

# MUSCULOSKELETAL CALCULATOR

**Second Local Authority Bulletin**  
Prevalence of back pain in England  
and Liverpool



**76,511**

estimated people  
in **Liverpool** live  
with back pain

## SUMMARY

Arthritis Research UK has partnered with Imperial College London to develop the Musculoskeletal Calculator, a prevalence modelling tool for musculoskeletal conditions. Data on the burden of musculoskeletal conditions are lacking and for the first time this prevalence model provides estimates of the burden of back pain to local areas.

### Key messages

- \ Low back pain is the leading cause of disability in the UK.
- \ Approximately 1 in 6 adults in England have some form of back pain. There's variation in the prevalence of back pain across local authority areas in England.
- \ The prevalence of back pain can be reduced through tackling obesity and improving physical activity. There also appears to be an association between smoking and back pain, but this doesn't seem to be causative.

The Musculoskeletal Calculator for back pain is the second of four local datasets. The back pain estimates were preceded by estimates for knee and hip osteoarthritis, and will be followed by figures for rheumatoid arthritis and high risk fragility fractures.

**1 in 6**

people in  
England have  
back pain

# BACK PAIN IN ENGLAND

## Prevalence

There's variation in the prevalence of back pain at local authority level in England as estimated by the MSK Calculator. Approximately **1 in 6 people (16.9%)** in England have back pain. This includes people of all ages and all causes of back pain.\* The prevalence varies across local authorities in England, ranging from **11.8% to 21.4%**.

## Severity

In our modelling, we identified people with back pain as those with back pain lasting for three or more months.

Around 5.5 million people are estimated to have severe back pain, which is 61% of all people with back pain.

People were defined as having severe back pain if they reported experiencing either:

- \ a high intensity of pain
- \ severe limitation as a result of their pain.

\*The model includes all ages however cases were identified in people aged 16 years and over only.

**Figure 1. Prevalence of total back pain at local authority level in England**

- Highest third
- Middle third
- Lowest third



**Figure 2. Prevalence of severe back pain at local authority level in England**

- Highest third
- Middle third
- Lowest third



**9m**

**estimated people in England live with back pain**

**16.9%**

**estimated prevalence of back pain in England**



**5.5m**

**estimated people in England have severe back pain**

# AREA SPECIFIC ESTIMATES FOR LIVERPOOL

## Prevalence

The Musculoskeletal Calculator estimates that 76,511 people in Liverpool live with back pain. This means that of the total Liverpool population, 16.3% are estimated to have back pain (overall prevalence). This is lower than the overall England prevalence of 16.9%.

## Severity

It's estimated that there are 46,836 people in Liverpool with severe back pain, which equates to 10.0% of the population.

## Liverpool:



**76,511**

estimated people in Liverpool live with back pain

**16.3%**

estimated prevalence of back pain in Liverpool



**46,836**

estimated people in Liverpool have severe back pain



**29,341**

males have back pain (male prevalence 12.6%)



**47,170**

females have back pain (female prevalence 19.9%)

## Of the total who have back-pain:

**18,753**

are aged under 35 years (24.5%)

**36,317**

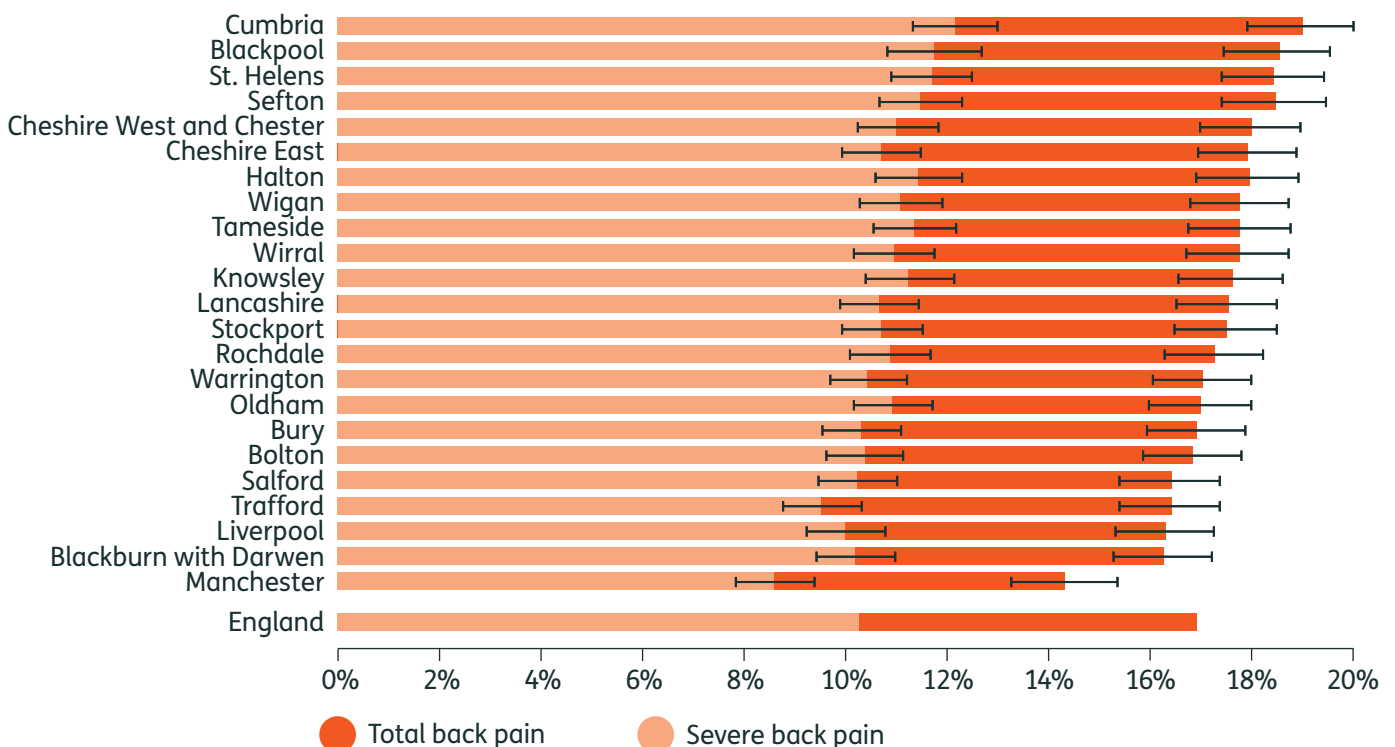
are aged 35 to 64 years (47.5%)

**21,441**

are aged 65 years and over (28.0%)

\*due to rounding, percentages may not always add up to 100%

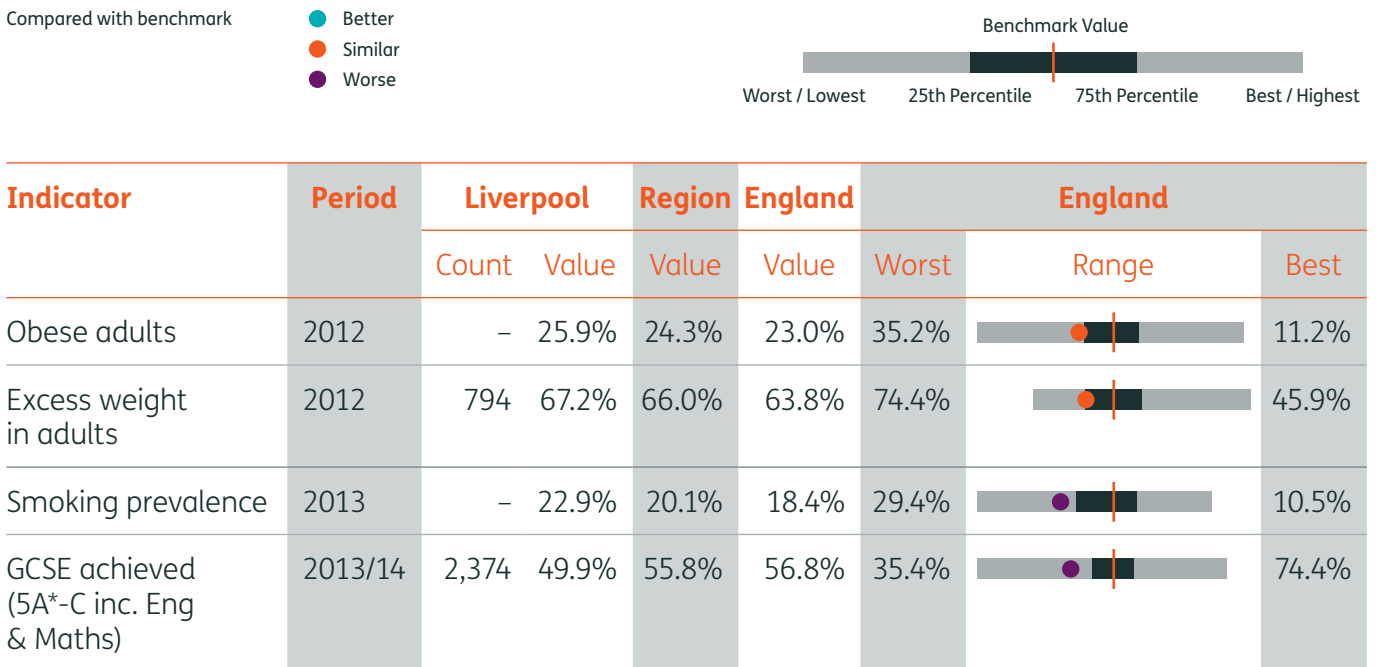
**Figure 3. Back pain prevalence for local authorities in the North West, compared to England**



# RISK FACTORS FOR BACK PAIN IN LIVERPOOL

In our modelling, we found that risk of back pain is related to age, sex, socioeconomic status, body mass index, smoking status and education. Liverpool is among the most deprived local authority areas in England (deprivation decile 1). It has a significantly lower proportion of adults who are physically active compared to the England average and the overall smoking prevalence is significantly higher than the England average. The proportion of adults in Liverpool who are overweight or obese is similar to the England average. All local authority areas could benefit from further improvements to their risk factor profiles regardless of their position relative to the England average.

**Figure 4. Indicators showing how Liverpool compares to England for risk factors relevant to back pain**



Source: © Crown copyright 2015 Health Profiles accessed via <http://fingertips.phe.org.uk/> 16th April 2015.

# GENERAL INFORMATION ON BACK PAIN



**BACK PAIN IS THE MOST COMMON CAUSE OF DISABILITY IN THE UK AND HAS BEEN FOR AT LEAST 20 YEARS!**

## **Cause**

Some back pain can be due to underlying medical conditions, but about half of chronic cases have no identified cause (non-specific back pain).<sup>i</sup> Long-term back pain is associated with depression,<sup>iii</sup> so people with back pain are likely to have a greater need for mental health services.

## **Burden of disease**

About 20% of people with low back pain consult their GP, which poses a large burden on the health and social care system.

Back pain results in millions of lost working days, and is responsible for £10 billion of indirect costs each year.<sup>ii</sup>

## **Risk factors**

There are a number of risk factors for the development of back pain including increasing age, female sex, smoking, low educational attainment and heavy physical lifting in the workplace. The largest modifiable risk factor is obesity. Given the projected increases in obesity, and the growth and ageing of the population the proportion of people affected by low back pain is expected to rise.<sup>iv</sup>

In terms of reducing the prevalence of persistent back pain, there's reasonable evidence that many types of post-treatment back exercise can reduce low back pain recurrence.<sup>v</sup> There's also evidence that exercise in combination with education is likely to prevent episodes of low-back pain.<sup>vi</sup>

# TAKING LOCAL ACTION ON BACK PAIN

**Arthritis Research UK's**  
**'Musculoskeletal health:  
a public health approach'**  
[arthritisresearchuk.org](http://arthritisresearchuk.org)

An ageing population, alongside rising levels of obesity and physical inactivity, is expected to increase the number of people living with painful musculoskeletal conditions. Like other long-term conditions, obesity and physical inactivity are major avoidable risk factors for developing musculoskeletal conditions. This report adopts a life course approach to musculoskeletal health and makes four recommendations for a public health approach to musculoskeletal conditions:

- 1** When assessing local and national population health, musculoskeletal health must be included in the assessment.
- 2** When designing, implementing and evaluating programmes targeting lifestyle factors such as obesity and physical inactivity, impact on musculoskeletal health should be explicitly included.
- 3** When developing health promotion messages, the benefits of physical activity to people with musculoskeletal conditions should be emphasised.
- 4** All this public health activity must be underpinned by high-quality data about musculoskeletal health.

Local authorities and commissioners have an important role to play in supporting people that have back pain. However, our research shows that **62%** of local authorities fail to include back pain in their assessment of local health needs.<sup>vii</sup>

## **STarTBack**

[www.keele.ac.uk/sbst](http://www.keele.ac.uk/sbst)

This is an approach to back pain care developed by Keele University. Patients are stratified according to prognosis, and then matched to the appropriate treatment package.

This new model of treatment results in greater health benefits, achieved at a lower average health-care cost, with an average saving to health services of **£34.39** per patient and societal savings of **£675** per patient.<sup>viii</sup>

## **National Institute for Health and Care Excellence (NICE)**

NICE make recommendations about the treatment and care of people with back pain. These recommendations include:

- \ holistic care of people with back pain
- \ self-management
- \ initial treatments which include exercise and manual therapy, with consideration of psychological therapy and surgery at a later stage.

These recommendations can be found in 'Low back pain and sciatica in over 16s: assessment and management' (November 2016)

[www.nice.org.uk/guidance/ng59](http://www.nice.org.uk/guidance/ng59)

## Map of Medicine

<http://mapofmedicine.com>

Map of Medicine is a series of care pathways in flowchart form, including national ones on low back and radicular pain, developed by the British Pain Society. These consolidate the evidence-base, expert opinion and national policy to provide a best-practice pathway that can aid clinical and commissioning decisions.

You can find these pathways under Medicine / Pain management / Low back and radicular pain, and access them with an Athens account.

<http://app.mapofmedicine.com/mom/230/index.html>

**62%** of local authorities fail to include back pain in their assessment of local health needs<sup>vii</sup>

## The Cochrane Library

[www.thecochranelibrary.com](http://www.thecochranelibrary.com)

The Cochrane Collaboration publish high-quality systematic reviews to inform healthcare decision making covering a range of topics. Recent reviews relating to back pain include:

Muscle energy technique (MET) for non-specific low back pain (December 2014).

Multidisciplinary biopsychosocial rehabilitation treatment for chronic low back pain (September 2014).

## Musculoskeletal Calculator prevalence estimates

Arthritis Research UK has worked with Imperial College London to develop the Musculoskeletal Calculator. Risk factors for back pain were identified through a comprehensive literature review.

Questions in the Health Survey for England giving information related to these risk factors were then extracted and analysed. The Musculoskeletal Calculator incorporates these factors to estimate the total number of people with back pain lasting three months and over in each local area in England while specifically estimating the number of individuals with severe back pain. Severe back pain is pain rated by survey respondents as high intensity or severely limiting.

Information presented in this briefing is at local authority level. The Musculoskeletal Calculator generates estimates of the number of cases of back pain by local authorities, clinical commissioning groups and GP practices. The purpose of the Musculoskeletal Calculator is to provide estimates of the burden of back pain to inform joint strategic needs assessments, service planning and prioritisation in local areas.

As with all statistical models, the back pain estimates produced by the Musculoskeletal Calculator should be treated with caution.

## MSK Calculator bulletins series

### Currently available

\ Osteoarthritis bulletin

### MSK Calculator online tool

The MSK Calculator online tool will be re-launched in Spring 2017 with access to the prevalence estimates for all four models: osteoarthritis, back pain, rheumatoid arthritis and high risk of fragility fracture.

## References

- i Murray C, Richards M, Newton J, et al. UK health performance: findings of the Global Burden of Disease Study 2010. *Lancet* 2013, 381:997-1020.
- ii Manladakis N et al (2000). The economic burden of back pain in the UK. *Pain* 84(1):95-103.
- iii Currie S, Wang J. Chronic back pain and major depression in the general Canadian population. *Pain* 2004, 107:54-60.
- iv Arthritis Research UK, Osteoarthritis in General Practice. Available via <http://www.arthritisresearchuk.org/>
- v Choi B, Verbeek J, Tam W, Jiang J. Exercises for prevention of recurrences of low-back pain (Review). *The Cochrane Collaboration* 2011.
- vi Steffens D. et al. Prevention of Low Back Pain A Systematic Review and Meta-analysis. *JAMA Intern Med* 2016, <http://archinte.jamanetwork.com/article.aspx?articleid=2481158>.
- vii Arthritis Research UK (2015) A fair assessment? Musculoskeletal conditions: The need for local prioritisation
- viii Hill J. et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet* 2011, V378, No. 9802; 1560-1571.
- ix Department of Health (2014), 2012-13 Programme budgeting benchmarking tool.



Arthritis Research UK is the charity dedicated to stopping the devastating impact that arthritis has on people's lives.

Everything that we do is focused on taking the pain away and keeping people active. Our remit covers all conditions which affect the joints, bones and muscles including osteoarthritis, rheumatoid arthritis, back pain and osteoporosis. Together, these conditions affect around 10 million people across the UK and account for the fourth largest NHS programme budget spend of £5 billion in England.<sup>ix</sup> We fund research into the cause, treatment and cure of arthritis, and we provide information on how to maintain healthy joints and bones and how to live well with arthritis. We also champion the cause, influence policy change and work in partnership with others to achieve our aims. We depend on public support and the generosity of our donors to keep doing this vital work.

#### **About Public Health England**

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through advocacy, partnerships, world-class science, knowledge and intelligence, and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

#### **Nature of partnership work**

Arthritis Research UK has worked with Imperial College London to develop the Musculoskeletal Calculator modelled prevalence data. Public Health England has worked with Arthritis Research UK to develop this bulletin.

**For further information please contact:  
[data@arthritisresearchuk.org](mailto:data@arthritisresearchuk.org)**

Arthritis Research UK  
Copeman House  
St Mary's Gate  
Chesterfield  
S41 7TD

**[arthritisresearchuk.org](http://arthritisresearchuk.org)**

 [@ArthritisRUK](https://twitter.com/ArthritisRUK)

 [arthritisresearchuk](https://www.facebook.com/arthritisresearchuk)