Cost of low back pain

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Introduction

What is low back pain?

Back pain can develop suddenly or gradually, but it is rarely caused by a serious illness. It is not a homogeneous condition, and it can present people with different levels of severity. (NICE 2007). The source of pain is often down to work-related conditions, such as fixed or constrained body position, unsuitable work station, repetitive body movements, or for example fast paced work preventing recovery between movements (Buckley 2015; ISD Scotland 2015). The pain can also result from bad posture, uncomfortable position while sitting or standing; while lifting something or bending awkwardly (NHS Choices 2016; ISD Scotland 2015).

Low back pain or lumbago is the most common type of back pain (NHS Choices 2016). According to University hospital Southampton (2014) 95% of all back pain affects the lower back. Chronic low back pain is the most common pain clinic complaint (Price et al., 2012).

Disclaimer

In sources used for collating this report low back pain is often embedded in data relating to “back pain”, “musculoskeletal disorders” or “chronic pain”. I have sought to refer to the most recent data available, but the numbers vary due to the time of publication of the report, the time span and the geographical area the data is collected from, the purpose of the report, and how “low back pain” is situated in the field of musculoskeletal disorders. Most of the figures published have been estimates. Therefore it has not been possible to come up with any definite figures for low back pain and its economic cost to the NHS and the society more generally. This report should be taken as illustrative of the seriousness of the condition and the extent of its impact on the NHS, the workforce and the society more generally.

Prevalence of low back pain in the UK

Back pain is a common health problem that will affect most people during their lifetime (Macfarlane et al., 1999; Wynne-Jones et al., 2013). The problem is global in scale, with low back pain being listed among the top ten high burden diseases and injuries by Global Burden of Diseases Study in 2010 overtaking HIV, tuberculosis, lung cancer and preterm birth complications (Duthey 2013). While the trend

for incidents for back pain (among other work related musculoskeletal problems) has been decreasing steadily in the past decade (Buckley 2015), it is still the most common health complaint among the working-age population, especially those aged 40-60 (NICE 2007).

Johnson (2012) defines the *prevalence of back pain* as the number of people living with or managing back pain within a given time span. He estimates that in the UK up to 80% of everyone over 16 years of age will experience back pain, whether mild or more chronic, at some point during their lives. Low back pain (LBP), specifically, is the largest single cause of long term disability in England (Murray et al., 2013). In the UK, low back pain was the main cause of years lived with disability both in 1990 and 2010, during which time the prevalence of cases increased by 12%. LBP is responsible for the loss of 2,313 of disability adjusted life years (DALY) per 100,000 – a much higher ratio than the remainder of musculoskeletal issues (911), depression (704) and diabetes (337) combined. (NHS England National Pathfinder project 2014.) According to the NHS Pathfinder project, back pain accounts for 11% of the overall disability burden from all diseases in the UK. The burden is on the increase both in absolute (3.7%) and proportionate terms (7-8.5%).

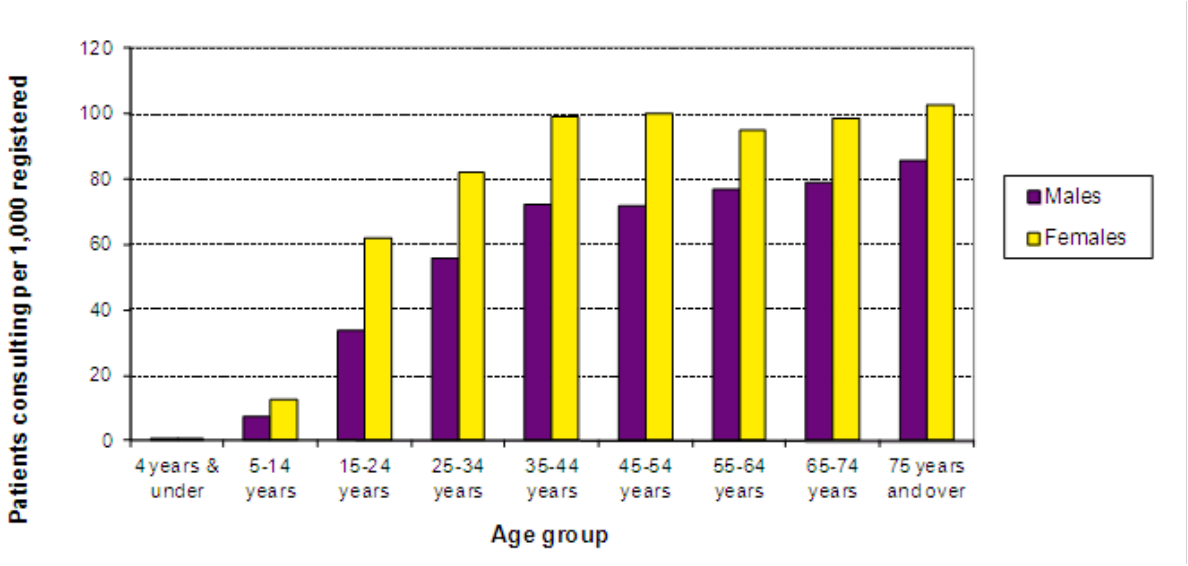
Back disorders are the most prevalent among workers within the construction (870 cases per 100 000) as well as storage and transport industries (850 per 100 000). The average across all industries is 570/100 000. *Work-related musculoskeletal disorders* (WRMSD include back, upper and lower body limb disorders) are widespread also among employees within health and caring occupations, skilled agricultural trades and postal workers, manufacturing, public administration and the defence industry. (Mody and Brooks 2012; Buckley 2015) For example, among the NHS staff 40% of the sickness absence results from musculoskeletal pain (NHS Employer 2015). Back pain affects most commonly men in their 40s and 50s, with women of the same age following close by. The prevalence of back pain declines in the older age groups. (Mody and Brooks 2012; Buckley 2015)

On average over a three year period (2011/12, 2013/14, 2014/15) the industries with highest rates of work-related musculoskeletal disorders are agriculture and forestry, construction, transport and storage and public administration and defence. (Buckley 2015)

In terms of general population, a figure based on the Information Services Division (ISD) Scotland statistics from 2013 exhibits the estimated number of patients in Scotland (per 1,000 registered with a practice), who consulted either a GP or a practice nurse for *back pain* at least once in the year ending

31 March 2013. The figure shows that females are more likely to seek help for back pain, while surveys suggest that back pain is more common in men than women. (ISD Scotland 2013).

Back pain - estimated number of patients in Scotland consulting a GP or practice nurse at least once in the financial year 2012/13 per 1,000 patients registered by gender and age group



Source:http://www.isdscotland.org/Health-Topics/General-Practice/GP-consultations/Health-Conditions/Back-Pain/index.asp

UK has the highest numbers of back pain related absenteeism in the EU (Miller 2014). Bevan et al. (2009) estimate that 12.5% of all work absence in the UK results from back pain. Early return to work is important for economic, social and health reasons (Wynne-Jones et al. (2013).

The majority of patients with non-specific low back pain recover and return to work within four to six weeks (Johnson 2012; Wynne-Jones 2013). However, if a person has been incapacitated by back pain for one month, there is a 20% change of them being off work one year later. After two years off work due to bad back the probability of the employee returning to employment decreases strongly, while their reliance on NHS resources increases. (Waddell 2004; Wynne-Jones 2013)

Cost of low back pain to society

(Who has what costs related to low back pain - employers, health insurers, governments (NHS), consumers? Who is spending how much on dealing with LBP?)

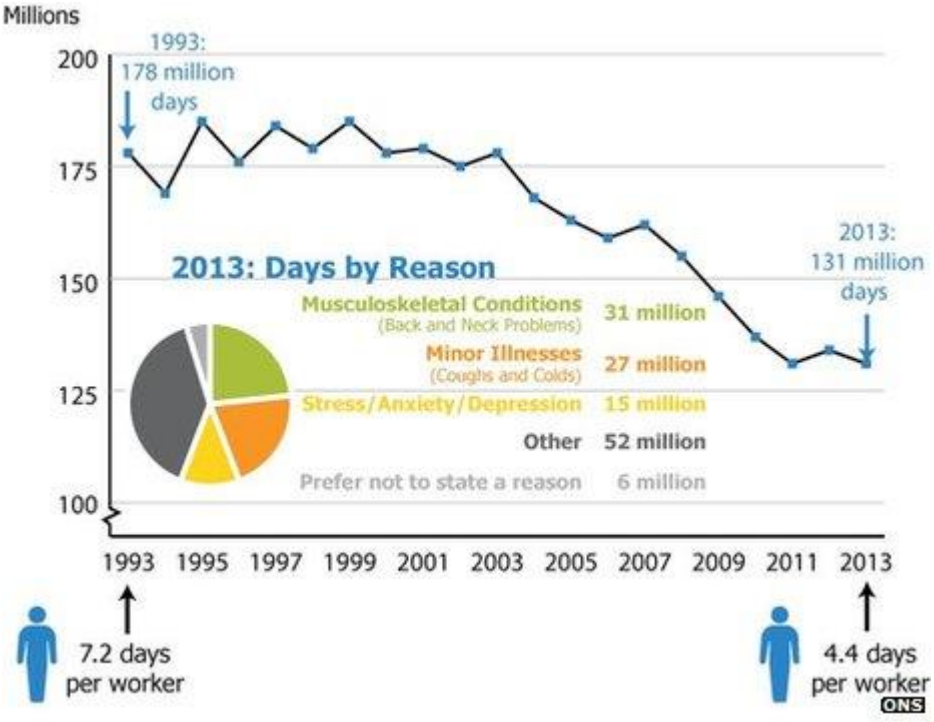
Back pain is one of the most costly conditions for which an economic analysis has been carried out in the UK, according to the NHS Pathfinder project (2014), a finding in line with the situation in other countries. Employers and the work force in general carry a great burden related to low back pain and other work-related musculoskeletal disorders (WRMSD, which include back, upper and lower body limb disorders) (Buckley 2015). Only the common cold exceeds back pain as a reason people seek medical health in the UK: almost 7 million GP visits are due to back pain annually (Johnson 2012).

There are varying estimates as to how many working days are lost annually to musculoskeletal disorders, which include low back pain.

- Thirty-one million work days were lost in 2013 due to back, neck and muscle pain in the UK (Office of National Statistics quoted by the NHS Employer 2015). The cost to the UK economy is a staggering £14bn/year. This figure will account not only for the lost productivity, but also for the other cost to the NHS, and the society in terms of social benefits, and other spin off expense that being marginalised from working for a living will incur for the back pain sufferer and their family.

- Nine-and-a-half million working days were lost in 2014/15 due to work-related musculoskeletal disorders, which accounted for a total of 44% of all work-related illness cases in the UK during that period, claim the report by Buckley (2015). This translates to an average of 17 lost work days per case. Out of the total days lost to WRMDS (9 466 000), back disorders account for 31% of days lost (2 857 000 days) with the lower and upper limb disorders accounting for the rest.

- Nearly 10 million workdays were lost to back pain in 2014 with a cost of lost productivity of £1bn according to UK Statistics Authority figures reported by the Express newspaper on June 12, 2015. Ca 4.2 million working days were lost to back pain by workers aged 50-64 in 2014. The 25-34 year olds were absent for 1.89 million days and those aged 34-49 missed 3.86 million working days. The number of sick days due to chronic conditions grew from 7.7 million in 2013 to 9.96 million in 2014. (Batchelor 2015)
- Johnson (2012) reports that the cost to UK business from work-related back pain can be in the excess of £5bn with 50 million lost working days. More than 30% of employer's accident litigation cases are accounted to back pain. According to Johnson, the average number of days lost annually per sufferer is around 19. It is hard to discover the actual costs as incapacity and loss of ability to carry out daily activities are incalculable, Johnson states.



Source: BBC News Miller 2014

Cost to the NHS

University hospital Southampton (2014) estimates that 1.1 million people in the UK suffer from back pain with 95% of the patients suffering from problems affecting the lower back. This costs the NHS £1bn per year, including £150million going to physiotherapy.

A widely referenced, yet by now outdated study by Maniadakis and Grey (2000) show that the cost of back pain for the NHS back in 1998 was an estimated £1.6bn with a societal cost of informal care, and production loss at £10.7bn. The figures reflect the lowering trend of lower back pain cases over time. While the figures are almost 20 years old, the distribution of cost is interesting to note:

- 35% - private sector costs paid for by patients and their families;
- 37% - physiotherapists and allied specialists;
- 31% - hospital sector;
- 14% - primary care;
- 7% - medication;
- 6% - community care;

- 5% - radiology and imaging (Maniadakis et al., 2000)

Lower back pain has been reported to cost the NHS in excess of £500 million (Industrial injuries advisory council 2007), or £481million with a further £197 million incurred from non-NHS costs (private consultations and prescriptions) (Johnson 2012). The majority of the cost of low back pain to the NHS arises from a minority of people whose condition becomes chronic (Macfarlane et al., 1999).

In Scotland over 684 000 visits to the GP were due to back pain in 2013/14. Back and neck disorders accounted for one in every ten patients seeing their GP in 2012/13 in Scotland, making it one of the top 10 conditions people seek medical help from their GPs (ISD Scotland 2013b).

Hong et al. (2013) estimate in their study that the annual healthcare costs for patients with chronic lower back pain are double those of matched controls (£1074 vs. £516). A large proportion, 58.5%, of this cost was attributable to GP's consultations, 22.3% to referrals to secondary care and the rest to pain relief medication.

A single GP visit of 11.7 minutes costs the NHS £45 according to the Personal Social Services Research (2013). A home visit of 23.4 min costs £114. A single prescription from a GP costs £41.35 including the cost of the medication. An appointment with a nurse (15min) costs £13. (Curtis 2013)

- If we could stop one person needing to see their GP once, it would save £45 of GP's time and £41.35 in prescription charges.

- Preventing low back pain from becoming chronic would save an average £1074 per patient. This would save £628.29 in GPs time, £239.5 in referrals to secondary care and £206.21 in pain relief medication.

- Based on the numbers quoted by the University hospital in Southampton, creating a 1% reduction in numbers of back pain sufferers would save the NHS ca. £10million per year, with a £1.5million decrease in physiotherapy costs. Based on numbers on Johnson (2012) report this saving would be worth £5million.

- Early detection of back pain is essential for quick recovery. In a two-year trial in Madrid 13 000 workers, who had been off work for five days or more suffering from back, neck and muscle pain were assessed and treated for it. The early intervention reduced the long term absences by 39%.

In the British context more than 60 000 Britons would be able to return to work if the Madrid approach to back pain was used here, the Work Foundation estimates. (BBC news February 25, 2014, Miller)

The potential impact of technology for driving down the costs of treating back pain

What is the potential impact for technology to drive their costs down? IF there are examples of savings being made with digital health in other areas, could this be extrapolated to LBP?

Assessing the potential impact for technology to drive down medical costs appears to be a complicated task (Lee and Davis 2013; MIT news 2013; National Research council 1991; Steventon et al., 2012). These technologies are so rare indeed that MIT news (Regaldo 2013) names that as the challenge of 21st century: how to move from cost-increasing to cost-reducing health technology? One part of the problem is that while a new medical technology might introduce savings in one area, it is likely to increases these in another (Prantel 2013). Another concern is that savings generated with a new device in one part of the health care system could in fact produce savings for another service provider or payer (Lee and Davies 2013), an issue more prominent in the US than in the UK. No evidence relating to technology reducing the cost of back pain were found.

Already in 1991 the National Research Council of America asserted “Researchers generally agree that medical technology has contributed to rising health care costs” (Neuman et al., 1991). Yet it was difficult to assess by how much. Part of this problem was the difficulty in defining what was meant by medical technology. A more recent study by Prantel (2013) suggests a number of different factors by which new technologies affect medical costs. The greatest impact is the cost of treating a single patient, which will depend on whether the new technology is supplementing an already existing treatment wholly or partially, or if it proposes an alternative to the existing treatment. How the cost of treatment is affected depends on whether the new technology reduces or increases the initial cost of treatment. Further, the cost is affected by whether the new technology will have direct or indirect impact on the cost of other hospital services. The level of use of the new technology has is also a defining aspect: a widely used technology tends to make savings due to economies of scale. According to Moore’s law the cost of computing will fall by half every two years. Eric Topol, the director of the Scripps Translational Science Institute in San Diego has suggested that harnessing Moore’s Law for medicine would provide a solution to the increased costs of adoption medical innovations: the more digital health care services become, the more productive these should become over time. (Regaldo 2013)

Lee and Davies (2013) point out that companies should adapt to new market realities and adjust their R&D approaches. First of all, patient outcomes and health economics are recommended to be considered at an early stage of development, with structured approach to technology risk management, early scrutiny to pass/fail outcomes and close monitoring of competition. An emerging trend among medtech companies is to "adopt" an entire disease area instead of focussing on one stage of a condition. This enables the medical-device developers to analyse and demonstrate the cost/benefit potential of their products, and it allows them to explore new business models to deliver a continuum of care and to better realise profits in terms of cost and efficiency benefits. Some of the potential benefits gained from using technology in healthcare include reduced hospital times through improved surgical outcomes; improved diagnosis and expediting diagnoses; enabling remote patient monitoring through eHealth, connected health and wearable technologies; and advances in disease prevention. (For more, see Lee and Davies 2013)

While there is a plethora of new and emerging technologies that enable citizens to better monitor their health and manage chronic conditions, there is very little scientific evidence on the impact these technologies have on medical costs. A single study has come up by Bloss et al., (2016) investigating the link between mobile health devices and health care utilization. The study sought to ascertain whether mobile monitoring of chronic health conditions (diabetes, hypertension and cardiac arrhythmia) might lead to short-term changes in health care resource utilization, which was being measured by looking at the health insurance claim submissions. In this prospective randomized control trial one group used smartphone-enabled biosensors to monitor their health condition(s), while a control group did not. Even if there is an expectation that proper health-monitoring will yield better health outcomes, which in term will lower the burden on health services long-term, the short-term concern is that the new health technologies will lead to over-utilization of already stretched services due to patient inability to interpret data correctly. The study found no basis for this concern, and concluded that "any apprehension directed at consumer mobile health monitoring with respect to over-utilization of health care resources should be tempered, and focus should be placed on the potential merits of empowering patients through active health monitoring." (Anderson 2016; Bloss et al., 2016)

Ultimately the problem facing the uptake of medical innovations is that they have as yet not been proven to cut costs. It may take years for this to be ascertained. (Lee and Davies 2013) For example, personal computers took a decade before their use showed any productivity gains in the wider economy in the

late 1990s. Micky Tripathi, CEO of the Massachusetts eHealth Collaborative describes us being at "Version 1.0 of health information technology". (Regaldo 2013).

However, there is also a more systematic aspect to this problem. In the US, which is one of the largest economies in the world, and which spends most of its GDP on healthcare, a new federal research institute that studies which medicine works and which does not is forbidden from considering costs or cost savings in their work. At the same time five out of seven largest lobby groups in Washington DC are run by doctors, insurance companies and drug firms. The financial incentives to progress cost-saving innovations within medicine in a global scale do not, as yet, exist. (Regaldo 2013)

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