

# How should we allocate the budget: Efficiency or fairness first

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# SUMMARY

## Objective of economics

Best allocation of finite resources

BUT methods have mixed success

- Simple competitive markets ✓✓
- Social infrastructure - ??

- Economic evaluation
  - ← Unsupported assumptions *wrt* values, motivations
- Empirical evidence
  - Need for revision of theory/practice
  - Fairness first paradigm
    - ie theory, methods commence with fairness

# CONTENT

1. Economic evaluation
2. Failed theory
3. Empirical evidence: personal values
4. Empirical evidence: social values
5. Fairness vs Efficiency paradigms



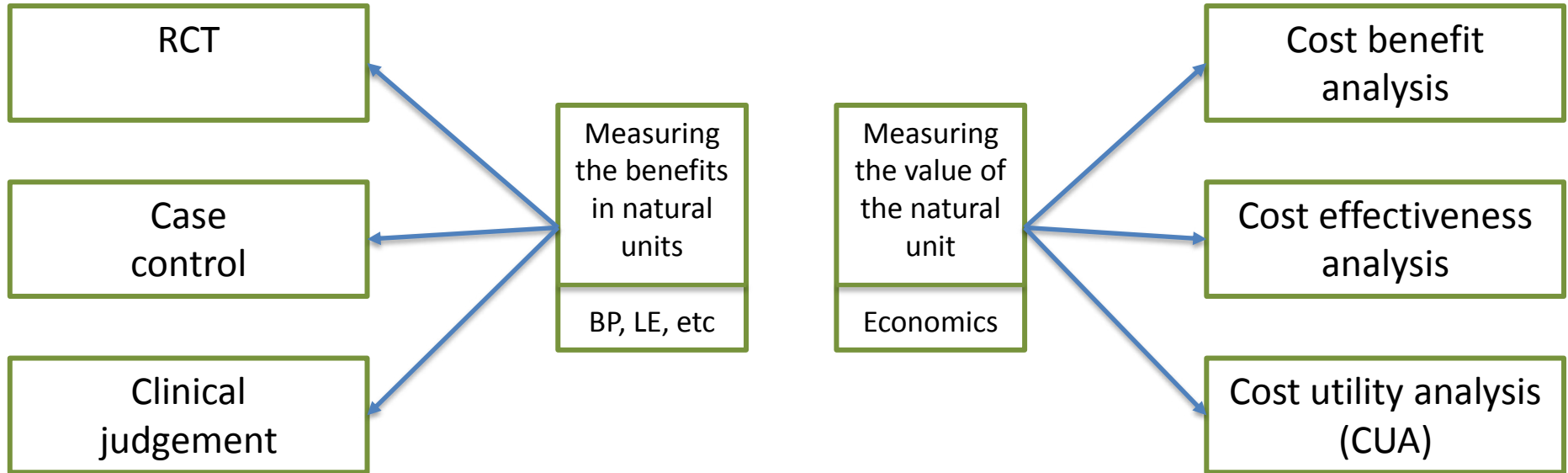
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# 1. OVERVIEW OF ECONOMIC EVALUATION

# THE EVALUATION FRAMEWORK



# COST UTILITY ANALYSIS

- $QALY = (\text{life years}) * (\text{utility}) = \text{unit of output}$   
= Quality Adjusted Life Year  
‘utility’ = strength of preference
- Decision criteria  
minimise cost/QALY  
→ maximum QALYs from a budget

# FOCUS OF COST UTILITY ANALYSIS

- An 'equity efficiency' trade-off is recognised

*BUT*

- 'Efficiency': Methods well developed → maximise QALYs
- Fairness: No methods developed, commonly ignored
- Conclude
  - CUA = 'efficiency first paradigm'





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## 2. WHERE ECONOMIC EVALUATION FAILS

# PROBLEMATIC THEORY AND IMPLEMENTATION

- Implementation – imperfect methods
  - eg Measuring utility: seriously defective (EQ-5D)
  - Theory = ‘foundations’ of evaluation methods
    - ← problematic assumptions = focus below  
(bad theory → measurement  
irrelevant/ambiguous use)

# ASSUMPTIONS of CUA

1. Personal motivation ... maximise utility
2. Social motivation (what we want for others)  
... Maximum QALYs (ie LY weighted utility)

## Result

← Social = personal goal scaled up

# PROBLEM 1 INDIVIDUAL MOTIVATION

- Is maximising utility the only motivation?
  - Habit/duty/religion/conformity/marketing ??

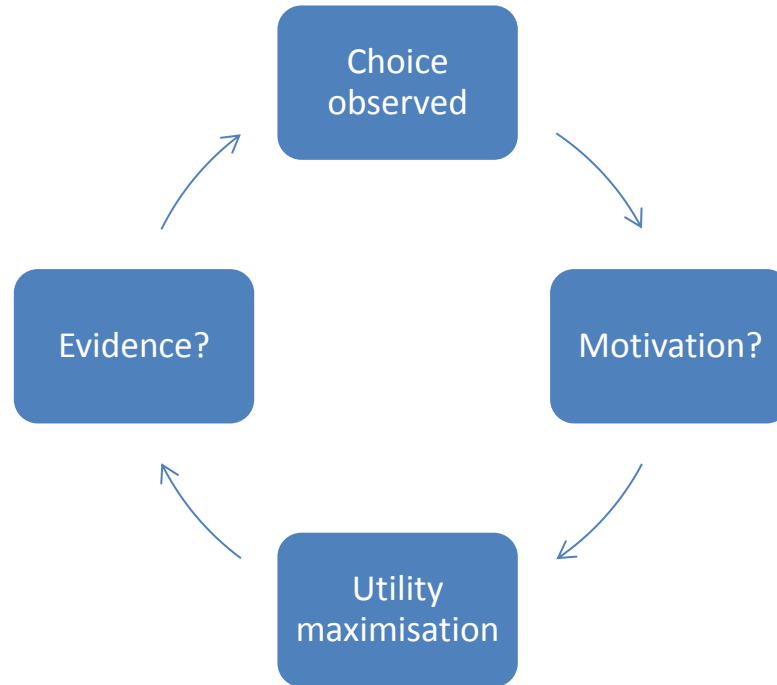
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- **‘Solution’**: the revealed preference criterion
  - If choose  $x$  then, by definition, you prefer  $x$  to alternatives
  - Choice identifies utility

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  - Choice identifies utility
- **Criterion behaviourally barren**

# THE REVEALED PREFERENCE TAUTOLOGY



# CONCLUDE

- CUA ~~←~~ empirical evidence of individual motivation
- Motivation ← behaviourally barren tautology
- Behavioural economics = a response

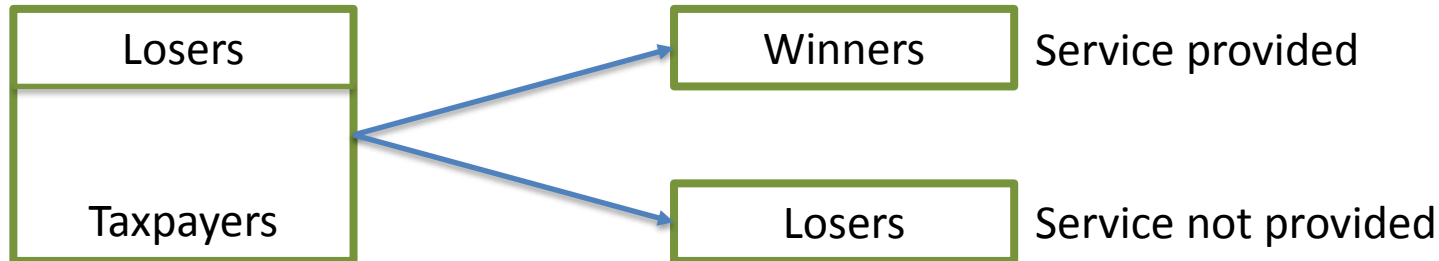


## PROBLEM 2 SOCIAL PREFERENCES

- Do people want maximum QALYs
  - Maximisation ignores distribution
    - 4 people:  $(5+5+5+0) > (3+3+3+3)$   
15 QALYs > 12 QALYs

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    - 4 people:  $(5+5+5+0) > (3+3+3+3)$
    - 15 QALYs > 12 QALYs
  - CUA → winners/losers



# JUSTIFICATION FOR NON-PROVISION TO LOSERS

- Rhetorical: more QALYs (health) better than less losers ... lose!
- Ethical ... utilitarianism: an assumed goal
- Evidence of population support ... na

## 3. EMPIRICAL EVIDENCE: VALUES

# SURVEY EVIDENCE FROM AUSTRALIA n=455

## Which ethical principle

- Australians are not hedonic utilitarians

‘Action producing happiness is always right’

agree 22.8%

disagree 57.4%

‘Maximising happiness is more important than any other principle’

agree 14.3%

disagree 65.9%

# SURVEY EVIDENCE FROM AUSTRALIA n=455

- There is a strong commitment to 'duty', 'role in community' (solidarity/communitarianism)

'I must fulfil duties even if it makes me less happy'

agree 92.0%

disagree 8.0%

'Having duties is a natural part of being a member of society'

agree 95.0%

disagree 5.0%

# DUTY = LONG RUN SELF INTEREST ??

‘People help others only because they gain something personally’

agree	18.2%
disagree	60.7%

# CONCLUDE

- Personal motivation  
    ≠ pure self interest
- Social motivation therefore:  
    unlikely to be the sum of individual self-interest
- Task: what personal motivations are relevant to social decisions



# EVIDENCE FROM ANTHROPOLOGY

## Behaviour ← social role/social inter-relations

- Social behaviour
  - Motivation
    - Reciprocal altruism ('weak reciprocity')
      - Help others expect reciprocal treatment
    - Strong reciprocity
      - Punish others for selfishness in absence of self interest

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  - Evidence: Behavioural economics
    - Ultimatum game: Personal loss to punish unfair behaviour
    - Dictator game: Share with others at personal loss; no possible penalty

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  - 'Sharing is a core feature of human society' (Kameda 2002)



## 4. EMPIRICAL EVIDENCE

Allocating the budget: Results from 4 surveys

# SIMILAR METHODS

- Web based allocation exercises
- Fixed budget:  
    allocate between  low cost QALY ... CUA includes  
    higher cost QALY ... CUA excludes
- Budget rises, sharing possible

# Sharing Survey 1

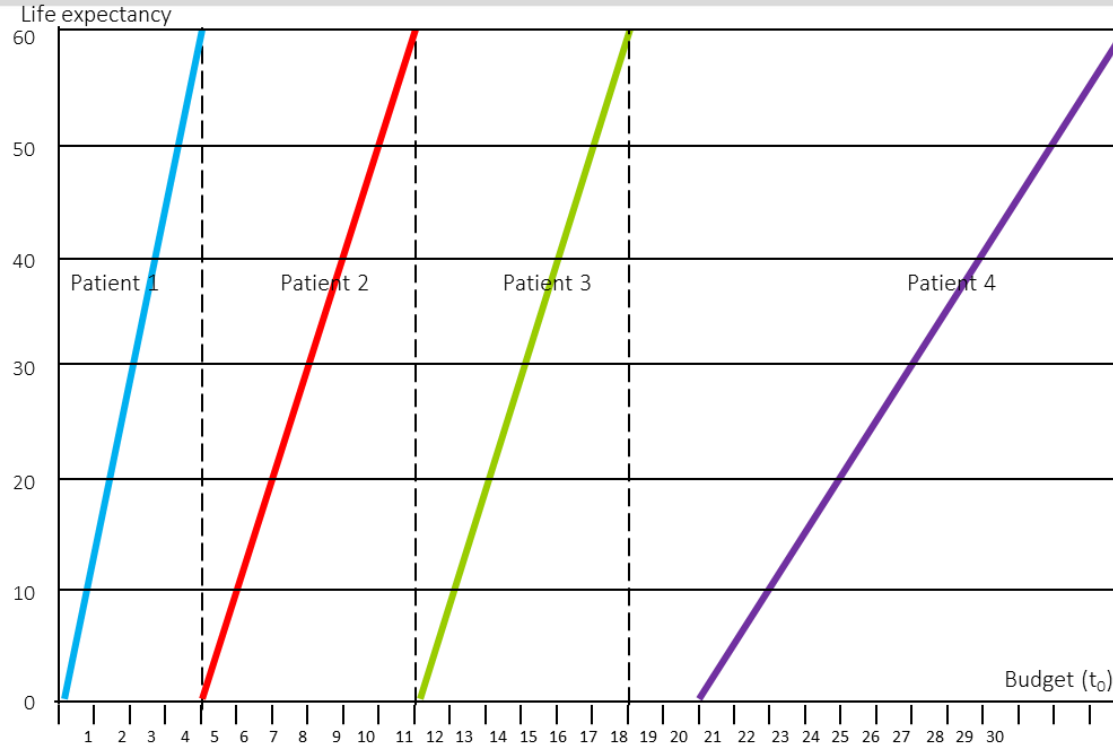
Maximising health versus sharing: measuring preferences for the allocation of the health budget

Richardson J, Sinha K, Iezzi A, Maxwell A  
*Social Science and Medicine* 2012 75(8):1351-1361

# WEB BASED ALLOCATION EXERCISE (n=532)

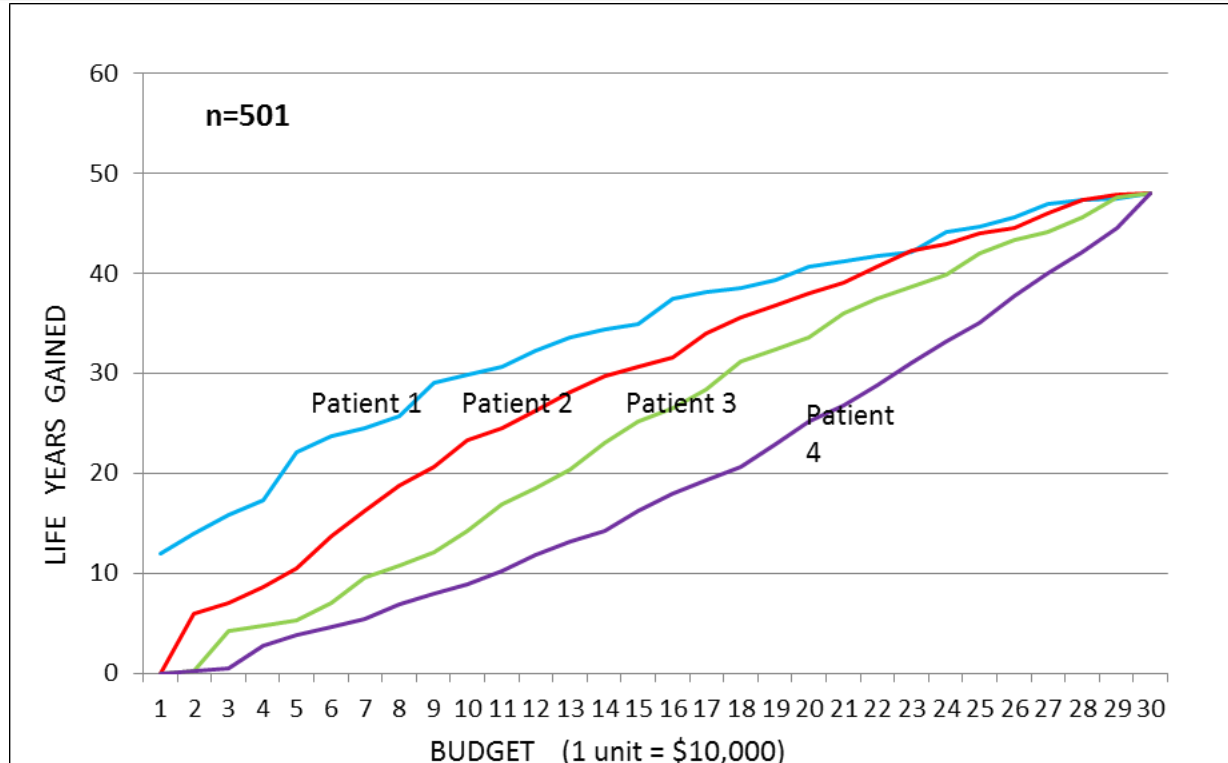
Patient 1	<b>12 yrs</b>	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs	12 yrs
Patient 2	<b>8 yrs</b>	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs	8 yrs
Patient 3	<b>6 yrs</b>	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs
Patient 4	<b>4 yrs</b>	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs

# CEA AND LIFE YEARS ALLOCATED





# SURVEY RESULT



# CONCLUSION, SHARING SURVEY 1

- Cost is relevant  
*But*
- Sharing with most costly treatment immediate

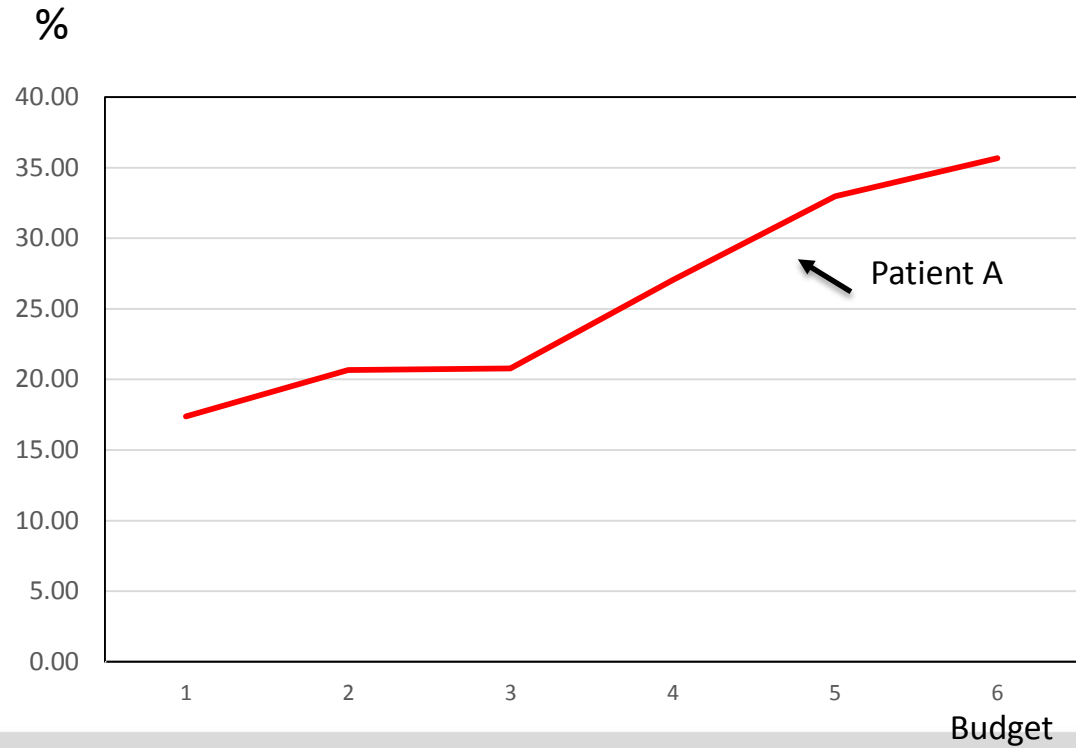
# SHARING 2 LIFE EXTENSION

Sharing and the provision of “cost ineffective” life extending services to less severely ill patients

Richardson, Iezzi, Maxwell *Value in Health* 2018 (in press)

	A	B
Life Expectancy	10	2
Cost/LY	2,000	1,000
Budget = progressively increases		
n= 430		

% LY to A  
(LE longer  
cost/QALY higher)



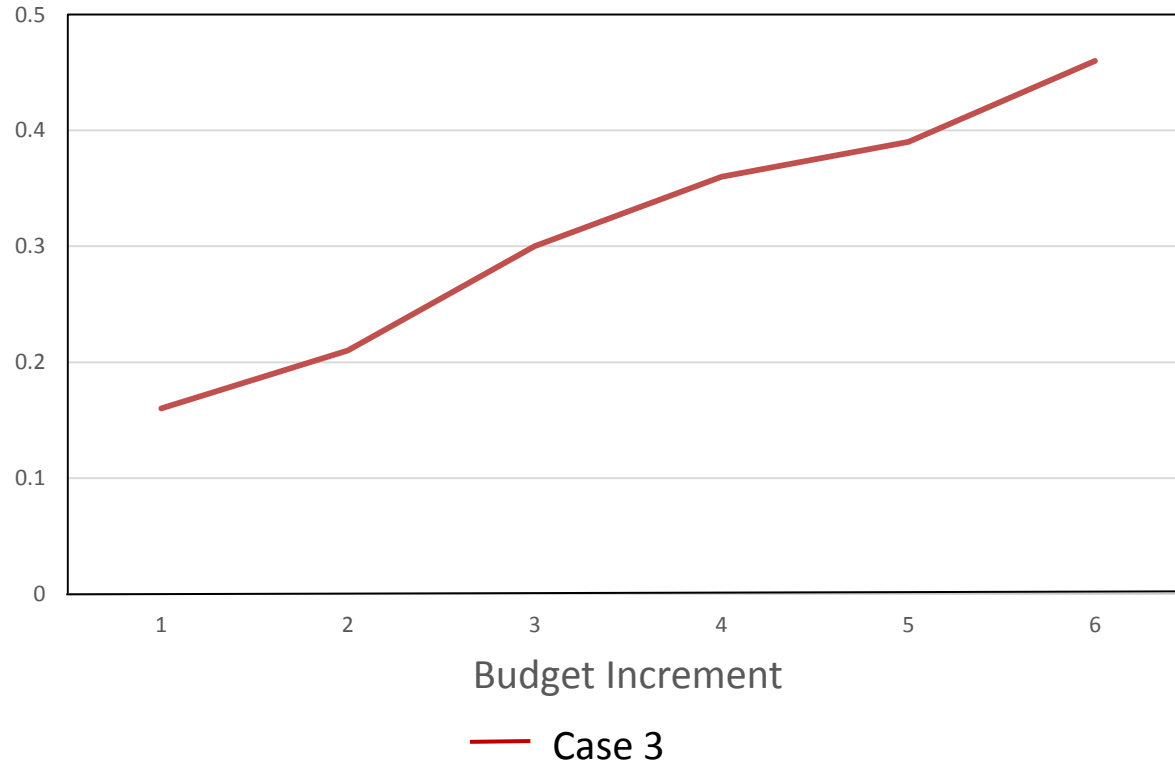
## SHARING 3 QoL

Sharing in a communal health scheme when services improving the quality of life are not cost effective and patients are not severely ill

Richardson, Iezzi, Maxwell  
*Medical Decision Making* 2018 (under review)

# SHARING QUALITY (n=203)

% share of  
Budget to  
Patient A:  
 $\text{cost}/\text{QoL}=3 \times \text{B}$   
QoL 50 vs 30



# SHARING SURVEY 4: Orphan Products

Sharing in a communal health scheme when services improving the quality of life are not cost effective and patients are not severely ill:

Results of a population survey

Richardson, Iezzi, Maxwell

*PharmacoEconomics* 2017; online 2016



# SURVEY (n=432)

- Allocate a budget
  - Illness A: 5 patients (no treatment – die; budget  $\uparrow \rightarrow$  QoL  $\uparrow$ )
  - Illness B: many patients (budget  $\uparrow \rightarrow$  QoL  $\uparrow$ )
- Cost varied:  $\uparrow$  QoL A = 20, 15, 10, 5, 2 x Cost  $\uparrow$  QoL B
- Size Group B varied: n = 100, 300, 600

# TRADE-OFF

- Budget to A → less for B
- Small benefit/\$ vs large benefit \$
- Small total benefit vs large total benefit

# TRADE-OFF

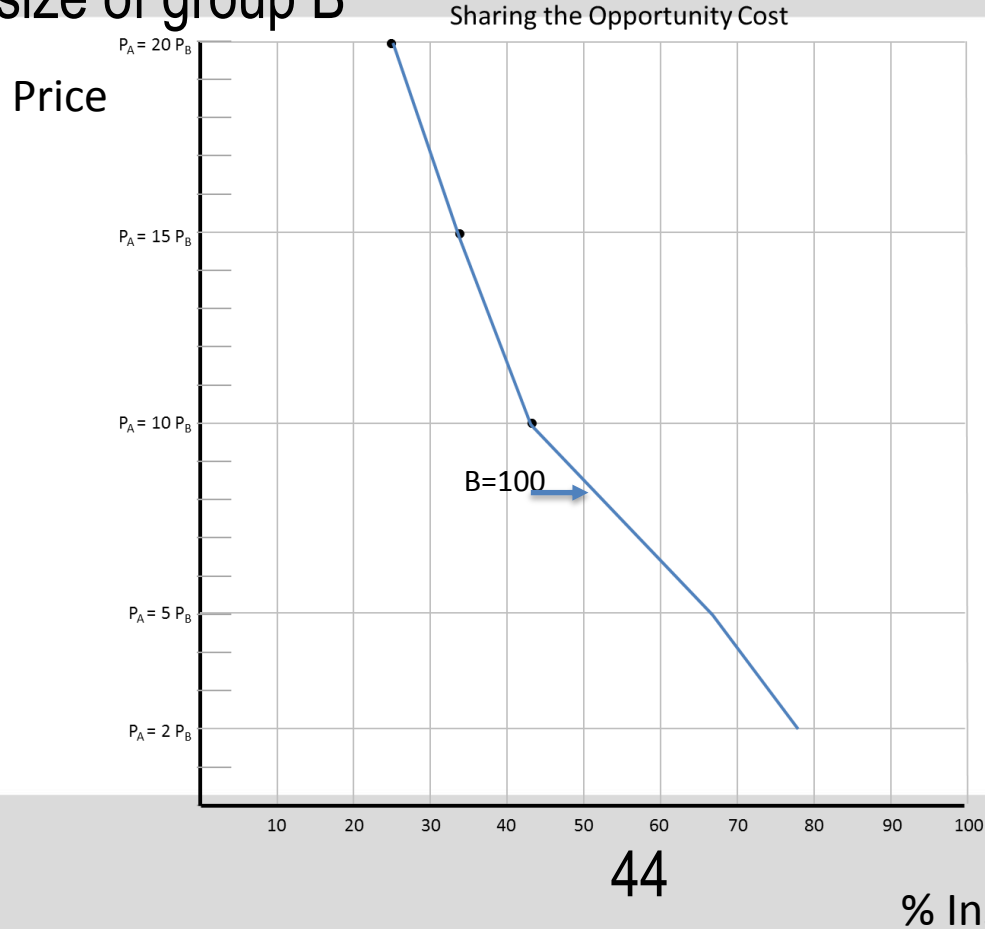
- Budget to A → less for B
- Small benefit/\$ vs large benefit \$
- Small total benefit vs large total benefit

## Sailor at Sea Hypothesis

- Small numbers in group A → low loss/person B
- Urgent benefit A vs non urgent effect B
- Hypotheses
  - Immediate sharing (CUA → no budget for A)
    - Number of B ↑ → loss/person B ↓
    - sharing ↑
    - Cost A ↑ → sharing ↓

# ALLOCATION TO HIGH COST PATIENT (B)

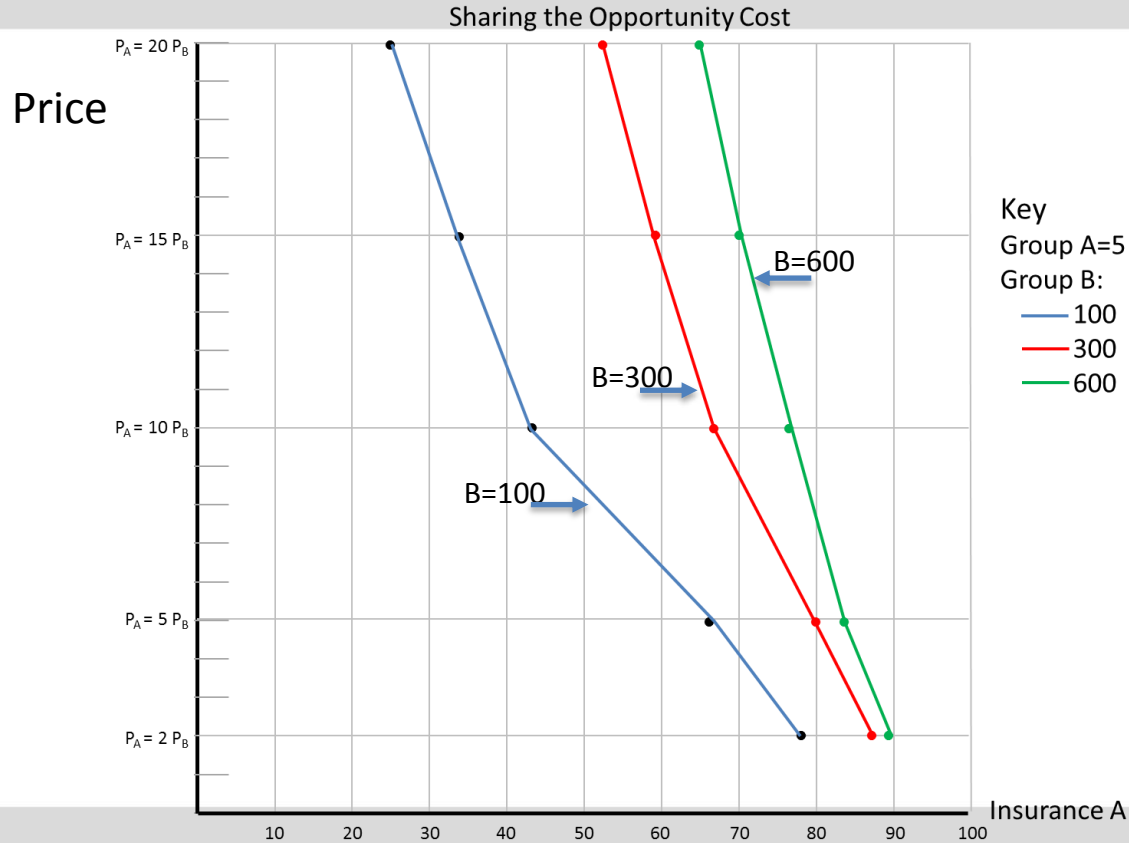
## Price and size of group B



Group A=5

Group B: \_\_\_\_\_100

# INSURANCE A BY PRICE A AND SIZE OF GROUP B



# CONCLUSION SHARING STUDIES

- Sharing allows
  - Partial treatment of high cost/QALY services
  - In exchange for small loss for less severe patients
- Rationing ← intensity of care  
✗ exclusion of individuals

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- Sharing allows
  - Partial treatment of high cost/QALY services
  - In exchange for small loss for less severe patients
- Rationing ← intensity of care  
    ↔ exclusion of individuals
- **Implication**
  - Evaluation theory/methods need revision



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## 5. FAIRNESS vs EFFICIENCY PARADIGMS



# REASONS FOR CHANGE

1. Motivation as a citizen in a social context  
≠ motivation as an individual (Aristotle)

Individual, utility maximisation

- a) An inadequate explanation of behaviour
- b) (Wrongly) extrapolated to social context

2. Utilitarianism: excludes individuals  
rejected by public  
never empirically supported

# REASONS FOR CHANGE FROM ECONOMIC THEORY (Cont)

## 3. Exclusion of patients

- Violates medical practice
- Violates social preferences

## 4. Community support

- Sharing
- Other fairness variables in literature

# TWO PARADIGMS

- Extra Welfarism (Present theory)
  - Focus: Services (← simple theory of a market)
  - Objective: Maximise efficiency of service mix
  - Rationing: Exclude services
  
- Communitarianism
  - Focus: Patients
  - Objective: Universal entitlement
  - Rationing: Intensity of care

# TWO PARADIGMS

Attribute	Present (Extra Welfarism)	Communitarianism
Analytical Focus	Maximisation	Optimisation (Fairness)
Social objective	Max utility	Fair sharing
Criterion for funding	Cost/QALY < threshold, T	Presumed entitlement
*Exclusions	Yes Cost/QALY >T	No (except extreme cases)
*Caveat	Ad hoc adjustment for undefined equity	Systematic adjustment for cost effectiveness
Funding formula	If criterion met, then 100% funding	Level of treatment varies =f[ <i>fairness variables, cost, effectiveness</i> ]
*Role of cost	Pivotal: max benefit ← min cost/QALY	Secondary: alters allocation, ie the intensity of care
Ethical basis	Utilitarianism	Communitarianism satisfaction of community preferences

# CHALLENGES (HOPEFULLY) FOR FUTURE RESEARCH

- Agreement/quantification of fairness
- A budget allocation rule?
- Who makes decisions?

- Utilitarianism ... historical not empirical  
numerous alternatives exist
- Deontological ethics (duty etc)  
... population support
- Communitarian ethics  
... population support  
... the Golden Rule (Christianity)  
(reciprocal altruism)

# FINAL COMMENT

Could economists be fundamentally wrong for so long?

YES Evaluation theory  $\Rightarrow$  empirical error learning

Wrong allocation formula

$\Rightarrow$  stock exchange crash

$\Rightarrow$  bridge collapse

$\rightarrow$  contradictory observations

- Epistemology The 'method a priori': legacy of philosophical rationalism
- Alternative: 'Empirical Ethics'
  - investigate population values
  - *s.t.* ethical critique
- Ultimate arbiter: (laundered) social values



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*Thank You*





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*Vielen Dank*