

Patient Preferences for breast cancer treatments: A Discrete Choice Experiment from four European countries

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Introduction

Breast cancer (BC) treatments have rapidly evolved over the last decade leading to tailored therapies for the different types and stages of breast cancer. Each treatment has a profile of benefits and adverse effects.

A Discrete Choice Experiment (DCE) was conducted to explore the preferences of patients for treatments based on their efficacy, toxicity and general impact on their quality of life.

DCE is a quantitative method that measures the preferences of the individuals and allows the examination of the trade-offs that they make for different treatment options[1]. Participants are presented with alternative hypothetical scenarios and are asked to indicate their most preferred option, with each option involving several attributes and levels (i.e. treatment characteristics).

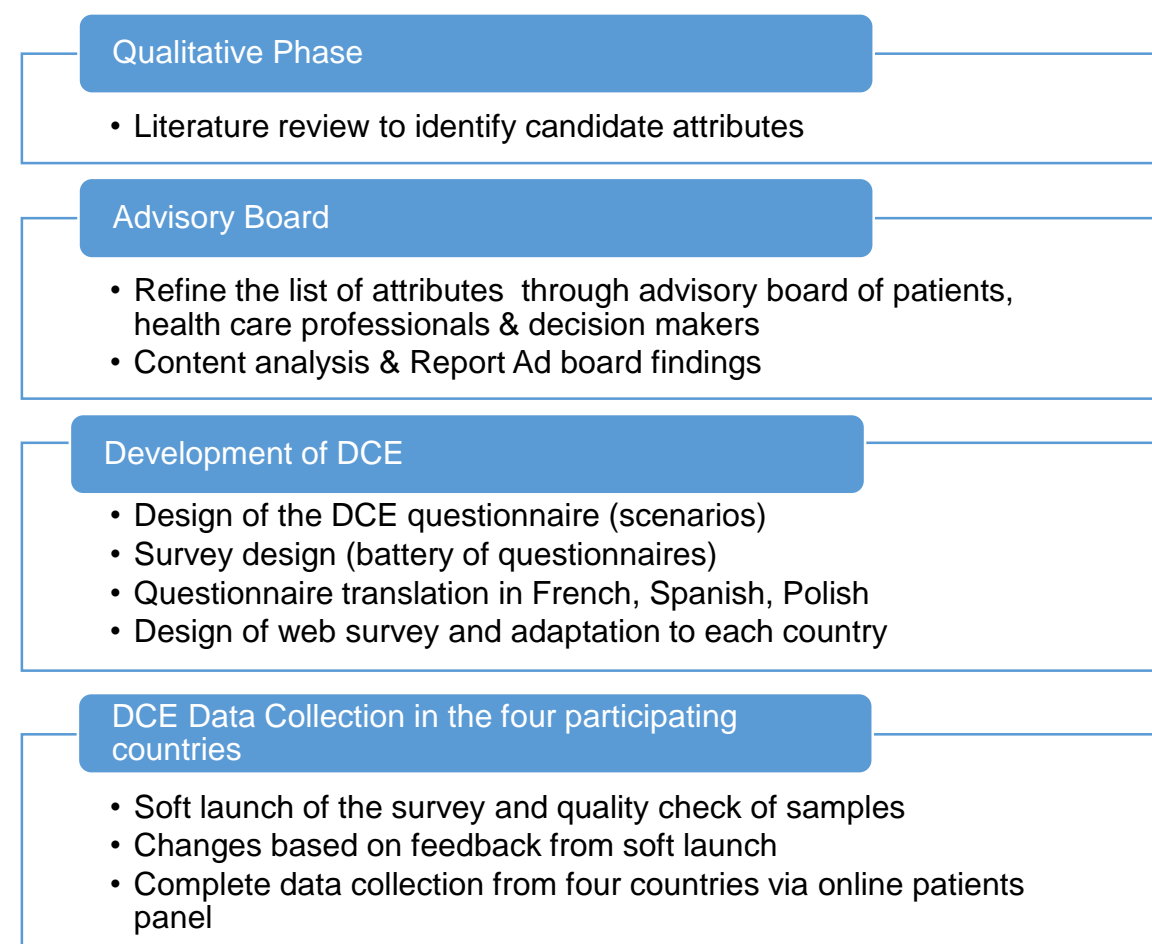
Objectives

- To highlight breast cancer treatment characteristics valued as most important by patients
- Gain information on patients' trade-offs between available treatments.
- To understand breast cancer patient's perspective when choosing their treatment

Methods

Choice of attributes

A multi-step approach was adopted for the selection of the DCE attributes. Literature review identified a list of candidate attributes, which were then refined through an advisory board where BC patients, clinicians and health policy makers participated.



Experimental design and analysis

- Tables 1 and 2 present attributes and levels of DCE emerging from literature review and Advisory Board.
- Experimental design created in SAS software package based on D-efficiency criterion.
- 16 choice-sets per respondent (including 3 warm up scenarios and 2 tests for rationality and consistency): Treatment A vs Treatment B or Opt-out of treatment options.
- Data were analysed with the use of the conditional logit model, a widely used econometric model for the analysis of discrete choice data. [2]
- Out-of-pocket payment, Progression-free survival (PFS) and Febrile neutropenia (FN) were treated as continuous variables, while Pain and Functional well-being (FWB) were dummy-coded, using the most severe level as reference.
- Marginal rates of substitution (MRS) between the Out-of-pocket payment and other treatment attributes were calculated.
- The MRS constitute the "part-worth" values for each attribute, an indicator of the relative weighting of the attributes and the willingness to trade-off between attributes.

Table 1. Attributes and levels for treatment options

Attributes	Levels
Progression-free survival	1: 10 months 2: 15 months 3: 20 months 4: 25 months
Febrile neutropenia	1: 16% chance of occurring 2: 6% chance of occurring 3: 2% chance of occurring 4: 1% chance of occurring
Pain	1: Severe pain 2: Moderate pain 3: None/Mild pain
Functional wellbeing	1: Severely impaired 2: Moderately impaired 3: Not impaired/Mildly impaired
Out-of-pocket payment	1: Euros 0 2: Euros 3,000 3: Euros 5,000 4: Euros 8,000

Table 2. Attributes and levels for "Opt-out of treatment" option

Attributes	Levels
Progression-free survival	5 months
Febrile neutropenia	0% chance of occurring
Pain	Severe pain
Functional wellbeing	Severely impaired
Out-of-pocket payment	Euros 0

Results

Respondents' Socio-demographic and disease characteristics

- The majority of the sample were of white ethnic background, 29% were between 45 and 54 years old, 22% had completed university education
- Most were receiving at the time of the survey, or had received in the past, hormonal therapy and radiotherapy (51% and 58% respectively)
- Patients had either received/or were receiving radiotherapy treatment (58,22%) followed by chemotherapy (51,21%) and hormone therapy (50,94%) at the time of the survey (Table 3)

Table 3. Respondents' characteristics related to their disease and cancer treatment

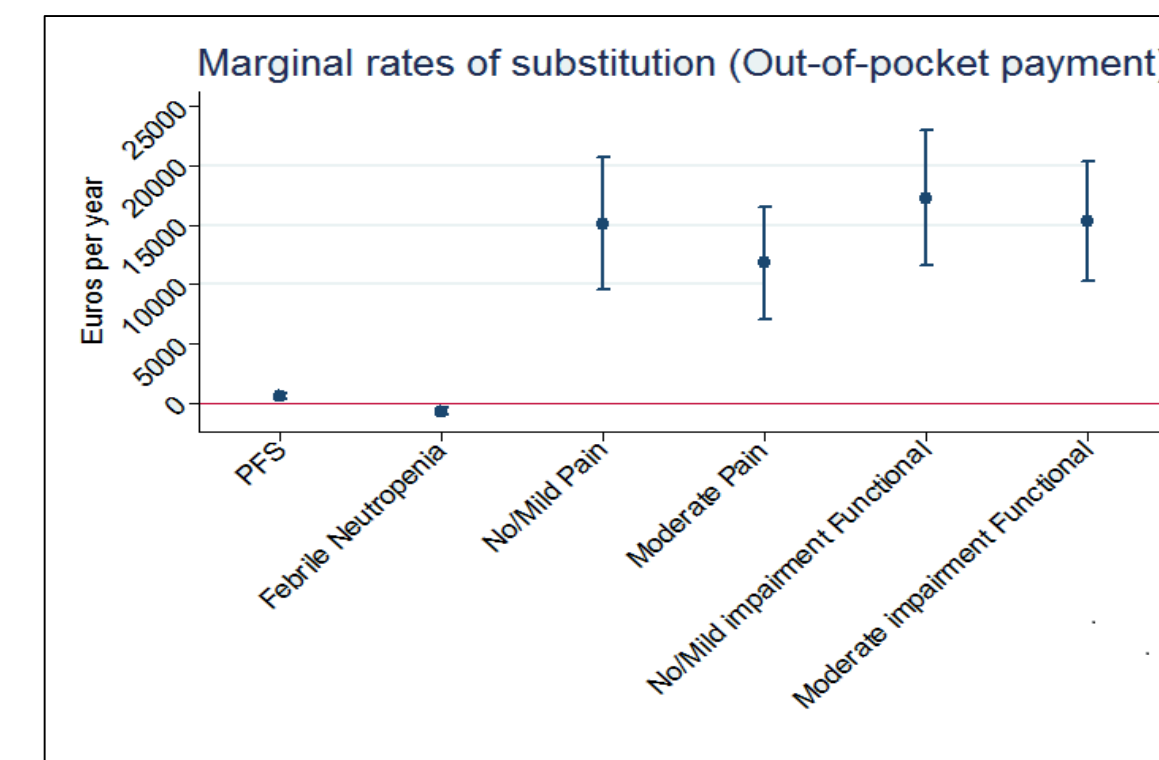
	All countries	France	Ireland	Spain	Poland
	N=371(%)	N=101(%)	N=70(%)	N=100(%)	N=100(%)
STAGE OF CANCER CURRENTLY					
Localised	124(33.42)	14(13.86)	14(20)	28(28)	68(68)
Advanced	31(8.36)	6(5.94)	13(18.57)	7(7)	5(5)
Remission	216(58.22)	81(80.2)	43(61.43)	65(65)	27(27)
STAGE OF CANCER AT INITIAL DIAGNOSIS					
Localised	211(56.87)	45(44.55)	36(51.43)	60(60)	70(70)
Advanced	81(21.83)	27(26.73)	22(31.43)	20(20)	12(12)
I do not know	79(21.29)	29(28.71)	12(17.14)	20(20)	18(18)
TREATMENTS THAT PATIENTS ARE CURRENTLY RECEIVING OR HAVE RECEIVED IN THE PAST					
Chemotherapy	190(51.21)	52(51.49)	37(52.86)	59(59)	42(42)
HER2 targeted therapy	35(9.43)	10(9.9)	11(15.71)	5(5)	9(9)
Hormone therapy	189(50.94)	50(49.5)	27(38.57)	54(54)	58(58)
Radiotherapy	216(58.22)	76(75.25)	39(55.71)	67(67)	34(34)
Cdk4/6 treatments	19(5.12)	0(0)	7(10)	3(3)	11(11)
Other treatments	58(15.63)	17(16.83)	20(28.57)	9(9)	12(12)

Most highly valued attributes: Functional Wellbeing followed by Pain

- The MRS shows the amount in € that the respondents are willing to trade-off (as out-of-pocket payment) to gain 1 month of PFS or to avoid 1% risk of suffering a FN event.
- Patients' preferences are intuitive and move from the severe levels (i.e. the reference levels) to the moderate/no pain or impairment in functional wellbeing.
- Respondents are willing to trade-off the largest amount in €, as out-of-pocket payments per year to move from the severe impairment in the functional wellbeing to "No impairment" level. This is followed by the moderate impairment of the functional wellbeing.
- The respondents were willing to give €17,288 as out-of-pocket payments for No impairment in functional wellbeing, followed by moderate impairment (€15,297) and No pain state (€15,138).
- Patients are willing to pay €574 as out-of-pocket payment for one additional month of PFS which is equivalent to €6,896 per year for one year of PFS.

Table 4. Marginal rates of substitution

Attribute	MRS (€ per year)	Upper 95% CI	Lower 95% CI
Progression Free Survival	574.67	819.05	330.29
Febrile neutropenia (1% risk)	-721.41	-431.54	-1011.28
No pain	15138.99	20724.11	9553.86
Moderate pain	11818.40	16549.91	7086.89
No impairment functional wellbeing	17288.22	23026.47	11549.98
Moderate impairment functional	15297.23	20290.58	10303.88



Strengths and Limitations

Strengths

- This is the first European survey that explore patients' preferences in a quantifiable manner for all currently available breast cancer treatments and all breast cancer patients' profiles.
- Large sample of 371 patients from four European countries.
- The multi-step approach that was followed for identification of attributes ensures content validity of the DCE.
- The quality of the data was assured with a number of checks including consistency, rationality and systematic choice bias checks.

Limitations

- Potential bias towards patients that are technology savvy due to online data collection.
- Diverse patients' profile with respect to the stage of the disease. Some DCE profiles might be directly applicable to a sub-group of the sample.
- PFS was used rather than both PFS and Overall-survival (OS).

Conclusions

- Breast cancer treatments that improve functional wellbeing, pain and progression free survival are considered preferred treatments from patients' perspective.
- Results are intuitive i.e. patients prefer the "better" levels vs. the "worse" levels for all the attributes.
- Functional wellbeing and Pain attributes are considered as the most important from the list of attributes.
- The preferences of breast cancer patients are in line with Pain reduction, Functional well-being improvement and avoidance of Febrile Neutropenia.

Importance

- Patients' preferences move differently from what it is considered as "standard" by the medical society, where the aim is usually to improve the survival (including the progression-free survival) of patients with secondary aim to improve the health-related quality of life.
- Establishing the MRS between a price proxy (e.g. out of pocket payment) and treatment attributes helps in assessing whether treatment-specific benefits (e.g. PFS, Quality of life) are in line with patients' preferences and how much patients value those benefits.
- Such knowledge may also help in the cost-effective provision of new interventions as there may be an option to create a monetary rank-order of various treatments based on the stated patients' values.
- Knowledge of patients' preferences for the different attributes of breast cancer treatments can help clinicians and drug developers tailor the new interventions based on these preferences.

References

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Disclosures

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Sample and Data collection

- 371 patients with breast cancer: localized, metastatic or in remission
- >18 years old
- Four European countries: France, Ireland, Poland and Spain
- The DCE was designed as a self-administered, online survey.

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