

Where Would You Go for Your Next Hospitalization?

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Introduction

- Three non-controversial assertions:
 - Medical providers vary in diverse dimensions of quality (clinical quality, interpersonal skills, patient outcomes)
 - Consumers are likely to value each of these dimensions
 - It is often difficult for consumers to observe provider quality in health care markets (Arrow, 1963)
- Policy recommendation: Improve consumer information for better decisions and better-performing health care markets
- But implementing this recommendation has been surprisingly difficult

Introduction (2)

- Recent efforts have focused on public release of comparative quality information often including clinical quality
 - Consumer response has been small
 - Consumers may not value such information or they already know about it prior to public reporting
- Let's step back and ask, what types of quality information would consumers value and use in making health care decisions?
 - The answer may help to devise effective strategies to increase consumer information
 - Few studies have examined this question

Our research objective

To examine the effects of different dimensions of hospital quality in the context of a future hospital choice

We focus on:

- 1) consumers' perceptions of unobservable (to researchers) quality attributes, such as hospital reputation and amenities
 - 2) hospital clinical quality, whose indicators are often included in public reporting programs
 - 3) consumers' satisfaction from their own recent experiences with hospitals
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Literature on hospital choice

- Consumers chose closer hospitals (Porell & Adams, 1995): distance used as instrument in clinical effectiveness studies
- After release of report cards, consumers chose hospitals with lower than expected mortality rates, but effects were small (Mukamel et al., 2004/2005; Dranove & Sfekas, 2008)
- Financial incentive for using “safer” hospitals had mixed effects on hospital choice (Scanlon, Lindrooth, and Christianson, 2008)

Hospital quality and choice

- Goal of prior studies has been to obtain unbiased estimates of the impact of reported quality information on choices
- Researchers realize that consumers' perceptions of unmeasured quality may play a significant role in hospital choice
- Researchers rely on hospital fixed effects to control for perceptions of unmeasured hospital quality
 - Fixed effects capture multiple unmeasured quality attributes with a single variable
 - Can't examine the contributions of different attributes to choice

Our approach

- We utilize stated preference data to infer consumers' perceptions of unobservable hospital attributes (e.g. reputation)
- We estimate parameters of a hospital choice model that reveals consumers' perceptions of several unmeasured hospital attributes
- We identify the average amount of each unobserved attribute offered by each hospital
- Enables us to examine the relative contribution of each attribute to consumer utility

Additional contribution

- We include satisfaction ratings from consumers' own experiences in the hospital choice model
 - Certain important features of hospital quality can be evaluated only by experience
 - Consumers report they use experience to make health care decisions (Feldman et al., 2000; Schultz et al., 2001)
 - We estimate the impact of individual satisfaction ratings on hospital choice in terms of a driving time trade-off: how much longer would you drive to a hospital where you had a satisfying prior experience?

Study setting and data

- Survey of employees or covered spouses working for a large, self-insured employer in one metropolitan area
 - Administered twice: Spring 2004 and Spring 2005
 - Independent random samples stratified by union status and hospitalization in the last year
 - 70% cooperation rate
- Key variables from the survey
 - Future hospital choice from a hypothetical question
 - Stated preference weights for four unobserved attributes: Overall reputation, medical services, amenities, and out-of-pocket (OOP) cost
 - Future choice and preference-weight data available for both users and non-users
 - Satisfaction with prior hospital for users on a 1 to 10 scale

Stated preference weights

- Example of question for reputation:
 - “On a scale of 1 to 10, with 1 being not at all valuable and 10 being extremely valuable, please rate each item.”*
 - “The next time you decide which hospital to use for inpatient services, how valuable would you find the hospital's overall reputation?”*
- Preference weights represent importance of each attribute to the chooser, not how much of the attribute was present at any particular hospital
- Medical services offered (e.g. cardiac bypass surgery)
- Amenities (e.g. private rooms and convenient parking)
- Out-of-pocket cost

Other data sources

- 2005 Hospital Quality Initiative (HQI)
 - Hospitals' clinical quality scores for treating heart attacks, heart failure, and pneumonia among Medicare patients
 - CMS released the scores in April, 2005 (after 2nd survey)
 - Not publicly available during our study period, but consumers may have known about hospital quality by word of mouth
 - We include this measure in the models, as well as an interaction of the quality score x 2005 survey to capture any trend in awareness
 - Mapquest.com: driving time to each hospital
 - American Hospital Association: hospital profit status and teaching status
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2-Stage model and estimation strategy

- ❑ Stage 1: Use stated preference data from non-hospitalized (naïve) people to estimate future hospital choice model
 - Identifies average hospital-specific beliefs about unobserved hospital attributes
- ❑ Stage 2: Use data from hospitalized people to estimate future choice model
 - Identifies the influence of different dimensions of hospital quality, including consumers' beliefs obtained from the first stage, on future hospital choice

1st stage: consumers' perceptions of quality

- Based on approach developed by Harris & Keane (Journal of Econometrics, 1999); used by Harris, Schultz & Feldman (Journal of Health Economics, 2002)
 - Estimate choice model for non-hospitalized people that includes interactions between individual preference weights and hospital dummy variables
 - Turns the normal utility-based choice model on its head:
 - Preference-weight interactions on reputation, medical services, amenities, and OOP cost are variables
 - Coefficients represent perceptions of average amount of each unmeasured attribute possessed by each hospital, relative to a reference hospital
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Estimation – stage 1

- The naïve consumer's expected utility of using hospital j is:

$$(1) \quad U_{ij} = \alpha R_j + \beta E_{ij} + \gamma D_{ij} + \varepsilon_{ij}$$

- R_j – hospital j 's observed attributes, e.g. clinical quality
 - E_{ij} – consumer i 's beliefs about hospital j 's unobservable attributes
 - D_{ij} – driving time
- We do not observe E_{ij} but we observe the individual's preference weights for the attributes, β_i , so we estimate:

$$(2) \quad U_{ij} = \alpha R_j + \beta_i E_j + \gamma D_{ij} + \varepsilon_{ij}$$

1st stage: other explanatory variables

- Driving time from centroid of person's residence zip code to each hospital
- Hospital teaching status (yes or no)
- Hospital profit status (for-profit or non-profit)
- Hospital HQI score
- Hospital HQI score x 2005 survey

2nd stage: future hospital choice

- Extends Harris & Keane by asking how perceptions of unobserved attributes affect future choices
- Estimate future choice among hospitalized people as function of:
 - Consumers' perceptions of unobserved hospital attributes (from 1st stage)
 - Indicator for prior use of specific hospital (yes or no)
 - Satisfaction with hospital used (1-10 scale)
 - Other covariates as in 1st stage
- Standard errors based on bootstrapping because model includes estimates of E_j

Estimation – stage 2

- The next equation describes how experienced (k) consumers update their beliefs about quality:

$$(3) \quad E_{kj} = (1 - h)E_j + h(S_{kj}I_{kj} + I_{kj})$$

- E_j – average hospital-specific belief before experience
- I_{kj} – indicator of use (1 if consumer k used hospital j; 0 otherwise)
- S_{kj} – satisfaction rating
- h – weight given to experiential signal

Substitute (3) into (1):

$$(4) \quad U_{kj} = \alpha R_j + \beta (1 - h)E_j + \beta h S_{kj} I_{kj} + \beta h I_{kj} + \gamma D_{kj} + \varepsilon_{kj}$$

Why 2 stages?

- ❑ 1-stage choice model using preference weights from hospitalized people would reveal how experienced consumers perceive unmeasured attributes across hospitals (e.g. hospital A has good reputation, B has poor reputation, etc.)
- ❑ However, it would extract all the information from the data
- ❑ We need 2nd stage to estimate the effects of these attributes on choices
- ❑ Future work: how do naïve and experienced consumers' perceptions of quality differ?

Descriptive statistics

- We used data from 15 hospitals chosen by 15 or more people
 - 969 recently-hospitalized and 790 non-hospitalized people
 - Driving time: 41.2 min (SD = 24.5 min)
 - Average preference weights among non-hospitalized people:
 - Reputation = 8.41
 - Medical services = 8.78
 - Amenities = 6.62
 - Out-of-pocket cost = 7.55
 - Satisfaction rating (among users): 8.11
 - Intention to use another hospital (among users): 31.7%
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1st stage: perceptions of unobserved attributes

	Coefficient	Reality check
<i>Reputation</i>		
Hospital 11	22.210***	These hospitals are affiliated with systems (multiple hospitals under common ownership)
Hospital 12	19.468*	
Hospital 14	31.507***	
<i>Medical services</i>		
Hospital 5	38.388***	Hospital 5 has 2 nd largest number of AHA services
<i>Out-of-pocket cost</i>		
Hospital 1	-25.135***	Union employees using these hospitals have to pay out-of-pocket cost sharing
Hospital 2	-15.583**	
Hospital 9	-12.820**	
Hospital 11	-15.343***	
Hospital 12	-13.922*	

*p<0.10, **p<0.05, ***p<0.01; preference weights for amenities never significant

2nd stage: future choice model for users

Specification:	(I) Basic Model	(II) Add Perceptual Parameters	(III) Add Experience
<i>Measured hospital char.</i>			
Driving time	-0.073***	-0.081***	-0.045***
For-profit	-1.880***	-0.625**	-0.416
Teaching	0.699***	-2.290***	-2.013***
HQI score	0.092***	0.086***	0.063***
HQI score x 2005 survey	-0.021	-0.019	-0.021
<i>Perceptual parameters</i>			
Reputation		0.722***	0.617***
Medical services		0.969***	0.695***
Out-of-pocket cost (+ scale)		-0.392***	-0.390***
<i>Experiential measures</i>			
Use indicator			3.253***
Satisfaction rating			0.820***

Model III effects

1 SD Increase in Variable (or other indicated change)	Effect on Use from 20% Baseline (or other measure of effect)
Medical services	31%
Reputation	29%
HQI score	25%
Prior use (0 → 1)	64 %-point increase
Satisfaction rating	18.6 minute increase in driving time

Our approach vs. fixed effects

	Model III	Hospital Fixed Effects
<i>Driving time</i>	-0.045***	-0.047***
<i>Perceptual parameters</i>		
Reputation	0.617***	-
Medical services	0.695***	-
Out-of-pocket cost (+ scale)	-0.390***	-
<i>Experiential measures</i>		
Use indicator	3.253***	3.271***
Satisfaction rating	0.820***	0.818***

Sensitivity analysis (1)

	<i>Weights on physician recommendation</i>		<i>Admission through emergency room</i>	
	Top tertile	Bottom	Yes	No
<i>Perceptual parameters</i>				
Reputation	0.677***	0.774***	0.783***	0.467***
Medical services	0.931***	0.690***	0.691***	0.704***
Out-of-pocket cost (+ scale)	-0.330*	-0.562***	-0.557***	-0.244***
<i>Experiential measures</i>				
Use indicator	3.578***	3.142***	3.091***	3.356***
Satisfaction rating	0.796***	1.029***	0.884***	0.779***

Sensitivity analysis (2)

- The estimated perceptions of reputation and medical services may simply reflect the popularity of certain hospitals
- We estimated model III including the perceptual parameters and the share (percentage) of naïve consumers who named each hospital as their first choice
 - Perceptual coefficients did not change
 - The share variable was not significant
- Suggests that the perceptual parameters do not omit relevant unobserved dimensions of quality

Summary of results (both stages)

- Naïve consumers perceive differences in reputation, medical services, and OOP costs across hospitals
- Large effects of consumers' beliefs about unobservable attributes are consistent with a study of health plan choice (Harris, Schultz & Feldman, 2002)
- Consumers may already know about hospital clinical quality prior to public reporting, but its contribution to hospital choice is small (the effect may be larger after public reporting)
- Large effect of prior use is consistent with literature
- Satisfaction with prior hospital has a large effect on future hospital choice

Limitations

- Data were obtained by prospective questions
 - Hypothetical future choices may differ from actual choices
 - But we avoid potential biases associated with repeated hospitalizations
- Stated preference data were collected from non-hospitalized people during a survey window
 - Did not control for hospital use before the window
 - Non-users may not be as naïve as we think
- We can estimate only average hospital-specific beliefs
 - Use indicator may capture individual heterogeneity in beliefs

Discussion

- Recent trend to include information about patient satisfaction in hospital “report cards”
 - Medicare initiated hospital satisfaction ratings in 2008
 - Inexperienced consumers may turn to report cards that contain quality measures based on others’ experience
 - Consider publicizing information about hospital reputation and medical services
 - May represent what consumers would like to see
 - This would increase consumers’ responses to report cards
 - Reporting of comparative out-of-pocket cost data would be relevant for consumers who face OOP cost differences among hospitals
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Discussion (2)

- Efforts are needed to increase consumers' awareness and use of quality information to overcome effects of persistence in hospital choice
 - Employers can disseminate quality information
 - Ensure that physicians are informed about hospital quality and incorporate it in their recommendations
- Goal: use economic analysis to design effective strategies to increase consumer information and improve performance in health care markets