

Conjoint Analysis QALYs for Acute Conditions: An Application to Vasomotor Symptoms

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CONFLICT OF INTEREST

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BACKGROUND

- Quality-adjusted life years (QALYs) provide a common metric for measuring health impacts of diseases and their treatments.
- Health utility estimates have proven useful for evaluating a wide range of diseases, but obtaining and interpreting QALY estimates for acute conditions can be problematic.^{1,2}

OBJECTIVES

- To demonstrate a method of obtaining QALY estimates for acute conditions.
- To apply conjoint analysis (CA) methods to obtain time trade-offs for acute vasomotor symptoms associated with menopause.

METHODS

Survey Instrument Design

- Time trade-off preferences elicited using CA.
 - CA is the most valid and reliable technique available for quantifying patient preferences.³
 - CA quantifies subjects' willingness to accept trade-offs among alternatives with multiple attributes.
 - Time trade-off questions simulate choices among clinically relevant treatment alternatives.
- Treatment features drawn from published literature and in consultation with medical experts (see Table 1).

Survey Instrument Pre-Test

- Conducted pre-test of the survey with two sets of interviews with 16 women in total.
- Assessed respondents' ability to understand and accept the treatment attributes and levels.
- Confirmed willingness to trade off treatment efficacy against time.

Subjects

- US adult women between the ages of 46 and 60 who speak English and provided informed consent.
- Patients (N=523) drawn from a list of subscribers to the Harris Interactive Web site.

Study Design and Analytic Techniques

- All data were collected via an online survey instrument.
- Each respondent completed 8 conjoint trade-off tasks (see Figure 1).
- The survey included several internal validity tests to ensure data quality.
- An ordered probit model was used to estimate women's preferences from the observed pattern of choices in the trade-off tasks.

Table 1. Treatment Attributes and Levels

Treatment Feature	Levels
Severity of Daytime Hot Flashes	<ul style="list-style-type: none"> No daytime hot flashes Mild: a fleeting warm sensation with no sweating that does not disrupt normal daily activity Moderate: a warm sensation with sweating that does not disrupt normal daily activity Severe: a hot sensation with sweating that can disrupt normal daily activity
Frequency of Daytime Hot Flashes	<ul style="list-style-type: none"> None (0 times) 1–2 times a day 3–6 times a day More than 6 times a day
Frequency of Night Sweats	<ul style="list-style-type: none"> None (0 times) 1–3 times a night 4 or more times a night
Duration of Hot Flashes and Night Sweats	<ul style="list-style-type: none"> 1 year 2 years 4 years 7 or more years
10-Year Risk of Hip or Back Fracture	<ul style="list-style-type: none"> 15/1,000 (1.5%) or 50% decrease in risk 30/1,000 (3%) or no change in risk
10-Year Risk of Heart Infarct	<ul style="list-style-type: none"> 38/1,000 (3.8%) or 25% decrease in risk 50/1,000 (5%) or no change in risk 65/1,000 (6.5%) or 30% increase in risk
10-Year Risk of Breast Cancer	<ul style="list-style-type: none"> 23/1,000 (2.3%) or 25% decrease in risk 3/1,000 (3%) or no change in risk 39/1,000 (3.9%) or 30% increase in risk

Figure 1. Example of Conjoint Trade-off Task

Considering the different results and risks associated with Treatments A and B, which would you prefer if these were the only options available?

	Results of Treatment A	Results of Treatment B
Intensity of daytime hot flashes	Mild	Severe
Frequency of daytime hot flashes	More than 6 times a day	1–2 times a day
Frequency of night sweats	1–3 times a night	None
Duration of hot flashes and night sweats	7 years	2 years
Risk of hip or back fractures within 10 years	↓ 50% decrease in risk	↓ 50% decrease in risk
Risk of heart attack within 10 years	↓ 25% decrease in risk	↑ 30% increase in risk
Risk of breast cancer within 10 years	No change in risk	↓ 25% decrease in risk

Check the box that best describes your opinion

A is much better
 A is somewhat better
 A and B are the same
 B is somewhat better
 B is much better

RESULTS

Demographic Characteristics

- The mean age of the sample was 52 (SD=4.4), 89% of the sample was white, and 41% had full-time jobs. The mean years of education and the annual household income were 14 (SD=3) and \$55K (SD=\$46K), respectively.

Experience with Vasomotor Symptoms (Table 2)

- The majority (74%) of the sample had experienced vasomotor symptoms, whereas 10% of the sample was not sure whether they had or not.
- Of the women who had experienced vasomotor symptoms, only 20% had severe hot flashes, the majority (56%) had 1 to 2 hot flashes a day, and 83% had 1 to 3 night sweats a night.
- Of the women who experienced vasomotor symptoms in the past, only 14% had more than 5 years of symptoms, whereas this number increased to 29% among the women who had vasomotor symptoms at the time of the survey.

QALYs for Full Sample

- Larger improvements in efficacy correspond to larger QALYs.
- QALYs were non-linear, and ΔQALY estimates ranged from 2.92 to 6.97 (see Table 3).
- Younger women had lower ΔQALY estimates than older women for all health outcomes, but they were not statistically significant (see Table 4).
- If we interpret QALY changes as benefits and assume that 1,000 women received an intervention for vasomotor symptoms, then benefits (years) = ΔQALY × number of patients.

Table 2. Experience with Vasomotor Symptoms

Characteristic	Value
Menopause Experience	
Have never experienced	16%
Experienced	74%
Not sure	10%
Intensity of Daytime Hot Flashes	
Mild to moderate	80%
Severe	20%
Frequency of Daytime Hot Flashes	
1–2 times per day	56%
3–6 times per day	31%
More than 6 times per day	13%
Frequency of Night Sweats	
1–3 times per night	83%
4 or more times per night	17%
Duration of Hot Flashes and/or Night Sweats (Past Experience)	
1–5 years	86%
More than 5 years	14%
Duration of Hot Flashes and/or Night Sweats (Current Experience)	
1–5 years	71%
More than 5 years	29%

Table 3. Example of Change in QALYs for 3 Specific Health State Improvements

Initial Health State	Final Health State	ΔQALY (years per patient)	Lower Bound	Upper Bound
Intensity of Hot Flashes: Severe Frequency of daytime hot flashes: >6 Frequency of night sweats: >3	Intensity of Hot Flashes: Moderate Frequency of daytime hot flashes: 3–6 Frequency of night sweats: 1–3	3.71	3.01	4.56
Intensity of Hot Flashes: Moderate Frequency of daytime hot flashes: 3–6 Frequency of night sweats: 1–3	Intensity of Hot Flashes: Mild Frequency of daytime hot flashes: 1–2 Frequency of night sweats: None	4.41	2.92	6.92
Intensity of Hot Flashes: Severe Frequency of daytime hot flashes: >6 Frequency of night sweats: >3	Intensity of Hot Flashes: Mild Frequency of daytime hot flashes: 1–2 Frequency of night sweats: None	5.75	4.90	6.97

Table 4. Example of Age-Specific Change in QALYs for 3 Specific Health State Improvements

Initial Health State	Final Health State	ΔQALY (years per patient)	
		Age ≤ 52	Age > 52
Intensity of Hot Flashes: Severe Frequency of daytime hot flashes: >6 Frequency of night sweats: >3	Intensity of Hot Flashes: Moderate Frequency of daytime hot flashes: 3–6 Frequency of night sweats: 1–3	3.52	4.05
Intensity of Hot Flashes: Moderate Frequency of daytime hot flashes: 3–6 Frequency of night sweats: 1–3	Intensity of Hot Flashes: Mild Frequency of daytime hot flashes: 1–2 Frequency of night sweats: None	3.30	6.77
Intensity of Hot Flashes: Severe Frequency of daytime hot flashes: >6 Frequency of night sweats: >3	Intensity of Hot Flashes: Mild Frequency of daytime hot flashes: 1–2 Frequency of night sweats: None	5.08	6.90

CONCLUSIONS

- Women in the sample were willing to trade longer durations of milder symptoms for shorter durations of severe symptoms.
- Older women and/or women with menopausal experience had higher time equivalents than younger women for the same improvements in health.

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