

The Prevalence, Cost and Disease Burden of Arthritis in Australia

Prepared for
The Arthritis Foundation of Australia

By
Access Economics Pty Limited
Canberra ACT
March 2001



Contents

| | |
|--|-----------|
| Executive Summary | 1 |
| 1 Prevalence of Arthritis in Australia | 2 |
| 1.1 What is arthritis? | 2 |
| 1.2 Treatment and Management | 5 |
| 1.3 Demographic Prevalence | 6 |
| 1.4 Detailed results from the 1995 National Health Survey | 7 |
| Chart 1: Prevalence of Arthritis by age group, Australia, 1995 | 8 |
| 1.5 Impact of Treatment | 9 |
| 2 Costs of Arthritis in Australia | 10 |
| Table 1: Summary of the Financial Costs of Arthritis, 2000 | 10 |
| 2.1 Direct Costs | 10 |
| Table 2: Direct Costs of Arthritis and Musculoskeletal Disease | 11 |
| Chart 2: Sectoral contributions to Direct Costs, Arthritis, 2000 (%) | 12 |
| Table 3: Average Annual Health System Costs per Treated Case (\$) | 12 |
| 2.2 Indirect Costs | 13 |
| Table 4: Potential Tax Revenue lost due to Arthritis | 14 |
| 2.3 Methodology | 15 |
| 3 The Burden of Disease | 17 |
| Table 5: Disability Adjusted Life Years, 1996 & 2000 | 18 |
| 4 Comparisons with other diseases | 19 |
| 4.1 Direct costs | 19 |
| Table 6: Comparison of direct costs of disease and injury, 1993-94 | 19 |
| 4.2 Prevalence | 19 |
| Chart 3: Reporting of selected conditions | 20 |
| Chart 4: Reporting of musculoskeletal conditions | 20 |
| 4.3 The burden of disease | 20 |
| Table 7: Leading Causes of Burden of Disease and Injury, 1996 | 21 |
| 5 International comparisons | 22 |
| 5.1 The United States | 22 |
| 5.2 Canada | 23 |
| Table 8: Costs of Disease and Injury, Canada, 1993 | 23 |
| 5.3 Europe | 23 |
| 5.4 United Kingdom | 24 |
| 5.5 Manifestos and national action plans | 24 |
| 6 The Arthritis Foundation of Australia | 26 |
| 6.1 Mission and Roles | 26 |
| 6.2 An Australian Action Plan for Arthritis | 26 |
| 7 Conclusions | 27 |
| Appendices | 28 |
| Bibliography | 28 |
| Website homepages and links | 29 |

This report was proudly supported with an educational grant from Amgen. Amgen has had no part in the commissioning or content of the report. Any person relying on the information contained in this document.

While every effort has been made to ensure the accuracy of this document, the uncertain nature of economic data, forecasting and analysis means that Access Economics Pty Ltd is unable to make any warranties in relation to the information contained herein. Access Economics Pty Ltd, its employees and agents disclaim liability for any loss or damage which may arise as a consequence of any person relying on the information contained in this document.

Executive Summary

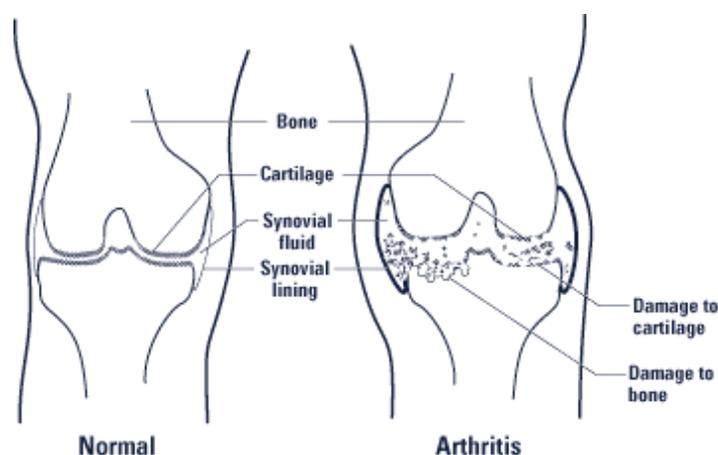
- Arthritis is Australia's major cause of disability and chronic pain. It affects an estimated 3.1 million people (as at June 2000) or approximately 16.5% of Australians. Women are significantly over-represented—60.4% of all people with arthritis compared with half the population. Almost 60% of all people with arthritis are of working age (15-64 years). Nearly 5% of Australians are taking medication for arthritis, and 1.5% will receive hospital treatment this year. 2% of the population are disabled or handicapped with arthritis. Despite this, there are indications that a not insignificant proportion of people with arthritis go undiagnosed and untreated.
- Juvenile chronic arthritis affects 4 per 1000 with 3 per 1000 not diagnosed. Juvenile chronic arthritis affects more children than diabetes or cerebral palsy.
- Arthritis has a significant economic impact. It affects nearly 11% of the workforce. Rheumatoid arthritis in particular is recognised as one of the major health reasons for leaving work early. Arthritis is responsible for nearly 1.8 million days of reduced activity and about 213,000 days off work or school each year in Australia.
- The overall financial cost of arthritis in Australia is enormous—approaching \$9 billion (1.4% of gross domestic product) in 2000.
- The direct, health system costs of prevention and treatment are estimated at about \$2.24 billion in 2000. Of that, \$900 million (41%) are hospital costs. Each year, arthritis accounts for 8.5 million GP visits, 2.2 million specialist visits and 1.4 million visits to other health practitioners. Research accounts for only 0.9% of direct costs. The direct (health system) costs of arthritis are similar to those of cancer and far greater than those of diabetes or asthma.
- The indirect costs—including loss of earnings and lost production due to premature retirement—are estimated at triple the direct costs (\$6.72 billion).
- Estimates of the burden of disease—in which the burden is expressed in terms of the years of healthy life lost—indicate that over 80,000 years of healthy life are lost to arthritis every year, thus making arthritis one of the “top ten” causes of disease burden, ahead of both diabetes and asthma. Most were years of life lost due to disability (YLD), although over 3,000 years of life are lost each year due to premature death (YLL). Among the various types of arthritis, rheumatoid arthritis in particular reduces the lifespan of patients. Osteoarthritis alone is the fourth largest contributor to years lost due to disability and the third largest source of disability burden (YLD) for women (behind depression and dementia).
- Compared to other sources of disease and injury in Australia, more people report arthritis than hayfever, headaches and high blood pressure. In terms of patient reporting, it is also more prevalent than five of the six National Health Priority areas (asthma, injuries, mental disorders, diabetes and cancers).
- As the population ages, we are seeing a growing burden of arthritis—to the individuals, their families, their voluntary carers, the health system, the social welfare system, the labour market and the economy. The World Health Organisation has identified musculoskeletal disease as an “epidemic” and is committed to an awareness plan. In Australia, arthritis should receive greater public policy attention, including the development of a National Action Plan.

1 Prevalence of Arthritis in Australia

1.1 What is arthritis?¹

Musculoskeletal disease is the major cause of disability and handicap in Australia, and arthritis is the most prevalent form of musculoskeletal disease. 'Arthritis' is a general term that refers to disorder of one or more joints. There are more than 100 known types of arthritis, of which five account for 90 per cent of cases—osteoarthritis (OA), rheumatoid arthritis (RA), fibromyalgia, systemic lupus erythematosus and gout. One peculiarly Australian form of arthritis—Ross River virus—is increasing in incidence with global warming.

It is well known that the incidence of arthritis increases with age, but the incidence of juvenile arthritis is not nearly as well appreciated.



Osteoarthritis (OA)

Osteoarthritis is the most common form of arthritis, affecting around 5-10% of the total population—particularly women. It develops when articular cartilage (the smooth covering over bones in the joints) starts to break down, usually as a result of trauma, aging or failure of joint repair and maintenance mechanisms. Degradation of the cartilage can be associated with underlying bone damage, thickening and bone-on-bone friction. Symptoms include stiffness, pain and tenderness in the joints and surrounding muscles and ligaments, possibly with fatigue, reduction in motor skills, and deformities. The most common pattern of joint involvement in OA involves the major weight-bearing joints such as the hips, knees or lower spine, with neck and hands² also being frequently affected sites. There is no single cause for OA, with identified risk factors including: being overweight, advancing age, low socio-economic status, hereditary factors, chronic stress across joints or joint trauma (such as in sports injuries) and other metabolic or inflammatory disorders. Because of the gender differences in incidence, hormones (especially oestrogen) are suspected to have a relationship to OA, but there is conflicting evidence.

¹ Access Economics is indebted to Associate Professor Les Cleland of the University of Adelaide for assistance with the description of arthritis, and its treatment and management.

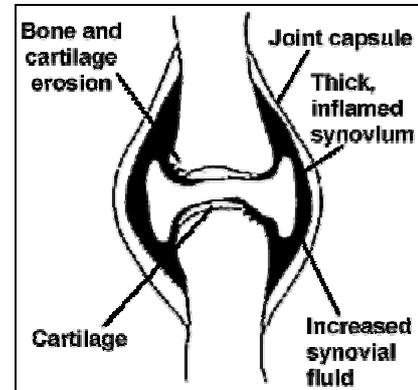
² OA of the hands is a distinct sub-type of OA and very common in women. Unlike the gradual onset of other types of OA, this type can begin suddenly and painfully. It is progressive and causes classic deformities of the fingers with enlarged joints.

Osteoporosis—not arthritis

Osteoporosis is a non-arthritic disorder, not to be confused with OA. It is a condition in which the bones lose calcium, become fragile and tend to break more easily, and usually affects people over 40, mostly women as hormonal changes accompanying menopause accelerate the loss of calcium.³

Rheumatoid Arthritis (RA)

Rheumatoid arthritis affects around 2-3% of the population, again with greater incidence in women. It is a progressive disease, with onset most likely between 25-50 at a time when people are active in the workplace or family care roles. RA is characterised by inflammation within joints that serves no evidently useful purpose and which damages joint structures. The synovial membrane that lines joints is thickened and an over-production of synovial (joint) fluid occurs. The joints become painful, swollen, stiff and, as the process continues, deformed from damage to the cartilage and other soft tissue.⁴ Other symptoms include fatigue, interrupted sleep, weight loss, anaemia, nodules (in 30% of people), ulcers, atrophic skin, muscle weakness, impaired joint function and inflammation of the heart, lungs, eyes, nerves, blood vessels and lymph glands. There is significant morbidity and mortality (over half of patients will have to reduce significantly or stop work after ten years of the disease).



Like OA, RA is multifactorial in origin (genetic, hormonal, environmental and other factors). Family history is a key risk factor. Hormonal influences are evident with pregnancy associated remissions, a lifelong protective effect of pregnancy, and never having children conferring risk. Other possible contributing factors include race, diet, trauma, and 'triggering agents' (most likely bacteria or virus). Climatic conditions can exacerbate discomfort.

Fibromyalgia

Fibromyalgia (previously known as fibrositis) is a condition in which discomfort is widespread and felt within the muscles and ligaments, which may be tender. Damage to joints or other tissues is not a feature. A common association with sleep dysfunction and irritable bowel symptoms suggests an underlying neural irritability. Fatigue, feelings of demoralisation and seemingly insoluble life stresses may be part of the picture. Fibromyalgia is to be distinguished from 'soft tissue rheumatism' which refers to irritation or inflammation of structures such as ligaments and the synovial sacs (bursae) that lubricate tendon movement.

Systemic Lupus Erythematosus

Systemic Lupus Erythematosus (usually abbreviated to lupus or SLE) is a chronic inflammatory autoimmune disease of the connective tissues. It affects the skin—especially in sun exposed areas such as the cheeks, which become red and scaly—and various internal organs (kidneys, heart, lungs and brain can all be affected by inflammation and subsequent scar tissue). Lupus often causes general fatigue,

³ Bones comprise a hard outer shell covering a less dense tissue resembling honeycomb. When osteoporosis develops, the outer bone 'shell' becomes thin and weak, and the 'honeycomb' develops large holes, weakening the bones and increasing the risk of fracture. Serious complications can result, particularly for hip fractures.

⁴ Queensland Arthritis Foundation, www.arthritis.org.au/rheuarth.html, also for RA diagram.

tiredness, loss of concentration and memory. Internal organ involvement can lead to organ failure and death.

Gout

Gout is caused by the reaction of defence cells in joints to the presence of uric acid crystals. Uric acid (a.k.a. urate) is a by-product of the breakdown of the purines in the body. (Purines are components of the genetic template (DNA) and of certain messenger substances within cells.) Gout is characterised by severe acute attacks of joint pain and swelling, which typically affect joints such as the big toe, the ankle, knee and elbow. An excess of urates can also cause kidney damage, including the formation of stones.

Ross River virus

The mosquito-transmitted Ross River virus and the similar Barmah Forest virus cause epidemic polyarthritis—acute arthritis in many joints causing severe aches and pain. Viral arthritis does not usually damage the joints like RA, but the arthritis and fatigue can sometimes last for years before the joint returns to normal. Symptoms include chronic fatigue, rashes, severe headaches, impaired concentration and memory as well as depression. There is no specific treatment or vaccination, although scientists are working to develop a vaccine.

Juvenile Arthritis (JA)

Juvenile arthritis can resemble adult RA but other distinctive patterns also occur. JA is one of the most prevalent and chronic illnesses amongst children. Earlier Australian epidemiological studies indicated that the prevalence of JA was in the range 0.6 to 1.1 per 1,000. However, a study of 2,300 12-year olds has indicated a prevalence of 4 per 1,000, of which 3 per 1,000 were not previously diagnosed⁵. JA has a higher prevalence than juvenile diabetes or cerebral palsy. While some patients go into remission, others battle the symptoms lifelong, and many go untreated because of lack of recognition of early symptoms.

Living with Arthritis—Kerry's Story

Kerry Daley developed arthritis when she was 10 years old, with pain in her feet and hands. Kerry experienced years of undiagnosed symptoms, as her mother was told that “*people under 40 don't get arthritis*”. She was frequently absent from school including the whole of Year 11, with a month of that year spent at St Vincent's Hospital in Sydney. Kerry had a number of operations, including one hip replacement at 24 and the other at 26, wrist fusions in both hands and knuckle replacements. Now 36, she manages pain and flare-ups by avoiding physical exertion and stress and “*separating my mind from my body*”. She lives in a single level house with lever taps, remote controls and a brother who lives close by who can visit to mow lawns, change light-bulbs and open jars. There are a myriad of things she just cannot do. If her hip dislocates, she can knock the phone off the hook and a call goes through to her neighbours to call an ambulance. Kerry retired from a successful but tiring career in the motor industry to study science at the University of Western Sydney, as a step towards her goal to work in RA research. Kerry's prognosis is for twisted useless hands, shoulder joints that won't allow arms to be lifted above the head, a neck that won't support her head, and reduced life expectancy. She comments: “*When you appear happy and trying to live a 'normal' life, people think you're not really sick. But you're continually being knocked down and getting back up again, and you just have to cope.*”⁶

⁵ Manners, P. et al, (1996).

⁶ Kerry's story drawn from Garvan Research Foundation (1998), p6.

Other forms of Arthritis and related musculoskeletal disorders

Other types of arthritis include ankylosing spondylitis (which mainly affects young men), spondyloarthritis, psoriatic arthritis, scleroderma, bursitis, tendonitis, carpal tunnel syndrome, polymyalgia rheumatica, dermatomyositis, and Reiters Syndrome.

1.2 Treatment and Management

Treatment and management of arthritis is multi-pronged:

1. **Drugs:** Medications are aimed at reducing pain, increasing mobility and slowing the progression of inflammation. Over-the-counter drugs include analgesics and NSAIDs (non-steroidal anti-inflammatory agents).⁷ Prescription drugs include COX-2 inhibitors—a new class of medicines including Celebrex and Vioxx. In RA, methotrexate is the mainstay of treatment with concurrent use of other drugs, such as Plaquenil and sulphasalazine providing additional benefit. Corticosteroids are very potent anti-inflammatory drugs that are invaluable in the management of life-threatening inflammation. Patients vary in their responsiveness and tolerance to drugs and treatment will often need to be individualised. Topical therapies include lotions and creams with capsaicin or wintergreen.
2. **Surgery:** Orthopaedic surgery can be undertaken to strip the thickened inner lining of inflamed joints (synovectomy) or to resurface with artificial materials joints that have failed due to full thickness cartilage loss. Problems following joint replacement surgery can include infection (early or late) and a late inflammatory reaction to wear particles shed by implanted components that leads to loosening of the implant and secondary joint failure. While surgical revision of failed artificial joints is possible, the procedure is more difficult than primary joint replacement.
3. **Physiotherapy and exercise:** These therapies can be used to strengthen muscles, maintain joint mobility and position, improve heart and lung fitness, reduce stress, control weight, improve sleep and contribute to overall wellness and coping strategies. Exercise programs include hydrotherapy, walking, aerobics, dancing, as well as more specifically localised exercises.
4. **Alternative and adjunctive therapies:** Many 'natural' treatments are marketed and used by arthritis sufferers. Some have been well tested in clinical trials such as fish oil in RA and glucosamine in OA. Numerous other 'natural' therapies are used, such as herbal remedies, acupuncture, yoga, tai chi, and magnet therapy. While they are generally harmless, benefit has not always been rigorously demonstrated and can often be costly.
5. **Diet:** Being overweight is associated with OA, while RA sufferers tend to be underweight. Maintaining a healthy balanced diet can be complicated by medications, difficulty in preparing meals, and metabolic changes associated with the disease for which some foods must be avoided (eg, foods high in purines in gout) while others are recommended (eg, fish containing omega 3 fatty acids with RA). Supplements and referral to dietitians is sometimes useful.
6. **Aids and modifications:** Arthritis sufferers can purchase a variety of tools specifically designed to maximise independence and quality of life, from kitchen

⁷ NSAIDs are used by about 13 million Americans to manage arthritis pain, but result in 107,000 hospitalisations for gastro-intestinal complications from the drugs. There are also an estimated 16,500 NSAID-related deaths per year in the US (see www.drdonnica.com/display.asp?article=164&pg=5).

gadgets and exercise aids to walking frames and wheelchairs. Houses may need to be modified as the disease progresses, or nursing home accommodation sought.

7. **Psychological support and occupational therapy:** Daily pain, stress and fatigue can lead to anger and depression, as well as relationship difficulties. A spouse, partner or care giver is often a vital support. Referral to a psychologist or counsellor can help, as can group therapy or occupational therapy. Arthritis Self Help Programs and Chronic Disease Self Management Programs have been appropriately evaluated and allow people with the condition to acquire skills and knowledge and to manage their condition. Studies show those who took the programs compared with those who did not demonstrated significant improvements in exercise, cognitive symptom management, communication with physicians, self reported general health, health distress, fatigue disability and social/role limitations. They also spent fewer days in hospital, and there was a trend toward fewer outpatient visits and hospitalisations. The data (from the USA) show the programs yield a cost to savings ratio of approximately 1:10 and many of these results persist for three years.⁸ These programs are available from the arthritis foundations throughout Australia (1800 011 041)

Arthritis and Depression Links

*"The costs associated with musculoskeletal health problems include psychological and social detriments well as financial expenditure... Those who work in the field encounter instances of psychological disturbance, severe social disruptions, marital breakdowns and even suicides in which musculoskeletal disorders and associated disabilities are significant contributing factors."*⁹ Between 14% and 27% of adults with RA are depressed, compared with only 5% of the general population. Psychologist Gail Wright, who researches the emotional and physical costs of arthritis in Missouri, notes that over 50% of people with RA have to make some changes in their work schedule, so financial pressures set in. More than 70% of people with arthritis cannot participate in recreational activities and their transportation can be limited because driving or sitting for long periods is painful. Another stress factor is the uncertainty about what is going to happen, as the disease can progress to varying degrees of severity. These stresses, together with additional family pressures and pain, contribute to the higher rates of depression. In terms of the physiological links between arthritis and depression, Susan Buckelew, a US psychologist and fibromyalgia researcher, notes the neurotransmitters that control pain for fibromyalgia also modulate psychological distress and, as a result, many physicians now think that these conditions may be linked. Arthritis and depression also may have a hereditary component, but no specific gene has been identified for either disease. Awareness of the link between depression and arthritis is being raised through publications for patients, primary care physicians and rheumatologists. Treatment for the disease can include treatment for associated depression.¹⁰

1.3 Demographic Prevalence

It is estimated that as at June 2000, there were some 3.1 million Australians with arthritis, representing approximately 16.5% of the population.

This estimate is a little higher than that obtained from projecting the results of the 1995 National Health Survey:

- The ABS estimated that in 1995, 4.8 million Australians (or 26.5% of the population) suffered from musculoskeletal disease;
- Arthritis accounted for 2.66 million of these (14.7% of the population); and
- Applying the 1995 National Health Survey indicators of the prevalence of arthritis by age and gender to the year 2000 results in a projection that 15.4% of the

⁸ Outcome data reported in Lorig, K.R. et al. (1999).

⁹ Department of Health and Family Services et al. (1997), p10.

¹⁰ Missouri Arthritis Rehabilitation Research and Training Center (1997), *Depression and Arthritis*, from www.hsc.missouri.edu

population, or just under 3 million Australians, were affected by arthritis in the year 2000.

The National Health Survey¹¹ is a respected, valuable and important source of health data for Australia. There are several good reasons, however, for estimating the prevalence of arthritis to be a little higher than that revealed by the National Health Survey, including:

1. The National Health Survey is a survey of households. It picks up those who **report** health conditions. Under-reporting of a health condition may occur because the condition is undiagnosed, because the condition is not recognised by the patient for what it is, because the patient regards the condition as sensitive and is unwilling to reveal it, or because the patient is in denial in regard to the condition.
2. Some arthritic disorders such as systemic lupus erythematosus (ICD-9 category 710.0), spondylosis and spondylitis (ICD-9 categories 720, 721.2-721.9) in the residual category 'other diseases of the musculoskeletal system and connective tissue' rather than in the 'arthritis nec'¹² category.

Although it is difficult to adjust scientifically for these measurement issues, the lifestyle and environmental similarities between Australia and other similar OECD countries would indicate that we should not expect the prevalence of arthritis in Australia to be markedly at variance. The prevalence of arthritis is estimated at 18.4% in the USA, approaching 16% in Canada and 14% in Europe and the UK. Australia would have 3.5 million people with arthritis if prevalence were at US levels. International comparisons are addressed in more detail in Section 4, Context.

1.4 Detailed results from the 1995 National Health Survey

Of people reporting arthritis in 1995¹³:

- 1.16 million (43.7%) suffered OA and 476,516 (17.9%) suffered RA;
- almost all (98%) suffered 'chronic' arthritis (more than 6 months); and
- 355,509 (13.4%) were classified as disabled or handicapped.¹⁴

In terms of the age-sex profile of the disease, the National Health Survey revealed that:

- 1.61 million (60.5%) of arthritis sufferers were women and, in particular:
 - ◆ 64% (nearly two thirds) of both RA and OA sufferers were women.
- Although 40% of people with arthritis were over 65, there was also a significant proportion of younger patients—2.1% of 15-24 year olds and 5.2% of 25-34 year olds suffered arthritis. In total, 214,682 people aged under 35 had arthritis. Over half (52.8%) of Australians in the 75+ age group had arthritis (see Chart 1).

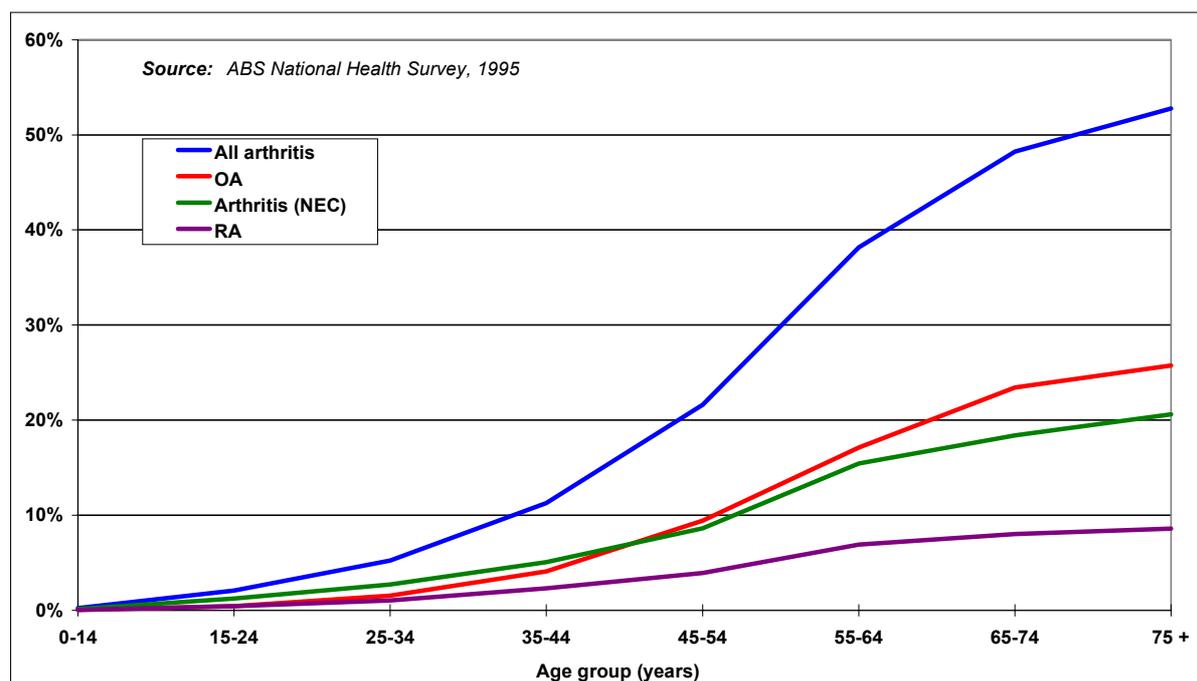
¹¹ The National Health Survey is conducted periodically (every 6 or 7 years) by the Australian Bureau of Statistics. Past surveys were conducted in 1989-90 and 1995. The next National Health Survey will be conducted during 2001 with results expected late 2002, with a further survey scheduled for 2004-05.

¹² *nec*—not elsewhere classified

¹³ ABS data from National Health Survey, 1995.

¹⁴ *Impairment*—organic disturbance, anatomical loss or damage. *Disability*—functional limitation imposed by impairment. *Handicap*—disadvantage experienced by an individual because of impairment and disability. World Health Organisation (1986).

Chart 1: Prevalence of Arthritis by age group, Australia, 1995



The National Health Survey also revealed the significant impact of arthritis on the Australian workforce:

- of those aged 15-64 who were in the workforce, there were 862,748 or 10.7% with arthritis;
- however, 13.1% of this age-group in the total population reported arthritis; the under-representation of arthritis sufferers in the workforce indicates that arthritis is a significant cause of people leaving the workforce;
- some 167,253 people in the 15-64 (working) age group were defined as disabled or handicapped by the disease;
- arthritis accounted for 8,201 cases of days off work (or school) and 67,319 cases of days of reduced activity in the two weeks prior to the National Health Survey;
- while people with arthritis are found in all income ranges, the most numerous income group was those with income in the range \$9,999 to less than \$19,999. This supports the hypothesis that arthritis contributes to low incomes; and
- arthritic prevalence was higher in rural and remote areas (16.4% of the population of those areas) compared to capital cities (13.8%).

There has also been an increase in the number of people suffering arthritis or rheumatism as long term conditions, from 5.7% of the population (785,000 people) in 1977-78 to 11.5% (1.96 million) in 1989-90 and up to 12.6% (2.27 million) by 1995.¹⁵ Given falling fertility rates and higher life expectancy, together with the concentration of the condition in older age groups, the proportion of Australians suffering arthritis is likely to continue to rise as the population ages. The so-called "baby boomer" effect will ensure a quite marked aging of the Australian population over the next 25 years. While there is some divergence of opinion among demographers, if the birthrate continues to fall and

¹⁵ As a result of classification and methodological changes in the 1995 National Health Survey, data for arthritis and rheumatism are not considered directly comparable with earlier data, so these figures should be used with caution.

life expectancy continues to rise, the population will continue aging into the middle distance.

1.5 Impact of Treatment

The Australian Institute of Health and Welfare (AIHW) note that the total prevalence of RA and OA (16.1% of reported conditions) is substantially higher than the treated prevalence (only 4.3%).¹⁶ This indicates that a large number of arthritis sufferers have not sought contact with health services or health professionals according to the 1995 National Health Survey results. Nonetheless, the data indicates that arthritis is one of Australia's most significant diseases in terms of treatments.

Arthritis and musculoskeletal disease generally are leading causes of visiting a doctor, of prescriptions, of allied health consultations and of nursing home residency. In the two weeks prior to the National Health Survey, arthritis was related to:

- 760,694 sufferers (29%) taking medication;
- 93,622 people (3.5%) visiting a doctor—sometimes multiple times, so that in total there were 325,670 GP visits and 86,254 specialist visits;
- 53,646 patients (2%) consulting other health professionals;
- 1,463 (0.1%) patients being hospitalised;
- 9,712 casualty, outpatients or emergency patients (0.3%); and
- 2,437 day clinic patients (0.1%).

Compared with other types of disorders, musculoskeletal disorders were:

- the second most common reason for hospitalisation (exceeding childbirth and antenatal) and for visits to casualty, outpatients or emergency (behind injuries and poisoning);
- the second most common reason for visiting a doctor (behind respiratory disorders ie, colds and flu primarily);
- the third most common reason for using medication (behind respiratory disorders and circulatory disorders); and
- by far the most common reason for consultation with other health practitioners.

¹⁶ Mathers, C. and Penm, R. (1999), p21 and Table 12.

2 Costs of Arthritis in Australia

There is more than one way of estimating the burden of a disease. This section presents estimates of the financial cost of arthritis to the community. Section 3 reports a very different, non financial methodology developed by the Australian Institute of Health and Welfare (AIHW) based on international burden of disease studies. In that methodology, the burden of disease is measured in terms of Disability Adjusted Life Years (DALYs)—a measure of the number of years of healthy life that are lost as a result of the mortality and morbidity associated with a disease.

In 2000, arthritis costs were estimated by Access Economics to total almost \$9 billion, equivalent to 1.4 per cent of gross domestic product (GDP) or \$469 per Australian. Of this total, the direct costs of health services to prevent, diagnose and treat arthritis were estimated at \$2.2 billion (0.35 per cent of GDP or \$117 per Australian) while the indirect costs were estimated at \$6.7 billion (1.06 per cent of GDP or \$352 per Australian). Table 1 provides more detail.

Table 1: Summary of the Financial Costs of Arthritis, 2000

| Direct costs | \$A million | % GDP | \$ per capita |
|---|--------------------|--------------|----------------------|
| Hospitals | 900 | | |
| Nursing homes | 321 | | |
| Medical services | 387 | | |
| Allied health | 310 | | |
| Pharmaceuticals | 206 | | |
| Research and other | 115 | | |
| Total Direct costs | 2,240 | 0.35% | \$117.27 |
| Indirect Costs | | | |
| Early Retirement loss of earnings | 6,264 | | |
| <i>On which</i> Loss of potential tax revenue | 1,852 | | |
| Absenteeism loss of earnings | 56 | | |
| Volunteer Carers | 300 | | |
| Equipment and Devices | 99 | | |
| Total Indirect Dollar Costs | 6,719 | 1.06% | \$351.66 |
| Total Dollar Direct and Indirect Costs | 8,960 | 1.42% | \$468.93 |

Section 2.1 addresses direct costs. Section 2.2 addresses indirect costs. A technical discussion of the estimation methodology is provided in Section 2.3.

2.1 Direct Costs

Direct costs: The health system costs of providing prevention and treatment services for health problems. Australian Institute of Health and Welfare ¹⁷

As described further in Section 2.3, the AIHW has utilised DCIS prevalence-based methodology to estimate the direct costs of disease, including musculoskeletal disease, in the base year 1993-94 (the most recent currently estimated by AIHW). This report extends the AIHW work to identify the minimum and estimated direct costs of arthritis in 1993-94 and project estimates for 1999-2000.

¹⁷ *Ibid*, p27.

Musculoskeletal disorders are the third leading cause of health system expenditures in Australia, with an estimated total expenditure of \$3.0 billion in 1993-94, behind circulatory and digestive diseases (each about \$3.7 billion) and ahead of the other major categories—injury (\$2.6 billion), mental illness (\$2.6 billion), respiratory disorders (\$2.5 billion) and disease of the nervous system (\$2.4 billion).

Within musculoskeletal disorders, the precise proportion spent on arthritis is unclear because of reporting and classification issues discussed in section 2.3. Hence Table 2 below shows for 1993-94 the minimum direct cost of arthritis (\$905 million)¹⁸ and the Access Economics estimate (\$1.67 billion). Allowing for population increase and cost inflation, the Access Economics estimate of direct costs for 1999-2000 is \$2.24 billion.

The method for projecting costs to the year 2000 is conservative. Other methodologies produce slightly higher figures. For example, if the direct costs of arthritis had remained as a constant percentage of national health spending, the 1999-2000 estimate of direct cost would be \$2.4 billion.

Table 2: Direct Costs of Arthritis and Musculoskeletal Disease

| Health system costs, (\$ million) | | | | | | | |
|---|---------------------|--------------|----------------|---------------|------------------|--------------|---------------|
| 1993-94 | Hospital Inpatients | | Non-inpatients | Nursing Homes | Medical services | | Allied Health |
| | Public | Private | | | GPs | Specialists | |
| Osteoarthritis | 131.7 | 134.8 | 34.3 | 117.2 | 35.8 | 44.2 | 35.9 |
| Rheumatoid arthritis | 20.1 | 9.2 | 14.7 | 17.9 | 9.2 | 17.7 | 6.5 |
| Systemic lupus (SLE) | 2.2 | 0.4 | 0.2 | 0.3 | 0.2 | 0.4 | 0.4 |
| Arthritis (spondylosis and spondylitis) | 9.9 | 5.1 | 15.0 | 13.9 | 16.8 | 19.8 | 38.8 |
| Other musculoskeletal disorders | 298.7 | 329.1 | 201.7 | 280.6 | 156.3 | 217.9 | 334.2 |
| Total Arthritis (minimum) | 163.9 | 149.5 | 64.2 | 149.3 | 62.0 | 82.1 | 81.6 |
| as a % of total musculoskeletal | 35.4% | 31.2% | 24.1% | 34.7% | 28.4% | 27.4% | 19.6% |
| Total Arthritis (AE estimate)* | 257 | 266 | 148 | 239 | 121 | 167 | 231 |
| Total Musculoskeletal | 462.6 | 478.6 | 265.9 | 429.9 | 218.3 | 300.0 | 415.8 |
| 1999-2000 Total Arthritis (AE)** | 345.3 | 357.3 | 198.5 | 320.9 | 163.0 | 223.9 | 310.4 |

| 1993-94 | Pharmaceuticals | | | | 1993-94 Total Costs | 1999-2000 Total Costs | % Share of Musculoskeletal |
|---|-----------------|------------------|--------------|--------------|---------------------|-----------------------|----------------------------|
| | Prescription | Over-the-counter | Research | Other | | | |
| Osteoarthritis | 37.5 | 20.5 | 5.4 | 26.7 | 624.0 | 837.9 | 20.8% |
| Rheumatoid arthritis | 18.7 | 8.1 | 1.1 | 5.5 | 128.7 | 172.8 | 4.3% |
| Systemic lupus (SLE) | 0.2 | 0.1 | 0.0 | 0.2 | 4.7 | 6.3 | 0.2% |
| Arthritis (spondylosis and spondylitis) | 12.7 | 8.3 | 1.3 | 6.3 | 148.0 | 198.7 | 4.9% |
| Other musculoskeletal disorders | 108.4 | 62.0 | 18.0 | 89.7 | 2096.4 | 2815.2 | 69.8% |
| Total Arthritis (minimum) | 69.1 | 37.0 | 7.8 | 38.7 | 905 | 1215.8 | 30.2% |
| as a % of total musculoskeletal | 38.9% | 37.4% | 30.2% | 30.1% | 30.2% | 30.2% | n.a. |
| Total Arthritis (AE estimate)* | 99 | 55 | 14 | 71 | 1669 | n.a. | n.a. |
| Total Musculoskeletal | 177.5 | 99.0 | 25.8 | 128.4 | 3001.8 | 4031.0 | 100.0% |
| 1999-2000 Total Arthritis (AE)** | 132.5 | 73.9 | 19.3 | 95.8 | n.a. | 2240.7 | 55.6% |

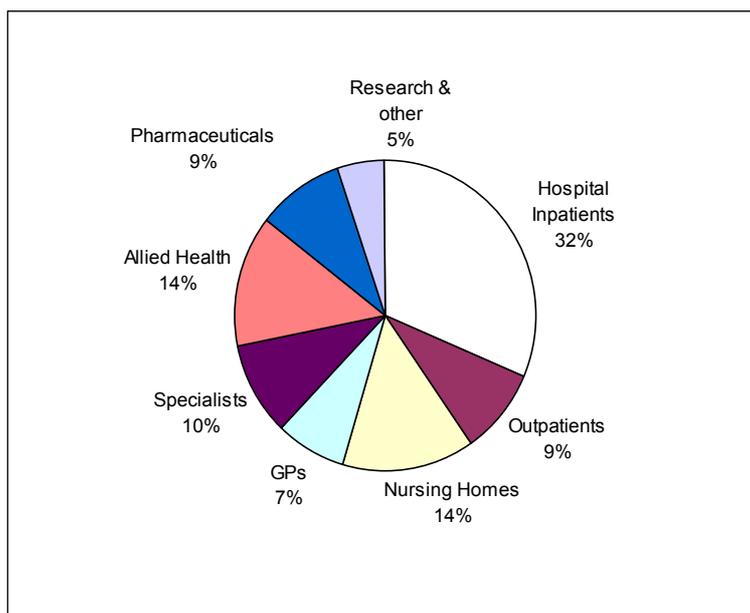
* based on NHS incidence ** based on NHS incidence, population increase and the Health and Community Services GDP deflator

In 2000, inpatient hospital costs were \$703 million (31% of direct costs) of arthritis, with just under \$200 million (9%) in outpatient costs. Nursing homes contributed a further \$321 million (14%), with allied health services roughly on par (also 14% of total direct

¹⁸ This estimate is in line with the Access Economics (1994) estimate, using different methodology, of the minimum direct costs of arthritis at this time as \$886 million (with further \$270 m for osteoporosis).

costs). Physiotherapy is a significant component of allied health. Specialist care (mainly rheumatologists and surgery) represented 10% of direct costs and GP services 7.3%. Pharmaceuticals for arthritis treatment represent 9% of total costs (about the same as outpatients), with prescribed drugs nearly twice the total cost of over-the-counter drugs. The 'other' category includes administration costs which, together with research into the disease, comprised 5% of direct costs. However, research alone is only 0.9% of total costs, which is relatively small. Chart 2 illustrates the contributions of the various direct cost components.

Chart 2: Sectoral contributions to Direct Costs, Arthritis, 2000 (%)



Mathers and Penm (1999) calculate the direct costs of arthritis for different age-sex cohorts. Per capita expenditure rises steadily with age, to \$1,382 and \$1,296 per man and woman respectively aged 65 years and over with RA or OA. This is due both to increased prevalence and the higher costs of nursing home care at older ages. Interestingly, "RA and OA" is the only category where costs per female are less than per male, and is the least costly of treatment of all musculoskeletal disorders for every age-group (see Table 3).

Table 3: Average Annual Health System Costs per Treated Case (\$)¹⁹

| Sex-age group | Arthritis (RA and OA only) | Back problems | Other musculoskeletal | All musculoskeletal |
|--------------------------|----------------------------|---------------|-----------------------|---------------------|
| Males | | | | |
| Less than 25 years | 320 | 428 | 2149 | 1547 |
| 25-64 years | 710 | 1090 | 1593 | 1325 |
| 65 years and over | 1382 | 2249 | 2342 | 2029 |
| Females | | | | |
| Less than 25 years | 91 | 688 | 1385 | 1152 |
| 25-64 years | 642 | 995 | 1493 | 1229 |
| 65 years and over | 1296 | 4255 | 2818 | 2349 |
| Persons, all ages | 973 | 1291 | 1819 | 1562 |

¹⁹ Extracted from Mathers, C. and Penm, R. (1999), p26.

2.2 Indirect Costs

Indirect costs of arthritis have been estimated for:

- loss of earnings due to absenteeism and early retirement from arthritis;
- loss of potential Federal tax revenue; and
- the value of volunteer carers.

Based on internationally accepted methodologies described in Section 2.3, total indirect costs are estimated conservatively to be three times the direct costs, or \$6.72 billion in the financial year 1999-2000, excluding the potential tax revenue foregone.

Loss of earnings due to absenteeism and early retirement

Labour force participation is lower for people with arthritis. Yelin (1992) noted that persons with arthritis do a disproportionate share of work that is not remunerated at all or, if remunerated, poorly so. The cost of such under-remunerated work is not estimated in this paper.

With respect to absenteeism due to arthritis in Australia, section 1.4 showed that 8,201 persons had days off work in the two weeks prior to the National Health Survey. The average length of time off work was 2.9 days. For one year this is equivalent to 88,336 weeks of work lost due to arthritis and, multiplied by average earnings (\$634.70 for May 2000), this amounts to \$56.1 million lost due to absenteeism from arthritis.

Of course, early retirement costs dwarf those lost to absenteeism. The RA patient in particular faces increasing functional disability with the likelihood of work disability within 10 years after the onset of the disease, and a dramatic reduction in earnings²⁰. If the numbers of people with arthritis were equally represented in the employed workforce as in the working age population, there would be an extra 189,804 people employed in the workforce, with average annual earnings (as of May 2000) of \$6.264 billion.

In total then, the estimate of earnings lost from absenteeism and early retirement, due to arthritis, in mid-2000 was \$6.32 billion.

Loss of potential tax revenue

Potential tax revenue is lost when arthritis sufferers retire early or reduce the amount that they work. There are two sources of lost tax revenue—potential income tax foregone and potential indirect (sales) tax foregone. Indirect tax revenue is lost because, as income falls, so does consumption.

Table 4 below summarises the tax losses for the most recent fiscal year, \$1.85 billion in 1999-2000, comprising \$1.53 billion (82%) of personal income tax and \$0.33 billion (18%) of indirect tax. A conservative forecast is also made for 2000-2001, because of the major change to the tax structure as at 1 July 2000 with the introduction of GST and reductions in personal income tax rates of *A New Tax System*. The forecast tax loss is slightly smaller at \$1.82 billion in 2000-01, comprising \$1.30 billion (71%) of personal income tax and \$0.52 billion (29%) of indirect tax.

²⁰ See "The Correlation of Life Expectancy and Arthritis", *Arthritis with Carol Eustice*, on www.arthritis.about.com/health/arthritis/library/weekly/aa120997.htm

Table 4: Potential Tax Revenue lost due to Arthritis

| | 1999-2000 | 2000-2001 |
|---|------------------------|------------------------|
| Potential Earnings Lost | \$6.264 billion | \$6.360 billion* |
| Average personal income tax rate# | 24.36% | 20.45% |
| Potential personal income tax lost | \$1.526 billion | \$1.301 billion |
| Average indirect tax rate# | 10.18% | 15.18% |
| Potential indirect tax lost | \$0.326 billion | \$0.524 billion |
| Total potential tax revenue lost | \$1.852 billion | \$1.824 billion |

* Forecast based on the most recently available Average Weekly Earnings (public and private before tax) figure of \$644.40 per week as at November 2000. The estimate is conservative because it assumes the same number of people not in the workforce due to arthritis as the previous FY.

Source: AEM Model, Access Economics.

The Value of Volunteer Carers, equipment and devices

US studies have estimated the cost of equipment and devices to be 4.4% on top of total direct costs. Using this estimate, in Australia for 1999-2000 the indirect cost of equipment and devices was just under \$100 million or \$32 per annum for each person with arthritis.

Since costs of volunteer carers represent the residual of indirect costs. These are estimated as:

$$\begin{aligned}
 \text{Volunteer carers costs} &= \text{Total indirect costs} - \text{earnings lost} - \text{equipment costs} \\
 &= \$6.72 \text{ billion} - \$6.32 \text{ billion} - \$0.10 \text{ billion} \\
 &= \$300 \text{ million} (\$97 \text{ pa for each person with arthritis})
 \end{aligned}$$

This may underestimate the carer cost, and sample surveying is necessary in order to identify and accurately estimate both the above items successfully in Australia.

2.3 Methodology

Direct costs

Most cost of illness studies employ the prevalence-based approach to estimating direct costs. The prevalence-based approach estimates the costs incurred for health services to prevent, diagnose and treat illness that is prevalent during the period.²¹

The Australian Institute of Health and Welfare (AIHW), in collaboration with the National Centre for Health Program Evaluation (NCHPE), have used the prevalence-based approach since 1992 in the development of the Disease Costs and Impact Study (DCIS). This major study measures health services utilisation and expenditure for specific diseases and disease groups in Australia, in accordance with the Ninth Revision of the International Classification of Disease (ICD9) published by the World Health Organisation (WHO) in 1977. The DCIS methodology has been gradually refined to estimate direct costs of hospitals, GP and specialist medical services, allied professionals, pharmaceuticals, nursing homes, research and other costs (such as administration), primarily from hospital morbidity data, casemix data and the National Health Survey (NHS), as well as other sources. The DCIS methodology is detailed in Mathers et al (1998).

Comparison of the DCIS ICD-9 classification categories within musculoskeletal disorders (Mathers and Penm (1999) Appendix A, Table 3, p 34) with the ABS National Health Survey categorisation shows slightly different allocations for the less prevalent arthritic conditions (those other than OA and RA). Hence the categories included in the 'minimum' estimates in Section 2.1 above are the ones separately identified in DCIS, namely:

- Rheumatoid arthritis (ICD-9 category 714);
- Osteoarthritis (ICD-9 category 715);
- Arthritis, spondylosis and spondylitis (ICD-9 categories, 720, 721.2-721.9); and
- Systemic lupus erythematosus (SLE) (ICD-9 category 710.0);

The National Health Survey data (referred to in Section 1) also includes ICD-9 categories 711-713 and 716 in the "*Arthritis nec*" category, but places ICD-9 category 710 in "*other musculoskeletal disease*", that is, it excludes SLE from arthritis classification. Moreover, the National Health Survey data is limited by the nature of the reporting so, for example, if a patient reports a "chronic back pain" it may or may not be due to an arthritic condition but is classified within "*back problems*" which falls outside the arthritis umbrella and (as shown in Table 3) is a higher cost item than RA and OA. There is also the further complication, as noted earlier, that a significant portion of people with arthritis remain undiagnosed.

For all these reasons, the AE 1993-94 estimates are based on the direct costs of arthritis assuming the relative incidence of the RA, OA and arthritis nec categories as identified in the National Health Survey are projected to the musculoskeletal categories of the DCIS. The projections to 2000 are based on two inflators:

1. Population inflator—the Australian population grew 7% over the period; and
2. Cost inflator—the Health and Community Services GDP deflator was used, which grew 25% over the period.

²¹ Rice, D.P., Kelman, S. and Miller, L.S., (1991) *Economic Costs of Drug Abuse*, NIDA Research Monographs 113:10-32, cited in Mathers et al (1998) p5.

There is likely to be a very minor understatement of the cost projection due to the demographic ageing of the population.

Indirect Costs

Measurement of indirect costs remains a matter of some debate and controversy. In the Access Economics (1994) report, the Felts and Yelin "lifetime costs" approach was adopted which, based on US studies, indicated that indirect costs were 75-87% of total costs. Thus indirect costs of arthritis were estimated conservatively as three times the direct costs. Components of indirect costs include the following:

Lost earnings and production ('human capital'): This focuses on the loss of production or earnings associated with illness and premature death. The higher end of such estimates would include absenteeism costs plus the discounted stream of lifetime earnings lost. The lower end might include only the 'friction' period until the worker can be replaced, which would take account of labour market conditions and un(der)employment levels. The lower is unemployment, the more accurate is the former approach, which is adopted in this paper.

Social welfare payments: The sickness benefits and disability pension paid to those suffering from disease, as well as carer payments through Centrelink, is a cost to the tax-paying community, which could be put to alternative use. This is not estimated in this paper.

Carer costs, equipment and devices: For many illnesses such as arthritis, the patient is supported and cared for by a spouse, family member or significant other. Furthermore, people with arthritis may need to purchase a variety of different aids as well as alterations to houses and vehicles. In so far as these costs do not enter the health care system, the under-estimation should be recorded in indirect costing.

Potential tax revenue foregone: People with arthritis who work less or retire early will not only forego income, but will also pay less personal income tax. The income tax foregone is a product of the average personal income tax rate and the foregone income. With arthritis and lower income, there will be less consumption of goods and services, up to the level of the disability pension. Without arthritis, it is conservatively assumed that consumption would comprise 90% of income (the savings rate may well be lower than this). The indirect tax foregone is a product of the foregone consumption and the average indirect tax rate. At 1 July 2000, the changes to the Australian taxation system meant that there is a significant difference in the direct and indirect components analysed in Section 2.2 and Table 4 above.

3 The Burden of Disease

Economists have always encountered difficulty in attaching economic values to the pain, suffering or premature death that disease may cause. The estimates of indirect costs addressed in Section 2 do not specifically seek to value pain, yet disease imposes burdens on patients which go well beyond the loss of income. There is no objective way to ascertain how much a patient might be prepared to pay to avoid pain or death. While it is possible to ask a patient hypothetically to state the amount he or she would pay, there is no way to 'reality check' any such figure.

In recent years, a methodology has been developed internationally by the World Health Organisation (WHO), The World Bank and Harvard University.²² *The Global Burden of Disease* (1996) provides a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. The approach has been adopted and applied in Australia by the AIHW²³ with a separate comprehensive study in Victoria²⁴. The burden of disease of mortality, disability, impairment, illness and injury is quantified through the calculation of Disability Adjusted Life Years (DALYs). Each DALY can be thought of as a lost year of "healthy life". DALYs comprise both the years of life lost (YLL) due to premature death and equivalent "healthy" years of life lost due to disability (YLD).

*"The burden of disease, therefore, is a measurement of the gap between current health status and an ideal situation where everyone lives into old age free of disease and disability. As such it is an indication of the 'unfinished' health agenda, identifying areas in which additional health gains can be made"*²⁵

Mathers, Vos and Stevenson (1999) estimate the cost of RA to be 11,989 DALYs and OA to be 56,305 DALYs in 1996. Interestingly, these two types of arthritis alone represent over three quarters of musculoskeletal disease DALYs. Other forms of arthritis, including Ross River virus, are estimated here to account for 6,680 DALYs, amounting to 74,974 DALYs for arthritis in total. This places arthritis as a leading cause of disease burden in Australia.

The incidence of arthritis is even more important when looking at the burden of disability from the disease (excluding the impact of premature mortality). YLDs might be thought of as measuring suffering while still alive, and on this measure, OA alone contributes 4.8% of the total burden of disability in Australia, and this ignores the links between arthritis and depression (the largest contributor). For women, OA accounts for 5.7% of the total years of females' life lost due to disability in Australia.

Table 5 over the page presents the 1996 AIHW estimates together with Access Economics' projections to 2000. In 2000 in Australia, arthritis is estimated to have cost 81,441 years of healthy life, of which 78,381 years (96.2%) were lost due to disability and 3,060 years (3.8%) were lost due to premature death. The YLL due to premature death is higher for RA than OA, because of the significant reductions in life expectancy caused

²² Murray, C. J. L. and Lopez, A. D. (eds) (1996).

²³ Mathers, C., Vos, T. and Stevenson, C. (1999).

²⁴ The Victorian study is available on www.ibdn.net/morbidity.

²⁵ *Ibid*, morbidity/executive_summary.htm, p1.

by RA, with greater risk of mortality due to infections, renal disease, respiratory conditions and gastrointestinal disease (although deaths due to cardiovascular disease and malignancy occur at a comparable incidence to non-RA patients). RA standardised mortality ratios from different studies has ranged from 1.13 to 2.98, implying that life expectancy survival rates are comparable to those of Hodgkin's disease, diabetes mellitus and three-vessel coronary artery disease. A 1989 Finnish study showed the lifespan of subjects with RA was shortened by 15-20% from the date of onset of the illness.²⁶

Table 5: Disability Adjusted Life Years, 1996 & 2000

| | 1996 | | | 2000 | | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|
| | Males | Females | Total | Males | Females | Total |
| Years of life lost due to disability (YLD) | | | | | | |
| OA | 22,442 | 33,296 | 55,738 | 24,378 | 36,168 | 60,546 |
| RA | 3,122 | 6,868 | 9,990 | 3,391 | 7,460 | 10,852 |
| Arthritis other | 2,377 | 4,052 | 6,429 | 2,582 | 4,401 | 6,984 |
| <i>Arthritis total</i> | <i>27,941</i> | <i>44,216</i> | <i>72,157</i> | <i>30,351</i> | <i>48,030</i> | <i>78,381</i> |
| Years of life lost due to premature death (YLL) | | | | | | |
| OA | 168 | 399 | 567 | 182 | 433 | 616 |
| RA | 524 | 1,475 | 1,999 | 569 | 1,602 | 2,171 |
| Arthritis other | 191 | 60 | 251 | 207 | 65 | 273 |
| <i>Arthritis total</i> | <i>883</i> | <i>1,934</i> | <i>2,817</i> | <i>959</i> | <i>2,101</i> | <i>3,060</i> |
| DALYs | | | | | | |
| OA | 22,610 | 33,695 | 56,305 | 24,560 | 36,601 | 61,162 |
| RA | 3,646 | 8,343 | 11,989 | 3,960 | 9,063 | 13,023 |
| Arthritis other | 2,568 | 4,112 | 6,680 | 2,790 | 4,467 | 7,256 |
| <i>Arthritis total</i> | <i>28,824</i> | <i>46,150</i> | <i>74,974</i> | <i>31,310</i> | <i>50,131</i> | <i>81,441</i> |

AE estimates derived from Mathers, Vos and Stevenson (1999). 2000 projections based on the estimated increase in the population with arthritis.

²⁶ "The Correlation of Life Expectancy and Arthritis", *ibid*.

4 Comparisons with other diseases

4.1 Direct costs

Table 6 compares the direct costs of musculoskeletal disorders with other major disease categories. All figures are 1993-94 dollars. Musculoskeletal disease is the third most costly category, behind circulatory and digestive disorders. Arthritis, as a sub-component of musculoskeletal disorders, generates higher direct costs to the Australian health care system than diabetes or asthma, both of which are National Health Priority areas.

Table 6: Comparison of direct costs of disease and injury, 1993-94

| Disease category (ICD-9 chapter) | Total Costs | Dental & | | | | | |
|-------------------------------------|----------------|---------------|--------------|----------------------|------------------|-----------------|--------------|
| | | Hospitals | Medical | Pharma- ceuticals | Allied Health | Nursing Home | Other |
| Circulatory | 3,719 | 1,657 | 503 | 715 | 40 | 587 | 218 |
| Digestive | 3,715 | 1,070 | 284 | 275 | 1,849 | 35 | 202 |
| Musculoskeletal | 3,002 | 1,207 | 518 | 276 | 416 | 430 | 154 |
| Injury | 2,601 | 1,663 | 393 | 127 | 160 | 112 | 146 |
| Mental | 2,586 | 1,007 | 432 | 198 | 83 | 718 | 147 |
| Respiratory | 2,521 | 833 | 624 | 784 | 37 | 107 | 135 |
| Nervous system | 2,334 | 766 | 431 | 248 | 227 | 503 | 159 |
| Cancer | 1,904 | 1,327 | 261 | 53 | 12 | 32 | 219 |
| Arthritis (AE estimate) | 1,669 | 671 | 288 | 154 | 231 | 239 | 86 |
| Genito-urinary | 1,662 | 997 | 383 | 143 | 17 | 32 | 90 |
| Symptoms | 1,334 | 478 | 426 | 302 | 57 | 5 | 66 |
| Complications of pregnancy | 1,051 | 941 | 32 | 11 | 6 | 0 | 60 |
| Endocrine | 966 | 235 | 222 | 309 | 54 | 47 | 98 |
| Skin | 956 | 336 | 247 | 259 | 56 | 6 | 53 |
| Infectious | 849 | 246 | 316 | 193 | 15 | 13 | 65 |
| Perinatal | 239 | 221 | 1 | 0 | 0 | 3 | 14 |
| Blood | 192 | 101 | 42 | 24 | 1 | 5 | 18 |
| Congenital | 159 | 116 | 18 | 2 | 0 | 13 | 8 |
| Other | 1,607 | 859 | 505 | 122 | 44 | 0 | 77 |
| Total | 31,397 | 14,062 | 5,640 | 4,042 | 3,075 | 2,647 | 1,932 |

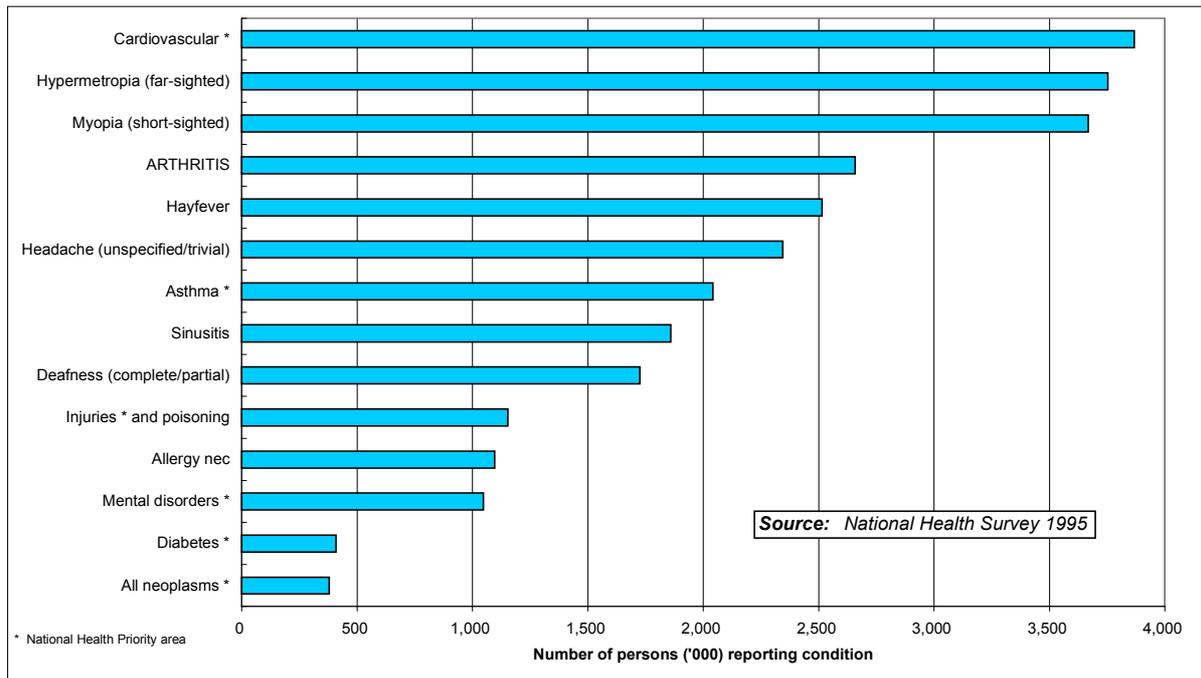
4.2 Prevalence

Another way of comparing diseases is to consider prevalence. The National Health Survey provides a useful indication of the total number of people reporting a particular condition. As noted earlier, there may be some under-reporting. That said, larger numbers of people report arthritis than those reporting hayfever, headaches and high blood pressure. On this measure, arthritis is more prevalent than five of the six National Health Priority areas (asthma, injuries, mental disorders, diabetes and cancers).²⁷

Chart 3 over the page compares the reporting of selected health conditions, while Chart 4 compares the reporting of items within the broad category of musculoskeletal disorders.

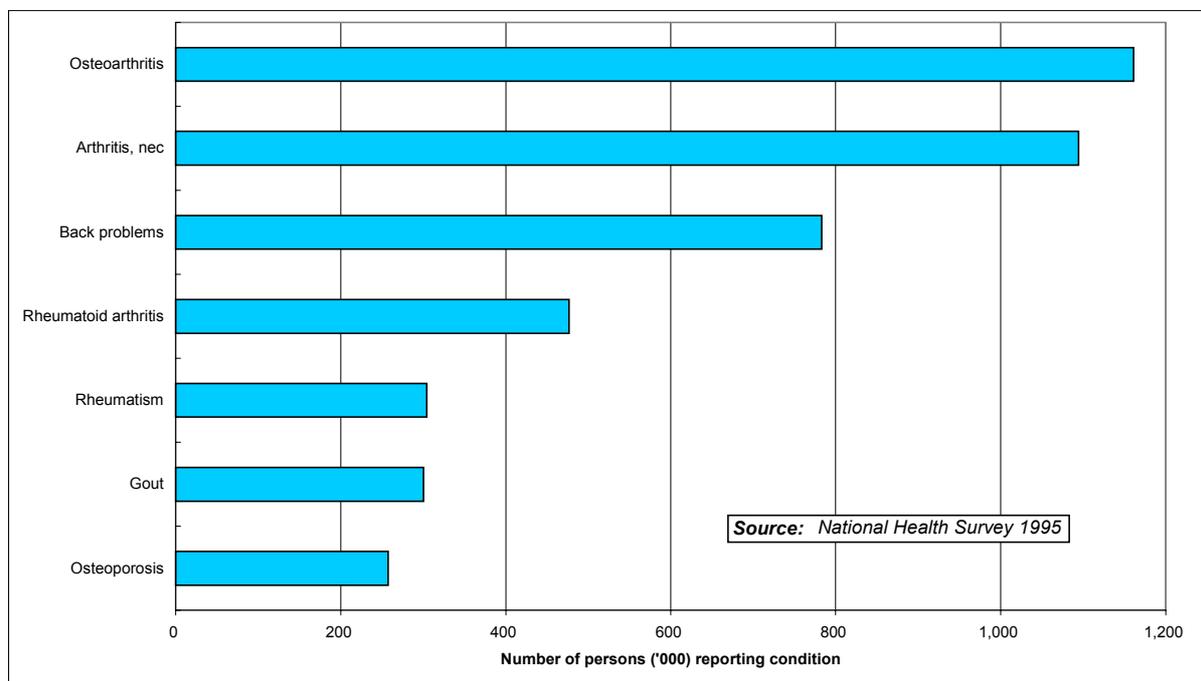
²⁷ It is also worth noting that, even though cardiovascular disease is the most prevalent condition, this category is largely comprised of less serious disorders such as varicose veins and haemorrhoids. If these latter two sub-categories were excluded from cardiovascular disease, it would also be ranked less prevalent than arthritis.

Chart 3: Reporting of selected conditions



Neoplasms are defined as morbid growth or tissue formation, and include the skin and breast cancer categories. Cardiovascular includes hypertension, heart disease and stroke. Mental disorders includes depression, nerves/tension, and alcohol and drug dependence.

Chart 4: Reporting of musculoskeletal conditions



4.3 The burden of disease

AIHW work on the burden of disease allows a third type of comparison of diseases, in terms of DALYs, YLD and YLL. Table 7 over the page shows arthritis as a leading cause of disease burden in Australia, again ahead of diabetes and asthma—two of the six national health priority areas.

In terms of the disability burden of specific diseases, osteoarthritis is the fourth largest contributor and the third largest for women.

Table 7: Leading Causes of Burden of Disease and Injury, 1996

| Total Burden of Disability and Premature Death Males and Females (disease category) | DALYs | Burden of Disability Males and Females (specific disease) | YLD | Burden of Disability Females (Specific disease) | % Total Female YLD |
|---|---------------|---|---------------|---|--------------------|
| 1. Heart disease | 315,387 | 1. Depression | 92,795 | 1. Depression | 9.8 |
| 2. Unintentional injuries | 143,120 | 2. Dementia | 65,091 | 2. Dementia | 6.8 |
| 3. Stroke | 136,330 | 3. Asthma | 55,791 | 3. Osteoarthritis | 5.7 |
| 4. COPD* | 93,387 | 4. Osteoarthritis | 55,738 | 4. Asthma | 5.3 |
| 5. Depression | 93,016 | 5. Hearing Loss AO# | 48,170 | 5. Gen. anxiety## | 3.5 |
| 6. Lung cancer | 90,522 | 6. Diabetes mellitus | 43,823 | 6. Diabetes mellitus | 3.5 |
| 7. Dementia | 88,978 | 7. Alcohol abuse | 41,065 | 7. Vision disorders | 2.9 |
| 8. Anxiety disorders | 75,676 | 8. COPD* | 38,894 | 8. Stroke | 2.7 |
| 9. Arthritis | 74,974 | 9. Stroke | 38,055 | 9. Hearing loss AO# | 2.6 |
| 10. Diabetes | 74,931 | 10. Isc. Heart disease** | 35,552 | 10. COPD* | 2.5 |

* Chronic obstructive pulmonary disease **Ischaemic heart disease # Adult onset (AO) ## Generalised anxiety disorder

5 International comparisons

International experience in North America and Europe parallels the incidence and treatment costs of arthritis in Australia outlined in this paper. However, there has been a concerted public health response in overseas countries to the burgeoning problems of arthritis. There has been nothing comparable in Australia.

In Geneva in January 2000, the World Health Organisation launched the **International Bone and Joint Decade**, initiated because of “the epidemic of musculoskeletal disease that is occurring worldwide as the population ages.”²⁸ Momentum for such an initiative has been building since the 1990 Global Burden of Disease Study revealed that musculoskeletal conditions represent more than half of all chronic conditions worldwide and are the most common cause of severe long term pain and physical disability. The Bone and Joint Decade—which will be launched in Australia on April 27—is largely a medical initiative seeking worldwide recognition for the prevalence and priority of musculoskeletal disease.

The following sections present a snapshot of the prevalence and cost of arthritis in the USA, Canada, Europe in general and the United Kingdom.

5.1 The United States

In the US, some 43 million people, or 18.4% of the population, have arthritis—including 21.1% of women, 15.7% of men, 5% of 16-44 year olds, 21% of 45-64 year olds, and nearly 50% of those over 65. Arthritis is the most common cause of long term disability in the US, accounting in 1999 for 39 million physician (GP) visits, 2.4% of hospital discharges (with an average length of hospital stay of 5 days), 2.9 million outpatient visits, 2.2 million emergency visits and 4.8% of home health care discharges (with an average length of 88.7 days).²⁹

By 2020 it is estimated that 60 million Americans (20% of the population) will have arthritis. The disease was estimated to cost \$US65 billion annually in 1992 dollars, with \$US15 billion in direct costs and \$US50 billion in indirect costs (77% of total costs).³⁰

Arthritis and other rheumatic conditions have an annual economic impact on the United States roughly equivalent to a moderate recession, with an aggregate cost of about 1.1% of the gross national product.³¹

A number of American studies have estimated the impact of arthritis on ability to work, and these form the basis for the now fairly sturdy assumption in this paper of a 1:3 ratio of direct/indirect costs. Pincus et al (1989) found substantial earnings losses and work disability in people under 65 with OA; Reisin et al (1989) found 43% of women in paid employment at RA-onset were work disabled by the time of evaluation; Yelin (1994) showed that approximately half of patients in paid employment at RA onset eventually became work disabled; and Yelin and Callahan (1995) showed a significant correlation

²⁸ Hazes, J.M. and Woolf, A.D. (2000), p1.

²⁹ MMWR (1999), p349, see www.cdc.gov/epo/mmwr/preview/mmwrhtml/mm4817a2.htm

³⁰ Center for Disease Control and Prevention, cited in www.dimethaid.com/prod/pennsaid/arthfacts.html.

³¹ Yelin, E., University of California, San Francisco, *ibid*.

between arthritis and the capacity of individuals to do work. Callahan (1998) also cites other studies which show arthritis as the leading cause of physical limitations in activities of daily living, as well as significant work disability and limitation in performing roles and activities traditionally associated with women.

5.2 Canada

More than 4 million Canadians suffer arthritis, and it is one of three most common chronic conditions in Canada. In 1996 arthritis was estimated to cost the Canadian economy \$US5 billion, with \$US1.1 billion in direct costs and \$US3.9 billion in indirect costs (78% of total). One in three prescriptions written in Canada are for treatments for arthritis and it is the second most common reason for purchasing over-the-counter drugs. An estimated 1,900 Canadians die every year from NSAID-induced ulcers (more than road accidents, fires and gunshot wounds combined).³²

A 1997 Health Canada Report, *Economic Burden of Illness in Canada, 1993*, quantifies both direct and indirect costs related to illness and injury. Indirect costs are measured as the present value of lost productivity due to disability and premature death. The report shows cardiovascular disease as the most costly at C\$19.7 billion, followed by musculoskeletal disease (C\$17.8 billion), with indirect costs highest for musculoskeletal disease was the highest (18% of the total). The data (see Table 8) show that indirect costs for musculoskeletal disease are the highest proportion of total costs, at 86.2%. These data also confirm the enormous size of the disability burden of musculoskeletal disease (2.5% of GDP or C\$531 per capita).

Table 8: Costs of Disease and Injury, Canada, 1993

| Diagnostic Category | Direct costs (C\$bn) | Indirect Costs (C\$bn) | Total Costs (C\$bn) | Indirect Costs as % of Total |
|---------------------------------|----------------------|------------------------|---------------------|------------------------------|
| Cardiovascular | 7.35 | 12.37 | 19.72 | 62.7 |
| Musculoskeletal | 2.46 | 15.33 | 17.79 | 86.2 |
| Injuries | 3.12 | 11.22 | 14.34 | 78.2 |
| Cancer | 3.22 | 9.85 | 13.07 | 75.4 |
| Respiratory | 3.79 | 8.39 | 12.18 | 68.9 |
| Nervous system/ sense organs | 2.25 | 7.32 | 9.57 | 76.5 |
| Mental disorders | 5.05 | 2.79 | 7.84 | 35.6 |
| Digestive | 3.33 | 2.92 | 6.25 | 46.7 |
| Ill-defined disease | 1.85 | 2.52 | 4.37 | 57.7 |
| Endocrine-related | 1.33 | 2.09 | 3.42 | 61.1 |
| Total | 33.75 | 74.80 | 108.55 | 68.9 |

5.3 Europe

There are an estimated 103 million people with arthritis and rheumatism across Europe, about 14% of the population. Almost half are below the age of retirement, but many retire early on account of ill-health or disability.³³ They have organised themselves into a variety of bodies, with a secretariat for the movement called the *People with Arthritis/Rheumatism in Europe* (PARE), which lobbies the European Parliament.

³² Dimethaid Research, *Arthritis Facts*, citing the Canadian Arthritis Society, see www.dimethaid.com.

³³ Jones, R. (2000), p23.

5.4 United Kingdom

There are about 8 million people with arthritis in the United Kingdom, approaching 14% of the population. This includes more than 1 million with osteoarthritis, 600,000 with rheumatoid arthritis, 155,000 with gout, 115,000 with ankylosing spondylitis (a spinal form of arthritis) and 15,000 with lupus. Up to 10% of the population have conditions collectively known as soft tissue rheumatism, such as fibromyalgia, frozen shoulder and tennis elbow.

More than 3 million people in the UK are significantly disabled by a rheumatic disease. Arthritis and rheumatic diseases are the most common cause of chronic illness and account for around 20% of all doctor visits. In 1997, more than 26 million prescriptions were issued for musculoskeletal and joint diseases with a total bill of Stg205 million.³⁴

5.5 Manifestos and national action plans

Manifestos are found in most OCED countries. To date, the USA alone has formally adopted a national action plan.

The United States has, since 1999, recognised that arthritis and other rheumatic conditions are a large and increasing public health problem, leading to the development of the *National Arthritis Action Plan: A Public Health Strategy*. The NAAP was developed under the leadership of the Center for Disease Control and Prevention, the US Arthritis Foundation and the Association of State and Territorial Health Officials. It contains objectives for arthritis in national health objectives for 2010, with a three-pronged approach focusing on:

1. surveillance, epidemiology and prevention research;
2. communication and education; and
3. programs, policies and systems.

The NAAP is available on-line at www.cdc.gov/nccdphp.

“The impact of arthritis has been under-recognised, and key interventions that reduce arthritis pain and health care costs have been under-used.” Kruger, J.M. et al, 1998.

On 22 June, 2000, the European Manifesto for the Third Millennium was launched in Nice, France. It was drawn up by three main bodies—the Standing Committee of the European League Against Rheumatism (EULAR), Arthritis and Rheumatism International (ARI) and the International Organization of Youth with Rheumatism (IOYR).

The Manifesto is a proposed action plan which requires policy-makers, service providers and researchers to:

1. Raise public awareness;
2. Empower people with arthritis/rheumatism by funding user-led programs;
3. Involve people with arthritis/rheumatism in policy development;
4. Develop and recognise national and international organisations of people with arthritis/rheumatism;
5. Provide prompt and good quality health and community services;
6. Ensure doctor and health professional awareness;

³⁴ Arthritis Research Campaign 2000, www.arc.org.uk

7. Involve people with arthritis/rheumatism in helping to determine relevant medical research priorities and budgets;
8. Expand research into the societal impacts of arthritis/rheumatism;
9. Strengthen laws and regulations; and
10. Provide fully accessible education/training programs.

The United Kingdom does not, as yet, have a national action plan in place. Arthritis Care is, however, planning to draw up action plans and to lobby for their adoption by the National Parliaments (in England, Scotland, Wales and Northern Ireland) which are now the level of government responsible for the delivery of health care in the UK.

6 The Arthritis Foundation of Australia

6.1 Mission and Roles

Mission

To improve the quality of life of people by reducing and preventing the effects of musculoskeletal disorders.

Roles

1. To be the central body for allocating all research grants.
2. To coordinate the policy directions for education and marketing programs for improved knowledge and awareness.
3. To be the office responsible for lobbying Federal Government.
4. To produce high quality publications for distributions by affiliate offices.
5. The national office will be funded by affiliates in accordance with an approved budget.
6. To dedicate greater attention to securing national sponsors for naming rights and product endorsements and other sponsorship activities.
7. To develop the Grandparent of the Year Award into a major fundraising activity which will culminate in an annual award of significance and prestige.

Arthritis Foundation of Australia, *Annual Report (1999-2000)*, p1.

6.2 An Australian Action Plan for Arthritis

The Board of the Arthritis Foundation of Australia (AFA) has made it a priority to develop an Australian Action Plan for Arthritis. The analysis in this report strongly supports the need for such a plan which is not only warranted, but overdue. Following the lead of other peak bodies internationally (such as the US Arthritis Foundation and EULAR), and in line with the AFA's mission and Roles 2 and 3 above, there is scope for activity by the Foundation towards partnership with key government bodies (in particular the Department for Health and Aged Care) and affiliated State and Territory organisations in developing an Australian Action Plan for Arthritis (AAPA).

The AAPA would aim to:

- raise awareness of the increasing incidence of arthritis in Australia within government, the medical profession and the community;
- recognise arthritis as a National Health Priority due to the pre-eminent costs of arthritis to the Australian people, in terms of both the direct costs to the health system as well as the burden of disease due to disability and premature death;
- identify objectives and implementation strategies for arthritis in national health policy, including programs for epidemiology, research, prevention, health education, early diagnosis, management and treatment; and
- build relationships and effective communication channels among AAPA partners and with Australians suffering arthritic disorders.

7 Conclusions

“The main uses of cost of illness data are in providing an economic justification for disease control action and an input into evaluating the potential cost-effectiveness of interventions for the purpose of priority setting.” Mathers et al, AIHW (1998)

The cost of arthritis, at \$8.96 billion in 2000 and 1.4% of GDP, has a significant impact on the Australian economy and subtracts from Australia’s productive potential in an increasing and ongoing manner. Each year, over 80,000 years of healthy life are lost by Australians because of the disease. Currently, 3.1 million Australians (16.5% of the population), with women over-represented, suffer the effects of crippling osteoarthritis, rheumatoid arthritis and other arthritic disorders. Moreover, the chronic nature of many arthritic diseases is being linked to depression and other dysfunction. Most people with arthritis (60%) are of working age, adding to the socioeconomic aspects of the disease. The problems are worsening as the population ages—for the individuals concerned, their families, their voluntary carers, the health system, the social welfare system, the labour force and the national income.

Despite the huge prevalence and costs of the disease, arthritis has received very little public policy attention in Australia. This paper has shown that, when compared to the six National Health Priority areas—cardiovascular disease, cancer, mental health, injury, diabetes and asthma—the prevalence, financial costs and burden of disease attributable to arthritis are of comparable and frequently greater importance. Unlike in Europe and North America, where the burgeoning arthritis epidemic has prompted responses such as the European Manifesto and the National Arthritis Action Plan in the United States, there has been no notable public policy response in Australia to the launch by the World Health Organisation of the international Bone and Joint Decade, 2000-2010.

As is the case with other chronic diseases such as diabetes, there is ample evidence that early diagnosis and commencement of appropriate management programs, including well-directed self-management programs, will produce long term health benefits to patients and reduce costs to the community.³⁵

There is much that can and still needs to be done to relieve the suffering caused by arthritis in Australia, through preventative measures, interventionist treatments and self-help programs. Research into the disease could be accorded a far higher national priority. The Arthritis Foundation of Australia and its affiliated State and Territory bodies provide an excellent and well-organised network for communication between those suffering arthritis and health policy makers. As the peak organisation responsible for lobbying government and overseeing awareness and research programs, the AFA is taking the initiative to call for an Australian Action Plan for Arthritis (AAPA). The findings in this report provide strong support for the AFA’s actions in this area.

³⁵ See, for example, Lorig, K.R. et al (1993) and Kruger JM et al 1998.

Appendices

Bibliography

- Access Economics (1994), *The Arthritis Foundation of Australia Submission to the Industry Commission Inquiry into Charitable Organisations*, April 1994
- Arthritis Foundation (United States), ASTHO, CDC (1999), *National Arthritis Action Plan: A Public Health Strategy*, available on www.cdc.gov/ncccdphp
- Australian Bureau of Statistics (1997), *1995 National Health Survey: Summary of Results*, Cat.No.4364.0.
- Australian Institute of Health and Welfare (2000), *Australian Hospital Statistics 1998-99*, Health Services Series No. 15, AIHW Cat. No. HSE 11.
- Bellamy, N., Brooks, P.M., Campbell, J., Drane, D. and F. Dupen, D. (1994) "An Australian Survey of Current Prescribing Practices of Methotrexate in Rheumatoid Arthritis", *Australian and New Zealand Journal of Medicine* 24: 214-216.
- Brooks, P.M. and Hart, J.A.L. (2000) "The Bone and Joint Decade: 2000-2010", *Medical Journal of Australia*, Vol. 172, pp307-308.
- Callahan, L.F. (1998), "Prevalence and Impact of Arthritis in Women", *Medicine and Behaviour*, April 1998, reprinted on www.medinfo.source.com/mb/mb980433.html
- Department of Health and Family Services, the Australasian Faculty of Musculoskeletal Medicine, and the Bone and Joint Institute of the University of Newcastle (1997) *The National Musculoskeletal Health Initiative: Rationale and Methods—a guide prepared by the Directorate*, 2 May 1997.
- Garvan Research Foundation (1998) "Lifelines—beyond the pain barrier" *The Garvan*, Spring 1998.
- Hazes, J.M. and Woolf, A.D. (2000) "The Bone and Joint Decade 2000-2010", *Journal of Rheumatology*, Vol. 27, pp1-3.
- Jones, R. (2000) "Manifesto for the Third Millennium", *The Patient's Network*, Vol. 5, No. 3, 2000.
- Kruger, J.M., Helmick, C.G., Callahan, L.F., Haddix, A.C., (1998) "Cost-effectiveness of the Arthritis Self-help Course", *Archives of Internal Medicine*, Vol. 158, June 8, 1998.
- Lorig, K.R., Mazonson, P.D., Holman, H.R., (1993), "Evidence suggesting that health education for self-management in patients with chronic arthritis has sustained health benefits while reducing health care costs", *Arthritis and Rheumatism*, Vol. 36, No. 4, April 1993.
- Lorig, K.R., Sobel, D.S., Stewart, A.L., Brown, B.W. Jr, Bandura, A., Ritter, P., Gonzalez, V.M., Laurent, D.D., Holman, H.R. (1999) "Evidence suggesting that a chronic disease self-management program can improve the health status while reducing hospitalization: a randomized trial", *Medical Care*, 37(1):5-14, Jan. 1999.
- Manners, P.J. and Diepeveen, D.A. (1996) "Prevalence of Juvenile Chronic Arthritis in a Population of 12-Year-Old Children in Urban Australia", *PAEDIATRICALS*, Vol. 98 No. 1, July 1996.
- Mathers, C., Vos, T., Stevenson, C. and Begg, S.J. (2000) "The Australian Burden of Disease Study: measuring the loss of health from diseases, injuries and risk factors", *Medical Journal of Australia*, Vol. 172, 19 June 2000.
- Mathers, C., Vos, T. and Stevenson, C. (1999) *The burden of disease and injury in Australia*, AIHW Cat. No. PHE17.
- Mathers, C. and Penm, R. (1999) *Health system costs of injury, poisoning and musculoskeletal disorders in Australia 1993-94*, Health and Welfare Expenditure Series No.6, AIHW.
- Mathers, C., Stevenson, C., Carter, R. and Penm, R. (1998) *Disease costing methodology used in the Disease Costs and Impact Study 1993-94*, Health and Welfare Expenditure Series No.3, AIHW.
- Murray, C.J.L. and Lopez, A.D. (eds) (1996) *The Global Burden of Disease*. Geneva, Cambridge, Mass., Washington. Published by The Harvard School of Public Health, on behalf of WHO and The World Bank, distributed by Harvard University Press.

Pincus, T., Mitchell, J.M. and Burkhauser, R.V. (1989) "Substantial work disability and earnings losses in individuals less than age 65 with osteoarthritis: comparisons with rheumatoid arthritis", *Journal of Clinical Epidemiology*, Vol. 42, pp449-457.

Reisine, S.T., Grady, K.E., Goodenow, C. and Fitfield, J. (1989) "Work disability among women with rheumatoid arthritis: the relative importance of disease, social, work and family factors", *Arthritis and Rheumatism*, Vol. 32, pp538-543.

World Health Organisation (1986), *International Classification of Impairments, Disabilities and Handicaps*, WHO, Geneva.

Yelin, E. (1994) "Work disability and rheumatoid arthritis" in Wolfe, F. and Pincus, T. (eds) (1994) *Rheumatoid Arthritis: Parthenogenesis, Assessment, Outcome and Treatment*, Marcel Dekker Inc., New York, pp261-271.

Yelin, E. (1992) "Arthritis: The Cumulative Impact of a Common Chronic Condition", *Arthritis and Rheumatism*, May 1992, Vol. 35 No. 5, pp 489-495.

Yelin, E. and Callahan L.F., (1995) "The Economic Cost and Social and Psychological Impact of Musculoskeletal Conditions", *Arthritis and Rheumatism*, Vol. 38, pp1351-1362.

Website homepages and links

About Arthritis, www.arthritis.about.com/health/arthritis/library

Arthritis Foundation of Australia Website www.arthritisfoundation.com.au

Australian Bureau of Statistics, www.abs.gov.au

Australian Institute of Health and Welfare, www.aihw.gov.au

Center for Disease Control (US), www.cdc.gov

Department of Health and Aged Care, www.health.gov.au

Dimethaid Research, Canada, www.dimethaid.com

Dr Donnica, www.drdonnica.com

Garvan Research Foundation, www.victorchang.unsw.edu.au/foundation/media

Medical information sources, www.medinfosource.com

Medical Journal of Australia, www.mja.com.au/public/issues

Missouri Arthritis Rehabilitation Research and Training Center (1997), www.hsc.missouri.edu

Victorian Burden of Disease study, www.ibdn.net/morbidity