5 August 2016

Attention: Chair and Members,
Australian Medical Research Advisory Board
c/- MRFF@health.gov.au

Burden of musculoskeletal conditions

At recent public consultations on the strategy and priorities for the Medical Research Future Fund, questions were raised about the accuracy of the burden of disease estimates for musculoskeletal conditions being used by the Advisory Board in its deliberations. As requested by Advisory Board members, we are writing to provide you with the most up to date data on the burden of these conditions.

Arthritis Australia made a submission through the formal processes but burden of disease data was not provided, as instructions specifically requested that this information not be included.

The signatories to the attached submission represent peak organisations and world-leading individuals working in musculoskeletal care, research and consumer advocacy.

The most recent estimates of burden of disease for Australia are available from the Global Burden of Disease Study (2012)[1, 2] and from the 2016 Australian Burden of Disease Study.[3]

Both of these studies show that the total burden of musculoskeletal conditions is between 12-14% of the total burden of disease in Australia. These estimates are much higher than the 4% estimated in the 2007 Australian Burden of Disease Study,[4] which appears to be the data being used by the Advisory Board.

The increase in burden for musculoskeletal conditions since the 2007 report appears to be due primarily to improved methodology rather than an increase in burden, indicating that the burden of musculoskeletal conditions has been underestimated and overlooked in Australia for too long. This has resulted in a substantial gap between disease burden and research funding, creating inequity for the millions of people living with these conditions as well as a significant area of unmet need.

As the attached submission demonstrates, by any metric, be it total burden of disease, prevalence, cost, disability, quality of life, productivity and economic impact, or future impact due to an ageing population, there is an urgent need to prioritise research on the most effective and affordable strategies to deal with musculoskeletal conditions.

We strongly urge the Advisory Group to include musculoskeletal conditions as a priority in the Australian Medical Research and Innovation Strategy (the Strategy).

Yours sincerely

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Submission to the consultation on the Australian Medical Research and Innovation Strategy and related Priorities

The Burden of Musculoskeletal Conditions in Australia

Summary of key points

- Musculoskeletal conditions in Australia are:
  - the most common and disabling of all chronic conditions, affecting nearly 7 million people and accounting for at least 31% of disability;
  - the fourth most costly disease group in the health system, at a cost $5.7 billion in 2008-09;
  - a major drain on economic productivity as the leading cause of early retirement due to ill-health.
- The most recent ***global burden of disease*** estimates for Australia (published in 2012) show musculoskeletal conditions:
  - account for 13.63% of the total disease burden (DALYs), in close third place after cancer (15.7%) and mental health and substance abuse (13.66%);
  - are the leading cause of non-fatal burden, accounting for 24% of total YLDs.
- The most recent ***Australian burden of disease*** study (published by AIHW in 2016) shows musculoskeletal conditions:
  - are the fourth leading cause of total disease burden in Australia (DALYs), accounting for 12% of the burden (very close to mental health conditions);
  - the second leading cause of non-fatal burden (YLDs) (23%) after mental health and substance abuse (24%), but the leading cause in women.
- Research funding for musculoskeletal conditions is disproportionately low relative to the disease burden and cost of these conditions.
  - NHMRC funding for the musculoskeletal National Health Priority Area in 2015 was just 3.5% of total NHPA funding, or about one quarter of the estimated disease burden
  - Clinical research funding for these conditions is also disproportionately low at about 5% of total NHMRC funding for clinical trials.

Conclusion

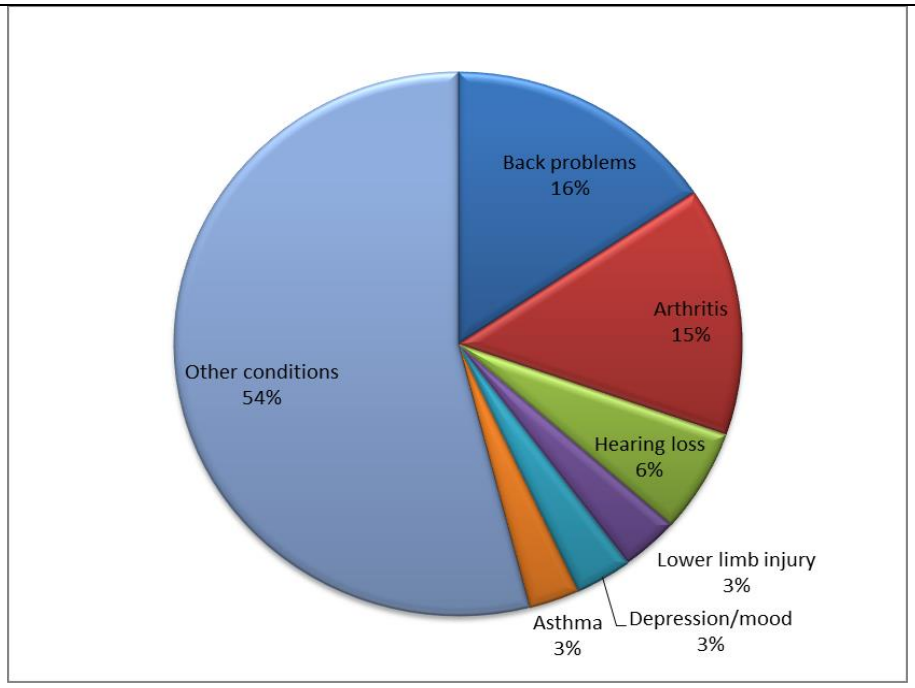
- Musculoskeletal conditions should be a priority area for research funded from the MRFF supported by:
  - Priority setting to identify key research areas
  - Targeted calls for research
  - Dedicated research and practitioner fellowships to build research capacity
  - Funding for Centres of Research Excellence and Partnership Programs to improve clinical interventions and management and provide health work force education
  - Funding for research infrastructure such as patient databases to support research into causes and potential cures.

The Burden of Musculoskeletal Conditions in Australia

1. Cost, prevalence and impact

Musculoskeletal conditions encompass a number of conditions including back pain, neck pain, more than 100 forms of arthritis, and osteoporosis.

These conditions affect nearly 7 million Australians of all ages, including children.[5] They are the leading cause by far of disability (Figure 1)[6] and contribute to 1 in 20 deaths in Australia.[7]



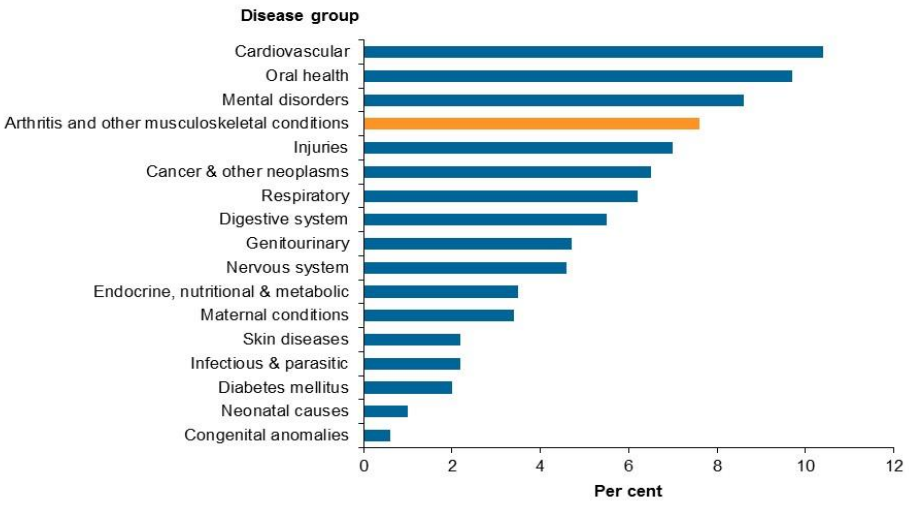
Source: ABS Survey of disability ageing and carers 2009[6]

Figure 1. Proportion of all disability by main condition causing disability, Australia 2009

Musculoskeletal conditions are the fourth most costly conditions to the health system, costing $5.7 billion and accounting for nearly 9% of expenditure allocated to disease groups in 2008/09 (Figure 2).[8] More recent estimates show that arthritis alone costs the health system over $5.5 billion in 2015 and this is projected to rise to $7.6 billion by 2030 unless more is done to prevent and better manage this group of conditions.[9]

The impact on productivity is also substantial. Musculoskeletal conditions account for 41% of early retirements due to ill-health in Australians aged 45-64 years, at an annual cost of $16 billion in lost GDP.[10]

Musculoskeletal conditions also cause more than 85% of chronic pain in Australia.[11] So it is surprising that chronic pain, but not musculoskeletal conditions, was suggested as a priority area for the Strategy during the Sydney consultation.



Source: Australian Institute of Health and Welfare.[12]

Figure 2 Proportion (%) of health care expenditure by disease group, Australia, 2008/09

Comorbidity

Another potential priority area raised during discussion at the Sydney consultation was management of co-morbid conditions. Arthritis and musculoskeletal conditions are important in this context. Three out of four people with arthritis have more than one co-morbid condition, most commonly cardiovascular disease, back problems and mental health problems.[13] Arthritis and back problems are also the most common co-morbidities in people with other major chronic conditions across all age groups.[14]

Musculoskeletal conditions significantly limit a person's ability to self-manage other chronic conditions because of their negative impact on physical activity and mental health, as well as adding complexity to general management. Yet they are often overlooked or given low priority as co-morbid conditions.

Healthy ageing

Musculoskeletal conditions represent a global threat to healthy ageing, according to a report for the WHO on ageing and health.[15]

Musculoskeletal health is central to active healthy ageing. It is critical for people's mobility and their ability to work and actively participate in all aspects of life, and to maintain economic, social and functional independence across their life-course.

Musculoskeletal health enables physical activity to reduce the risk and support the management of other non-communicable diseases. A strong relationship exists between arthritis and musculoskeletal pain and a lack of physical activity in the elderly resulting in functional decline, frailty, loss of well-being and loss of independence.

Research into the prevention and management of musculoskeletal conditions across the life course will be crucial to enhance musculoskeletal health and prevent disability in older people and will be a critical to achieve healthy ageing objectives.[15]

Osteoporosis

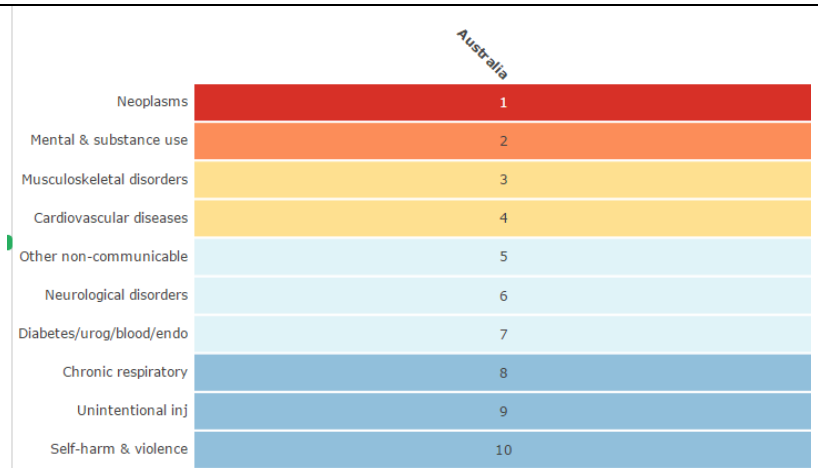
The burden of osteoporosis in Australia is commonly overlooked. In the 50+ population, 66% of people have poor bone health (osteoporosis or osteopenia).[16] 1.2 million Australians are affected by osteoporosis.[17] Patients with osteoporosis fracture easily at sites such as the hip, wrist and spine, and within a year of fracture 20% of patients die and half the remainder do not walk unaided.[18] Indeed, a single low trauma fracture doubles the risk of death for up to 10 years.[19] It is estimated that 155,000 fractures will occur in Australia in 2016 at a cost of $3.185 billion (direct and indirect cost) and estimated costs of $33.6 billion over 10 years (2013-2022).[16] Hip fracture remains the mostly costly type of fracture with average mean direct cost of hip fracture (aged 70+) of $33,576 ($2012).[16]

It is widely acknowledged there are significant gaps in Australia's health information infrastructure and in particular limited information on certain conditions including musculoskeletal conditions.[20] In addition AIHW acknowledges osteoporotic fracture data is under-reported.[21]

2. Burden of disease

2.1 Disability Adjusted Life Years (DALYs)

The most recent Global Burden of Disease Study[1,2] found that musculoskeletal conditions account for 13.63% of the total disease burden in Australia, in a close third place after cancer (15.7%) and mental health and substance abuse (13.66%) (Fig 3).



Source: Global Burden of Disease 2013 Data visualisations[2]

Figure 3: Total Burden of Disease, Australia- 10 leading causes, 2013. DALYs per 100,000 people

According to the AIHW[3], musculoskeletal conditions are the fourth leading cause of disease burden in Australia, accounting for 12% of the total disease burden. This is much higher than the 4% estimate for these conditions in the 2007 Australian Burden of Disease study.[4]

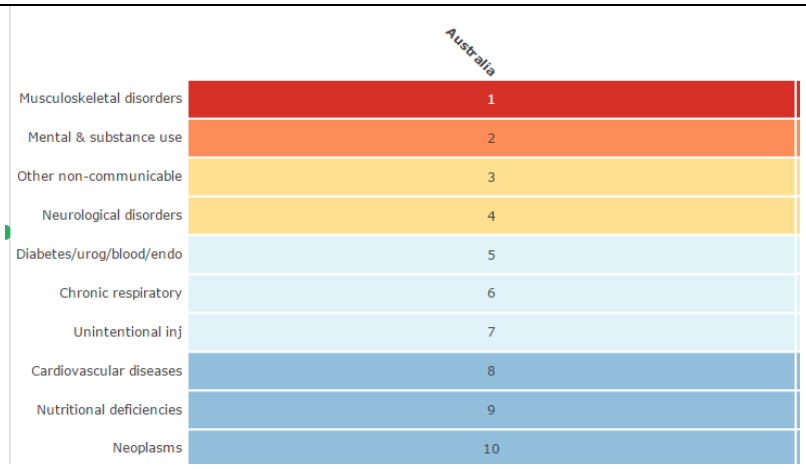
For women, musculoskeletal conditions were second only to cancer as the leading cause of disease burden. At the disease level 'other musculoskeletal conditions', a group which largely consists of other forms of arthritis (other than osteoarthritis or rheumatoid arthritis) and related conditions, were the third leading cause of disease burden after heart disease and lung cancer.[3]

The burden of musculoskeletal conditions is significant across most ages: it is second only to mental and behavioural disorders from adolescence through to age 45 years and is the leading burden for those aged 45-55 years while cancer and cardiovascular disease become the leading causes of burden in older age groups.[1,2,3]

2.2 Years Lived with Disability (YLDs)

Musculoskeletal conditions are the leading cause of years lived with disability in Australia, accounting for 24% of total YLDs, according to the Global Burden of Disease study (Fig 4).

According to the AIHW, musculoskeletal conditions are the second leading cause overall of non-fatal burden (YLDs) (23%) after mental health and substance abuse (24%), but the leading cause in women.[3]



Source: Global Burden of Disease 2013 Data visualisations[2]

Figure 4 Leading causes of Years Lived with Disability, Australia, 2013, All causes.

3. Research funding relative to disease burden

NHMRC data on research funding for National Health Priority Areas (NHPA)[22] shows that funding for the arthritis and musculoskeletal conditions NHPA totalled just $23 million in 2015 or around 3.5% of total NHPA funding (Figure 5). This figure is much lower than the most recent estimate of 12% of total disease burden for musculoskeletal conditions. In comparison, research funding for diabetes represents 11% of total NHPA funding, compared to a total burden estimate of 2.4%.

In the last decade, research funding has grown by just 33% for the musculoskeletal NHPA while funding for NHPAs overall has nearly doubled (Figure 6).

With over 100 forms of arthritis and many musculoskeletal conditions, this low level of research investment cannot possibly hope to address the challenge of even the most common conditions. Less common conditions miss out altogether. For example, juvenile idiopathic arthritis, which is one of the most common chronic conditions of childhood and a focus area for the arthritis and musculoskeletal NHPA, receives negligible government funding for research and has only ever received one small NHMRC research funding grant.

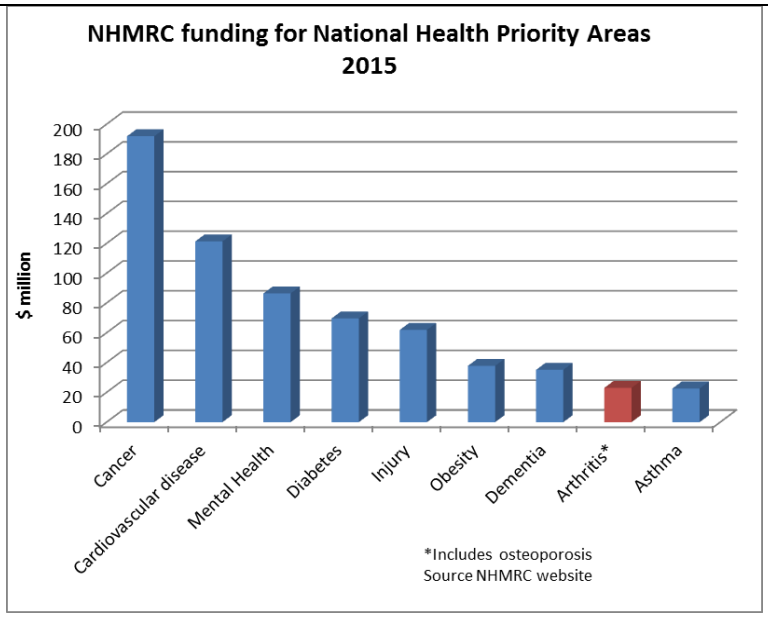


Figure 5: NHMRC funding for National Health Priority Areas 2015

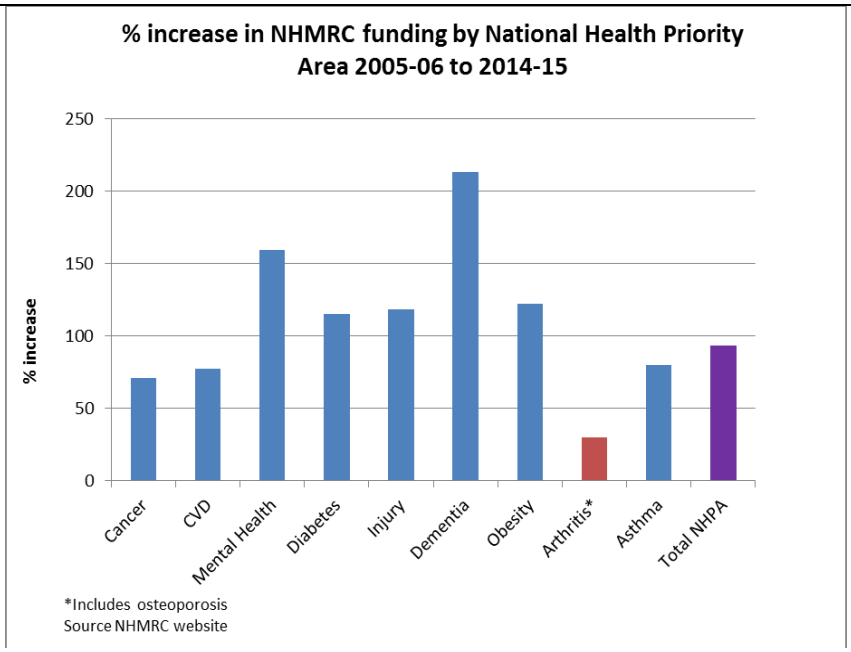


Figure 6: Percentage increase in NHMRC funding by NHPA, 2005-06 to 2014-15

Underfunding of arthritis and musculoskeletal research relative to other NHPAs is even more pronounced when you consider the total pool of research funding available, including funding from other sources. Funding for cancer research from government and non-government organisations for example totalled $300 million in 2011,[23] $125 million on top of the NHMRC allocation. The same year, the National Heart Foundation invested $13 million in cardiovascular research.[24] In comparison, Arthritis Australia, the largest non-government provider of research funding for musculoskeletal conditions in Australia, was able to allocate only $726,000 to arthritis research in 2012/13.

3.1 Clinical trials activity

Funding for MSK clinical trials in Australia is also disproportionately low compared to the burden of these conditions, representing just 5% of NHMRC clinical trial funding. This undermines our capacity to deliver best evidence-informed, cost-effective care and optimal outcomes for people living with these conditions.[25]

This conclusion has recently been re-affirmed. An analysis by Lam and colleagues[26]of clinical trials activity in Australia against burden of disease, based on 2003 estimates, initially concluded that the proportion of registered Australian arthritis and musculoskeletal trials was about twice as high as expected. However, in response, a re-analysis by Buchbinder, Maher and Harris[27] using the most recent Global Burden of Disease estimates came to the opposite conclusion (Table 1).

In acknowledging this re-analysis, Lam and colleagues concluded:

> *'Using the GBD 2010 estimates, musculoskeletal trial activity is 54% of expected for trial number and below 50% of expected for planned recruitment, ranking close to obesity and dementia as an area of need, with important implications for assigning research priorities'*[27]

Table 1: Comparison of trial activity to disease burden for Australian National Health Priority Areas; trial activity and AIHW disease burden data are from Lam[17] and GBD data were accessed from http://www.healthmetricsandevaluation.org on July 21 2015

National Health Priority Area	Trials (% of total)	Disease burden (% total DALYs)		Do GBD data change conclusion of matching of trial activity to disease burden?
		AIHW 2003	GBD 2010	
Cancer	16.9	19.0	16.5	Yes: trials match GBD burden
Cardiovascular	12.6	18.0	13.9	No
Mental health	13.5	13.3	12.9	No
Obesity	3.8	7.5	8.5	No
Injury	2.7	7.0	9.9	No
Diabetes mellitus	5.5	5.5	2.3	Yes: trials exceed GBD burden
Arthritis & Musculoskeletal Conditions	8.0	4.0	14.7	Yes: trials are less than GBD burden
Dementia	1.3	3.6	2.4	No
Asthma	1.3	2.4	2.3	No

4. Conclusion

Arthritis and musculoskeletal conditions are an existing National Health Priority Area (NHPA), but this has not been reflected in government investment in programs or research to address the growing burden, prevalence and expense of these conditions.

Research funding for arthritis and musculoskeletal conditions falls well short of the health and economic impact of these conditions. To address this issue, it is vital that the true burden

of musculoskeletal conditions is acknowledged by making them a priority area in the Medical Research and Innovation Strategy currently being developed for the MRFF.

As proposed in our original submission, this should include:

- Support for research priority setting to allow Australian researchers, clinicians, policymakers and consumers to work collaboratively to prioritise the most important research questions and undertake well designed trials to deliver best evidence-informed care and optimal outcomes for people with musculoskeletal conditions. Work in this area has been initiated by the recently formed Australian and New Zealand Musculoskeletal Clinical Trials Network (ANZMUSC).
- Targeted calls for research proposals in the field to support funding for identified priority research questions
- Dedicated research and practitioner fellowships to build research capacity in the field
- Funding for Centres of Research Excellence and Partnership Programs to improve clinical interventions and management and provide health work force education
- Funding for research infrastructure such as patient databases to support research into causes and potential cures.

Supporting organisations

Arthritis Australia

Australia and New Zealand Musculoskeletal Clinical Trials Network

Australian Rheumatology Association

Australian Paediatric Rheumatology Group

Rheumatology Health Professionals Association

Institute of Bone and Joint Research

Australia and New Zealand Orthopaedic Research Society

The George Institute for Global Health, Musculoskeletal Division,

Supporting individuals

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Sub-Dean (Research), Sydney Medical School Northern Clinical School
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Further information

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