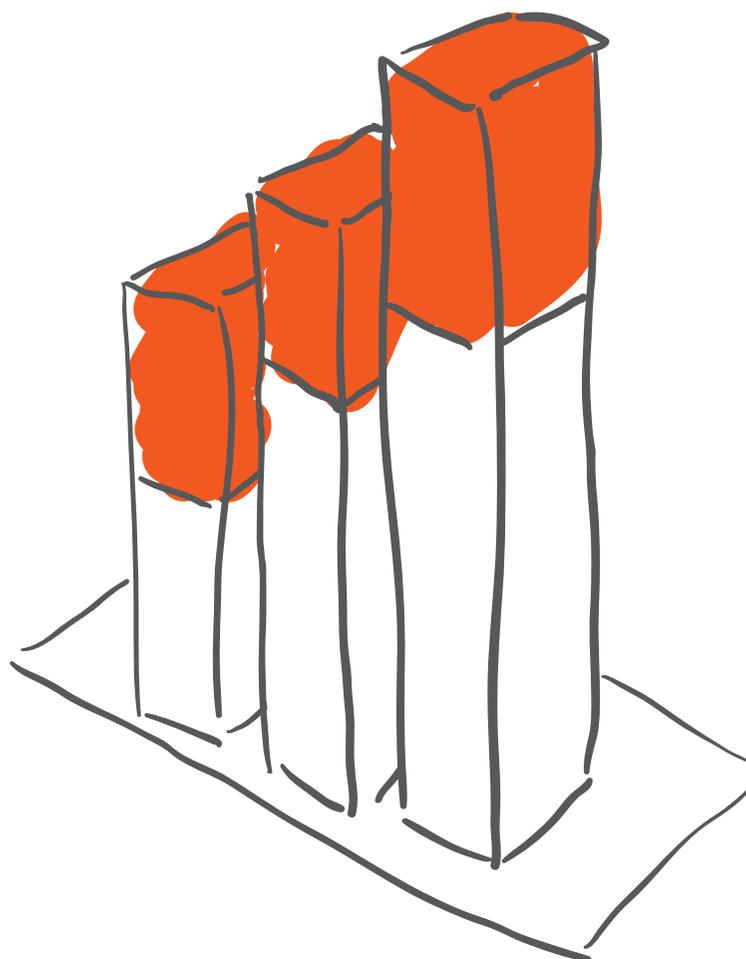


OSTEOARTHRITIS IN GENERAL PRACTICE

Data and perspectives



ARTHRITIS RESEARCH UK

Arthritis Research UK is the leading authority on arthritis in the UK, conducting scientific and medical research into all types of arthritis and other musculoskeletal conditions. It is the UK's fourth largest medical research charity and the only charity solely committed to funding high quality research into the cause, treatment and cure of arthritis.

Our remit includes arthritis and musculoskeletal conditions, which are disorders of the joints, bones and muscles – including back pain – along with rarer systemic autoimmune diseases such as lupus. Together, these conditions affect around ten million people across the UK and account for the fourth largest NHS programme budget spend of £5 billion in England.

Arthritis is the biggest cause of pain and disability in the UK, and each year 1 in 5 of the general population consults a GP about a musculoskeletal condition. As a charity we fund research, provide information to patients and educational resources for health professionals.

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

This report presents new data revealing the overall extent of osteoarthritis in the UK. It is based on data collected in the Consultations in Primary Care Archive (CiPCA) and analysed by the Arthritis Research UK Primary Care Centre at Keele University. Estimates of the future extent of osteoarthritis in the UK, carried out by Arthritis Research UK, are also included.

Osteoarthritis is the most common musculoskeletal condition in older people. Around a third of people aged 45 years and over in the UK, a total of 8.75 million people, have sought treatment for osteoarthritis. Osteoarthritis affects the joints, causing them to become painful and limiting their movement.

The overall impact of osteoarthritis on the person with the condition varies depending on the joints involved, the level of pain, and extent of loss of function. In severe cases, osteoarthritis is a substantial barrier to people's mobility and independence, and significantly compromises their wellbeing and quality of life.

Many people struggle with osteoarthritis, thinking that nothing can be done to help. This isn't the case. By taking a strategic approach to identifying people with, or at risk of, osteoarthritis and supporting them to manage the condition, much can be done to help people with osteoarthritis improve their quality of life.

Arthritis Research UK makes the following recommendations to address the impact of osteoarthritis:

Recommendation 1:

The substantial contribution of osteoarthritis to multimorbidity and frailty should be recognised by NHS England and Public Health England. A coordinated programme of activity should be implemented to address this condition as a public health priority, and as a priority in the primary care management of long term conditions.

Recommendation 2:

Healthcare professionals should be alert to the presence of osteoarthritis in people with other conditions. They should routinely ask people whether they are experiencing musculoskeletal pain, and proactively consider and address its impact on overall health and mobility when discussing a person's needs.

Recommendation 3:

Health and wellbeing boards should assess and monitor the impact of osteoarthritis in their local population, and hold clinical commissioning groups and NHS England to account for ensuring the national clinical guidelines for osteoarthritis are put into practice.

Recommendation 4:

Standardised coding for osteoarthritis should be adopted in general practice, and encouraged in other care settings including community care and hospital outpatient departments. Indicators for osteoarthritis should be developed and included within the NHS and Public Health Outcomes Frameworks.

Recommendation 5:

Local authorities, clinical commissioning groups and NHS England must ensure that appropriate services to meet the physical and mental health needs of people with osteoarthritis are commissioned, accessible and integrated. Joint Strategic Needs Assessments produced by health and wellbeing boards should recognise the impact of osteoarthritis on the health of the local population and clearly state measures to promote physical exercise, tackle obesity, and to identify and provide support for the mental health needs of people with osteoarthritis, including management of depression.

Recommendation 6:

Pioneering, high quality research to develop the best means of preventing and treating osteoarthritis should be pursued and supported.

1. INTRODUCTION

Musculoskeletal conditions affect the muscles, bones and joints. They are common often long term conditions which can result in an ongoing loss of quality of life. Collectively, musculoskeletal conditions are the greatest cause of disability in the UK, accounting for close to a third of all years lived with disability.¹

The majority of people who seek medical help for musculoskeletal conditions are treated in general practice. Each year around a fifth of the population consult their general practitioner (GP) about a musculoskeletal condition.² This amounts to over 100,000 consultations a day and consumes significant general practice resource.³

Osteoarthritis is the most common musculoskeletal condition in older people. Around a third of people aged 45 years and over in the UK, a total of 8.75 million people, have sought treatment for osteoarthritis. Osteoarthritis affects the joints, causing them to become painful and limiting their movement. The condition occurs in different sites, but often affects the knee, hip or finger joints.

The overall impact of osteoarthritis on a person with the condition varies depending on the joints involved, the level of pain, and extent of loss of function. When the hands are affected, osteoarthritis can prevent people being able to undertake everyday activities, such as fastening buttons, writing and opening food containers. Osteoarthritis in the hips or knees can restrict mobility, limit walking, climbing stairs, bathing and personal care, and driving a car. In severe cases, osteoarthritis is a substantial barrier to people's mobility and independence, and significantly compromises their wellbeing and quality of life.

Between 1990 and 2010, disability due to osteoarthritis in the UK increased by 16%.⁴ This trend is expected to continue, as osteoarthritis is more common in older people and in people who are obese, and the proportion of the population within these groups is set to rise.⁵

About this report

Despite its overall impact on the nation's health and wellbeing, and the demand it places on general practice, osteoarthritis has been an '*unrecognised public health priority*'.⁶ A lack of data to accurately describe the extent of the condition within the population has been a major barrier, both to raising awareness and to effectively addressing osteoarthritis at a national level.

This report presents new data revealing the overall extent of osteoarthritis in the UK. It is based on anonymised data collected, under permission from the National Research Ethics Service, in the Consultations in Primary Care Archive (CiPCA), and analysed by the Arthritis Research UK Primary Care Centre at Keele University. A new method, using data collected over a seven year period, has been used to accurately describe, for the first time, the number of people in the UK with osteoarthritis (see Annex I for methods).

The future impact of osteoarthritis taking into account the size, ageing and anticipated rise in the level of obesity within the UK population is also considered. It is illustrated by new estimates produced by Arthritis Research UK, of the future numbers of people likely to have knee osteoarthritis, the joint in which osteoarthritis is most often found.

Data alone cannot describe the impact of osteoarthritis on the quality of life of people across the UK. The experiences of people living with osteoarthritis are illustrated in their own words throughout this report. Recommendations to address the impact of osteoarthritis are outlined.

2. OSTEOARTHRITIS

What is osteoarthritis and what is its impact?

Osteoarthritis is a condition in which the joints of the body become damaged, stop moving freely, and become painful. Osteoarthritis results from a combination of the breakdown of the joint and the body's attempted repair processes. Cartilage (the tissue that coats the end of bones) roughens and becomes thin, the underlying bone thickens and grows into the joint forming bony spurs (osteophytes), and the gap between the bones narrows. The inner layer of the joint capsule (synovium) may thicken and make excess fluid, causing the joint to swell, while the capsule and ligaments around the joint thicken and contract. In severe osteoarthritis, the loss of cartilage can result in bones rubbing against each other and wearing away (see figure 1).

Pain is the main symptom of osteoarthritis and can have a devastating impact on people's lives, preventing sleep and causing fatigue. Depending on the joints involved and severity, the lack of mobility caused by osteoarthritis can impact on many areas of life, preventing people from fully living their family, social and intimate lives, and reducing their ability to work. Self-confidence, self-esteem, wellbeing and quality of life can all be significantly reduced.

What causes osteoarthritis?

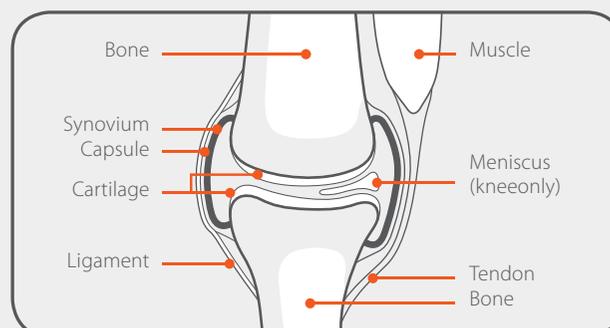
The causes of osteoarthritis are not yet fully understood. However, a range of factors which increase the risk of osteoarthritis are known, and it is often a combination of these that leads to its development. Osteoarthritis can be caused by damage to the joints, either through repeated excessive loading and stress of a joint over time (for example, the knee joint in an obese person) or by injury (such as a break or dislocation of a finger joint). Genetic factors make some people more likely to develop osteoarthritis. Risk factors vary depending on the joint involved and different factors may affect the initial development of osteoarthritis in a joint, and the extent to which a joint is affected over time. The main risk factors for osteoarthritis (see figure 2) include:

- » **Age:** Osteoarthritis is more common in people from their 40s and increases with age.
- » **Gender:** Osteoarthritis is more common in women than in men for most joints.*
- » **Obesity:** Being overweight increases loading on the joints and the risk of osteoarthritis, especially in the knee.
- » **Bone density:** High bone density is a risk factor for the development of knee, hand and hip osteoarthritis; low bone density is linked to rapid progression of knee and hip osteoarthritis.

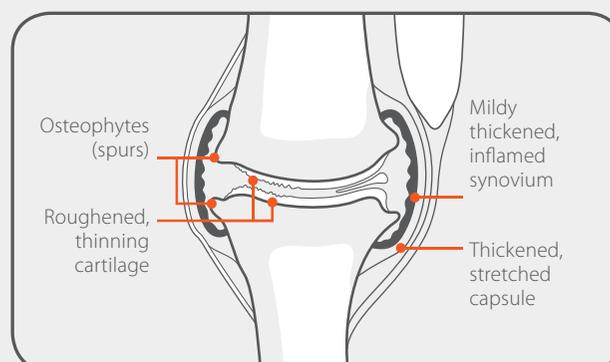
* The gap between the genders decreases after the menopause in women.

Figure 1: How osteoarthritis affects a joint

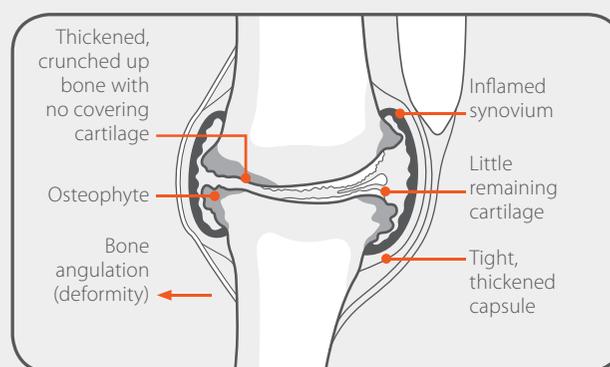
1.1: A normal joint



1.2: A joint with mild osteoarthritis



1.3: A joint that has been deformed by severe osteoarthritis



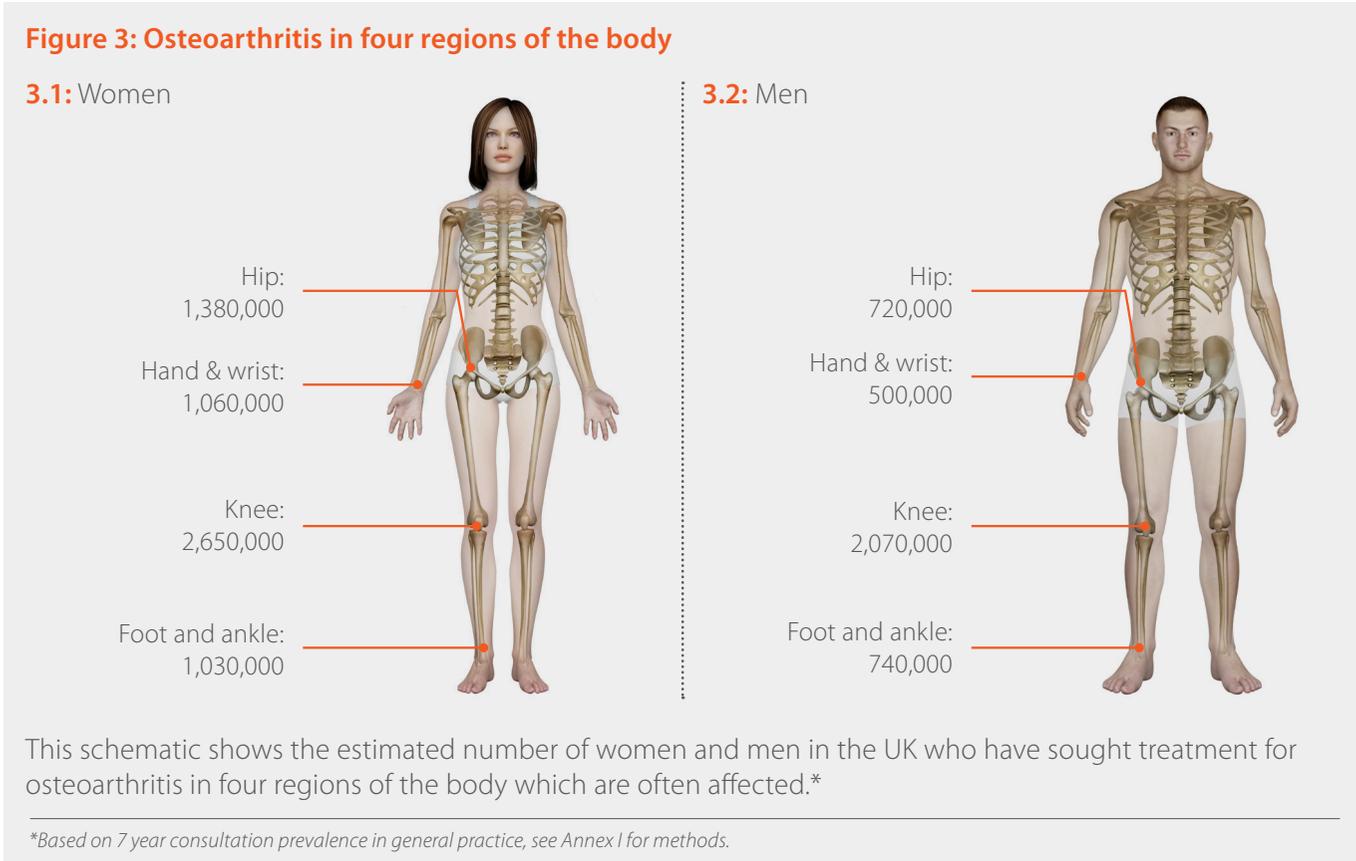
- » **Joint injury or disease:** Injury to a joint, joint surgery or other types of joint disease (including rheumatoid arthritis or gout) may lead to osteoarthritis.
- » **Occupation:** Physically demanding work can increase the risk of osteoarthritis in some joints.
- » **Joint abnormalities:** Osteoarthritis can result from abnormal development of joints.
- » **Genetic factors:** Genetic factors are a key risk factor for osteoarthritis of the hands, and play a smaller role in osteoarthritis of the hip and knee. The genes involved are not fully known.



Which joints are affected by osteoarthritis?

Osteoarthritis can affect any joint in the body, but the most commonly affected joints are the knee and hip as well as joints within foot, ankle, hand and wrist (see figure 3). Within the hand, the joints at the base of the thumb and the ends of the fingers are most often affected. It is common to have osteoarthritis in more than one region of the body.

Joints within the spine (back and neck) are also affected by osteoarthritis, particularly the joints of the lower back. Osteoarthritis within spinal joints is challenging to diagnose as there is a relatively weak association between back pain (which is very common in adults) and changes to the joints of the spine which are visible on x-ray. Therefore, osteoarthritis of the spine is not considered in this report.



What are the treatments for osteoarthritis?

There are a range of treatments for osteoarthritis; an important aspect of treatment is to agree and then regularly review a management plan which people can use to help them self-manage their osteoarthritis. Exercise, of an appropriate type and level, should be included as a core treatment. Other aspects of treatment which can be included depending on the joints involved are weight loss and maintenance of a healthy weight, lifestyle change to avoid stress on the joints (such as pacing the amount of activity undertaken), painkilling medication, use of joint supports and assistive devices. For people with severe arthritis, joint replacement can be necessary and very successful in reducing pain and increasing mobility.

What are the national standards of care for people with osteoarthritis?

The National Institute for Health and Care Excellence (NICE)'s clinical guidance sets the standards for high quality healthcare and encourages healthy living.⁷ Its clinical guideline makes recommendations to the NHS on the treatment and care of people with osteoarthritis, which includes:

- » Healthcare professionals should take a **holistic approach** in assessing the impact of osteoarthritis on a person's life, considering how the conditions affect their quality of life, work, mood, relationships and leisure activities.
- » People with osteoarthritis should have a **periodic review** to meet their needs.
- » A **management plan** should be agreed between the person with osteoarthritis and a healthcare professional. This should take into account **comorbidities** which can increase the impact of osteoarthritis on a person's life.
- » Everybody with osteoarthritis should be **offered advice and information** about osteoarthritis on an ongoing basis.
- » Individualised **self-management strategies** should be agreed.
- » **Exercise** appropriate to the person should be advised as a core treatment.
- » **Weight loss** advice should be offered if the person is overweight.
- » Additional factors to be considered include: use of **electrotherapy** for pain relief; use of **thermotherapy**; advice on **footwear** for lower limb osteoarthritis; assessment for **bracing, joint supports** and **insoles** for people with instability; **assistive devices** (e.g. sticks and tap turners).
- » Treatments which should be considered include: **analgesics** (painkillers); **topical analgesics** including capsaicin cream for hand or knee osteoarthritis; **anti-inflammatories**; and **corticosteroid injections** for pain in knee osteoarthritis.
- » People with osteoarthritis that substantially impacts on their quality of life should be referred for **joint replacement surgery** before they have prolonged functional limitation and severe pain.



Carol has been diagnosed with osteoarthritis as well as hypermobility syndrome. She didn't find physiotherapy effective for reducing the pain and is considering a hip replacement.

"I love to do ballroom dancing and I find that the music and concentrating on remembering the steps distracts me from the pain of exercising. Like lots of other people with arthritis, I don't want to stop doing the things I enjoy."

2.1 OSTEOARTHRITIS: DATA



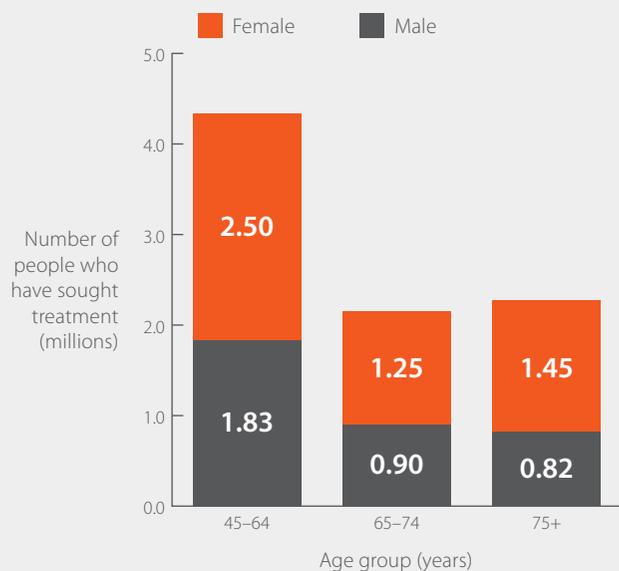
Key Statistics

- » One third of people aged 45 years and over in the UK have sought treatment for osteoarthritis.
- » 8.75 million people in the UK have sought treatment for osteoarthritis.
- » Women are more likely than men to have sought treatment for osteoarthritis.
- » Osteoarthritis increases between the ages of 45 and 75 years.
- » Of those aged 75 years and over, 49% of women and 42% of men have sought treatment for osteoarthritis.

Our data indicate that one third of people aged 45 and over in the UK have sought treatment for osteoarthritis. This is a total of 8.75 million people (see figure 4.1). Women are more likely than men to have sought treatment, with the total number of women exceeding 5 million, compared to 3.5 million men. The likelihood of having osteoarthritis increases with age. A third of women and almost a quarter of men between 45 and 64 have sought treatment for osteoarthritis, this rises to almost half of people aged 75 and over (see figure 4.2). The UK population size decreases with age, but a greater proportion of people living to older age have sought treatment for osteoarthritis (see figure 5).

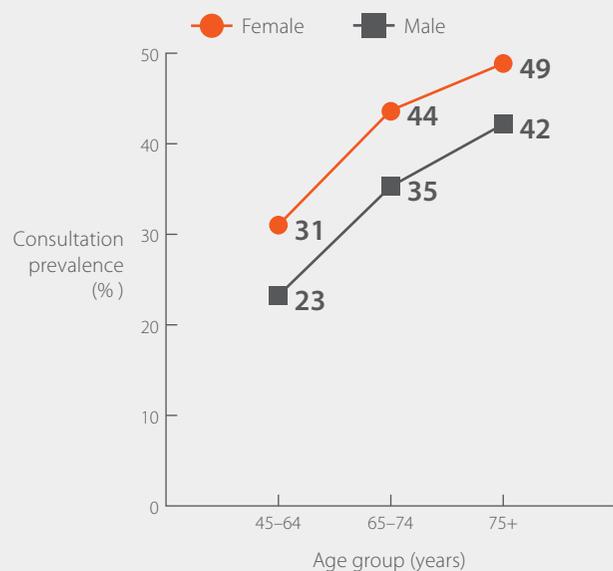
Figure 4: Osteoarthritis in the UK

4.1: How many people in the UK have osteoarthritis?



This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis, by gender and age group. A total of **8.75 million people** in the UK have sought treatment about osteoarthritis.*

4.2: How common is osteoarthritis in the UK?



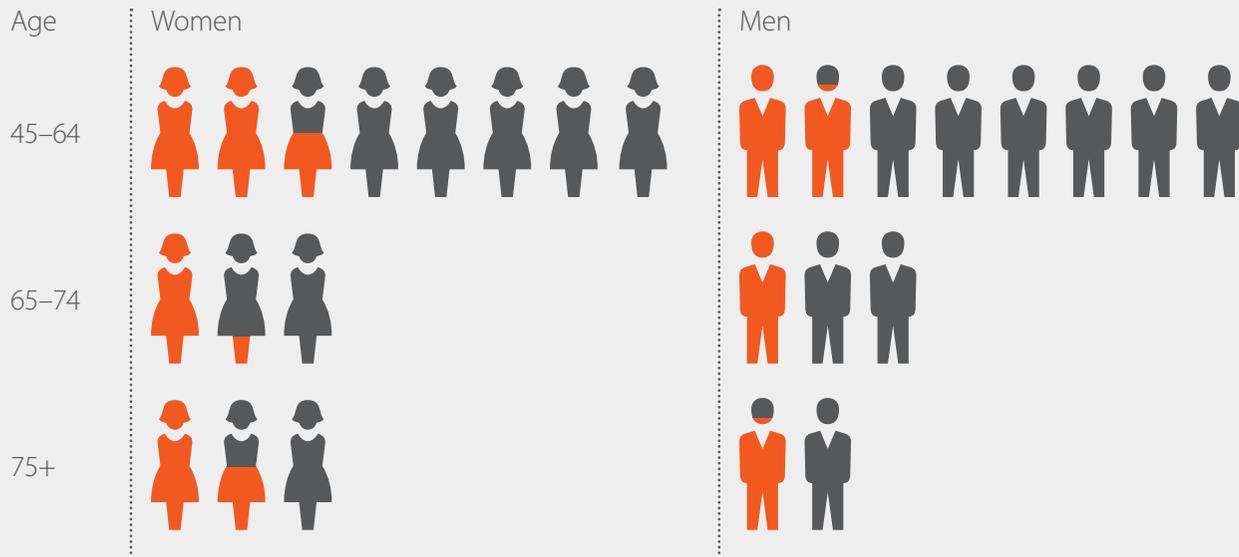
This graph shows the estimated proportion of people in the UK who have sought treatment for osteoarthritis, by gender and age group. In all, **one third of the population** aged 45 and over have sought treatment about osteoarthritis.*

*Based on 7 year consultation prevalence in general practice, for methods see Annex I.

What does consultation prevalence mean?

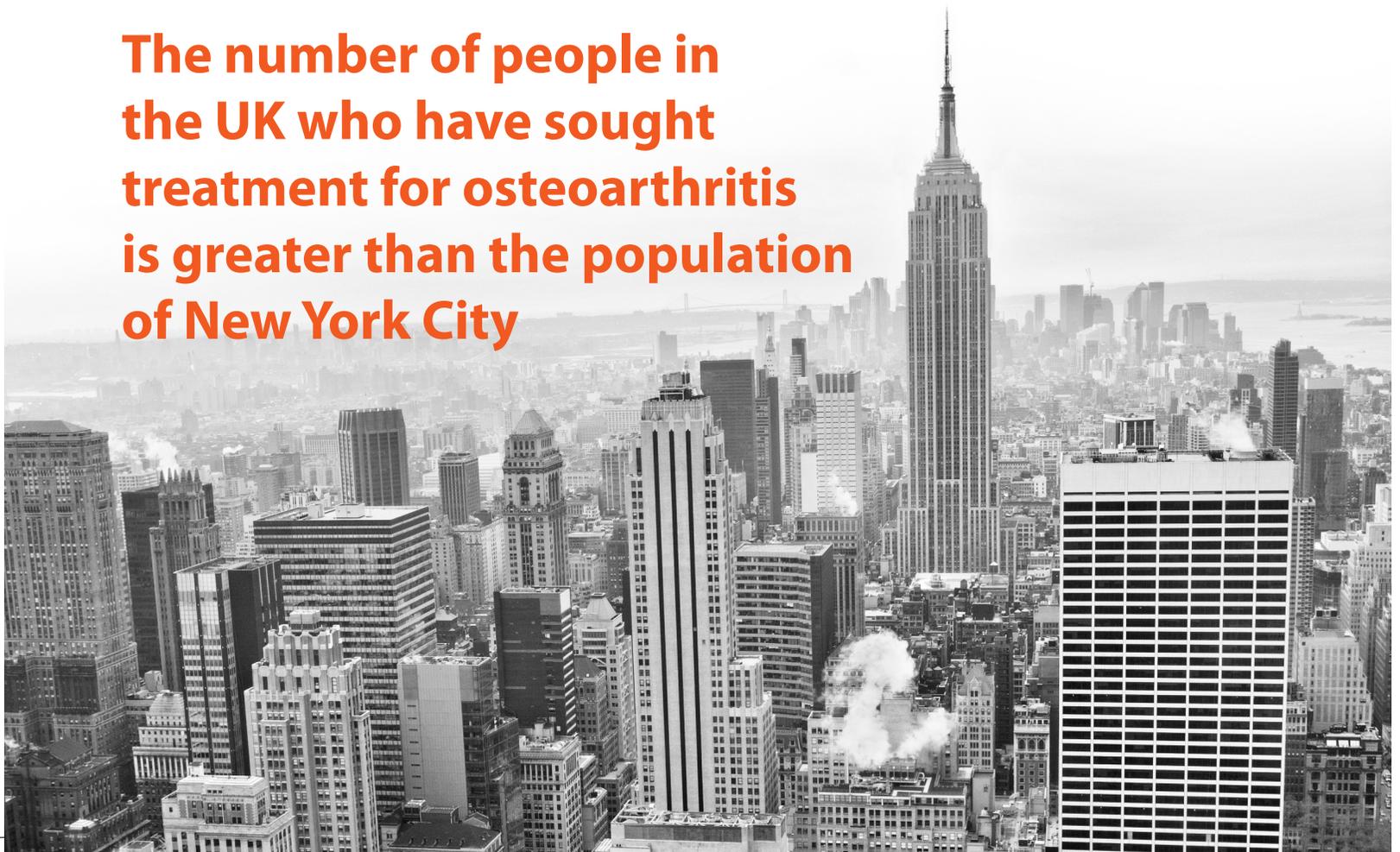
Consultation prevalence refers to the proportion of people within a defined population who consult a GP about a particular condition. It is expressed as a percentage of the total population, or as a ratio (e.g. 1 in 100).

Figure 5: How does the number of people with osteoarthritis in the UK relate to the age and size of the population?



This graphic shows the number of people in the UK by gender and age. Each figure represents 1 million people; the orange figures represent people with osteoarthritis. The UK population size decreases with age, but a greater proportion of people living to older age have osteoarthritis.

The number of people in the UK who have sought treatment for osteoarthritis is greater than the population of New York City



1/3 A third of people aged 45 and over have sought treatment for osteoarthritis

Over half a million women of working age in the UK have sought treatment for osteoarthritis of the hand or wrist

98% of initial knee replacements are due to osteoarthritis

Just under a quarter of people who have sought treatment about osteoarthritis have the condition in their hip



Close to **1 in 5** people aged 45 and over have sought treatment for knee osteoarthritis

19% of people aged 75 and over who have sought treatment about osteoarthritis have the condition in the foot and ankle

8.75 MILLION PEOPLE in the UK have sought treatment for osteoarthritis

By 2035, **8.3 million** people in the UK aged 45 and over could have knee osteoarthritis

3. OSTEOARTHRITIS OF THE HIP

What is osteoarthritis of the hip and what is its impact?

The hip is a common site for osteoarthritis. The hips support the body's weight in standing and moving positions, and over a lifetime, physical stress makes the joint susceptible to osteoarthritis. Osteoarthritis can develop in one hip, in both simultaneously, or in each at different times. The pain caused by hip osteoarthritis can be debilitating, making walking difficult and preventing sleep. People with hip osteoarthritis can find it difficult to get in and out of a chair and may have to stop driving a vehicle. The need to use a walking stick for support, giving up active hobbies, and a sense of fatigue can profoundly impact people's quality of life and self-esteem.

What causes osteoarthritis of the hip?

For many people hip osteoarthritis has no clear cause. A strong genetic component means that some people are more likely to develop osteoarthritis of the hip. It is also associated with physically demanding work including farming, and linked with childhood hip problems including congenital hip dislocation.⁸

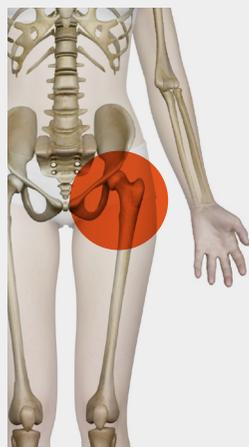
What are the treatments for osteoarthritis of the hip?

In its early stages, treatment for hip osteoarthritis focuses on disease management approaches including appropriate exercise, maintaining a healthy weight, use of walking aids and appropriate footwear and pain management. For severe stages of hip osteoarthritis, joint replacement can be very effective in decreasing pain and restoring mobility. Osteoarthritis is the main reason that people require a hip replacement, 93% of the initial hip replacements recorded in 2011 in the UK (more than 66,000) were due to osteoarthritis.⁹



Jacqueline's hip osteoarthritis started suddenly at the age of 50. She has now had both her hips replaced.

"The pain I went through ... I would not wish on my worst enemy. You can't do anything to get rid of it, and it affects everything you try to do. Some days I felt that I couldn't even get out of bed. As soon as I put my foot on the floor I'd get this awful grating pain."



Key Statistics

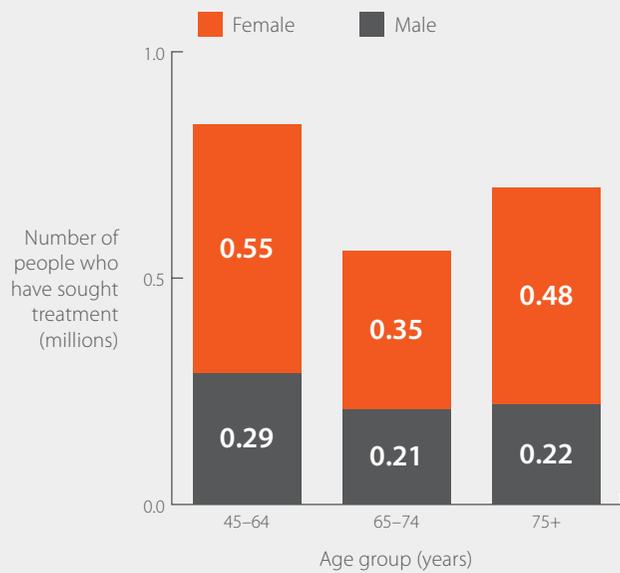
- » 8% of people aged 45 and over in the UK have sought treatment for osteoarthritis of the hip.
- » 2.12 million people in the UK have sought treatment for osteoarthritis of the hip.
- » Women are more likely than men to have sought treatment for osteoarthritis of the hip.
- » Osteoarthritis of the hip increases between the ages of 45 and 75 years.
- » Of those aged 75 years and over, 16% of women and 11% of men in the UK have sought treatment for hip osteoarthritis.
- » Just under a quarter of people who have sought treatment for osteoarthritis, have osteoarthritis of the hip.

"Stiffness is more easily dealt with than the pain. I still walk and do dance classes"

Our data indicate that **2.12 million people in the UK aged 45 and over have sought treatment for osteoarthritis of the hip** (see figure 6.1). Women are more likely than men to have sought treatment for hip osteoarthritis, for example between the ages of 45 and 64 it affects 7% of women, but 4% of men. The likelihood of having osteoarthritis of the hip increases with age for both women and men, and is greatest in those aged 75 or over (see figure 6.2).

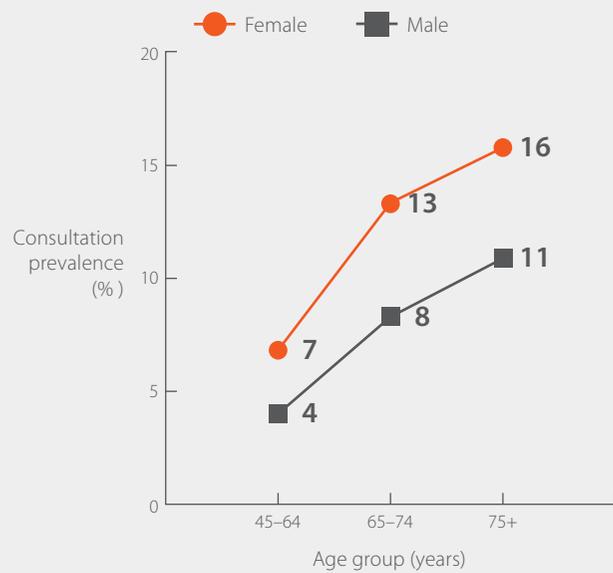
Figure 6: Osteoarthritis of the hip

6.1: How many people in the UK have osteoarthritis of the hip?



This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis of the hip, by gender and age group. An estimated **2.12 million people** in the UK have sought treatment for osteoarthritis of the hip.*

6.2: How common is osteoarthritis of the hip in the UK?



This graph shows the proportion of people in the UK who have sought treatment for osteoarthritis of the hip, by gender and age group. Overall **8% of people** aged 45 and over have sought treatment for osteoarthritis of the hip.*

*Based on 7 year consultation prevalence in general practice, for methods see Annex I.

24%

Just under a quarter of people who have sought treatment for osteoarthritis have it in their hip.

2/3

The number of people who have sought treatment for osteoarthritis of the hip is equivalent to two-thirds of the population of Wales.



"I was given a course of anti-inflammatory tablets that were strong and effective but I was taken off them because I would have serious side effects"

4. OSTEOARTHRITIS OF THE KNEE

What is osteoarthritis of the knee and what is its impact?

The knee is the most common site in the body for osteoarthritis. It is the largest joint in the body and one of the most complex. The knee allows the leg to bend, straighten and rotate, and it carries the weight of the body. The stress and impact of weight, and twisting and turning actions on the knee makes it susceptible to osteoarthritis. Knee osteoarthritis can make walking, standing and sitting extremely painful, draining people of energy. It can impact on the careers of sports-people and those with physically demanding work.

What are the causes of knee osteoarthritis?

Obesity is a strong risk factor for knee osteoarthritis, with obese people 14 times more likely to develop the condition than those of a healthy weight.¹⁰ Knee osteoarthritis has a genetic component in some people. Major joint injury and forms of work including underground mining and professional soccer are also associated with knee osteoarthritis.

What are the treatments for knee osteoarthritis?

In many people, knee osteoarthritis can be managed through lifestyle modifications including maintaining a healthy weight, appropriate exercise, knee strengthening exercises, and taping and bracing of the knee. Painkillers, anti-inflammatory gels or injections of corticosteroids into the joint can help to relieve pain. For severe stages of knee osteoarthritis, joint replacement can be very effective in reducing pain and restoring mobility. Osteoarthritis is the single biggest reason that people require knee replacement; 98% of initial knee replacements recorded in 2011 – over 77,000 - were because of osteoarthritis.¹¹



Richard's osteoarthritis meant an end to his career as a professional footballer. He feels pain every day in each step he takes.

"The damage to my knee and the extent of my osteoarthritis now prevents me from running for any prolonged period – something I used to be able to do for hours. ... Some days are more painful than others, especially in winter, but I try to stay positive ..."



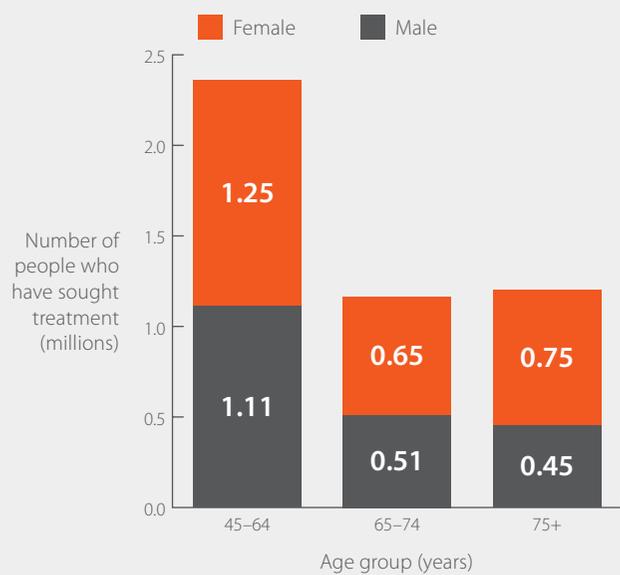
Key Statistics

- » The knee is the most common site in the body to have osteoarthritis in people aged 45 and over.
- » Close to 1 in 5 people aged 45 and over in the UK have sought treatment for osteoarthritis of the knee.
- » 4.71 million people in the UK have sought treatment for osteoarthritis of the knee.
- » Women are more likely than men to have sought treatment for knee osteoarthritis.
- » Osteoarthritis of the knee increases between the ages of 45 and 75 years.
- » Of those aged 75 years and over, a quarter of women and 23% of men in the UK have sought treatment because of knee osteoarthritis.
- » Just over half of all people who have sought treatment for osteoarthritis have knee osteoarthritis.

Our data indicate that 4.71 million people in the UK aged 45 and over have sought treatment for osteoarthritis of the knee (see figure 7.1). Women are slightly more likely than men to have sought treatment for knee osteoarthritis. The likelihood of having osteoarthritis of the knee increases with age for both women and men; of those aged 75 or over, almost a quarter of people have sought treatment for knee osteoarthritis (see figure 7.2).

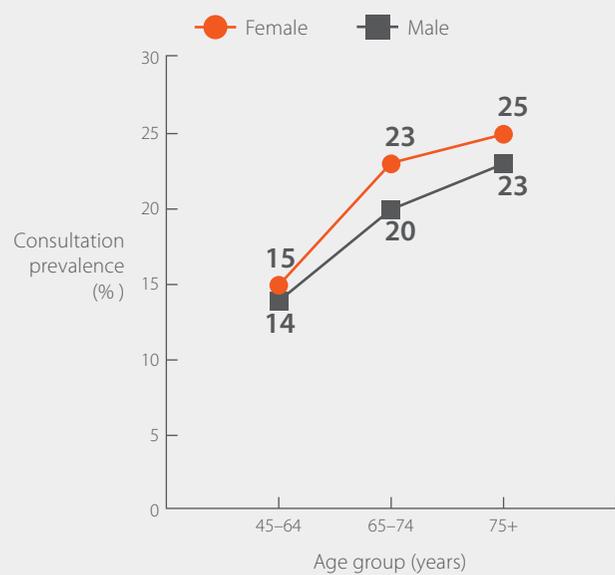
Figure 7: Osteoarthritis of the knee

7.1: How many people in the UK have osteoarthritis of the knee?



This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis of the knee, by gender and age group. **2.36 million** working age people have sought treatment for knee osteoarthritis.*

7.2: How common is osteoarthritis of the knee?



This graph shows the estimated proportion of people in the UK who have sought treatment for osteoarthritis of the knee, by gender and age group. Overall, **18% of the population** aged 45 and over have sought treatment for osteoarthritis of the knee.*

*Based on 7 year consultation prevalence in general practice, for methods see Annex 1.

4.7m

The number of people who have sought treatment for knee osteoarthritis is equivalent to the population of Outer London

1/2

Just over half of all people consulting about osteoarthritis have knee osteoarthritis.



"My doctor just said it was wear and tear and there was no cure. I then tried to find my own ... Although I still have arthritis, it's much better and improving all the time."

4.1 OSTEOARTHRITIS OF THE KNEE: FUTURE PROJECTIONS

Future projections for knee osteoarthritis based on the increasing size and age of the population

The population of the UK is increasing in size and ageing.¹² Knee osteoarthritis is more common in older people and, as the proportion of older people in the UK rises, the number of people in the UK with knee osteoarthritis is expected to rise considerably.



Future projections of knee osteoarthritis

- » Taking into account the growth and ageing of the UK population alone:
 - The number of people with osteoarthritis of the knee is estimated to increase from 4.7 million in 2010, to 5.4 million in 2020, reaching 6.4 million by 2035.
 - The increase in knee osteoarthritis will be substantial in those over 65, and greatest in those over 75.
- » Taking into account the increase in obesity, together with growth and ageing of the UK population:
 - The number of people with osteoarthritis of the knee is estimated to increase from 4.7 million in 2010, to 6.5 million by 2020, reaching 8.3 million by 2035.

"I'd like medication without side effects... information on exercises for strength and mobility"

Our estimates suggest that, based on the increasing size and age of the UK population, the number of people with osteoarthritis of the knee will increase from 4.71 million in 2010, to 5.4 million in 2020, reaching 6.4 million by 2035. The number of women with knee osteoarthritis is likely to continue to be greater than men so that by 2035 an estimated 2.88 million men, but 3.52 million women in the UK will have knee osteoarthritis (see figure 8).

Our estimates indicate that over the period to 2035, a substantial number of people with knee osteoarthritis will be people within the working ages of 45 and 64. They also predict a steep rise in the number of people aged 65 and over with osteoarthritis of the knee. In those aged 65 to 74, the number of men with knee osteoarthritis is estimated to be 0.76 million by 2035, and number of women will be 0.96 million. This change is even more marked in those aged 75 years or over, with over 2 million people in this age group estimated to have knee osteoarthritis by 2035.

Future projections for knee osteoarthritis taking into account the rise in obesity

Obesity is a strong risk factor for knee osteoarthritis, with very obese people being 14 times more likely to develop the condition than those with a healthy body weight.¹³ National data indicates that the level of obesity is rising, and predicts that over half of the adult population in England could be obese by 2050.^{14,15} This trend is expected to cause a substantial increase in the number of people with knee osteoarthritis in the future.

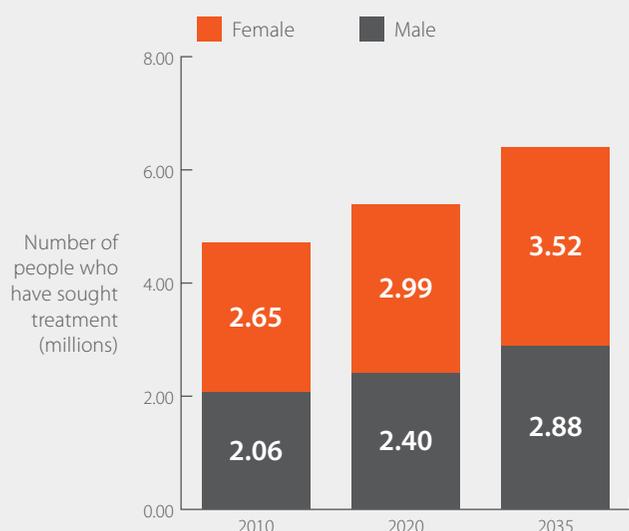
Our estimates suggest that the effect of rising obesity alone would increase the number of people in the population consulting a GP about knee osteoarthritis from 4.71 million to 5.80 million by 2020, and to 6.61 million by 2035.

Future projections for knee osteoarthritis taking into account the rise in obesity, together with the increasing size and age of the population

An overall estimate of future levels of knee osteoarthritis can be produced by taking into account both the increasing size and ageing of the population, and the expected increase in obesity. When these factors are combined, our estimates suggest that the the number of people in the UK seeking treatment for osteoarthritis could rise from 4.71 million in 2010 to 8.30 million by 2035 (see figure 8.4).

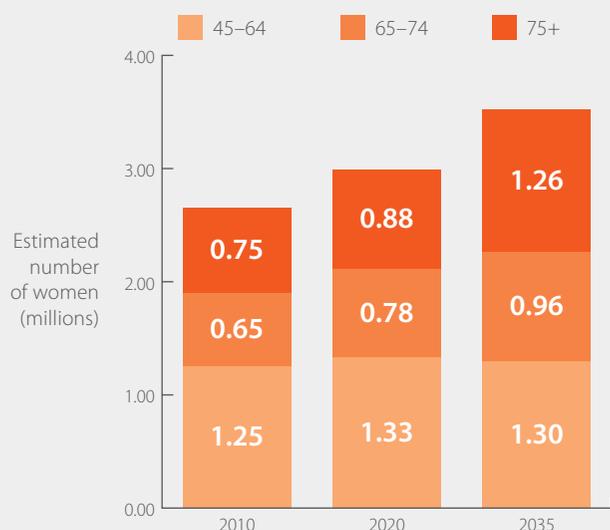
Figure 8: Future projections of knee osteoarthritis

8.1: Taking into account the size and ageing of the UK population, how many people in the UK will have osteoarthritis of the knee in future?



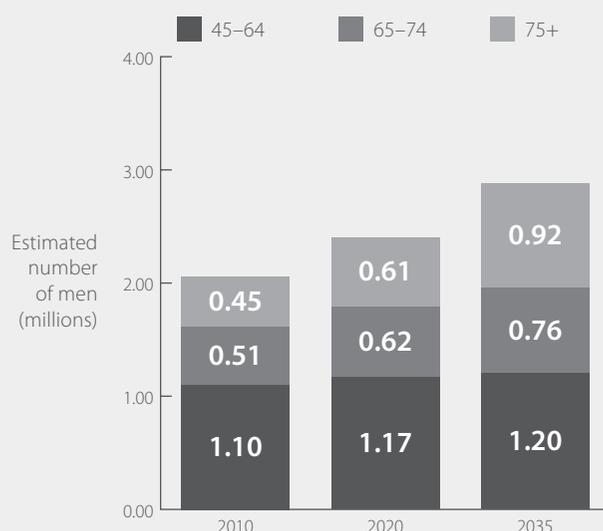
This graph shows the estimated number of people in the UK who will have knee osteoarthritis in the future. Estimates suggest that by 2035, **6.4 million people** in the UK will have osteoarthritis of the knee.*

8.3: Taking into account the size and ageing of the UK population, how many women will have osteoarthritis of the knee in future?



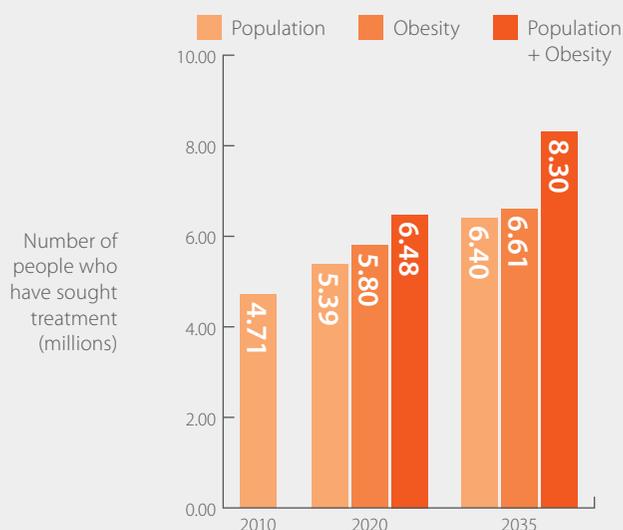
This graph shows the estimated number of women in the UK who will have knee osteoarthritis in the future, by age group. The number of working age women with knee osteoarthritis is estimated to taper between 2020 and 2035, due to the population demographic. The increase in consulting about knee OA is expected to be highest in women of older age, due to the size and ageing of the population in future.*

8.2: Taking into account the size and ageing of the UK population, how many men will have osteoarthritis of the knee in future?



This graph shows the estimated number of men in the UK who will have knee osteoarthritis in the future, by age group. The estimated future increase in knee OA, due to the size and ageing of the population, is clear in men over 75 years.*

8.4: Taking into account obesity, the size and ageing of the UK population, how many people in the UK will have knee osteoarthritis in the future?



This graph shows the estimated number of people in the UK who will have knee osteoarthritis in the future, taking into account the effect of obesity, and the changes to the size and ageing of the population, and the two factors combined.*

*For methods see Annex I.

5. OSTEOARTHRITIS OF THE FOOT AND ANKLE

What is osteoarthritis of the foot and ankle and what is its impact?

The foot and ankle form a complicated structure, made up of 26 bones, 33 joints and over a hundred muscles, tendons and ligaments, which work together to bear the weight of the body and enable walking. The joint between the big toe and the foot, and a collection of joints in the mid-foot known as the tarsus joints are mostly likely to be affected by osteoarthritis (see figure 9.3). Foot osteoarthritis may be asymptomatic, but can cause pain and joint stiffness. Besides causing pain, arthritis of the foot and ankle can make walking difficult and, together with a fear of falling, can restrict social lives and relationships. It can also lead to compensatory changes in foot posture, in turn causing further deterioration of the joints of the foot, or leading to painful swellings known as bunions.

What are the causes of osteoarthritis in the foot and ankle?

Factors which can lead to the development of osteoarthritis in the foot and ankle include damage from injury and repeated episodes of gout (an inflammatory form of arthritis which commonly affects the big toe). Inappropriate footwear can also be a cause.

What are the treatments for osteoarthritis of the foot and ankle?

The choice of appropriate footwear can play a key role in managing osteoarthritis of the foot and ankle. Healthcare professionals should offer people advice on appropriate footwear (including their shock-absorbing properties) as part of core treatment for people with lower limb osteoarthritis. Joint supports and insoles should be considered, especially for people with joint pain or instability.¹⁶



Lorraine was diagnosed with osteoarthritis when, after taking early retirement, she began to experience pain in her feet, knees and back. She sometimes struggles with day-to-day tasks such as climbing the stairs, but finds massage, aromatherapy, hydrotherapy and acupuncture help her to manage her condition.

"I never imagined I wouldn't be able to run again. In fact now, I have difficulty even walking especially managing stairs; however I still have that wonderful memory of running in the fresh air of the countryside pain free. Although my arthritis has severely restricted my movement, I still manage to exercise by swimming"



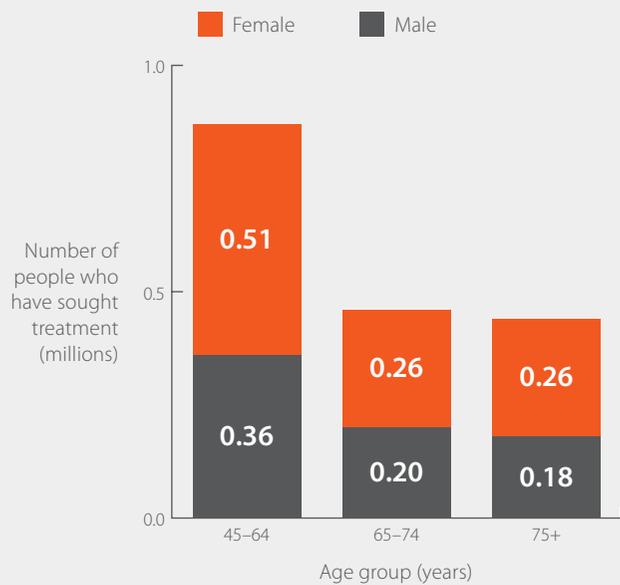
Key Statistics

- » 7% of people aged 45 and over in the UK have sought treatment for osteoarthritis of the foot or ankle.
- » 1.77 million people in the UK have sought treatment for osteoarthritis of the foot or ankle.
- » Women are slightly more likely to have sought treatment about osteoarthritis of the foot or ankle than men.
- » There is an increase in osteoarthritis of the foot and ankle between the ages of 45 and 75 years.
- » Of those aged 75 years and over in the UK, 9% of people have sought treatment because of osteoarthritis of the foot or ankle.
- » One in five people who have sought treatment for osteoarthritis have it in the foot or ankle.

Our data indicate that **1.77 million people in the UK aged 45 and over have sought treatment for osteoarthritis in their foot or ankle (see figure 9.1)**. Women aged between 45 and 74 are more likely than men of the same age to have sought treatment for osteoarthritis of the foot and ankle. The likelihood of having osteoarthritis of the foot and ankle increases with age; 9% of both men and women aged 75 and over have sought treatment because of this condition (see figure 9.2).

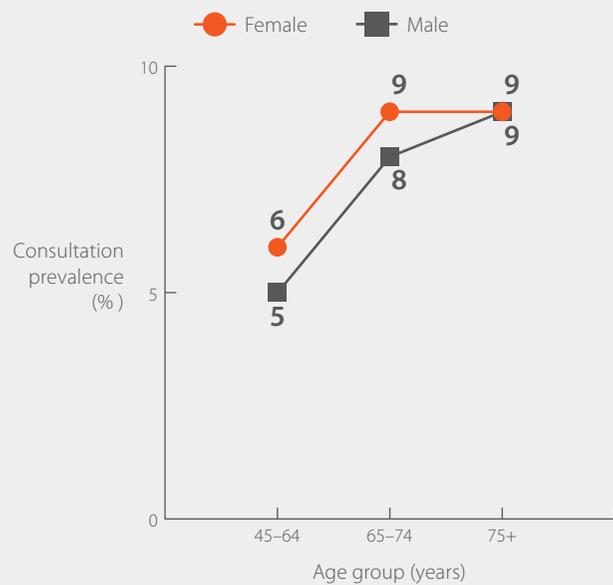
Figure 9: Osteoarthritis of the foot and ankle

9.1: How many people in the UK have osteoarthritis of the foot or ankle?



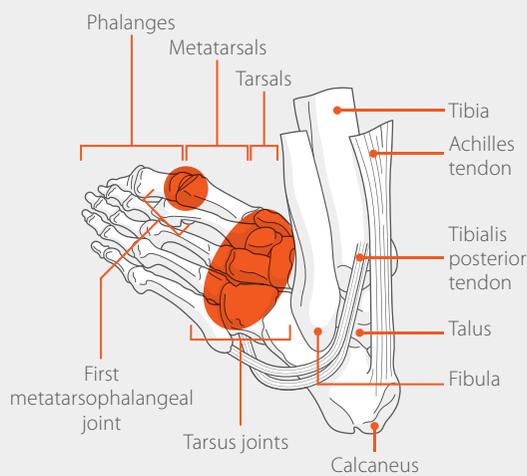
This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis of the foot or ankle, by gender and age group. A total of **1.77 million people** have sought treatment for osteoarthritis of the foot or ankle.*

9.2: How common is osteoarthritis of the foot and ankle?



This graph shows the estimated proportion of people in the UK who have sought treatment for osteoarthritis of the foot and ankle by gender and age group. Overall **7% of people** aged 45 and over have sought treatment about osteoarthritis of the foot or ankle.*

9.3: Diagram of the foot and ankle highlighting the areas most likely to be affected by osteoarthritis



1/5

One in five people who have sought treatment for osteoarthritis have it in their foot or ankle

*Based on 7 year consultation prevalence in general practice, for methods see Annex I.

6. OSTEOARTHRITIS OF THE HAND AND WRIST

What is osteoarthritis of the hand and wrist and what is its impact?

Osteoarthritis in the hands is often a type known as nodal osteoarthritis in which painful inflammation of the joints subsides over time leaving bony swellings (or nodes) behind the joints. The joints at the finger ends and base of the thumb are most often affected. Although the fingers often continue to function well, the thumb joint can become stiff and the ability to grip can be reduced. Hand function can be significantly impaired when the finger joints closest to the hand are affected. Osteoarthritis of the hand and wrist can have a profound impact on people's lives, limiting people's ability to make the hand movements necessary for everyday activities and work. Losing the ability to open food containers, to write, to fasten buttons, or to turn a key in a lock can threaten independence and confidence.

What causes osteoarthritis of the hand and wrist?

Osteoarthritis of the hand has a genetic component, which is stronger than that for other forms of osteoarthritis, and often maternally inherited. It is also associated with some forms of heavy manual work. High bone density is an additional risk factor.¹⁷

What are the treatments for osteoarthritis of the hand and wrist?

Hand and wrist osteoarthritis often does not require medication, although some people use anti-inflammatory gels to reduce pain. Hand or wrist splints may be used for protection and support, either to rest the joints of the wrist and hand, or to support the hand at work. Surgical fusion of the joints can be undertaken to improve grip, although this is rare.



Gayle has osteoarthritis in her hands, shoulder, lumbar facet joint and painful fingers. As an asthmatic she is limited in the painkillers she can take.

"Arthritis runs in my family, so I always thought that I might get it ... I do worry about having children and passing it onto them. It's not been pleasant so far, and ... I know I have the worst to come."



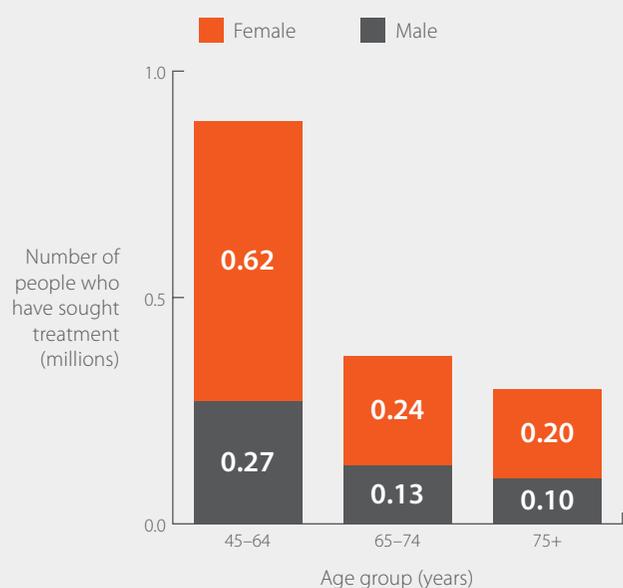
Key Statistics

- » 6% of people aged 45 and over in the UK have sought treatment about osteoarthritis of the hand or wrist.
- » 1.56 million people in the UK have sought treatment about osteoarthritis of the hand or wrist.
- » Women are more likely than men to have sought treatment about osteoarthritis of the hand or wrist.
- » Women aged 45-64 are more than twice as likely to have sought treatment about osteoarthritis of the hand or wrist than men.
- » 620,000 working age women in the UK (45-64 years) have sought treatment about osteoarthritis of the hand or wrist.
- » Just over one in every 6 people who have sought treatment for osteoarthritis have it in their hand or wrist.

Our data indicate that 1.56 million people in the UK aged 45 and over have sought treatment for osteoarthritis of the hand or wrist (see figure 10.1). Women are more likely than men to consult about osteoarthritis of the hand and wrist, with women aged between 45 and 64 more than twice as likely to have sought treatment than men of the same age (see figure 10.2). The number of women of working age who have sought treatment for osteoarthritis of the hand or wrist is particularly high, at around 620,000.

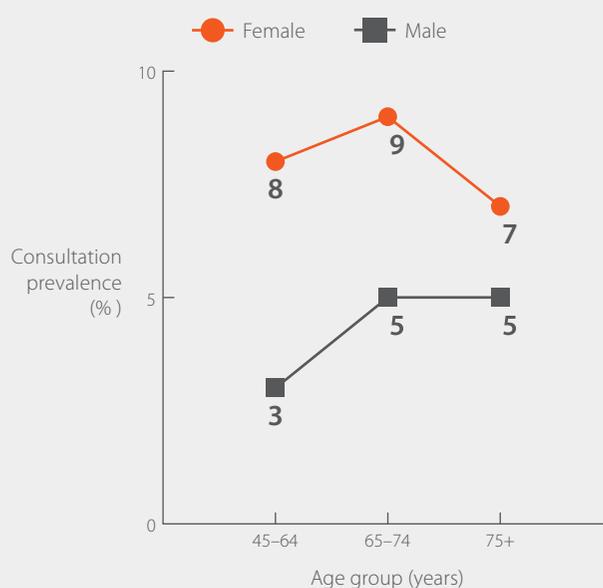
Figure 10: Osteoarthritis of the hand and wrist

10.1: How many people in the UK have osteoarthritis of the hand or wrist?



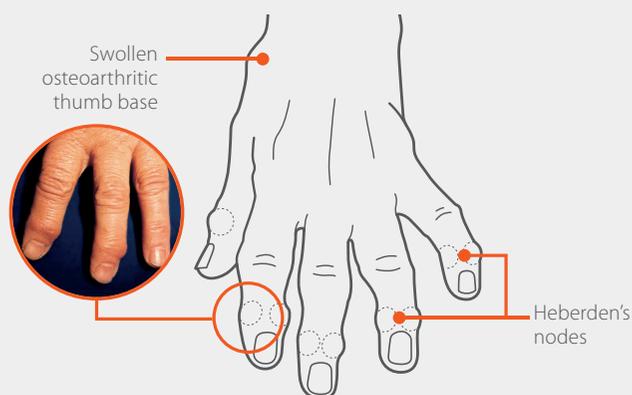
This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis of the hand and wrist, by gender and age group. Over half a million women of working age in the UK have sought treatment for osteoarthritis in their wrists or hands.*

10.2: How common is osteoarthritis of the hand and wrist?



This graph shows the estimated proportion of people in the UK who have sought treatment for osteoarthritis of the hand and wrist by gender and age group. Overall 6% of the people aged 45 and over have sought treatment for osteoarthritis of the wrist or hand.*

10.3: Illustration of an osteoarthritic hand.



1/6

Over one in every 6 people who have sought treatment for osteoarthritis have it in their hand or wrist

*Based on 7 year consultation prevalence in general practice, for methods see Annex I.

7. OSTEOARTHRITIS IN SEVERAL SITES OF THE BODY

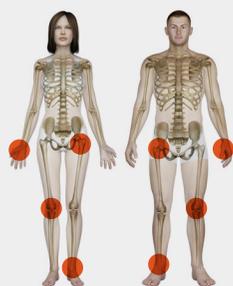
What is multi-site osteoarthritis and what is its impact?

People often develop osteoarthritis in more than one joint of their body. Our analysis included osteoarthritis in two or more regions of the body - knee, hip, hand/wrist, or foot/ankle - as multi-site osteoarthritis. Experiencing pain from several joints at the same time can have a major impact on people's wellbeing. The impact of osteoarthritis on mobility can also be compounded if osteoarthritis occurs in several regions of the body – for example, osteoarthritis of the foot may require the use of a walking stick or frame, in turn putting pressure on the joints of the hands and wrist. For some people with severe osteoarthritis the need to undergo multiple joint replacements over time can become limiting, with recovery cutting into their time available for work, social life and holidays.



Terry has had severe osteoarthritis since her 50s and has had four joint replacements – both shoulders, her left hip and left knee. She is having cortisone injections in the right knee, which will need replacing soon. The progress of the disease is slow and degenerative, and she has good days and bad days, like most people with osteoarthritis.

"...if everything that I have gone through can be avoided by identifying osteoarthritis early - if we can find who will get osteoarthritis or get it badly, and intervene early in the disease process - how fantastic that would that be!"



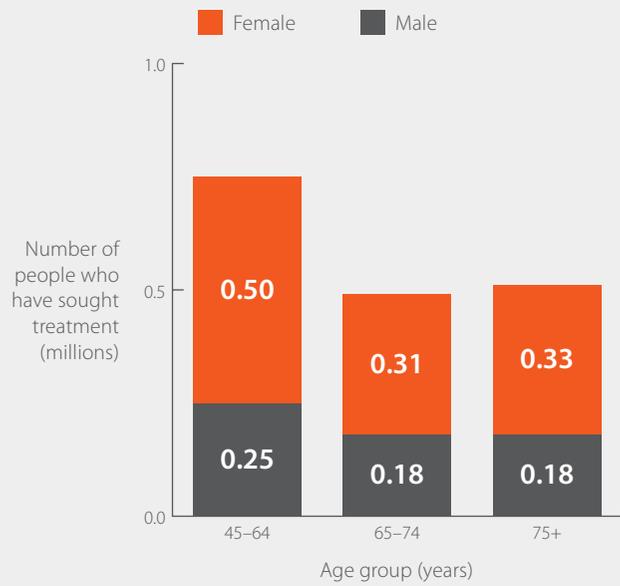
Key Statistics

- » 7% of people aged 45 and over in the UK have sought treatment for osteoarthritis in more than one site of the body.
- » 1.76 million people in the UK have sought treatment for osteoarthritis in two or more sites of the body.
- » Women are more likely to consult about osteoarthritis in multiple joints of the body than men.

Our data indicate that 1.76 million people in the UK aged 45 and over in the UK have got osteoarthritis in two or more regions of the body (see figure 11.1). Women are more likely to have sought treatment about multi-site osteoarthritis than men, and the likelihood of having multi-site osteoarthritis increases with age. Around 10% of people aged 75 and over have sought treatment for osteoarthritis in more than one site of the body (see Figure 11.2).

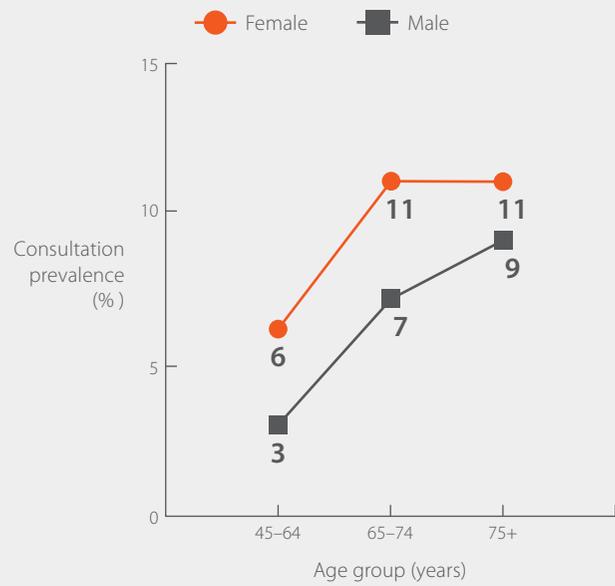
Figure 11: Osteoarthritis in several sites of the body

11.1: How many people in the UK have osteoarthritis in more than one region?



This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis in more than one region of the body, by gender and age group. 1.76 million people have sought treatment for osteoarthritis in two or more regions of the body.*

11.2: How common is osteoarthritis in more than one region of the body?



This graph shows the estimated number of people in the UK who have sought treatment for osteoarthritis in more than one region of the body, by gender and age group. Overall 7% of people aged 45 and over have sought treatment for osteoarthritis in two or more regions of the body.*

*Based on 7 year consultation prevalence in general practice, for methods see Annex I.

8. WHAT CAN BE DONE TO ADDRESS THE IMPACT OF OSTEOARTHRITIS?

The data in this report indicate that 8.75 million people in the UK, around a third of the population aged 45 and over, have sought treatment for osteoarthritis. This condition has a significant impact on the nation's health and wellbeing, and consumes substantial resource within general practice. Estimates of knee osteoarthritis alone indicate the massive future impact of osteoarthritis, compounded by the ageing of the population and rise in obesity. What can be done to minimise the impact of osteoarthritis, now and in the future?

1. Prioritisation of osteoarthritis in national policy

To limit the impact of osteoarthritis it is essential that this condition is addressed within public health, the health service and social care policy.

Recommendation 1: The substantial contribution of osteoarthritis to multimorbidity and frailty should be recognised by NHS England and Public Health England. A coordinated programme of activity should be implemented to address this condition, as a public health priority, and as a priority in the primary care management of long term conditions.

2. Identifying musculoskeletal pain in people with other long term conditions

Many people who contact the health service for other long term conditions (for example, heart or lung disease, or diabetes) will have osteoarthritis that impacts on their quality of life and on the effectiveness of their treatment. However, people may not proactively discuss osteoarthritis with a healthcare professional.

Recommendation 2: Healthcare professionals should be alert to the presence of osteoarthritis in people with other conditions. They should routinely ask people whether they are experiencing musculoskeletal pain, and proactively consider and address its impact on overall health and mobility when discussing a person's needs.

Arthritis Research UK and the Royal College of General Practitioners are working to improve the core skills of GPs and GP trainees in diagnosing and managing musculoskeletal conditions, including osteoarthritis, through new e-learning modules, consultation skills workshops and online resources.¹⁸

3. Ensuring people with osteoarthritis have access to recommended, high quality care

Although national clinical guidelines set out the elements of care that adults with osteoarthritis should expect, these are not universally available. The current inequity in access to the best quality treatment for osteoarthritis should be addressed.

Recommendation 3: Health and wellbeing boards should assess and monitor the impact of osteoarthritis in their local population, and hold clinical commissioning groups and NHS England to account for ensuring the national clinical guidelines for osteoarthritis are put into practice.

4. Improving data collection for outcome measures about osteoarthritis

Data on incidence and prevalence, clinical activity and health outcomes of people receiving treatment can support improvement in the quality of healthcare.

Recommendation 4: Standardised coding for osteoarthritis should be adopted in general practice, and encouraged in other care settings including community care and hospital outpatient departments. Indicators for osteoarthritis should be developed and included within the NHS and Public Health Outcomes Frameworks.

Arthritis Research UK is working to develop a Musculoskeletal Patient Reported Outcome Measure (M-PROM) which could be used by people with osteoarthritis to rate their own health status, and has potential as an indicator in the NHS Outcomes Framework.¹⁹

5. Ensuring services meet the physical and mental health needs of people with osteoarthritis

In addition to GPs, multidisciplinary care for people with arthritis can be provided through practice and district nursing, physiotherapy, podiatry, exercise and weight management programmes, pain specialists and pain management services, and mental health services.

Recommendation 5: Local authorities, clinical commissioning groups and NHS England must ensure that appropriate services to meet the physical and mental health needs of people with osteoarthritis are commissioned, accessible and integrated. Joint Strategic Needs Assessments produced by health and wellbeing boards should recognise the impact of osteoarthritis on the health of the local population and clearly state measures to promote physical exercise, tackle obesity, and to identify and provide support for the mental health needs of people with osteoarthritis, including management of depression.

6. Addressing osteoarthritis through research

Research is needed to better understand the underlying causes of osteoarthritis, to enable identification of the people most at risk, to find new means of identifying osteoarthritis in its early stages, and to develop new interventions to postpone the onset and prevent the progression of osteoarthritis as well as the optimal approach to repair damaged joints.

Recommendation 6: Pioneering, high quality research to develop the best means of preventing and treating osteoarthritis should be pursued and supported.

Arthritis Research UK supports research into osteoarthritis including:

Arthritis Research UK Tissue Engineering Centre: This centre brings together leading academic clinicians with scientists in engineering, biology and material science. They are working to develop novel treatments to address osteoarthritis in its early stages. A particular aim is to find ways of repairing the joint damage caused by osteoarthritis using a patient's own stem cells to regenerate bone and cartilage. New and less invasive techniques to repair damage such as key-hole surgery are also in development.

Arthritis Research UK Primary Care Centre: This centre works to provide an evidence-base to inform the provision of the very best care for patients with arthritis (including osteoarthritis, chronic musculoskeletal pain, gout and polymyalgia rheumatica) in general practice. The centre's research aims to shift the way that musculoskeletal conditions are managed in primary care, from disease-focused reactive treatments, to a pro-active positive approach to self-management. The MOSAICS (Management of osteoarthritis in consultations) study, for example, is currently assessing the effectiveness of a GP-practice led intervention for osteoarthritis.

Arthritis Research UK Centre for sport, exercise and osteoarthritis: This centre brings together specialists in sports medicine and osteoarthritis to understand why some sports injuries will go on to develop into osteoarthritis, and whether we can prevent or slow down degeneration of the joints. The centre's research aims to develop better injury treatments and screening tools to predict an individual's risk of developing osteoarthritis following sports injury.

Biomechanical interventions for osteoarthritis: Arthritis Research UK supports two experimental osteoarthritis treatment centres (EOTC's) which are working to test novel biomechanical interventions for the prevention of osteoarthritis, particularly of the knee. The first is investigating how orthotic interventions (such as braces, insoles and splints) can halt or slow the progression of osteoarthritis, the second focuses on therapies which modify the forces exerted on the joints. We also support a series of clinical trials assessing the effectiveness of different treatments for osteoarthritis.

arcOGEN: Supported by Arthritis Research UK, the arcOGEN study is the world's largest genetic study into osteoarthritis, involving over 7,400 patients and 11,000 healthy volunteers. To date, it has identified eight new genetic regions that play a role in increased risk of developing osteoarthritis.

Arthritis Research UK Pain Centre: This centre's research is focused on investigating how people experience pain. Its research is aimed at understanding the biological basis of pain in osteoarthritis, to develop new drugs to treat pain more effectively and to target existing drugs more effectively at individual patients. The basic pathways of pain perception and the changes in the tissues caused by arthritis are also being investigated, to help identify new targets for developing treatments.

For information on all the research we fund visit www.arthritisresearchuk.org

NICE clinical guidelines for the care and management of osteoarthritis in adults:

People with osteoarthritis should have:

- » **Holistic assessment** of their needs in partnership with a health professional. This is essential, as 82% of people with osteoarthritis have at least one other long term condition.²⁰
- » **Care planning:** Despite its inclusion in guidance, a recent survey found that only 18% of people have an agreed management plan (or care plan) for their osteoarthritis.²¹ People with osteoarthritis should be supported to develop a personalised management plan, through a process which enables them to prioritise their own health and wellbeing needs and sets out how these can be met. The agreed plan should be shared in an appropriate format and regularly reviewed. NHS England should meet its objective set out in its mandate to ensure that everyone with a long term condition is offered a personalised care plan.²²
- » **Support for self-management:** People with osteoarthritis should be supported to develop strategies which enable them to manage their condition (including their emotional and psychological needs).
- » **Shared decision making:** People with osteoarthritis should be empowered to make informed decisions about their treatment (e.g. whether to have joint replacement).
- » **Information and advice about osteoarthritis** should be provided, or signposted by a health professional on an ongoing basis.
- » **Exercise:** Advice on general aerobic fitness and local muscle strengthening appropriate to the person should be provided (although exercise itself may not be provided by the NHS).
- » **Weight loss:** Advice on weight loss should be provided.
- » **Pain relief:** People with osteoarthritis should be offered pain relieving or anti-inflammatory medication, after consideration of the relevant risks and benefits.
- » **Additional support:** People with instability should be assessed for bracing, joint supports and insoles; assistive devices (e.g. sticks and tap turners) should be considered. People with lower limb osteoarthritis should receive advice on appropriate footwear.
- » **Access to joint replacement surgery:** People with osteoarthritis should be referred for surgery before they have prolonged functional limitation and severe pain. People waiting for joint replacement surgery should be informed of their right to receive consultant-led treatment within 18 weeks of GP referral, as outlined in the NHS Constitution.²³

Arthritis Research UK produces information for people with osteoarthritis,²⁴ including leaflets on:

- » Osteoarthritis
- » Osteoarthritis of the knee
- » Keeping moving
- » Looking after your joints when you have arthritis
- » Work and arthritis

These can be accessed at www.arthritisresearchuk.org

ANNEX I: METHODS

1. Overview

The data in this report is drawn from two sources:

1. Figures about the numbers of people with osteoarthritis are based on a new analysis of data from the Consultations in Primary Care Archive (CiPCA) produced by the Arthritis Research UK Primary Care Centre at Keele University.^{25,26,27} This analysis is the source of all the data presented in this report except that in (2) below.
2. Additional analyses to provide estimated projections of the future number of people with osteoarthritis of the knee have been carried out by Arthritis Research UK. This data is included in tables 4-9, and is discussed in section 4.1.

This annex provides information on the methods and additional data sources used (for example national population statistics). A copy of the data is included at Annex II.

1.1 Estimating the number of people with osteoarthritis in the UK

Osteoarthritis is challenging to define and diagnose, and data on the extent of this condition in the population is difficult to obtain.²⁸ Estimates of the numbers of people with osteoarthritis have previously been based on data from national surveys, general practice research databases, and bespoke epidemiology and cohort research studies, as there is no systematic data collection within the NHS to provide comprehensive national figures.²⁹ This report uses data about the number of people consulting with osteoarthritis in general practice to provide an estimate of the number of people living with this condition nationally.

A major challenge is that, in contrast to other conditions (such as diabetes, which can be diagnosed using biomedical measurements including blood sugar levels), there is no simple test to determine whether an individual has osteoarthritis. Diagnosis tends to embrace a variable combination of patient reported features (joint pain and restricted movement), radiographic or magnetic resonance imaging (MRI) of the joint, and clinical exclusion of rare diseases which might cause similar symptoms. Damage to joint cartilage and bone thickening, which characterise osteoarthritis, can be examined using x-ray, but x-ray findings often do not correlate with other symptoms including joint pain. Two people with similar evidence of joint damage on x-ray could experience very different levels of pain. Consequently, diagnosis of osteoarthritis varies greatly between individual GPs and across general practices, with GPs often using symptom labels such as 'knee pain' rather than a diagnostic label of osteoarthritis. This has been a barrier to standardised data collection which would enable the burden of osteoarthritis on a national scale to be determined. Steps taken to minimise variation in diagnosis and coding in this analysis are discussed below.

1.2 Approach taken to estimate the number of people in the UK with osteoarthritis

- » The analysis in this report used data recorded in an anonymised general practice database, the CiPCA dataset. (see box).
- » The number of people consulting with osteoarthritis was defined as the number of people aged 45 years and over given a diagnosis of osteoarthritis, or recorded as having symptoms, predominantly pain, in one of four main joint regions (knee, hip, hand/wrist, foot/ankle), in the absence of a record of another diagnosis (fracture, infection, gout, rheumatoid arthritis) for these symptoms. This inclusive definition allows for variation in diagnosis and coding between GPs and practices.
- » A 7 year consultation period was used (2004-2010). This timeframe would enable people with osteoarthritis who do not consult regularly to be included (so avoiding any potential under-estimation which may occur if annual consultation data is used). Osteoarthritis is a long term condition, and once diagnosed, many people do not consult their GP regularly.
- » The number of people registered with the general practices contributing to the CiPCA dataset is known, and can be analysed by gender and age band (45-64, 65-74, 75+ years).

- » The proportion of people consulting with osteoarthritis ('consultation prevalence') in each gender and age group was calculated by dividing the number consulting at least once with osteoarthritis by the total number of persons in the relevant subgroup of the registered population. These calculated figures were next standardised to the UK age and gender distribution.³⁰ Standardisation accounts for the differences between the age and gender distribution of the CiPCA database population and that of the UK. These data are included in table 1.
- » Consultation prevalence figures were then scaled up to produce UK-wide estimates of the numbers of people with osteoarthritis.³¹ See table 2.
- » Estimates of the numbers of people with osteoarthritis in England were also generated.³² See table 3.
- » This approach provides a practical and reasonable means of estimating the numbers of people in the UK with osteoarthritis, which represents all those who have sought treatment about their osteoarthritis at least once over a seven year period.

Consultations in Primary Care Archive (CiPCA)

- » The Consultations in Primary Care Archive (CiPCA) is a high quality database held at Keele University. The database contains anonymised data from 11 general practices in the North Staffordshire region of England, covering a registered population of just under 95,000 people.* Use of this data is covered by permissions from the National Research Ethics Centre.
- » All contact with each general practice (appointments, home visits or telephone calls, by GPs or nurses) is recorded in CiPCA. For each contact, the focus of the consultation is coded using the Read Code system to record the illness or symptom.** Close to 97% of patient contacts with a GP are coded.
- » Methodology and expertise in the coding of musculoskeletal conditions has been developed within the general practices contributing to CiPCA through collaboration with Keele University. Practices undergo an annual cycle of assessment, feedback and training in how they record musculoskeletal symptoms and conditions.³³
- » Data from CiPCA about the numbers of people consulting their GPs about musculoskeletal conditions have been found to be comparable to estimates from other national³⁴ and international³⁵ datasets.

2. Estimated projections of the future number of people with osteoarthritis of the knee

2.1 Estimating the future numbers of people with osteoarthritis of the knee in the UK

The knee is the most common site in the body in which people aged 45 years and over have osteoarthritis. Analysis of the CiPCA dataset produced estimates that 18% of people registered with a GP aged 45 and over consult with this condition (see section 4). Further analyses were carried out to estimate the future numbers of people with osteoarthritis of the knee, these were:

1. Estimated future numbers of people over 45 with osteoarthritis of the knee, taking into account the anticipated demographic trends which will increase the number of elderly people.
2. Estimated future numbers of people over 45 with osteoarthritis of the knee, taking into account the demographic trends above and the additional impact of the increased numbers of obese individuals within the population.

* The registered population was taken as the number of people registered in the CiPCA practices on 31 December 2010. The CiPCA practices cover a range of areas in terms of deprivation, although in general terms North Staffordshire is more deprived than England as a whole.

** The Read Code system is used by clinicians to record patient findings and procedures in health and social care on IT systems. For example, they are used by general practice surgeries to record the conditions for which people attend, and by pathology services for the reporting of results. In General Practice the coding system is structured in levels of increasing specificity, for example 'Level 1 : N "Musculoskeletal and connective tissue diseases", down to 'Level 5: N05zL "Osteoarthritis NOS, of knee". The codes have been used in the NHS since 1985, and facilitate electronic communication and support patient records, public health and activity reporting, payments, audit, research and the automation of repetitive manual tasks.
<http://systems.hscic.gov.uk/data/uktc/readcodes/index.html>

2.2 Estimating the future numbers of people with osteoarthritis of the knee in the UK, taking into account the anticipated increase in the size and ageing of the population.

Method 2a:

- » In an initial analysis, projections of the age and gender distribution of the UK population for those aged 45 and over were obtained for each of the years 2010, 2020, 2035 and 2051.³⁶
- » The overall consultation prevalence rate for osteoarthritis of the knee in those over 45, of 18% derived from the CiPCA data set (see Table 2), was applied to these populations to provide an estimate of number of people over 45 with knee osteoarthritis at each of these time points.
- » These data are included in table 4.
- » This method assumes that the consulting prevalence of osteoarthritis of the knee will remain at 18% - i.e. that osteoarthritis of the knee will not become more common in the future.
- » A second assumption is that the influence of age on arthritis risk will remain constant over this time period.
- » (England only estimates were also generated, using population projections for England.³⁷ See table 7).

Method 2b:

- » In a second more detailed analysis, age and gender adjusted consultation prevalence rates for osteoarthritis of the knee were obtained from the CiPCA data set (e.g. Females: 45-64 = 15.4%, 65-74 = 22.9%, 75+ = 25.5%, see Table 1).
- » These rates were applied to projections of the size of the UK population for each of the given age bands, and for each of the years 2010, 2020 and 2035.³⁸ These data are included in table 5.
- » This method assumes that the age-specific population rates of osteoarthritis of the knee will not change in the future (i.e. that the incidence of knee osteoarthritis among each age group will remain constant, and there will not be disproportionate increases in either younger or older people).
- » The total numbers of people predicted to have osteoarthritis of the knee are slightly higher in method 2b compared to method 2a, as a result of taking into account the variation across age groups (for example in the 75+ age group consulting rates of 23-25%, than the fixed rate of 18% used in method 2a).
- » (England only estimates were also generated, using population projections for England.³⁹ See table 8 for England data.)

2.3 Estimating the future numbers of people with osteoarthritis of the knee in the UK, taking into account anticipated population ageing and the anticipated increase in obesity.

The analyses above predict the future numbers of people with osteoarthritis of the knee, taking into account the increasing size and ageing of the UK population, but assuming that the prevalence of knee osteoarthritis in the population will not change. However, there are known risk factors for osteoarthritis of the knee, which are likely to change the prevalence of the disease in future. In particular, obesity is a known risk factor for osteoarthritis of the knee, with morbidly obese people 14 times more likely to develop the condition than people of healthy weight.^{40,41}

An analysis was carried out to estimate the future numbers of people with osteoarthritis of the knee in the UK, taking into account the anticipated increase in population size and ageing and the anticipated increase in obesity. It is difficult to predict the future levels of knee osteoarthritis attributable to obesity accurately: not only may the level of obesity in the population be subject to changes but also the risk of osteoarthritis is related to the number of years an individual's joints are exposed to the excess weight. Based on the current data showing increased levels of obesity it is likely that this trend will be reflected in an increased number of people with osteoarthritis of the knee in the future. As a guide to this likely effect we have derived estimates of future number of cases using an assumption of the increased number of people with obesity.

Method 2c:

- » Projected population increases in the levels of osteoarthritis, taking into account the anticipated size and ageing of the UK population, were obtained as above (method 2b).⁴²
- » A Population attributable risk (PAR) figure was used to estimate the current numbers of cases of knee

osteoarthritis attributable to obesity. There have been many studies investigating the risk of knee osteoarthritis due to obesity. It is difficult to determine an exact PAR for obesity and knee osteoarthritis across the UK due to the number of variables which affect this risk. In this analysis, a PAR of osteoarthritis of the knee due to obesity was taken to be 50%, as a reasonable conservative estimate.*

- » Anticipated changes in the level of obesity were obtained (based on England estimates).** Whilst any future rise in obesity is difficult to predict, it is anticipated that the greatest increase in obesity will be in the number of people with serious obesity (a body mass index, BMI, of 30 or more). People in this group have the highest risk of developing knee osteoarthritis.
- » For this analysis, increases in obesity levels were estimated to increase 1.8-fold in the period 2010-2020 and 2.2-fold in the period 2020-2035 in men; and 1.2-fold in the period 2010-2020 and 1.5-fold in the period 2020-2035 in women.
- » Based on these assumed levels, predicted increases in obesity rates were applied to 'current cases attributable to obesity' figures to estimate how many cases of knee osteoarthritis could be expected if the rates of obesity were to increase as predicted.
- » The figures are presented as projected numbers of people with osteoarthritis of the knee attributable to the age and size of the population, obesity or both (the age and size of the population and obesity estimates added together). These data are included in table 6.
- » (England only estimates were also generated, using population projections for England.⁴³ See table 9 for England data.)

Assumptions

These figures are estimates because:

1. Predicted obesity rates are estimated for adults, these figures will be affected by a variety of factors including social group, regional area, gender and ethnicity.
2. The risk of knee osteoarthritis due to obesity (PAR) is an estimate, this risk varies according to factors including age, gender, and the level of obesity in an individual (dose-response relationship).

* Hoboken (Arthritis Care Res . 2011 Jul;63(7):982-90) estimated an odds ratio of knee osteoarthritis due to obesity of 3.91, which corresponds to a PAR of 42%.

** Changes in the rates of obesity were estimated from the Foresight report (Government Office for Science (October 2007). FORESIGHT Tackling obesities: Future choices – project report) and data published by the National Obesity Observatory (now within Public Health England). HSE 2011 http://www.noo.org.uk/NOO_about_obesity/adult_obesity . The Foresight report provided estimates that obesity rates in adults were around 25% in 2011, and would to increase to 36% (men) and 28% (women) by 2015 and 60% (men) and 50% (women). These estimates were adjusted to match the time frames under consideration (2010, 2020, 2035).

ANNEX II: DATA TABLES

Arthritis Research UK Primary Care Centre, Keele University

Consultation prevalence

Table 1: Consultation prevalence of osteoarthritis*¹ in the CiPCA dataset per 10,000 registered population stratified by age and gender.

Gender	All	Female			Male		
		Age 45+	45-64	65-74	75+	45-64	65-74
Osteoarthritis	3340 (33%)	3096 (31%)	4413 (44%)	4914 (49%)	2345 (23%)	3517 (35%)	4164 (42%)
Knee osteoarthritis	1797 (18%)	1542 (15%)	2290 (23%)	2545 (25%)	1414 (14%)	1970 (20%)	2313 (23%)
Hip osteoarthritis	808 (8%)	685 (7%)	1252 (13%)	1628 (16%)	376 (4%)	832 (8%)	1127 (11%)
Hand/wrist osteoarthritis	597 (6%)	774 (8%)	866 (9%)	666 (7%)	346 (3%)	500 (5%)	508 (5%)
Foot/ankle osteoarthritis	677 (7%)	635 (6%)	928 (9%)	867 (9%)	459 (5%)	795 (8%)	916 (9%)
More than 1 region* ²	670 (7%)	616 (6%)	1102 (11%)	1132 (11%)	321 (3%)	715 (7%)	907 (9%)
Other/unspecified* ³	232 (2%)	182 (2%)	396 (4%)	518 (5%)	99 (1%)	226 (2%)	310 (3%)

Percentage figures (consultation prevalence per 100 registered population) are shown in brackets

*1 - Recorded osteoarthritis or synonymous joint pain coded consultation

*2 - Consultation for osteoarthritis/joint pain for 2 more regions (knee, hip, hand/wrist, foot/ankle)

*3 - Consultation for other or unspecified body region (patient not included elsewhere)

Numbers of people consulting - UK

Table 2: Estimated number of people consulting about osteoarthritis*¹ in UK, stratified by age and gender

Gender	All		Female			Male		
	Age 45+	(%)* ²	45-64	65-74	75+	45-64	65-74	75+
Osteoarthritis	8.75 m	(33%)	2.50 m	1.25 m	1.45 m	1.83 m	0.90 m	0.82 m
Knee osteoarthritis	4.71 m	(18%)	1.25 m	0.65 m	0.75 m	1.11 m	0.51 m	0.45 m
Hip osteoarthritis	2.12 m	(8%)	0.55 m	0.35 m	0.48 m	0.29 m	0.21 m	0.22 m
Hand/wrist osteoarthritis	1.56 m	(6%)	0.62 m	0.24 m	0.20 m	0.27 m	0.13 m	0.10 m
Foot/ankle osteoarthritis	1.77 m	(7%)	0.51 m	0.26 m	0.26 m	0.36 m	0.20 m	0.18 m
More than 1 region* ³	1.76 m	(7%)	0.50 m	0.31 m	0.33 m	0.25 m	0.18 m	0.18 m
Other/unspecified* ⁴	0.61 m	(2%)	0.15 m	0.11 m	0.15 m	0.08 m	0.06 m	0.06 m

m = million

*1 - Recorded osteoarthritis or synonymous joint pain coded consultation

*2 - Equivalent percentage

*3 - Consultation for osteoarthritis/joint pain for 2 more regions (knee, hip, hand/wrist, foot/ankle)

*4 - Consultation for other or unspecified body region (patient not included elsewhere)

Numbers of people consulting - England

Table 3: Estimated number of people consulting about osteoarthritis*¹ in England, stratified by age and gender

Gender	All		Female			Male		
	Age 45+	(%)* ²	45-64	65-74	75+	45-64	65-74	75+
Osteoarthritis	7.30 m	(33%)	2.08 m	1.03 m	1.21 m	1.53 m	0.75 m	0.69 m
Knee osteoarthritis	3.93 m	(18%)	1.04 m	0.54 m	0.63 m	0.92 m	0.42 m	0.38 m
Hip osteoarthritis	1.77 m	(8%)	0.46 m	0.29 m	0.40 m	0.25 m	0.18 m	0.19 m
Hand/wrist osteoarthritis	1.30 m	(6%)	0.52 m	0.20 m	0.16 m	0.23 m	0.11 m	0.08 m
Foot/ankle osteoarthritis	1.48 m	(7%)	0.43 m	0.22 m	0.21 m	0.30 m	0.17 m	0.15 m
More than 1 region* ³	1.46 m	(7%)	0.41 m	0.26 m	0.28 m	0.21 m	0.15 m	0.15 m
Other/unspecified* ⁴	0.51 m	(2%)	0.12 m	0.09 m	0.13 m	0.06 m	0.05 m	0.05 m

m = million

*1 - Recorded osteoarthritis or synonymous joint pain coded consultation

*2 - Equivalent percentage

*3 - Consultation for osteoarthritis/joint pain for 2 more regions (knee, hip, hand/wrist, foot/ankle)

*4 - Consultation for other or unspecified body region (patient not included elsewhere)

Future projections for knee osteoarthritis (Arthritis Research UK)

Future projections for knee osteoarthritis (UK)

Table 4: Projections of the number of people consulting about knee osteoarthritis in the UK, age 45+. (Method 2a)

Year	Estimated number of consultations (millions)
2010	4.71
2020	5.32
2035	6.09
2051	6.69

Based on a consultation prevalence of 18%.

Future projections for knee osteoarthritis (UK)

Table 5: Projections of the number of people consulting about knee osteoarthritis in the UK stratified by age and gender allowing for the size and ageing of the population. (Method 2b).

Gender	All		Female			Male		
	Age 45+		45-64	65-74	75+	45-65	65-74	75+
2010	4.71		1.25	0.65	0.75	1.10	0.51	0.45
2020	5.40		1.33	0.78	0.88	1.17	0.62	0.61
2035	6.40		1.30	0.96	1.26	1.20	0.76	0.92

Data are in millions

Table 6: Projected number of people consulting about knee osteoarthritis in adults aged 45+ in the UK allowing for the size and ageing of the population and increasing rates of obesity

Year	Increase due to	Projected number consulting (millions)
2010	Baseline	4.71
2020	Population	5.39
	Obesity	5.80
	Population + obesity	6.48
2035	Population	6.40
	Obesity	6.61
	Population + obesity	8.30

Future projections for knee osteoarthritis (England)

Table 7: Projections of the number of people consulting about knee osteoarthritis in England, age age 45+. (method 2a)

Year	Estimated number of consultations (millions)
2010	3.93
2020	4.45
2035	5.12
2051	5.66

Based on a consultation prevalence of 18%.

Table 8: Projections of the number of people consulting about knee osteoarthritis in England stratified by age and gender allowing for the size and ageing of the population (method 2b)

Gender	All	Female			Male		
		45-64	65-74	75+	45-64	65-74	75+
Age group	age 45+						
2010	3.93	1.04	0.54	0.63	0.92	0.42	0.38
2020	4.52	1.11	0.65	0.74	0.99	0.52	0.51
2035	5.37	1.10	0.80	1.06	1.02	0.64	0.77

Data are in millions

Table 9: Projected number of people consulting about knee osteoarthritis in adults aged 45+ in England allowing for the size and ageing of the population and increasing rates of obesity

Year	Increase due to	Projected number consulting (millions)
2010	Baseline	3.93
2020	Population	4.52
	Obesity	4.84
	Population + obesity	5.43
2035	Population	5.39
	Obesity	5.51
	Population + obesity	6.97

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