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# MEDICINES DELIVER VALUE FOR PATIENTS AND THE COMMUNITY

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## Measuring the impact of pharmaceutical innovation

Research by Professor Deborah Schofield  
and University of Sydney's Economics Team

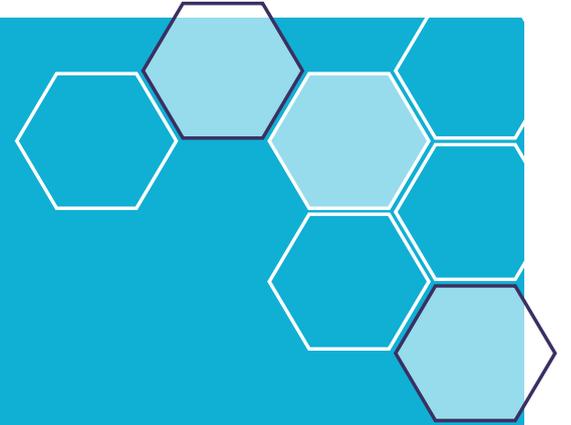


## About the author



Professor Deborah Schofield is the Chair of Health Economics at the Faculty of Pharmacy, University of Sydney, Murdoch Children's Research Institute and Garvan Institute of Medical Research.

Her career has spanned the Australian Government public service, academia and clinical practice. Professor Schofield and her team and their collaborators have undertaken economic modelling to genomic medicine, modelling ageing and retirement and their relationships with health and the labour force; and development of economic models that measure the impact of illness not only on the health system, but also family economic circumstances, other Government portfolios, and GDP.



# MEDICINES DELIVER VALUE FOR PATIENTS AND THE COMMUNITY

Medicines keep Australians out of hospital, prevent disease and play a pivotal role in ensuring a productive and healthy community.

Many chronic conditions place a huge economic burden on society through, for example:

- employee absenteeism
- in-patient hospital and surgical costs (typically associated with later stages of treatment for serious disease)
- societal (psychological, family and community) costs associated with illness, permanent disability or premature death.

There are also significant hidden benefits of medicines and other treatments in terms of improvements in productivity and the Australian economy as a whole.

Studies and analyses show more clearly that new treatments can, and do, directly save the Australian Government money. There is a link between health interventions and increased economic outcomes.

Medicines Australia engaged Professor Deborah Schofield of the University of Sydney to conduct a research study. 'Measuring labour productivity and the benefits of interventions for osteoarthritis' evaluated the broader economic gains associated with an intervention to manage osteoarthritis.

The analysis used population statistics and results from a previously published osteoarthritis (OA) study to determine how many people with OA could have remained in the labour force if they managed their pain with non-steroidal anti-inflammatory drugs (NSAIDs).

## Economic benefits through improved productivity due to effective management of osteoarthritis

The study found there would be over 1,000 additional people of working age from the OA population in the labour force.

Using this outcome, the University of Sydney's Economics team (USET) quantified the economic benefits to individuals and the Government delivered by a larger labour force. It was found that in the aggregate, individuals would have an estimated increase in income of roughly \$43 million per year. Furthermore, the Government would experience an estimated increase in taxation revenue of \$11 million per year and a reduction in welfare costs of \$16 million per year. Finally, it was estimated that the increased labour force participation would increase Australia's gross domestic product (GDP) by \$164 million in 2015 alone.

The outcomes provided by this study demonstrate the magnitude of the foregone economic benefits not currently captured in health program analysis. This information is highly valuable for Government when assessing investments for interventions that draw on scarce resources.

The pharmaceutical industry is thinking about what healthcare delivery systems will look like in the future. That is why Medicines Australia has identified options to improve productivity reporting to gain a greater understanding of the outcomes delivered by health interventions.

Better use of big health and economic data will lead to greater sophistication in the modelling and thus information about how health interventions improve health outcomes while reducing costs. The potential is great; however, there remain many challenges to overcome such as getting multiple Government departments to share data. This could be addressed through two approaches: better productivity measures in the Government's health program funding decisions and to build on the provision of open source Government data.



## Osteoarthritis is an important health and economic challenge

### Osteoarthritis is a prominent health condition

OA is a degenerative disease of the joints or 'wear and tear' form of arthritis. It is the most common chronic health condition of the joints, and one of the most common chronic conditions in general. As an example of this in 2010, OA was identified as the 11th most frequent cause of disability. To add to this the number of people with OA is increasing. This is due to the increased prevalence of several risk factors such as obesity, sedentary behaviours, and population ageing. In fact the Global Burden of Disease Study (1997) identified that population ageing could make OA the 9th cause of disability-adjusted life years (DALYs) in developed countries by the year 2020.

Osteoarthritis will be the **9th** cause of disability adjusted life-years by 2020, according to the Global Burden of Disease study

### The condition generates substantial direct and indirect costs for the community

The prevalence of OA in the community is reflected in health expenditure. In 2004-2005 alone \$1.2 billion was spent on the management of the condition. GP consultations that include the management of OA are one contributor to these costs.

For example, in 2007-08 the cost came to \$2.7 million in Medicare-paid consultations. However, health expenditure is not the only associated expense. The group most impacted by OA is 45 to 64 year olds, which is the age group that is the fastest growing in the working age population. On top of this a critical issue of OA is early retirement due to OA, which has a financial implication for both individuals and the Government.

### The amount of health expenditure attributed to osteoarthritis in Australia during 2004 - 2005



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## The study examined the economic benefits of pharmaceutical treatment in meeting this challenge

### The impact of an Osteoarthritis intervention on labour force participation was investigated

The USET analysed the broad economic costs associated with OA. Modelling was performed to estimate the potential increase in the labour force as a result of reduced bodily pain achieved by a pharmaceutical intervention. Using this outcome, the flow on economic costs to individuals and the Government were estimated. The intervention investigated was NSAIDs, which reduce inflammation and relieve bodily pain.<sup>1</sup> Bodily pain was the focus of the study as it is a key symptom of OA and has been found to have a substantial impact on labour force participation.

### Results from a previously published study supported the analysis

The results from a previous study were used as inputs for the model. A study by Rabenda et al in 2005 looked at roughly 800 OA patients aged 35 and above who started treatment with NSAIDs. The study measured the bodily pain of the patients using the Medical Outcomes Study Short Form-36 (SF-36) bodily pain score. This is a measure of overall pain using a score from 0 to 100, with higher scores reflecting better health status. The SF-36 scores for the participants were collected at baseline and three months. Rabenda's study found that patients reported an average improvement of about seven units in the bodily pain score over the period of the study.<sup>2</sup>

## Pharmaceutical treatment of osteoarthritis delivers substantial economic benefits

### Pain management for osteoarthritis increases the labour force

The USET estimated that the labour force participation rates of those with OA was roughly 63% for men and 53% for women. It was then estimated that the improvement in bodily pain scores would result in an increase in labour force participation rates, with 450 (8%) men and 670 (7%) women returning to the workforce. These outcomes were used to estimate the associated indirect economic benefits. The benefits investigated were the estimated increase in individual's income, the increase in income tax and reduction in welfare payments for the Government, and the increase in GDP.

Reduced pain and improved function from pharmaceutical treatment delivered an estimated **6-8% increase** in labour force participation rates

<sup>1</sup> Dr. Bathon, J 2011, *Osteoarthritis: Treatment*, viewed 19 May 2017, <<https://www.hopkinsarthritis.org/arthritis-info/osteoarthritis/oa-treatments/>>

<sup>2</sup> It is important to note that Rabenda's study was not a randomised controlled trial and as such it is not possible to comment that the improvement estimated in the study is greater than the placebo effect. However, the sample size was large enough to be representative of the population with OA which was why the results were used for analysis in the USET.

## Incomes increase

The potential increase in the income of individuals with OA was estimated by identifying a counterpart in the labour force for each person not in the labour force due to OA and comparing their incomes. The counterpart was of the same age, sex and had attained the equivalent highest level of education. The study found that if people avoided being out of the labour force by managing their OA their income would have increased by roughly \$52,000 for men and \$26,000 for women aged between 45 to 64. There would be an estimated aggregate increase of \$43 million in income per year.

## Government experienced an increase in tax revenue and a reduction in welfare burden

The economic benefits to the Government were estimated as the total increase in income taxes and total reduction in welfare costs. The USET found that an increase in labour force participation because of the OA intervention would lead to an overall estimated increase in taxation revenue of \$11 million each year. This equates to an increase of \$14,000 for men and \$6,000 for women aged 45 to 64. Additionally, the overall reduction in welfare costs would result in a saving of roughly \$13,000 for men and \$14,000 for women aged 45 to 64. This would save the Government a total of \$16 million each year.

## Individuals with osteoarthritis could increase their income with effective treatment



A potential increase of  
1,177 individuals  
(aged 15-64) into the  
labour force would  
increase GDP by  
**\$164 million**

## Osteoarthritis intervention would increase GDP

The USET study estimated the increase in GDP from an increased labour force as a result of OA management with NSAIDs. The impact was determined on a pro-rata basis using published GDP data and the number of people in the workforce aged 15 to 64. The study estimated that in 2015 the additional roughly 1,000 people in the workforce would have increased Australian GDP by approximately \$164 million.

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# KEY POLICY ISSUES

1.

## There is an opportunity to better understand the economic impacts of pharmaceutical interventions

The USET study demonstrates the substantive economic benefits through productivity from one pharmaceutical intervention that addresses one pain condition. The benefits delivered by all interventions would be extensive; however, productivity is generally not measured, captured and reported. There is an opportunity to begin improving health economic analysis by reporting productivity as a key outcome, which would allow meaningful comparisons to be made across health and broader program funding areas that have competing calls on scarce resources.

This study demonstrates the ways in which interested Government agencies could easily implement new assessment methods that seek to measure the macroeconomic benefits of health interventions. The Commonwealth Department of Health has previously released approximately one billion lines of de-identified historical Medicare and Pharmaceutical Benefits Schedule health data dating as far back as 1984 for a random 10% sample of Australians.

The availability and accessibility of linked data collections (not just PBS data) is vital in working towards improvements in the healthcare system. At a population level, data linkage has the potential to provide researchers, agencies and other stakeholders with new insights to better identify emerging trends.

2.

## Improved productivity reporting can provide new insights on the benefits of pharmaceutical treatment

There is a clear need to address current assessment processes so that they include measures of the real value of pharmaceutical interventions to the broader economy. A number of Government agencies have a stake in continuing to build an evidence base that can help measure and quantify the value of medicines and/or health interventions to the broader economy.

Two approaches to help coordinate a more sophisticated data and reporting program are:

- include better productivity measures as part of the Government's reporting and evaluation of health program funding; and
- build on the provision of open-source Government data through the Prime Minister and Cabinet's Digital Transformation Office as part of the Innovation Agenda.<sup>3</sup>

As an outcome the Government and pharmaceutical industry will be equipped with a better understanding of the broad outcomes delivered by health interventions. This information can be used to identify where best to focus investments and resources.

<sup>2</sup> Australian Government 2017, *Federal Budget Submission 2017/18*, Medicines Australia, viewed 19 May 2017, <<https://medicinesaustralia.com.au/wp-content/uploads/sites/52/2010/02/Medicines-Australia-Budget-Submission-2017-18.pdf>>

## About Medicines Australia

At Medicines Australia we represent the discovery-driven pharmaceutical industry in Australia. Our member companies invent, manufacture and supply innovative medicines and vaccines to the Australian community. Those medicines keep Australians out of hospitals, prevent disease and play a pivotal role in ensuring a productive and healthy community. Our membership consists of around 50 companies who are committed to advancing the health outcomes of all Australians.

Our strategic priorities are:

1. to be an industry role model and build unity and strength
2. to achieve a predictable and positive environment for the registration and reimbursement of medicines in Australia
3. to partner with the Australian Government and actively create a favourable environment for investment by the innovative medicines industry
4. to strengthen the reputation of the industry.

We achieve our strategic priorities by forming effective alliances, including engaging with the Parliament, Government and Government departments, other peak bodies in the medicines industry, consumer groups and health professionals to develop health and industry policy.

Guided by the Code of Conduct, we work with healthcare professionals, Government and other stakeholders to ensure the innovative medicines sector maintains a high standard for the ethical marketing and promotion of prescription medicines.

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