

The Global Burden of Low Back Pain

1. Low back pain is a common global problem

Global Burden of Disease studies have defined low back pain (LBP) as “pain in the area on the posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds with or without pain referred into one or both lower limbs that lasts for at least one day” [1].

Low back pain is a common global problem. The point prevalence of low back pain (LBP) in 2017 was estimated to be about 7.5% of the global population, or around 577.0 million people [2].

LBP has been the leading cause of years lived with disability (YLDs) since 1990 [2] and remains a significant global public health concern.

2. Low back pain is not usually associated with a specific identifiable pathoanatomical cause.

85-95% of people presenting to primary care providers do not have a specific identifiable pathoanatomical origin for their pain [3].

The proportion of people presenting to primary care with a specific identifiable cause of LBP is estimated to be 0-7-4.5% with osteoporotic vertebral fractures, 5% with inflammatory spondyloarthropathies⁴, 0.0-0.7% with malignancy, and 0.01% with infections [3].

3. Low back pain is the leading cause of global disability.

The global burden of disability associated with LBP has been increasing since 1990.

Disability associated with LBP increased in all age groups between 1990 and 2019 and was greatest in the 50-54 age group in 2019. Approximately 70% of years lost through disability were in working aged people (20-65 years) [5].

4. The number of people with low back pain is increasing as the global population increases and ages.

There have been increases in both the number of people living with LBP and the prevalence of LBP in all age groups from 1990 to 2017. Although the prevalence of LBP increases with increasing age until 80-89 years, the greatest number of people with LBP globally are currently in the 50-54 year age group [5].

The overall increase in the burden of LBP is likely to be driven by ageing and an increasing population, however there may be other contributing factors [2].

5. Low back pain does not always result in disability

It is estimated that fewer than 1 in 3 people living with chronic LBP have associated substantial restriction of participation in work, social activities, and self-care activities for 6 months or more (high-impact LBP) [6, 7, 8].

Although less than 28% of people with LBP have severe disability, they account for 77% of all disability caused by low back pain [9].

6. A biopsychosocial framework improves the understanding and management of LBP.

Despite evidence that biological, psychological and social factors influence LBP and associated disability, the global burden of LBP is increasing. Further research is needed to determine whether the biopsychosocial approach, its application, or both require modifying [10].

The management of LBP includes consideration of surgical, interventional, pharmacological, physical, psychological, educational and supported self-management modalities.

The management of LBP should involve the integration of the best available evidence, clinician expertise, patient values and expectations, and community resources.

7. Costs associated with low back pain are associated with health care utilization and loss of work productivity

Studies in European countries indicate the total costs associated with low back pain varies between 0.1-2% of gross domestic product [11, 12]. The costs associated with low back pain in low- and middle-income countries (LMICs) are largely unknown. The costs associated with loss of productivity are likely to be substantial [13] given the overall prevalence of chronic low back pain in LMICs is estimated to be around 52% in workers [14, 15]

Over 80% of the total costs attributable to LBP are due to indirect costs such as loss of productivity and disability payments in countries that have functioning social welfare systems [16, 17].

Non-adherence to LBP treatment guidelines is possibly associated with increased direct healthcare costs. Patients who obtain early imaging or surgery for LBP without exhausting conservative therapies account for a disproportionate amount of total costs associated with LBP [18].

8. Factors associated with high impact low back pain

There are many factors associated with LBP and disability, including biological, psychological, social and societal factors. These factors seem to be important in low- and high-income societies [19].

Factors that are consistently reported to be associated with disability and high societal costs of chronic LBP include older age, poor general health, increased psychological or psychosocial stress, worse baseline functional disability, sciatica, and the presence of compensation [20]. Social determinants of

health with moderate to large effects on poor LBP disability outcomes include “socioeconomic deprivation,” low income, unemployment, and occupational factors (manual lifting, working overtime, and lack of supporting staff) [21].

9. Public education and low back pain

Public health strategies may be important in bridging the gap between research findings and public perceptions and expectations regarding the nature and management of back pain [22] and can be successfully aimed at primary school children and their parents [23, 24].

Public mass media campaigns have resulted in modest changes in both short- and long-term societal beliefs regarding LBP [25] but may have little sustained impact on health care utilization or disability outcomes [26]. The impact of campaigns may depend on cultural and contextual factors, as well as ongoing exposure (“top-up” campaigns) [27]. Campaigns should be developed in partnership with people living with LBP [22].

10. Models of care and low back pain

The World Health Organization (WHO) defines high-quality care as “care that is safe, effective, people-centred, timely, efficient, equitable and integrated”. The aim is to maximize health outcomes, prevent disability, and reduce costs [28]. The Global Spinal Care Initiative developed a model of care, based on WHO principles, that aims to transform spine care globally, particularly in LMICs [29].

LBP-specific strategies have been proposed to meet these goals, including stepped care guidelines which direct increases in intensity of treatments if initial treatments fail, and stratified care guidelines which direct the intensity of initial treatments depending on predicted outcomes. Both models can improve health and cost outcomes, particularly in primary care, but their success may depend on cross-cultural differences in implementation and adherence, and their ability to adapt to people with differing LBP disability trajectories [30, 31, 32, 33].

It has been suggested however that a more global approach be used to managing the burden of LBP, particularly in LMICs, by integrating the management of chronic conditions within processes to improve overall health care, rather than duplicating efforts and wasting limited resources by developing approaches based on individual conditions [35, 36].

11. Social determinants of health, intersectoral collaboration and low back pain.

Low back pain is a “wicked” problem, i.e. socially complex, multi-causal with many interdependencies, with no clear solution and beyond the responsibility of any one organization or government department [37]. Understanding and dealing with interactions between chronic pain and social determinants of health involves considering sectors beyond the domain of the health sector, such as the education, employment, youth and aged services, indigenous affairs, environment and finance sectors.

The WHO Health in All Policies approach may facilitate intersectoral engagement and co-operation in the development of policy aimed at addressing the global burden of LBP [38].

Whether LBP is best dealt with by specific public health policies, within frameworks of national pain strategies, or a combination of both is yet to be determined.

REFERENCES

- [1] Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, Williams G, Smith E, Vos T, Barendregt J, Murray C, Burstein R, Buchbinder R. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis* 2014 ;73: 968–974
- [2] Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, Blyth FM, Smith E, Buchbinder R, Hoy D. Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017. *Ann Trans Med* 2020; 8(6): 299-313.
- [3] Finucane LM, Downie A, Mercer C, Greenhalgh SM, Boissonnault WG, Pool-Goudzwaard AL, Beneciuk JM, Leech RL, Selfe J. International framework for red flags for potential serious spinal pathologies. *J Orth Sports Phys Ther* 2020; 50(7): 350-372.
- [4] Underwood MR, Dawes P. Inflammatory back pain in primary care. *Br J Rheum* 1995; 34: 1074-1077
- [5] Global Health Group Data Exchange <http://ghdx.healthdata.org/gbd-results-tool> accessed Nov 15, 2020).
- [6] Pitcher MH, Von Korff M, Bushnell MC, Porter L. Prevalence and Profile of High-Impact Chronic Pain in the United States. *J Pain* 2019; 20(2): 146–160.
- [7] Walker BF, Muller R, Grant WD. Low back pain in Australian adults. Prevalence and associated disability. *Journal of Manipulative and Physiological Therapeutics* 2004; 27(4): 238-244.
- [8] Dunn KM, Campbell P, Jordan KP. Long-term trajectories of back pain: cohort study with 7-year follow-up. *BMJOpen* 2013; 3: e003838.
- [9] Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, Hoy D, Karpainen J, Glenn Pransky, Sieper J, Smeets RJ, Underwood M. What low back pain is and why we need to pay attention. *Lancet* 2015; 386: 2145-2191.
- [10] Pincus T, Kent P, Bronfort G, Loisel P, Pransky G, Hartvigsen J. Twenty-five years with the biopsychosocial model of low back pain-is it time to celebrate? A report from the twelfth international forum for primary care research on low back pain. *Spine (Phila Pa 1976)*. 2013 Nov 15;38(24):2118-23.
- [11] Olafsson G, Emma Jonsson E, Fritzell P, Hägg O, Borgström F. Cost of low back pain: results from a national register study in Sweden. *European Spine Journal* 2018; 27:2875–2881
- [12] Wenig CM, Schmidt CO, Kohlmann T, Schweikert B. Costs of back pain in Germany. *European Journal of Pain* 13 (2009) 280–286.
- [13] Carregaro RL, Tottoli CR, Rodrigues DdS, Bosmans JE, da Silva EN, van Tulder M (2020) Low back pain should be considered a health and research priority in Brazil: Lost productivity and healthcare costs between 2012 to 2016. *PLoS ONE* 15(4): e0230902. <https://doi.org/10.1371/journal.pone.0230902>
- [14] Jackson T, Thomas S, Stabile V, Shotwell M, Han X, McQueen K. A systematic review and meta-analysis of the global burden of chronic pain without clear etiology in low- and middle-income countries: trends in heterogeneous data and a proposal for new assessment methods. *Anesthesia & Analgesia* 2016; 123(3): 739-748
- [15] Mullerpatan R, Nahar S, Singh Y, Cote P, Nordin M. Burden of spine pain among rural and tribal populations in Raigad District of Maharashtra State of India. *Eur Spine J* 2020 Sep 10. doi: 10.1007/s00586-020-06585-3. Online ahead of print.
- [16] Tymecka-Woszczerowicz A, Wrona W, Kowalski PM, Hermanowski T. Indirect costs of back pain – Review. *Polish Annals of Medicine* 2015; 22: 143–148.
- [17] Dutmer AL, Schiphorst Preuper HR, Soer R, Brouwer S, Ute Bültmann U, Dijkstra PU, Coppes MH, Stegeman P, Buskens E, van Asselt ADI, Wolff AP, Renemanet MF. Personal and societal impact of low back pain. *Spine* 2019; 44(24): E1443–E1451.
- [18] Kim LH, Vail D, Azad TD, Bentley JP, Zhang Y, Ho AL, Fatemi P, Feng A, Varshneya K, Desai M, Veeravagu A, Ratliff JK. Expenditures and health care utilization among adults with newly diagnosed low back and lower extremity pain. *JAMA Network Open*. 2019; 2(5): e193676.
- [19] Igwesi-Chidobe CN, Coker B, Onwasigwe CN, Sorinola IO, Godfrey EL. Biopsychosocial factors associated with chronic low back pain disability in rural Nigeria: a population-based cross-sectional study. *BMJ Glob Health* 2017; 2: e000284.
- [20] Hayden JA, Chou R, Hogg-Johnson S, Bombardier C. Systematic reviews of low back pain prognosis had variable methods and results – guidance for future prognosis reviews. *Journal of Clinical Epidemiology* 2009; 62: 781-796.
- [21] Karran EL, Grant AR Moseley GL. Low back pain and the social determinants of health: a systematic review and narrative synthesis *PAIN* 2020; 161: 2476–2493
- [22] Setchell J, Costa N, Ferreira M, Hodges PW. What decreases low back pain? A qualitative study of patient perspectives. *Scand J Pain* 2019; 19(3): 597–603.

- [23] Nsangi A, Semakula D, Oxman AD, Austvoll-Dahlgren A, Oxman M, Rosenbaum S, Morelli A, Glenton C, Lewin S, Kaseje M, Chalmers I, Fretheim A, Ding Y, Sewankambo NK. Effects of the Informed Health Choices primary school intervention on the ability of children in Uganda to assess the reliability of claims about treatment effects: a cluster-randomised controlled trial. *Lancet* 2017; 390: 374–388.
- [24] Semakula D, Nsangi A, Oxman AD, Oxman M, Austvoll-Dahlgren A, Rosenbaum S, Morelli A, Glenton C, Lewin S, Kaseje M, Chalmers I, Fretheim A, Kristoffersen DT, Sewankambo NK. Effects of the Informed Health Choices podcast on the ability of parents of primary school children in Uganda to assess claims about treatment effects: a randomised controlled trial. *Lancet* 2017; 390: 389–398.
- [25] Buchbinder R, Gross DP, Werner EL, Hayden JA. Understanding the characteristics of effective mass media campaigns for back pain and methodological challenges in evaluating their effects. *Spine* 2008; 33(1): 74–80.
- [26] Gross DP, Russell AS, Ferrari R, Battie MC, Schopflocher D, Hu R, Waddell G, Buchbinder R. Evaluation of a Canadian back pain mass media campaign. *Spine* 2010; 35(8): 906–913.
- [27] Suman A, Bostick GP, Schopflocher D, Russell AS, Ferrari R, Battie MC, Hu R, Buchbinder R, Gross DP. Long-term evaluation of a Canadian back pain mass media campaign. *Eur Spine J* 2017; 26: 2467–2474.
- [28] World Health Organization (WHO). WHO global strategy on integrated people-centred health services 2016–2026: placing people and communities at the centre of health services. WHO, Geneva, 2015.
- [29] Johnson CD, Haldeman S, Chou R, Nordin M, Green BN, Côté P, Hurwitz EL, Kopansky-Giles D, Acaroğlu E, Cedraschi C, Ameis A, Randhawa K, Aartun E, Adjei-Kwayisi A, Ayhan S, Aziz A, Bas T, Blyth F, Borenstein D, Brady O'D, Brooks P, Camilleri C, Castellote JM, Clay MB, Davatchi F, Dudler J, Dunn R, Eberspaecher S, Emmerich J, Farcy JP, Fisher-Jeffes N, Goertz C, Grevitt M, Griffith EA, Hajjaj-Hassouni N, Hartvigsen J, Hondras M, Kane EJ, Laplante J, Lemeunier N, Mayer J, Mior S, Mmopelwa T, Modic M, Moss J, Mullerpatan R, Muteti E, Mwaniki L, Ngandeu-Singwe M, Outerbridge G, Rajasekaran S, Shearer H, Smuck M, Sönmez E, Tavares P, Taylor-Vaisey A, Torres C, Torres P, van der Horst A, Verville L, Vialle E, Vijay Kumar G, Vlok A, Watters W, Wong CC, Wong JJ, Yu H, Yüksel S. The Global Spine Care Initiative: model of care and implementation. *European Spine Journal* (2018) 27 (Suppl 6): S925–S945.
- [30] George SZ, Lentza TA, Beneciuk JM, Bhavsard NA, Mundte JM, Boissoneault J. Framework for improving outcome prediction for acute to chronic low back pain transitions. *Pain Reports* 2020; 5: e809.
- [31] Linton SJ, Nicholas M, Shaw W. Why wait to address high-risk cases of acute low back pain? A comparison of stepped, stratified, and matched care. *Pain* 2018; 159: 2437–2441.
- [32] Kongsted A, Kent P, Quicke JG, Skou ST, Hill JC. Risk-stratified and stepped models of care for back pain and osteoarthritis: are we heading towards a common model? *Pain Reports* 2020; 5: e843.
- [33] George SZ, Goertz C, Hastings SN, Fritz JM. Transforming low back pain care delivery in the United States. *Pain* 2020; 161(12): 2667–2673
- [34] Briggs AM, Woolf AD, Dreinhöfer K, Homb N, Hoy DG, Kopansky-Giles D, Åkesson K, March L. Reducing the global burden of musculoskeletal conditions. *Bull World Health Organ* 2018; 96: 366–368
- [35] Hoy D, Geere JA, Davatchi F, Meggitt B, Barrero LH. A time for action: opportunities for preventing the growing burden and disability from musculoskeletal conditions in low- and middle-income countries. *Best Pract Res Clin Rheumatol*. 2014;28(3):377–393.
- [36] Croft P, Louw Q, Briggs AM. Transforming back pain care –why, what, and how? *Pain* 2020; 12: 2657–2658
- [37] Australian Public Service Commission. Tackling wicked problems: a public policy perspective, 2018 (<https://www.apsc.gov.au/tackling-wicked-problems-public-policy-perspective> accessed November 18, 2020).
- [38] World Health Organization (WHO). Key learning on Health in All Policies implementation from around the world – Information Brochure. WHO, Geneva, 2018 (<https://apps.who.int/iris/bitstream/handle/10665/272711/WHO-CED-PHE-SDH-18.1-eng.pdf?ua=1> accessed November 18, 2020).

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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