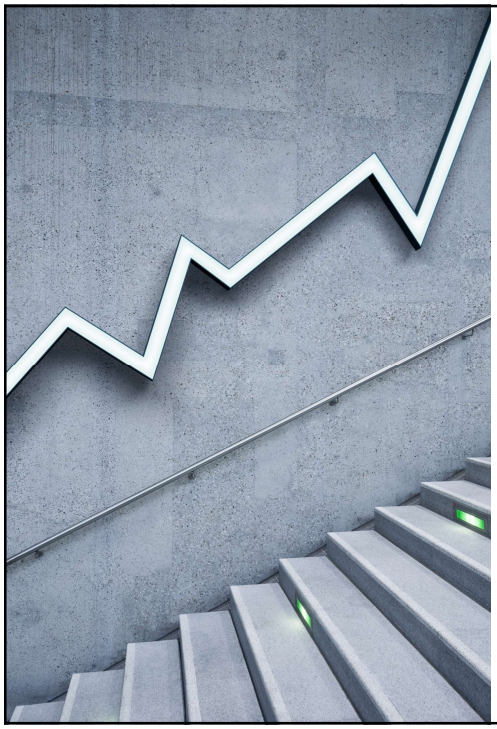

Economic evaluation:
From "Does it work?" to "Is it worth it?"

JEFFREY S. HOCH, PHD

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1

Disclaimer

The opinions expressed in this talk are mine and do not represent official positions of the people or groups with whom I work.

2

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UC Davis

What is economic evaluation? (part 1)

THE ART OF "SMART SHOPPING": WHAT YOU GET AND WHAT IT COSTS

3

BEFORE BUYING SOMETHING, IT MAKES SENSE TO KNOW

- What you will pay
  - And
- What you will get

4

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Smart shopping 101

- What you get
  - Quantity,
  - Quality,
  - Cost

?

5

5

Is the new thing worth it?

6

6

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7

8

Economic evaluations

- Cost Benefit Analysis (CBA)
- Cost Utility Analysis (CUA)
- Cost Effectiveness Analysis (CEA)
- Cost Minimization Analysis (CMA)
- Cost blah blah analysis (CBBA)

9

Must examine what it costs ***and*** what you get!!!

10

The Importance of Outcome (O)

- CBA
- CUA
- CEA
- CMA

- Many Outcomes (O) in $
- Two Os (Q&q) in one QALY
- One O in whatever
- Zero Os (NO OUTCOMES!)

!!!! The decision about how to treat outcome determines the type of economic evaluation

11

11

WHICH TYPE OF ECONOMIC EVALUATION TO USE?

- **Effect data determines the technique:**

Technique	Costs	Effect(s)
Cost-Minimization Analysis	$	0 (equivalent)
Cost-Effectiveness Analysis	$	1 outcome not in $
Cost-Utility Analysis	$	2 outcomes: quality and length of life
Cost-Benefit Analysis	$	many outcomes in $

12

12

COST-MINIMIZATION: SCREENING

ONLINE EXCLUSIVE

The Use of Registered Nurses to Perform Flexible Sigmoidoscopy Procedures in Ontario: A Cost Minimization Analysis

Sigmoïdoscopie flexible effectuée par les infirmières autorisées en Ontario : analyse de minimisation des coûts

The Use of Registered Nurses to Perform Flexible Sigmoidoscopy Procedures in Ontario

Abstract

Rationale: Rates of colorectal cancer (CRC) are on the rise in Canada. Flexible sigmoidoscopy (FS) is an initial screening test for CRC primarily used in adults aged 50 years and older at average risk for the disease. Physicians and registered nurses have been shown to have the same effectiveness in performing a FS procedure. This paper presents an analysis of the use of registered nurses (RN) compared to physicians in Ontario to assess costs to the healthcare system.
Objectives: To evaluate whether FS performed by RNs is a less costly alternative to increase access to CRC screening capacity in Ontario.
Methodology: A cost minimization analysis was conducted from a health system perspective.
Discussion: RN-performed FS is a viable alternative for increasing CRC screening capacity in Ontario. Remuneration schedules for on-call physicians must be taken into consideration if policies are developed for the implementation of RN screening procedures.
Results: The findings suggest that the use of RNs may be cost saving compared to physician-performed FS procedures, depending on physician remuneration.

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CEA WITH QUALITY OF LIFE (CUA)

Wong et al. BMC Health Services Research 2012, 12:479
http://www.biomedcentral.com/1472-6963/12/479

BMC Health Services Research

RESEARCH ARTICLE Open Access

Cost-effectiveness of a health-social partnership transitional program for post-discharge medical patients

Frances Kam Yuet Wong[1*†], June Chau[2†], Ching So[2†], Stanley Ku Fu Tam[3†] and Sarah McGhee[2†]

Abstract

Background: Readmissions are costly and have implications for quality of care. Studies have been reported to support effects of transitional care programs in reducing hospital readmissions and enhancing clinical outcomes. However, there is a paucity of studies executing full economic evaluation to assess the cost-effectiveness of these transitional care programs. This study is therefore launched to fill this knowledge gap.

Methods: Cost-effectiveness analysis was conducted alongside a randomized controlled trial that examined the effects of a Health-Social Transitional Care Management Program (HSTCMP) for medical patients discharged from an acute regional hospital in Hong Kong. The cost and health outcomes were compared between the patients receiving the HSTCMP and usual care. The total costs comprised the pre-program, program, and healthcare utilization costs. Quality of life was measured with SF-36 and transformed to utility values between 0 and 1.

Results: The readmission rates within 28 (control 10.2%, study 4.0%) and 84 days (control 19.4%, study 8.1%) were significantly higher in the control group. Utility values showed no difference between the control and study groups at baseline ($p = 0.308$). Utility values for the study group were significantly higher than in the control group at 28 ($p < 0.001$) and 84 days ($p = 0.002$). The study group also had a significantly higher QALYs gain ($p < 0.001$) over time at 28 and 84 days when compared with the control group. The intervention had an 89% chance of being cost-effective at the threshold of £20000/QALY.

Conclusions: Previous studies on transitional care focused mainly on clinical outcomes and not too many included cost as an outcome measure. Studies examining the cost-effectiveness of the post-discharge support services are scanty. This study is the first to examine the cost-effectiveness of a transitional care program that used nurse-led services participated by volunteers. Results have shown that a health-social partnership transitional care program is cost-effective in reducing healthcare costs and attaining QALY gains. Economic evaluation helps to inform funders and guide decisions for the effective use of competing healthcare resources.

Keywords: Health-social transitional care, Readmission, Cost-effective analysis

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What is economic evaluation? (part 2)

THE ECONOMICS PART

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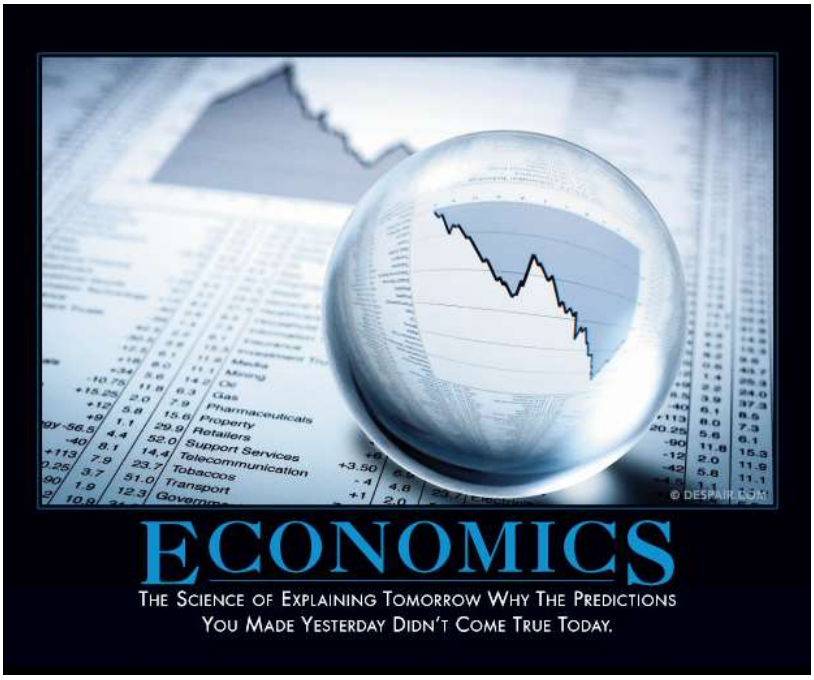

Econ can help!

- Cost-effectiveness analysis (CEA) is a type of economic evaluation.
- Economic evaluation is a part of health economics.
- Health economics is a field of economics.

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WHAT IS ECONOMIC EVALUATION?

- "Methods such as 'what we did last time,' 'gut feelings,' and even 'educated guesses' are not always better than *organized consideration* of the factors involved in a decision to commit resources to one use instead of another."

Drummond MF, O'Brien BJ, Torrance GW, Stoddart GL. Methods for the economic evaluation of health care programmes. 2nd ed. Oxford: Oxford University Press; 1997.

17

17

WHAT IS ECONOMIC EVALUATION?, CONT.

- "Methods such as 'what we did last time,' 'gut feelings,' and even 'educated guesses' are not always better than organized consideration of the factors involved in a decision to commit resources to one use instead of another."

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WHAT MAKES IT "ECONOMIC EVALUATION"?

- organized consideration of the factors involved in a decision to commit resources to one use instead of another."
  - Economic (1 use)
  - Evaluation (organized)

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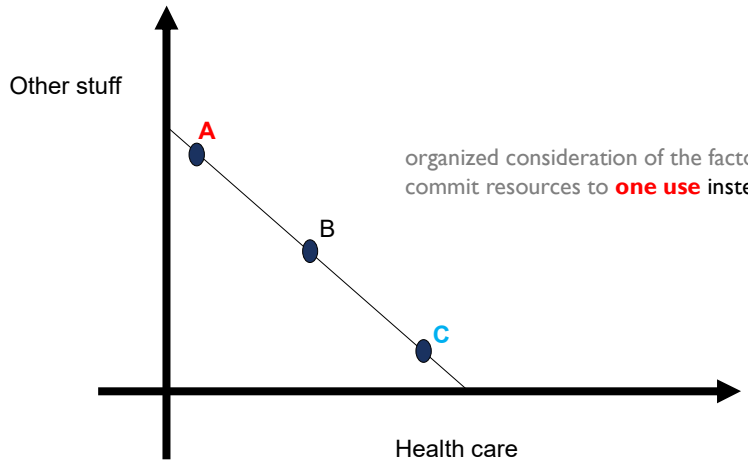
ECONOMICS = SCARCITY AND TRADEOFFS



organized consideration of the factors involved in a decision to commit resources to **one use** instead of **another**."

20

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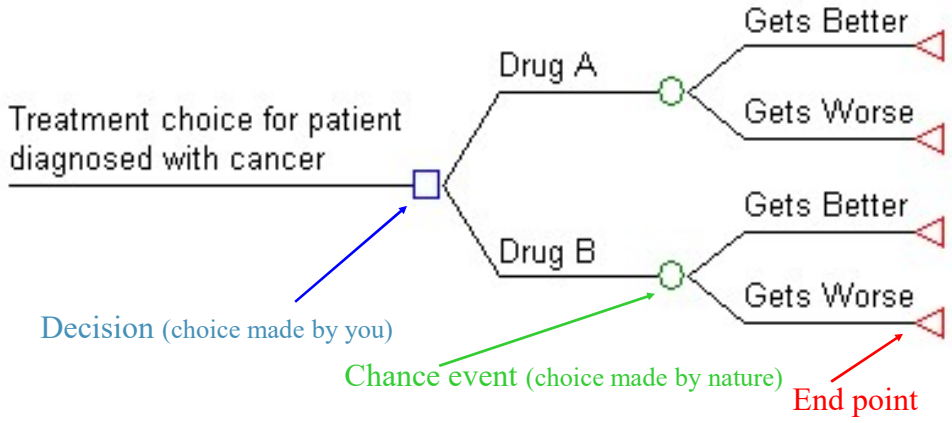
PUTTING WHICH EGGS IN YOUR BASKET?

21

EVALUATION: DECISIONS, DATA, RESULTS

organized consideration of the factors involved in a decision to commit resources to one use instead of another."



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Economic evaluation ≠ Menu without prices nor prices with no menu

23

23

Why do economic evaluation?

IT INFORMS DECISIONS WHEN YOU WANT TO SPEND WISELY

24

WHY DO ECONOMIC EVALUATION?

- "That's nice, but how much does it cost?
- "Why should we pay more for this?"
- "Are there better ways to spend our resources?"

25

25

"Health economists are concerned… because **the prices of cancer drugs appear to be rising faster than the health benefits associated with them**… the increase in the cost of treatment exceeded the magnitude of improvement in efficacy… making each treatment advance less cost-effective than the one that preceded it." Bach, 2009.

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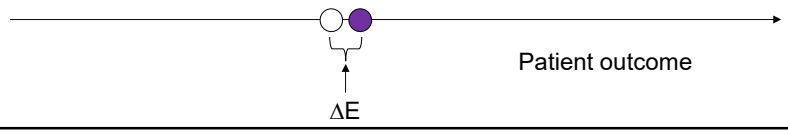
GO FOR WHICH DOT?



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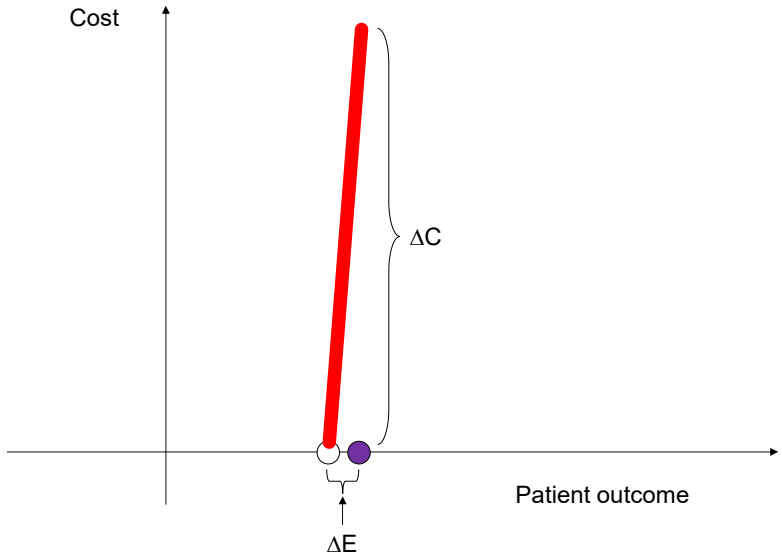
IF RESOURCES WERE SCARCE: GO FOR WHICH DOT?



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WHO DOES ECONOMIC EVALUATION?

- Typically, it is done
  - in multi-disciplinary teams

by more than one group

29

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Why do economic evaluation (again)?

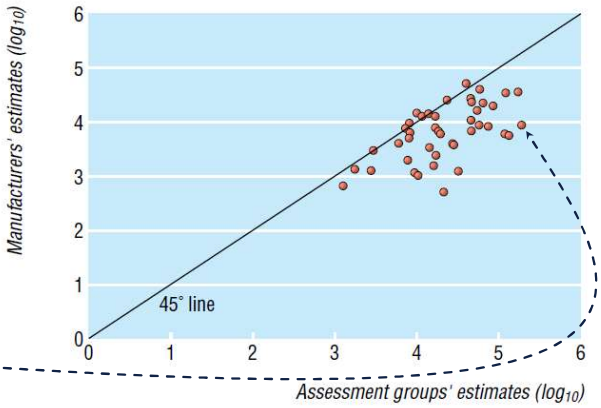
RESULTS CAN VARY DEPENDING ON WHO DOES THE STUDY

30

Miners AH, Garau M, Fidan D, Fischer AJ. Comparing estimates of cost effectiveness submitted to the National Institute for Clinical Excellence (NICE) by different organisations: retrospective study. BMJ. 2005 Jan 8;330(7482):65.

WHO DOES ECONOMIC EVALUATION?

- Typically, it is done
  in multi-disciplinary teams
  by more than one group
  - Example where the groups with different financial incentives reach different conclusions
    - $10,000 vs. $100,000



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There may be more there than you thought

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Who uses economic evaluation results?

DECISION MAKERS CAN USE THE RESULTS TO MAKE SURE THEY ARE SPENDING EFFICIENTLY

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WHERE IS ECONOMIC EVALUATION USED?

- Used all over the world, e.g.,
  - Center for Drug Evaluation (Taiwan)
  - The National Institute for Health and Care Excellence (UK)
  - Pan Canadian Oncology Drug Review (Canada)
  - Committee to Evaluate Drugs (Ontario, Canada)

- **Why?**
  - Yields *more* than evidence-based decisions, it *increases accountability* for $ spent
    - More than does it work or will it work? ***Is it a good use of $?***

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BOTTOM LINE

Economic evaluation is sometimes required and always good for clarifying value

CEA is the most common type of economic evaluation (1 outcome)

35

When can you do cost-effectiveness analysis?

BEFORE, DURING OR AFTER THE TREATMENT IS FUNDED

36

WHEN IS ECONOMIC EVALUATION DONE?

- Economic evaluation can be done *before* or *after* a new treatment or intervention is in common use.
  - E.g.,
    - RCT of a new treatment shows it is effective, but is it cost-effective?
    - Clinicians use a new treatment in a way or on a different patient population from how it was originally studied.
      - Is this a good use of resources?
        - MRI for backache, PSA for women, cancer drug for 80+ year old patients, etc.

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HOW IS ECONOMIC EVALUATION DONE?

- One studies either
  - real patients over a hypothetically useful amount of time
- Or
  - hypothetical patients over a real useful amount of time
- Comparing at least two alternatives with respect to their differences in costs and outcomes.

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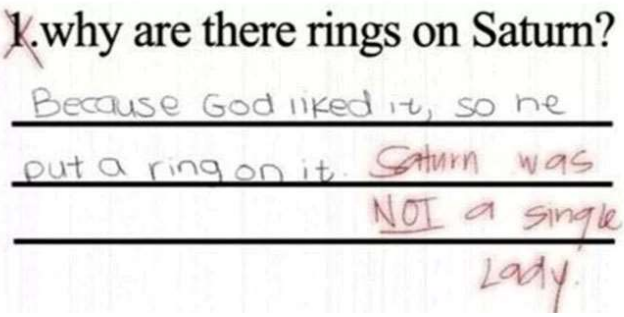

TEST YOUR UNDERSTANDING

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HOW DO WE GET ECONOMIC EVIDENCE?

- Two main options
  - Organic
    - Analyze your own
  - Synthetic
    - make some with what's around

ORIGINAL ARTICLE

Advantages of the Net Benefit Regression Framework for Economic Evaluations of Interventions in the Workplace

A Case Study of the Cost-Effectiveness of a Collaborative Mental Health Care Program for People Receiving Short-Term Disability Benefits for Psychiatric Disorders

Jeffrey S. Hoch, PhD and Carolyn S. Dewa, PhD

RESEARCH ARTICLE

Decision Analysis in Aerospace Medicine: Costs and Benefits of a Hyperbaric Facility in Space

AVA JOHN-BAPTISTE, TIM COOK, SHARON STRAUS, GARY NAGLIE, GARY GRAY, GEORGE TOMLINSON, AND MURRAY KRAHN

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EXAMPLES

- A medical journal publishes your study show than usual care.
  - Option 1 (trial-based): Using the clinical trial effectiveness of the new treatment compared
  - Option 2 (model-based): Using the trial data(s published studies, clinical opinion, etc.) use a m extra cost and the extra effectiveness of the m
  - Option 3 ("real world"): Using the data from extra cost and the extra effectiveness of the m
    - What if you only have 1 year of data?

ICER
INSTITUTE FOR CLINICAL AND ECONOMIC REVIEW

ABOUT ASSESSMENTS METHODS COMMENTARIE

Amyloidosis

ICER reviewed new therapies for the treatment of hereditary transthyretin-related (hATTR) amyloidosis, a rare genetic condition characterized by nerve, heart, and eye damage that is currently treated through supportive measures alone. Therapies included **Inotersen (Akcea Therapeutics)**, an antisense oligonucleotide that interferes with transthyretin production in the liver, and **patisiran (Onpattro™, Alnylam Pharmaceuticals)**, which inhibits transthyretin through an RNA interference pathway.

ASSOCIATED MEETINGS

September 13, 2018
9am- 5pm CT

The Midwest CEPAC deliberated and voted on ICER's report on treatments for hereditary transthyretin-related (hATTR) amyloidosis, a rare genetic condition characterized by nerve, heart, and eye damage that is currently treated through supportive measures alone. The Council also reviewed a report on therapies for

Khor et al. BMC Cancer 2014, 14:586
http://www.biomedcentral.com/1471-2407/14/586

BMC Cancer

RESEARCH ARTICLE Open Access

Real world costs and cost-effectiveness of Rituximab for diffuse large B-cell lymphoma patients: a population-based analysis

Sara Khor[1,2,3,4], Jaclyn Beca[1,2,3], Murray Krahn[3,5,6,7,11], David Hodgson[3,7,8,11], Linda Lee[9], Michael Crump[10], Karen E Bremner[6], Jin Luo[11], Muhammad Mamdani[2,7,11], Chaim M Bell[7,12], Carol Sawka[3,7], Scott Gavura[13], Terrence Sullivan[3,7,14], Maureen Trudeau[15], Stuart Peacock[3,16,17] and Jeffrey S Hoch[1,2,3,7,11*]

Abstract

Background: Current treatment of diffuse-large-B-cell lymphoma (DLBCL) includes rituximab, an expensive drug, combined with cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP) chemotherapy. Economic models have predicted rituximab plus CHOP (RCHOP) to be a cost-effective alternative to CHOP alone as first-line treatment of DLBCL, but it remains unclear what its real-world costs and cost-effectiveness are in routine clinical practice.

Methods: We performed a population-based retrospective cohort study from 1997 to 2007, using linked administrative databases in Ontario, Canada, to evaluate the costs and cost-effectiveness of RCHOP compared to CHOP alone. A historical control cohort (n = 1,099) with DLBCL who received CHOP before rituximab approval was hard-matched on age and treatment intensity and then propensity-score matched on sex, comorbidity, and histology to 1,099 RCHOP patients. All costs and outcomes were adjusted for censoring using the inverse probability weighting method. The main outcome measure was incremental cost per life-year gained (LYG).

Results: Rituximab was associated with a life expectancy increase of 3.2 months over 5 years at an additional cost of $16,298, corresponding to an incremental cost-effectiveness ratio of $61,984 (95% CI $34,087-$135,890) per LYG. The probability of being cost-effective was 90% if the willingness-to-pay threshold was $100,000/LYG. The cost-effectiveness ratio was most favourable for patients less than 60 years old ($31,800/LYG) but increased to $80,600/LYG for patients 60–79 years old and $110,100/LYG for patients ≥80 years old. We found that post-market survival benefits of rituximab are similar to or lower than those reported in clinical trials, while the costs, incremental costs and cost-effectiveness ratios are higher than in published economic models and differ by age.

Conclusions: Our results showed that the addition of rituximab to standard CHOP chemotherapy was associated with improvement in survival but at a higher cost, and was potentially cost-effective by standard thresholds for patients <60 years old. However, cost-effectiveness decreased significantly with age, suggesting that rituximab may be not as economically attractive in the very elderly on average. This has important clinical implications regarding age-related use and funding decisions on this drug.

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WHY YOU SHOULD CARE?

01	02	03
Costs challenge patients and payers	Paying for Value (not volume) is a popular 'solution'	Cost-effectiveness analysis is a way to look at Value

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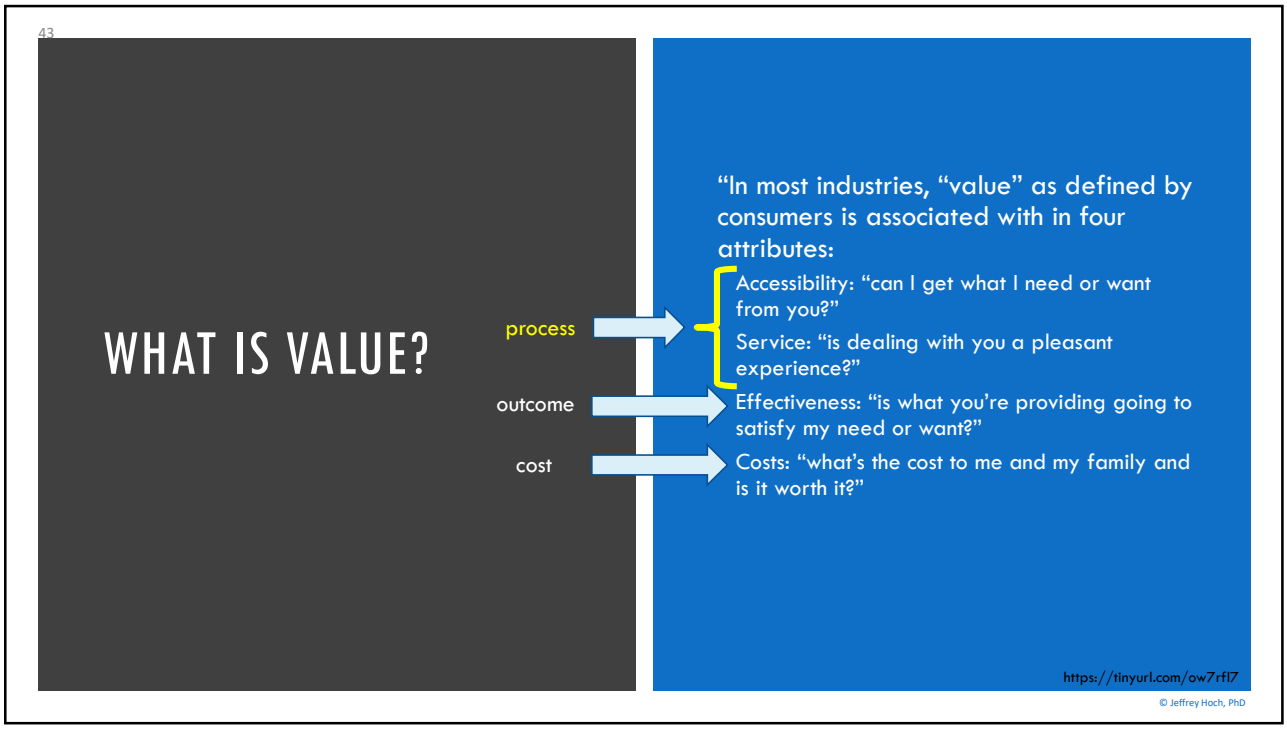

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Using cost-effectiveness analysis in the real world?

KEEPING IN MIND WHAT'S IMPORTANT

44

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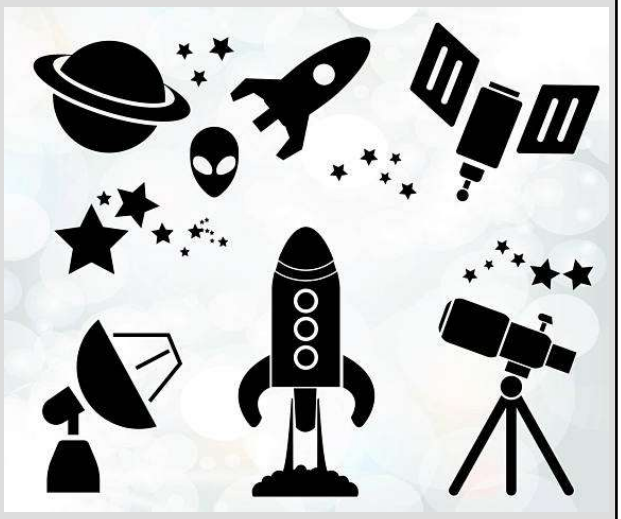
TO USE CEA, YOU MUST HAVE …

4 Quadrants
3 Findings
2 Items of interest
1 Thing



https://tinyurl.com/ycmqu724

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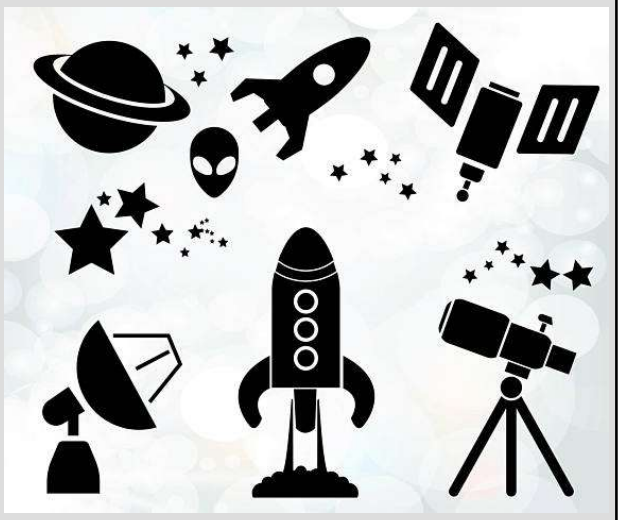
COUNT DOWN TO USE

4 Quadrants
3 Findings
2 Items of interest
1 Thing



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WHERE ARE WE?

CEA tells you a *tradeoff*
located in one of 4 areas

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more		
Costs less		

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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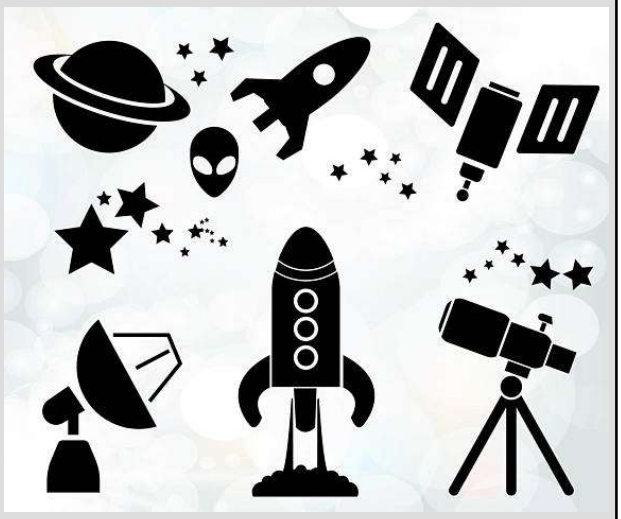
COUNT DOWN TO USE

4 Quadrants

3 Findings

2 Items of interest

1 Thing



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4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more		
Costs less		

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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51

4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more	Easy NO	
Costs less		

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

51

52

4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more		
Costs less		Easy YES

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

52

53

4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more		It Depends
Costs less	It Depends	

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

53

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9 potential outcomes

	Less effective	Similar Effect	More effective
Costs more			
Similar Costs			
Costs less			

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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3 potential findings

	Less effective	Similar Effect	More effective
Costs more			
Similar Costs			
Costs less			

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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What do you need to know?

4 potential outcomes

2 dimensions x 2 directions	Less effective	More effective
Costs more		
Costs less		

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

FINANCIAL TIMES

US COMPANIES MARKETS OPINION WORK & CAREERS LIFE & ARTS

Drugs research + Add to myFT

US regulator signs off on new $475,000 cancer therapy

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https://tinyurl.com/y8avgp85

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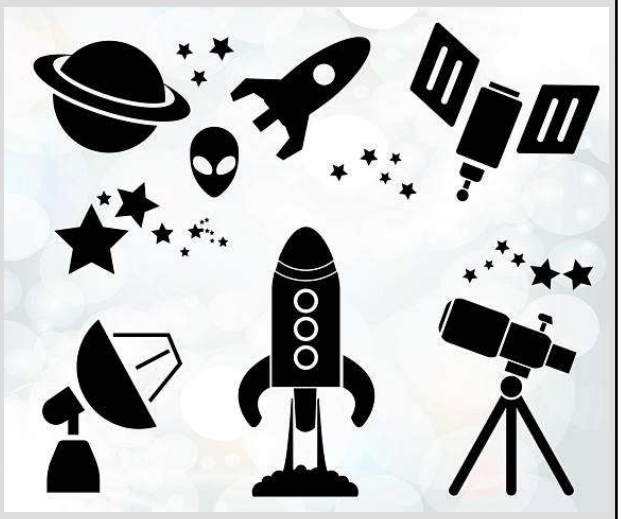
COUNT DOWN TO USE

4 Quadrants
3 Findings
2 Items of interest
1 Thing



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2 items of interest: 1) Estimate

	Less effective	Same Effect	More effective
Costs more			
Costs the same			
Costs less			

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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Are we sure?

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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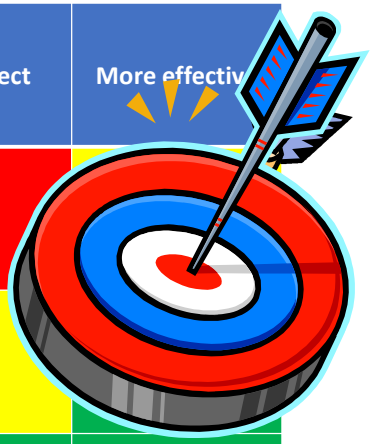
2 items of interest: 2) Uncertainty

	Less effective	Same Effect	More effectiv
Costs more			
Costs the same			
Costs less			



4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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2 ITEMS OF INTEREST: 1) ESTIMATE & 2) UNCERTAINTY

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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USING 2 ITEMS OF INTEREST: 1) ESTIMATE & 2) UNCERTAINTY

ESTIMATE	UNCERTAINTY
• ***How much*** extra cost?	• What other values are possible?
• ***How much*** extra effect?	• What is the 95% CI?

- ***How much*** extra cost *per* extra effect?
- ***How much*** more extra benefit *than* extra cost?

$75,000 extra cost and 6 more months of life

$75,000 / 0.5 years = $150,000 per year of life

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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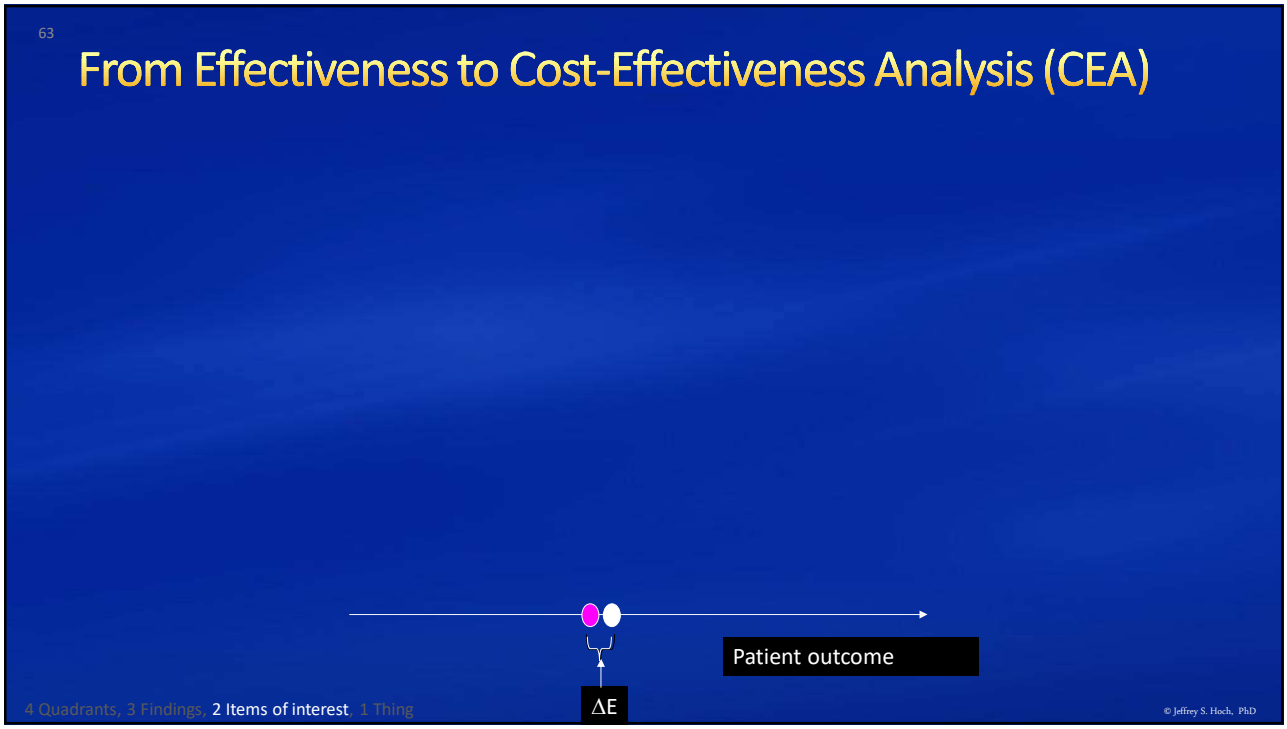
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From Effectiveness to Cost-Effectiveness Analysis (CEA)
Patient outcome
ΔE
4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing
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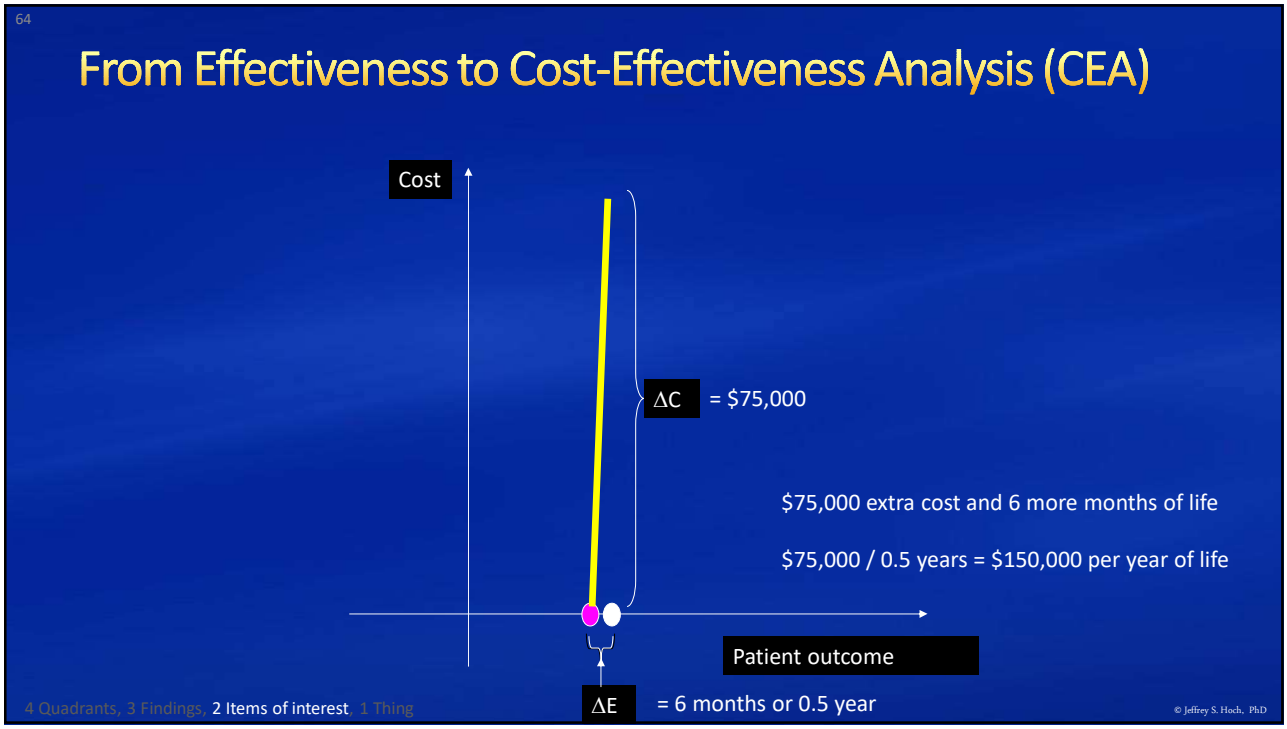
64
From Effectiveness to Cost-Effectiveness Analysis (CEA)
Cost
ΔC
= $75,000
$75,000 extra cost and 6 more months of life
$75,000 / 0.5 years = $150,000 per year of life
Patient outcome
ΔE
= 6 months or 0.5 year
4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing
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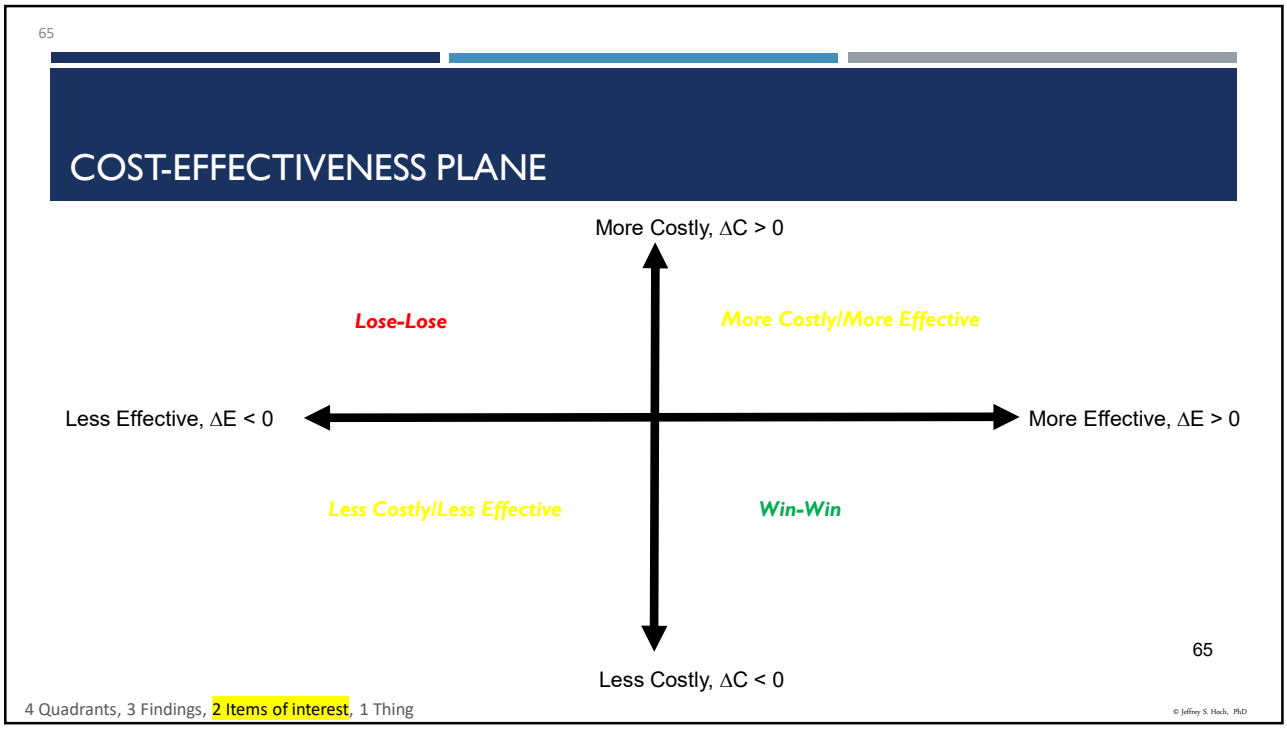
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COST-EFFECTIVENESS PLANE
More Costly, ΔC > 0
Lose-Lose
More Costly/More Effective
Less Effective, ΔE < 0
More Effective, ΔE > 0
Less Costly/Less Effective
Win-Win
Less Costly, ΔC < 0
65
4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing
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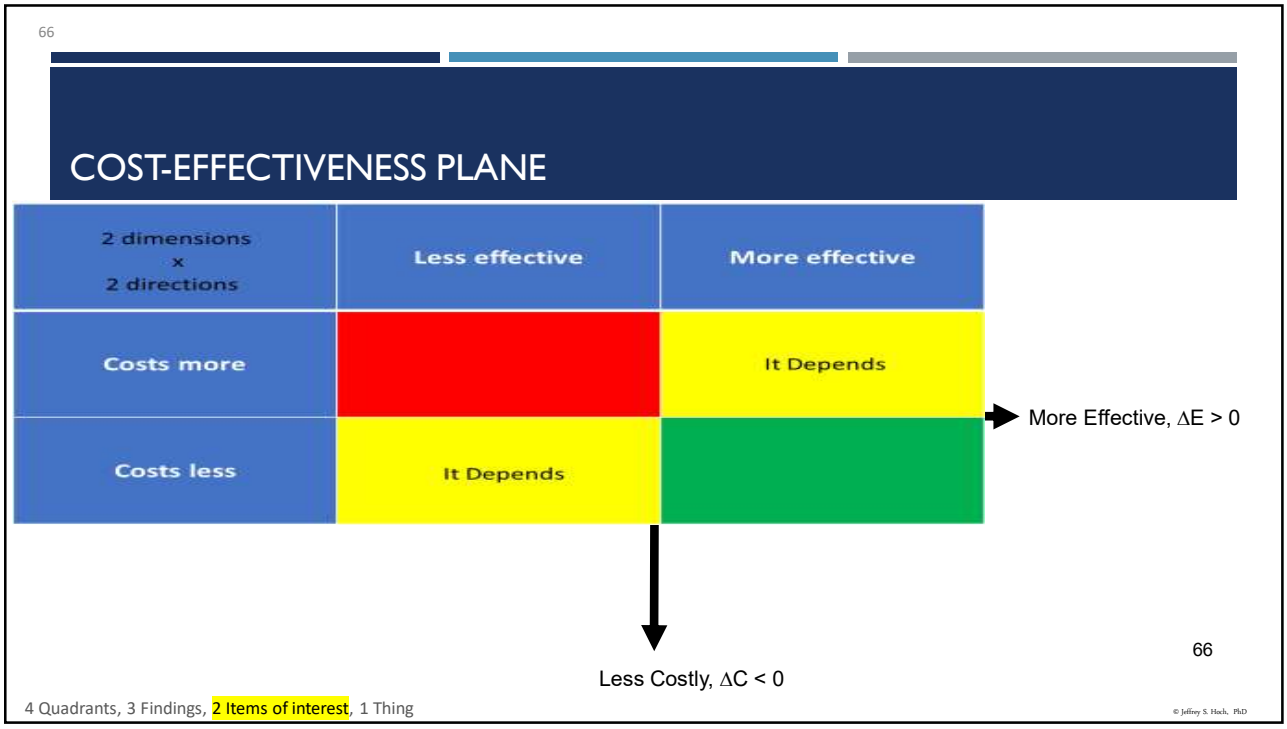
66
COST-EFFECTIVENESS PLANE
2 dimensions
x
2 directions
Less effective
More effective
Costs more
It Depends
Costs less
It Depends
More Effective, ΔE > 0
Less Costly, ΔC < 0
66
4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing
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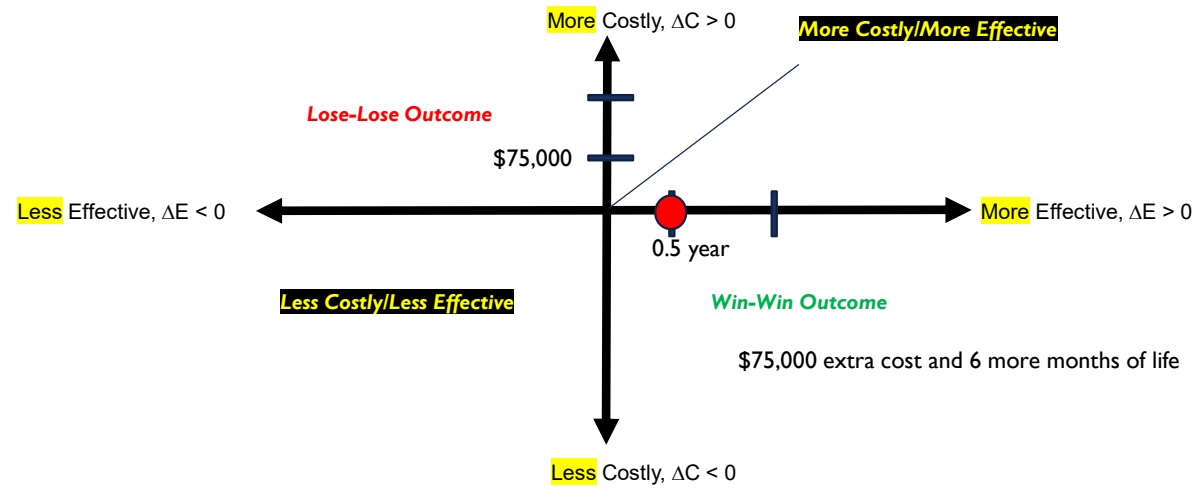
COST-EFFECTIVENESS PLANE



4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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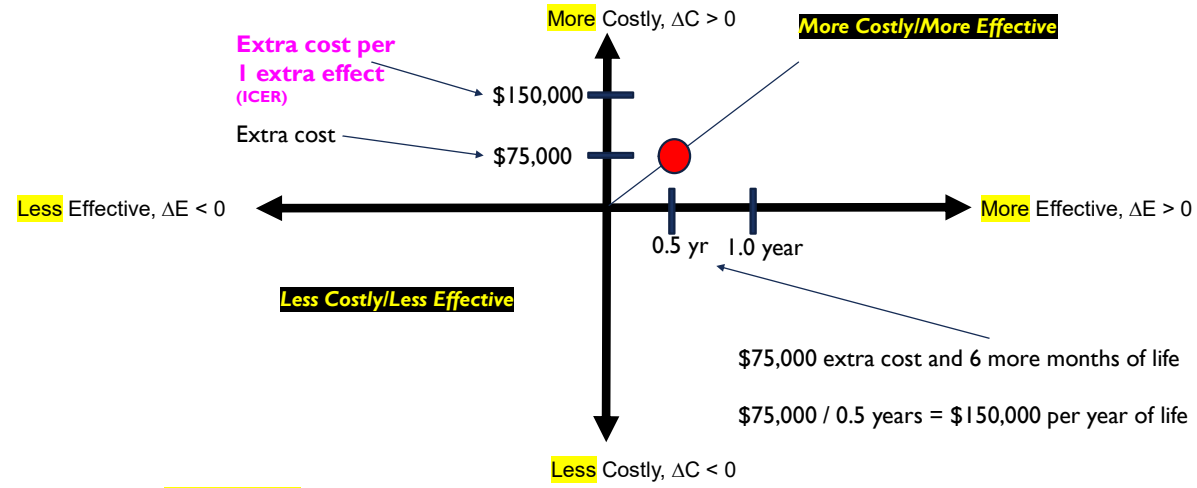
COST-EFFECTIVENESS PLANE



4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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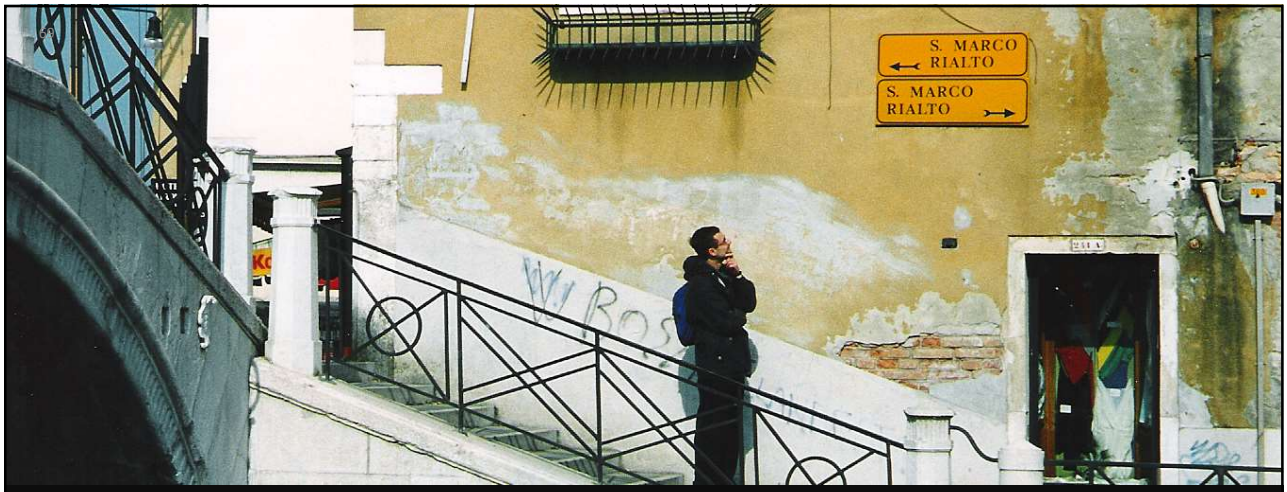

Where to go from here?

What should be done?

Is it cost-effective?
Is it worth it?
Is it value for money?

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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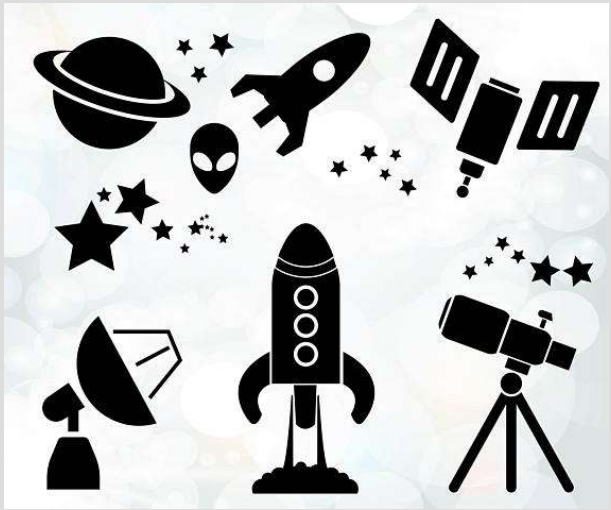
COUNT DOWN TO USE

4 Quadrants
3 Findings
2 Items of interest
1 Thing



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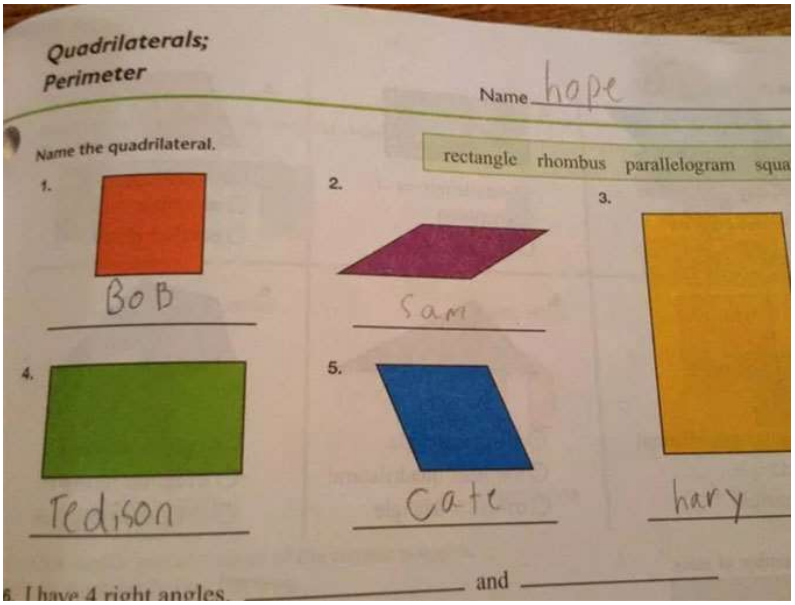

CHOOSING IN THEORY VS. PRACTICE

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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IN THEORY: SPEND EFFICIENTLY!

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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There is something odd about the choreography of the CEA…

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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DEATH OF CEA ONLY

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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WHAT IS BEING CONSIDERED?

"Given the available evidence on comparative effectiveness and incremental cost-effectiveness, and considering other benefits①, disadvantages②, and contextual considerations③, what is the long-term value for money of treatment with **acupuncture and usual care** versus **usual care alone** for patients with chronic low back pain?

Low: 1 votes	**Intermediate: 11 votes**	High: 2 votes

AN ICER PROGRAM

CTAF CALIFORNIA TECHNOLOGY ASSESSMENT FORUM

4 Quadrants, 3 Findings, 2 Items of interest, 1 Thing

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How to do economic evaluation "right"?

THERE IS HELP

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GUIDANCE DOCUMENTS: CHEERS TO HAVING 11 PUBS!

Vintage 2013

GUIDELINE Open Access

Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement

Don Husereau[1,2,3,15*], Michael Drummond[4], Stavros Petrou[5], Chris Carswell[6], David Moher[7], Dan Greenberg[8,9], Federico Augustovski[10,11], Andrew H Briggs[12], Josephine Mauskopf[13], Elizabeth Loder[14,16] and on behalf of the CHEERS Task Force

Abstract

Economic evaluations of health interventions pose a particular challenge for reporting. There is also a need to consolidate and update existing guidelines and promote their use in a user friendly manner. The Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement is an attempt to consolidate and update previous health economic evaluation guidelines efforts into one current, useful reporting guidance. The primary audiences for the CHEERS statement are researchers reporting economic evaluations and the editors and peer reviewers assessing them for publication.

The need for new reporting guidance was identified by a survey of medical editors. A list of possible items based on a systematic review was created. A two round, modified Delphi panel consisting of representatives from academia, clinical practice, industry, government, and the editorial community was conducted. Out of 44 candidate items, 24 items and accompanying recommendations were developed. The recommendations are contained in a user friendly, 24 item checklist. A copy of the statement, accompanying checklist, and this report can be found on the ISPOR Health Economic Evaluations Publication Guidelines Task Force website (www.ispor.org/TaskForces/EconomicPubGuidelines.asp).

We hope CHEERS will lead to better reporting, and ultimately, better health decisions. To facilitate dissemination and uptake, the CHEERS statement is being co-published across 10 health economics and medical journals. We encourage other journals and groups, to endorse CHEERS. The author team plans to review the checklist for an update in five years.

http://tinyurl.com/y9oud52s

Vintage 1996

Editors' short checklist and partial evaluation checklist

Item	Yes	No	Not clear
Short checklist			
(1) Is the research question stated?	☐	☐	☐
(2) Are the source(s) of effectiveness estimates used clearly stated?	☐	☐	☐
(3) Are the primary outcome measure(s) clearly stated?	☐	☐	☐
(4) Are the methods for the estimation of quantities and unit costs described?	☐	☐	☐
Partial evaluation checklist			
(1) Is the question important?	☐	☐	☐
(2) Is the economic importance of the question stated?	☐	☐	☐
(3) Is the topic of interest to the *BMJ*?	☐	☐	☐
(4) Is there enough economic detail to allow peer review?	☐	☐	☐
(5) If the economic content is sound would we want to publish it?	☐	☐	☐
(6) Is there a reasonable chance that the economic content is sound?	☐	☐	☐

Guidelines for authors and peer reviewers of economic submissions to the *BMJ*

M F Drummond, T O Jefferson on behalf of the *BMJ* Economic Evaluation Working Party

http://tinyurl.com/ybex9fp5

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TWO CHECKLISTS

Table 1 CHEERS checklist—Items to include when reporting economic evaluations of health interventions

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as "cost-effectiveness analysis", and describe the interventions compared.	
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study.	
		Present the study question and its relevance for health policy or practice decisions.	
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	
Measurement of effectiveness	11a	*Single study-based estimates:* Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	
	11b	*Synthesis-based estimates:* Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	
Estimating resources and costs	13a	*Single study-based economic evaluation:* Describe approaches used to estimate	

Referees' checklist (also to be used, implicitly, by authors)

Item	Yes	No	Not clear	Not appropriate
Study design				
(1) The research question is stated	☐	☐	☐	
(2) The economic importance of the research question is stated	☐	☐	☐	
(3) The viewpoint(s) of the analysis are clearly stated and justified	☐	☐	☐	
(4) The rationale for choosing the alternative programmes or interventions compared is stated	☐	☐	☐	
(5) The alternatives being compared are clearly described	☐	☐	☐	
(6) The form of economic evaluation used is stated	☐	☐	☐	
(7) The choice of form of economic evaluation is justified in relation to the questions addressed	☐	☐	☐	
Data collection				
(8) The source(s) of effectiveness estimates used are stated	☐	☐	☐	
(9) Details of the design and results of effectiveness study are given (if based on a single study)	☐	☐	☐	☐
(10) Details of the method of synthesis or meta-analysis of estimates are given (if based on an overview of a number of effectiveness studies)	☐	☐	☐	☐
(11) The primary outcome measure(s) for the economic evaluation are clearly stated	☐	☐	☐	
(12) Methods to value health states and other benefits are stated	☐	☐	☐	☐
(13) Details of the subjects from whom valuations were obtained are given	☐	☐	☐	☐
(14) Productivity changes (if included) are reported separately	☐	☐	☐	☐
(15) The relevance of productivity changes to the study question is discussed	☐	☐	☐	☐
(6) Quantities of resources are reported separately from their unit costs	☐	☐	☐	
(17) Methods for the estimation of quantities and unit costs are described	☐	☐	☐	
(18) Currency and price data are recorded	☐	☐	☐	
(19) Details of currency of price adjustments for inflation or currency conversion are given	☐	☐	☐	
(20) Details of any model used are given	☐	☐	☐	☐
(21) The choice of model used and the key parameters on which it is based are justified	☐	☐	☐	☐

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TEST QUESTIONS

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Is this a CEA?

- "The costs of caring for dementia patients are enormous and impose a tremendous economic burden on the whole of our society. The total worldwide societal cost of dementia was estimated to be US$ 604 billion in 2010.
- "The costs of dementia dwarf those of other diseases such as stroke, heart disease, and cancer....

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Estimate or Uncertainty?

Table 2 Incremental cost effectiveness of a genetic test for the apolipoprotein ε4 allele in combination with preventive donepezil treatment in patients with amnestic mild cognitive impairment

Strategy	Cost (Can$)	QALYs	Δ Can$/Δ QALYs
Targeted therapy	132,105	4.980	–
Standard of care	131,090	4.953	–
Difference	1,015	0.027	38,016

Can$ 2009 Canadian dollars, *QALYs* quality-adjusted life-years

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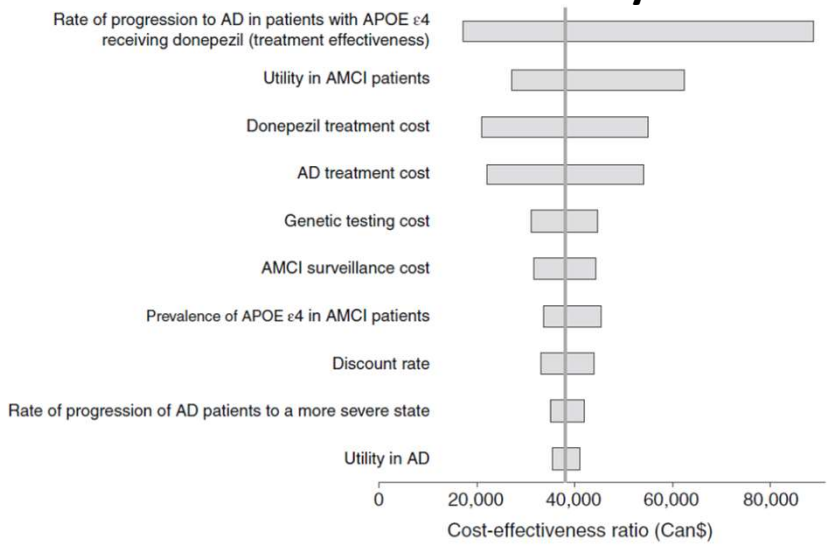
81

Estimate or Uncertainty?



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FINAL EXAM

- Is this cost-effective?

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FINAL EXERCISE

"Economic analysis of erythropoietin use in orthopaedic surgery." by Coyle D, Lee KM, Fergusson DA, Laupacis A. Transfus Med. 1999 Mar;9(1):21-30.

- **Example**: Cost-effectiveness of epoetin-alpha (EPO) to augment preoperative autologous blood donation (PAD) in elective surgery
  - **Concerns**:
    - Allogeneic (someone else's) blood might have disease
    - Autologous (your own) blood is costly to get, and so is EPO

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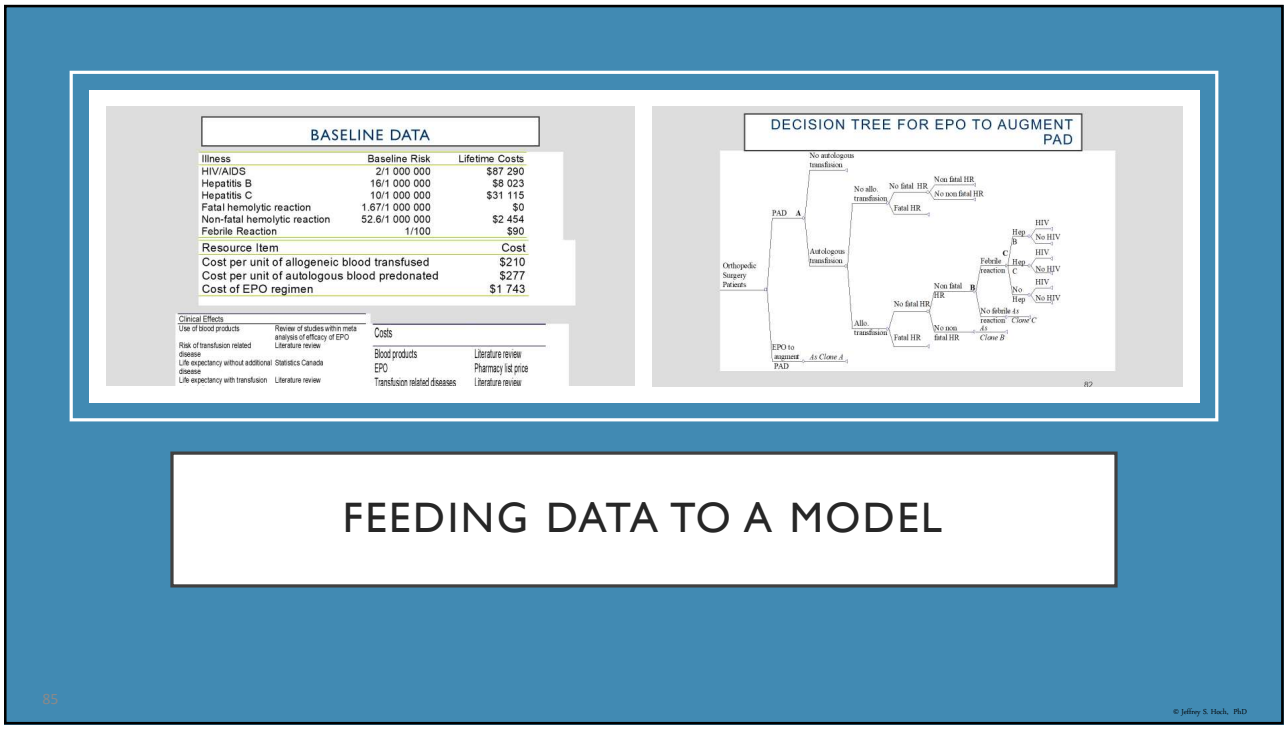

FEEDING DATA TO A MODEL

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COST EFFECTIVENESS RESULTS

Intervention	Life Years	Cost	Average Cost per life year
EPO + PAD	13.037731	2903	$222.66 per life

Is EPO cost-effective?

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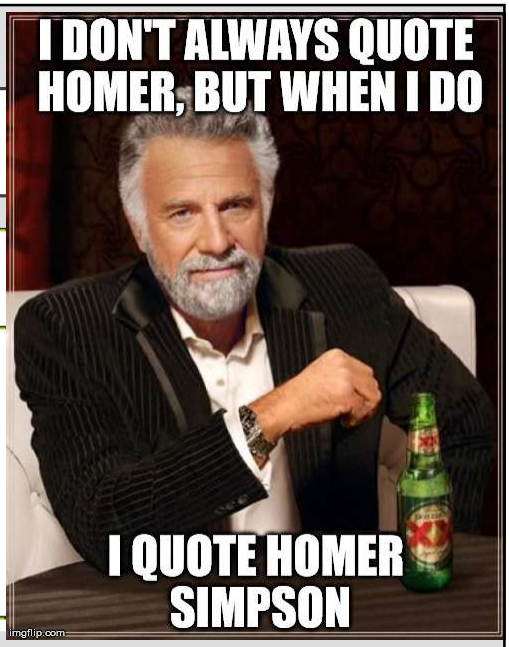
COST EFFECTIVENESS BY HOMER

Intervention	Life Years	Cost
PAD	13.037725	968
EPO + PAD	13.037731	2903



Is EPO cost-effective?

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COST EFFECTIVENESS RESULT BY HOMER SIMPSON

Intervention	Life Years	Cost	Average life
PAD	13.037725	968	$74.25 per life
EPO + PAD	13.037731	2903	$222.66 per life

Is EPO cost-effective?

What do we already know (what can we already achieve w/o EPO)?

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COST EFFECTIVENESS RESULTS

Intervention	Life Years		Cost		
PAD	13.037725		968		
EPO + PAD	13.037731		2903		

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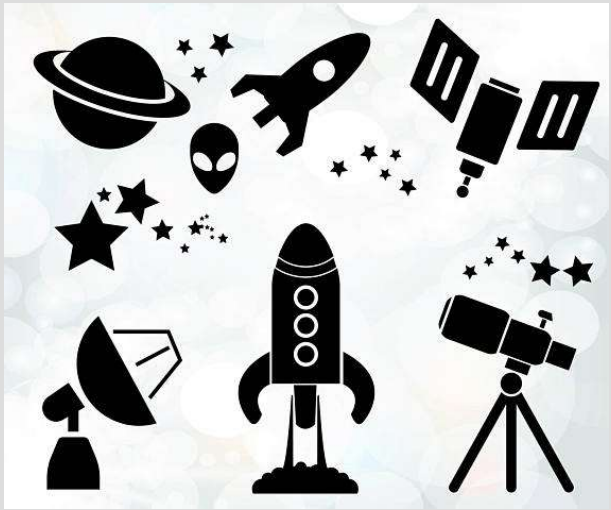
TO USE CEA, YOU MUST HAVE …

- 4 Quadrants → More costly, more effective
- 3 Findings → Easy no
- 2 Items of interest →
  - ΔC = $1935 ΔE= 3 minutes;
  - ΔC/ΔE = 330 mill per 1 YR
  - NO uncertainty shown
- 1 Thing



https://tinyurl.com/ycmqu724

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AS HEALTHCARE BECOMES MORE EXPENSIVE…

There will be more focus on "value" (i.e., cost and effectiveness of new treatments).
Cost-effectiveness analysis (CEA) is a tool used throughout the world to help inform policy.
The questions you ask when "smart shopping" are the same ones users of CEA should ask

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Main point #2
Collect evidence to compare what you get and what it costs
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Main point #3
Help is available
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Contact information

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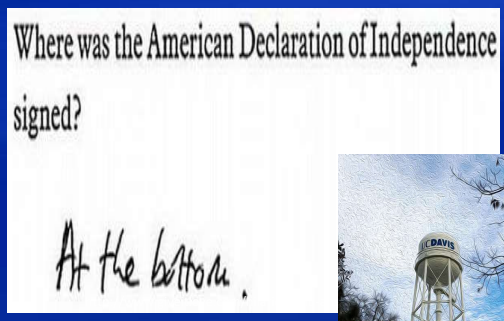

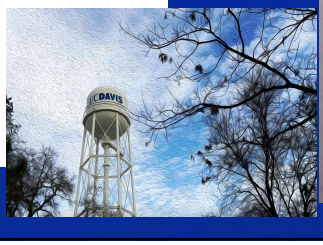

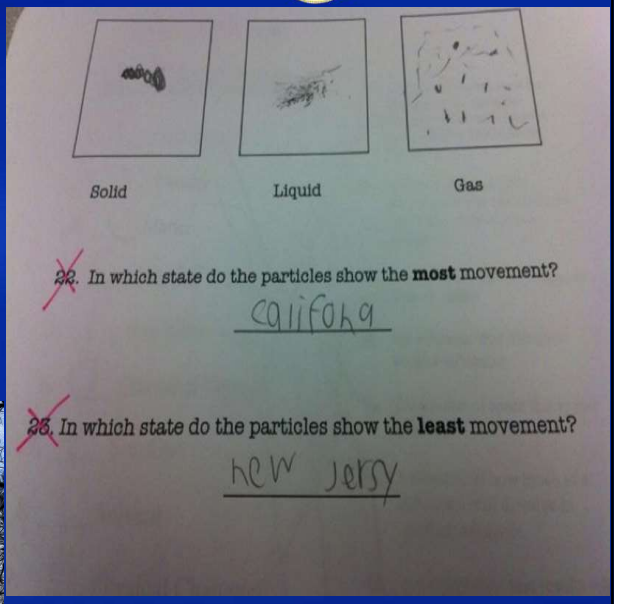

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