



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/jval](http://www.elsevier.com/locate/jval)

## Investigating the Heterogeneity in Women's Preferences for Breast Screening: Does the Communication of Risk Matter?

Caroline M. Vass, PhD<sup>1</sup>, Dan Rigby, PhD<sup>2</sup>, Katherine Payne, PhD<sup>1,\*</sup>

<sup>1</sup>Manchester Centre for Health Economics, The University of Manchester, Manchester, UK; <sup>2</sup>Department of Economics, The University of Manchester, Manchester, UK

### ABSTRACT

**Background:** The relative benefits and risks of screening programs for breast cancer have been extensively debated. **Objectives:** To quantify and investigate heterogeneity in women's preferences for the benefits and risks of a national breast screening program (NBSP) and to understand the effect of risk communication format on these preferences. **Methods:** An online discrete choice experiment survey was designed to elicit preferences from female members of the public for an NBSP described by three attributes (probability of detecting a cancer, risk of unnecessary follow-up, and out-of-pocket screening costs). Survey respondents were randomized to one of two surveys, presenting risk either as percentages only or as icon arrays and percentages. Respondents were required to choose between two hypothetical NBSPs or no screening in 11 choice sets generated using a Bayesian D-efficient design. The trade-offs women made were analyzed using heteroskedastic conditional logit and scale-adjusted latent class models. **Results:** A total of 1018 women completed the discrete choice experiment (percentages-only version = 507; icon

arrays and percentages version = 511). The results of the heteroskedastic conditional logit model suggested that, on average, women were willing-to-accept 1.72 (confidence interval 1.47–1.97) additional unnecessary follow-ups and willing-to-pay £79.17 (confidence interval £66.98–£91.35) for an additional cancer detected per 100 women screened. Latent class analysis indicated substantial heterogeneity in preferences with six latent classes and three scale classes providing the best fit. The risk communication class format received was not a predictor of scale class or preference class membership. **Conclusions:** Most women were willing to trade-off the benefits and risks of screening, but decision makers seeking to improve uptake should consider the disparate needs of women when configuring services. **Keywords:** breast screening, discrete choice experiment, risk, willingness-to-pay.

Copyright © 2017, International Society for Pharmacoeconomics and Outcomes Research (ISPOR). Published by Elsevier Inc.

### Introduction

Breast cancer is the most common cancer in women [1]. Because of the burden and high expense of cancer care, which is an estimated £15 billion annually in the United Kingdom, many Western countries now encourage participation in screening for common malignant diseases [2]. In England, the National Health Service currently invites all women between the ages of 50 and 70 years for screening using mammography every 3 years as part of the National Health Service national breast screening program (NBSP). This and similar NBSPs provided in other countries are based on the premise that regular screening can identify tumors of the breast and ensure that therapy commences as soon as possible [3].

Screening for breast cancer via mammography has been proven to detect cases of breast cancer earlier [4], and women who participate in NBSPs have been shown to have improved mortality rates because of earlier intervention [5]. Nevertheless, because the mammogram produces an image that is interpreted

by a radiographer, there is a chance of a cancer being missed (a false-negative) [6]. There is also a risk that the image will locate either dense breast tissue that is not cancerous (a false-positive) or a true cancer but one that is so slow-growing that it would never have been harmful in the woman's lifetime (termed "overdiagnosis") [7]. The potential for overdiagnosis means women may be recalled for unnecessary tests and biopsies [8]. Whether an NBSP causes more harm than good has been extensively debated by clinicians and academics [3,9–12]. Despite this, few studies [13,14] have quantified women's preferences for the benefits and risks associated with breast cancer screening.

Discrete choice experiments (DCEs) are a commonly used method of quantifying preferences for health care programs [15,16]. DCEs are a survey-based method, underpinned by economic theories [17,18], in which respondents choose their hypothetically preferred option from a choice set comprising a series of discrete options (typically products, programs, or policies), defined in terms of attributes that differ in their levels. Respondents are assumed to trade-off the levels of the attributes in

Conflicts of interest: The authors have no conflicts of interest.

\*Address correspondence to: Katherine Payne, Manchester Centre for Health Economics, The University of Manchester, Oxford Road, Manchester M13 9PL, UK.

E-mail: [Katherine.payne@manchester.ac.uk](mailto:Katherine.payne@manchester.ac.uk)

1098-3015/\$36.00 – see front matter Copyright © 2017, International Society for Pharmacoeconomics and Outcomes Research (ISPOR).

Published by Elsevier Inc.

<http://dx.doi.org/10.1016/j.jval.2017.07.010>

choosing the option yielding the greatest satisfaction or “utility” with a degree of randomness due to unobserved factors [19]. The choices made can be analyzed to reveal the strength of preference they have for the attributes [20].

Systematic reviews of the health care literature have shown that DCEs are increasingly used to elicit preferences for benefits and risks [16,21]. There has also been recent acknowledgment of their usefulness for regulatory decision making about the levels of risk that consumers of health care interventions will tolerate for an associated benefit [22,23]. Nevertheless, numerical probabilistic information is a notoriously difficult concept to communicate [24]. If DCE respondents do not understand the choice task, they may use simplifying heuristics, such as ignoring confusing attributes, violating the axiom of continuity in preferences resulting in biased preference estimates. Reviews of health care DCEs have found risk to be a neglected attribute [16,21]. A systematic review [21] of this literature identified that risk attributes were most commonly communicated quantitatively, most often as a numerical percentage. This is in contrast to recommendations in the risk communication literature that advocate pictures and/or graphics [25,26], which were used in 27 (23%) health care DCEs.

Quantification of women’s preferences for benefits and risks may provide a useful contribution to the debate about the relative merits and harms of an NBSP. In the analysis of DCE data there is an increasing focus on heterogeneity in preference—both its determinants and its implications [27]—because the preferences of the “average” person can be of limited value. Decision makers presented with average preference data, from a sample of respondents, without any idea of the proportion of individuals feeling that way or that the range of these values may have an incomplete view that could hamper generalizations from the study results to the relevant population. This study aimed to examine the degree of heterogeneity in women’s preferences for the benefits and risks associated with an NBSP.

To collect reliable preference data, the elicitation method used must be robust to formatting effects. In breast screening, the communication of risk in invitation leaflets has been controversial [28,29], with some suggesting that the format of risk may affect uptake. A secondary aim of this study was to understand whether preferences were affected by the risk communication format used.

## Methods

This study used an online DCE to elicit women’s preferences for a hypothetical NBSP. Approval for the study was obtained from The

University of Manchester’s Research Ethics Committee (AJ/ethics/1809/13/ref13178). The study was designed and reported in line with published recommendations [30,31].

### Attributes and Levels

Attributes were identified through an iterative process of interviews with clinical experts (n = 4), a patient representative (n = 1) and female members of the public (n = 4), and reviews of the breast screening and DCE literatures. Levels were assigned through literature reviews and consultation with experts (n = 4) to determine a plausible and clinically relevant range. Table 1 presents the attributes and the levels used in the DCE.

The levels for out-of-pocket cost were chosen to reflect the costs associated with taking time off from work and traveling to a screening center (personal communication, Ian Jacob, 2013) and a realistic maximum based on the price of a private mammogram in the United Kingdom [32]. The attribute “probability of detecting a cancer” was assigned a range of 20 years on the basis of a study that found that the average woman entering screening at age 50 years had about a 3.5% probability of detecting a cancer [33]. Other levels were chosen to reflect detection rates achievable through stratified or more frequent screening [34]. Discussions with experts (n = 4) identified “unnecessary follow-up” to be the most pertinent and accurate representation of the downside risk of screening, rather than “overdiagnosis” or “unnecessary treatment.” The attribute was assigned levels on the basis of the results of the Independent Review of Breast Cancer Screening [35], which estimated that just over 1% of women invited for screening would receive unnecessary follow-up, and a review of the Norwegian screening program that estimated that false recalls after mammography could be as high as 20% [8].

### Experimental Design and Questionnaire

Fractional factorial designs can be used when there are too many possible profile combinations of attribute levels [36]. In this study, a fractional factorial design for the DCE was chosen to reduce the number of choice sets and, in turn, respondent fatigue. An experimental design minimizing the D error was generated using Ngene (ChoiceMetrics) [37] originally with conjectured priors, updated after a pilot study. The alternatives created were split into four blocks containing 11 choice sets, guided by the pilot study, including a check for monotonic preferences to verify that the respondents were answering in line with economic theory. Because screening is voluntary and uptake to the NBSP

**Table 1 – Attributes and levels used in the DCE.**

Label	Attribute	Definition	Levels for programs	Levels for opt-out of “no screening”
Detect	Probability of detecting a cancer	The chance of detecting a cancer from screening over a 20-y period	3%, 7%, 10%, 14%	None: no cancers detected (0%)
Risk	Risk of unnecessary follow-up	The probability of being recalled for a procedure or procedures when no harm existed	0%, 1%, 5%, 10%, 20%	None: no unnecessary follow-ups (0%)
Cost	Out-of-pocket cost of screening over a lifetime	The costs of attending the program including original screens and recalls; these could include transport, time off from work, and carer costs	£100 (£20 per screen); £250 (£50 per screen); £750 (£150 per screen); £1000 (£200 per screen)	No cost to you (£0)

DCE, discrete choice experiment.

Download English Version:

<https://daneshyari.com/en/article/7389242>

Download Persian Version:

<https://daneshyari.com/article/7389242>

[Daneshyari.com](https://daneshyari.com)