Preference-Based Assessment

Combining Individual-Level Discrete Choice Experiment Estimates and Costs to Inform Health Care Management Decisions about Customized Care: The Case of Follow-Up Strategies after Breast Cancer Treatment

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A B S T R A C T

Objective: Customized care can be beneficial for patients when preferences for health care programs are heterogeneous. Yet, there is little guidance on how individual-specific preferences and cost data can be combined to inform health care decisions about customized care. Therefore, we propose a discrete choice experiment–based approach that illustrates how to analyze the cost-effectiveness of customized (and noncustomized) care programs to provide information for hospital managers. **Methods:** We exploit the fact that choice models make it possible to determine whether preference heterogeneity exists and to obtain individual-specific parameter estimates. We present an approach of how to combine these individual-specific parameter estimates from a random parameter model (mixed logit model) with cost data to analyze the cost-effectiveness of customized care and demonstrate our method in the case of follow-up after breast cancer treatment. **Results:** We found that there is significant preference heterogeneity for all except two attributes of breast cancer treatment fol- low-up and that the fully customized care program leads to higher utility and lower costs than the current standardized program. Compared with the single alternative program, the fully customized care program has increased benefits and higher costs. Thus, it is necessary for health care decision makers to judge whether the use of resources for customized care is cost-effective. **Conclusions:** Decision makers should consider using the results obtained from our methodological approach when they consider implementing customized health care programs, because it may help to find ways to save costs and increase patient satisfaction.

Keywords: breast cancer, customized care, discrete choice experiment, economic evaluation, individualized care, process-related aspects of care, preference heterogeneity.

Introduction

Heterogeneity in taste is prominent in health care, for example, in variations in preferences between individuals for different treatment programs [1,2]. Furthermore, the rise of consumerism and the growth in available information through the Internet have raised patients' expectations about care and increasingly patients demand care that is more in line with their own individual preferences. This trend emphasizes the importance for health care organizations to evaluate the possibility of offering customized care (also referred to as custom-made care). *Customized care* is defined as health care that is individually tailored on a patient-by-patient basis [3]. We distinguish customized care from personalized medicine, which involves the systematic use of genetic or other information about an individual patient to select that patient's preventative and therapeutic medi- cine or medical intervention [4,5]. Rather, we operationalize customized care more broadly as any type of health care that offers individualized programs that reflect each patient's own preferences. This contrasts customized care with standardized care, which offers the same health care program to all patients, thereby largely ignoring differences in patients' preferences. We note that in daily health care practice intermediate approaches are often followed, for example, on the basis of patient stratification or with clinical practice guidelines that offer doctors the possibility to partially take patients' prefer- ences into account.

Although customized care is potentially beneficial to pa- tients, it is not commonly implemented in practice, possibly because of the fear for high additional communication, cogni- tion, coordination, and capability costs (i.e., the fixed cost in having a capability available, the equivalent of an up-front in-

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Table 1 – Attributes and attribute levels.		
Attributes	Attribute levels	Explanations
Attendance at educational group program	Yes No	The educational group program consists of two group meetings of 2 h, led by a breast care nurse and a health care psychologist, in which patients (and their partners) are informed of the physical and psychosocial consequences of the disease and its treatment, and possible signs of recurrence.
Frequency of visits	Every 3 mo Every 4 mo Every 6 mo Every 12 mo	The frequency of visits determines whether a patient has scheduled follow-up visits every 3, 4, 6, or 12 mo. Regardless of the frequency, patients can always make additional appointments whenever they feel the need.
Waiting time in minutes	5 30 60 90	This is the time a patient has to wait after the set time of the appointment. This can thus be at the hospital or general practitioner's office (face-to-face contact) or at home (telephone contact).
Contact mode	Face to face Telephone	A visit (face-to-face) to a health care provider consists of a short physical examination and open discussion about general well-being and the recovery process. A telephone follow-up consists of an open discussion about general well-being and the recovery process only. If the patient or health care provider feels the need, an additional appointment (face-to-face) can be made.

Health care provider	Medical specialist
	Breast care nurse/
	  nurse practitioner
	General practitioner
	Breast care nurse
	  and medical
	  specialist
		The medical specialist is (preferably) the patient's surgeon, oncologist, or radiotherapist. They may alternate. The breast care nurse is a nurse specialized in breast cancer; a nurse practitioner is a nurse with advanced medical training (master's level). They are both referred to as breast care nurse in the survey. In all cases, the last contact with the health care provider is with a medical specialist to conduct a mammography.

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vestment cost) [3]. The concept of customized care fits well with the principles of shared decision making, in which a doctor and a patient jointly come to a decision about treatment [6,7]. Customized care may potentially generate efficiency gains, because there may be circumstances in which a large proportion of individuals prefer a less costly health care program above a more expensive one. In such a case, introducing customized health care programs that better serve patients' preferences may be an option. It is of paramount importance to determine whether customized care leads to a cost-effective use of resources before it is implemented in practice. For this purpose, insights into individuals' specific health care program preferences are needed, and perhaps even more importantly, a method should be available that allows one to use these preferences in combination with corresponding cost data to inform health care decision makers (e.g., hospital managers) about customized care. To our knowledge, such a method is not available in the health care literature. Yet, when individual-specific preferences are not accurately measured, this can lead to biased utility (welfare) measures and erroneous evaluations of customized care [8,9].

Including individual-specific preferences in cost-effectiveness analysis to inform health care decision making

Traditionally, the focus of cost-effectiveness analysis has lain on identifying average costs and benefits in the population and on the identification of subgroups of patients for which a health care program may be more or less cost-effective. Research, however, has shown that it is also valuable to identify cost-effectiveness on the individual level [10–12]. Therefore, in this article we incorporate individual benefits, instead of average benefits, in cost-effectiveness analysis. More specifically, we provide a method to combine individual-specific preference data, which can flexibly include aspects of care related to health and process (i.e., nonhealth), with health care program–specific cost data to inform health care decision makers about (the cost-effectiveness of) customized care.

Our approach combines individual-specific preferences identified from a discrete choice experiment (DCE) with health care program–specific cost data. A DCE is a method based on stated preferences in which respondents are asked to choose between hypothetical alternatives constructed on the basis of an experimental design. A large number of DCE applications can be found in the health economics literature, and the trend shows that DCEs have been used more widely for health economics research in recent years [13,14]. Traditionally, DCEs are used to elicit patient preferences and to quantify trade-offs between alternative treatments [15–18]. Although there is growing recognition that DCEs have the potential to contribute more directly to outcome measurement for use in economic evaluations [19], the question how DCE data can be used to inform health policy [20] is still relatively unexplored. For example, McIntosh [21] proposed an initial framework for cost-benefit analysis using DCEs and McCormack et al. [22] review different types of benefit measures that can be analyzed to support health policy decisions including DCE-derived welfare estimates as one of the options. However, in these articles, the focus has been on estimating average preferences.

In contrast, we used DCE data to estimate choice models (e.g., the random parameters logit or generalized mixed logit model) that reflect individual-level preferences. Appropriate analysis of DCE data determines whether preference heterogeneity exists, and if so, individual-specific utility estimates for different health care programs can be obtained. More specifically, DCE-based choice models offer utility estimates for all attribute levels of a health care program (including health- and process-related aspects), making it possible to investigate the cost-effectiveness of a wide range of possible programs.

Thus, this article contributes to the literature by presenting a methodological approach of how to combine individual-specific DCE-based preference information with health care program–specific cost data to inform health care decision makers about the cost-effectiveness of customized care. Especially in view of