

AN ANALYTIC APPROACH TO INCORPORATE PATIENT PREFERENCES INTO VALUE ELEMENTS FOR ECONOMIC EVALUATION

SUSAN DOSREIS, JULIA SLEJKO,
DARIUS LAKDAWALLA, RICHARD WILLKE

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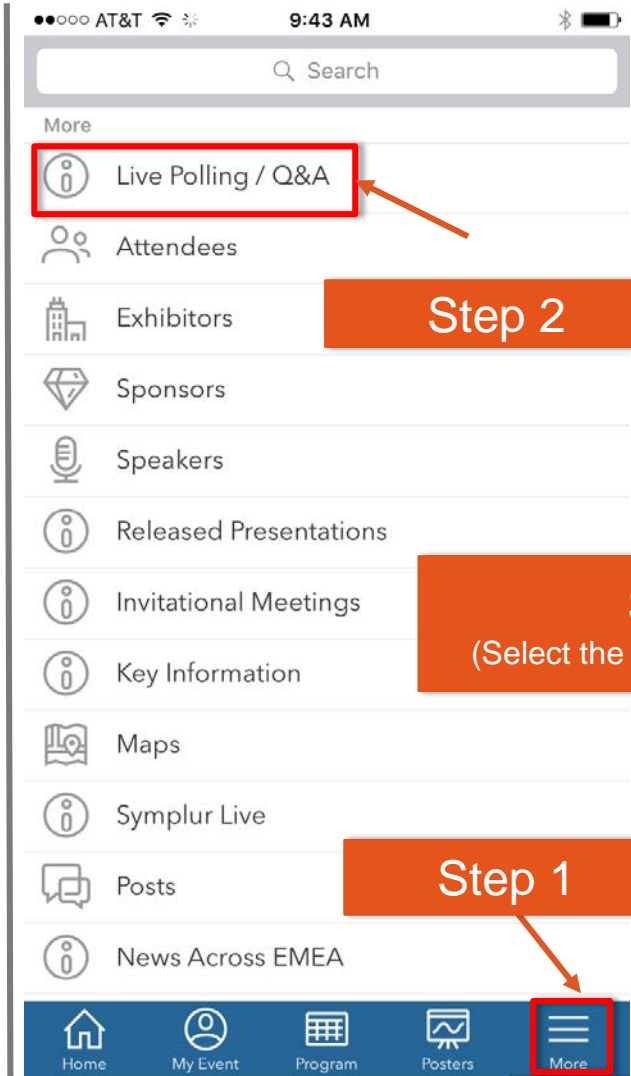
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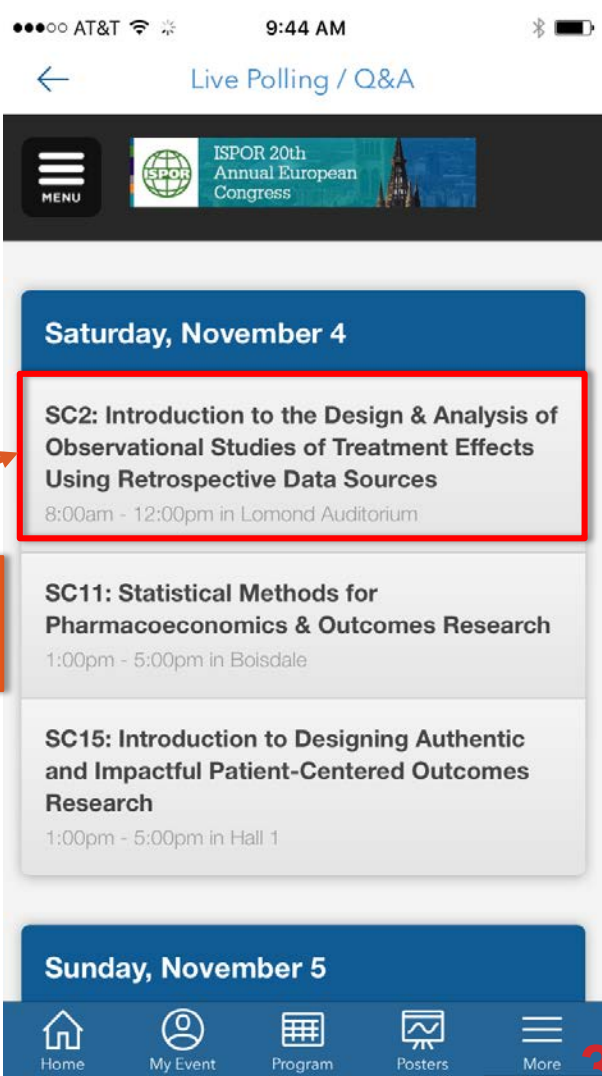
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Step 2

Step 3
(Select the appropriate session)

Step 1



USE THE APP!

- Question available now, answers revealed during discussion
- Interactive audience polling throughout
- Use Social Q&A for discussion questions

POLL –VOTE IN THE APP

In your experience with measuring treatment benefits for CEA, the biggest challenge has been:

- **Finding instruments that capture treatment-specific areas of benefit**
- **Adjusting health state utilities for treatment-specific areas of benefit**
- **Adapting models to include treatment-specific areas of benefit**
- **All of the above**

WORKSHOP OVERVIEW

Goals

- Demonstrate through audience participation how to elicit and prioritize novel patient-driven value elements
- Illustrate how to quantify patient-driven value elements
- Present approaches to incorporate patient-driven values into economic evaluations
- Discuss novel value elements

INTRODUCTION

Selected recommendations from ISPOR's Special Task Force on Value Assessment Frameworks

Fundamental concepts in conventional value assessment

Benefit measurement challenges

AUDIENCE POLL

Are you familiar with ISPOR's Special Task Force on Value Assessment?

AUDIENCE POLL

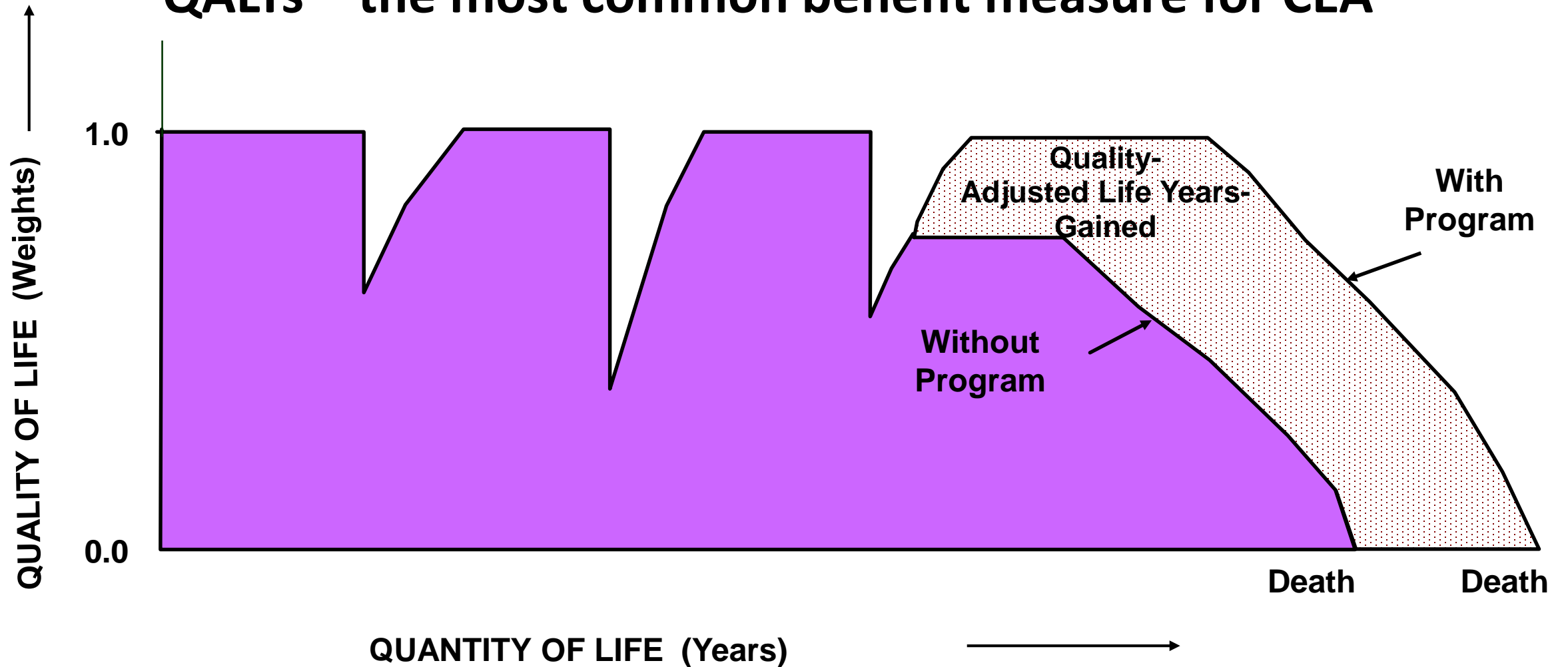
How familiar are you with DCE?

ISPOR'S SPECIAL TASK FORCE ON VALUE ASSESSMENT FRAMEWORKS – SELECTED RECOMMENDATIONS

Base health plan coverage and reimbursement decisions on an evaluation of the incremental costs and benefits of healthcare technologies as is provided by cost-effectiveness analysis.

Explore and test novel elements of benefit to improve value measures that reflect the perspectives of both plan members and patients.

QALYs – the most common benefit measure for CEA



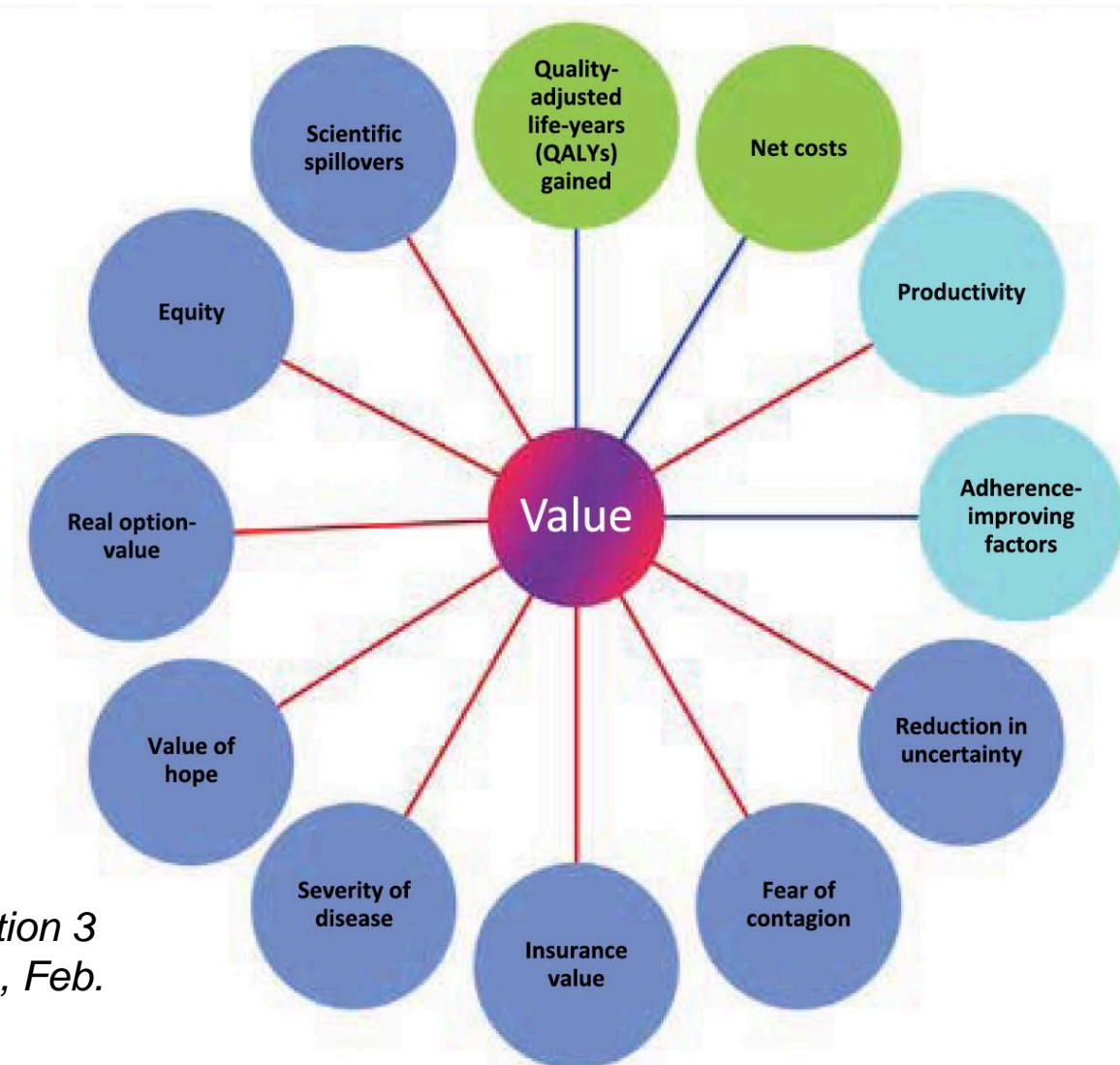
VALUING TREATMENT BENEFIT

Key Steps:

- What elements of benefit should be valued?
- Do you try to value these elements all together?
- Or do you value them separately? If so, how do you combine them into a single metric?

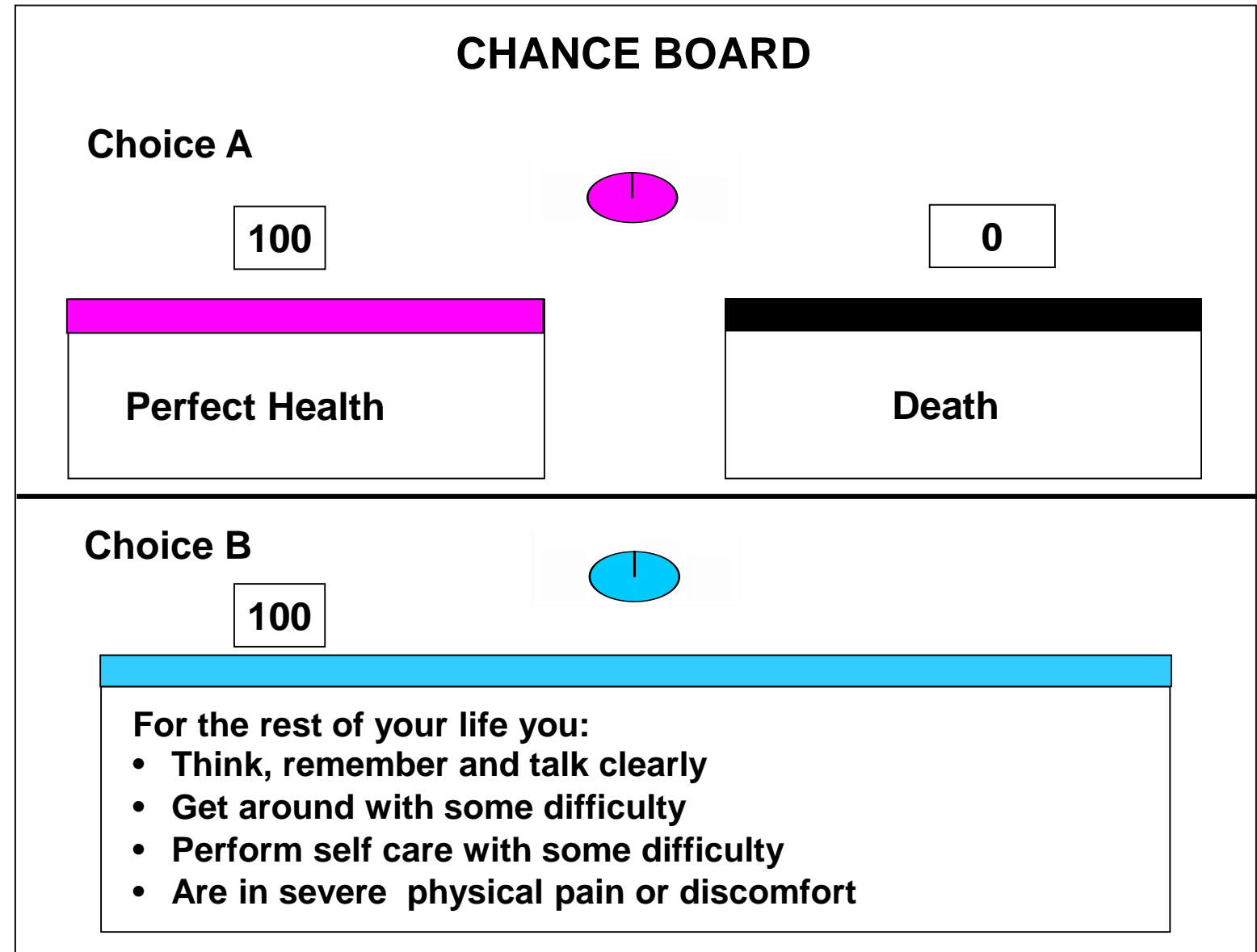
And how do you make it as patient-centric as possible?

POTENTIAL ELEMENTS OF VALUE FOR AUGMENTED COST-EFFECTIVENESS ANALYSIS (ACEA)



Source: STF Final Report, Section 3
(Lakdawalla et al, Value Health, Feb.
2018)

Valuing elements
all together:
Standard
Gamble
approach



Valuing elements
all together:
Multi-attribute
utility index
approach

EUROQOL QUESTIONNAIRE (EQ-5D)

MOBILITY

- I have no problems in walking about
- I have some problems in walking about
- I am confined to bed

SELF-CARE

- I have no problems with self-care
- I have some problems washing or dressing myself
- I am unable to wash or dress myself

USUAL ACTIVITIES (e.g. work, study, housework family or leisure activities)

- I have no problems with performing my usual activities
- I have some problems with performing my usual activities
- I am unable to perform my usual activities

PAIN/DISCOMFORT

- I have no pain or discomfort
- I have moderate pain or discomfort
- I have extreme pain or discomfort

ANXIETY/DEPRESSION

- I am not anxious or depressed
- I am moderately anxious or depressed
- I am extremely anxious or depressed

BENEFIT MEASUREMENT – FINE TUNING

In some diseases and treatment situations, benefit relies on novel elements or more specific considerations - ways to handle this include:

- Direct utility function estimation
- Discrete choice experiments
- Mapping PROs to utility measures



**Mapping to Estimate Health-State Utility from
Non-Preference-Based Outcome Measures: An ISPOR
Good Practices for Outcomes Research Task Force Report**

Allan J. Wailoo, MA, PhD^{1,*}, Monica Hernandez-Alava, MSc, PhD¹, Andrea Manca, MSc, PhD²,
Aurelio Mejia, MSc³, Joshua Ray, MSc⁴, Bruce Crawford, MA, MPH⁵, Marc Botteman, MS, MA⁶,
Jan Busschbach, PhD⁷



BENEFIT MEASUREMENT CHALLENGES

Whose perspective?

- Health plan enrollees
 - May have an a priori perspective – Rawlsian “veil of ignorance”
 - Are making cross-disease choices about their insurance “package”
- Patients with disease
 - Know the disease experience much better than the average enrollee
 - Are making actual treatment decisions

Aggregation of values

- Some benefit elements are difficult to capture with utility measures
 - Some benefit elements may apply more to society than to individuals (eg, equity)
 - Different stakeholders may need to be included in the decision-making process
- => A flexible, transparent deliberative process such as MCDA may be needed



Patient-Driven Value Elements

Eliciting, Prioritizing, and Estimating Preferences



PATIENT-DRIVEN
VALUES *in* HEALTHCARE
EVALUATION

Patient-Driven Value Element Development: General Approach

- A bottom-up approach using a staged and systematic process to identify patient-driven value elements that are important in healthcare decision-making
 - Engage patients directly to elicit the elements of value
 - Validate the value elements across diverse patient communities
 - Identify value element priorities specific to a health condition
- Use a stated preference method (e.g., discrete choice experiment) to assess trade-offs among a select set of prioritized value elements
- Estimate preference weights that can be used to assess maximum acceptable risk

Patient-Driven Value Element: Elicitation and Validation

Phase 1 Elicit Patient-Driven Value Elements by Engaging Key Patient Stakeholders	Phase 2 Validate Patient-Driven Value Elements with Diverse Patient Groups
A. Review the literature <ul style="list-style-type: none">1) Elements in existing value frameworks2) Patient values in healthcare decision-making3) Economic evaluations with patient-driven value elements	A. Assess the relative importance and meaning of individual patient-driven value elements <ul style="list-style-type: none">1) General rating of importance (high, medium, low)2) Define the meaning of the element
B. Engage patient stakeholder advisors <ul style="list-style-type: none">1) Relevance of each element to patients2) Added novel patient-driven value elements3) Defined the meaning of the element to patients	B. Obtain feedback from an expert panel

Example of a Validation Question

Goal of this exercise is to determine whether to keep this value element or drop it from the list

Tolerability	Would you rephrase the element label or the definition?		If yes, how would you rephrase the element label or the definition?	How important to treatment decision-making is this to the patient community?		
	Yes	No		High	Medium	Low
The ability to endure treatment (side effects, dosing, administration burden, etc.).						

Patient-Driven Value Elements Ranked High Importance by Patient Stakeholders

Value Element Ranked High Importance by >75%
Tolerability
Side Effects
Ability to Maintain Relationships with Family Members
Ability to Work
Impact on Depression
Affordability
Long-term Costs
Reimbursed Care
Available Treatment
Appropriateness of Care
Provider Willing to Deliver Care
Explanation of Treatment (Risks & Benefits)

Patient-Driven Value Element: Prioritization

*When considering a treatment,
which of the following factors do
you most value?*

Select the 5 most important to you.

Treatment Related Factors
Medication Frequency
New Therapeutic Option
Available Treatment
Appropriateness of Care
Provider Relationship & Trust
Affordability
Long-Term Costs
Reimbursed Care
Fatigue
Length of Treatment

Patient-Driven Value Element: Prioritization

*When considering a treatment,
which of the following factors do
you most value?*

Select the 5 most important to you.

Outcome Related Factors
Intermediate/Surrogate Outcomes
Maintain Social Activities
Ability to Work
Physical Abilities
Emotional Status
Impact on Career
Predictable Healthcare Needs
Ability to Plan
Life Expectancy
Autonomy/Dependence

Identify Patient-Driven Value Element Priorities Among Patients with COPD

- Qualitative Methods
 - Recruit 30 individuals to provide feedback on value element priorities
 - Select the 5-7 value elements to design a discrete choice experiment (DCE) instrument
- Quantitative Methods
 - Engage the patient community in the DCE design
 - Pre-test the DCE
 - Administer to a larger patient sample
 - Obtain utilities and calculate the benefit-to-risk trade-off

Patient-Driven Value Element Priorities Among Patients with COPD

Preliminary Findings

Treatment-Related	Number Selecting as a Priority	Outcome-Related	Number Selecting as a Priority
Side Effects	12	Physical Abilities	15
Medication Frequency	10	Maintain Social Activities	8
New Therapeutic Option	9	Ability to Plan	7
Provider Relationship & Trust	9	Relationship with Family	7



Translating Patient-Driven Value Elements to CEA

A Case Study in COPD Modeling



PATIENT-DRIVEN
VALUES *in* HEALTHCARE
EVALUATION

Patient Drive Value Elements → Model Inputs

The approach we'll discuss today:

- Use prioritization of Value Elements to inform model inputs
- Use results from DCEs to derive or adjust health-state utilities

How do we typically model COPD CEAs?

Among economic evaluations of COPD treatments, frequent modeled outcomes/endpoints are **exacerbations and forced expiratory volume (FEV1)**

- These are important for prescribers in making a treatment decision.
- How do these align with value elements important to patients?

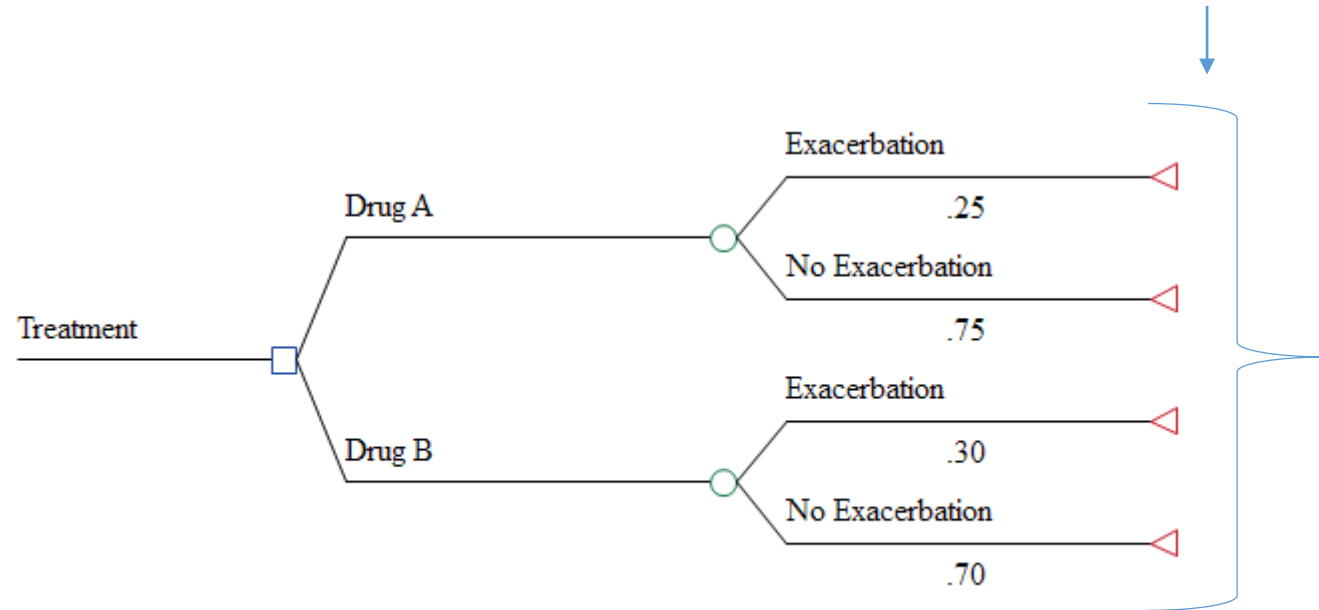
PRS12 (Poster Session IV): Aligning COPD Outcomes with Patient-Informed Value Element Domains for Use in Economic Evaluations.

PRS63: (Poster session IV): Identifying COPD Patient-Informed Value Elements in Economic Evaluations- a Systematic Review.

Generic Model of COPD

- Traditional methods require inputs on effectiveness, costs, health state utilities.

Exacerbations are an important endpoint; commonly reported in trials.



Treatment- and Outcome-Related Value Elements

Treatment-Related	Number Selecting as a Priority	Outcome-Related	Number Selecting as a Priority
Side Effects	12	Physical Abilities	15
Medication Frequency	10	Maintain Social Activities	8
New Therapeutic Option	9	Ability to Plan	7
Provider Relationship & Trust	9	Relationship with Family	7

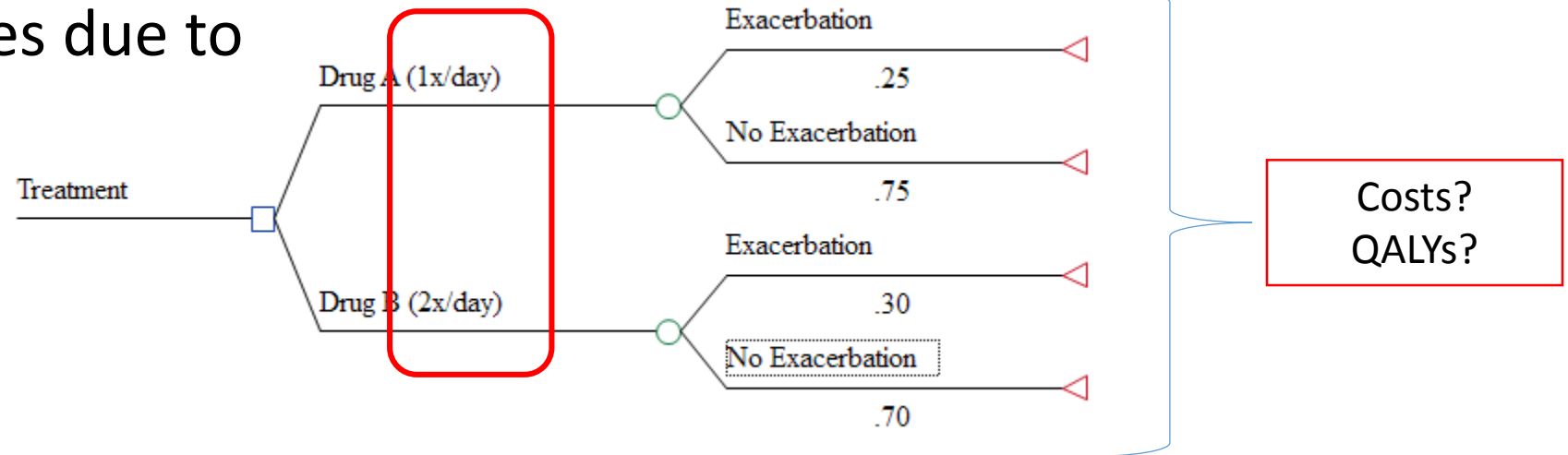
Patient Drive Value Elements → Model Inputs

Side effects & Medication Frequency

- Examine model structure and basic assumptions
- Identify model inputs that need modification
- Incorporate DCE results

Model Structure

- If drugs with differential dosing can be compared in a CEA, a number of model elements may reflect differences due to dosage.



Medication Frequency: Model Input Changes

Component of CEA	Effect of Element
Modeled Treatments (model structure & assumptions)	E.g. Drug A (1x/day) vs. Drug B (2x/day)
Costs	Is Drug A more expensive? Typically, we model cost per day/week/month, so different dosing would result in different costs if the drug product itself were priced differently.
Drug Efficacy/Effectiveness (probabilities)	Dosage frequency would be reflected through measures effectiveness. i.e. does Drug A prevent exacerbations/lung function decline better than Drug B?
QALYs	Health state utilities derived from EQ-5D, if not collected from a specific trial of Drug A vs. Drug B, will be generic for COPD health states.

Health State Utilities

- Models are typically naïve to preferences about dosage.
- COPD health state utilities typically depend on HRQoL outcomes, not on the drug attributes themselves.

Can we use information about preferences to 'adjust' the health state utilities used in our model for Drug A vs. Drug B?

Variables	Severity of COPD by GOLD Stage			p Value†
	Moderate	Severe	Very Severe	
EQ-5D				
VAS	67.74 (66.51–68.97)	62.45 (60.97–63.92)	57.84 (54.52–61.16)	< 0.001
Utility score				
UK value set	0.787 (0.771–0.802)	0.750 (0.731–0.768)	0.647 (0.598–0.695)	< 0.001
US value set	0.832 (0.821–0.843)	0.803 (0.790–0.816)	0.731 (0.699–0.762)	< 0.001

Table excerpt from: Rutten-van Mölken, M.P., Oostenbrink, J.B., Tashkin, D.P. et al. *Chest*. 2006; 130: 1117–1128

Discrete Choice Experiment (DCE)

- Stated preference method that ask respondent to rate, rank or choose from a set of profiles containing attributes/levels.
- Allows us to quantify the impact of changes in attribute levels on choice.
- Regression models estimate interpretable preference weights.

Choice 4	Treatment A	Treatment B
Number of times per day you need to take the maintenance medication	Three times each day	Once each day
Degree of day-time symptom control	Your symptoms are stable and well controlled most of the day	Your symptoms are stable and well controlled some of the day
Sleep disturbance (number of nights each week you wake up)	You wake up fairly often because of your asthma (three or four nights a week)	You do not wake up because of your asthma
Frequency of flare ups / exacerbations of your asthma symptoms	You do not experience any flare ups / exacerbations	You rarely experience flare ups / exacerbations (no more than once a year)
Physical activities you are able to do each day (exercise, household chores)	You are able to do all of the physical activities you would like to	You are able to do most of the physical activities you would like to
Social activities you are able to do each day (seeing friends/family, going out for a meal)	You are able to do some of the social activities you would like to	You are able to do all of the social activities you would like to
Ease of use and convenience of inhaler	Very easy and convenient to use	Fairly easy and convenient to use
Cost per month	£50 per month	£10 per month

Which do you prefer?

☐ ☐

DCE instrument from: Svedstar, Leather, Robinson et al. *Respiratory Medicine*. 2017. 132(76-83).

Discrete Choice Experiment Results

Table 2
Participants' treatment preferences according to DCE survey.

	COPD (N = 150)
Preferences for treatment, OR (95% CI)	
Sleep disturbance:	
waking up 1–2 times a week vs 3–4 times a week	2.15 (1.93–2.40) ^a
not waking up vs waking up 3–4 times a week	2.84 (2.52–3.20) ^a
Costs no more than:	
£25 vs £50 per month	2.12 (1.89–2.39) ^a
£10 vs £50 per month	3.95 (3.50–4.47) ^a
Ease of use:	
fairly easy/convenient vs fairly difficult/inconvenient	1.70 (1.51–1.90) ^a
very easy/convenient vs fairly difficult/inconvenient	1.95 (1.74–2.18) ^a
Sensitivity to triggers; experience exacerbations^b:	
1 vs 2–3 times per year	2.17 (1.93–2.44) ^a
0 vs 2–3 times per year	2.43 (2.17–2.73) ^a
Ability to take part in desired physical activities:	
most vs some physical activities each day	1.29 (1.16–1.44) ^a
all vs some physical activities each day	1.60 (1.44–1.79) ^a
Stable and well controlled symptoms:	
most vs some of the day	1.33 (1.19–1.50) ^a
all vs some of the day	1.64 (1.47–1.84) ^a
Ability to take part in desired social activities:	
most vs some social activities each day	1.16 (1.03–1.30) ⁶
all vs some social activities each day	1.39 (1.25–1.56) ^a
Medication frequency:	
twice a day vs three times a day	1.05 (0.93–1.18) ⁷
once a day vs three times a day	1.15 (1.03–1.29) ⁵

For example:

	Moderate COPD	
	Drug A (1x/day)	Drug B (2x/day)
Preference-naïve model	.832	.832
Dosage-adjusted preferences	>.832	<.832

What adjustments can we make given our data on preferences?

Table excerpt from: Svedstar, Leather, Robinson et al. *Respiratory Medicine*. 2017. 132(76-83).

Audience Poll

- I would consider eliciting Patient-Driven Value Elements for studies of...



The Frontiers of Healthcare Value Assessment

Darius N. Lakdawalla, PhD

University of Southern California

The Economic Theory of Healthcare Value Assessment Struggles to Value Therapy for Severe and/or Rare Illness



Cancer Drugs Fund

The Cancer Drugs Fund (CDF) is a source of funding for cancer drugs in England. On 29 July 2016, a [new approach to the appraisal and funding of cancer drugs in England](#) began operating.

To see which treatments are currently funded by the CDF, please see the [Cancer Drugs Fund list](#).

This new approach provides:

- Access to promising new treatments, via managed access arrangement, while further evidence is collected to address clinical uncertainty.
- Interim funding for all newly recommended cancer drugs, giving patients access to these treatments many months earlier than before.

Policymakers often ignore cost-effectiveness criteria when treating severe illnesses.

the *pharma*letter

Should we pay more to treat rare diseases?

By [Simon Wentworth](#)



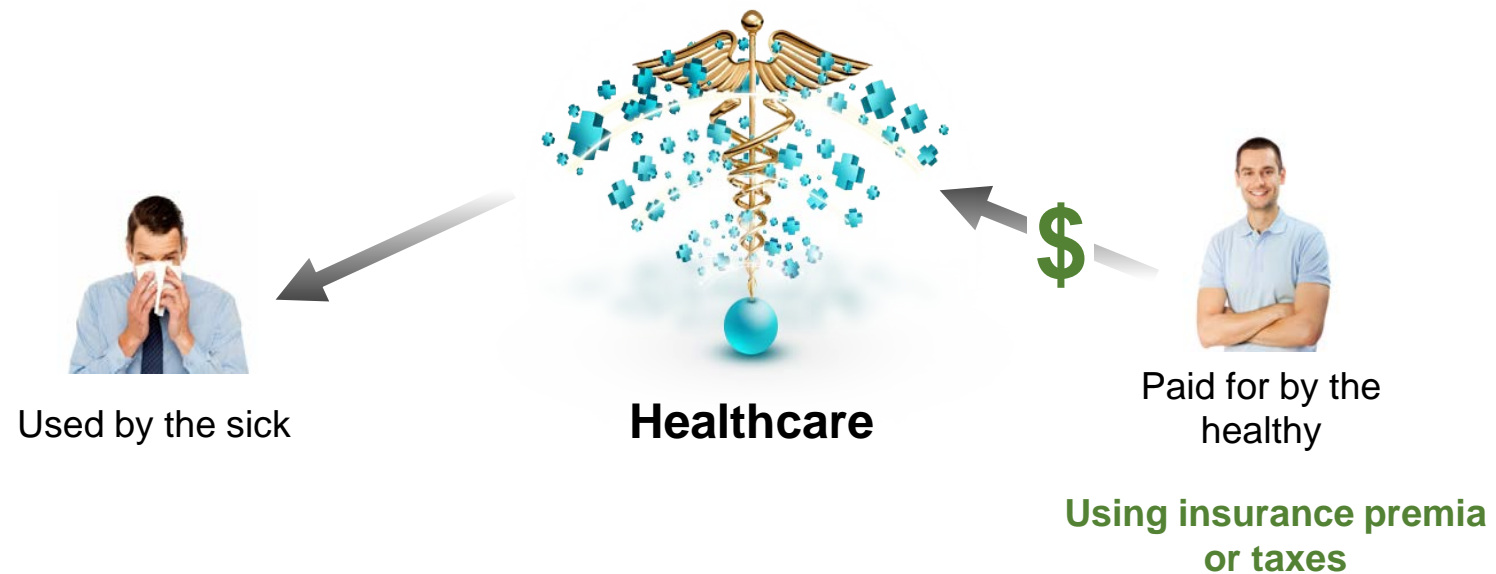
22-03-2017

The UK's public health watchdog is [pressing ahead](#) with plans to introduce a “dynamic upper limit” to the price new orphan drugs recommended for use in the National Health Service (NHS) can command.

The approach will introduce “a sliding scale, so that the more the medicine costs the greater the health benefit it must provide in order to be approved for routine use.”

The upper limit for orphan drugs will be £300,000 (\$370,000) per quality-adjusted life year, triple the amount [originally proposed](#) by the National Institute for Health and Care Excellence (NICE).

Conventional Approach to Valuing Healthcare Takes an Incomplete Perspective

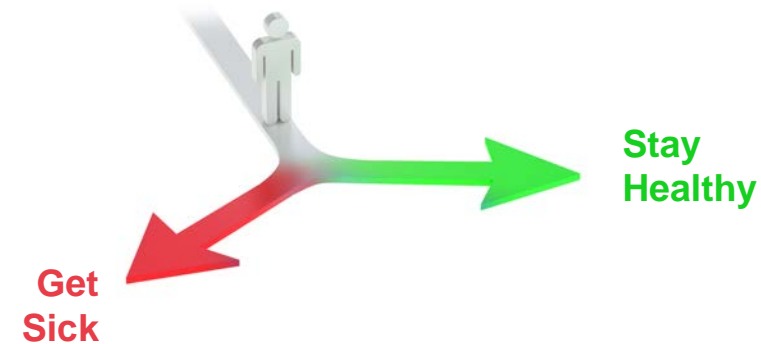


Conventional Question: How much would sick people pay for technology to treat their illness?

Relevant Question: What additional premiums or taxes would healthy people pay for technology?

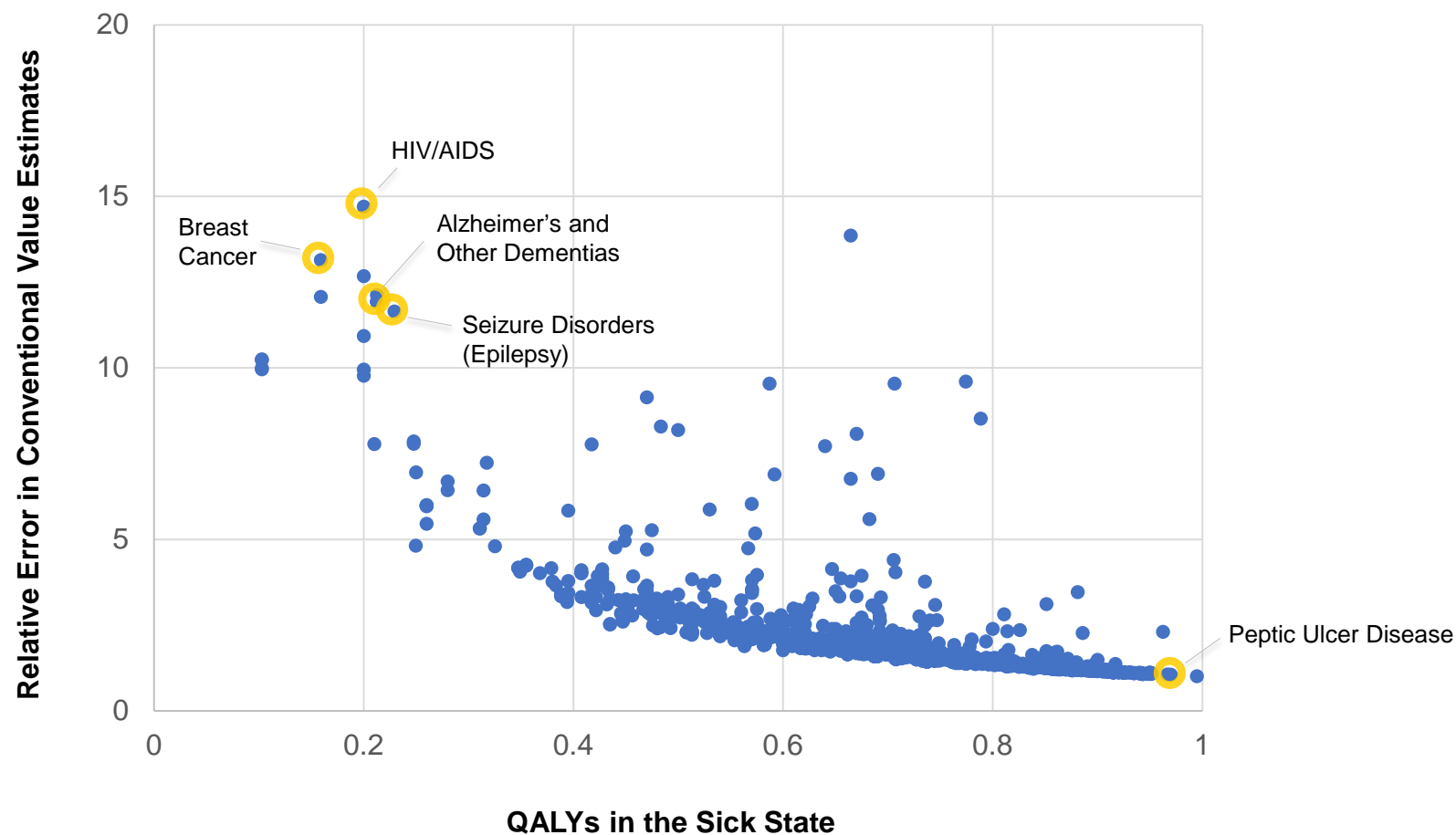
Key Insight: The Healthy Value Medical Technology for Different Reasons than the Sick

To a healthy person,
illness is a risk, not an
existing condition



- The healthy value medical innovation because it protects them from risk of falling sick – analogous to an insurance policy that protects against losses to property
- These values are the “insurance value” of medical technology (Lakdawalla, Malani, Reif, *Journal of Public Economics*, 2017)

The more Severe the Illness, the Greater is the Error in Economists' Conventional Value Estimates



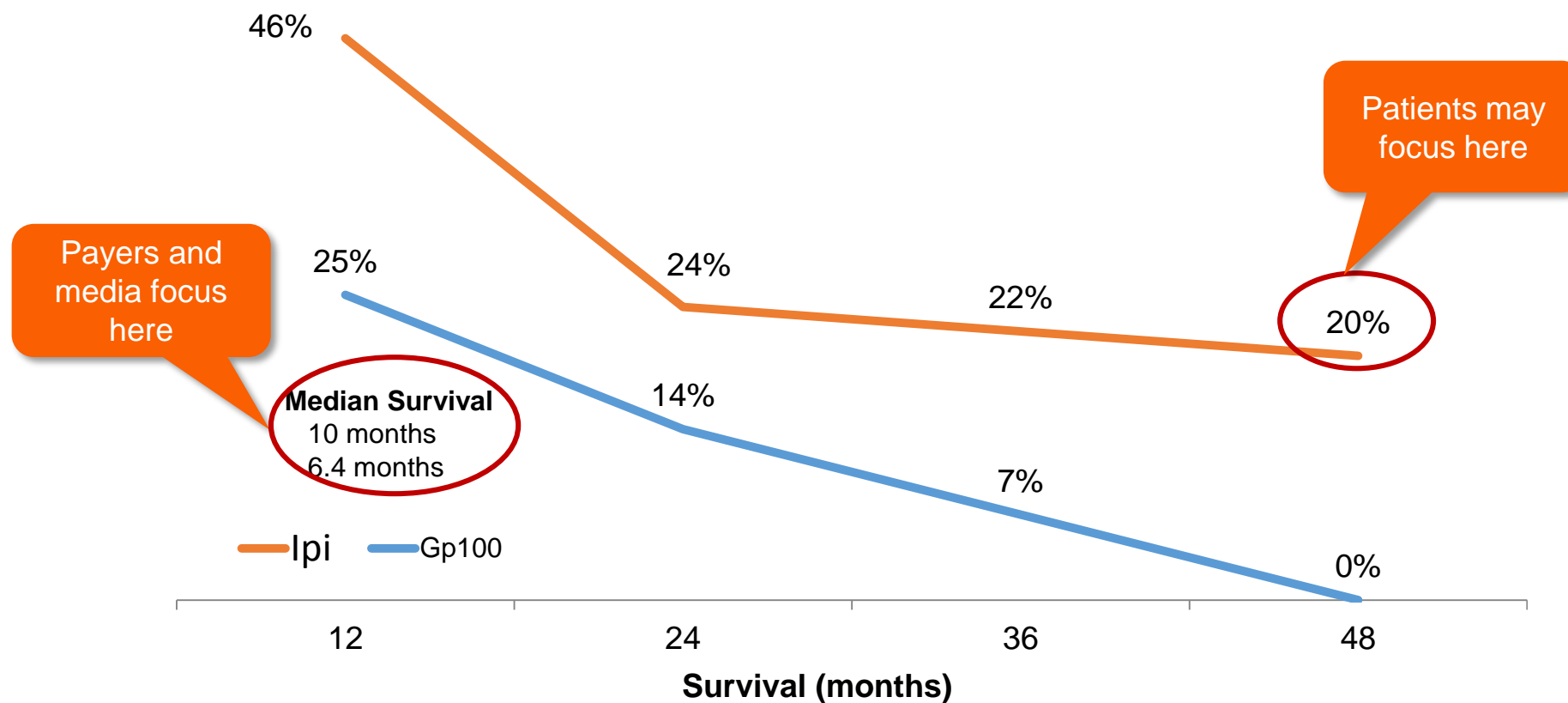
Estimating Insurance Value Requires Just One Additional Parameter

Insurance value depends on an individual's degree of risk-aversion, which is well-estimated in the economics literature

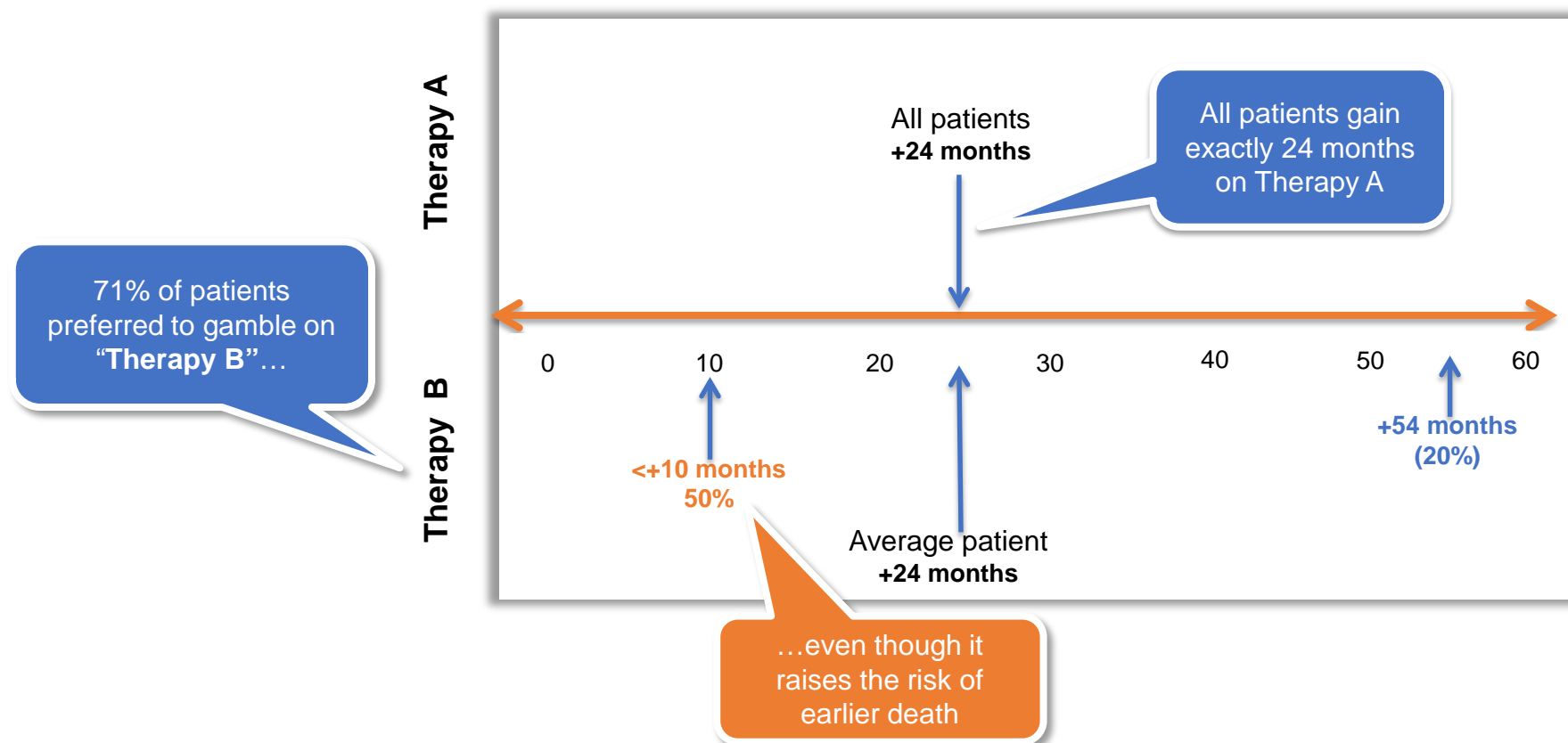
Risk-aversion, along with the standard set of parameters in a cost-effectiveness analysis, is sufficient to recover insurance value

Incorporating insurance value leads to more accurate inferences about the value of treating severe conditions

Focusing on Median or Average Clinical Benefits May Lead to Mistaken Inferences



71% of Cancer Patients Surveyed Preferred a Therapy with Positively Skewed Outcomes to One with a Sure 24-Month Gain



Estimating “Value of Hope” Requires One (or Two) More Parameters

Just as risk-aversion measures a patient’s aversion to uncertainty, “prudence” is the parameter measuring a patient’s taste for positively skewed outcomes

Health technology assessment can leverage a variety of existing estimates of consumer’s degree of “prudence” in the existing literature

The analyst also needs to know the positive skew in the distribution of clinical outcomes – this is not always estimated in RCTs

Aligning Health Technology Assessment with the Preferences of Real-world Patients

Analysts have often taken ad hoc approaches to resolving the challenge of valuing treatments for highly severe illnesses

Theoretical and empirical tools now exist to take a more systematic approach

Incorporating insurance value and the value of hope into health technology assessments can help bridge the gap between value assessments and the values of patients

DISCUSSION