

The Effects of Hospital Safety Scores, Total Price, Out-of-Pocket Cost, and Household Income on Consumers' Self-reported Choice of Hospitals

Christopher C. Duke, PhD,* Brad Smith, PhD,† Wendy Lynch, PhD,* and Michael Slover, MS*

Objectives: The study measured the relative influence of the following 3 factors in consumers' choice of hospitals: (1) cost, (2) out-of-pocket cost, and (3) safety as measured by Leapfrog Hospital Safety Score letter grade.

Methods: Two hospital-choice questions regarding a hypothetical medical procedure were administered to 2357 online respondents. In question 1, respondents were assigned a scenario in which hospital 1 grade (A through D), hospital 2 grade (B through F), and hospital 2 total cost (3 levels) were randomly varied across respondents. In all cases, hospital 2 had a lower safety grade than hospital 1, and hospital 1 cost was held constant. In question 2, scenarios varied out-of-pocket cost rather than total cost. Demographic characteristics, income level, health status, health literacy, and opinions about value were also measured.

Results: On average, 94% and 88% of the respondents chose the safer hospital in questions 1 and 2, respectively. In all but 1 of 30 possible scenarios, where hospital 2 cost the individual \$1000 less and was rated a B whereas hospital 1 was rated an A, respondents chose the safer hospital. Higher incomes, higher health literacy, and being female were associated with a stronger preference for hospital 1 (safer). There was a small effect suggesting that approximately 4% of the respondents selected a higher-cost hospital despite lower safety, but it was outweighed by predominant selections of the safer hospital.

Conclusions: When shown Hospital Safety Score and cost information, consumers chose safer hospitals in 97% of cost and safety scenarios.

Key Words: patient safety, consumer health information, hospital costs

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Increasing levels of transparency in health care costs, safety, and quality are becoming part of public reporting in the U.S. health care system. Significant developments in transparency have occurred in 2013. The Department of Health and Human Services released price information comparing 100 different procedures across 3000 hospitals.¹ In addition, the status of state laws reinforcing transparency received attention through the release of a public report card.²

As consumers face increasing levels of cost responsibility in the form of high-deductible plans and health spending accounts, the availability of price information becomes more essential.³ Price transparency is presumed to introduce more competition and to increase consumers' ability to assess the value of their health care choices.⁴ However, studies indicate that price information alone can lead to misinterpretation by consumers who may equate higher cost with higher quality.^{5–7} Thus, researchers suggest balancing price information with indicators of health care quality or safety.⁶ Similarly, there is concern that many consumers

do not trust public reporting of health care quality⁸ and that quality data can be complex and confusing.⁹ Ideally, consumers could access simple, straightforward indicators that support meaningful choices about both cost and quality.¹⁰

To better explain hospital safety to consumers, a variety of patient safety measures have been developed, such as those from Consumer Reports, Health Grades, and the Leapfrog Group. The Leapfrog Hospital Safety Score was calculated under the guidance of a blue ribbon panel of patient safety experts, and its methodology and data were publicly disclosed and reviewed in the literature. This score combines numerous metrics regarding error rates, accidents, and infections into a single, simple letter grade from A to F.¹¹ Its developers sought to simplify consumer choice into one easy-to-understand yet scientifically valid metric. As such, it could serve the purpose of informing consumers without adding complexity.¹²

Given the increasing availability of hospital pricing, such as those available through the Department of Health and Human Services^{1,2} and safety scores,¹¹ we sought to investigate how both pricing and safety information influenced patient choice in hospitals. This study conducted a survey that combined Hospital Safety Scores and price information to test the degree to which a safety letter grade and cost of surgery influenced consumer choice of hospital. Both total cost (to payer and consumer) and individual cost were studied in combination with safety score. In addition, the survey included measures of household income, health literacy, and opinions about health care value to assess whether these attributes influence choices about safety and cost.

METHODS

Survey questions were administered via a Web portal to a panel of respondents managed by Survey Sampling International. Eligible respondents had to have traditional indemnity or preferred provider organization health insurance, not Medicare or Medicaid. A total of 2592 respondents completed the survey. Of those, 235 surveys were removed because of incomplete or questionable responses, for example, completing the survey 70% faster than the median duration, choosing nonsensical or repeat pattern responses. Panel participants provided self-reported information about age, sex, and household income. The typical completion time for the survey was approximately 15 minutes.

Survey questions collected information about health status and recent hospital care, opinions about health care value, health literacy, and 2 questions posing hypothetical choices between 2 hospitals. For health status, respondents rated their current health on a scale of poor, fair, good, very good, or excellent. They were also asked if they had 1 or more hospital stays in the past 12 months. Regarding health care value, respondents were asked their level of agreement (5-point Likert scale from strongly disagree to strongly agree) with the following statements: "Cost is an important part of my health care choices"; "I look for the best health care, regardless of cost"; and "Sometimes, I shop to find the best value in health care." Moreover, respondents were asked to

From the *Center for Consumer Choice in Health Care, Altarum Institute, Ann Arbor, Michigan; and †Health Systems and Services Research, Drexel University, Philadelphia, Pennsylvania.

Correspondence: Christopher C. Duke, PhD, Center for Consumer Choice in Health Care, Altarum Institute, 3520 Green Court, Suite 300, Ann Arbor, MI 48105 (e-mail: chris.duke@altarum.org).

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rate whether the following behavior, “I use official ratings of doctors to see how well their patients are doing,” described them (5-point scale from “not at all like me” to “very much like me”).

Health literacy was measured using the Medicaid passage from the Short Test of Functional Literacy in Adults.¹³ Survey respondents read a short passage followed by sentences where words were omitted. To complete the survey, respondents selected 1 word from 4 options to fill in the omitted words. As an example, “I can _____ a hearing by writing or _____ the county where I applied.” With options of (a) request, (b) refuse, (c) fail, and (d) mend for the first blank and (a) counting, (b) reading, (c) calling, and (d) smelling for the second blank. There is a possible perfect score of 20 if all blanks are completed correctly.

Hospital-choice questions were introduced using a graphic (Fig. 1) and the following text:

“According to the leading experts in hospital safety, some hospitals have much greater safety than others. The diagram below shows one area of the country and the safety grades hospitals achieved. Scores were created by an independent, non-profit group advised by experts based on the actual experiences of patients in these hospitals. A hospital with an A grade is the safest, with fewer problems such as infections, injuries, medication errors, and deaths during surgery. Hospitals with an F have the worst safety record, where patients have a much greater chance of dying or getting sicker or injured while there. ‘Total cost’ is what the hospital charges you and your insurer, but ‘your cost’ is the only part that you personally would pay.”

Hospital safety scores were modeled after the grades given by Leapfrog. Although multiple hospital safety ratings exist, Leapfrog was chosen as a model because of the simplicity in communicating a single-letter grade in an experimental design and because their methodology is peer reviewed.¹¹ The first question about hospital choice was a discrete choice between 2 hospitals, where information about safety and total cost varied randomly across respondents, although personal cost did not vary. In all cases, hospital 1 had a total cost of \$35,000. However, safety grade was A, B, C, or D. For hospital 2, safety was always lower than hospital 1 and varied randomly as B, C, D, or F. On hospital 2, total cost (not out-of-pocket [OOP] cost) was one of 3 values

as follows: \$17,500, \$35,000, or \$52,500. This represented a 10 × 3 between-participants experimental design (10 levels of safety score differences and 3 levels of total cost). The result was 30 different possible scenarios from which to choose, shown in Table 1. Each respondent evaluated 1 scenario. Every 1 of the 30 scenarios was evaluated by approximately 80 respondents.

To test the differences in hospital choice across cost levels, we used a series of dummy variables to compare the price tags that were put on hospital 2 (Table 1). Hospital 1 was always priced at \$35,000. Our contrasts compared the likelihood of selecting hospital 1 when hospital 2 was priced higher and then again when it was priced lower, contrasted against the cases where hospital 2 was the same price (\$35,000) as hospital 1. The comparison where hospital 2 was priced lower than hospital 1 (\$17,500 versus \$35,000) assesses cost consciousness. The comparison where hospital 2 was priced higher than hospital 1 (\$52,500 versus \$35,000) assesses the prevalence of consumers who equate cost and quality and select a higher-priced option despite worse safety.

The second question was designed similarly, except that OOP cost varied across 3 options as follows: \$500, \$1500, and \$3000 (Table 2). Again, there were 30 scenarios of cost and safety, each of which was administered to approximately 80 respondents. This represented a second 10 × 3 between-participants experimental design (10 levels of safety score differences and 3 levels of OOP cost). There was no systematic association between the assigned scenarios in the 2 hospital-choice questions.

In summary, both hospital-choice questions varied the safety scores, with the second hospital always having a lower rating than the first hospital. In the first question, the total surgery cost varied but not patient OOP cost. In the second question, the patient OOP cost varied but the total cost did not. All participants completed both hospital-choice questions.

All statistical analyses were conducted using SAS software, version 9.2,¹⁴ and Stata 11.¹⁵ Rates of selecting hospital 1 were calculated for each combination of safety and price. In addition, logistic regression models were used to predict the likelihood of selecting hospital 1. Predictors included safety score of hospital 1, difference in safety score (number of grades lower) between hospital 1 and hospital 2, price relative to hospital 1, sex, age

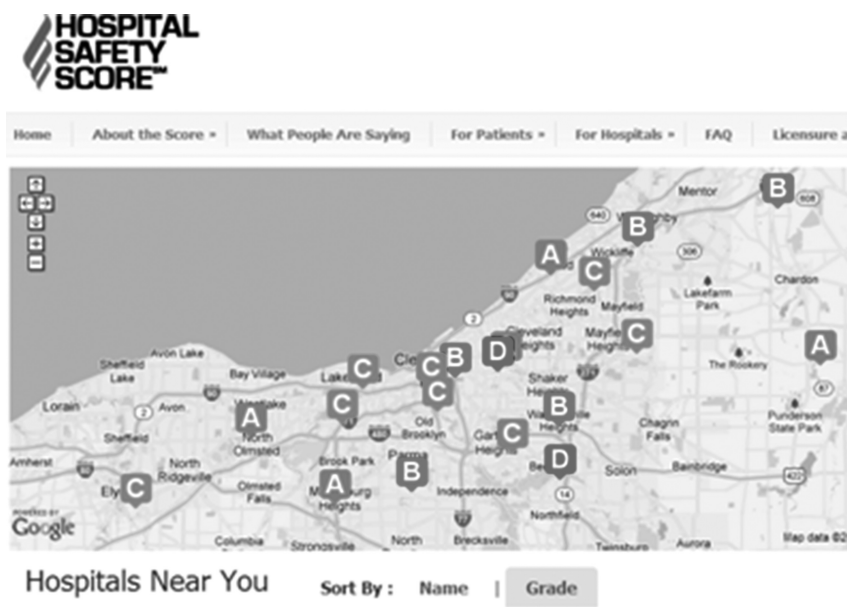


FIGURE 1. Hospital safety score graphic.

TABLE 1. Variables Testing Consumer Choice With Total Cost Scenario

		Question 1							
		Hospital 1			Hospital 2				
		Price, \$17,500			Price, \$35,000				
		Price, \$52,500							
Safety		B	C	D	F	B	C	D	F
Hospital 1 Price, \$35,000	A	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 11	Scenario 12	Scenario 13	Scenario 14
	B	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 15	Scenario 16	Scenario 17
	C	Scenario 8	Scenario 9	Scenario 10	Scenario 18	Scenario 19	Scenario 20	Scenario 21	Scenario 22
	D							Scenario 23	Scenario 24
								Scenario 25	Scenario 26
								Scenario 27	Scenario 28
								Scenario 29	Scenario 30

TABLE 2. Variables Testing Consumer Choice With OOP Cost Scenario

		Question 2							
		Hospital 1			Hospital 2				
		OOP, \$500			OOP, \$1500				
		OOP, \$3000							
Safety		B	C	D	F	B	C	D	F
Hospital 1 OOP, \$1500	A	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 11	Scenario 12	Scenario 13	Scenario 14
	B	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 15	Scenario 16	Scenario 17
	C	Scenario 8	Scenario 9	Scenario 10	Scenario 18	Scenario 19	Scenario 20	Scenario 21	Scenario 22
	D							Scenario 23	Scenario 24
								Scenario 25	Scenario 26
								Scenario 27	Scenario 28
								Scenario 29	Scenario 30

TABLE 3. Demographic Characteristics

Variable	Frequency	Percentage
Sex		
Male	982	41.66
Female	1375	58.34
Age		
25–34	619	26.26
35–44	518	21.98
45–54	611	25.92
55–64	555	23.55
65+	54	2.29
Income		
<\$20,000	37	1.57
\$20,000–\$29,999	129	5.47
\$30,000–\$39,999	266	11.29
\$40,000–\$49,999	305	12.94
\$50,000–\$59,999	298	12.64
\$60,000–\$74,999	386	16.38
\$75,000–\$99,999	422	17.9
\$100,000–\$149,999	352	14.93
\$150,000+	162	6.87
Literacy		
Mean	18.8	
SD	1.62	
Value seeking		
Mean	3.1	
SD	1.04	
Total	2357	

group, household income, health status, hospital use in the past 12 months, and opinions about health care value.

RESULTS

Demographic characteristics of respondents are shown in Table 3. Fifty-eight percent of respondents were female, and 42% were male. All age groups between 25 and 64 years were well represented; each decade of age had 22% to 26% of the respondent population. Self-reported household incomes ranged from less than \$20,000 to more than \$150,000. The median category was \$60,000 to \$74,900, and 20% of the respondents reported a household income of more than \$100,000.

A majority of respondents (41%) agreed or strongly agreed (24%) with the statement, “Cost is an important part of my health care choices.” Forty percent were neutral regarding the statement,

“I look for the best health care, regardless of cost,” whereas another 40% agreed or strongly agreed. Twenty-seven percent disagreed with the statement, “Sometimes, I shop to find the best value in health care,” whereas 35% were neutral and 38% agreed. On the behavior of comparing doctors, only 5% reported it being “very much like me,” 31% said it was “not at all like me,” and 25% said it was “somewhat like me.”

Because many of the items in health literacy were very simple, a score of less than 10 was considered an indication that the respondent did not read the survey items carefully, did not speak English fluently, or hurried through the responses without paying attention. Approximately six percent of the respondents fell in this category, and their surveys were removed, as part of the 235 invalid responses mentioned earlier. Overall, health literacy was high. Forty-two percent scored a perfect 20 of 20. Another 31.5% scored 19 of 20. Very few (7%) scored 16 or lower.

Hospital Choice

Unadjusted rates for selecting hospital 1 across different safety score and price combinations are shown in Table 4. In the first question, where safety score and total price varied, there was less variation in rates of selecting hospital 1 (79%–100%) than there was in question 2 where safety score and OOP cost varied (Table 5). As would be expected, in choices where the total cost was the same for hospital 1 and hospital 2 but hospital 1 had a better safety grade, almost everyone (95.5%–100%) chose hospital 1. When hospital 2 was significantly more expensive than hospital 1, a large majority selected hospital 1 but not quite as frequently as when total costs were equal. When hospital 2 was significantly less expensive than hospital 1, a majority of respondents chose hospital 1, but the rate seems to be sensitive to the magnitude of difference in safety. When comparing an A grade to a B grade, where the B hospital price was half as much as the A hospital, 79% selected A. When comparing an A grade to an F grade, where the F hospital was half as expensive as the A hospital, 91% selected the A hospital.

In the second question regarding hospital choice, a majority of respondents also selected hospital 1 over hospital 2 in all scenarios except one. Of those asked whether they would sacrifice an A grade for a B grade while saving \$1000 in OOP expense, only 39.2% chose hospital 1. In other words, for a difference of \$1000, 60.8% would sacrifice an A for a B. However, larger safety differences reduced the likelihood to choose \$1000 over worse safety. Only 37.5% would sacrifice an A for a C; 26.2% would sacrifice an A for a D; and 10.5% would sacrifice an A for an F. Similarly, 26% would trade a D-rated hospital for an F-rated hospital in to save \$1000. When the OOP costs were the same, 94% to 99% selected the safer hospital. When hospital 2 was both more costly and less safe, 95% to 100% selected the safer, less costly hospital.

TABLE 4. Effect of Hospital Grade Information on Choice by Total Cost

	Safety	Question 1											
		Hospital 2						Hospital 2					
		Price, \$17,500		Price, \$35,000		Price, \$52,500		Price, \$17,500		Price, \$35,000		Price, \$52,500	
Hospital 1 Price, \$35,000	A	B	C	D	F	B	C	D	F	B	C	D	F
	A	79.3%	87.8%	90.1%	91.8%	100.0%	98.8%	98.9%	98.8%	90.9%	85.9%	98.7%	100.0%
	B		86.1%	89.4%	89.7%		96.6%	100.0%	95.5%		92.6%	94.6%	94.0%
	C			93.3%	85.5%			95.5%	100.0%			97.3%	97.3%
	D				88.5%				100.0%				95.7%

TABLE 5. Effect of Hospital Grade Information on Choice by OOP Cost

		Question 2											
		Hospital 2											
		OOP, \$500				OOP, \$1500				OOP, \$3000			
	Safety	B	C	D	F	B	C	D	F	B	C	D	F
Hospital 1 OOP, \$1500	A	39.2%	62.5%	73.8%	89.5%	97.2%	98.6%	94.6%	98.8%	95.1%	97.1%	98.7%	97.1%
	B		51.3%	78.9%	82.9%		97.6%	98.6%	95.6%		96.1%	96.3%	97.5%
	C			70.3%	86.0%			94.0%	93.9%			95.7%	98.6%
	D				74.0%				97.7%				100.0%

Logistic Regression

Models analyzing responses to hospital-choice question 1 (safety and total cost) indicate that safety, differences in safety, and differences in cost all influence likelihood to select hospital 1. Greater differences in safety between hospital 1 and hospital 2, where hospital 2 is always less safe, increased the likelihood of choosing hospital 1. Higher hospital grades in hospital 1 are associated with a lower likelihood of choosing hospital 1. Although seemingly counterintuitive, in combination with grade difference, this indicates that the difference between A and B was weighed less heavily than the difference between D and F. Moreover, an A grade in hospital 1 allows the greatest possible difference score. (Note that the interaction between hospital 1 grade and grade difference was tested and was significant at $P = 0.06$. Thus, it was removed in favor of a simpler model.)

Females were more likely to choose the safer hospital, as were those with higher household income and higher health literacy (scoring a 19 or 20). Age and opinions were not significant. Both cost comparisons were significant, indicating that there was both a significant shopping effect as well as a significant, although smaller, opinion that cost equals quality (Table 6).

TABLE 6. Odds Ratios for Hospital Choice Models

Variable	Total Cost Model Odds Ratio (95% CI)	OOP Cost Model Odds Ratio (95% CI)
Hospital 1 grade	0.78 (0.64–0.94)	0.64 (0.55–0.75)
Difference in grades (hospital 2 – hospital 1)	1.45 (1.19–1.76)	1.94 (1.64–2.30)
Income in thousands	1.01 (1.00–1.01)	1.01 (1.00–1.01)
Female	1.90 (1.34–2.69)	
Hospital 2 cost, \$17,500	0.11 (0.06–0.20)	
Hospital 2 cost, \$52,500	0.27 (0.14–0.53)	
High health literacy	2.68 (1.78–4.04)	1.63 (1.10–2.42)
OOP cost difference		6.13 (4.75–7.90)
Respondent is a value seeker		0.75 (0.65–0.86)

CI, confidence interval.

Based on these results, Figure 2 shows the probability of choosing hospital 1 by total cost of the procedure at hospital 2 and hospital 2 grade, holding hospital 1 grade at A and other variables constant at the mean or most populous category for dummy variables. Figure 3 shows the probability of choosing hospital 1 by hospital 2 grade and literacy, holding other variables constant.

Models analyzing responses to hospital-choice question 2 (safety and OOP cost) indicate that safety score, difference in safety score, and individual price all significantly influence hospital choice. Lower personal cost and better safety both increased the likelihood of selecting hospital 1. In addition, higher income level, health literacy, and disagreement with the statement, “Sometimes, I shop to find the best value in health care” were associated with a greater likelihood of selecting hospital 1. Age, sex, and other opinions were not significant and therefore dropped from the final model.

As was seen with question 1, a larger difference in safety grades was associated with a greater likelihood of selecting hospital 1. Moreover, a higher grade of hospital 1 was associated with a lower likelihood of selecting that hospital, for similar reasons as described earlier. Out-of-pocket cost had a linear effect on likelihood of selecting hospital 1. A higher OOP cost reduced the likelihood of selecting hospital 1.

Based on these results, Figure 4 shows the probability of choosing hospital 1 by hospital 2 grade and OOP cost, holding other variables constant.

DISCUSSION

Given options that include a safety score and cost information, consumers seem to make rational choices that balance price and

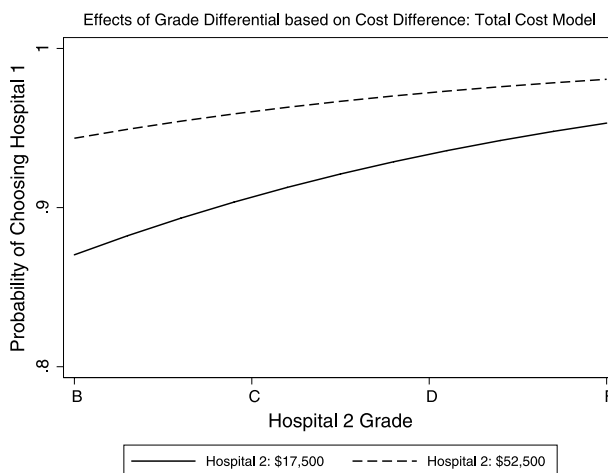


FIGURE 2. Effects of grade differential based on cost difference. Total cost model.

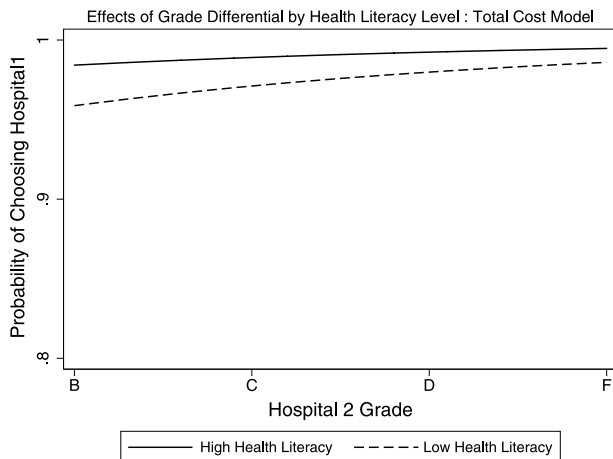


FIGURE 3. Effects of grade differential by health literacy level. Total cost model.

safety. Regardless of personal or overall cost, the vast majority of respondents preferred the safer facility, and larger differences in safety resulted in greater preference. When no difference in total cost existed, virtually all (96%–100%) respondents chose the safer option. When OOP cost was higher and safety was worse, virtually no respondents (0%–6%) chose hospital 2.

Within the OOP question, when given an option to save \$1000 of their own money, a majority (61%) of consumers were likely to sacrifice an A for a B score. Some were willing to sacrifice an A for an even lower score. However, only 20% were willing to sacrifice an A for a B for a difference in overall cost.

In the total cost model, respondents chose hospital 1 an average of 10.3% less often when the cost was \$17,500 lower for hospital 2 compared with when cost was the same, across all safety differences within the total cost question. This can be considered a shopping or value effect, where a lower cost with better safety was considered a better value.

However, respondents also chose hospital 1 an average of 3.7% less often when the total cost was \$17,500 higher for hospital 2 compared with when cost was the same, across all safety differences. This might reflect the perception that higher cost somehow equates to higher quality in some way other than safety score. This effect was significant; however, the likelihood of choosing the safer hospital was still greater than 90% in every case. Given previous evidence that consumers equate high cost with high quality,⁶ one would have expected that, without any information about safety, consumers would choose the highest-cost hospital most often. This did not happen here. This result is especially important for hospital care because inpatient care generally exhausts the deductible, making the OOP cost the same for all hospitals.

Sex and age did not affect hospital choice when OOP cost was part of the decision. However, female respondents weighed safety more strongly in favor of hospital 1 than did male respondents. Whether this reflects women's traditional care-giving role or some other consideration is unclear.

The effect of income in both models suggests some important considerations in transparency efforts. In decisions about OOP cost, it seems logical that the impact of saving \$1000 has more influence over those with lower incomes. In other words, cost differences have a different relative weight compared with safety differences, depending on income. However, the effect of income on total cost considerations is less straightforward. It could

simply reflect a higher cost sensitivity overall, or it could imply a presumed higher cost-sharing although that was not presented in the scenario. Whether it also reflects a different perception of safety by lower-income respondents is unknown.

In summary, hospital safety grades seem to have a far more powerful effect on hospital choice than differences in total cost or OOP costs. However, a large proportion of patients will accept a *small* decrease in hospital safety to save \$1000 OOP, but the acceptability of this safety sacrifice rapidly decreases as the safety rating declines.

Limitations

The results of this survey may not be generalizable to the population at large. Respondents were higher income than the general population, insured (not by Medicaid and/or Medicare), and used the Internet to respond.

Given that 90% of the respondents chose the safer hospital across all scenarios, one can presume a reasonable level of understanding of the choices presented. Nevertheless, survey questions about health and health care choices may not reflect actual choices when consumers are facing a real-life medical procedure. In real choices, safety issues and costs may become less or more important, depending on life circumstances. Thus, results may not accurately reflect true hospital selection.

Similarly, although selected based on typical cost distributions, the cost differences presented in these survey questions may not resemble the types of choices consumers would face in a medical setting. Finally, although wording was constructed to explain the basic premise of hospital safety scores, respondents may or may not have fully understood how the letter grades reflect actual safety risk or doubted that the grades represented actual risk.

CONCLUSIONS

Overall, these findings suggest that the Hospital Safety Score provides a clear and simple indicator that influences hospital choice in a consistent and logical manner. Consumers perceived safety and differences in safety as important in their preferences, with greater safety being the preferred choice in 29 of 30 scenarios. In these hypothetical scenarios, very few respondents would sacrifice large differences in safety to save money.

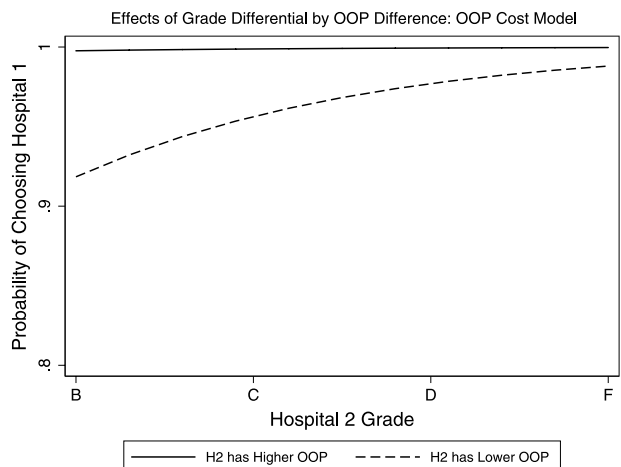


FIGURE 4. Effects of grade differential by OOP difference. OOP cost model.

REFERENCES

1. Centers for Medicare and Medicaid Services. Medicare Provider Charge Data 2013. Database online. Available at: <http://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/medicare-provider-charge-data/index.html>. Accessed May 10, 2013.
2. Catalyst for Payment Reform, Health Care Incentives Improvement Institute. Report Card on State Price Transparency Laws. 2013. Available at: <http://catalyzepaymentreform.org/images/documents/reportcard.pdf>. Accessed June 10, 2013.
3. Pyrellis R. Employees Opening Health Savings Accounts in Record Numbers. *Workforce (Magazine)*. 2013. Available at: <http://www.workforce.com/article/20130506/NEWS02/130509988/employees-opening-health-savings-accounts-in-record-numbers#>. Accessed June 10, 2013.
4. Sinaiko AD, Rosenthal MB. Increased price transparency in health care—challenges and potential effects. *N Engl J Med*. 2011;364:891–894.
5. Waber RL, Shiv B, Carmon Z, et al. Commercial features of placebo and therapeutic efficacy. *JAMA*. 2008;299:1016–1017.
6. Hibbard JH, Greene J, Sofaer S, et al. An experiment shows that a well-designed report on costs and quality can help consumers choose high-value health care. *Health Aff (Millwood)*. 2012;31:560–568.
7. Kaiser Family Foundation. 2008 Update on Consumers' Views of Patient Safety and Quality Information: Summary and Chartpack. October 2008. Available at: <http://kaiserfamilyfoundation.files.wordpress.com/2013/01/7819.pdf>. Accessed June 10, 2013.
8. Faber M, Bosch M, Wollersheim H, et al. Public reporting in health care: how do consumers use quality-of-care information? A systematic review. *Med Care*. 2009;47:1–8.
9. Hibbard JH, Peters E. Supporting informed consumer health care decisions: data presentation approaches that facilitate the use of information in choice. *Annu Rev Public Health*. 2003;24:413–433.
10. Hibbard JH, Greene J, Daniel D. What is quality anyway? Performance reports that clearly communicate to consumers the meaning of quality of care. *Med Care Res Rev*. 2010;67:275–293.
11. Austin JM, D'Andrea G, Birkmeyer JD, et al. Safety in numbers: the development of Leapfrog's composite patient safety score for U.S. hospitals. *J Patient Saf*. 2013. Available at: http://www.hospitalsafetyscore.org/media/file/JournalofPatientSafety_HospitalSafetyScore.pdf. Accessed June 10, 2013.
12. Peters E, Dieckmann N, Dixon A, et al. Less is more in presenting quality information to consumers. *Med Care Res Rev*. 2007;64:169–190.
13. Baker DW, Williams MV, Parker RM, et al. Development of a brief test to measure functional health literacy. *Patient Educ Couns*. 1999;38:33–42.
14. SAS. Version 9.2. Computer program. Cary, NC: SAS Institute Inc; 2011.
15. Stata Statistical Software. Version 11. Computer program. College Station, TX: StataCorp LP; 2009.