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# Global burden of pain and global pain policy—creating a purposeful body of evidence

Fiona M. Blyth[a,*], Carmen Huckel Schneider[b]



## 1. Introduction

Within the past decade or so, important signals about the burden of chronic pain at population level have emerged from separate fields of work. Broadly speaking, these fields can be divided into 2 main categories—(1) national and subnational population studies that have specifically focussed on characterising the burden of chronic pain in general, or specific pain conditions such as low-back pain,[10,14] and (2) global studies that characterise and rank the leading causes of death and disability at population level, conducted under the umbrella of the Global Burden of Disease Project (GBD)[9] and by the WHO, using similar methods.[17] An implicit shared purpose of these 2 fields is to provide evidence to inform policy responses that will lead to overall improvement in population health.

The connection between these 2 fields has, to date, mainly been limited to incorporation of data from some specific national and subnational population studies of chronic pain burden into the GBD estimation methods, and use of the significant methodological advances in how to measure burden of disease. The improvements in measurement have come from the GBD over more than 2 decades by researchers and governments in individual countries to improve local studies of burden of disease.[1]

Despite the evolution of a better evidence base, there has been a lack of translation into effective and coherent global pain policy. In this article, we suggest that there is considerable potential to use local policy action research to develop an evidence base that is both more robust and policy-relevant. We argue that such an approach would further the important aim of reducing the global burden of pain. The ultimate goal is to shift the goal away from statistical accuracy of burden metrics towards applying evidence and testing policy-oriented solutions.

The aims of this article are as follows: (1) to summarise recent evidence about the global burden of pain coming from the GBD about musculoskeletal pain, (2) to contextualise this evidence with insights emerging from our broader understanding of pain at a population level and as a chronic condition, and (3) the production of evidence and its relationship to global priority setting and the global health policy landscape. We then propose an agenda for expanding the body of evidence for policy and promoting its use in global health policy/prioritisation.

## 2. The changing burden if disease, its measurement, and the organisation of policy response

Over the course of recent human history, there have been transformative shifts in fertility and mortality rates that have seen life expectancy increase by decades. The rise in life expectancy has risen exponentially over the past 160 years, and in combination with falling population fertility rates is driving the overall ageing of the global population. The rapidity of this change is extraordinary, having occurred in about the last 4 of 8000 recorded human generations.[25] Improvements in public health, living conditions, and medical treatments have led to profound shifts in the major drivers of burden of disease at population level from the "age of pestilence and famine" before the 19th century as described by Omran[19] to the emergence of chronic non-communicable diseases in the mid-20th century as the leading contributors to death and disability. These changes occurred initially in high-income countries but are now also seen in low- and middle-income countries. The net result of these profound and interlocking changes is that we live in a world where populations are living longer, but living with higher burdens of multiple chronic conditions or multimorbidity. Indeed, within the past decade, nonfatal health burden has become a greater contributor to the overall global burden of disease than fatal health burden from premature loss of life for the first time.[26]

Accordingly, burden of disease concepts and methods has also evolved, particularly in the past half century.[7] In their current form, burden of disease measures can be grouped into 2 main approaches. The first of these focusses on specific diseases and conditions and the extent to which each reduces through premature death and/or disability and the ability to live a maximum lifespan in full health. The second approach uses a broader, domain-based approach to health that focusses on how diseases and conditions affect physical, mental, and functional performance. Both approaches generate summary measures that are used to assess the relative impact of conditions on a population's health.

In addition to changes in how we conceptualise burden of disease, the way in which we identify, prioritise, design, and implement measures to address disease in global health has also changed rapidly. We can conceptualise this change as comprising 3 strands. First, over the past 130 years, international cooperation in health has evolved from primarily ad hoc agreements between nations to limit the spread of infectious disease,

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[a] *Centre for Education and Research on Ageing, Concord Clinical School, University of Sydney, Sydney, New South Wales, Australia,* [b] *Menzies Centre for Health Policy, Sydney School of Public Health, University of Sydney, Sydney, New South Wales, Australia*

**Corresponding author. Address: Medical Education Centre, University of Sydney Concord Clinical School, Concord Hospital Building B26, Hospital Rd, Concord, NSW 2139, Australia. Tel.: (61 2) 9767 6842. E-mail address: fiona.blyth@sydney.edu.au (F.M. Blyth).*

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to a diverse, multiactor global health policy environment. This environment encompasses not only standing intergovernmental bureaucracies (including the World Health Organization)—but also a large number of state and nonstate organisations that engage in health policy advocacy, development, and implementation.[15] Second, in an increasingly globalised world, characterised by technological advances that allow for the rapid movement of goods, people, and information, the potential for policy transfer and learning (by means of comparative analysis of disease burden and policy action) has greatly increased.[13,24] Third, over the past 50 years, and even more so over the past 20 years, evidence-informed policy has risen as the dominant principle that legitimises health policy action. Although the extent to which policy decisions are evidence-based is contestable, there is little doubt that the mantra of evidence-based policy has taken hold.[5]

The GBD is reflected in each of these 3 strands. The history of the GBD lies in a commission from World Bank in the early 1990s, and today, it is run out of the Institute for Health Metrics and Evaluation (IHME), itself the result of a combination of philanthropic, academic, and state funding.[23] The GBD metric combines data from local sources in a way that enables international comparisons and ranking of disease burden. The GBD thus can inform policy decisions at global as well as local levels.[30] The GBD also provides information that can be used to monitor progress and performance–by means of providing the metrics that serve as a denominator in calculations that answer "what works?" types of questions for evidence-informed policy. In the current global health policy environment, the GBD therefore has a high potential to inform health policy agendas. However, there is also a need to maintain focus on the strength and credibility of its underlying methods, the information it provides, and the wider body of evidence that is needed to feed into decisions made by many relevant stakeholders. These decisions relate to prioritisation, goal setting, coalition building, funding, policy design, and implementation.[16] It is in this context that the evidence base for the global burden of musculoskeletal pain needs to be considered.

## 3. Summary of evidence of global burden of pain

The metric at the core of the GBD is health loss resulting from premature death and disability associated with specific conditions (communicable and noncommunicable conditions, and injuries). This fatal and nonfatal health loss metric is quantified with the disability-adjusted life years (DALYs), which is decomposed into fatal loss (years of life lost) and nonfatal loss (years lived with disability [YLDs]).

Estimates of the global burden of pain have been largely limited to musculoskeletal pain and have evolved over the past 1 to 2 decades with successive iterations of the GBD. The range of musculoskeletal conditions included in the burden estimation, although still limited in scope, has incrementally expanded over time because the overall number of conditions in GBD has increased. These conditions include low-back and neck pain, osteoarthritis, and rheumatoid arthritis. The conceptual and methodological framework for health loss measurement has become progressively more sophisticated over time, along with greater accessibility to and transparency of data inputs.[18] The GBD 2010 was notable, and in that for the first time, musculoskeletal pain conditions were identified amongst the leading causes of global disability, with low-back pain making the highest contribution to global disability burden.

A key change since GBD 2010 is more frequent updating and reporting of GBD estimates. The results continue to show that musculoskeletal pain conditions are among the leading causes of global disability, along with mental health and behavioural conditions with which persistent pain is often closely associated, notably depression and anxiety. Low-back pain was the most common specific cause of YLD for men in GBD 2016 and had the highest age-standardized YLD rates in 133 of the 195 countries and territories for which estimates were made, including parts of Northern and sub-Saharan Africa, Latin America, Central, and South-East Asia.[26] In women, low-back pain similarly had the highest age-standardized YLD rates in 109 countries and territories, again with an extensive global footprint. Over the period from 2006 to 2016, the number of estimated YLD for low-back and neck pain together rose by 19.3%. Although a lesser contributor to overall burden, it is noteworthy that the estimated YLD count for osteoarthritis rose by 31.5% over the same period, accompanied by an increase of 2.4% in the age-adjusted YLD rates.

Within the GBD, very little of the overall burden of musculoskeletal pain has been driven by premature loss of life. Despite this, in GBD 2016, low-back and neck pain were the third highest contributors to the total number of DALYs (which combines fatal and nonfatal burden), with only ischaemic heart disease and cerebrovascular disease contributing more on this measure.[9]

It is important to note that these estimates of musculoskeletal pain burden are constrained by the availability of recent high-quality epidemiological data. This is particularly true in low- and middle-income countries, where the estimates sometimes rely on a limited number of studies, or are based on extrapolated estimates when there are no local primary data available.

A number of approaches to developing better estimates have been identified. These include standardising case definitions and epidemiological data capture for common conditions such as low-back pain and neck pain, dedicated pain-specific coding in disease classification systems, more systematic characterisation of pain across all musculoskeletal conditions, better characterisation of common trajectories of pain episodes at a population level, and better identification of the contribution of other conditions (eg, resulting from road trauma and other types of injury)[2] to musculoskeletal pain conditions.

Other types of pain are common, and frequently co-occur with musculoskeletal pain conditions. Thus there is a need to strengthen the measurement of the population burden of pain conditions by expanding the range of pain conditions studied.[20] Some elements of this are already in place in GBD–eg, migraine was identified as a major contributor to YLD in GBD 2016 and ranked in the top 10 specific conditions in all 195 countries and territories.[26]

Another component of the GBD is the inclusion of comparative risk assessment data for a range of behavioural, environmental, metabolic, and occupational risk factors. In GBD 2016, 84 specific risk factors, and clusters of these factors, judged to be important for human health were assessed for their contribution to DALYs and to specific health conditions.[6] Some of these risk factors had been the subject of risk modification policies and programs. The trend data presented in GBD 2016 shows that these policies have had an effect in reducing DALYs, but to a limited extent for noncommunicable conditions such as pain as compared with communicable diseases. For conditions that have a predominantly nonfatal burden, including low-back pain, less than a third of the total burden can be attributed to those risk factors that are currently included in GBD. The reasons for this are not fully apparent but may include greater heterogeneity in trends for specific risk factors in relation to noncommunicable diseases,

or to the failure to measure some important determinants of this group of conditions.[27]

The global burden of disease in its more recent iterations has become informed by an increasing awareness that health metrics have a dual purpose: not only to provide information about burden, but also information that will inform policy decisions to address burden. With the publication of the results of GBD 2010, there was a clear intent that the evidence generated for fatal and nonfatal health burden should be used "…to create a global public good that will be useful for informing the design of health systems and the creation of public health policy."[11] The change in the focus of GBD from periodic static reports to a more flexible model with periodic updating of results with has occurred since the publication of GBD 2010 in late 2012. The explicit rationale for this change was so that GBD can be used to monitor trends in population health, and by extension, the effects of policy-driven interventions. The significant and growing contribution of musculoskeletal conditions to the global burden of disease over the different waves of GBD was explicitly acknowledged by the Institute for Health Metrics Evaluation after GBD 2010 was released "… using GBD tools to identify leading causes of disability such as mental and behavioural disorders and musculoskeletal disorders can help guide health system planning…" Decision makers can use GBD's findings to ensure that health care systems are designed to address the primary drivers of disability in a cost-effective way."[11] More recently, IHME announced an intention to expand the scope of GBD analyses to include a range of measures related to health system structure, resourcing, and functioning.[12]

This indicates a shift towards a more policy-oriented data set, ie, an evidence base that feeds more directly into the wider range of policy decision that go beyond agenda setting. Nevertheless, there is a lingering tendency to focus on metrics that demonstrate the scale of the problem, rather than to assess the efficacy, feasibility, and acceptability of solutions. The focus on scale of burden tends towards simplified metrics related to mortality. The Lancet taskforce on noncommunicable diseases (NCDs) and economics, eg, relies heavily on premature mortality as the key metric to demonstrate burden and set policy goals.

### 3.1. Towards a policy-relevant body of evidence

Frustration remains as to why there is so little political traction for pain and musculoskeletal health compared with other NCDs and infectious diseases in global health policy and research today; especially considering, we are well into a decade of calls for a global health response to musculoskeletal pain.[3,4,8,10] Musculoskeletal health is not specifically represented in the sustainable development goals, nor are they a focus in WHO's *Global action plan for the prevention and control of NCDs 2013 to 2020*.[29]

Global policy attention should be understood as a complex phenomenon, which cannot be directly attributed to any one or fixed combined set of factors. Over time, however, scholars of global public policy have identified a range of factors that play a part in the complex social processes that lead to some issue gain traction on the global level, while others do not. These include strength and cohesiveness of advocacy coalitions and policy communities, leadership, focussing events, and the completeness of the available evidence base.[22] These factors play out in the shadow of a "core paradigm"—ie, one which gives more attention to acute health problems and measurable, directly attributable solutions that provide a return on investment.[21] To overcome the "core paradigm," you need to have a lot more of the other factors mentioned above. Other movements, notably NCDs such as diabetes, and more recently mental health and universal health coverage, have managed to gain traction on these bases.

We propose that there is a need to better match the global body of evidence surrounding pain conditions (musculoskeletal and others) to the calls for global policy action. Evidence of burden, however accurate, provides only a fraction of the information needed to promote, inform, and maintain policy attention. There are 3 main types of evidence, each linked with a policy purpose, which are required for effective translation of evidence into policy.

First is the need for evidence of the burden itself. Its purpose is to be able to leverage data as an awareness raising tool, to gain traction for pain on the global policy agenda. For musculoskeletal pain, the function of such evidence is to give priority to chronic pain and musculoskeletal health by means of highlighting its relative importance amongst the many interrelated issues occupying global health policy attention. The GBD serves this purpose well, but more could be performed to translate what we know about incidence and prevalence to messages about what burden looks like (eg, effects on relationships and ability to participate in society) and the social and economic costs of that burden.

Second is the need for evidence that addresses underlying causes of chronic pain. Its purpose is to identify starting points for policy targets to prevent chronic pain, and to identify social, cultural, and environmental factors that are amenable to policy solutions. This type of evidence, grouped according to levels of economic development, and/or by policy-relevant demographic characteristics (age group and sex) can be used at national, regional, and supraregional levels as well as by global entities such as the World Health Organization to formulate policy packages that are more meaningful than awareness rising alone. The GBD provides a good starting point for this policy work. However, based on the empirical data from comparative risk factor analysis in GBD, there are questions as to whether all important risk factors have been included. Potential policy targets could include risk factors that are shared across chronic noncommunicable conditions (eg, high body mass index in relation to low-back pain), or health literacy. A second focus for policy targets could be pain-specific (eg, early screening and intervention for acute and subacute pain conditions at risk of progression to chronic disabling pain). It is also likely that policy targets to reduce the incidence of other conditions where chronic pain is a common sequela will help reduce the overall pain burden (eg, diabetes).

Third, there is a need for evidence that supports what can and should be performed to relieve pain burden, including the policy options and the potential costs and benefits of each. This body of evidence not only includes what we know about discrete interventions to prevent and treat pain, but also encompasses more complex approaches, that combine insights from comparative policy case studies, policy mapping, dynamic modelling, and system maps. Such a broad approach to evidence building requires access to local level data and global level analysis. In its current form, the GBD serves this purpose least well. Instead, the current body of evidence on underlying causes remains largely dispersed in local and national research. There is considerable potential in bringing together more locally produced evidence into an accessible, applicable body of evidence for global policy. This requires maintaining a policy lens on evidence production and dissemination.

## 4. Discussion

### 4.1. Applying policy lens for a purposeful body of evidence

Contrary to some common depictions of policy-making "cycles" and knowledge-to-action pathways, there is no clear linear policy

path that predetermines that strong evidence inevitably leads to action, or that agenda setting precedes policy development and implementation. Rather, policy decisions are made in multiple locations, by multiple actors continuously working through a mix of agenda setting, decision-making, policy formulation, evaluation, and implementation stages. Policy development can accelerate under favourable conditions, such as focussing events, and when policy communities work together to build institutions and frame policy ideas in ways that gain traction.[22] The evidence base to support such policy ideas should incorporate not only the extent of the problem and why we need to pay more attention to it (defined inevitably as burden) but also evidence regarding the success of different visions, policy solutions, and policy actions.

At the global policy level, the main tools of policy (instruments available to bring about change) are the following: goals and targets (and their monitoring); fund transfers; contractual treaties (such as international conventions and protocols); sanctions; best practice models with technical assistance, and implementation partnerships. Not all of these are desirable, appropriate, or effective in global pain policy (or health in general). However, all require an evidence base to be sustainable and effective. So, for example, to set global goals for musculoskeletal pain, we need to understand not only the level of burden, but also what is achievable in terms of reduction of that burden. With respect to fund transfers, we need to know who is spending what, on alleviating the pain burden, and what policies and programs show high potential to reduce burden. In terms of implementation partnership building, we need to know where the capacity lies within a system to affect change, and how different actors can, and need to work together. With respect to best practice/technical assistance, we need to know what has worked, for whom, in what context so as to work in local contexts to translate this evidence. This aligns with the findings of a Cochrane systematic review of psychological therapies for chronic pain published in 2012, which similarly concluded that the future direction of research should be to understand which components work best for whom.[28] A renewed global project investing in gathering all these types of data is possible and should be a priority for future global pain community.

## 5. Conclusion

In a policy climate where metrics are intended to provide a reliable simplified proxy for real world burden, premature mortality remains an easily graspable and often used statistic. However, this is not easily compatible for chronic conditions with complex aetiologies and impacts on health and well-being such as persistent pain. Pain burden and its policy solutions are also particularly difficult to conceptualise with metrics. This is because of the co-occurrence with other conditions and challenges differentiating and classifying pain as a condition in its own right at a population level, in addition to currently fragmented and partial capture of primary pain pathologies. More recently, calls for recognition of the burden of pain have been accompanied with directions for policy solutions, including setting global targets, integrating musculoskeletal health into national policy reform, and building treatment and prevention of pain into health financing and health care integration strategies.[3] A key message here is that many health conditions including pain, chronic disease, and healthy ageing overlap and must be addressed together. We need to invest time collating and synthesising this evidence in a way that is directed towards policy relevance if we are to effectively reduce the global burden of musculoskeletal pain.

## Conflict of interest statement

The authors have no conflict of interest to declare.

F.M. Blyth was a member on the Expert Reference Group for low-back pain for GBD2010.

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## References

[1] Australian Institute of Health and Welfare. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Canberra: AIHW, 2016.
[2] Blyth F, Briggs AM, Huckel Schneider C, Hoy D, March L. The global burden of musculoskeletal pain: where to from here? Am J Public Health 2018.
[3] Briggs AM, Woolf AD, Dreinhöfer K, Homb N, Hoy DG, Kopansky-Giles D, Åkessong K, Marchh L. Reducing the global burden of musculoskeletal conditions. Geneva: World Health Organization Marketing and Dissemination, 2018.
[4] Buchbinder R, Blyth FM, March LM, Brooks P, Woolf AD, Hoy DG. Placing the global burden of low back pain in context. Best Pract Res Clin Rheumatol 2013;27:575–89.
[5] Fan EL, Uretsky E. In search of results: anthropological interrogations of evidence-based global health. Crit Public Health 2017;27:157–62.
[6] GBD 2016 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017;390:1345–422.
[7] Gold MR, Stevenson D, Fryback DG. HALYS and QALYS and DALYS, Oh My: similarities and differences in summary measures of population Health. Annu Rev Public Health 2002;23:115–34.
[8] Goldberg DS, McGee SJ. Pain as a global public health priority. BMC Public Health 2011;11:770.
[9] Hay SI, Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, Abdulkader RS, Abdulle AM, Abebo TA, Abera SF, Aboyans V, Abu-Raddad LJ, Ackerman IN, Adedeji IA, Adetokunboh O, Afshin A, Aggarwal R, Agrawal S, Agrawal A, Ahmed MB, Aichour MTE, Aichour AN, Aichour I, Aiyar S, Akinyemiju TF, Akseer N, Al Lami FH, Alahdab F, Al-Aly Z, Alam K, Alam N, Alam T, Alasfoor D, Alene KA, Ali R, Alizadeh-Navaei R, Alkaabi JM, Alkerwi AA, Alla F, Allebeck P, Allen C, Al-Maskari F, AlMazroa MA, Al-Raddadi R, Alsharif U, Alsowaidi S, Althouse BM, Altirkawi KA, Alvis-Guzman N, Amare AT, Amini E, Ammar W, Amoako YA, Ansha MG, Antonio CAT, Anwari P, Ärnlöv J, Arora M, Artaman A, Aryal KK, Asgedom SW, Atey TM, Atnafu NT, Avila-Burgos L, Avokpaho EFGA, Awasthi A, Awasthi S, Azarpazhooh MR, Azzopardi P, Babalola TK, Bacha U, Badawi A, Balakrishnan K, Bannick MS, Barac A, Barker-Collo SL, Bärnighausen T, Barquera S, Barrero LH, Basu S, Battista R, Battle KE, Baune BT, Bazargan-Hejazi S, Beardsley J, Bedi N, Béjot Y, Bekele BB, Bell ML, Bennett DA, Bennett JR, Bensenor IM, Benson J, Berhane A, Berhe DF, Bernabé E, Betsu BD, Beuran M, Beyene AS, Bhansali A, Bhatt S, Bhutta ZA, Biadgilign S, Bicer BK, Bienhoff K, Bikbov B, Birungi C, Biryukov S, Bisanzio D, Bizuayehu HM, Blyth FM, Boneya DJ, Bose D, Bou-Orm IR, Bourne RRA, Brainin M, Brayne C, Brazinova A, Breitborde NJK, Briant PS, Britton G, Brugha TS, Buchbinder R, Bulto LNB, Bumgarner BR, Butt ZA, Cahuana-Hurtado L, Cameron E, Campos-Nonato IR, Carabin H, Cárdenas R, Carpenter DO, Carrero JJ, Carter A, Carvalho F, Casey D, Castañeda-Orjuela CA, Castle CD, Catalá-López F, Chang JC, Charlson FJ, Chaturvedi P, Chen H, Chibalabala M, Chibueze CE, Chisumpa VH, Chitheer AA, Chowdhury R, Christopher DJ, Ciobanu LG, Cirillo M, Colombara D, Cooper LT, Cooper C, Cortesi PA, Cortinovis M, Criqui MH, Cromwell EA, Cross M, Crump JA, Dadi AF, Dalal K, Damasceno A, Dandona L, Dandona R, das Neves J, Davitoiu DV, Davletov K, de Courten B, De Leo D, De Steur H, Defo BK, Degenhardt L, Deiparine S, Dellavalle RP, Deribe K, Deribew A, Des Jarlais DC, Dey S, Dharmaratne SD, Dhillon PK, Dicker D, Djalainia S, Do HP, Dokova K, Doku DT, Dorsey ER, dos Santos KPB, Driscoll TR, Dubey M, Duncan BB, Ebel BE, Echko M, El-Khatib ZZ, Enayati A, Endries AY, Ermakov SP, Erskine HE, Eshetie S, Eshrati B, Esteghamati A, Estep K, Fanuel FBB, Farag T, Farinha CSeS, Faro A, Farzadfar F, Fazeli MS, Feigin VL, Feigl AB, Fereshtehnejad SM, Fernandes JC, Ferrari AJ, Feyissa TR, Filip I, Fischer F, Fitzmaurice C, Flaxman AD, Foigt N, Foreman KJ, Franklin RC,

Frostad JJ, Fullman N, Fürst T, Furtado JM, Futran ND, Gakidou E, Garcia-Basteiro AL, Gebre T, Gebregergs GB, Gebrehiwot TT, Geleijnse JM, Geleto A, Gemechu BL, Gesesew HA, Gething PW, Ghajar A, Gibney KB, Gillum RF, Ginawi IAM, Gishu MD, Giussani G, Godwin WW, Goel K, Goenka S, Goldberg EM, Gona PN, Goodridge A, Gopalani SV, Gosselin RA, Gotay CC, Goto A, Goulart AC, Graetz N, Gugnani HC, Gupta PC, Gupta R, Gupta T, Gupta V, Gupta R, Gutiérrez RA, Hachinski V, Hafezi-Nejad N, Hailu AD, Hailu GB, Hamadeh RR, Hamidi S, Hammami M, Handal AJ, Hankey GJ, Hao Y, Harb HL, Hareri HA, Haro JM, Harun KM, Harvey J, Hassanvand MS, Havmoeller R, Hay RJ, Hedayati MT, Hendrie D, Henry NJ, Heredia-Pi IB, Heydarpour P, Hoek HW, Hoffman HJ, Horino M, Horita N, Hosgood HD, Hostiuc S, Hotez PJ, Hoy DG, Htet AS, Hu G, Huang JJ, Huynh C, Iburg KM, Igumbor EU, Ikeda C, Irvine CMS, Islam SMS, Jacobsen KH, Jahanmehr N, Jakovljevic MB, James P, Jassal SK, Javanbakht M, Jayaraman SP, Jeemon P, Jensen PN, Jha V, Jiang G, John D, Johnson CO, Johnson SC, Jonas JB, Jürisson M, Kabir Z, Kadel R, Kahsay A, Kamal R, Kar C, Karam NE, Karch A, Karema CK, Karimi SM, Karimkhani C, Kasaeian A, Kassa GM, Kassaw NA, Kassebaum NJ, Kastor A, Katikireddi SV, Kaul A, Kawakami N, Keiyoro PN, Kemmer L, Kengne AP, Keren A, Kesavachandran CN, Khader YS, Khalil IA, Khan EA, Khang YH, Khoja AT, Khosravi A, Khubchandani J, Kiadaliri AA, Kieling C, Kim YJ, Kim D, Kimokoti RW, Kinfu Y, Kisa A, Kissimova-Skarbek KA, Kissoon N, Kivimaki M, Knudsen AK, Kokubo Y, Kolte D, Kopec JA, Kosen S, Kotsakis GA, Koul PA, Koyanagi A, Kravchenko M, Krohn KJ, Kumar GA, Kumar P, Kyu HH, Lager ACJ, Lal DK, Lalloo R, Lallukka T, Lambert N, Lan Q, Lansingh VC, Larsson A, Leasher JL, Lee PH, Leigh J, Leshargie CT, Leung J, Leung R, Levi M, Li Y, Li Y, Liang X, Liben ML, Lim SS, Linn S, Liu PY, Liu A, Liu S, Liu Y, Lodha R, Logroscino G, Looker KJ, Lopez AD, Lorkowski S, Lotufo PA, Lozano R, Lucas TCD, Lunevicius R, Lyons RA, Macarayan ERK, Maddison ER, Magdy Abd El Razek HMA, Magdy Abd El Razek M, Magis-Rodriguez C, Mahdavi M, Majdan M, Majdzadeh R, Majeed A, Malekzadeh R, Malhotra R, Malta DC, Mamun AA, Manguerra H, Manhertz T, Mantovani LG, Mapoma CC, March LM, Marczak LB, Martinez-Raga J, Martins PHV, Martins-Melo FR, Martopullo I, März W, Mathur MR, Mazidi M, McAlinden C, McGaughey M, McGrath JJ, McKee M, Mehata S, Meier T, Meles KG, Memiah P, Memish ZA, Mendoza W, Mengesha MM, Mengistie MA, Mengistu DT, Mensah GA, Meretoja TJ, Meretoja A, Mezgebe HB, Micha R, Millear A, Miller TR, Minnig S, Mirarefin M, Mirrakhimov EM, Misganaw A, Mishra SR, Mitchell PB, Mohammad KA, Mohammadi A, Mohammed MSK, Mohammed KE, Mohammed S, Mohan MBV, Mokdad AH, Mollenkopf SK, Monasta L, Montañez Hernandez JC, Montico M, Moradi-Lakeh M, Moraga P, Morawska L, Mori R, Morrison SD, Moses M, Mountjoy-Venning C, Mruts KB, Mueller UO, Muller K, Murdoch ME, Murthy GVS, Murthy S, Musa KI, Nachega JB, Nagel G, Naghavi M, Naheed A, Naidoo KS, Nangia V, Nasher JT, Natarajan G, Negasa DE, Negoi RI, Negoi I, Newton CR, Ngunjiri JW, Nguyen CT, Nguyen QL, Nguyen TH, Nguyen G, Nguyen M, Nichols E, Ningrum DNA, Nong VM, Norheim OF, Norrving B, Noubiap JJN, Nyandwi A, Obermeyer CM, O'Donnell MJ, Ogbo FA, Oh IH, Okoro A, Oladimeji O, Olagunju AT, Olagunju TO, Olsen HE, Olusanya BO, Olusanya JO, Ong K, Opio JN, Oren E, Ortiz A, Osborne RH, Osgood-Zimmerman A, Osman M, Ota E, Owolabi MO, Pa M, Pacella RE, Panda BK, Pandian JD, Papachristou C, Park EK, Parry CD, Parsaeian M, Patil ST, Patten SB, Patton GC, Paudel D, Paulson K, Pearce N, Pereira DM, Perez KM, Perico N, Pesudovs K, Peterson CB, Petri WA, Petzold M, Phillips MR, Phipps G, Pigott DM, Pillay JD, Pinho C, Piradov MA, Plass D, Pletcher MA, Popova S, Poulton RG, Pourmalek F, Prabhakaran D, Prasad N, Purcell C, Purwar M, Qorbani M, Quintanilla BPA, Rabiee RHS, Radfar A, Rafay A, Rahimi K, Rahimi-Movaghar A, Rahimi-Movaghar V, Rahman MHU, Rahman MA, Rahman M, Rai RK, Rajsic S, Ram U, Ranabhat CL, Rangaswamy T, Rankin Z, Rao PV, Rao PC, Rawaf S, Ray SE, Reiner RC, Reinig N, Reitsma M, Remuzzi G, Renzaho AMN, Resnikoff S, Rezaei S, Ribeiro AL, Rivas JC, Roba HS, Robinson SR, Rojas-Rueda D, Rokni MB, Ronfani L, Roshandel G, Roth GA, Rothenbacher D, Roy A, Rubagotti E, Ruhago GM, Saadat S, Safdarian M, Safiri S, Sagar R, Sahathevan R, Sahraian MA, Salama J, Saleh MM, Salomon JA, Salvi SS, Samy AM, Sanabria JR, Sanchez-Niño MD, Santomauro D, Santos JV, Santos IS, Santric Milicevic MM, Sartorius B, Satpathy M, Sawhney M, Saxena S, Schelonka K, Schmidt MI, Schneider IJC, Schöttker B, Schutte AE, Schwebel DC, Schwendicke F, Seedat S, Sepanlou SG, Servan-Mori EE, Shaheen A, Shaikh MA, Shamsipour M, Sharma R, Sharma J, She J, Shi P, Shibuya K, Shields C, Shifa GT, Shiferaw MS, Shigematsu M, Shiri R, Shirkoohi R, Shirude S, Shishani K, Shoman H, Siabani S, Sibai AM, Sigfusdottir ID, Silberberg DH, Silva DAS, Silva JP, Silveira DGA, Singh JA, Singh OP, Singh NP, Singh V, Sinha DN, Skiadaresi E, Slepak EL, Smith DL, Smith M, Sobaih BHA, Sobngwi E, Soljak M, Sorensen RJD, Sousa TCM, Sposato LA, Sreeramareddy CT, Srinivasan V, Stanaway JD, Stathopoulou V, Steel N, Stein DJ, Steiner C, Steinke S, Stokes MA, Stovner LJ, Strub B, Subart M, Sufiyan MB, Sunguya BF, Sur PJ, Swaminathan S, Sykes BL, Sylte D, Szoeke CEI, Tabarés-Seisdedos R, Tadakamadla SK, Taffere GR, Takala JS, Tandon N, Tanne D, Tarekegn YL, Tavakkoli M, Taveira N, Taylor HR, Tegegne TK, Tehrani-Banihashemi A, Tekelab T, Terkawi AS, Tesfaye DJ, Tesssema B, Thakur JS, Thamsuwan O, Theadom AM, Theis AM, Thomas KE, Thomas N, Thompson R, Thrift AG, Tobe-Gai R, Tobollik M, Tonelli M, Topor-Madry R, Tortajada M, Touvier M, Traebert J, Tran BX, Troeger C, Truelsen T, Tsoi D, Tuzcu EM, Tymeson H, Tyrovolas S, Ukwaja KN, Undurraga EA, Uneke CJ, Updike R, Uthman OA, Uzochukwu BSC, van Boven JFM, Varughese S, Vasankari T, Veerman LJ, Venkatesh S, Venketasubramanian N, Vidavalur R, Vijayakumar L, Violante FS, Vishnu A, Vladimirov SK, Vlassov VV, Vollset SE, Vos T, Wadilo F, Wakayo T, Wallin MT, Wang YP, Weichenthal S, Weiderpass E, Weintraub RG, Weiss DJ, Werdecker A, Westerman R, Whiteford HA, Wijeratne T, Williams HC, Wiysonge CS, Woldeyes BG, Wolfe CDA, Woodbrook R, Woolf AD, Workicho A, Xavier D, Xu G, Yadgir S, Yaghoubi M, Yakob B, Yan LL, Yano Y, Ye P, Yihdego MG, Yimam HH, Yip P, Yonemoto N, Yoon SJ, Yotebieng M, Younis MZ, Yu C, Zaidi Z, Zaki MES, Zegeye EA, Zenebe ZM, Zhang X, Zheng Y, Zhou M, Zipkin B, Zodpey S, Zoeckler L, Zuhlke LJ, Murray CJL. Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017;390:1260–344.

[10] Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, Woolf A, Vos T, Buchbinder R. A systematic review of the global prevalence of low back pain. Arthritis Rheum 2012;64:2028–37.

[11] Institute for Health Metrics and Evaluation. The global burden of disease: generating evidence, guiding policy. Seattle: IHME, 2013.

[12] Institute for Health Metrics and Evaluation. Financing global health 2016: development assistance, public and private health spending for the pursuit of universal health coverage. Seattle: IHME, 2017.

[13] Irwin A, Scali E. Action on the social determinants of health: learning from previous experiences. Geneva: World Health Organization, 2010.

[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. Anesth Analg 2016;123:739–48.

[15] Lee K. Understandings of global health governance: the contested landscape. Global health governance. London: Palgrave MacMillan, 2009. p. 27–41.

[16] Luoto J, Maglione MA, Johnsen B, Chang CS, Higgs E, Perry T, Shekelle PG. A comparison of frameworks evaluating evidence for global health interventions. PLoS Med 2013;10:e1001469.

[17] Murray CJ, Lopez AD; Organization WH. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020: summary. Boston, MA: Harvard School of Public Health, 1996.

[18] Murray CJL, Lopez AD. Measuring global health: motivation and evolution of the global burden of disease study. Lancet 2017;390:1460–4.

[19] Omran AR. The epidemiologic transition. A theory of the epidemiology of population change. Milbank Mem Fund Q 1971;49:509–38.

[20] Rice AS, Smith BH, Blyth FM. Pain and the global burden of disease. PAIN 2016;157:791–6.

[21] Rushton S, Williams OD. Frames, paradigms and power: global health policy-making under neoliberalism. Glob Soc 2012;26:147–67.

[22] Shiffman J. A social explanation for the rise and fall of global health issues. Bull World Health Organ 2009;87:608–13.

[23] Shiffman J. Knowledge, moral claims and the exercise of power in global health. Int J Health Policy Manag 2014;3:297–9.

[24] Stone D. Transfer agents and global networks in the "transnationalization" of policy. J Eur Public Policy 2004;11:545–66.

[25] Vaupel JW. Biodemography of human ageing. Nature 2010;464:536.

[26] Vos T, Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, Abdulkader RS, Abdulle AM, Abebo TA, Abera SF, Aboyans V, Abu-Raddad LJ, Ackerman IN, Adamu AA, Adetokunboh O, Afarideh M, Afshin A, Agarwal SK, Aggarwal R, Agrawal A, Agrawal S, Ahmadieh H, Ahmed MB, Aichour MTE, Aichour AN, Aichour I, Aiyar S, Akinyemi RO, Akseer N, Al Lami FH, Alahdab F, Al-Aly Z, Alam K, Alam N, Alam T, Alasfoor D, Alene KA, Ali R, Alizadeh-Navaei R, Alkerwi Aa, Alla F, Allebeck P, Allen C, Al-Maskari F, Al-Raddadi R, Alsharif U, Alsowaidi S, Altirkawi KA, Amare AT, Amini E, Ammar W, Amoako YA, Andersen HH, Antonio CAT, Anwari P, Ärnlöv J, Artaman A, Aryal KK, Asayesh H, Asgedom SW, Assadi R, Atey TM, Atnafu NT, Atre SR, Avila-Burgos L, Avokphako EFGA, Awasthi A, Bacha U, Badawi A, Balakrishnan K,

Banerjee A, Bannick MS, Barac A, Barber RM, Barker-Collo SL, Bärnighausen T, Barquera S, Barregard L, Barrero LH, Basu S, Battista B, Battle KE, Baune BT, Bazargan-Hejazi S, Beardsley J, Bedi N, Beghi E, Béjot Y, Bekele BB, Bell ML, Bennett DA, Bensenor IM, Benson J, Berhane A, Berhe DF, Bernabé E, Betsu BD, Beuran M, Beyene AS, Bhala N, Bhansali A, Bhatt S, Bhutta ZA, Biadgilign S, Bicer BK, Bienhoff K, Bikbov B, Birungi C, Biryukov S, Bisanzio D, Bizuayehu HM, Boneya DJ, Boufous S, Bourne RRA, Brazinova A, Brugha TS, Buchbinder R, Bulto LNB, Bumgarner BR, Butt ZA, Cahuana-Hurtado L, Cameron E, Car M, Carabin H, Carapetis JR, Cárdenas R, Carpenter DO, Carrero JJ, Carter A, Carvalho F, Casey DC, Caso V, Castañeda-Orjuela CA, Castle CD, Catalá-López F, Chang HY, Chang JC, Charlson FJ, Chen H, Chibalabala M, Chibueze CE, Chisumpa VH, Chitheer AA, Christopher DJ, Ciobanu LG, Cirillo M, Colombara D, Cooper C, Cortesi PA, Criqui MH, Crump JA, Dadi AF, Dalal K, Dandona L, Dandona R, das Neves J, Davitoiu DV, de Courten B, De Leo DD, Defo BK, Degenhardt L, Deiparine S, Dellavalle RP, Deribe K, Des Jarlais DC, Dey S, Dharmaratne SD, Dhillon PK, Dicker D, Ding EL, Djalalinia S, Do HP, Dorsey ER, dos Santos KPB, Douwes-Schultz D, Doyle KE, Driscoll TR, Dubey M, Duncan BB, El-Khatib ZZ, Ellerstrand J, Enayati A, Endries AY, Ermakov SP, Erskine HE, Eshrati B, Eskandarieh S, Esteghamati A, Estep K, Fanuel FBB, Farinha CSES, Faro A, Farzadfar F, Fazeli MS, Feigin VL, Fereshtehnejad SM, Fernandes JC, Ferrari AJ, Feyissa TR, Filip I, Fischer F, Fitzmaurice C, Flaxman AD, Flor LS, Foigt N, Foreman KJ, Franklin RC, Fullman N, Fürst T, Furtado JM, Futran ND, Gakidou E, Ganji M, Garcia-Basteiro AL, Gebre T, Gebrehiwot TT, Geleto A, Gemechu BL, Gesesew HA, Gething PW, Ghajar A, Gibney KB, Gill PS, Gillum RF, Ginawi IAM, Giref AZ, Gishu MD, Giussani G, Godwin WW, Gold AL, Goldberg EM, Gona PN, Goodridge A, Gopalani SV, Goto A, Goulart AC, Griswold M, Gugnani HC, Gupta R, Gupta R, Gupta T, Gupta V, Hafezi-Nejad N, Hailu GB, Hailu AD, Hamadeh RR, Hamidi S, Handal AJ, Hankey GJ, Hanson SW, Hao Y, Harb HL, Hareri HA, Haro JM, Harvey J, Hassanvand MS, Havmoeller R, Hawley C, Hay SI, Hay RJ, Henry NJ, Heredia-Pi IB, Hernandez JM, Heydarpour P, Hoek HW, Hoffman HJ, Horita N, Hosgood HD, Hostiuc S, Hotez PJ, Hoy DG, Htet AS, Hu G, Huang H, Huynh C, Iburg KM, Igumbor EU, Ikeda C, Irvine CMS, Jacobsen KH, Jahanmehr N, Jakovljevic MB, Jassal SK, Javanbakht M, Jayaraman SP, Jeemon P, Jensen PN, Jha V, Jiang G, John D, Johnson SC, Johnson CO, Jonas JB, Jürisson M, Kabir Z, Kadel R, Kahsay A, Kamal R, Kan H, Karam NE, Karch A, Karema CK, Kasaeian A, Kassa GM, Kassaw NA, Kassebaum NJ, Kastor A, Katikireddi SV, Kaul A, Kawakami N, Keiyoro PN, Kengne AP, Keren A, Khader YS, Khalil IA, Khan EA, Khang YH, Khosravi A, Khubchandani J, Kiadaliri AA, Kieling C, Kim YJ, Kim D, Kim P, Kimokoti RW, Kinfu Y, Kisa A, Kissimova-Skarbek KA, Kivimaki M, Knudsen AK, Kokubo Y, Kolte D, Kopec JA, Kosen S, Koul PA, Koyanagi A, Kravchenko M, Krishnaswami S, Krohn KJ, Kumar GA, Kumar P, Kumar S, Kyu HH, Lal DK, Lalloo R, Lambert N, Lan Q, Larsson A, Lavados PM, Leasher JL, Lee PH, Lee JT, Leigh J, Leshargie CT, Leung J, Leung R, Levi M, Li Y, Li Y, Li Kappe D, Liang X, Liben ML, Lim SS, Linn S, Liu PY, Liu A, Liu S, Liu Y, Lodha R, Logroscino G, London SJ, Looker KJ, Lopez AD, Lorkowski S, Lotufo PA, Low N, Lozano R, Lucas TCD, Macarayan ERK, Magdy Abd El Razek H, Magdy Abd El Razek M, Mahdavi M, Majdan M, Majdzadeh R, Majeed A, Malekzadeh R, Malhotra R, Malta DC, Mamun AA, Manguerra H, Manhertz T, Mantilla A, Mantovani LG, Mapoma CC, Marczak LB, Martinez-Raga J, Martins-Melo FR, Martopullo I, März W, Mathur MR, Mazidi M, McAlinden C, McGaughey M, McGrath JJ, McKee M, McNellan C, Mehata S, Mehndiratta MM, Mekonnen TC, Memiah P, Memish ZA, Mendoza W, Mengistie MA, Mengistu DT, Mensah GA, Meretoja TJ, Meretoja A, Mezgebe HB, Micha R, Millear A, Miller TR, Mills EJ, Mirarefin M, Mirrakhimov EM, Misganaw A, Mishra SR, Mitchell PB, Mohammad KA, Mohammadi A, Mohammed KE, Mohammed S, Mohanty SK, Mokdad AH, Mollenkopf SK, Monasta L, Montico M, Moradi-Lakeh M, Moraga P, Mori R, Morozoff C, Morrison SD, Moses M, Mountjoy-Venning C, Mruts KB, Mueller UO, Muller K, Murdoch ME, Murthy GVS, Musa KI, Nachega JB, Nagel G, Naghavi M, Naheed A, Naidoo KS, Naldi L, Nangia V, Natarajan G, Negasa DE, Negoi RI, Negoi I, Newton CR, Ngunjiri JW, Nguyen TH, Nguyen QL, Nguyen CT, Nguyen G, Nguyen M, Nichols E, Ningrum DNA, Nolte S, Nong VM, Norrving B, Noubiap JJN, O'Donnell MJ, Ogbo FA, Oh IH, Okoro A, Oladimeji O, Olagunju TO, Olagunju AT, Olsen HE, Olusanya BO, Olusanya JO, Ong K, Opio JN, Oren E, Ortiz A, Osgood-Zimmerman A, Osman M, Owolabi MO, Pa M, Pacella RE, Pana A, Panda BK, Papachristou C, Park EK, Parry CD, Parsaeian M, Patten SB, Patton GC, Paulson K, Pearce N, Pereira DM, Perico N, Pesudovs K, Peterson CB, Petzold M, Phillips MR, Pigott DM, Pillay JD, Pinho C, Plass D, Pletcher MA, Popova S, Poulton RG, Pourmalek F, Prabhakaran D, Prasad NM, Prasad N, Purcell C, Qorbani M, Quansah R, Quintanilla BPA, Rabiee RHS, Radfar A, Rafay A, Rahimi K, Rahimi-Movaghar A, Rahimi-Movaghar V, Rahman MHU, Rahman M, Rai RK, Rajsic S, Ram U, Ranabhat CL, Rankin Z, Rao PC, Rao PV, Rawaf S, Ray SE, Reiner RC, Reinig N, Reitsma MB, Remuzzi G, Renzaho AMN, Resnikoff S, Rezaei S, Ribeiro AL, Ronfani L, Roshandel G, Roth GA, Roy A, Rubagotti E, Ruhago GM, Saadat S, Sadat N, Safdarian M, Safi S, Safiri S, Sagar R, Sahathevan R, Salama J, Saleem HOB, Salomon JA, Salvi SS, Samy AM, Sanabria JR, Santomauro D, Santos IS, Santos JV, Santric Milicevic MM, Sartorius B, Satpathy M, Sawhney M, Saxena S, Schmidt MI, Schneider IJC, Schöttker B, Schwebel DC, Schwendicke F, Seedat S, Sepanlou SG, Servan-Mori EE, Setegn T, Shackelford KA, Shaheen A, Shaikh MA, Shamsipour M, Shariful Islam SM, Sharma J, Sharma R, She J, Shi P, Shields C, Shifa GT, Shigematsu M, Shinohara Y, Shiri R, Shirkoohi R, Shirude S, Shishani K, Shrime MG, Sibai AM, Sigfusdottir ID, Silva DAS, Silva JP, Silveira DGA, Singh JA, Singh NP, Sinha DN, Skiadaresi E, Skirbekk V, Slepak EL, Sligar A, Smith DL, Smith M, Sobaih BHA, Sobngwi E, Sorensen RJD, Sousa TCM, Sposato LA, Sreeramareddy CT, Srinivasan V, Stanaway JD, Stathopoulou V, Steel N, Stein MB, Stein DJ, Steiner TJ, Steiner C, Steinke S, Stokes MA, Stovner LJ, Strub B, Subart M, Sufiyan MB, Sunguya BF, Sur PJ, Swaminathan S, Sykes BL, Sylte DO, Tabarés-Seisdedos R, Taffere GR, Takala JS, Tandon N, Tavakkoli M, Taveira N, Taylor HR, Tehrani-Banihashemi A, Tekelab T, Terkawi AS, Tesfaye DJ, Tesssema B, Thamsuwan O, Thomas KE, Thrift AG, Tiruye TY, Tobe-Gai R, Tollanes MC, Tonelli M, Topor-Madry R, Tortajada M, Touvier M, Tran BX, Tripathi S, Troeger C, Truelsen T, Tsoi D, Tuem KB, Tuzcu EM, Tyrovolas S, Ukwaja KN, Undurraga EA, Uneke CJ, Updike R, Uthman OA, Uzochukwu BSC, van Boven JFM, Varughese S, Vasankari T, Venkatesh S, Venketasubramanian N, Vidavalur R, Violante FS, Vladimirov SK, Vlassov VV, Vollset SE, Wadilo F, Wakayo T, Wang YP, Weaver M, Weichenthal S, Weiderpass E, Weintraub RG, Werdecker A, Westerman R, Whiteford HA, Wijeratne T, Wiysonge CS, Wolfe CDA, Woodbrook R, Woolf AD, Workicho A, Xavier D, Xu G, Yadgir S, Yaghoubi M, Yakob B, Yan LL, Yano Y, Ye P, Yimam HH, Yip P, Yonemoto N, Yoon SJ, Yotebieng M, Younis MZ, Zaidi Z, Zaki MES, Zegeye EA, Zenebe ZM, Zhang X, Zhou M, Zipkin B, Zodpey S, Zuhlke LJ, Murray CJL. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017;390:1211–59.

[27] Watts C, Cairncross S. Should the GBD risk factor rankings be used to guide policy? Lancet 2012;380:2060–1.

[28] Williams AC, Eccleston C, Morley S. Psychological therapies for the management of chronic pain (excluding headache) in adults. Cochrane Database Syst Rev 2012;11:Cd007407.

[29] World Health Organization. Global action plan for the prevention and control of NCDs 2013–2020. Geneva.

[30] Xu X, Mishra GD, Jones M. Mapping the global research landscape and knowledge gaps on multimorbidity: a bibliometric study. J Glob Health 2017;7:010414.