USING HEALTH ECONOMICS TO SET RESEARCH PRIORITIES AND INFLUENCE HEALTH POLICY

RESEARCH AUSTRALIA ROUNDTABLE
24TH NOVEMBER 2016

Associate Professor Cathy Mihalopoulos
Deakin Health Economics
School of Health and Social Development
Economics addresses the fundamental issue of:

ALLOCATING SCARCE RESOURCES BETWEEN COMPETING DEMANDS

• Demand for health care services/research is growing rapidly, and exceeds available resources

• How do we maximise “welfare/health gain” with available resources?
  
  – Important question is what do we want from our health services/research so we can decide how to allocate resources?
    
    • Is it better (more valuable) to invest in mental health or elsewhere?

  – Can’t judge value for money until we understand what is meant by “value”
Economists carry out 4 separate but interrelated tasks:

- **Description**
  - Describe – current activities, health status, resource use
    - Current burden of disease and costs

- **Prediction**
  - Predict – future activities, health status, resource use
    - Future burden of disease and costs

- **Explanation**
  - Explain – health status and trends; determine key economic influences
    - Causation can be difficult

- **Evaluation**
  - Evaluate – benefit of an intervention relative to its cost
    - Only task which can answer the question of “value for money”

**Research Prioritisation**

**Health Service/Policy Prioritisation**
INFORMING RESEARCH PRIORITIES

DESCRIPTION & PREDICTION
DESCRIPTION:

BURDEN OF DISEASE STUDIES
Substantial gains in population health

After accounting for population increase and ageing between 2003 and 2011, there was a:

- 10% reduction in total burden
- 15% reduction in fatal burden
- 3.8% reduction in non-fatal burden.

The largest absolute reductions in rates of total burden were for cardiovascular diseases, musculoskeletal conditions and cancer.
Cancer and cardiovascular diseases caused most of the fatal burden

- Cancer (33% males; 36% females) and cardiovascular diseases (23% in both males and females) accounted for the majority of the fatal burden (YLL) in 2011 (Figure 6).

- Other disease groups that contributed substantially to YLL included injuries (17% males; 9% females), neurological conditions (5% males; 8% females), respiratory diseases (5% in both males and females) and infant and congenital conditions (4% males; 5% females).

Figure 6: Proportion (%) of fatal burden (YLL) by disease group and sex, 2011
Five disease groups caused almost three-quarters of the non-fatal burden

- The top two disease groups in 2011—mental and substance use disorders and musculoskeletal conditions—accounted for 46% of the non-fatal burden in males and 47% in females (Figure 5).
- Respiratory diseases, neurological conditions and cardiovascular diseases accounted for the next 24% in males and 26% in females.

Figure 5: Proportion (%) of non-fatal burden (YLD) by disease group and sex, 2011
<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>0–14</th>
<th>15–24</th>
<th>25–44</th>
<th>45–64</th>
<th>65–84</th>
<th>85+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-term/Lbw complications (15.0; 10%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma (10.9; 7.5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth trauma/asphyxia (8.4; 5.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety disorders (7.3; 5.0%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive disorders (8.0; 5.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety disorders (14.0; 11%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive disorders (11.1; 8.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety disorders (6.7; 5.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other disorders of infancy (6.3; 5.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth trauma/asphyxia (8.8; 7.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-term/Lbw complications (8.8; 7.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety disorders (6.7; 5.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other disorders of infancy (6.3; 5.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety disorders (6.6; 5.2%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other musculoskeletal (6.6; 5.2%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bipolar affective disorder (16.8; 4.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: The numbers in parentheses represent the percentage of deaths.*
<table>
<thead>
<tr>
<th>Disease group</th>
<th>Tobacco use</th>
<th>High body mass</th>
<th>Alcohol use</th>
<th>Physical inactivity</th>
<th>High blood pressure</th>
<th>Dietary risks (joint effect)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proportion of total burden</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All diseases</td>
<td>9.0</td>
<td>5.5</td>
<td>5.1</td>
<td>5.0</td>
<td>4.9</td>
<td>7.2</td>
</tr>
<tr>
<td><strong>Proportion of disease group burden</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>22.0</td>
<td>4.5</td>
<td>3.3</td>
<td>6.4</td>
<td>..</td>
<td>7.0</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>12.0</td>
<td>21.0</td>
<td>4.8</td>
<td>21.0</td>
<td>32.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Mental</td>
<td>..</td>
<td>..</td>
<td>12.0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>Injuries</td>
<td>..</td>
<td>..</td>
<td>21.0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>Respiratory</td>
<td>36.0</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>Endocrine</td>
<td>3.5</td>
<td>49.0</td>
<td>2.0</td>
<td>30.0</td>
<td>..</td>
<td>32.7</td>
</tr>
<tr>
<td>Kidney/urinary</td>
<td>..</td>
<td>28.0</td>
<td>..</td>
<td>..</td>
<td>22.0</td>
<td>..</td>
</tr>
</tbody>
</table>
DESCRIPTION:

COST OF ILLNESS STUDIES
The economic cost of serious mental illness and comorbidities in Australia and New Zealand

Economic Report into the Cost of Influenza to the Australian Health System

Report to the Influenza Specialist Group
THE ROLE OF COST-OF-ILLNESS STUDIES

• PREVALENCE VS INCIDENCE BASED COST
  • Prevalence = annual budgetary implications
  • Incidence = where along the disease continuum costs are accruing

• PURPOSES (Rice 1994):
  – Advocacy tool to get more funding
  – Help set funding priorities
  – Underpin intervention programs

• BUT CRITICISED (Roux and Donaldson 2004, Byford et al. 2000):
  – High costs ≠ inefficiency, waste, or more necessary spending
  – Cost savings of preventing a disease sometimes overstated

• Key issue is whether investing in the problem will return benefits “worth” that investment compared to investing in another problem.
PREDICTION

Dementia now a health priority due to predicted increases in health expenditure


GLOBAL COST OF DEMENTIA SET TO REACH US$1 TRILLION BY 2018

Media Release
Tuesday 25 August 2015

Someone in the world develops dementia every 3 seconds

This is just one of the astounding statistics to come out of Alzheimer’s Disease International’s World Alzheimer’s Report 2015 ‘The Global Impact of Dementia: An analysis of prevalence, incidence, cost and trends’, released today in London.

The report found there are currently 46.8 million people living with dementia around the world, with numbers projected to nearly double every 20 years, increasing to 74.7 million by 2030.

The report also indicated that the current annual cost of dementia is US $818 billion, and is expected to become a trillion dollar disease in just three years’ time. This shows that the cost of dementia has increased by 35% since the 2010 World Alzheimer’s Report which estimated US $604 billion.
What are current Australian health research priorities?
Australian Government (ARC) has identified health services and public health research as a national priority

“Build healthy and resilient communities throughout Australia by developing treatments, solutions and preventative strategies to improve physical and mental well-being and improve the **efficiency** and effectiveness of Australia’s health care system. **This priority is focussed mainly on health services and public health research.**”


• NHMRC: Clinical and Medical Research
  • Target Calls for Research (often come from description/prediction studies above)
  • Economic analysis not formally required **(cf NICE)**
# Australian Medical Research and Innovation Priorities 2016-2018

Reference list for investments for Medical Research Future Fund

## Health Services & Systems Priorities:

<table>
<thead>
<tr>
<th>National Institute of Research</th>
<th>In partnership with the states and territories, determine the feasibility of establishing a national institute focused on health services, and public and preventive health research to facilitate evidence-based <strong>and cost-effective</strong> healthcare.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building evidence in primary care</td>
<td>Work alongside the <a href="https://www.health.gov.au">Medicare Benefits Schedule Review Taskforce</a> identify interventions with limited supporting evidence that are amenable to randomised control trial investigations, and engage the existing workforce to build capacity.</td>
</tr>
<tr>
<td><strong>Behavioural economics application</strong></td>
<td>Support development of research in applied behavioural economics that concentrates on public and preventive health, with an emphasis on <strong>early intervention in mental health, healthy eating and physical activity</strong></td>
</tr>
<tr>
<td>Drug effectiveness and repurposing</td>
<td>Invest in post-clinical effectiveness studies of drugs and other health interventions and support pre-clinical proposals that identify <strong>new uses for existing drugs</strong></td>
</tr>
</tbody>
</table>
OTHER RELEVANT MRFF PRIORITIES

• Data and Infrastructure
  • Clinical quality registries
  • National data management study (e.g. my health record) and interagency collaborative research

• MRFF Infrastructure and Evaluation
  • Consumer driven health and medical research agenda
  • A method to guide future MRFF priorities
  • The means to measure and report on economic returns from investments
    • Does not consider uncertainty in evidence base
    • Expected Value of Information is potential framework for such decisions
    • Not currently used
EXPECTED VALUE OF INFORMATION

• Uncertain evidence around effectiveness and cost-effectiveness
• Research should try to reduce uncertainty and increase decision confidence
• May not be “new” research per se but may have high value for our health system
  • E.g. focus maybe should be on translation rather than “new” interventions
• Answers the question of quantifying the value of eliminating uncertainty
• Formal approach for evaluating whether the value of obtaining additional information is higher than the value of actually adopting a health technology
• Comparison of potential benefits of further research compared to potential costs of research
• Can require use of a cost-effectiveness threshold (e.g. $50,000/QALY) and the calculation of whether the expected value of reducing uncertainty in estimating the ICER of an intervention is greater than the costs of the intervention
• Not routinely used as quite technical

https://www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP83_health_benefits_additional_evidence_PCORI.pdf
INFORMING HEALTH SERVICES AND POLICY PRIORITIES

EXPLANATION & EVALUATION
EXPLANATION:

“ECONOMETRIC” STUDIES
EXAMPLES OF ECONOMIC “EXPLANATION” STUDIES

• Behavioural Economics studies (MRFF priority)
  - Individual decision-making under conditions of uncertainty and “bounded rationality”
  - “Nudge” studies now quite popular

• Health Insurance studies (e.g. ARC study at UTS (CHERE) investigating the implications of the Medicare safety net

• Doctor workforce studies (e.g. NHMRC funded Mabel data set at Melb Institute)

• Payment incentive studies
EVALUATION:

VALUE FOR MONEY AND ULTIMATELY ‘EFFICIENCY’
ECONOMIC EVALUATION:

The comparative evaluation of two or more interventions in terms of both costs and outcomes

Is intervention/health service A better value-for-money than B??

Directly informs health policy and practice

Goes to the heart of “efficiency”
Implementation: Ready to step up?
Guest editor: Professor Caroline Finch
ECONOMIC EVALUATION

• ‘Solutions-based’ rather than a ‘problem-focused’ approach
  • Routinely used in some sectors of health policy and provision:
    • PBAC/MSAC notable examples

• No budget constraint
  • Single intervention studies
    • PBAC/MSAC
    • Now commonly included as part of funded trials (NHMRC, ARC plus other funding agencies)
    • Practitioner interest (along with COI studies)

• With fixed budget constraint
  • Priority-setting projects
    • Assessing Cost-effectiveness (ACE) type of Australian projects.
ACE-PREVENTION STUDY

• Five year study funded by NHMRC (completed in Sept 2010)

• 123 illness prevention measures where evaluated to identify those which will prevent the most illness and premature deaths and those that are best value for money.

Policy relevance: salt reduction, traffic light & junk food tax, suicide prevention (picked up by US task force) many more
For example:

• **Outcome measurement**
  • 2015 NHMRC funded Deakin study to investigate econ eval outcome measures children/adolescents with mental disorders

• **Which CE threshold should we use?**

• **Modelling methods**
IN CONCLUSION

• Health Economics has much to offer
  • Both research & health policy prioritisation

• Good growth in health economics research capacity
  • More will be required

• Difficult to evaluate the size of research income dedicated to health economics

• Also difficult to evaluate the lone policy impact of health economic research as only one part of the decision-making process.