

THE STATE OF MUSCULOSKELETAL HEALTH 2021

Arthritis and other musculoskeletal
conditions in numbers

VERSUS
ARTHRITIS



INDEX

Contents	2
01 Introduction	3
What is the State of Musculoskeletal Health?	3
Who is it for?	3
02 Methods	4
03 What are musculoskeletal conditions?	5
04 How common are they?	6
Long-term MSK conditions	7
Children and long-term MSK conditions	7
Condition-specific estimates	8
05 Variations by deprivation and ethnicity	9
Deprivation	9
Ethnicity	9
06 Chronic pain	10
07 Key factors affecting MSK health	12
Physical inactivity	12
Obesity	14
Multiple long-term conditions	15
08 Impact	16
Quality of life	16
Impact on daily activities	16
Work	17
Health and Care Services	18
Economy	19
09 MSK calculator estimates	20
10 Glossary	21
11 References	22



01 INTRODUCTION

Over 20 million people in the UK (around a third of the population) live with a musculoskeletal (MSK) condition, such as arthritis and low back pain.¹ Overall, 21% of years lived with illness and disability (YLD) in the UK population are associated with MSK conditions.¹ Low back and neck pain and osteoarthritis are the most common causes of pain and disability.

Pain is one of the leading symptoms of MSK conditions, however people living with conditions like arthritis also commonly experience high levels of fatigue, stiffness and loss of mobility and dexterity. Together these symptoms can steal life's fundamentals, affecting how we move, think, sleep and feel, and even our ability to work and spend time with loved ones.

As people age, the risk of developing certain MSK condition rises. Excess weight and physical inactivity can increase the risk of developing certain MSK conditions and can also exacerbate an existing condition.

What is the State of Musculoskeletal Health?

Measuring the prevalence of MSK conditions is challenging for many reasons, including the often hidden nature of MSK conditions and variation in diagnostic procedures, recording and reporting.

The State of Musculoskeletal Health is a compendium of statistics that aims to provide the best picture available of the current prevalence UK-wide, the number of people at risk of developing these conditions and the subsequent impact of MSK conditions on people's lives, the wider health system and society.

Who is it for?

It is a resource for healthcare professionals, policy makers, public health leads and anyone interested in MSK health. We believe that with the best information you can build awareness, make more informed decisions, feel more confident and ultimately help more people with MSK conditions.

[Read more about the lived experiences of people with arthritis.](#)

About Versus Arthritis

There are over 20 million people living with a musculoskeletal (MSK) condition like arthritis in the UK. That's one in three people, with half of those living in pain every single day. The impact is huge as these conditions slowly intrude on everyday life – affecting the ability to work, care for a family, to move free from pain and live independently. Yet arthritis is often dismissed as an inevitable part of ageing or shrugged off as 'just a bit of arthritis'. We don't think this is OK. Versus Arthritis is here to change that.

Find out how you can join us in the push to defy arthritis at www.versusarthritis.org

02 METHODS

Data, information and insight on musculoskeletal conditions are available from a range of different sources. At Versus Arthritis, we judge all evidence based on individual merit and ‘good evidence’ is evidence that accurately represents the needs, experiences, and perspectives of people with arthritis. Depending on the story you are trying to tell, and your audience, it is important to use the right kind of evidence. Different types of evidence can help answer different types of questions. The key is to select evidence based on the question and what is most relevant and useful for answering it.

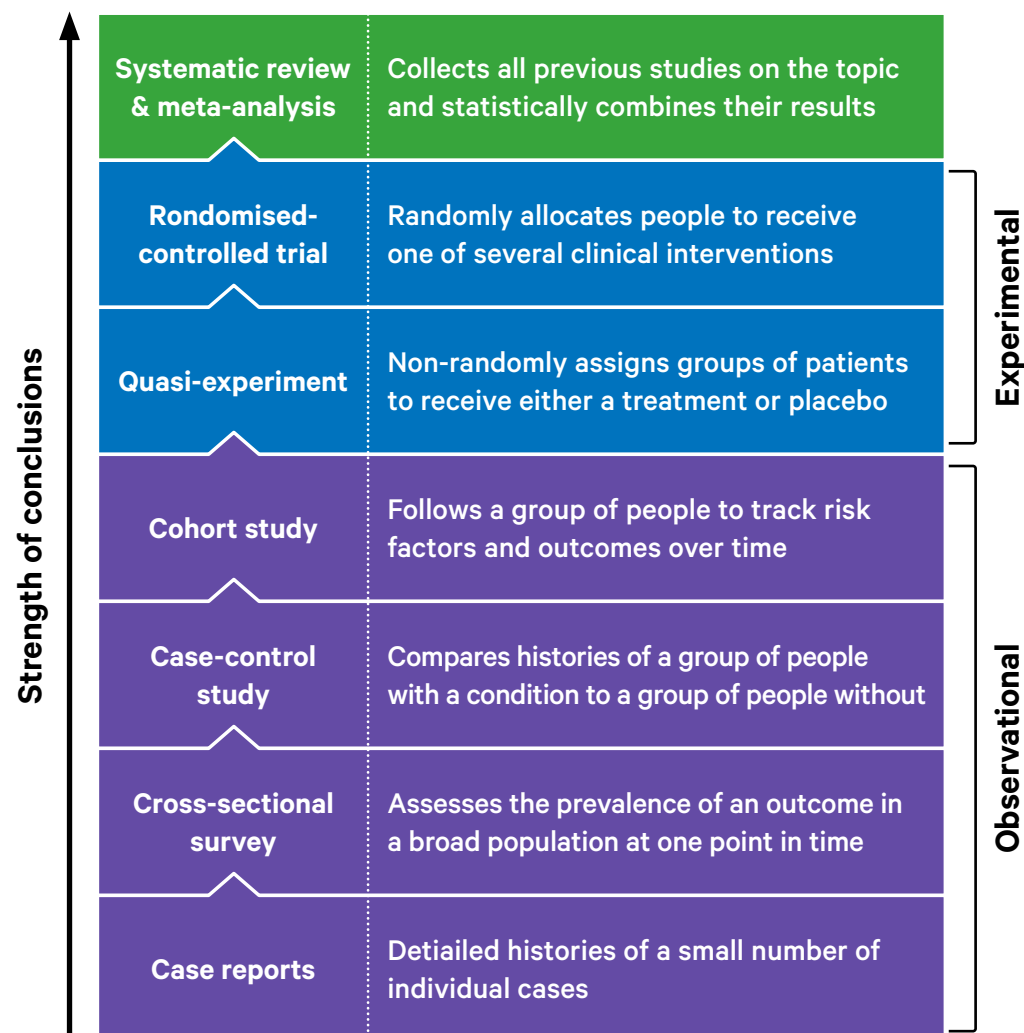
Figure 1 depicts a hierarchy of evidence.² It is important to note that while such frameworks have their merits in specific contexts, they are not without their limitations. Ranking evidence in this way may indirectly favour certain evidence sources over others, regardless of ability to inform a particular research investigation.

The evidence in this report mainly comes from quantitative studies (including systematic reviews, cross-sectional surveys, cohort/case-control studies and experimental studies) and real world evidence (data from national datasets and audits).

However, we also include evidence that has been generated from the variety of methodological approaches at our disposal, some of which may not rank highly in such hierarchies eg case study or focus group data or online survey data. This kind of evidence, drawing on lived experience of MSK conditions, adds increased depth and context to some of the statistics we present in this report.

If there is something you would like to know which isn’t covered in this report, ask us by emailing data@versusarthritis.org and we’ll see if we can help.

Figure 1. Hierarchy of Evidence²



03 WHAT ARE MUSCULOSKELETAL CONDITIONS?

Musculoskeletal (MSK) conditions affect the joints, bones, muscles and spine, and include rare autoimmune conditions such as lupus. Common symptoms may include pain, joint stiffness and a loss of mobility and dexterity. These symptoms can fluctuate over time. Millions of people develop these conditions over a lifetime, ranging from minor injuries to short or long-term conditions. Some MSK conditions are present at birth and are lifelong, while others can occur suddenly at any age and progress rapidly. Other MSK conditions progress gradually and become more common and worsen as we age.

Broadly speaking there are three groups of MSK conditions:



Age



Progression



Prevalence



Impact



Main treatment



Treatment location



Risk factors

	Age	Progression	Prevalence	Impact	Main treatment	Treatment location	Risk factors
INFLAMMATORY CONDITIONS (eg, rheumatoid arthritis)	Affects any age.	Often rapid onset.	Common. (eg, over 430,000 adults in the UK have rheumatoid arthritis).	Can affect and part of the body including skin, eyes, and internal organs.	Treated by suppressing the immune system.	Urgent specialist treatment needed usually provided in hospital outpatient departments.	Genetic factors, sex, smoking, obesity and diet.
CONDITIONS OF MSK PAIN (eg, osteoarthritis, back pain)	More common with rising age.	Gradual onset.	Very common. (eg over 8.5M people have osteoarthritis in the UK).	Affects the joints, spine and pain system.	Typically, non-drug-based treatments eg physical activity, weight management and in severe cases joint replacement.	Treatment based in primary care.	Age (late 40s onwards), sex, genetic factors, physical injury, obesity and previous joint illness or injury.
OSTEOPOROSIS AND FRAGILITY FRACTURES (eg, fracture after fall from standing height)	Affects mainly older people.	Osteoporosis is a gradual weakening of bone. Fragility fractures are sudden discrete events.	Common. (eg, 500,000 fragility fractures occur in the UK each year).	Hip, wrist and spinal bones are most common sites of fractures.	Medication to strengthen bones, falls prevention fracture treatment.	Prevention is based in primary and ambulatory care; fractures may require surgery.	Age, genetic factors, smoking, alcohol, inflammatory disorders, poor nutrition and low physical activity.

04 HOW COMMON ARE THEY?



MSK conditions affect people of all ages but become more common with increasing age.



MSK conditions are more common among women.



The estimated number of people with a MSK condition in...



England is 17.1M people (32%).¹



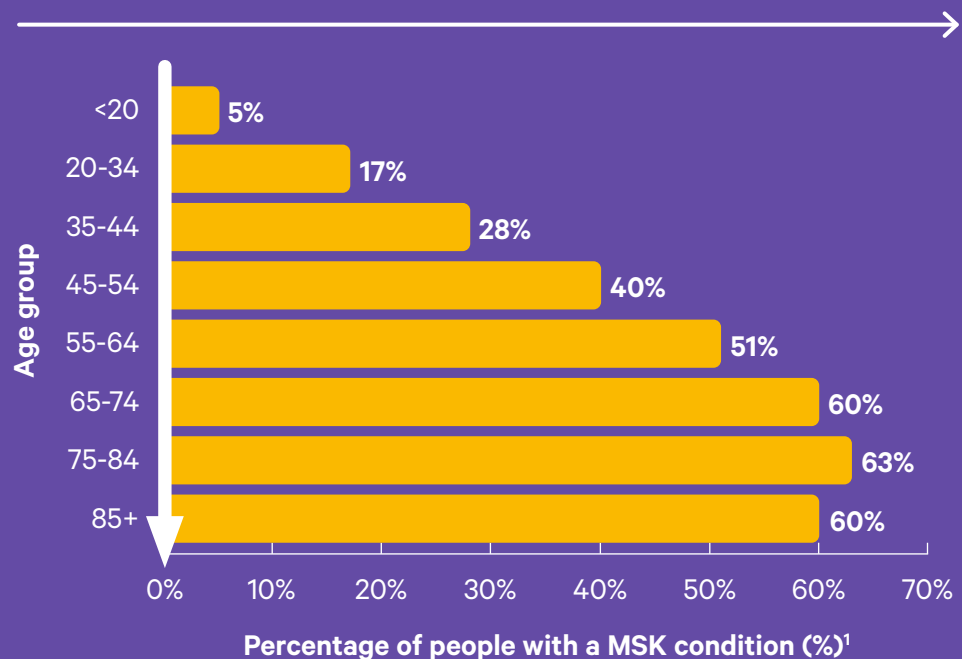
Scotland is 1.7M people (33%).¹



Wales is 974,000 people (32%).¹



Northern Ireland is 525,000 people (29%).¹

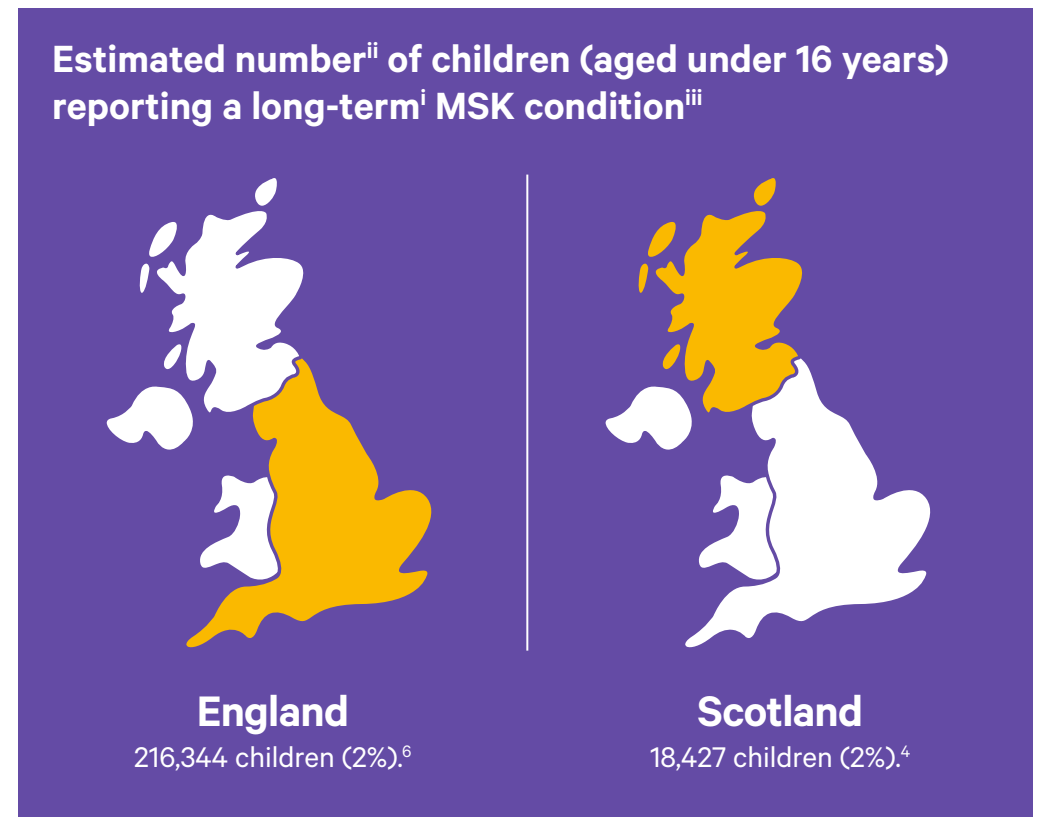


Long-term MSK conditions

National health survey data indicates that almost two in every ten people aged 16 and over in the UK report having a long-termⁱ MSK condition (one that has lasted or is expected to last a year or more).^{3,4,5}

Children and long-term MSK conditions

Two in 100 children (2%) aged under 16 years report having a long-termⁱ MSK condition in England and Scotland.^{4,6}



ⁱ Defined as a condition or illness that has lasted or is expected to last a year or more.

ⁱⁱ Calculated based on mid-2019 population estimates.

ⁱⁱⁱ Caution should be taken when making comparisons by nation. Survey methodology and data weighting/age-standardisation techniques will vary.

^{iv} Equivalent data is not available in the Health Survey Northern Ireland. This estimate is based on the weighted nation average of 18%.

Condition specific estimates - United Kingdom



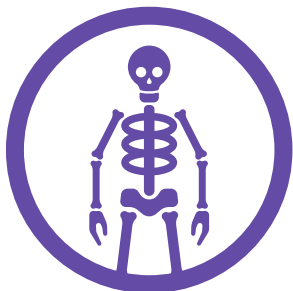
Inflammatory conditions

Over 430,000 people have rheumatoid arthritis.^{7,8}

Around 12,000 children have juvenile idiopathic arthritis.⁹

220,000 people have axial spondyloarthritis.¹⁰

Around 100,000 people have psoriatic arthritis.¹¹



Conditions of MSK pain

Around 8.5 million people have osteoarthritis.^{1,12}

10 million people have back pain.¹³

1.7 to 2.8 million[†] people have fibromyalgia.¹⁴



Osteoporosis and fragility fractures

3 million people have osteoporosis.¹⁵

500,000 fragility fractures occur each year.¹⁶

VIEW MSK CALCULATOR ESTIMATES

Prevalence estimates for osteoarthritis (hip/knee), rheumatoid arthritis and back pain for England, Scotland and Wales.

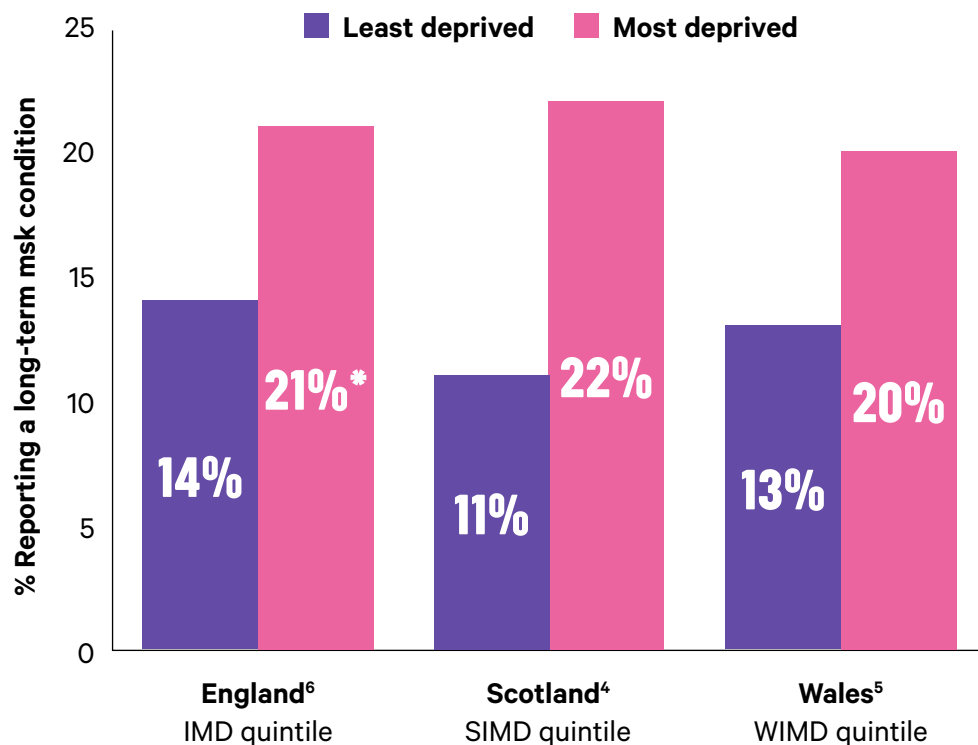
[†] prevalence estimation varies due to variation in classification/diagnostic criteria

05 VARIATIONS BY DEPRIVATION AND ETHNICITY

Deprivation

MSK conditions are more common in areas of greater poverty.

People who live in the most deprived fifth of society are more likely to report a long-term^{vi} MSK condition compared to those living in the least deprived fifth.^{vii}

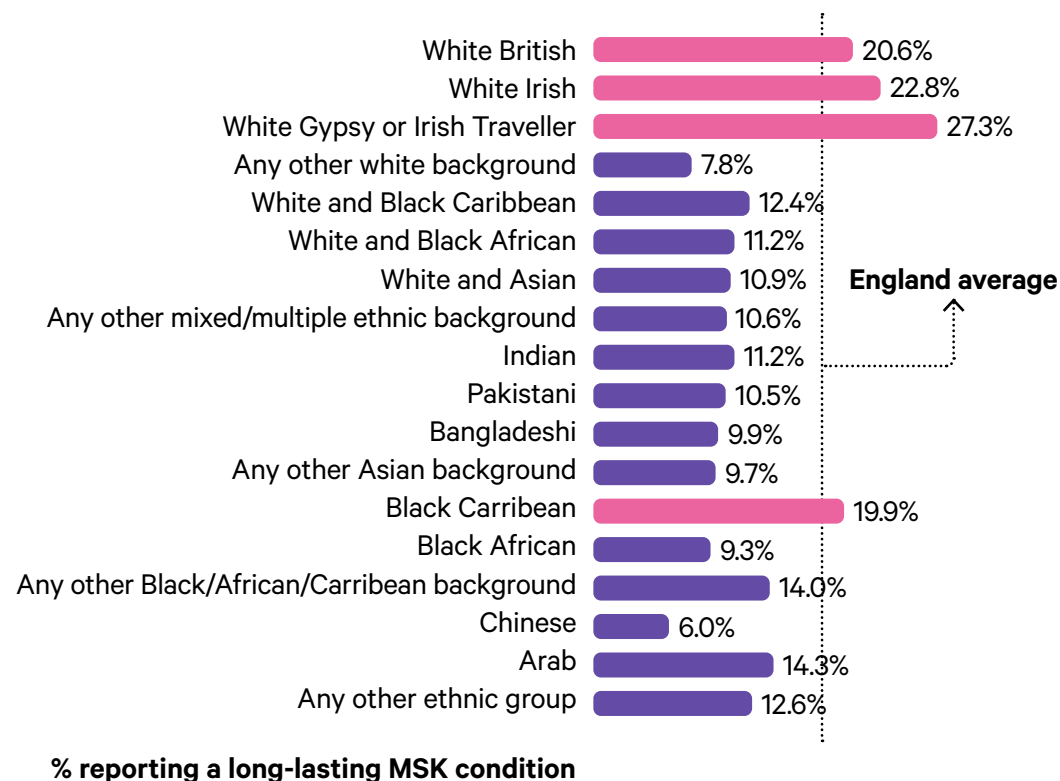


^{vi} Defined as a condition or illness that has lasted or is expected to last a year or more.

Ethnicity

MSK conditions may affect some ethnic groups more than others.

In England, people from the following ethnic groups - Gypsy or Irish Traveller (27.3%), White Irish (22.8%), White British (20.6%) or Black Caribbean (19.9%) - remained most likely to report a long-term^{vi} MSK condition.³



^{vii} Caution should be taken when making comparisons by nation. Methods used to calculate the index of deprivation will vary.

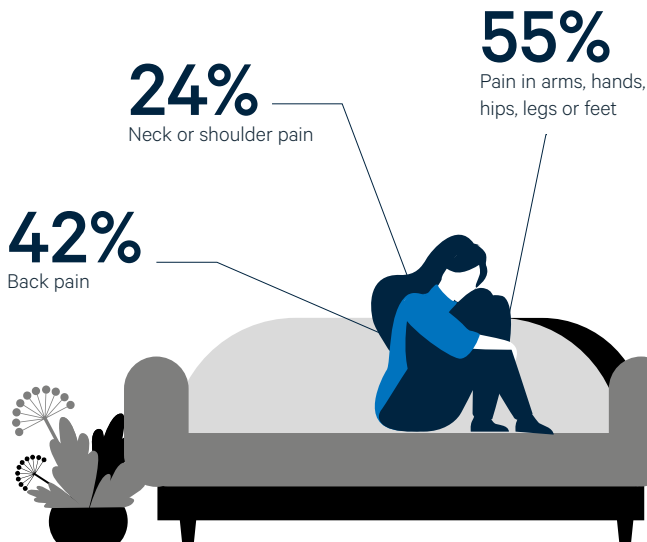
06 CHRONIC PAIN

Pain is one of the leading symptoms of MSK conditions.

Chronic pain – defined as pain which has lasted for more than three months - affects between **18.4 million**¹⁷ (34%) and **28 million people**¹⁸ (43%) in the UK.

Chronic pain in England

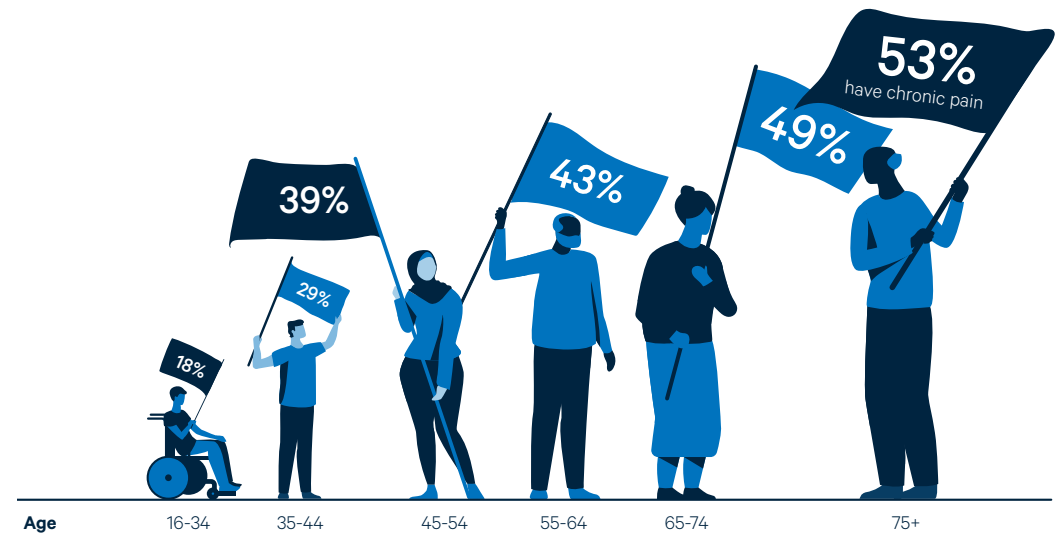
About **eight in every ten people (84%)** with chronic pain in England report that at least some of their chronic pain is in the neck or shoulder, back, limbs or extremities – all sites where pain is most likely to be musculoskeletal.¹⁷



More women are affected by chronic pain than men.

38% of women have chronic pain in England compared to **30%** of men.¹⁷
14% of women have high-impact chronic pain compared to **9%** of men.¹⁷

Chronic pain increases with increasing age, but people of all ages can have it.



Among young adults aged 16-34 with chronic pain in England, the proportion reporting high-impact chronic pain rose from 21% to 32% between 2011 and 2017.¹⁷

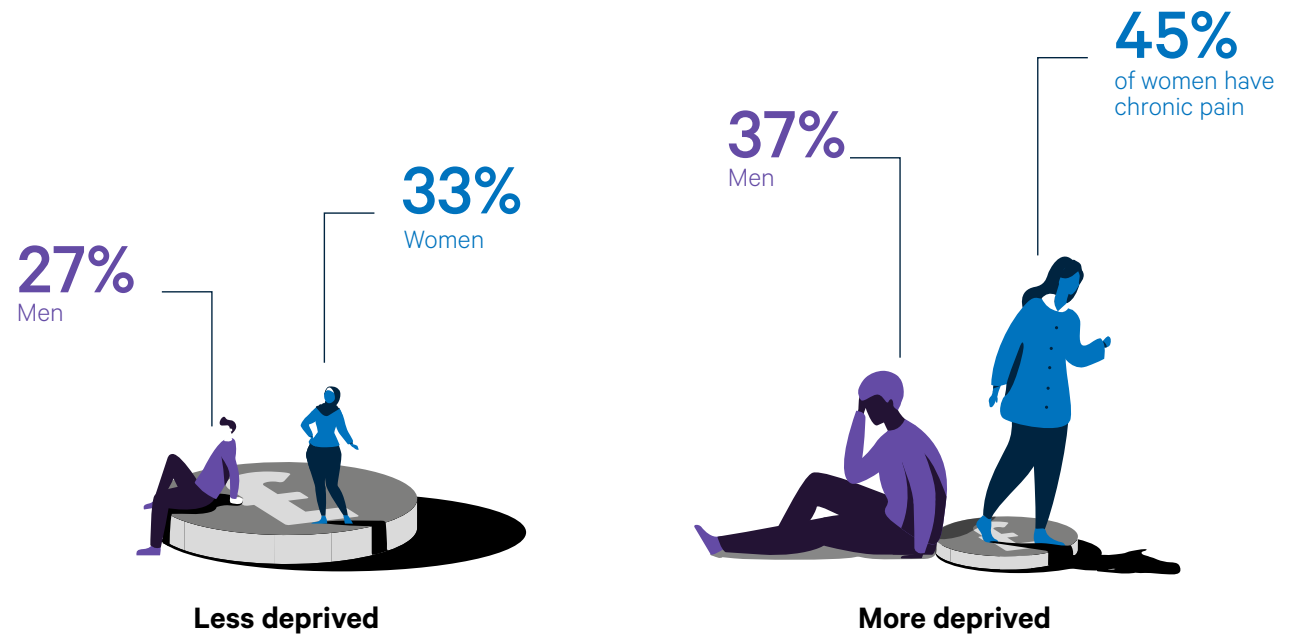
The same health inequalities that are seen in many long-term conditions are also seen in chronic pain.

Chronic pain is linked to deprivation.

Four in ten people (41%) who live in the most deprived fifth of society in England report chronic pain compared to 3 in 10 (30%) in the least deprived quintile.¹⁷

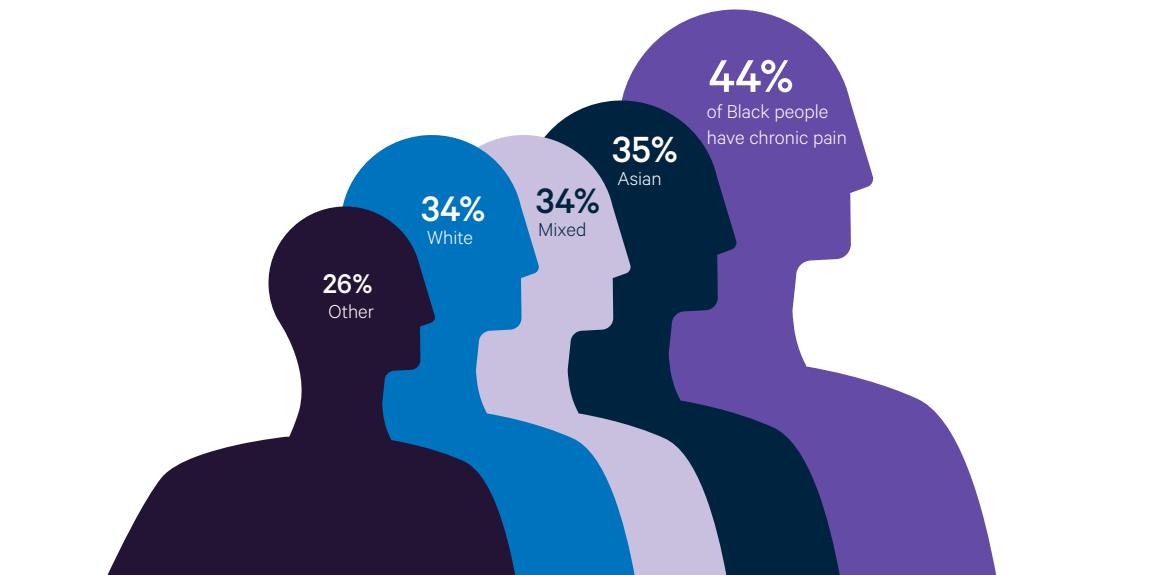
Read the full report

[Chronic pain in England: Unseen, Unequal, Unfair](#)



Chronic pain disproportionately affects some minority ethnic groups.

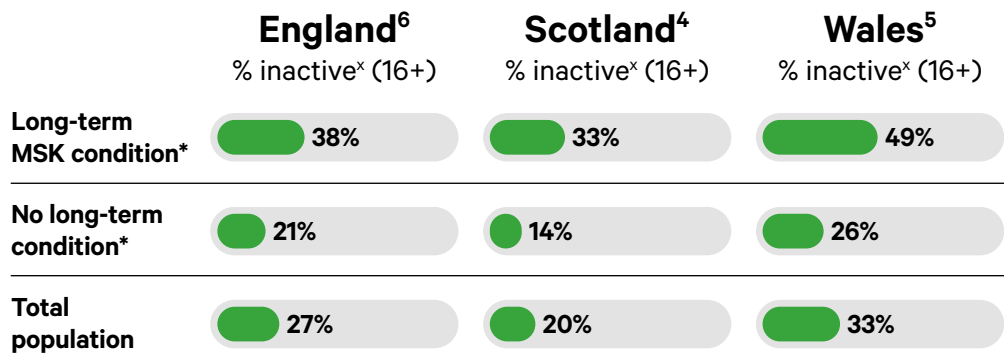
In England, 44% of Black people have chronic pain, compared with 34% of white people, 35% of Asian people, 34% of people of mixed ethnicity and 26% of people from other ethnicities.¹⁷



07 KEY FACTORS AFFECTING MSK HEALTH

Physical inactivity

Inactive people are at increased risk of developing certain painful MSK conditions.



^{viii} The UK Chief Medical Officers' Guidelines recommend that each week adults (19-64 years) do: at least 150 minutes moderate intensity activity, 75 minutes' vigorous activity, or a mixture of both; strengthening activities on two days; reducing extended period of sitting.

^{ix} Defined as a condition or illness that has lasted or is expected to last a year or more.

*Caution should be taken when making comparisons by nation. Survey methodology and data weighting/age-standardisation techniques will vary.

*age-standardised

Six in ten people (60%) we surveyed with MSK conditions reported using physical activity as a method of self-management.²⁵

45% of people who are physically inactive in England have chronic pain.¹⁷

Staying physically active helps to keep us healthy and is particularly important for MSK and mental health.

Regular physical activity reduces your risk of



Hip and knee osteoarthritis pain by **6%**¹⁹



Joint and back pain by **25%**²⁰



Depression by up to **30%**²¹



Hip fractures by up to **68%**²²



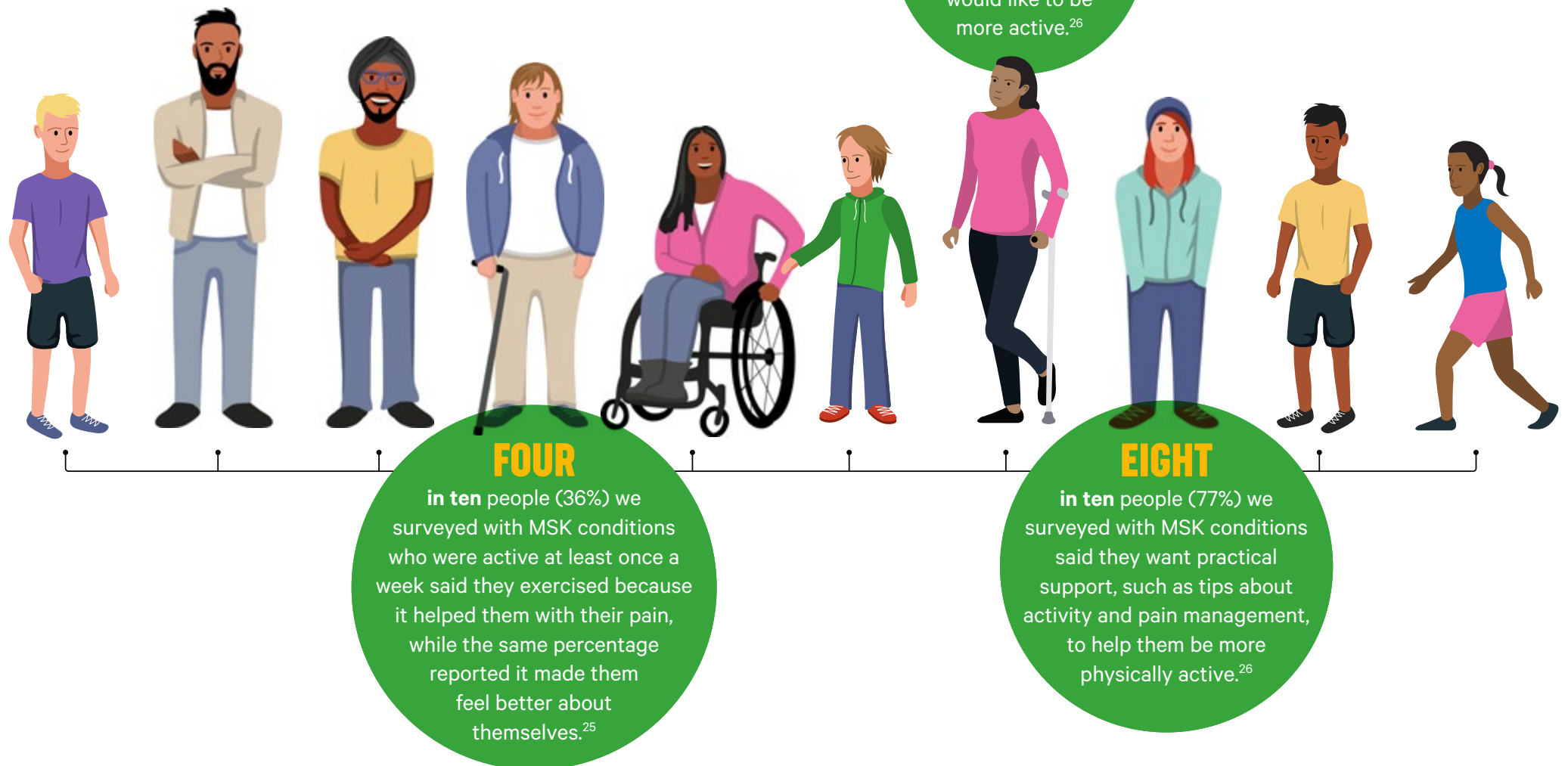
Falls by **76%**²³



It also helps to reduce stiffness and improve mobility and dexterity.²⁴

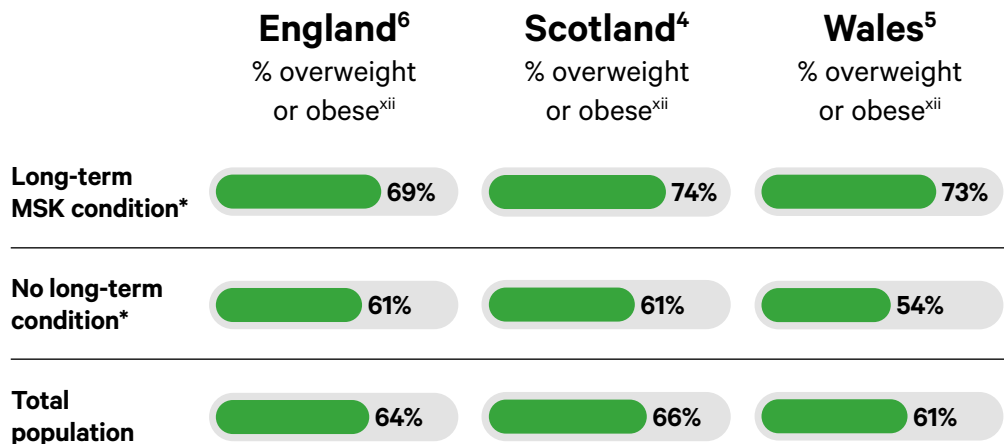
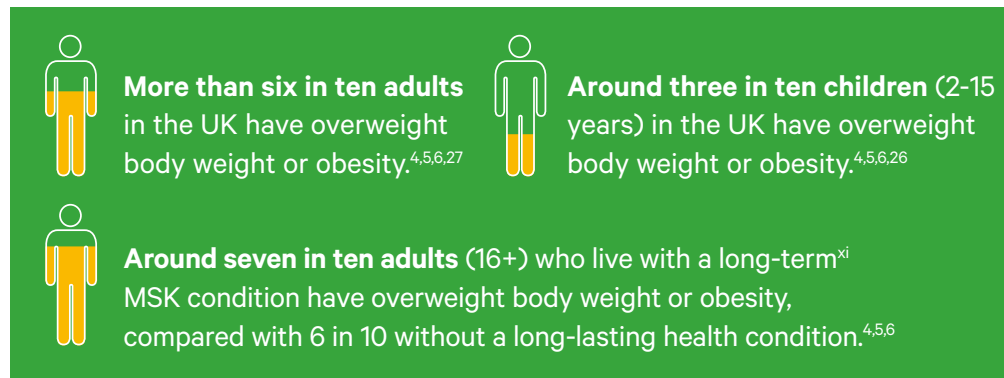
Those struggling with their MSK conditions are less likely to be active but have the most to gain from the right support.

Over half of people (56%) we surveyed with MSK conditions said that pain had a significant negative impact on their ability to do high impact physical activity (eg running, tennis, team sports). With fatigue (55%) and dexterity issues (54%) also reported as barriers.²⁵



Obesity

Obesity increases an individual's risk of developing MSK conditions, such as osteoarthritis and back pain. While the development of MSK problems can make it difficult to maintain a healthy weight.



^{xi} Defined as a condition or illness that has lasted or is expected to last a year or more.

*age-standardised

^{xiii} Caution should be taken when making comparisons by nation, BMI collection methods vary (self-reported versus objective measurements).

Adolescents who have obesity are more likely to experience persistent or recurrent joint pain, including knee pain.²⁹

Over half of adults (54%) who have high levels of obesity in England report chronic pain.¹⁷

Average BMI of hip and knee replacement patients:³⁰



Hip (28.8) overweight



Knee (31.0) obese

Compared to people who are of a healthy or normal body weight, people who are obese are:



Two times more likely to develop knee osteoarthritis³¹, with many estimates putting the risk between four and six times greater.^{32,33,34}



1.5 to 2.5 times more likely to have back pain, rising to four times more likely among those who are highly obese.^{35,36}



Two times more likely to develop gout and tend to develop it at a younger age.³⁷



At a significantly **increased risk** of developing rheumatoid arthritis.³⁸


Multiple long-term conditions


The number of people living with two or more long-term conditions (multimorbidity) is growing increasingly common.



ONE IN FOUR
people are living with
two or more long-term^{xiii}
conditions in the UK^{39,40}

The prevalence of multimorbidity increases with increasing age

 **One in three adults** (34%)
aged 46-48 years in
Britain have multimorbidity
in mid-life.⁴¹

 **Six in ten people** aged 65-84
years have multimorbidity
rising to 8 in 10 people aged
85 years or over.^{39, 40}

By 2035, the number of people aged over 65 years in England living with multimorbidity is expected to increase from 54% in 2015 to 68%.⁴⁰

Multimorbidity is significantly associated with higher social deprivation.

People living in the most deprived areas are significantly more likely to report two or more conditions³⁹ and can expect to develop them 10-15 years earlier than those in the least deprived.⁴⁰

Adults from a more disadvantaged social class^{xiv} are up to 43% greater risk of having multimorbidity in midlife (46-48 years) compared to those from a less disadvantaged social class.⁴¹

FOUR IN TEN
people with multimorbidity
are living with a physical and
a mental health condition.^{39,40}



ONE IN FIVE ADULTS

(21%) aged 46-48 in Britain with
multimorbidity have recurrent back issues and
one in every 13 (8%) have arthritis at midlife.⁴¹

ONE IN EIGHT PEOPLE

(13.2%) in England report living with at least two
long-term conditions, one of which is MSK related.⁴²



MSK conditions are very common in people with multiple long-term conditions.

Among people aged over 45 in England who report living with a major long-term condition, more than 3 in 10 also have an MSK condition, increasing to almost five in ten people among those aged 65 plus.⁴³

People with osteoarthritis are 1.2 times more likely to have any additional long-term condition than people without osteoarthritis and 2.5 times more likely to have three or more additional conditions.⁴⁴


^{xiii} Based on a list of conditions deemed likely to be chronic (defined as having significant impact over at least the most recent year) and with significant impact on patients in terms of need for chronic treatment, reduced function, reduced quality of life, and risk of future morbidity and mortality.

^{xiv} Measured as father's social class at birth (professional, managerial and technical, skilled non-manual/manual, partly skilled, unskilled).

08 IMPACT

Quality of life

The pain and fatigue caused by arthritis and related MSK conditions result in a substantial reduction in quality of life.



21%
of years lived with disability (YLDs) in the UK are accounted for by **MSK conditions**.¹

Low back pain remains the leading cause of years lived with disability (YLDs).¹

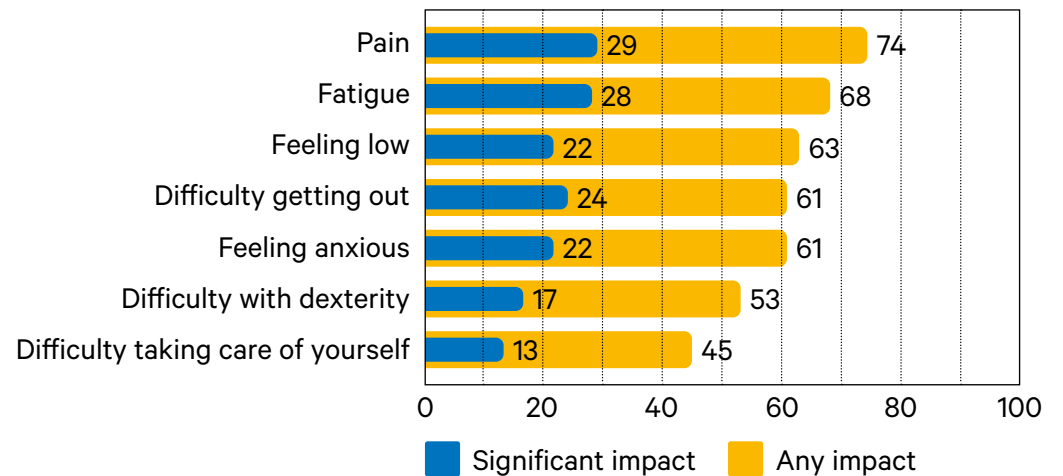

Top 10 UK causes of YLDs	
1	Low back pain
2	Diabetes
3	Depressive disorders
4	Headache disorders
5	Falls
6	Neck pain
7	Age-related hearing loss
8	Osteoarthritis
9	Other musculoskeletal conditions
10	Gynaecological

22% of people we surveyed with MSK conditions describe their general health as bad or very bad²⁴ compared with around 7% of people in UK overall.^{4,5,6,26}

Impact on daily activities

68% of people we surveyed with MSK conditions say the fatigue they experience impacts their daily activities (28% reporting a significant impact).²⁵

Factors impacting the lives of people with MSK conditions

Half of people (51%) we surveyed with MSK conditions feel like they cannot do anything themselves to lessen the impact of their condition on their lives.²⁵


Depression is four times more common among people in persistent pain compared to those without pain.⁴⁵

Work

THREE IN TEN working-age people in the UK have a long-term^{xv} health condition.^{46,47}

By 2040 **four in ten** working-age people in the UK will have a long-term condition.⁴⁸

ONE IN TEN working-age people in the UK have a long-term MSK condition.^{3,4,5}




People with MSK conditions are less likely to be in work than people with no long-term health condition and are more likely to retire early.⁴⁹

	MSK condition	No long-term condition
% in employment	62%	81%
% economically inactive	34%	15%

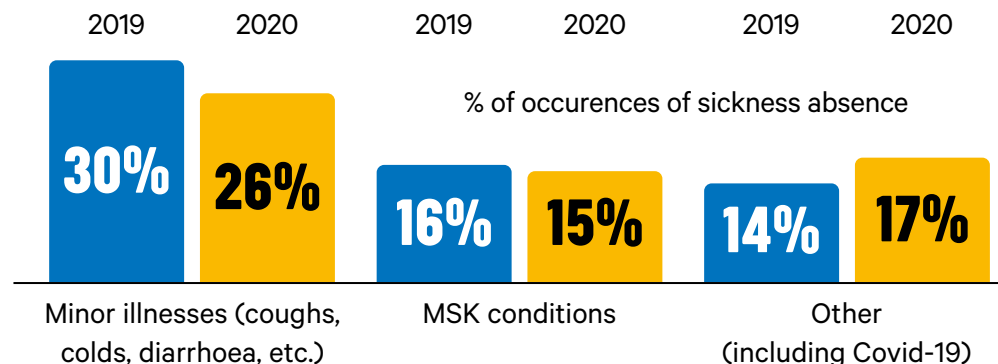
Oct-Dec 2020, UK

Over half of people (53%) we surveyed with MSK conditions say their symptoms have a negative impact on work, while almost half (46%) reported it interfered with their ability to concentrate.²⁵



^{xv} Defined as a condition that has lasted or is expected to last a year or more.

Top 3 reasons for working days lost⁵⁰



28.4M working days lost due to MSK conditions in 2019.⁵⁰

MSK conditions were the second most common reason for working days lost for the last decade. However, in 2020, other problems (incl. coronavirus (COVID-19) related illnesses) became more common.⁵⁰

Many people with MSK conditions want to work, but they need the right support to find and stay in employment.

One in three employees with long-term conditions have not discussed it with their employer.⁵¹

One in six people (6,820) receiving support from the UK's Access to Work scheme in 2019-20 had a MSK problem, but many more could benefit.⁵²

One in eight Employment and Support Allowance (ESA) claimants (13%) in Great Britain in 2020-21 have a MSK problem as their primary condition, second to mental health and behavioural problems (50%).⁵³

MSK conditions remain the second most common diagnosis on fit notes written by GPs in England, after mental health conditions, in 2019-20.

One in six fit notes (16%) issued to patients by GPs in England were for MSK conditions.⁵⁴

44% of fit note episodes for MSK conditions last five or more weeks.⁵⁴

Health and Care Services

People with MSK conditions are frequent users of primary, secondary and community-based health and social services.

MSK conditions account for up to
ONE IN THREE
GP CONSULTATIONS.^{55,56}



Four in ten people we surveyed see their GP as the main person they are supported by.²⁵



MSK conditions remained one of the most commonly recorded diagnoses for hospital admissions in England in 2019-20. Accounting for **1.26 million** finished admission episodes (7.3% of total).⁵⁷



118,316 hip replacements* and **123,691 knee replacements*** were carried out in the UK in 2019.^{58,59}



Half the expected number of joint replacements were carried out in 2020 due to the COVID-19 pandemic leaving hundreds of thousands of people with arthritis waiting for these life-changing surgeries.⁶⁰



Over 90% of hip and knee replacements are due to osteoarthritis.^{58,59}

Around 75,000 Hip fractures occur annually in the UK.^{61,62}

*primary and revision

People with MSK conditions often take a wide range of medications.

Approximately 29.4 million prescriptions (-8% since 2017) were dispensed for MSK conditions and joint diseases in England in 2020, costing approximately £171.2M (-12% since 2017).⁶³

Almost **five in ten** people (47%) with long-term MSK conditions in England take five or more medications on a regular basis.⁶⁴

Over **eight in ten** people (86%) we surveyed with MSK conditions think having access to methods other than medication to manage their condition would have a positive impact on their quality of life.²⁵

People's experiences of treatment and care and access to services vary greatly.



Five in ten people (53%) we surveyed with MSK conditions are satisfied with the level of support they receive from the health and social care professional they interact with.²⁵



Three in ten people (30%) we surveyed with MSK conditions are not satisfied with the pain relief they achieve with their current treatment plan/medication.²⁵



Four in ten people (42%) we surveyed with MSK conditions said the top thing that would have a positive impact on their life would be if healthcare professionals treated all their conditions and symptoms together, rather than as separate things.²⁵

Economy

Musculoskeletal ill-health results in significant costs for individuals, employers, the health service and the wider economy.

MSK CONDITIONS

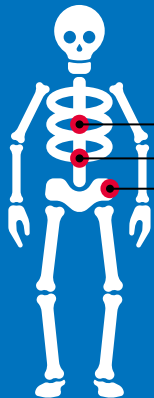


accounted for the third largest area of NHS programme spending at **£5 billion** in 2013-14.⁶⁵

Combined costs from worklessness and sickness absence in the UK amount to around **£100 billion** annually.⁶⁶



The cost of working days lost due to osteoarthritis and rheumatoid arthritis was estimated at **£2.58 billion** in 2017 rising to **£3.43 billion** by 2030.⁶⁸

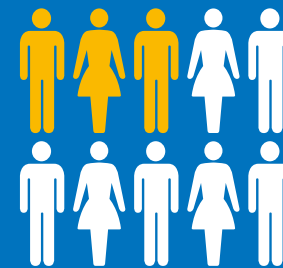
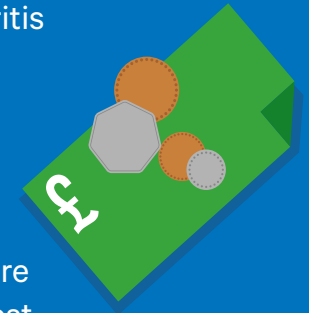


- Conditions such as back pain account for around 40% of all sickness absence in the NHS and costs around **£400 million per year**.⁶⁷
- Back pain cost the UK economy an estimated **£1.6 billion** direct and **£10 billion** indirect costs** in 2000.⁶⁹
- The hospital costs of hip fracture alone are estimated at **£1.1 billion** per year in the UK.⁷⁰

Treating the two most common forms of arthritis (osteoarthritis and rheumatoid arthritis) is estimated to have cost the economy

£10.2 BILLION

in direct costs* to the NHS and wider healthcare system in 2017. Cumulatively the healthcare cost will reach **£118.6 billion** over the next decade.⁶⁸



Nearly **three out of ten** (27%) people with arthritis are not aware of the welfare benefits they are entitled to.⁴⁹

The total work-related costs of axial spondyloarthritis due to early retirement, absenteeism and presenteeism is estimated to be at **£11,943 per person** with axial spondyloarthritis per year.⁷¹

Half (51%) of gross local authority expenditure on adult social care is on people over 65 years, of which a substantial number will have a musculoskeletal condition.⁷²



*This includes direct costs (NHS healthcare and other medical costs (ie prescriptions, home care).

**This includes direct costs (NHS healthcare and other medical costs (ie prescriptions, home care).

09 MSK CALCULATOR ESTIMATES

	England (2012)	Scotland (2016)	Wales (2017)
Rheumatoid arthritis	0.84% of people aged 16 and over in England live with rheumatoid arthritis. That's 382,000* people in 2019.	0.78% of people aged 18 and over in Scotland live with rheumatoid arthritis. That's 37,000 people.	0.94% of people aged 16 and over in Wales live with rheumatoid arthritis. That's 27,000 people.
Back pain	16.9% of people in England have back pain. That's 9.5 million* people, 5.7 million* of whom have severe back pain in 2019.	19.1% of people in Scotland have back pain. That's 910,000 people, 564,000 of whom have severe back pain.	18.3% of people in Wales have back pain. That's 523,000 people, 299,000 of whom have severe back pain.
Osteoarthritis of the knee	18.2% of people aged 45 and over in England have osteoarthritis of the knee. That's 4.5 million* people, 1.5 million* of whom have severe knee osteoarthritis in 2019.	16.6% of people aged 45 and over in Scotland have osteoarthritis of the knee. That's 420,000 people, 104,000 of whom have severe knee osteoarthritis.	17.2% of people aged 45 and over in Wales have osteoarthritis of the knee. That's 275,000 people, 71,000 of whom have severe knee osteoarthritis.
Osteoarthritis of the hip	10.9% of people aged 45 and over in England have osteoarthritis of the hip. That's 2.7 million* people, 790,000* of whom have severe hip osteoarthritis in 2019.	10.1% of people aged 45 and over in Scotland have osteoarthritis of the hip. That's 256,000 people, 64,000 of whom have severe hip osteoarthritis.	11.2% of people aged 45 and over in Wales have osteoarthritis of the hip. That's 180,000 people, 48,000 of whom have severe hip osteoarthritis.

*percentage prevalence has been applied to mid-2019 population estimates.

Access local level MSK Calculator estimates and technical documents [here](#).

10 GLOSSARY

Arthritis - a general term that most people use to mean painful joints. Medically, it refers to many different conditions leading to inflamed or damaged joints.

Comorbidity - any additional health conditions that people may have, beyond the main condition being addressed.⁴³

Disabled - someone with a long-term condition which substantially reduces their ability to carry out day-to-day activities, as defined by the Equality Act 2010.

Disability adjusted life-year (DALY) - a single metric of overall disease burden combining years of life lost (YLLs) due to mortality and years lived with disability (YLDs). One DALY can be thought of as one lost healthy life year.¹

Employment - people aged 16 or over who did some paid work in the reference week (whether as an employee or self-employed); those who had a job that they were temporarily away from (eg on holiday); those on government-supported training and employment programmes and those doing unpaid family work (eg working in a family business).⁴⁹

Finished Admission Episodes (FAEs) - the first period of admitted patient care under one consultant within one healthcare provider.

Fit note - issued to patients by doctors and other healthcare professionals following an assessment of their fitness for work. People who are off work sick for more than seven days will normally need to provide their employer with a fit note.⁵⁴

Inactive - participating in less than 30 minutes of moderate intensity physical activity (any activity where the effort put in is enough to raise your breathing rate) per week.

Long-term condition - health conditions that are persistent and recurrent. The list of conditions included in this definition vary depending on source. UK national health survey data use the following harmonised measure sometimes referred to as 'long-lasting health conditions': "Do you have any physical or mental health conditions or illnesses lasting or expected to last for 12 months or more?"

Morbidity - a term used to describe the state of being ill, diseased or disabled. It refers to the level of sickness and disability characterising a population.

Multimorbidity - a person living with multimorbidity has two or more long-term chronic conditions.⁴³

Prevalence - the percentage of a population that is affected with a disease at a given time.

Risk factor - any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or disorder. Some risk factors are modifiable, because you can change them (eg smoking, obesity, diet) other risk factors are non-modifiable, because you can't directly change them (eg age, family history, genetics).

Unemployment - refers to people without a job, who were able to start work in the two weeks following their Annual Population Survey interview, and who had either looked for work in the four weeks prior to interview or were waiting to start a job they had already obtained.⁴⁹

Work days lost - the number of work days lost for all people in employment aged over 16 years due to sickness absence.

Years lived with disability (YLD) - years of life lived with any short-term or long-term health loss.¹

11 REFERENCES

1. Global Burden of Disease Collaborative Network (2020). Global Burden of Disease Study 2019 (GBD 2019) Results. Institute for Health Metrics and Evaluation (IHME), Seattle.
2. Belluz, J. & Hoffman, S. (2015). The one chart you need to understand any health study. Vox. <https://www.vox.com/2015/1/5/7482871/types-of-study-design>
3. Public Health England. (2021). PHE Fingertips Musculoskeletal Conditions Profile. GP Patient Survey 2020 data. <https://fingertips.phe.org.uk/profile/msk/data>
4. ScotCen Social Research. (2020). Scottish Health Survey 2019. Scottish Government. <https://www.gov.scot/collections/scottish-health-survey/>
5. Welsh Government. (2020). National Survey Wales: April 2019 to March 2020. <https://gov.wales/national-survey-wales-april-2019-march-2020>
6. NHS Digital. (2019). Health Survey for England 2018: Longstanding Conditions. Health and Social Care Information Centre. <http://healthsurvey.hscic.gov.uk/support-guidance/public-health/health-survey-for-england-2018/longstanding-conditions.aspx>
7. Versus Arthritis. (2019). The Musculoskeletal Calculator (modelled prevalence estimates for rheumatoid arthritis). <https://www.versusarthritis.org/policy/resources-for-policy-makers/musculoskeletal-calculator/>
8. Quality Outcomes Framework. (2019). QOF estimates for England, Wales, Northern Ireland. GP contract. <https://www.gpcontract.co.uk/browse/UK/19>
9. Silman, A.J. & Hochberg, M.C. (2001). *Epidemiology of the Rheumatic Diseases*. 2nd Edition Oxford Medical Publications.
10. National Ankylosing Spondylitis Society. (2021). Facts & Figures. <https://nass.co.uk/about-as/as-facts-and-figures/>
11. Ogdie, A. et. al. Prevalence and treatment patterns of psoriatic arthritis in the UK. *Rheumatology*. 52(3),568-575. <https://doi.org/10.1093/rheumatology/kes324> (0.19% applied to mid-2019 population estimate)
12. Versus Arthritis. (2019). The Musculoskeletal Calculator (modelled prevalence estimates for hip and knee osteoarthritis). <https://www.versusarthritis.org/policy/resources-for-policy-makers/musculoskeletal-calculator/>
13. Versus Arthritis. (2019). The Musculoskeletal Calculator (modelled prevalence estimates for back pain). <https://www.versusarthritis.org/policy/resources-for-policy-makers/musculoskeletal-calculator/>
14. Jones, G., Atzeni, F., Beasley, M., Fließ, E.P. & Macfarlane, G. (2015). The prevalence of fibromyalgia in the general population: a comparison of the American College of Rheumatology 1990, 2010, and modified 2010 classification criteria. *Arthritis & Rheumatology*. 67 (2), 568-75. doi: 10.1002/art.38905
15. Svedbom, A. et al. (2013). Osteoporosis in the European Union: a compendium of country-specific reports. *Archives of Osteoporosis*. 8(1):137. doi: 10.1007/s11657-013-0137-0

- 16.** National Institute for Clinical Excellence. (2018). NICE impact falls and fragility fractures. Online. Accessed 17.08.2021. <https://www.nice.org.uk/media/default/about/what-we-do/into-practice/measuring-uptake/nice-impact-falls-and-fragility-fractures.pdf>
- 17.** Versus Arthritis. (2021). Chronic pain in England: Unseen, unequal, unfair. <https://www.versusarthritis.org/about-arthritis/data-and-statistics/chronic-pain-in-england/>
- 18.** Fayaz, A. et al. (2016). Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. *BMJ Open* doi: 10.1136/bmjopen-2015-010364
- 19.** Hurley, M. et al. (2018). Exercise interventions and patient beliefs for people with hip, knee or hip and knee osteoarthritis: a mixed methods review. *Cochrane Database of Systematic Reviews*. 4(4):CD010842. doi: 10.1002/14651858.CD010842.pub2.
- 20.** Choi, B., Verbeek, J., Tam, W. and Jiang, J. (2010). Exercises for prevention of recurrences of low-back pain. *The Cochrane Database for Systematic Reviews*. doi: 10.1002/14651858.CD006555.pub2.
- 21.** Department of Health, Physical Activity, Health Improvement and Protection. (2011). Start Active, Stay Active: A report on physical activity from the four home countries' Chief Medical Officers, Department of Health, London.
- 22.** NG England. (2012). Let's Get Moving Commissioning Guidance: A physical activity care pathway. Online. Accessed 17.08.2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216262/dh_133101.pdf
- 23.** Foster, C., Armstrong, M., Hillsdon, M., Skelton, D., Mavroei, A., Cavill, N. and Milton, K. (2017). Muscle and bone strengthening and balance activities for general health benefits in adults and older adults: Summary of a rapid evidence review for the UK Chief Medical Officers' update of the physical activity guidelines. Public Health England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf
- 24.** Sharif, K., Watad, A., Bragazzi, NL., Lichtbroun, M., Amital, H., and Shoenfeld, Y. (2018). Physical activity and autoimmune diseases: Get moving and manage the disease. *Autoimmunity Reviews*. 17(1), 53-72. <https://doi.org/10.1016/j.autrev.2017.11.010>
- 25.** Versus Arthritis (2020). Unmet Needs Research – Survey data (Unpublished) Note: Sample base=2,246 people with MSK conditions (UK wide)
- 26.** Versus Arthritis (2019). Musculoskeletal conditions and physical activity - Scoping Research (Unpublished)
- 27.** Northern Ireland Department of Health. (2020). Health survey Northern Ireland: first results 2019/20. Accessed 17.08.2021. <https://www.health-ni.gov.uk/publications/health-survey-northern-ireland-first-results-201920>
- 28.** Felson, D. et al. (2000). Osteoarthritis: new insights. Part 1: the disease and its risk factors. *Annals of Internal Medicine*. 133(8), 635-646. doi: 10.7326/0003-4819-133-8-200010170-00016.
- 29.** Deere, K. et al. (2012). Obesity is a risk factor for musculoskeletal pain in adolescents: findings from a population-based cohort. *Pain*. 153(9), 1932-1938. Obesity is a risk factor for musculoskeletal pain in adolescents: findings from a population-based cohort
- 30.** National Joint Registry (2020). NJR 17th Annual Report 2020-Surgical data to 31 December 2019. National Joint Registry for England, Wales, Northern Ireland, and the Isle of Man. <https://reports.njrcentre.org.uk/>

- 31.** Blagojevic, M., Jinks, C., Jeffery, A. and Jordan, K. (2010). Risk factors for onset of osteoarthritis of the knee in older adults: a systematic review and meta-analysis. *Osteoarthritis and Cartilage*. 18(1),24-33. doi: 10.1016/j.joca.2009.08.010.
- 32.** Anderson, J. and Felson, D. (1998). Factors associated with osteoarthritis of the knee in the first national Health and Nutrition Examination Survey (HANES I). Evidence for an association with overweight, race, and physical demands of work. *American Journal of Epidemiology*, vol. 128, no. 1, pp. 179-189.
- 33.** D. Felson, J. Anderson, A. Naimark, A. Walker and R. Meenan (1998). Obesity and knee osteoarthritis. The Framingham Study. *Annals of Internal Medicine*. 109(1), 18-24. DOI: 10.1093/oxfordjournals.aje.a114939
- 34.** Lohmander, L., Gerhardsson, de Verdier, M., Rollof, J., Nilsson, P. & Engström, G. (2009). Incidence of severe knee and hip osteoarthritis in relation to different measures of body mass: a population-based prospective cohort study. *Annals of the Rheumatic Diseases*. 68(4), 490-496vol. 68. DOI: 10.1136/ard.2008.089748
- 35.** Heuch, I., Hagen, K. & Zwart, J. (2013). Body mass index as a risk factor for developing chronic low back pain: a follow-up in the Nord-Trøndelag Health Study. *Spine*. 38(2), 133-139. DOI: 10.1097/BRS.0b013e3182647af2
- 36.** Smuck, M., Kao, M., Brar, N., Martinez-Ith, A., Choi, J. & Tomkins-Lane, C. (2014). Does physical activity influence the relationship between low back pain and obesity? *The Spine Journal*. 14(2), 209-216. DOI: 10.1016/j.spinee.2013.11.010
- 37.** M. McAdams DeMarco et al. (2011). Younger age at gout onset is related to obesity in a community-based cohort. *Arthritis Care & Research*. 63(8), 1108-1114. DOI: 10.1002/acr.20479
- 38.** Feng, J. et al. (2016). Body Mass Index and Risk of Rheumatoid Arthritis: A Meta-Analysis of Observational Studies. *Medicine*. 95(8). DOI: 10.1097/MD.0000000000002859
- 39.** Barnett, K., Mercer, S., Norbury, M., Watt, G., Wyke, S. and Guthrie, B. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *The Lancet*. 380(9836), 37-43. DOI:[https://doi.org/10.1016/S0140-6736\(12\)60240-2](https://doi.org/10.1016/S0140-6736(12)60240-2)
- 40.** Cassell, A., Edwards, D., Harshfield, A., Rhodes, K., Brimicombe, J., Payne, R. and Griffin, S. (2018). The epidemiology of multimorbidity in primary care: a retrospective cohort study. *Br J Gen Pract*, vol. 68, no. 669. DOI: <https://doi.org/10.3399/bjgp18X695465>
- 41.** Gondek, D., Bann, D., Brown, M. et al. (2021). Prevalence and early-life determinants of mid-life multimorbidity: evidence from the 1970 British birth cohort. *BMC Public Health*. (21) 1319. <https://doi.org/10.1186/s12889-021-11291-w>
- 42.** Public Health England (2021). PHE Fingertips Musculoskeletal Conditions Profile. GP Patient Survey 2020 data. Accessed August 2021. Available at link
- 43.** Versus Arthritis [formerly Arthritis Research UK]. (2017). Musculoskeletal conditions and multimorbidity.
- 44.** Swain, S., Sarmanova, A., Mallen, C., Kuo, CF., Coupland, C., Doherty, M., Zhang, W. (2020). Trends in incidence and prevalence of osteoarthritis in the United Kingdom: findings from the Clinical Practice Research Datalink (CPRD). *Osteoarthritis Cartilage*. 28(6), 792-801. doi: 10.1016/j.joca.2020.03.004. Epub 2020 Mar 14. PMID: 32184134.
- 45.** Lepine, J., and Briley, M. (2004). The epidemiology of pain in depression. *Human Psychopharmacology*. 10(1), S3-S7. DOI: 10.1002/hup.618
- 46.** Department for Work and Pensions & Department of Health (2016). Work, Health and Disability Green Paper Data Pack.

- 47.** Office for National Statistics (2021). Annual Population Survey-people with long-term health conditions, UK: January to December 2019. Accessed 20.08.2021. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/adhocs/11478peoplewithlongtermhealthconditionsukjanuarytodecember2019>
- 48.** Public Health England (2017). Health and work: infographics. Online. Accessed 20 August 2021. <https://www.gov.uk/government/publications/health-and-work-infographics>
- 49.** Labour Force Survey (2020). Employment Status of persons by long-term main health condition JM2020-OD2020 (data request-unpublished).
- 50.** Office for National Statistics. (2021). Sickness absence in the UK labour market 2020. Accessed 20 August 2021. <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/sicknessabsenceinthelabourmarket/2020>
- 51.** Varney, J. (2016). Understanding the relationship between health, work and worklessness. Public Health England. Online. Accessed 2 July 2021. <https://ukhsa.blog.gov.uk/2016/09/14/understanding-the-relationship-between-health-work-and-worklessness/>
- 52.** Department for Work and Pensions (2020). Official Statistics: Access to Work statistics: April 2007 to March 2020. Accessed 2 July 2021. <https://www.gov.uk/government/statistics/access-to-work-statistics-april-2007-to-march-2020/access-to-work-statistics-april-2007-to-march-2020>
- 53.** Department for Work and Pensions (2021). Employment and Support Allowance : ESA data from May 2018 (data collection). Stat-Xplore Online Tool. <https://stat-xplore.dwp.gov.uk/webapi/jsf/login.xhtml>
- 54.** NHS Digital. (2020). Fit Notes Issued by GP Practices, England March 2021. Experimental statistics. Accessed 20 August 2021. <https://digital.nhs.uk/data-and-information/publications/statistical/fit-notes-issued-by-gp-practices/march-2020>
- 55.** Department of Health (2006) The Musculoskeletal Services Framework. A joint responsibility: doing it differently. https://webarchive.nationalarchives.gov.uk/20130124073659/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4138412.pdf
- 56.** Keavy, R. (2020). The prevalence of musculoskeletal presentations in general practice: an epidemiological study. *Br J Gen Pract.* 70(1). doi: 10.3399/bjgp20X711497. PMID: 32554673.
- 57.** NHS Digital. (2020). Hospital Admitted Patient Care Activity 2019-20. Accessed 08 August 2021. <https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2019-20>
- 58.** National Joint Registry. (2020). 17th Annual Report 2020. National Joint Registry for England, Wales, Northern Ireland, and the Isle of Man, NJR Reports. Online. Accessed July 2021. <https://reports.njrcentre.org.uk/>
- 59.** National Services Scotland. (2021). Scottish Arthroplasty Project Annual Report 2020. Online. Accessed July 2021. <https://www.arthro.scot.nhs.uk/Reports/Dashboard-2020.html>
- 60.** Sayers, AE. et al. (2021). The COVID-19 induced joint replacement deficit in England, Wales and Northern Ireland. (Under Review). Accessed August 2021. <https://research-information.bris.ac.uk/en/publications/the-covid-19-induced-joint-replacement-deficit-in-england-wales-a>

- 61.** Royal College of Physicians. (2020). National Hip Fracture Database (NHFD): Data from January to December 2019. Falls and Fragility Fracture Audit Programme. Accessed July 2021. <https://www.nhfd.co.uk/20/hipfractureR.nsf/docs/2020Report> (~67,000 people)
- 62.** National Services Scotland. (2021). Scottish Hip Fracture Audit. Hip Fracture Care Pathway Report 2020. NSS Information and Intelligence. Accessed August 20 2021. https://www.publichealthscotland.scot/media/8737/v4_shfa-annual-report-2021_0415.pdf (~7,000 people)
- 63.** NHS England Business Services Authority. (2021). Prescription Cost Analysis - England 2020/2021. Statistical Summary Tables-Calendar Year. Accessed 08 August 2021. https://www.publichealthscotland.scot/media/8737/v4_shfa-annual-report-2021_0415.pdf
- 64.** Ipsos Mori and NHS England. (2020). GP Patient Survey January-March 2020 (data collection). Accessed March 2021. <https://gp-patient.co.uk/surveysandreports2020>
- 65.** NHS England (2015). CCG Programme Budgeting Benchmarking Tool 2013/14.
- 66.** Public Health England (2019). Health matters: health and work. Online. Accessed 2021 June 20. <https://www.gov.uk/government/publications/health-matters-health-and-work/health-matters-health-and-work>
- 67.** NHS Employers (2014). Back in Work: Introduction and Key Messages. <http://www.nhsemployers.org/-/media/Employers/Documents/Retain-and-improve/Back-in-Work/Back-in-work-part-1-Introduction-and-key-messages-web-final-25-March.pdf?la=en&hash=EFA3598B5B049291C6F3B0CF9B8AFE34529C5C60m>
- 68.** York Health Economics. (2017). The Cost of Arthritis: Calculation conducted on behalf of Arthritis Research UK (unpublished).
- 69.** Maniadakis, N. & Gray, A. (2000). The economic burden of back pain in the UK. *Pain*. 84(1), 95-103. DOI: 10.1016/S0304-3959(99)00187-6
- 70.** Leal, J., Gray, A. & Javaid, M. (2016). Impact of hip fracture on hospital care costs: a population-based study. *Osteoporos Int*. 27, 549-58. DOI: 10.1007/s00198-015-3277-9
- 71.** Husain, M. J., Brophy, S., Cooksey, R., Rahman, M. A., Phillips, C. J. & Siebert, S. (2014). The Work-Related Costs of Ankylosing Spondylitis in a UK Cohort. *Rheumatology*. 43, pp. 140-141. <https://doi.org/10.1093/rheumatology/keu115.010>
- 72.** Oliver, D., Foot, C., Humphries, R. (2014). Making our health and care systems fit for an ageing population. The King's Fund. https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/making-health-care-systems-fit-ageing-population-oliver-foot-humphries-mar14.pdf