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The Epidemiology of low back pain

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Low back pain is an extremely common problem that most people experience at some point in their life. While substantial heterogeneity exists among low back pain epidemiological studies limiting the ability to compare and pool data, estimates of the 1 year incidence of a first-ever episode of low back pain range between 6.3% and 15.4%, while estimates of the 1 year incidence of any episode of low back pain range between 1.5% and 36%. In health facility- or clinic-based studies, episode remission at 1 year ranges from 54% to 90%; however, most studies do not indicate whether the episode was continuous between the baseline and follow-up time point(s). Most people who experience activity-limiting low back pain go on to have recurrent episodes. Estimates of recurrence at 1 year range from 24% to 80%. Given the variation in definitions of remission and recurrence, further population-based research is needed to assess the daily patterns of low back pain episodes over 1 year and longer. There is substantial information on low back pain prevalence and estimates of the point prevalence range from 1.0% to 58.1% (mean: 18.1%; median: 15.0%), and 1 year prevalence from 0.8% to 82.5% (mean: 38.1%; median: 37.4%). Due to the heterogeneity of the data, mean estimates need to be interpreted with caution. Many environmental and personal factors influence the onset and course of low back pain. Studies have found the incidence of low back pain is highest in the third decade, and overall prevalence increases with age until the 60–65 year age group and then gradually declines. Other commonly reported risk factors include low educational status, stress, anxiety, depression, job dissatisfaction, low levels of social support in the workplace and whole-body vibration. Low back pain has an enormous impact on individuals, families, communities,

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governments and businesses throughout the world. The Global Burden of Disease 2005 Study (GBD 2005) is currently making estimates of the global burden of low back pain in relation to impairment and activity limitation. Results will be available in 2011. Further research is needed to help us understand more about the broader outcomes and impacts from low back pain.

Low back pain is well documented to be an extremely common health problem [1–4]; however, its burden is often considered trivial [5,6]. Low back pain is the leading cause of activity limitation and work absence throughout much of the world [7], and it causes an enormous economic burden on individuals, families, communities, industry and governments [8–10]. Until 10 years ago, it was largely thought of as a problem confined to Western countries [11]; however, since that time an increasing amount of research has demonstrated that low back pain is also a major problem in low- and middle-income countries [12–15].

As part of the GBD 2005, the study's Musculoskeletal Expert Group was given the task of estimating the global burden of low back pain. Epidemiological parameters such as prevalence, incidence and remission are important in the estimation of low back pain burden. In a previous article, we described the processes we undertook to derive a case definition of low back pain and a set of discrete health states to describe the severity levels and disabling consequences of low back pain [16]. In this article, we briefly present a summary of data we have gathered for estimating the global burden of low back pain for GBD 2005 together with an overview of the low back pain epidemiological literature.

We performed systematic reviews to determine the incidence, remission and prevalence of low back pain throughout the world. For each of these reviews, we searched Ovid Medline, Embase, Cinahl, CAB abstracts, WHOLIS and SIGLE databases from 1980 to 2009 inclusive. We developed a new tool to assess the risk of bias of the included studies [17]. This tool was modified from an existing checklist developed by Leboeuf-Yde and Lauritsen to assess the methodological quality of epidemiological surveys reporting on the prevalence of low back pain [18].

Incidence

Estimating the incidence of low back pain is problematic as the cumulative incidence of first-ever episodes of low back pain is already high by early adulthood [19] and symptoms tend to recur over time [20]. In addition, longitudinal studies, which measure incidence, are more expensive than cross-sectional studies, which measure prevalence. As a result, there is a significant amount of literature on the prevalence of low back pain, but much less information on low back pain incidence and remission.

In our systematic review of incidence, 12 studies met the inclusion criteria and underwent data extraction. Of these, four were considered to have a low risk of bias [20–23], four a moderate risk of bias [24–27] and four a high risk of bias [28–31]. Case definitions varied between these studies. Most measured pain in the 'low back' and three studied the 'back' [26,29,30]. Most did not specify a minimum episode duration that was required for a case to be counted; four required a minimum episode duration of 1 day [24,25,27,30] and one study required a period of 6 months [26].

Incidence was most commonly measured over 1 year. Other follow-up periods included 6 months [22], 2 years [26,29,31], 3 years [27] and 5 years [20]. Four of the studies limited their focus to first-ever episodes of low back pain [21,27,30,31], while the remainder of studies measure all episodes (i.e., first-ever and recurrent). All of the studies counted the number of people with an episode of low back pain as opposed to the number of episodes. The 1 year incidence of people who have a first-ever episode of low back pain ranged from 6.3% to 15.4%, and the 1 year incidence of people who have any episode of low back pain (i.e., first-ever or recurrent) ranged from 1.5% to 36% (Table 1). As these studies did not include repeat episodes in the period of interest, they are likely to underestimate episode incidence.

Table 1
One-year incidence of low back pain in the general population.

Citation	Country	Age range (years)	Inclusion criteria at baseline	Case definition[a]	Incidence (%)	Standard error (%)	Risk of bias
Incidence of number of people who have a first-ever episode							
Biering-Sorensen [21]	Denmark	30–60	Never had low back pain	Low back pain over past year	6.3[c]	0.8	Low
Croft et al. [24]	United Kingdom	18–75	Never had low back pain	Low back pain over past year	15.4[c]	0.9	Moderate
Mustard et al. [30]	Canada	21–34	Never had back pain >1 day	Back pain >1 day over past year	7.5[c]	0.6	High
Incidence of number of people who have any episode (first-ever or recurrent)							
Al-Awadhi et al. [28]	Kuwait	15–99	No low back pain at baseline	Low back pain over past year	1.5[b]	0.2	High
Cassidy et al. [23]	Canada	20–69	No low back pain for 6 months prior to baseline	Low back pain over past year	18.9[b]	2.2	Low
Croft et al. [24]	United Kingdom	18–75	No low back pain at baseline	Low back pain over past year	36.0[c]	1.2	Moderate
Hestbaek et al. [20]	Denmark	30–50	No low back problems over past year	Low back problems over past year	19.3[c]	1.7	Low
Jacob et al. [25]	Israel	22–70	No activity-limiting low back pain >1day over past month	Activity-limiting low back pain >1day over past year	18.4[c]	2.7	Moderate

[a] Definition of a new episode of low back pain.
[b] Age and sex- standardized.
[c] Unadjusted.

Remission

For estimating the burden of disease in GBD 2005, remission is defined as the rate at which people stop having the disease or condition, and is expressed as an annual hazard rate to recover from the disease. In many instances, people with activity-limiting low back pain will go on to have recurrent episodes [32–36] that may be longer in duration and associated with greater disability [37]. Consequently, the course of low back pain is increasingly viewed as a chronic, recurrent condition that may have one of several trajectories [38], replacing previous categorisations of low back pain as being either acute, subacute or chronic in nature. Thus, in the majority of cases, true remission in the sense that a single episode of low back pain never recurs, is rare. Furthermore, many people will continue to have symptoms and/or disability between episodes. Recent research investigating the meaning of remission from the patient's perspective found that many patients continue to suffer between episodes but change what they do to manage the potential for recurrence [39].

For the systematic review of low back pain remission, we were unable to identify any population-based studies that met our inclusion criteria and provided relevant information on the remission of low back pain. We therefore broadened our inclusion criteria to include study populations derived from clinic or health facilities. In total, we identified seven health facility- or clinic-based studies. Of these, two were considered moderate risk of bias [40,41] and five high risk of bias [38,42–45]. All studies were from high-income countries. Six measured remission of pain in the 'low back' region, and one measured remission in the 'lumbar' region [45]. Only one of the seven studies had a minimum episode duration required for cases to be counted – 'at least one day' [38]. Three of the studies focussed on activity-limiting low back pain [41–43] and the other four studies measured remission of all low back pain, whether activity-limiting or not. All studies measured remission of first-ever and recurrent episodes combined.

The average time between onset of pain and consultation was unclear in most of the studies making it difficult to accurately estimate the time to remission. Most studies did not indicate whether the episode was continuous between the baseline and follow-up time point(s). Given the chronic–episodic

nature of low back pain and the high rate of recurrence, this is an important consideration. If cases have asymptomatic phases between these points, remission may be underestimated. Remission at 1 year was measured in two studies and ranged from 54% to 90% (Table 2).

Duration

We conducted an abbreviated search of the literature and found a small number of cohort studies that estimated low back pain duration. Similar to remission, we found the only useful studies were health facility- or clinic-based. Again, there was substantial heterogeneity between studies. Many of the studies reported the proportion of people with pain at a certain time point , which is reported on in the remission section above. Van den Hoogen found the median duration of pain from the index episode was 42 days [47]. Von Korff found that the median pain days at 1 year follow-up was 15.5 days in those patients whose low back pain lasted less than 3 months from baseline, and 128.5 days in those patients whose low back pain lasted between 3 and 6 months from baseline [48].

Recurrence

The natural history of low back pain has been observed to be extremely variable and may last a few days or persist for many years [49]. Most commonly, people who experience activity-limiting low back pain lasting more than 1 day go on to have recurrent episodes [32–34,36,50]. Wasiak et al. (2006) found that low back pain recurrence contributed disproportionately to the burden from non-specific work-related low back pain [37]. They found that those people who had recurrences had longer duration of work disability than those who did not. Recurrent cases of low back pain have been shown to experience increased trunk stiffness, which may, in turn, increase the likelihood of further low back pain recurrence [51]. Previous episodes of low back pain have been shown to be predictive of recurrence within a 12-month period [52].

Rates of recurrence are heavily reliant on how recurrence is defined [53–55], which also depends on how remission is defined. Hestbaek et al. studied the long-term course of low back pain and found that approximately 50% of people have a recurrent episode by 1 year, 60% by 2 years and 70% by 5 years [36]. Stanton et al. found that within a 12-month period, recurrence of low back pain ranged from 24% to 33% [52]. In a study of injured workers with low back pain, Côté et al. found that almost a third of workers

Table 2
Remission of low back pain in health facility and clinic-based studies.

Citation	Country	Age range (years)	Definition of what is being counted at follow-up	Follow-up period (weeks)	Remission (%)	Standard error (%)	Risk of bias
Jones et al. [42]	United Kingdom	18–65	No activity-limiting low back pain in the last week	13	61[a]	1.6	High
Hancock et al. [43]	Australia	Not given	No low back pain >1 on the Visual Analogue Scale for seven consecutive days	13	89[b]	2.0	High
Dunn et al. [38]	United Kingdom	30–59	No low back pain >1 day in the last month	26	31[b]	2.5	High
Schiottz-Christensen et al. [40]	Denmark	18–60	Complete recovery	52	54[b]	2.2	Moderate
Van den Hoogen et al. [44]	Netherlands	16–99	No low back pain for past four weeks	54	90[b]	1.4	High
Carey et al. 2000; Carey 2010 [41,46]	United States of America	18–99	Functional recovery	96	96[b]	0.5	Moderate
Vingard et al. [45]	Sweden	20–59	Improved function over past six months	104	59[b]	2.1	High

[a] Adjusted for age, sex, and socio-economic status.
[b] Unadjusted.

experienced recurrence of back pain within 1 year [56]. Another study found that 80% of primary care patients had experienced a recurrent episode of low back pain at 12 months [57]. Cassidy found 20% of cases recurred within 6 months, and the rate of recurrence increased with age [23]. Another study found that recurrent low back pain is common among school children aged between 10 and 16 years [58]. Chenot et al. found that women were more likely than men to have recurrent low back pain [59].

Prevalence

Comparing the prevalence of low back pain between populations and over time is challenging due to considerable methodological heterogeneity across studies and difficulties in obtaining true population estimates. Having said this, there is considerably more literature on the prevalence of low back pain compared with incidence, remission and duration. Much of the methodological variation relates to the case definition and recall period, the age and sex distributions, the representativeness of the sample, the overall sample size, validation of the instrument used to measure prevalence, whether random methods were used in selecting the sample population, the extent of non-response and whether any measures were taken to deal with non-response bias. Systematic reviews have demonstrated particular case definition variation in relation to temporality and topography [18,60].

Definition by temporality

There are several ways that low back pain is defined by temporality – two common approaches are by recall period and episode duration. Definition by recall period is commonly used in cross-sectional studies. For example, a population-based study may define low back pain as 'current' low back pain (e.g., at the time of the interview) or 'past' low back pain (e.g., in the last 12 months) [61]. As the length of the recall period increases, so too does the risk for recall bias.

In our systematic review of the prevalence of low back pain in the general population, the most common recall periods were 1 year and point. Estimates of the point prevalence of low back pain ranged from 1.0% to 58.1% (mean: 18.1%; median: 15.0%), and 1 year prevalence from 0.8% to 82.5% (mean: 38.1%; median: 37.4%). The distribution of estimates for common recall periods is shown in Fig. 1. Table 3 presents the unadjusted prevalence from the studies considered to have a low risk of bias. Due to the heterogeneity of the data, mean estimates need to be interpreted with caution.

We found most studies did not have a minimum episode duration in their definition. Of the studies that did, a minimum duration of 1 day was the most common, and these cases had a slightly lower prevalence (mean: 25.7%; median: 24.7%) than those with an unspecified minimum episode duration (mean: 31.8%; median: 30.4%). A number of studies stated that they were measuring the prevalence of 'chronic' low back pain, but most did not specify the time point at which a case becomes chronic. Mean

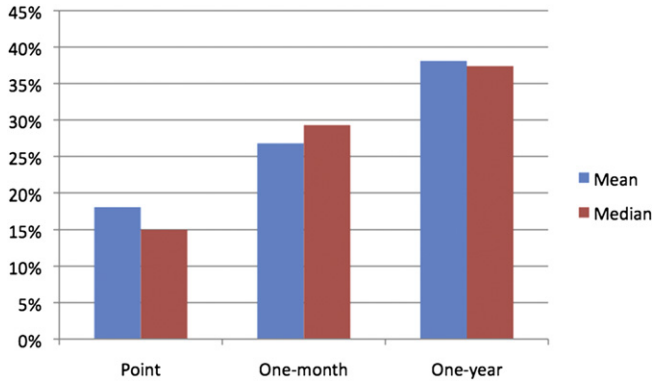

Fig. 1. Mean and median prevalence in low back and back pain prevalence studies.

Table 3
The unadjusted prevalence of low back pain in the general population, by country.

Citation	Country	Age range (years)	Prevalence (%)	Standard error (%)	Risk of bias
Point prevalence					
Walker et al. [66]	Australia	18–99	25.6	1.00	Low
Skovron et al. [67]	Belgium	15–99	33.0	0.76	Low
Cassidy et al. [68]	Canada	20–69	28.7	1.35	Low
Hoy et al. [13]	China	15–99	34.1	3.00	Low
Biering-Sorensen [21]	Denmark	30–60	13.7	0.87	Low
Bredkjaer [69]	Denmark	16–99	12.0	0.47	Low
Kohlmann et al. [70]	Germany	25–74	39.2	3.41	Low
Mahajan et al. [71]	India	15–99	8.4	0.87	Low
Mohseni-Bandpei et al. [72]	Iran	11–14	15.0	0.51	Low
Carmona et al. [73]	Spain	20–99	14.8	0.83	Low
Andersson et al. [74]	Sweden	25–74	23.2	1.05	Low
Harkness et al. [75]	United Kingdom	18–64	18.0	0.88	Low
Hillman et al. [76]	United Kingdom	25–64	19.0	0.69	Low
One-week prevalence					
Grimmer et al. [77]	Australia	13–13	7.8	1.29	Low
Haq et al. [78]	Bangladesh	15–99	20.1	1.11	Low
Davatchi et al. [79]	Iran	15–99	14.8	0.50	Low
Al-Awadhi et al. [80]	Kuwait	15–99	9.5	0.34	Low
Cardiel et al. [81]	Mexico	18–99	6.3	0.49	Low
Chaiamnuay et al. [12])	Thailand	15–99	11.7	0.92	Low
Jones et al. [58]	United Kingdom	10–16	15.6	1.62	Low
Minh Hoa et al. [82]	Viet Nam	16–99	11.2	0.68	Low
One-month prevalence					
Heistaro et al. [83]	Finland	30–59	49.5	0.66	Low
Stranjalis et al. [84]	Greece	15–99	31.7	1.47	Low
Kristjansdottir [85]	Iceland	11–16	34.0	1.03	Low
Croft et al. [86]	United Kingdom	18–75	39.0	0.73	Low
Watson et al. [87]	United Kingdom	11–14	24.0	1.15	Low
Three-month prevalence					
Miro et al. [88]	Spain	65–99	43.9	2.04	Low
One-year prevalence					
Lau et al. [89]	China, Hong Kong	18–99	21.7	2.30	Low
Hestbaek et al. [20]	Denmark	30–50	56.0	1.37	Low
Hestbaek et al. [90]	Denmark	12–22	32.4	0.48	Low
Taimela et al. [91]	Finland	7–16	9.7	1.23	Low
Demyttenaere et al. [92]	Spain	18–99	20.0	1.23	Low
Demyttenaere et al. [92]	Ukraine	18–99	50.3	1.70	Low
Walsh et al.; Demyttenaere et al. [92,93]	United Kingdom	20–59	36.1	0.93	Low

prevalence was slightly lower for chronic low back pain (mean: 19.4%; median: 18.1%) compared with low back pain with an unspecified minimum episode duration or minimum episode duration of 1 day.

Definition by topography

In population-based studies, the location of the painful area in the back may be indicated on pain drawings, which have been shown to have high reliability within subjects and between observers [62,63]. However, there is often variation between studies in the anatomical location that is studied. Some studies indicate the precise anatomical area (e.g., pain in the area between the inferior margin of the 12th rib and inferior gluteal folds); however, many simply state the 'low back' or the 'back' without any more specific anatomical description. In one systematic review, only 36% of studies gave a precise anatomical definition. Sixty percent of studies used the label 'low back pain' and the rest used 'back pain'. Leg pain was only sometimes included in the definition [60].

In our systematic review, the most common topographical definitions were 'low back', 'back' and 'the area between the inferior margin of the 12th rib and inferior gluteal folds'. Prevalence of 'low back pain' (mean: 26.2%; median: 23.1%) was relatively similar to that of 'back pain' (mean: 27.9%; median: 25.0%), whereas prevalence of 'pain on the posterior aspect of the body from lower margin of 12th rib to lower gluteal folds' was slightly higher (mean: 31.7%; median: 30.4%).

Other systematic reviews of the prevalence of low back pain have also found substantial heterogeneity. In 2000, Walker published a systematic review of the prevalence of low back pain. Of the 56 studies that met the inclusion criteria, only 30 (54%) were considered methodologically acceptable. Point prevalence ranged from 12% to 33% and 1 year prevalence ranged from 22% to 65% [60].

A uniform case definition of low back pain for the purpose of low back pain epidemiological studies would significantly enhance our ability to compare and pool results across studies, and Dionne et al. have recently performed a Delphi process to reach international agreement on a uniform case definition for use in prevalence studies [64]. Their case definition includes specification of both temporality and topography as follows: 'pain between the inferior margin of the 12th rib and inferior gluteal folds that is bad enough to limit usual activities or change the daily routine for more than 1 day. This pain can be with or without pain going down into the leg. This pain does not include pain from feverish illness or menstruation'. The Delphi definitions and derived questionnaires are available via the Delphi Definitions of Low Back Pain Prevalence website: www.uresp.ulaval.ca/backpaindefs [65].

Mortality

There are few studies that have investigated whether there is an association between back pain and mortality. Zhu et al. found those with back pain had a greater overall mortality risk (hazards ratio = 2.03; 95% confidence interval: 1.14–3.60) and a greater risk for death from coronary heart disease than those without back pain [94]. In two further studies, no relationship was found between mortality and back pain [95,96]. Further research is needed in this area.

Causes

Studies suggest that low back pain may arise from any one of a number of anatomical structures, including bones, intervertebral discs, joints, ligaments, muscles, neural structures and blood vessels [97]. In a minority of instances, approximately 5–15% [97–99], low back pain can be attributed to a specific cause such as an osteoporotic fracture, neoplasm or infection [97,100]. For the remaining 85–95% of cases, the specific cause of low back pain is unclear [97,100].

The search for causes of low back pain continues through causal inference, which is a process whereby several criteria are examined to assess causation. These include assessment of bias and confounding; demonstrating a temporal relationship (i.e., the cause must precede the effect); plausibility; consistency with other studies; the strength of the association (i.e., the relative risk); the dose–response relationship (i.e., does increased exposure lead to increased effect); and reversibility (i.e., does removal of the exposure reduce the disease risk) [101,102]. Due to methodological heterogeneity in studies that have investigated causation of low back pain, it is difficult to draw any conclusions about causality. Many studies have significant bias and confounding and relatively few cohort studies have been conducted. It has also been difficult to determine a temporal relationship between risk factors and low back pain (e.g., depression and low back pain), and it has been difficult to quantify exposure variables (e.g., in the occupational setting: the frequency/amount of lifting).

Risk and prognostic factors

Risk factors are variables associated with an increased risk of disease. Examining risk factors for a particular disease may involve measuring the occurrence of disease in two or more groups of people who have experienced different levels of exposure. While research into risk factors for low back pain is often challenging due to heterogeneity across research methods, case definitions and study populations, it is clear there are a number of environmental and personal factors that influence the onset and course of low back pain. Some of these are modifiable and some are not.

Age is one of the more common risk factors for low back pain. Some studies have found incidence is highest in the third decade [26,27,103,104], and overall prevalence increases with age until ages 60 or 65 years, and then gradually declines [105,106]. As noted above, Dionne et al. found prevalence continues to increase with age for more severe forms of low back pain [2], and an increasing number of studies are showing low back pain to be a very common problem among adolescents [2,19,77,107–118].

While most studies have found no significant gender differences in the prevalence of low back pain [26,119,120], our systematic review found that both the mean and median prevalence of low back pain was higher in women. Some studies have found a higher prevalence amongst older women compared with older men [121,122], and several studies have shown that women are more likely to take time off work and use health-care because of their low back pain, and more likely to develop chronic low back pain [120,123,124].

Less is known about age patterns in low- and middle-income countries, where introduction to the workforce takes place at earlier ages and life expectancies are significantly lower. Of the studies that have taken place in these settings, few have found any significant gender differences in the prevalence of low back pain. Manahan et al. found in their study of 1685 villagers in the Philippines that low back pain was not related to gender [125], while Anderson found no significant differences in the prevalence of back pain between men and women in Nepal [126].

Low educational status has been shown to be associated with an increased prevalence of low back pain [127–130]. This association is an even stronger predictor of episode duration and poor outcomes from low back pain [128]. In one study in Russia, those with a low educational level were shown to have significantly more low back pain complaints ($P < 0.05$) [119]. Other studies have found an inverse relationship between social status and the occurrence of low back pain [83,131,132].

In a systematic review of risk factors for low back pain, Leboeuf-Yde found that body weight was a weak risk factor [133]. Two studies found obesity or high body mass index (BMI) (>30 BMI) to be associated with an increased occurrence of low back pain [134,135]. This association may be stronger in women than in men [24]. Two further studies concluded that heredity plays a major role in lumbar disc degeneration and that heavy physical loading, through occupation or sport, is no longer considered as influential as previously thought [136,137].

There are a number of psychosocial factors associated with low back pain, including stress, anxiety, depression and certain types of pain behaviour; however, the direction for these relationships is often unclear [138–145]. Evidence shows that psychosocial factors are also significantly associated with the transition from acute to chronic low back pain [140,146]. Psychosocial workplace factors have also been shown to be important risk factors for low back pain. In two systematic reviews, it was found that job dissatisfaction, monotonous tasks, poor work relations, lack of social support in the workplace, demands, stress and perceived ability were associated with an increased occurrence of low back pain [147,148]. Job dissatisfaction has also been shown to be associated with transition from acute to chronic low back pain [138].

Other occupational factors have been shown to be associated with low back pain [138]. Matsui et al. demonstrated a clear correlation between physical demands of work and the prevalence of low back pain (with the exception of lifetime prevalence in female workers) [121]. They found the point prevalence of low back pain was 39% in manual workers, but only 18.3% in male sedentary workers. More recently, a systematic review found that manual handling, bending, twisting and whole-body vibration are risk factors for low back pain [147]. Although the data on occupational risk in low-income countries are relatively limited, it has been estimated that 80–90% of the population in these areas are involved in 'heavy work' [149], which suggests this may have a significant impact on the occurrence of low back pain.

Impacts and outcomes

Low back pain has a substantial impact on individuals and their families, communities, health-care systems and businesses. This includes pain, activity limitations, participation restrictions, career burden, use of health-care resources and financial burden. Impacts and outcomes from low back pain are likely to vary significantly between and within populations depending on socio-economic status, general access to health services, occupational distribution, pain perception and other factors that are

associated with the onset and prognosis of low back pain. In low-income countries, the impact may be particularly devastating.

The financial burden from low back pain is enormous and includes the costs of medical care, indemnity payment, productivity loss, employee retraining, administrative expenses and litigation [8–10]. In the USA, it was estimated that direct health-care expenditure for back pain was $90.7 billion in 1998 [150]. In the UK, it was estimated that low back pain accounted for £11 billion in direct and indirect expenditure in the year 2000 [151], and in Australia, Walker found low back pain to be one of the most costly diseases, with the combined direct and indirect costs in 2001 estimated to be $9.17 billion [152].

Conclusions

It is clear that low back pain is an extremely common problem, which most people experience at some point in their life. Most cases run a chronic–episodic course. It has a huge impact on individuals, families, communities, governments and businesses throughout the world. The GBD 2005 is currently making estimates of the global burden of low back pain in relation to impairment and activity limitation. Results will be available in 2011. Using a standardized case definition for low back pain in future epidemiological studies, as proposed by Dionne et al. [64] will improve between-study comparisons and use of data. Further research is needed to help us understand more about the long-term course and broader outcomes and impacts from low back pain.

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