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Choosing Doctors Wisely: Can Assisted Choice Enhance Patients' Selection of Clinicians?

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Abstract

We conducted a simulated clinician-choice experiment, comparing choices and decision-making processes of participants (N = 688) randomized among four experimental arms: a conventional website reporting only quantitative performance information, a website reporting both qualitative (patient comments) and quantitative information, the second website augmented by a decision aid (labeling of patient comments), and the decision-aided website further augmented by the presence of a trained navigator. Introducing patient comments enhanced engagement with the quality information but led to a decline in decision quality, particularly the consistency of choices with consumers' stated preferences. Labeling comments helped erase the decline in decision quality, although the highest percentage of preference-congruent choices was seen in the navigator arm. Engagement with the quality information and satisfaction with choices available were likewise highest in the navigator arm. Findings held for high- and low-skilled decision makers. Thus, navigator assistance may be a promising strategy for equitably promoting higher quality choices in information-rich contexts.

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Introduction

Each year, one in five Americans seeks out a new physician, half for primary care and half for specialty treatment (Center for Studying Health System Change, 2012). How this choice plays out has important consequences. When a patient's expectations match a doctor's practice style, the patient's experience and engagement with treatment are enhanced (Fung et al., 2005; Sabbatini et al., 2014). Conversely, failure to select a suitable match can undermine the capacity of clinicians and patients to connect and effectively communicate (Bowling, Rowe, & McKee, 2013; Greenfield et al., 2012; Keitz, Stechuchak, Grambow, Koropchak, & Tulsky, 2007).

As late as 2000, choices about physicians were made almost entirely based on word-of-mouth referrals from family, friends, and other clinicians (Henry J. Kaiser Family Foundation, 2000). Now, thanks to investments by government agencies, multistakeholder health care coalitions, and private entrepreneurs, comparative physician quality information is widely available on the Internet and used by consumers (Findlay, 2016). This information includes both quantitative performance metrics and patients' comments about clinicians (Center for Studying Health System Change, 2012; Santa, D'Alessandro, & Foong, 2013).

Proponents of quality reporting frequently presume that more abundant information yields more informed patient choices and improved clinician–patient matching (Shi, Scanlon, Bhandari, & Christianson, 2017). But research suggests otherwise, even when people want the additional information. First, when faced with too much data, many consumers can feel overwhelmed (Christoph, Tscheulin, Lindenmeier, Drevs, & Seemann, 2014). Those experiencing cognitive "overload" overlook some metrics or provider options entirely. They also fall back on simplistic decision strategies that ignore valued clinician attributes. Second, when information about clinician performance is presented in both qualitative and quantitative formats, many consumers struggle to integrate the strands of information into a coherent whole even more than they do with equally complex information sets that have exclusively one format or the other (Shi et al., 2017).

Narrative comments have been shown to pose a particular challenge when combined with numeric or symbol-based scores (Maciejovsky & Budeson, 2013; Winterbottom, Bekker, Conner, & Mooney, 2008). In a recent investigation, individuals tasked with using information on health-care quality to select a primary care doctor were more engaged by the task when the data included both quantitative scores and patient narratives but found it harder to make a decision and often made poorer choices than when given an equal amount of information presented in a purely quantitative format (Kanouse, Schlesinger, Shaller, Martino, & Rybowski, 2016). These decision challenges are most pronounced for individuals who are facing large choice sets or

have limited evaluative skills (Hanoch, Rice, Cummings, & Wood, 2009; Schlesinger, Kanouse, Martino, Rybowski, & Shaller, 2014).

These impediments to making well-informed decisions are not unique to selecting clinicians. But for other health-related decisions—including selection of insurance plans and medical treatments—we have, as a society, invested in training and deploying individuals to assist with the decision-making process. Support for these roles—variously labeled "decision navigators," "consumer assisters," or "community health workers"—dates back a quarter century and has been embodied in both programs open to all consumers and initiatives targeted to groups most challenged by complex choices (Becker, Kovach, & Gronseth, 2004; Darnell, 2013; Freeman & Rodriguez, 2011).

Navigators have played an important role in the implementation of the new health insurance exchanges under the Patient Protection and Affordable Care Act (PPACA; Grob & Schlesinger, 2015; Sommers, Maylone, Nguyen, Blendon, & Epstein, 2015), although much of this investment in consumer assistance goes unnoticed because it is integrated into institutional arrangements that serve multiple purposes (Becker et al., 2004). For example, a third of those with employer-based insurance seek assistance with health plan choice from the human resources staff in their firm each year, though few if any of these staff would be officially designated "choice navigators" on any organizational chart (Frostin & Elmlinger, 2015). Along with improving supportive caregiving relationships and continuity of care (Freund et al., 2008; Pedersen & Hack, 2010), assisters in their various incarnations consistently enhance patients' choices, particularly when paired with other decision aids (Belkora, Teng, Volz, Loth, & Esserman, 2011; Hacking et al., 2013; Sommers et al., 2015; J. J. Weber, Mascarenhas, Bellin, Raab, & Wong, 2012).

Despite this demonstrated track record improving health care choices, the research reported here is the first to deploy navigators to support and evaluate patients' choice of clinicians. We conducted a simulated clinician-choice experiment, comparing patients' choices and decision making among four experimental arms: (1) a conventional website reporting only comparative quantitative performance information, (2) a website that reported both qualitative (i.e., patient comments) and quantitative performance information, (3) the second website augmented by a decision aid, and (4) this decision-aided website further augmented by the presence of a trained navigator.

The decision aid that we evaluated in Arm 3 involves "tagging" patient comments with short labels conveying the content of comments. These labels provide a basis for sorting or filtering comments according to their content. They also align the content of comments with the quantitative data by using tags designed to call to mind the quantitative metrics, perhaps allowing easier integration of these metrics (Christoph et al., 2014). Though tagging is a common practice in presenting large amounts of narrative data, there is no evidence about how it may affect the processing of multiple patient comments.

We also assessed how the availability of a trained navigator might facilitate consumers' ability to integrate qualitative and quantitative forms of comparative performance information by helping them to better understand the relationship between these forms of information (Donelan et al., 2011). The navigators in this experiment

were trained to replicate the navigator's role for insurance choice in the health exchanges established under the PPACA. That is, they answered consumers' questions about metrics and sources of information but did not advise on which options were the "best" choices (Grob & Schlesinger, 2015).

Based on prior research, we predicted that the inclusion of comments would enhance consumers' engagement with the website but impair their ability to make choices that are consistent with their stated preferences (Kanouse et al., 2016; Schlesinger et al., 2014). Tagging of comments and the availability of a trained navigator were predicted to preserve the enhanced engagement induced by the introduction of comments, while potentially ameliorating some or all the detrimental effects of patient comments on decision making.

Method

Study Participants

Data were collected from a standing Internet panel of more than 60,000 U.S. households, the Knowledge Panel maintained by the research firm GfK. This panel is generally representative of the American public in terms of sociodemographics, Internet usage, and health status (Chang & Krosnick, 2009). Of panelists invited to participate in this study, 52% accepted.

Experimental Design and Procedure

Participants first completed a preliminary survey about their past exposure to comparative quality information, preferences regarding clinicians' attributes, level of consumer activation, and health status. To ensure that these preliminary responses did not bias either their choices of clinicians or their subsequent evaluation of those choices, participants were given a week-long hiatus before being invited back to the web-based experiment. Those who agreed (85.1%; $N = 688$) were randomized among experimental arms (see below) and transferred to a fictitious clinician-choice website where they were asked to select a clinician from 12 options, enough to create complexity without causing unnecessary burden (Kanouse et al., 2016; Schlesinger et al., 2014; Swait & Adamowicz, 2001). This website was accorded high usability ratings by participants in previous experiments: 90% said the site was somewhat easy or very easy to use, and 88% said they would probably or definitely recommend the site to family or friends who were selecting a clinician (Schlesinger et al., 2014).

Participants in Arm 1 (No Comments) were presented with three types of quantitative performance metrics per clinician (clinicians were ordered randomly on the site): (1) ratings from patient experience surveys, (2) clinical indicators of the extent to which the clinician delivered care in accordance with norms of good practice, and (3) the extent to which the clinician's practice adopted safety-enhancing protocols. Each quantified domain was summarized with a single aggregate star rating, with the capacity to "drill-down" to ratings for four component measures. Participants in Arm 2

(Conventional Comments) were presented with all of this same information, plus they were given the ability to read patients' comments about each clinician that were randomly drawn from a pool of real-world comments culled from the Internet and our previous studies. The average emotional valence of these comments (positive vs. negative affect) was matched to their rating from the patient experience survey.

In the assisted-choice arms, participants were exposed to modified versions of the Arm 2 website. In Arm 3 (Tagged Comments), patients' comments on the website were tagged with brief labels (one or more of six) that identified their content. This labeling was meant to facilitate users' assessment of narrative content and integration of the narrative information with the performance scores. Appendix A presents screen shots of the websites seen by participants in Arms 1 to 3. In Arm 4 (Tagged Comments + Navigator), participants saw the same tagged-comment website, but were also linked, by telephone, with a trained assister who could see on their own computer screen what the participant was seeing and answered questions. The navigators were trained to provide passive assistance: They responded to questions about the website but did not initiate advice nor suggest particular options as preferable or particular performance metrics as more or less important. Navigators' interactions with participants were monitored during the early stages of implementation, and periodically thereafter, to ensure that they were abiding by these constraints.

After participants viewed the website and selected a clinician, they were transferred to a postchoice survey, which inquired about their experience on the website, their decision-making process, and their satisfaction with the choices available to them. They were also asked about the attributes of clinicians that had mattered most in their choice. The postchoice survey concluded with a test of general decision-making skills and styles drawn from the psychology literature (Parker, Bruine de Bruin, & Fischhoff, 2007). These data were augmented by (1) tracking data on the time and actions (mouse clicks) of participants when they were on the website and (2) sociodemographic data, collected as part of the panel infrastructure.

Measuring Decision-Making Quality

The decision sciences distinguish between the quality of decision-making processes and the quality of the decisions themselves (Elwyn & Miron-Schtaz, 2009; Hanoch, Wood, Barnes, Lui, & Rice, 2011; Yates & Tschirhart, 2006). Process measures reflect certain fundamental elements relevant in every choice context, whereas decision quality depends on the context for each choice. Five elements of decision-making process that are identified in the literature as particularly relevant to consumer choices in health-care settings include (1) engagement, that is, the extent to which decision makers are paying careful attention to the nuances of their choice (Christoph et al., 2014; Schlesinger et al., 2014); (2) scope of outcomes considered (Christoph et al., 2014; Elwyn & Miron-Schtaz, 2009; Fowler, Levin, & Sepucha, 2011; Hacking et al., 2013); (3) value/preference clarification, reflecting the extent to which the selection process itself helps decision makers learn what they most value (Elwyn & Miron-Schtaz, 2009; Hacking, Scott, Wallace, Shepherd, & Belkora, 2014; Sepucha et al., 2013); (4)

Table 1. Categories and Measures of Decision-Making Quality.

Categories of decision quality		Identified in literature on: Decisional navigators	Clinical decision aids	Insurance choices	Decision sciences	Specific measures
Quality of decision-making process	Engagement	×	×		×	Time deliberating
						Number of actions on website
						Satisfaction with the website
	Considering full scope of outcomes			×	×	Number of metrics considered
	Values/preference clarification	×	×		×	Ease trading-off among metrics
	Information acquisition	×	×		×	Able to find information on website
	Information comprehension			×	×	Ease understanding metrics
Quality of decision itself	Preference-congruent choices		×	×	×	Match of clinician choice on website with favored clinician attributes
	Satisfaction with choice architecture	×		×	×	Satisfaction with choice of clinicians available

information acquisition, defined as the ability of decision makers to find information relevant to the aspects of choice they value most (Kurtzman & Greene, 2016; Piper, 2014; Sepucha et al., 2013; Sick & Abraham, 2011); and (5) information comprehension, which is a product of the decision makers' ability to evaluate the meaning and import of available information for their own choices (Christoph et al., 2014; Finucane, Mertz, Slovic, & Schmidt, 2005). These measures have been deployed unevenly across studies of different health-care choices (Table 1).

The literature also suggests two distinct ways of assessing the quality of decisions themselves: based on the decision makers' own subjective assessments (e.g., satisfaction with choice or choice architecture; Thaler & Sunstein, 2008) or using objective measures of decision quality, such as preference-congruent choices (e.g., whether observed choices match attributes consumers report valuing; Hanoch et al., 2009; Kurtzman & Greene, 2016; Sepucha et al., 2013). In this study, we use objective measure of the quality of the decision itself and a subjective measure of the choice architecture, as well as measures for each of the five elements of the decision-making process identified above.

We used data from the postchoice survey and tracking data to construct measures of each domain of decision-making quality listed in Table 1. A detailed description of each measure can be found in Appendix B. Engagement was assessed using three measures: the length of time and number of concrete actions (i.e., mouse clicks) on the website, as well as whether participants would recommend a site like this one to family and friends who were choosing a doctor (Findlay, 2016). Scope of outcomes considered by respondents was assessed by asking respondents which dimensions of performance information they considered in making a decision (even if they did not necessarily use the dimension when making their final selection). We used this information to distinguish participants who considered only a subset of the available information from those who considered all of the available information, thus avoiding the sort of tunnel vision that often accompanies cognitive overload (Christoph et al., 2014; Kurtzman & Greene, 2016; Schlesinger et al., 2014).

To evaluate values/preference clarification, participants were asked in the postexperiment survey how easy it was to make trade-offs among the three quantitative dimensions of performance (e.g., "How easy or difficult was it for you to tell if it was worth it to choose a doctor highly rated on patient surveys, if that meant giving up a doctor who used the most effective treatments?"; Lichtenstein & Slovic, 2006; Tetlock, Kristel, Elson, Green, & Lerner, 2000; E. U. Weber, Baron, & Loomes, 2001). We averaged participants' responses to these four questions ($\alpha = .84$) and distinguished participants who reported that, on average, it was "very" or "somewhat" easy to make trade-offs among all three performance metrics from those who reported that, on average, it was "neither easy nor difficult," "somewhat difficult," or "very difficult" to make trade-offs.

Respondents' ability to extract the most relevant information from the website was assessed using two approaches. First, we created an "information acquisition" measure by asking respondents to identify from a list the three attributes of clinicians (e.g., bedside manner, safety, and technical quality of care provided by the doctor) that were most important to them when choosing a doctor and then to rate how well they were able to tell which doctors on the website excelled in these areas. We averaged these ratings for the three attributes identified by a respondent as most important to them to create a single index of ease of finding relevant information on the website. For making cross-arm comparisons, we calculated the percentage of participants in each arm who said they had, on average, "a good sense" of which doctors excelled in personally relevant areas of performance. Our second approach was to create an "information comprehension" measure based on respondents' reported ability to understand the three star-rated metrics presented on the website. For making cross-arm comparisons, we calculated the percentage of participants in each arm who indicated that it was, on average, very or somewhat easy to identify the best clinicians using the three metrics.

Consistent with the extant literature, we constructed both objective and subjective measures of decision quality. The objective measure was based on preference congruence: whether respondents who identified one of the performance dimensions as being among their top attributes of a preferred clinician actually selected a doctor on the website who was highly rated (four or five stars; on each dimension there were two doctors

who met this criterion) on that metric. This congruence measure was constructed using the preferences expressed on the postchoice survey to allow for learning from the website (Fowler et al., 2011). The subjective measure reflected respondents' reported satisfaction with the choice architecture presented to them (Belkora et al., 2011).

Respondent Characteristics Related to Decision-Making Quality

To assess whether decision-support interventions are most usefully deployed if targeted at particular "high-risk" subgroups, it is useful to identify subsets of participants who might find complex health-care choices particularly challenging. The study collected data on an array of relevant attributes, including sociodemographics, past exposure to comparative performance data on clinicians, and measures of consumerism (patient activation, decision-making skills, and decision-making styles). Although these measures are not that closely related to one another (first-order correlations of 0.10-0.20), their relationship with decision-making quality tends to be quite similar; thus, we report here one illustrative attribute: decision-making skill. This was assessed with a choice task (Bruine de Bruin, Parker, & Fischhoff, 2007) placed at the end of the postchoice survey. Respondents were asked to apply four decision rules to a choice set for which each rule had an unambiguously correct answer: decision-making skill was measured by the number of rules successfully applied (0-4).

Analytic Approach

Univariate statistical methods (i.e., chi-square tests for categorical variables and *F* tests for continuous variables) were used to test for statistically significant differences ($p < .05$, two-sided) across experimental arms. When an omnibus test revealed a statistically significant difference across arms, we followed it up with tests of all pairwise comparisons among the experimental arms.

To assess whether consumer assistance and decision aids of the sort tested in this study are particularly (or only) useful for consumers with limited decision-making skills, we used multivariable regression to predict each of our outcomes from experimental arm, decision skill, and the interaction of these two variables. We used the navigator arm as the reference category for experimental arm so that we could directly test whether decision skill moderated the impact of introducing a navigator. For these regression analyses, we categorized respondents into those with high decision skills (correct answers on 3-4 questions from the skill-assessment exercise; 40% of the sample) and those with lower skills. Because decision skill was not under our experimental control (unlike study arm), we controlled for other respondent attributes (i.e., demographic characteristics and self-rated health) that are known to be related to choice processes and outcomes.

Results

As is evident from Table 2, our sample was slightly older, more likely to be White, and less likely to be in excellent health than the general public. Characteristics were

Table 2. Sample Characteristics in Each Experimental Arm.

Respondent characteristics	Experimental arm					
	No comments (%) (*n* = 175)	Conventional comments (%) (*n* = 176)	Tagged comments (%) (*n* = 179)	Tagged comments + navigator (%) (*n* = 158)	*p* value for omnibus chi-square test	Percent of adults in U.S. Population (2010)[a]
Demographics						
Age (years)						
18-29	14.3	13.6	14.0	12.0	.89	23.1
30-44	19.4	22.2	20.7	22.8		24.1
45-60	30.9	30.1	29.1	29.8		25.1
>60	35.4	35.4	36.3	35.4		27.7
Race/ethnicity						
White	79.4	78.4	74.3	79.8	.08	69.6
African American	7.4	4.6	10.1	7.0		11.2
Latino	3.3	3.4	5.0	8.2		12.7
Other	9.7	13.6	10.6	5.1		6.5
Education						
High school or less	35.3	31.1	38.5	26.7	.47	44.1
Some college	25.7	27.8	25.1	28.5		25.9
College graduate	40.0	40.9	36.3	44.9		29.9
Health status						
Chronic health problems						
Yes	42.9	47.2	46.4	51.9	.43	45.7
Self-reported health						
Fair/poor	11.5	14.8	8.9	12.7	.05	12.9
Good	33.7	28.4	40.2	33.5		26.7
Very good/ excellent	54.8	56.8	54.9	53.8		60.3

[a]Population demographic information is from the 2012 U.S. Census. Population information on chronic health problems and self-reported health is from the National Health Interview Survey (Blackwell, Lucas, & Clarke, 2014; Ward, Schiller, & Goodman, 2014).

generally balanced across the three experimental arms, though the tagged comment arm had relatively fewer minority respondents who judged themselves to be in fair or poor health.

Impact of Comments and Decision Support on the Quality of Patients' Selection of Clinicians

Overall, patients tended to be satisfied with the website (75% said they would recommend the site to others who were choosing a doctor) and report that the metrics on the site were easy to understand (70%). However, less than half the sample (46%) said that it was easy to make trade-offs among the metrics included on the site and more than two thirds selected clinicians who were inconsistent with their stated preferences.

Table 3. Impact of Comments and Support on Quality of Decision Making in Patients' Choice of Clinician.

Domains of decision making	Measured in study by	Experimental arm				*p* value for omnibus chi-square or *F* test
		No comments	Conventional comments	Tagged comments	Tagged comments + navigator	
Engagement	Time deliberating (no. of seconds)	365_a	438_b	541_b	790_c	<.01
	Active exploring of website (no. of actions)	13.9_a	19.1_b	18.8_b	29.3_c	<.01
	Satisfaction with website (% recommend)	70.3_a	77.1_a	71.5_a	84.8_b	.02
Scope of outcomes considered	Considered all quality metrics (% all)	61.1	59.1	52.0	63.9	.13
Values/ preference clarification	Ease of making trade-offs (% easy)	46.3	40.1	30.7	37.8	.47
Information acquisition	Able to find relevant information on site (% yes, top 3 clinician attributes)	54.0_a	51.3_a	43.7_b	61.6_c	<.01
Information comprehension	Ease of understanding metrics (% easy, safety metrics)	71.8	64.4	69.6	76.4	.34
Preference-congruent choices	Match of clinician choice with preferences (% matching)	33.7_a	21.6_b	30.2_a	36.7_a	.01
Satisfaction with choice architecture	Satisfaction with choice of clinicians available (% very or somewhat)	79.3_{ab}	74.1_a	74.4_a	83.5_b	.04

Note. Means/percentages sharing the same subscript are not significantly different ($p < .05$) from one another. Pairwise comparisons were only conducted when the omnibus chi-square test was significant ($p < .05$).

The design and content of the website had little evident impact on the scope of outcomes considered, ease of making trade-offs, and consumers' ability to understand particular quality metrics (all *p* values for the omnibus test of cross-arm differences ≥0.13; see Table 3). As we found in our previous research, however, introducing patient comments to the website—in any format—substantially enhanced patient engagement with the quality information in terms of time spent deliberating and the number of actions taken on the website. Tagging comments did not enhance engagement beyond what was observed in the conventional comments condition. Engagement was highest among participants in the navigator condition, who not only spent the

most time deliberating and exploring the website but also expressed the highest satisfaction with the website.

Unexpectedly, tagging comments led to a decline in participants' ability to find relevant information on the website (vs. having no comments or comments without labels), but having a navigator present more than compensated for this decrement. In fact, a far greater percentage of participants in this arm (62%) said that they were able to find relevant information in the website than in any other arm (percentages for the other arms ranged from 44% to 54%).

As we found in our previous research, the introduction of patient comments was associated with a significant decline in decision quality, particularly the consistency of choices with consumers' expressed preferences. Tagging comments helped erase this decline in decision quality, but the highest percentage of preference-congruent choices (37%) was observed in the navigator arm. Likewise, participants' satisfaction with the choices available to them on the website was highest in the navigator arm.

Does Decision Support Work Equally Well for Patients More or Less Skilled in Making Choices?

The only outcome for which decision skill was a significant predictor was the scope of outcomes considered in the choice of a clinician—more skilled consumers were more likely to make use of all available metrics ($p = .02$). None of the coefficients for the 18 interaction terms (six outcome measures for which we found statistically significant cross-arm differences × Three experimental arms) were statistically significant. The results of these fully powered regression analyses suggest that the benefits of navigators—as well as the benefits and costs of including patient comments—apply equally to high- and low-skilled decision makers. This is also evident from a more granular, but less statistically powerful analysis in which we simply split the sample into those with high and low decision skills and conducted all pairwise comparisons by arm for all six outcomes for which we found statistically significant cross-arm differences. Means and percentages for all six outcomes by level of decision skill (high vs. low) are presented in Table 4.

Discussion

Our findings suggest that having navigators present enhances patients' ability to select among clinicians. Having this type of support seems to protect against the choice overload that results from the introduction of patient comments (and is not ameliorated by labeling comments) in a way that is effective even for consumers who are relatively skillful in comparing and selecting goods and services, a pattern consistent with previous studies assessing other forms of decision assistance (Hacking et al., 2014; Sick & Abraham, 2011). That said, it should be recognized that even under the most supportive circumstances for informed decision making, many consumers struggle to understand quality metrics, have difficulty making trade-offs among valued attributes, and

Table 4. Impact of Comments and Support on Quality of Decision Making in Patients' Choice of Clinician, Stratified by Decision-Making Skills.

Measure	Experimental arm			
	No comments	Conventional comments	Tagged comments	Tagged comments + navigator
Time deliberating (no. of seconds)				
Respondents with below-average decision skills	309_{a}	440_{b}	541_{b}	737_{c}
Respondents with above-average decision skills	333_{a}	434_{a}	512_{b}	860_{c}
Active exploration of website (no. of actions)				
Respondents with below-average decision skills	12.5_{a}	18.1_{a}	19.1_{a}	29.4_{b}
Respondents with above-average decision skills	13.9_{a}	20.6_{a}	18.3_{a}	29.1_{b}
Satisfaction with website (% recommend)				
Respondents with below-average decision skills	69.1_{a}	78.2_{ab}	69.4_{a}	82.0_{b}
Respondents with above-average decision skills	72.3_{a}	75.7_{a}	75.8_{a}	85.1_{b}
Able to find relevant information on site				
Respondents with below-average decision skills	55.6_{a}	53.2_{a}	45.7_{b}	60.6_{c}
Respondents with above-average decision skills	52.0_{a}	48.6_{a}	39.7_{b}	62.9_{c}
Match of clinician choice with preferences (% yes, top 3 clinician attributes)				
Respondents with below-average decision skills	35.5_{ab}	25.5_{a}	29.7_{a}	38.9_{b}
Respondents with above-average decision skills	32.3_{a}	16.2_{b}	31.8_{a}	34.3_{a}
Satisfaction with choice of clinicians available (% very or somewhat)				
Respondents with below-average decision skills	83.2_{a}	75.2_{ab}	72.1_{b}	85.6_{a}
Respondents with above-average decision skills	73.8_{a}	72.6_{a}	71.4_{a}	82.1_{a}

Note. Means/percentages within the same row sharing the same subscript are not significantly different ($p < .05$) from one another.

make choices that can be at odds with their expressed preferences. Effective choice in health care is difficult. There are ways to lessen those difficulties, but no known way to eliminate them.

The persistence of these findings across both objective and subjective measures of choice make it unlikely that the more positive results simply reflect respondents' feelings of indebtedness to their personal assister. Nonetheless, there is much more to be learned about how and why navigators affect the selection of clinicians. Having an

assister might encourage consumers to be more attentive to choices simply because they are feeling "observed" (Zajonc, 1965). Or it may increase their confidence in their ability to handle the task (Reed, Mikels, & Löckenhoff, 2012) and embolden them to explore data more thoroughly.

One limitation of our experimental design is that we did not include a condition in which navigators were paired with untagged comments or with no comments. Thus, we cannot tell if navigators are useful to decision-makers independent of the type of performance data under consideration or if they are useful only in counteracting the drawbacks of including patient narratives alongside quantitative performance metrics. If patient narratives continue to gain prominence as a way to convey information about health care quality, then disentangling the effects of navigators and narratives becomes less important. If enthusiasm for narratives recedes, however, knowing whether navigators confer a benefit that is independent of narratives becomes vital.

Our design also prevented us from examining some important aspects of decision making—most consequentially, consistency, another marker deployed by decision scientists for identifying well-considered choices (Hacking et al., 2014; Parker & Fischhoff, 2005). Assessing consistency requires observing multiple choices over time. Extending the design to collect such data would also allow for assessment of whether some consumers, with or without navigators, come to regard their earlier decisions as insufficiently well considered and thus regrettable (Hacking et al., 2013; Hacking et al., 2014). Extending the study of navigators in the future to real-world settings would make these sorts of longitudinal assessments feasible. It would also facilitate discernment of whether navigators have more or less value when consumers can revisit websites multiple times, learning how to use them and interpolating the information with input from other sources such as friends, family, and other clinicians.

Despite these limitations, our findings suggest that having navigators available to assist with choice may help retain the benefit of enhanced engagement that comes with the inclusion of narrative comments, while protecting against the erosion of consumers' ability to make choices that are consistent with their expressed preferences, another consequence of including narratives on comparative quality websites (compare Arms 1 and 2 in Table 3). Indeed, introducing comments accompanied by navigators enhanced engagement even more than including comments on their own—and by quite a substantial margin. For example, although time on the website increased by 50% when comments were integrated into the website, it more than doubled when a navigator was introduced to the decision-making process. This was generally *not* because consumers were taking time to interact with the navigators, since the vast majority of these interactions were very brief. But being "accompanied" seemed to empower consumers to explore more of the information on the website.

Even if the benefits are evident, however, the question remains whether policy makers (public and private) would willingly invest the resources necessary to support a broad-based infrastructure of consumer assistance to support patient choice. It is not yet clear how large an investment this would take. The interactions between

consumers and navigators that we observed in this experiment suggest that the time commitments for each case would be modest; the navigators in the experiment for the most part were there "on call" should website users have questions rather than active participants in the decision-making process. These were, however, hypothetical choices; real-world decisions have far higher stakes and might require more active assistance.

Would *any* broad-based level of investment be feasible, in a health care system that is struggling to cut costs? That is difficult to judge; some existing circumstances seemingly hold promise, whereas others raise doubts. On the positive side, the magnitude of our current investment in public and private settings to support other forms of health-related choices, such as choice among health insurance plans, is far more substantial than is commonly recognized. For example, we estimate that resources devoted to support health plan choice alone are on the order of $2 to $3 billion annually (see Appendix C). On the other hand, these investments have proven politically controversial, even among elected officials who are purportedly proponents of market-oriented health care reforms (Hackman, 2017).

These political tensions intensified in the fall of 2017, when the Trump administration cut funding for ACA navigators on the grounds that past investments had done little to expand enrollment (Jost, 2017). Whether or not this critique was accurate, it largely ignored navigators' potential for improving consumer choice (Jost, 2017). Evidence on the decision-making benefits of navigators, such as that presented above, could provide an alternative rationale for public financing. Whether that rationale will prove influential depends on how much health policy is actually shaped by evidence in the current era of partisan policy discord (Gerber & Patashnik, 2010).

It is difficult to anticipate how these cross-cutting influences and pressures might play out. But even if support for assistance with choice of doctors lagged behind support for assistance with plan choice, there is clearly precedent in both public and private sectors to make *some* level of investment to support better-informed choices. Once made, these preliminary investments could serve as a test bed for better assessing impact and, at least in principle, potentially set the stage for further investments in the future.

Conclusion

Consumers are, and will be, increasingly choosing clinicians in environments rich with comparative performance information (Holliday, Kachalia, Meyer, & Sequist, 2017; Lagu et al., 2017). Though these choices are not irreversible, they do tend to lock patients into relationships, out of both habit and a desire to maintain continuity of care (Schlesinger, Druss, & Thomas, 1999). These choices also matter for patients' engagement with and experiences of care.

The burdens of complex information make it tempting to simplify websites by omitting information like patient comments. But restrictions of this sort may be

neither feasible nor desirable. Feasibility seems questionable because comments have become a part of virtually all consumer-facing quality websites reporting clinician information (Lagu et al., 2017), simply because consumers find these narratives appealing and engaging (Holliday et al., 2017). Nor would restrictions on public reporting of narratives be desirable, because they are essential for conveying certain aspects of patient experience that are not reliably measured through close-ended questions on conventional patient experience surveys (Schlesinger et al., 2015). It therefore seems a worthy ambition to design interventions that facilitate carefully considered, better-informed choices that integrate multiple forms of quality information. Consumer assistance in the form of navigators may be an especially promising strategy for equitably promoting higher quality choices, particularly, if the value of such assistance is shown to exceed the cost of providing it.

Appendix A

Data Displays Seen by Participants in the No Comments, Conventional Comments, and Tagged Comments Study Arms

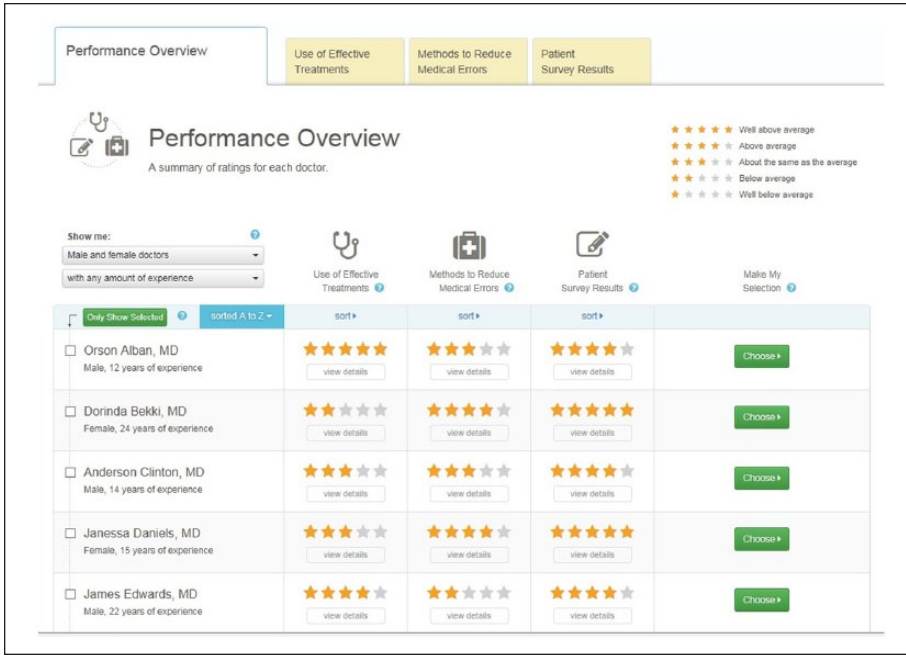

Figure A1. Overview page, SelectMD, No Comments Arm.

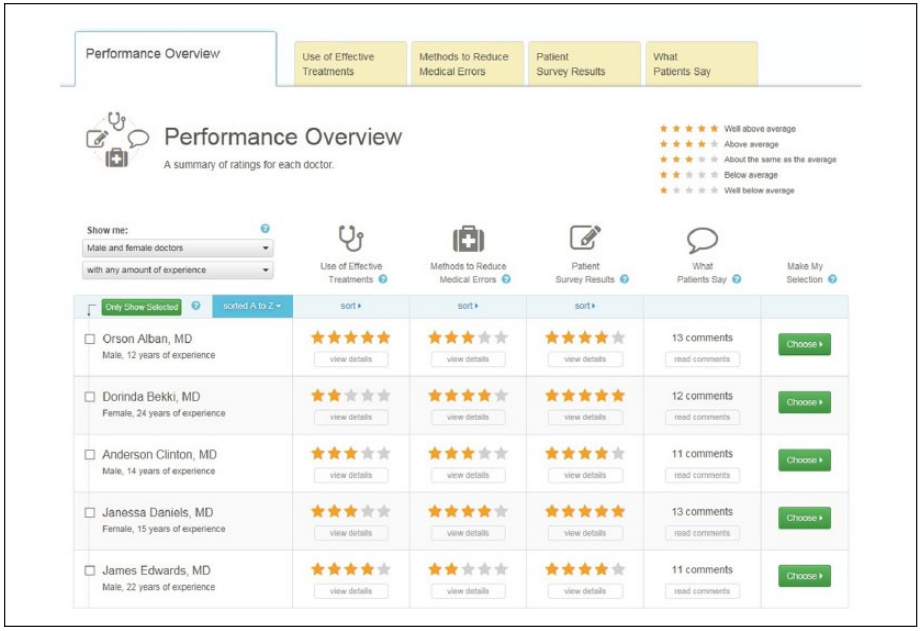

Figure A2. Overview page, SelectMD, Conventional Comments Arm.

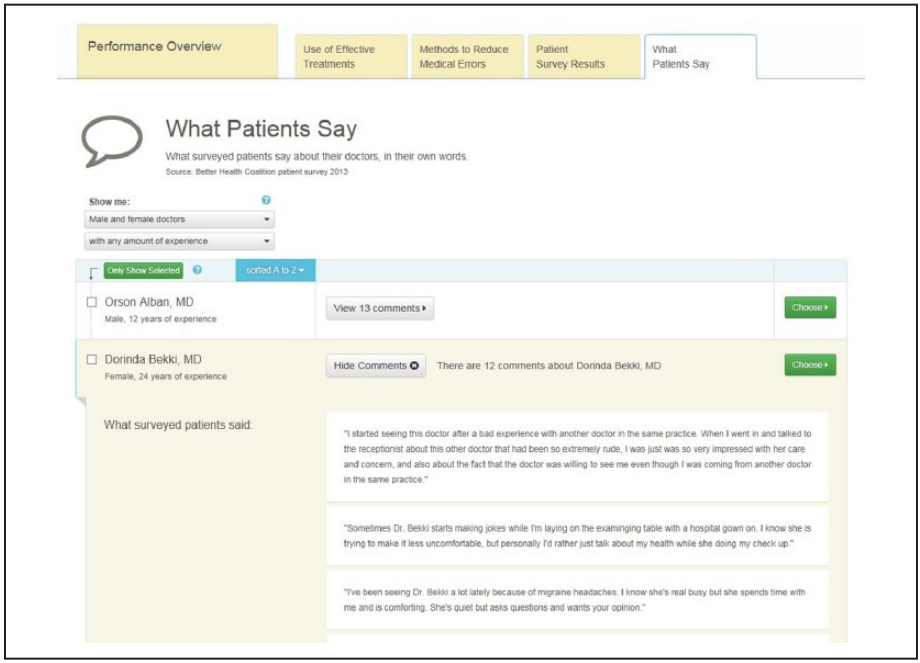

Figure A3. Comments display, SelectMD, Conventional Comments Arm.

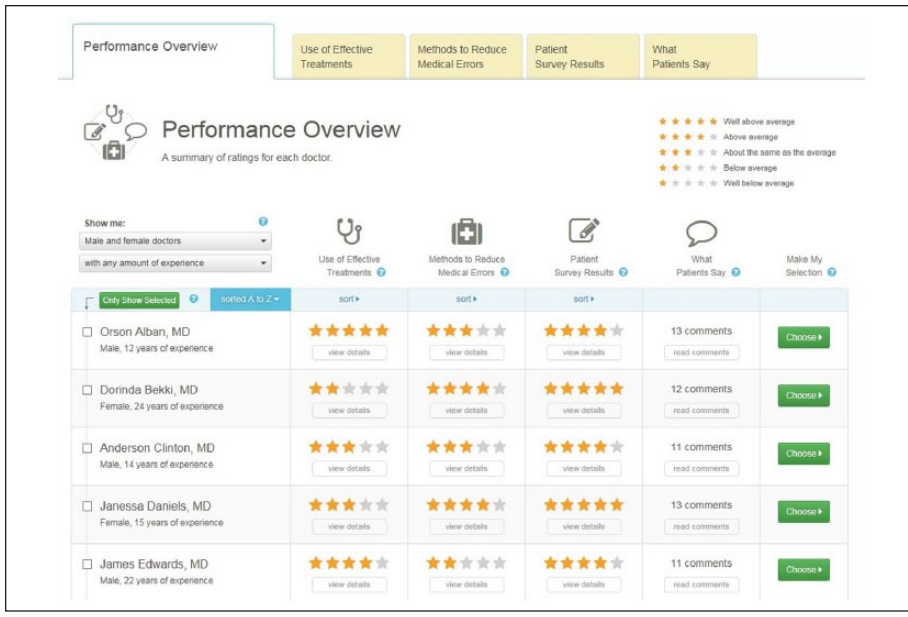

Figure A4. Overview page, SelectMD, Tagged Comments Arm.

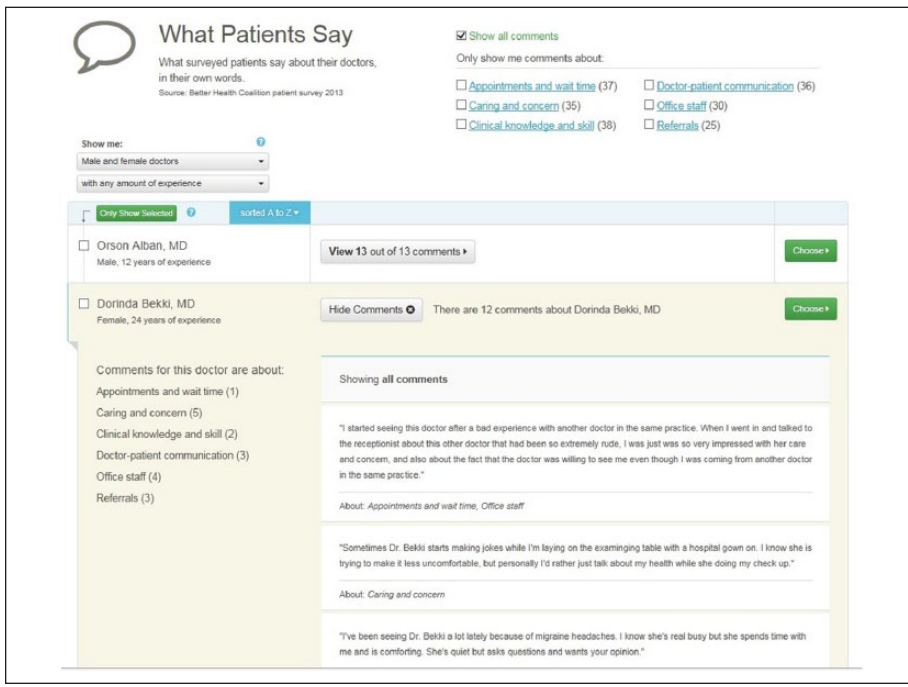

Figure A5. Comments display, SelectMD, Tagged Comments Arm.

Appendix B

Detailed Description of Outcome Measures Included in the Analysis

Measure	Source	Exact question wording and response options	Scoring
Time deliberating	Tracking data	n/a	Number of seconds that participants spent on the website prior to choosing a clinician
Active exploration of website	Tracking data	n/a	Total number of mouse clicks made while on the website
Satisfaction with website	Postchoice survey	"Would you recommend that your friends and family use a website like this one when they make their own choices about a primary care doctor (definitely not recommend, probably not recommend, not sure, probably recommend, definitely recommend)?"	Participants who responded "probably recommend" or "definitely recommend" were given a score of 1; all other participants were given a score of 0.
Considered all quality metrics	Postchoice survey	Which of the following describes how you choice a doctor on this website: I picked the doctor who seemed most likable to me; I focused on the one quality rating that seemed most important to me; I searched for a doctor who was good enough, rather than trying to figure out who was the best; I tried to take all of the ratings into account; I figured out how much each quality rating mattered to me, then chose a doctor based on the ratings that seemed most important; None of the above (I went about choosing in a different way)?	Participants who responded "I tried to take all of the ratings into account were given a score of 1; all other participants were given a score of 0.
Ease of making trade-offs	Postchoice survey	"It can be difficult to choose among doctors who are highly rated on some measures of quality but not others. How easy or difficult was it to choose a doctor highly rated for reducing medical errors if that meant giving up a doctor who used the most effective treatments? How easy or difficult was it to choose a doctor highly rated for reducing medical errors if that meant giving up a doctor highly rated on their patient surveys? How easy or difficult was it to choose a doctor highly rated on patient surveys if that meant giving up a doctor who used the most effective treatments?" Each of these three items was rated on the following response scale: very difficult [1], somewhat difficult [2], neither easy nor difficult [3], somewhat easy [4], very easy [5].	The three measures were averaged to produce a single index of ease of making trade-offs. For Table 3, percentages shown are the proportion of respondents with average scores of 4 (somewhat easy) or higher.

(continued)

Appendix B (continued)

Measure	Source	Exact question wording and response options	Scoring
Able to find relevant information on site	Postchoice survey	"When you selected a doctor on the website, how much did each of these factors matter to you: reputation (recommendation by others), bedside manner (warmth, caring, good listener), time availability (not rushed during visits), patient complaints (few complaints or malpractice charges), treatment orientation (how aggressively treats illness), trustworthy (choices on behalf of patient, not insurer), proximity (close to home or work), safety (avoiding medical errors), technical quality (gives patients best treatments and tests), office staff (friendly, courteous, helpful)." Participants rated each item on the following response scale: did not matter, mattered a little, mattered a lot. For all attributes rated as mattering a lot, participants were asked to select the three factors that mattered the most. For each of these three factors that mattered the most, participants were asked, "Based on the website that you just visited, how well were you able to tell which doctors were best in this regard (could not judge this [coded 0], had some sense of this [coded 0.5], had a good sense of this [coded 1]).	The three measures were averaged to produce a single index of ability to find relevant information on the site. For Table 3, percentages shown are the proportion of respondents with average scores of 0.66 or higher, that is, those who reported, on average, a greater ability to judge than "had some sense of this."
Ease of understanding metrics	Postchoice survey	• This question is about surveys of patient experiences with their care, their doctors, and doctors' office staff. These scores come from a survey of a scientific sample of each doctor's patients. Do you remember seeing this information (yes, no)?" If yes, "How easy or difficult was it to tell which doctors were best using this information: very difficult [1], somewhat difficult [2], neither easy nor difficult [3], somewhat easy [4], very easy [5]? • This question is about information on how often a doctor provides the most effective treatments and preventive care. This information comes from records of the care that doctors have provided to patients with certain common medical conditions. Do you remember seeing this information (yes, no)?" If yes, "How easy or difficult was it to tell which doctors were best using this information (very difficult, somewhat difficult, neither easy or difficult, somewhat easy, very easy)?"	The three measures were averaged to produce a single index of ease of understanding metrics. For Table 3, percentages shown are the proportion of respondents with average scores of 4 (somewhat easy) or higher.

(continued)

Appendix B (continued)

Measure	Source	Exact question wording and response options	Scoring
		• This question is about information on how successful a doctor is in reducing medical errors. This type of information comes from the doctor's practice. Do you remember seeing this information (yes, no)?" If yes, "How easy or difficult was it to tell which doctors were best using this information (very difficult, somewhat difficult, neither easy or difficult, somewhat easy, very easy)?"	
Match of clinician choice with preferences	Tracking data and postchoice survey	For each of the three star-rated attributes reported on the website, we identified whether the respondent viewed that attribute as important in their choice of a physician. If they did, their choice was identified as preference-congruent if they selected a clinician who was rated four stars or higher on that attribute.[a]	For Table 3, the percentages shown represent the proportion of MD attributes identified by respondents as important for which the selected clinician was rated four stars or higher on the website.
Satisfaction with choice of clinicians available	Postchoice survey	How satisfied were you with the choice of doctors available to you? (very dissatisfied [1], somewhat dissatisfied [2], neither satisfied nor dissatisfied [3], somewhat satisfied [4], very satisfied [5])	For Table 3, the percentages shown represent the proportion of patients who were very or somewhat satisfied (scores or 4 or above)

Note. n/a = not applicable.
[a]Similar indices were constructed using five stars as the congruence criterion. Results from that analysis are similar to the ones reported in the article.

Appendix C

Estimates of Past Investments in the Role of Navigators for Health Insurance Choices

Assessing the scale of investment in supporting choice among health plans is challenging for several reasons. First, resources are typically allocated (in both public and private settings) to activities involving assistance for both enrollment and choice, that is, for considering one's health plan options and then completing the paperwork to obtain coverage. Once people are enrolled, these same assisters often help enrollees who are confused about their benefits, have had claims denied by the insurer, or are dealing with coverage limitations (Grob & Schlesinger, 2015; Gurley-Calvez, Pellillo, Fitzgerald, & Walsh, 2011). In both contexts, assistance with choice is a part of the deliberation but not the only role that assisters are serving. Second, although it is feasible to construct reasonably complete assessments of the public (tax-financed) dollars devoted to assistance, it is far more difficult to measure the private resources devoted to health plan choice, either the funding that private foundations contribute to complement public funding for insurance navigators or the activities of human resource administrators to

support choice among employer-based insurance options. Finally, even when the formal expectations for navigators are to assist with choice of insurers, they sometimes broaden their help to include choice of providers because their clients are seen to need this sort of guidance for their insurance to be useful. For example, in recent media coverage of the future of federal funding for insurance navigators under the PPACA, a manager in a federally funded navigator program emphasized the significance of the navigator role by noting that "people don't know how to find a doctor or make an appointment" (Hackman, 2017).

Public-Sector Investments. During the initial 3 years of implementation for the health insurance exchange established under the PPACA, the federal government devoted roughly $450 million annually to support insurance navigators (Pollitz, Tolbert, & Semanskee, 2016). In addition, the federal government has, since the mid-1990s, devoted funds to support assistance of Medicare enrollees choosing among coverage options at the rate of roughly $50 million annually. Support for insurance choice among Medicaid beneficiaries is more difficult to estimate because the program is administered at the state level with considerable variation in practices. But extrapolating from states where enrollment and plan choice investment have been itemized suggests that roughly $300 million per year is devoted to these forms of insurance assistance (Kincheloe, Frates, & Brown, 2007). This totals to $800 million each year, supporting the choices of roughly 140 million Americans (Gurley-Calvez et al., 2011). About one third of those selecting a health plan in these public-sector contexts made use of a navigator or comparable form of direct assistance (Blavin, Zuckerman, & Karpman, 2014).

Private-Sector Investments. Funding from private foundations often supplements public financing of insurance navigators. The magnitude of private supplementation is difficult to assess, as it often involves in-kind contributions of staff time. But estimates place this investment at roughly 20% to 30% of public-sector spending (Kincheloe et al., 2007; Pollitz et al., 2016). That brings the total financing for insurance choice navigators in the public sector (Medicare, Medicaid, ACA insurance exchanges) to $1 billion dollars per year. The rest of the insured public is covered by private insurance, typically through employer-based coverage. When these individuals seek assistance with health plan choices, they turn to their human resources (HR) department. Although the total resources committed are unknown, surveys indicate that a third of all employees during a given year had consulted with HR staff for assistance with health insurance choices (Frostin & Elmlinger, 2015). That translates into assistance for 65 million individuals annually.

A reasonable estimate for the total public- and private-sector resources devoted to assisting consumers with choices among health insurance plans might therefore be on the order of $2 to 3 billion annually.

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