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Predicting the place of out-of-hours care—A market simulation based on discrete choice analysis

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ABSTRACT

Background: Increasing cost pressure and changing patients' needs in the healthcare sector have led to new delivery models for primary care. Researchers and practitioners need to establish innovative methods to obtain insights into patients' preferences and effectiveness of healthcare services.
Aim: This study reveals the crucial decision criteria of patients in choosing out-of-hours services and provides a projection of a future market share of the newly established central out-of-hours service, called General Practitioner Cooperative.
Design: A computer-aided discrete choice experiment.
Method: Respondents were 350 patients in a European city who decided for a service when confronted with a medical emergency in an out-of-hours case; two scenarios called 'adult' and 'child', describing the persons requiring medical assistance, were used to increase generalizability.
Results: The two most important attributes were 'explanation by the doctor' and 'waiting time' while the others – 'availability of technical equipment', 'ease of access', 'type of consultation' and 'payment method' – were of less importance. The market share projections predict that the new General Practitioner Cooperative will capture about one third of the market ('adult': 39.1%, 'child': 31.3%), ahead of the emergency department, the second most preferred service ('adult': 32.7%, 'child': 30.7%).
Conclusions: This study quantifies the adoption of a new medical service. As a result, it extends current research approaches on eliciting and matching patient's needs and assists policy makers in establishing adequate service capacities.

1. Introduction

The aging society, increasingly demanding patients and cost pressures have steered most recent health care reforms in developed countries [1]. The objective of improving health system efficiency through cost reduction while at the same time increasing patient satisfaction is the focus of the transformations. To ensure better decision making during these reforms, policy makers need to obtain a better understanding of patients' preferences and the effectiveness of existing and new healthcare services [2,3].

With regard to primary care in out-of-hours situations, there is a trend to use hospital emergency rooms (ER) for standard and less urgent problems [4] resulting in poorer service for actual emergency cases. At the same time, the decreasing number of general practitioners and their concerns about out-of-hours workload and 24 h availability have led to an increasing workload and dissatisfaction

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among the remaining general practitioners. Policy makers have attempted to address these trends by organizing out-of-hours care in a more structured and feasible way [5,6]. Ultimately, this led to a stronger centralization of primary care centers in various European countries. As the development of the centralized general practitioner (GP) services has been induced by supply rather than demand conditions, little is known on how well new healthcare services meet existing health care needs [7]. Yet, particularly in countries with a free choice option on various medical healthcare services such as England, Sweden, Belgium, Germany and France, it is important to assess the alternatives' relative effectiveness as it determines their adoption. An alternative way to ensure adoption, i.e., through restricting access to some services has been unpopular with patients, professionals and policy makers as this reduced accessibility and quality of primary care in many European countries [8].

Several studies on the use of and satisfaction with GP centers have been conducted [6,7,9,10]. The majority of these studies are based on the assumption that greater satisfaction and loyalty will be reached if patients give high assessments of all individual service elements such as treatment quality, waiting time and accessibility. However, this approach is lacking in estimation of trade-offs between the service elements which would describe patients' behavior in a more realistic way [4,11]. Furthermore, context dependent questions, such as 'why do people prefer one service over another' or 'what is the impact of the new service on the competition' are not answered. Nevertheless, they are important from a scientific as well a practitioners' point of view and warrant further research [3,12].

General research on new services reports a 40% failure rate indicating the intricacy in their development and launch [13]. Crucial factors hereby are a lack of unique customer benefit compared with existing services and the setting of unrealistic market potential and adoption goals [14]. An accurate market assessment is suggested to support better predictions of the demand and service-customer fit [15].

Therefore, this study investigates critical decision criteria in choosing out of hours care and the effectiveness of a new out-of-hours service through a market share prediction. Firstly, the critical characteristics of an out-of-hours healthcare service are identified and the relative importance of the attributes in the decision process estimated. Secondly, a market simulation predicts how well the newly established GP center (General Practitioner Cooperative: GPC) matches these needs and hence, how it will be adopted in comparison to the alternatives of the emergency department (ER), a house visit by a general practitioner (HV) or a pediatric consultation (PD). The findings give policy makers valuable information on the effectiveness of a new medical service to adjust its design and capacity before the final roll-out when changes are more costly [16,17].

2. Methodology

Discrete choice experiments (DCEs) are a popular instrument in healthcare economics [e.g., 2,3,18] to determine how individuals make trade-offs in choosing competing services. It is based on the premise that patients assess the value of a service by combining the separate amounts of values assigned to each service attribute. Moreover, it assumes that the value is not directly observable but only the overall choice. Patients can best provide judgment on objects formed by a combination of attributes rather than on each separate attribute [11]. It is more realistic because respondents are confronted with decisions similar to the ones they face in their daily lives [12]. Evaluating bundles of attributes increases not only the realism but also the complexity for respondents. Earlier studies emphasized restricting the number of attributes and choice tasks depending on the applied method [18].

Table 1
Service attributes and levels.

Attributes	Levels
Type of consultation	Hospital emergency department – ER General practitioner Cooperative – GPC Home visit by the general practitioner on duty – HV Pediatrician – PD (in 'child' scenario)
Waiting time between first contact or call and consultation	Less than 30 min Between 30 and 90 min More than 90 min
Information about health problem and therapy	Doctor does not give enough information Doctor gives enough information
Accessibility of the service	Location and phone number are not known Location and phone number are known
Availability of technical equipment	Available Not available
Method of payment	Immediate payment Deferred payment (sent by invoice)

DCEs allow understanding of the relative importance of one attribute with respect to the overall utility and to what extent a desirable attribute level can compensate for a less acceptable level of another attribute [11]. The availability of tools such as market simulators to measure economic outcomes is another reason for the popularity of DCE [19]. A market simulator allows forecasts of how patients might react when a new service is introduced into an existing market. The market simulation based on DCEs comprises four steps: establishing the attributes and levels; choosing alternative scenarios to present; establishing and estimating preferences; and simulating market behavior [16].

2.1. Attributes and levels

We identified a pool of different attributes and their levels based on a review of medical and services literature [3–5,7,19–21]. Afterwards, we conducted semi-structured interviews with key informants, i.e., GPs, academic researchers and patients to verify, prioritize and refine the service characteristics as well as to assure the relevance for the health care systems' context. Several iteration rounds led to our final, limited set of attributes and levels that were realistic, tradable and comprehensible (Table 1 [18]).

2.2. Scenarios

The next step concerns the context for the patients. To increase the generalizability and robustness of our findings,