

# INCLUDING HEALTH ECONOMICS IN TRANSLATIONAL GRANTS

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*A COLLABORATION OF SYDNEY CATALYST & THE TCRN*

# WHAT IS HEALTH ECONOMICS AND DO I NEED IT IN MY GRANT?

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# THINK OF YOUR NEW INTERVENTION / PROGRAM / SERVICE

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- What will be better as a result of it?
- How much will it cost?
- Is it good value for money?

- These are the questions that hospitals / government and other funders will expect you to answer

# EXAMPLE

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## NSW Health Translational Research Grants Scheme:

- Grants support research projects that will translate into better patient outcomes, improve the delivery of health services and improve population health and wellbeing
- Consideration of sustainability and scalability of the results of the study in the research design and translation plan, including that *the study design will provide evidence to support funding decisions regarding the implementation of positive outcomes*

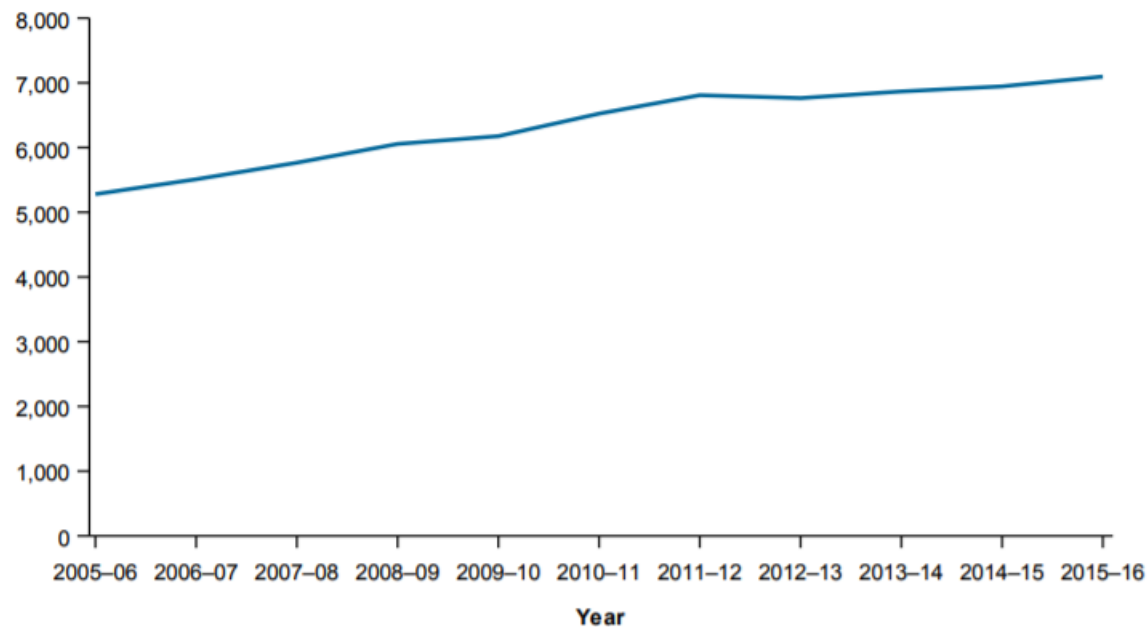
# HOW MUCH DOES AUSTRALIA SPEND ON HEALTHCARE PER YEAR?

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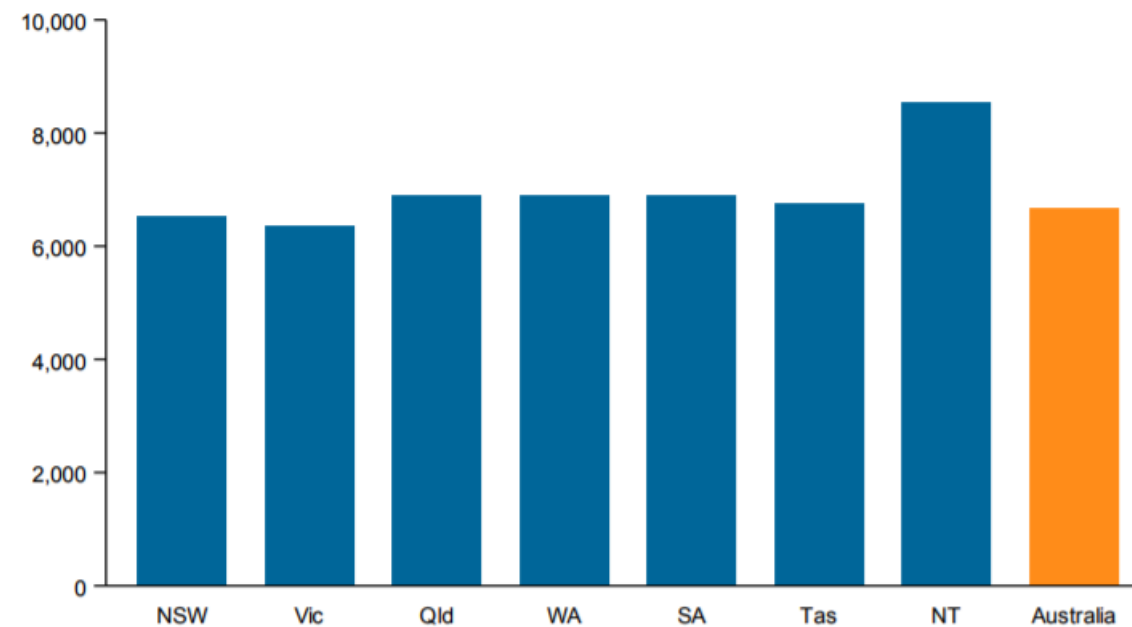
- 90 million
- 1 billion
- 170 billion
- 600 billion
  
- What % of our GDP is this?

# AVERAGE HEALTH EXPENDITURE PER PERSON

\$ per person



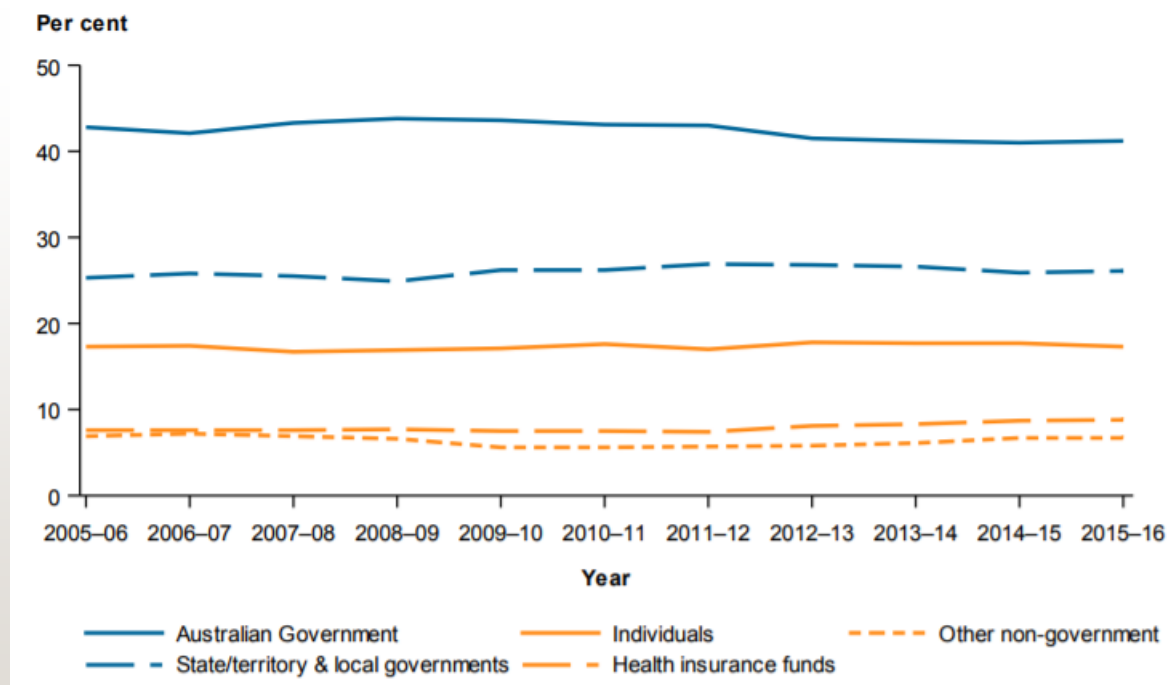
\$ per person



AIHW. Health expenditure Australia 2015-16 #58

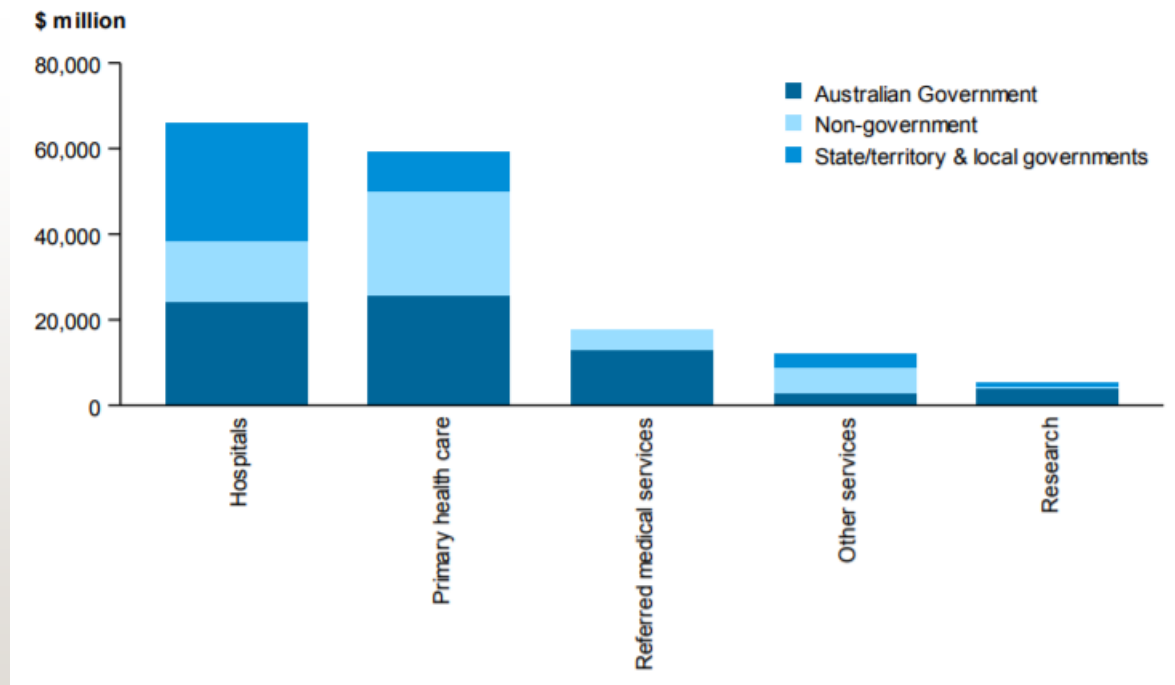


# TOTAL HEALTH EXPENDITURE BY SOURCE OF FUNDS



AIHW. Health expenditure Australia 2015-16 #58

# RECURRENT HEALTH EXPENDITURE BY AREA AND SOURCE OF FUNDS



AIHW. Health expenditure Australia 2015-16 #58



# WHAT IS HEALTH ECONOMICS?

## CONCEPTS AND TERMINOLOGY (I)

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- **Resources** are the basic inputs to production – time, abilities, capital, natural resources
- **Scarcity** means that there are not enough resources to satisfy all demands and needs. It has two sides – the infinite nature of human wants and the finite nature of the resources available

# WHAT IS HEALTH ECONOMICS?

## CONCEPTS AND TERMINOLOGY (2)

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- **Economics** is the study of how individuals and societies choose to allocate scarce resources among competing alternative uses, and how to distribute the products from these resources
- **Health Economics** is the study of how scarce resources are allocated among alternative uses for the care of illness and the promotion, maintenance and improvement of health

# GOVERNMENT HEALTHCARE CHOICES





# COST OF ILLNESS STUDIES

Deloitte Access Economics

## The shifting burden of cardiovascular disease in Australia



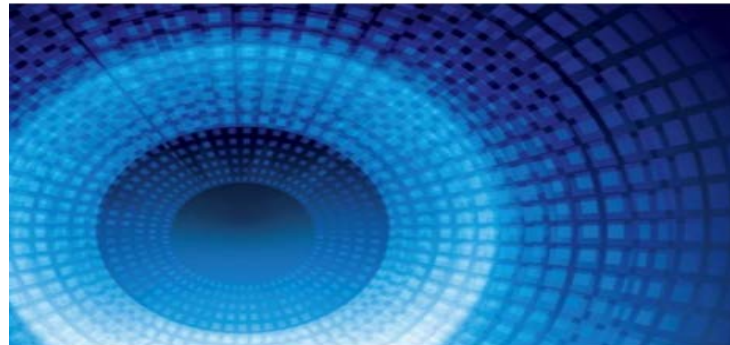
Report by Access Economics Pty Limited 2005

Deloitte Access Economics

## The economic impact of diabetic macular oedema in Australia

Bayer Australia Ltd

APRIL 2015



## The economic impact of stroke in Australia

National Stroke Foundation

13 March 2013



# COST OF ILLNESS STUDIES

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- Focus on size of the problem
- No information about interventions
  - Incremental outcomes and cost
- Often used for advocacy / grant applications
- Helpful for decision making?

# ECONOMIC EVALUATION

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- **Premise**: scarce (health care) resources
- **Aim**: to maximise health gain with the available resources
- **Method**: compare costs and outcomes of interventions
- **Definition**: “The comparative analysis of alternative courses of action in terms of both their costs and their consequences” (Drummond *et al*, 2005)
- Explicit way for making choices



# COMPARATOR

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- All economic evaluations are comparative
  - May include multiple comparators
- Vital to choose appropriate comparator(s) for study question
- Appropriate comparator(s) comprise the treatment(s)/ services that are most likely to be replaced by the therapy you are evaluating

# TYPES OF ECONOMIC EVALUATION

	<b>Outcome</b>
<b>Cost-minimisation</b>	Equal effectiveness and safety of interventions
<b>Cost-effectiveness</b>	Natural units (e.g. life years, cases detected)
<b>Cost-utility</b>	Quality Adjusted Life Years (longevity and quality of life)
<b>Cost-benefit</b>	Monetary valuation of outcomes

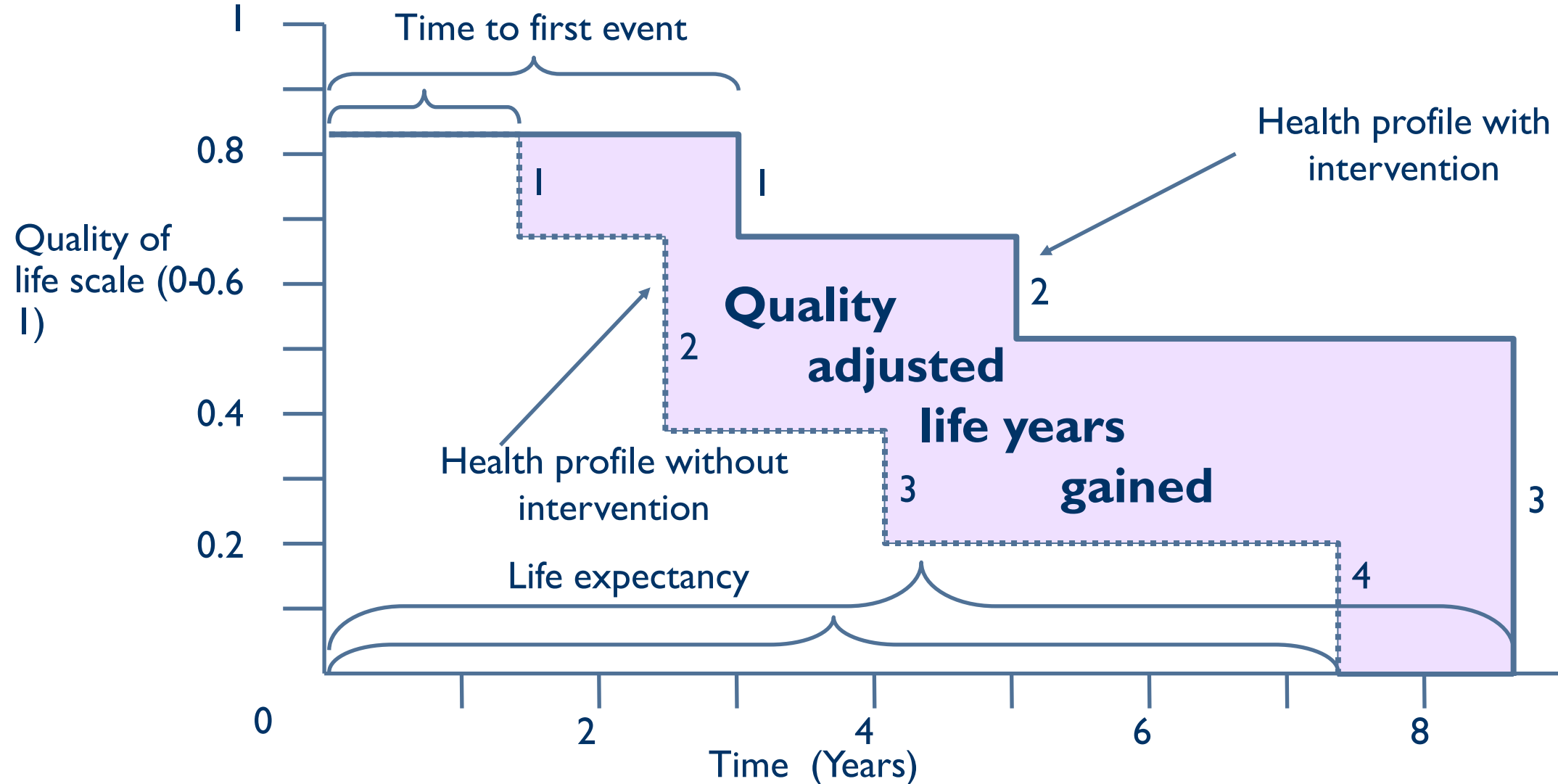
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# Measuring Health Outcomes

# OUTCOMES

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- **Natural units**
    - cases detected (breast cancer screening);
    - cases prevented (cholesterol level lowering drugs);
    - symptom-free days (asthma treatment);
    - life years gained (LYG)
  - **Quality Adjusted Life Year (QALY)**
    - considers impact on length and quality of life
    - comparable across interventions

# USING QALYS TO MEASURE HEALTH GAIN



# Measuring Costs



# WHICH COSTS SHOULD BE CONSIDERED?

- 
- **Economic (opportunity) cost is different from accounting cost**
  - **Opportunity cost:** The potential benefits which are sacrificed when resources are committed to one purpose rather than another
    - So the opportunity cost of investing in a healthcare intervention is the health benefit that could have been achieved had the money been spent on the next best alternative intervention
    - *Example: Informal carers*
  - **Perspective**

Affects what costs are included

    - Cost to the individual
    - Cost to the health provider
    - Cost to the government
    - Cost to society

# THE IMPORTANCE OF PERSPECTIVE (EXAMPLE)

	New Vaccination	Old Vaccination	Net cost of new vaccination versus old vaccination
Vaccine and Administration	8	5	3
Disease Management Costs	4	7	-3
Total Costs – Healthcare Perspective	12	12	-
Lost Productivity Costs	4	13	-9
Other Indirect Costs	-	1	-1
Total Costs – Societal Perspective	16	26	-10

(Can\$ million, 1997) (All costs are rounded to the nearest Can\$1,000,000)

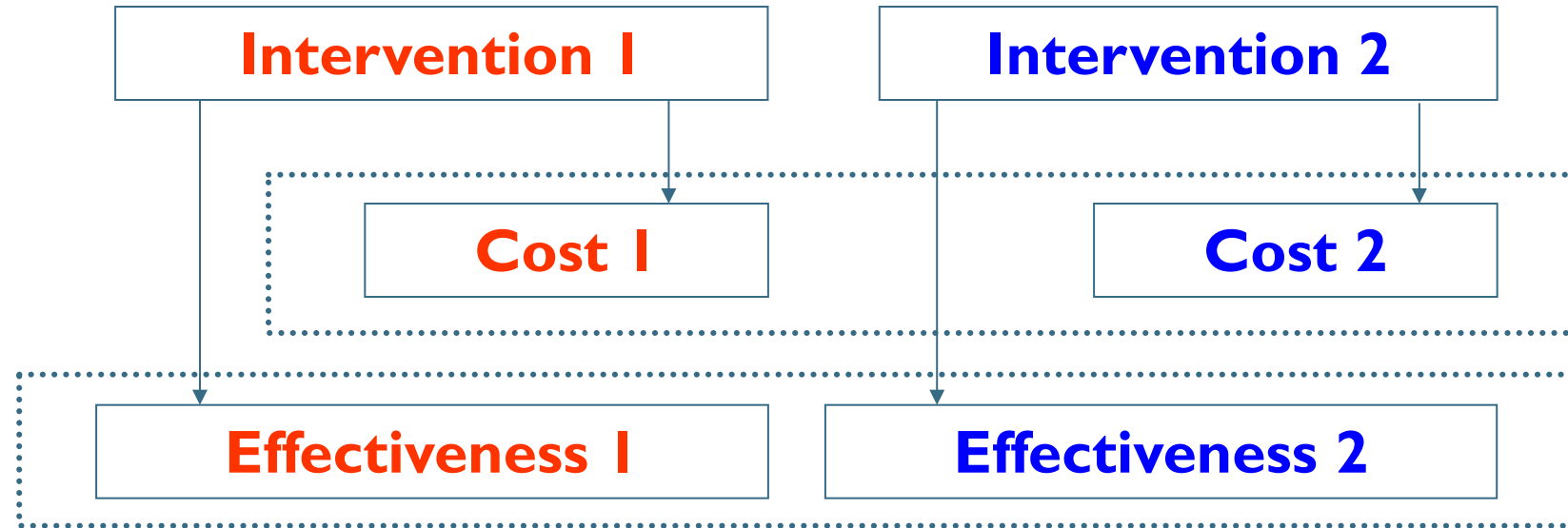
Source: Iskudjian M, et al. Economic Evaluation of a New Acellular Vaccine for Pertussis in Canada. (Pharmacoeconomics 2001; 19(5 Pt 2):551-63)

# ELEMENTS OF COST

- **Resource use** (cost generating event)
  - A day in hospital / hospital stay, a GP consultation / consultation with a specialist, admission to long term care
  - Available from case report forms in clinical trials, hospital records, patient questionnaires
- **Unit cost**
  - Cost per in-patient day / per hospitalisation, cost per GP consultation / per GP minute / per consultation with a specialist, cost per month / year in a long term care facility
  - Available from individual hospitals, AR-DRGs, NWAUs, National Efficient Price, Pharmaceutical Benefits Scheme for drugs, MBS items
- **Total cost** is the sum of the product of each quantity of resource and its unit cost

# Combining Cost and Outcome Data

# COST-EFFECTIVENESS FRAMEWORK

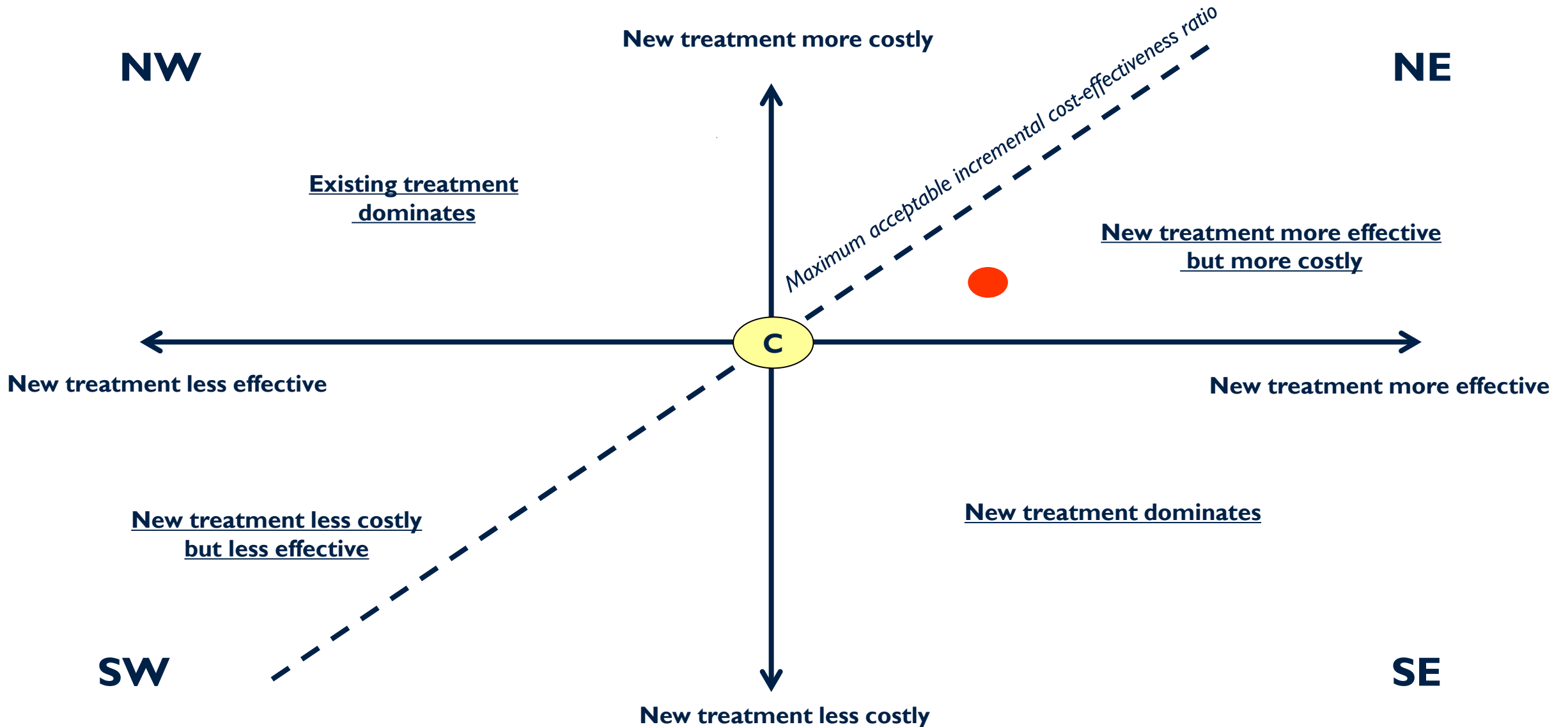


**Incremental cost-effectiveness ratio  
(ICER) =**

**Cost 1 - Cost 2**

**Effect 1 - Effect 2**

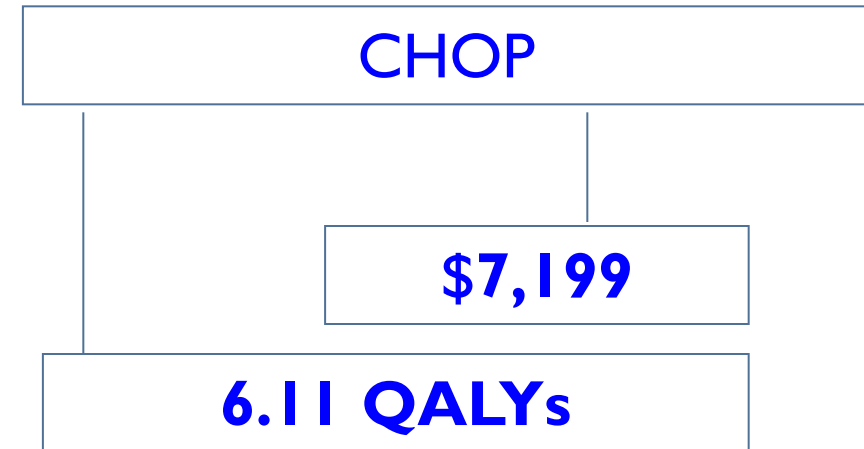
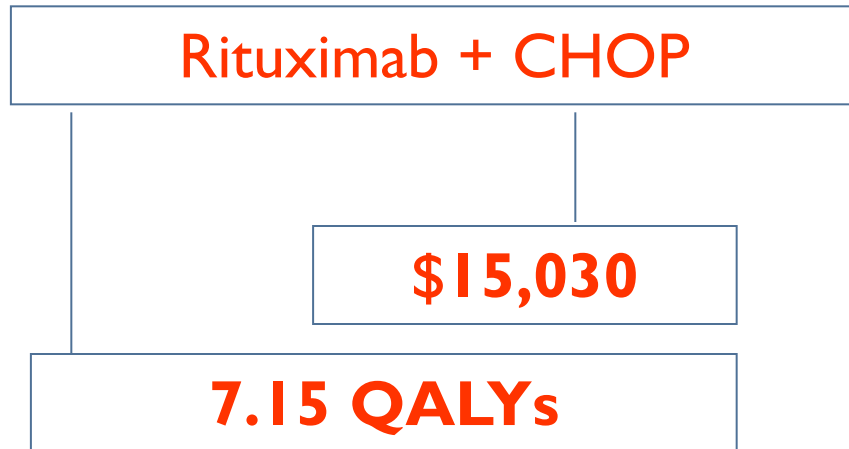
# THE COST-EFFECTIVENESS PLANE





# INCREMENTAL COSTS AND OUTCOMES

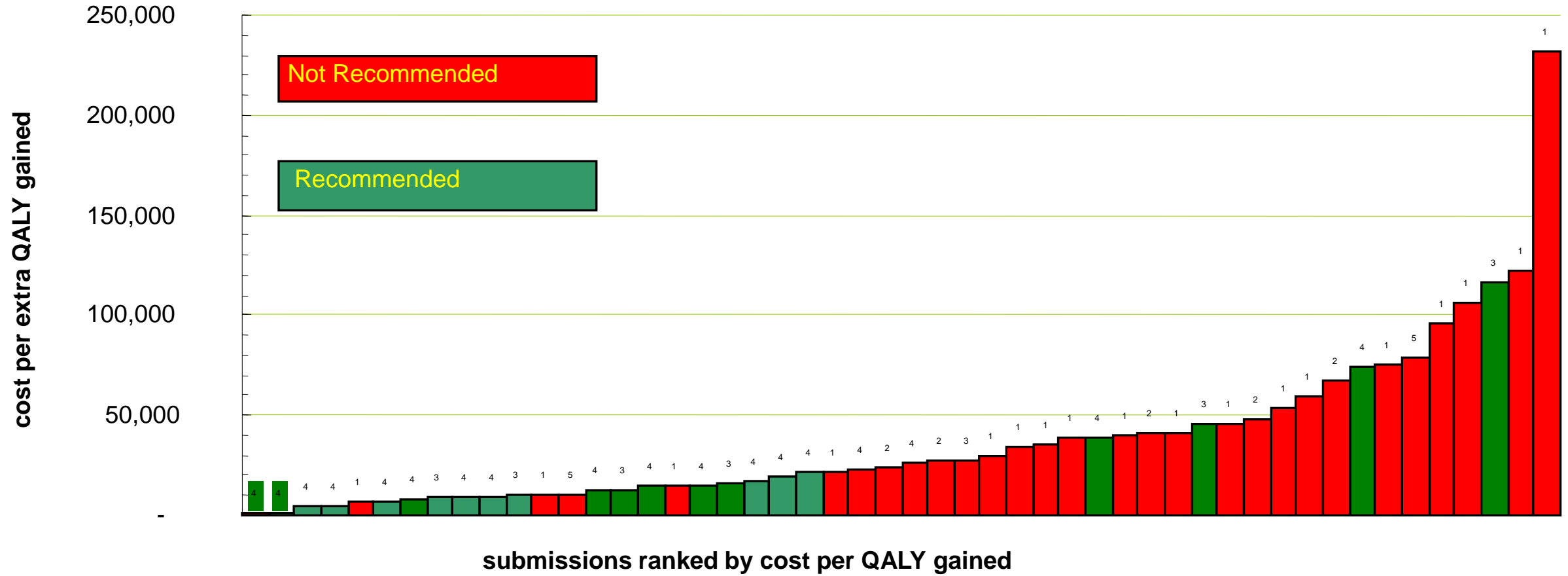
- NICE Technology Appraisal no.65: Rituximab for aggressive non-Hodgkin's lymphoma ([www.nice.org.uk](http://www.nice.org.uk))



$$\frac{\$15,030 - \$7,199}{7.15 \text{ QALY} - 6.11 \text{ QALY}} = \$7,529 \text{ per QALY}$$

What additional effectiveness is considered to be worth the additional cost?

Recommendation of the PBAC Oct 1992 to Dec 2000  
based on cost per QALY gained



# WILLINGNESS-TO-PAY THRESHOLDS

- AUS \$30,000-70,000 per QALY dependent on level of certainty<sup>1</sup>
- UK £20,000-30,000 per QALY<sup>2</sup>
- Netherlands €80,000 per QALY<sup>3</sup>
- US \$50,000-100,000 per QALY<sup>4</sup>
- Canada \$20,000-\$100,000 per QALY<sup>5</sup>
- Low-middle income countries:
  - Highly cost-effective (<GDP per capita)
  - Cost-effective (1-3 xGDP per capita)
  - Not cost-effective (>3 xGDP per capita)<sup>6</sup>

<sup>1</sup>Department of Health 2008. Access to Medicines working Group – Attachment B, Canberra;

<sup>2</sup>N.I.C.E. 2010. Measuring effectiveness and cost-effectiveness: the QALY;

<sup>3</sup>The Council for Public Health and Healthcare, 2006

<sup>4</sup>Grosse SD, 2008. *Expert Rev Pharmacoecon Outcomes Res.* 8(2):165-78;

<sup>5</sup>Laupacis A et al. 1992. *CMAJ.* 146(4):473-81;

<sup>6</sup>WHO-CHOICE cost-effectiveness thresholds 2005

# EXAMPLE: HEALTHY BEGINNINGS TRIAL



Healthy Beginnings Program is **a staged, home-based** early intervention in the **first two years**, delivered by early childhood nurses and designed to **improve family and behavioural risk factors** for childhood obesity.

*The project has been carried out in some of the most socially and economically disadvantaged areas of Sydney, where the risk of obesity is greater than in areas of higher socioeconomic status.*

# HEALTHY BEGINNINGS TRIAL

- **Question:** Is a home based intervention cost-effective on children's BMI at 3 years after intervention?
- **Sample:** 369 children followed up until 5 years of age
- **Intervention:** 8 home visits by nurses, age appropriate education, advice on feeding, nutrition and activity
- **Perspective:** Health care funder
- **Outcome:** Children's BMI and BMI z scores
- **Resources/costs:** cost of the intervention (staff time, vehicle costs, training, materials and equipment); health care utilisation costs



# EXAMPLE: RESULTS

	Home based program	Usual care
Costs: (average cost person)	\$4105	\$2672
Outcome: Unit of BMI	15.84	16.17

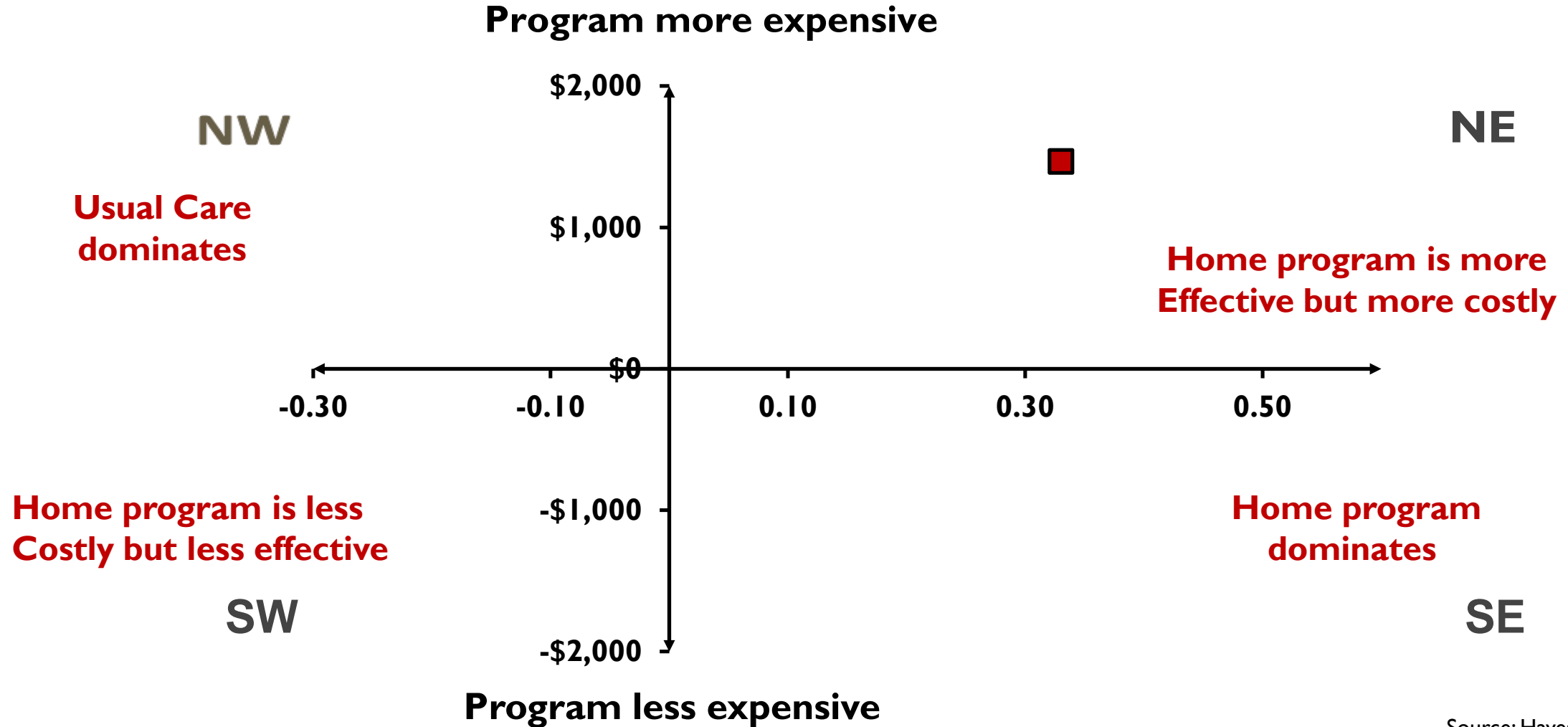
Source: Hayes et al

# COST-EFFECTIVENESS CALCULATION

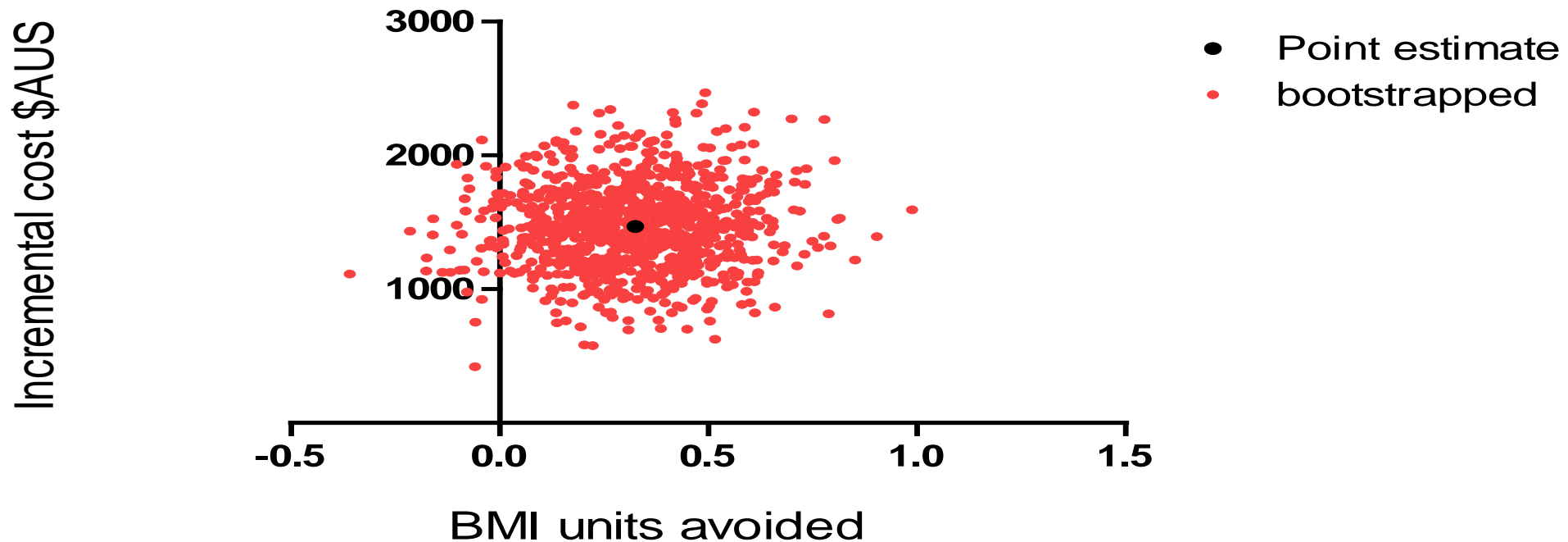
$$\begin{aligned}\text{ICER} &= \frac{\text{Cost Intervention} - \text{Cost Usual care}}{\text{Effects Intervention} - \text{Effect Usual care}} \\ &= \frac{\$4105 - \$2672}{15.84 - 16.17} \\ &= \$4230 \text{ per unit of BMI increase avoided}\end{aligned}$$

Source: Hayes et al

# COST-EFFECTIVENESS



# COST-EFFECTIVENESS

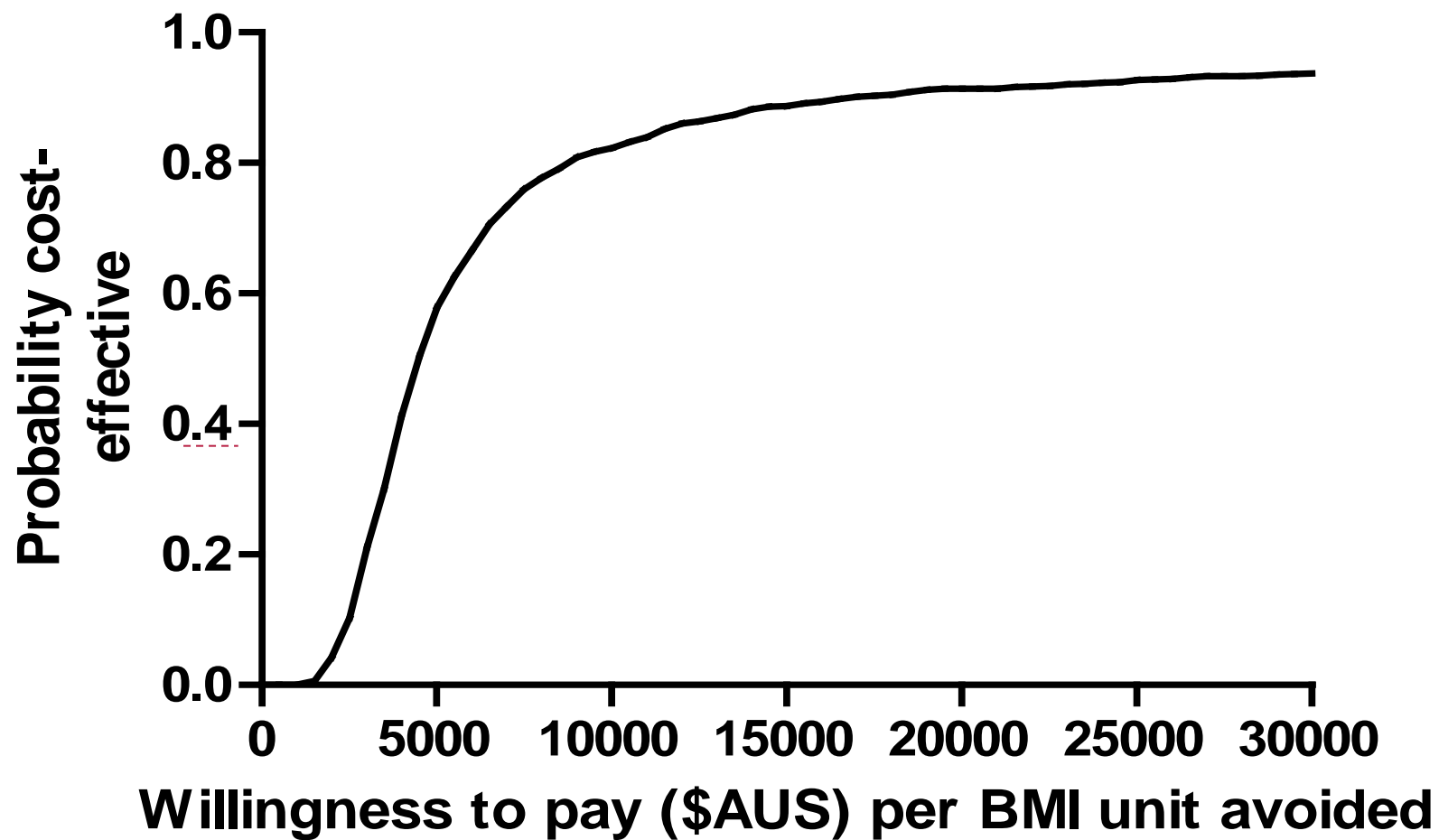


$\Delta \text{ cost} = \$1466 (865, 2112)$

$\Delta \text{ effect} = 0.33 \text{ BMI units} (-0.04, 0.66)$

ICER = \$AUS 4230 per BMI unit avoided

## CEA curve



# OVERALL CONCLUSIONS

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- The availability of health interventions exceeds our ability to afford them
- We need decision rules to guide us towards choices that are likely to give the most health benefit for the population
- Economic evaluation offers one decision framework.... but not the only criterion (i.e. affordability, only treatment, effectiveness, non-health benefits, equity, social justice, patient choice, policy imperative etc.)
- Incorporate economic evaluation into your grant where relevant

# SOME REFERENCES

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# QUESTIONS

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