.3.5: Differences in fruit and vegetable consumption by income fifth appear to be slightly more modest than by area deprivation fifth.

Proportion of adults who ate less than 1 portion of fruit and vegetables in the previous day (%), according to fifths of household income: 2008-10 to 2017-19



	2008-10	2011-13	2014-16	2017-19
Population average (%)	13.7%	13.3%	15.9%	14.6%
Relative difference	2.4	2.2	2.1	2.0
Absolute gap (%)	11.5%	11.5%	11.9%	9.9%

Source: New analysis of the Scottish Health Survey.

Chapter 4: Health and social care services

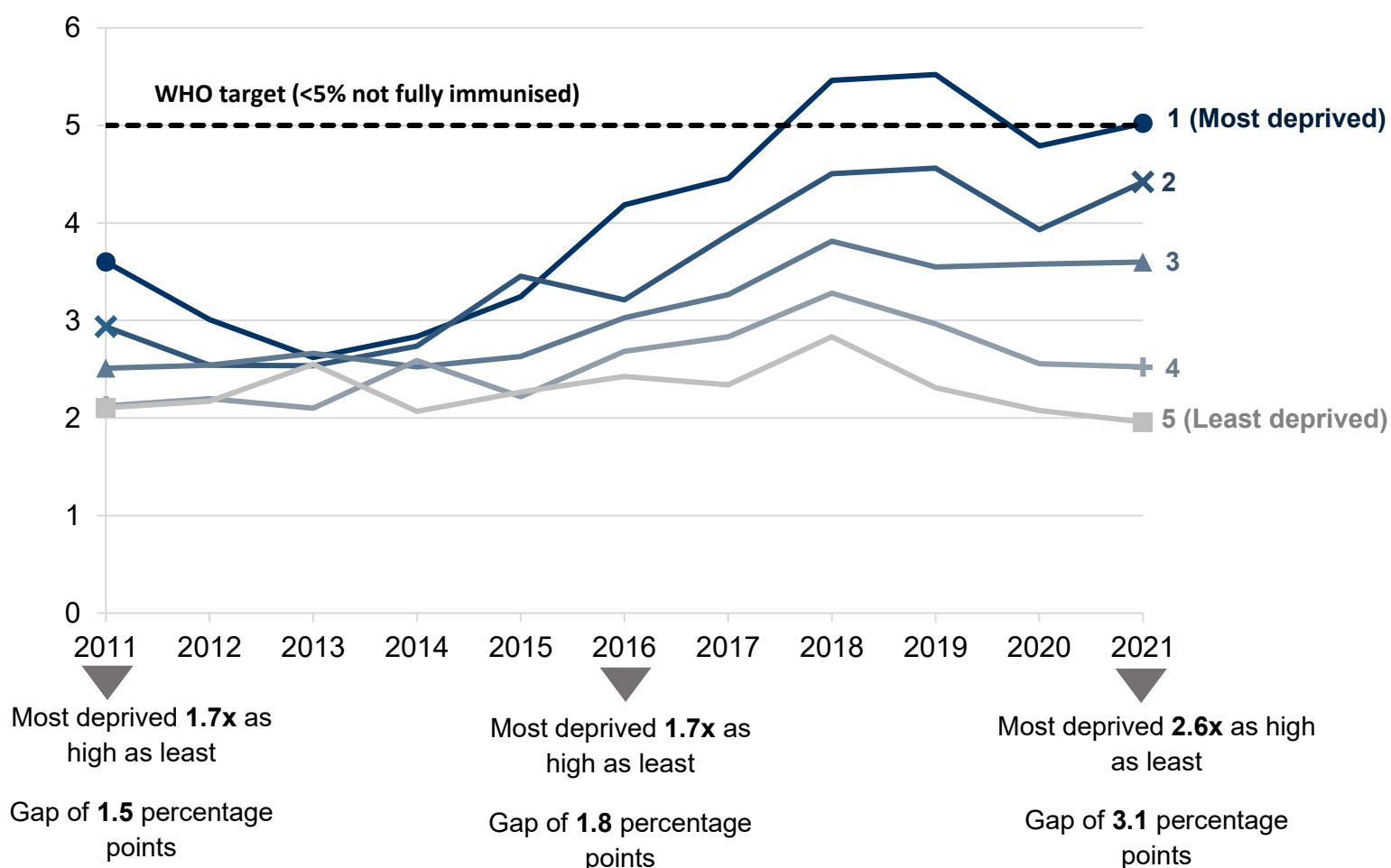
E.4.1. Primary immunisations

As shown in Figure E.4.1 below, the proportion of infants not fully immunised with the primary immunisations by age 12 months (due at 2, 3 and 4 months) has fluctuated, but importantly was below 5% across the entire period (therefore meeting WHO targets to achieve 95% coverage). However, the proportions of infants not fully immunised has been increasing in more deprived areas since 2013, albeit with some fluctuation during the pandemic. This has led to a widening of inequality between the most and least deprived areas: the absolute gap increased from 1.5 percentage points to 3.1 percentage points across the period, with the relative difference increased from 1.7 to 2.6.

So, while the picture in terms of overall uptake is more positive for primary immunisations than for the first vaccine of the MMR (5.6% were unimmunised in 2021), primary immunisation uptake is following similar trends.

Figure E.4.1: Inequalities in primary immunisations have widened since ~2013

Proportion of 12-month-olds not fully immunised with all three doses of the primary vaccines (due at 2, 3, 4 months) by area-level deprivation fifths: 2011-2021



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Population average	2.7	2.5	2.5	2.6	2.8	3.2	3.4	4.1	3.9	3.5	3.6
Relative difference	1.7	1.4	1.0	1.4	1.4	1.7	1.9	1.9	2.4	2.3	2.6
Absolute gap (%)	1.5	0.8	0.1	0.8	1.0	1.8	2.1	2.6	3.2	2.7	3.1

Source: Public Health Scotland. Childhood immunisation statistics Scotland reports.

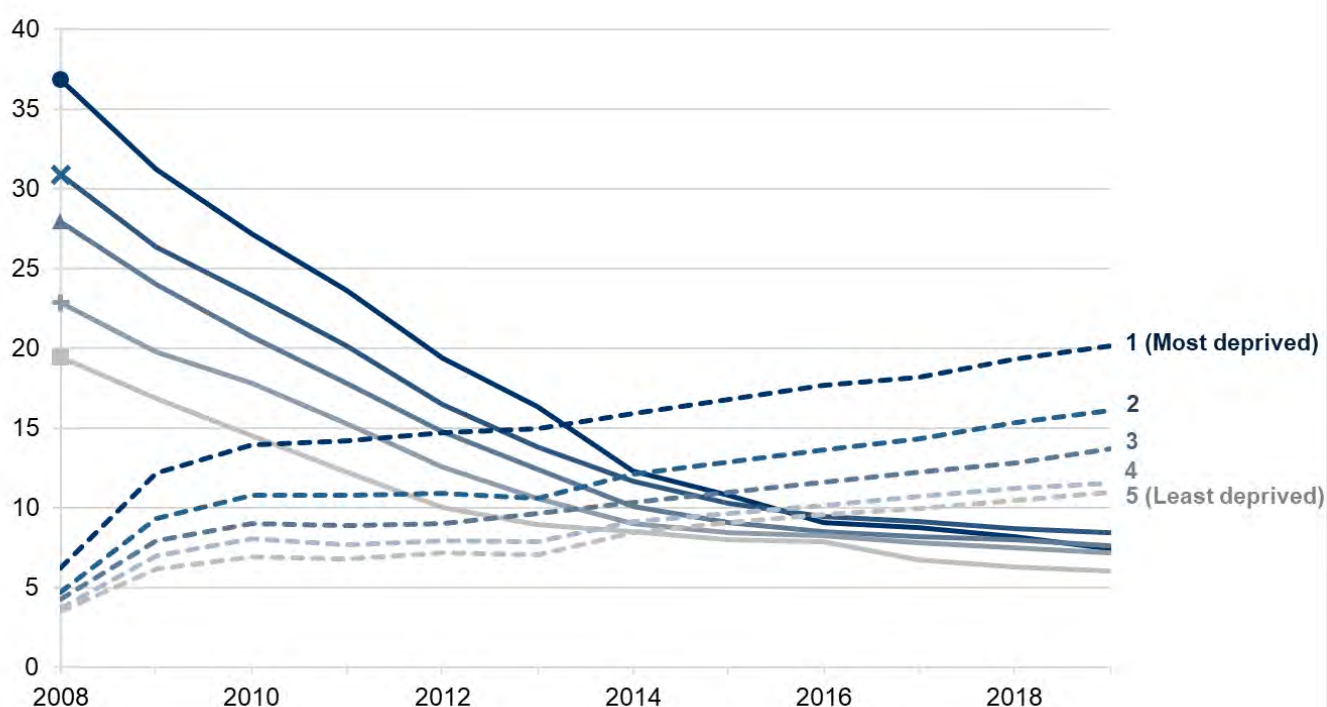
E.4.2. Proportions of children and adults registered and attending NHS dentists

As discussed in Chapter 4, the proportion of children not registered with an NHS dentist (shown in the solid lines in figures E.4.2 and E.4.3) decreased dramatically from 26% to 6% between 2008 and 2019 with a narrowing of inequalities by area-level deprivation. This decrease occurred after the introduction of ‘lifetime registration’.

However, this has been accompanied by increases in proportions not attending among those who are registered (shown in the dotted lines), from 7% to 16% and a widening of inequalities. This is likely an underestimation of inequalities, because those living in less deprived areas are more likely to use private dental care, which is not captured.

Figure E.4.2: while inequalities in the proportion of children not registered with a dentist have narrowed, but inequalities in those not attending have increased

Percentage of children not registered with (solid line) and not attending in the past 2 years (dotted line) an NHS dentist, according to fifths of deprivation, 2008-2019 (September)



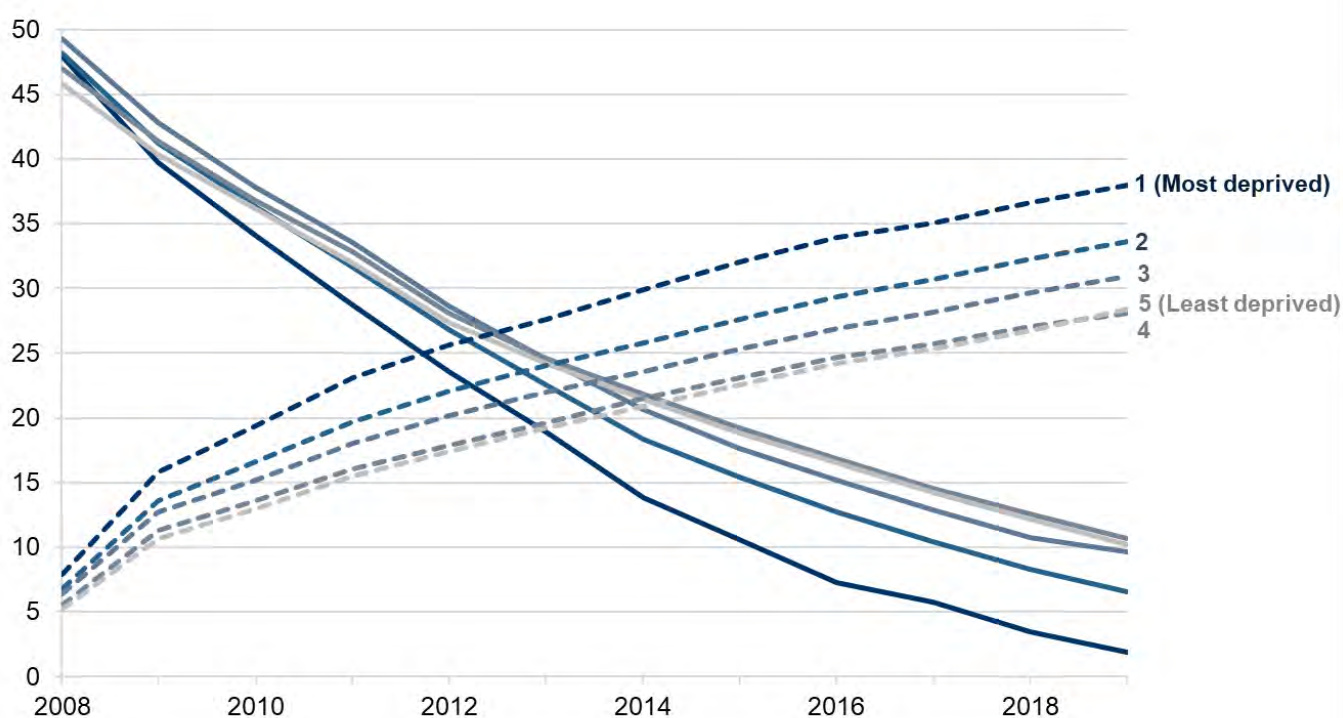
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Not registered	Population avg	25.5	21.2	18.6	15.5	12.3	10.1	8.1	7.2	6.7	6.4	6.2	6.0
	Relative difference	1.9	1.9	1.9	1.9	1.9	1.8	1.4	1.3	1.2	1.3	1.3	1.2
	Absolute gap (%)	17.4	14.4	12.7	11.4	9.4	7.4	3.8	2.8	1.3	2.0	1.9	1.4
Not attending	Population avg	6.6	10.7	11.9	11.4	11.7	12.3	13.0	13.6	14.2	14.6	15.2	15.8
	Relative difference	5.6	2.7	2.1	1.8	1.4	1.3	1.0	0.9	0.8	0.7	0.6	0.6
	Absolute gap (%)	16.0	10.7	7.6	5.5	2.9	1.9	0.0	-1.0	-1.8	-3.2	-4.2	-4.9

Source: Public Health Scotland. Dental statistics - NHS registration and participation. January 2022.

Similar patterns have been seen in adults (Figure E.4.3). The prevalence of adults not registered (solid lines) decreased from 46% to 5% and declines were greatest in the most deprived areas meaning that there is now a reverse social gradient in registration – those living in the least deprived areas are more likely to *not* be registered with an NHS dentist (although note this may be due to higher rates of private dentist use among the more advantaged). Proportions of those registered who had not attended within the past two years, though, increased from 7% to 34% and inequalities became larger.

Figure E.4.3: the proportion of adults registered with a dentist has increased and inequalities have fallen, but attendance has decreased, with a widening of inequalities

Percentage of adults registered with (solid line) and attending in the past 2 years (dotted line) an NHS dentist, according to fifths of deprivation, 2008-2019 (September)



		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Not registered	Population avg	45.9	39.0	34.2	29.5	24.5	20.4	16.6	13.6	10.9	8.8	6.7	5.0
	Relative difference	1.0	1.0	0.9	0.9	0.9	0.8	0.6	0.6	0.4	0.4	0.3	0.2
	Absolute gap (%)	2.1	-0.6	-2.1	-3.2	-3.8	-5.4	-7.6	-8.2	-9.2	-8.5	-8.6	-8.3
Not attending	Population avg	7.1	14.2	17.1	20.1	22.6	24.6	26.4	28.2	29.9	31.1	32.5	33.8
	Relative difference	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3
	Absolute gap (%)	2.7	5.2	6.4	7.6	8.2	8.4	9.0	9.5	9.7	9.7	9.9	9.5

Source: Public Health Scotland. Dental statistics - NHS registration and participation. January 2022.

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