

Does Insurance Value in metastatic breast cancer vary by age? Testing for variation in willingness to pay for novel treatments among women in the US.

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Objectives



Quantify the “Insurance Value” of a potential new treatment that improves efficacy outcomes for HR+/HER2- metastatic breast cancer (mBC) patients among women without cancer



To examine whether Insurance Value varies across age groups

Study Implications



Conventional value assessment frameworks may underestimate the value of mBC treatments by including only the expected health gains the treatment provides to patients and ignoring Insurance Value of the treatments.



Incorporating non-traditional metrics such as Insurance Value is essential for accurately evaluating total treatment value and informing reimbursement decisions.

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Background

•**Epidemiology:** Breast cancer (BC) is the most common type of cancer for women, with 6% being metastatic at the time of diagnosis and approximately 35% of primary BC patients eventually developing distant metastases.^{1,2} In the US, the average age at metastatic breast cancer (mBC) diagnosis is 62.³

•**Treatment landscape:** Historically, endocrine therapy has been used to treat mBC, but there has been rapid innovation in the treatment of BC in recent years, including the introduction of cyclin-dependent kinase (CDK) 4/6 Inhibitors.⁴

•**Evidence gap:** Payers may be concerned about the costs of treating mBC patients, given the perception that cancer therapies yield limited incremental value for money. However, this perspective fails to account for the broader societal value of treatment or incorporate the value to healthy individuals of reducing future health risks (e.g., risk of death due to disease).⁵

•**Insurance Value** is defined as the value to healthy individuals of reduced uncertainty in health outcomes beyond expected health gains, which can be measured as the difference between (a) the willingness-to-pay (WTP) of the general population for treatment coverage and (b) the expected direct health benefits of an intervention to patients, measured in quality-adjusted life-years (QALYs).

Materials and Methods

SURVEY OVERVIEW

•**Purpose:** To assess individuals' WTP for coverage of a hypothetical new mBC treatment offering improved survival over the standard-of-care (SoC); and to estimate the proportion of WTP representing “Insurance Value” by age group

•**Setting:** Online survey

•**Subjects:** US women ≥ 21 years with no history of cancer stratified into 3 age groups: 21-39, 40-64, ≥65 years of age.

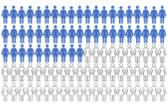
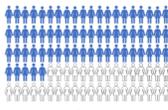
•**Survey Instrument:** Participants were presented with a clinical scenario describing age-specific risk of being diagnosed with mBC in the next year and expected survival for two treatment options. They were then asked, in a sequence of choice tasks, to select between two potential insurance plans (Figure 1).

–**[Insurance Plan 1]** SoC; no additional monthly premium

–**[Insurance Plan 2]** Both SoC and a new treatment with improved survival, but at an additional monthly premium.

The additional monthly premium for Insurance Plan 2 was adjusted iteratively over a series of 6 questions using a random staircase design.⁶

Figure 1. Survey question as viewed by participants

	Insurance Plan 1 (Conventional treatment is covered and available)	Insurance Plan 2 (Both conventional and new treatment are covered and available)
Portion of patients alive 3 years after treatment initiation	 50 out of 100 patients	 65 out of 100 patients
Additional monthly cost	\$0 Beyond what you currently pay	\$9.00 Beyond what you currently pay
Which insurance plan do you prefer?	<input type="radio"/>	<input type="radio"/>

ELICITATION OF INSURANCE VALUE

•**Initial value of additional monthly premium for Insurance Plan 2:** Equivalent to the monthly risk-neutral value of treatment, i.e., per-month value of expected health gains from treatment (Table 1)

$$\text{Annual mBC incidence} * \text{QALY gains of new mBC treatment} * \text{WTP per QALY} / 12 \text{ months}$$

–**Annual mBC incidence:** Calculated by age group from SEER data⁷

–**QALY gains of new mBC treatment:** Health state utility for mBC⁸ * life years gained (new treatment vs. SoC)[†]

[†3-year overall survival benefits: endocrine therapy as SoC; cyclin-dependent kinase 4 and 6 inhibitors as potential new treatment⁹]

–**ICER WTP per QALY Price Benchmark:** \$150,000¹⁰

•**Individuals' monthly WTP for additional coverage** is defined as the premium for Insurance Plan 2 at which a participant is indifferent between the two insurance plans

Estimation of Insurance Value

–**Step 1:** Calculate average maximum monthly premium for Insurance Plan 2 → Average monthly WTP for additional coverage

–**Step 2:** Calculate difference between the average monthly WTP for additional coverage and risk-neutral value of hypothetical new treatment → Insurance Value \ddagger
[‡ No difference between WTP for additional coverage and risk-neutral value indicates \$0 Insurance Value for the treatment]

Statistical analyses

–ANOVA: Variation in Insurance Value across age groups

–T-tests: Differences in Insurance Value across socio-economic strata

•**Sensitivity analysis:** Sample reweighted to match US age-income distribution¹¹

Table 1. Risk-Neutral Value by Age Group

Age Group	21-39	40-64	≥65
Annual mBC Incidence Rate ⁷	0.007%	0.071%	0.135%
Health state utility of mBC ⁸	0.52		
Additional life years gained from new treatment vs. SoC ⁹	2.015		
WTP per QALY ¹⁰	\$150,000		
Monthly risk-neutral treatment value (rounded)	\$1.00	\$9.00	\$18.00

Results

PARTICIPANT CHARACTERISTICS

•Among 306 participants, average age was 51.8 years; 101 were aged 21-39, 101 were aged 40-64, and 104 were ≥65 years old.

•Baseline characteristics: 93.7% were insured, 76.1% were White, and 52.5% had ≥ bachelor's degree.

PRIMARY ANALYSIS

•**Existence of Insurance Value:** 84.6% (n=259) of participants preferred to pay for additional coverage of the potential new treatment at the risk-neutral value of the treatment (Figure 2).

•**Insurance Value:** (Table 2, Figure 3)

–70.1% of the estimated WTP for access to the new treatment was attributed to Insurance Value of the treatment.

–Insurance Value share modestly decreased with increasing age (76.0% for ages 21-39 to 69.5% for ages ≥ 65).

SENSITIVITY ANALYSIS

•Insurance Value share was higher among participants who were White, had more than a high school education, higher income, private insurance, or a connection to a BC patient, (data not shown), consistent with expectation.

Table 2. Percent of participants choosing to pay for coverage of a new treatment at the risk-neutral value (i.e., positive Insurance Value)

Age Group	Monthly Value, \$		
	WTP for Additional Coverage of New Treatment	Risk-neutral Value of New Treatment	Insurance Value of New Treatment
21-39	\$4.17	\$1.00	\$3.17
40-64	\$30.41	\$9.00	\$21.41
≥65	\$59.07	\$18.00	\$41.07
Overall	\$31.49	\$9.42	\$22.07

Figure 2. Percent of participants choosing to pay for coverage of a new treatment at the risk-neutral value (i.e., positive Insurance Value)

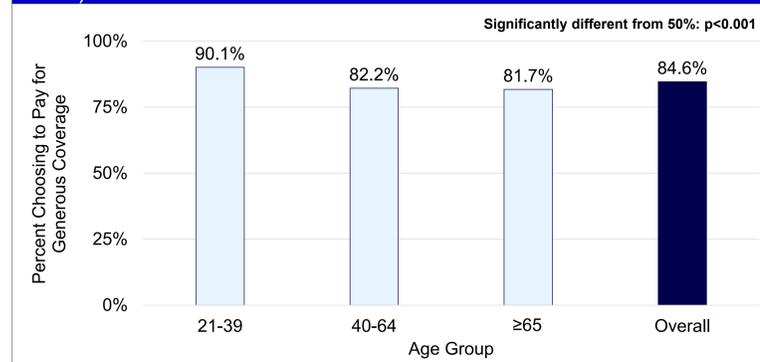
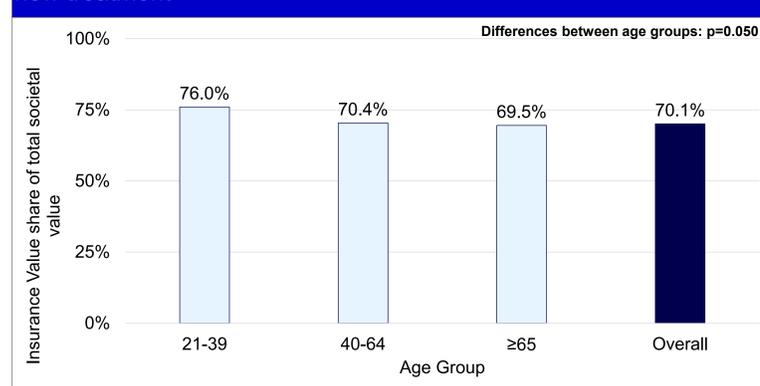


Figure 3. Insurance Value as a share of value to society of potential new treatment



Discussion

•The general population is willing to pay more for coverage of a potential new treatment than the value of the expected health gains the treatment provides to current patients.

•Thus, the value of expected health gains alone understate the value of novel treatments.

•70.1% of what the individuals in the general population were willing to pay for coverage of a potential new mBC treatment was attributed to Insurance Value, or the value from reducing uncertainty in efficacy benefits, beyond the value of expected health gains.

•Insurance Value exhibited modest variability across age groups.

Limitations

•The study included only women from the US general population at risk of breast cancer, which may limit generalizability of these findings.

•The online survey format required internet access and digital literacy, potentially excluding groups whose preferences may systematically differ.

•Survival outcomes for the potential new treatment were based on first-line CDK4/6 inhibitors, thus results may differ for alternative therapeutic classes or lines of therapy.